



**Water for the Future Program:
Upstate Water Supply Resiliency**

Draft Scope of Work

CEQR No. 15DEP006U

Prepared by New York City Department of Environmental Protection
Commissioner **Emily Lloyd**
Lead Agency Contact Angela Licata
Deputy Commissioner of Sustainability
New York City Department of Environmental Protection
59-17 Junction Boulevard
Flushing, NY 11373
(718) 595-4413

October 2014

**Water for the Future: Upstate Water Supply Resiliency
DEIS
Draft Scope of Work**

Prepared for:



October 2014

Water for the Future:
Upstate Water Supply Resiliency DEIS
Draft Scope of Work

October 10, 2014

CEQR No: 15DEP006U

Lead Agency: **New York City Department of Environmental Protection**

Commissioner: **Emily Lloyd**

Lead Agency Contact: Angela Licata
Deputy Commissioner of Sustainability
New York City Department of Environmental Protection
59-17 Junction Boulevard
Flushing, NY 11373
(718) 595-3287

Preparers: **New York City Department of Environmental Protection**
Bureau of Environmental Planning and Analysis

HDR
711 Westchester Avenue
White Plains, NY 10604

Hazen and Sawyer
498 Seventh Avenue, 11th Floor
New York, NY 10018

Table of Contents

CHAPTER 1: INTRODUCTION.....	1
1.1 Overview of Water for the Future.....	1
1.2 Upstate Water Supply Resiliency	3
1.2.1 Catskill Aqueduct Repair and Rehabilitation Project	3
1.2.2 Water for the Future Shutdown System Operations	3
1.2.3 Rondout-West Branch Tunnel Inspection and Repair	3
1.3 In-City Water Supply Resiliency	4
1.3.1 Queens Groundwater Rehabilitation Project	4
1.4 Organization of the Draft Scope of Work.....	5
CHAPTER 2: PURPOSE AND NEED FOR WATER FOR THE FUTURE	6
CHAPTER 3: ENVIRONMENTAL REVIEW APPROACH.....	7
3.1 Environmental Review Procedure: New York State and New York City Environmental Quality Review	8
3.2 Public Outreach Process and Coordination with Local Municipalities.....	8
CHAPTER 4: OVERVIEW OF THE DRAFT SCOPE OF WORK	10
CHAPTER 5: WATER FOR THE FUTURE PLANNING AND IMPLEMENTATION SCHEDULE.....	12
5.1 Water for the Future Planning Background.....	12
5.2 Water for the Future Implementation Timeline	12
CHAPTER 6: THE WATER SUPPLY SYSTEM.....	14
6.1 Surface Water Supply System Overview	14
6.2 Surface Water Supply System Operation.....	15
6.3 Delaware Water Supply System Overview.....	16
6.4 Catskill Water Supply System Overview.....	17
6.5 Croton Water Supply System Overview.....	18
6.6 Queens Groundwater System Overview.....	18
CHAPTER 7: WATER SUPPLY SYSTEM PROGRAMS AND PROJECTS INDEPENDENT OF WATER FOR THE FUTURE.....	19
7.1 Demand Management.....	19
7.2 Shaft 4 Interconnection	20
7.3 Croton Water Filtration Plant.....	20

7.4	Cross River and Croton Falls Pump Stations	20
CHAPTER 8: DESCRIPTION OF WATER FOR THE FUTURE.....		22
8.1	Upstate Water Supply Resiliency	22
8.1.1	Proposed Catskill Aqueduct Repair and Rehabilitation.....	22
8.1.2	Proposed Water for the Future Shutdown System Operations	25
8.1.3	Proposed Rondout-West Branch Tunnel Inspection and Repair	27
8.2	Proposed In-City Water Supply Resiliency.....	29
CHAPTER 9: POTENTIAL MAJOR DISCRETIONARY APPROVALS, COORDINATION, AND CONSULTATIONS		30
CHAPTER 10: ORGANIZATION AND SCOPE OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT.....		32
10.1	DEIS Executive Summary.....	33
10.2	DEIS Chapter 1: Introduction.....	33
10.3	DEIS Chapter 2: Program Description.....	34
10.4	DEIS Chapter 3: Purpose and Need for the Proposed Upstate Water Supply Resiliency Project.....	34
10.5	DEIS Chapter 4: Water Supply System.....	34
10.6	DEIS Chapter 5: Water for the Future Planning and Implementation Schedule..	34
10.7	DEIS Chapter 6: Description of Proposed Upstate Water Supply Resiliency Project.....	34
10.8	DEIS Chapter 7: Potential Major Discretionary Approvals, Coordination, and Consultations.....	34
10.9	DEIS Chapter 8: Analytical Framework for the Draft Environmental Impact Statement	35
10.10	DEIS Chapter 9: Proposed Catskill Aqueduct Repair and Rehabilitation	38
10.10.1	Proposed Catskill Aqueduct Repair and Rehabilitation Overview.....	38
10.10.2	Schedule.....	38
10.10.3	General Design Features of Proposed Catskill Aqueduct Repair and Rehabilitation Project	38
10.10.4	Proposed Catskill Aqueduct Repair and Rehabilitation Project Impact Methodology and Assessment	41
10.10.5	Proposed Catskill Aqueduct Repair and Rehabilitation Impact Assessment.....	42
10.10.6	Mitigation.....	51
10.11	DEIS Chapter 10: Proposed Water for the Future Shutdown System Operations	51
10.11.1	Proposed Water for the Future Shutdown System Operations Overview.....	51
10.11.2	Schedule.....	54
10.11.3	General Design Features of Proposed Water for the Future Shutdown System Operations	54

10.11.4	Proposed Water for the Future Shutdown System Operations: Delaware System Description	54
10.11.5	Proposed Water for the Future Shutdown System Operations: Delaware System Impact Methodology and Assessment	55
10.11.6	Proposed Water for the Future Shutdown System Operations: Delaware System Impact Assessment.....	55
10.11.7	Mitigation.....	64
10.11.8	Proposed Water for the Future Shutdown System Operations: Catskill and Croton Systems Description.....	64
10.11.9	Proposed Water for the Future Shutdown System Operations: Catskill and Croton Systems Impact Methodology and Assessment.....	64
10.11.10	Proposed Water for the Future Shutdown System Operations: Catskill and Croton Systems Impact Assessment	65
10.11.11	Mitigation.....	74
10.12	DEIS Chapter 11: Proposed Rondout-West Branch Tunnel Inspection and Repair.....	74
10.12.1	Proposed Rondout-West Branch Tunnel Inspection and Repair Overview.....	74
10.12.2	Schedule.....	76
10.12.3	General Design Features of the Proposed Rondout-West Branch Tunnel Inspection and Repair Project	76
10.12.4	Proposed Rondout-West Branch Tunnel Inspection and Repair Impact Methodology and Assessment	77
10.12.5	Proposed Rondout-West Branch Tunnel Inspection and Repair Impact Assessment.....	78
10.12.6	Proposed Decommissioning Impact Methodology and Assessment	85
10.12.7	Proposed Decommissioning Impact Assessment.....	86
10.12.8	Mitigation.....	93
10.13	DEIS Chapter 12: Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project.....	93
10.13.1	Overview.....	93
10.13.2	Potential Cumulative Impacts Analyses	94
10.14	DEIS Chapter 13: Mitigation.....	95
10.15	DEIS Chapter 14: Alternatives Analysis	95
10.16	DEIS Chapter 15: Unavoidable Adverse Impacts	96
10.17	DEIS Chapter 16: Irreversible and Irretrievable Commitment of Resources.....	96
10.18	Technical Appendices	96

List of Acronyms

Alum	Aluminum Sulfate
CATIC	Catskill Influent Chamber
CEA	Critical Environmental Areas
CEQR	City Environmental Quality Review
DEIS	Draft Environmental Impact Statement
DEP	Department of Environmental Protection
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
GHG	Green House Gases
LWRP	Local Waterfront Revitalization Programs
mgd	million gallons per day
MSGP	Multisector General Permit
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NYC	New York City
NYCDOH	New York City Department of Health
NYCDOHMH	New York City Department of Health and Mental Hygiene
NYNHP	New York Natural Heritage Program
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OPRHP	Office of Parks, Recreation, and Historic Preservation
PCE	Passenger Car Equivalents
REC	Rondout Effluent Chamber
RWBT	Rondout-West Branch Tunnel
SASS	Scenic Areas of Statewide Significance
SCFWH	Significant Coastal Fish and Wildlife Habitats
SEQRA	State Environmental Quality Review Act
SERP	State Environmental Review Process
SPDES	State Pollutant Discharge Elimination System
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile organic chemical
WSSO	WFF Shutdown System Operations

List of Figures

	<u>Following page</u>
Figure 1-1: Water Supply System Map	1
Figure 1-2: Delaware Aqueduct Rondout-West Branch Tunnel Location and Bypass	2
Figure 1-3: Water for the Future Program Overview	2
Figure 1-4: Proposed Catskill Aqueduct Repair and Rehabilitation.....	3
Figure 1-5: Proposed Rondout-West Branch Tunnel Inspection and Repair	3
Figure 5-1: Water for the Future Major Milestones Schedule	13
Figure 6-1: Delaware and Catskill Water Supply Systems.....	15
Figure 6-2: Croton Water Supply System.....	15
Figure 6-3: Queens Aquifers.....	18
Figure 8-1: Proposed Chlorination System at Ashokan Reservoir Screen Chamber Building.....	23
Figure 8-2: Proposed Dechlorination System at Pleasantville Treatment Facility	23
Figure 8-3: WSSO Rondout Reservoir Siphons Rendering.....	25
Figure 8-4: Rondout-West Branch Tunnel: Decommissioned Segment and Bypass Tunnel.....	28
Figure 10-1: Approximate Location of Ashokan Screen Chamber Study Area	42
Figure 10-2: Approximate Location of Vly Atwood Road Study Area.....	42
Figure 10-3: Approximate Location of Pine Bush Road Study Area	42
Figure 10-4: Approximate Location of Warrens Way Study Area.....	42
Figure 10-5: Approximate Location of Canal Road Study Area	42
Figure 10-6: Approximate Location of Lower Knolls Road Study Area	42
Figure 10-7: Approximate Location of New Paltz-Minnewaska Road Study Area	42
Figure 10-8: Approximate Location of Forest Glen Road Study Area.....	42
Figure 10-9: Approximate Location of Le Fevre Lane Study Area.....	42
Figure 10-10: Approximate Location of Strawridge Road Study Area.....	42
Figure 10-11: Approximate Location of Passaro Drive Study Area.....	42
Figure 10-12: Approximate Location of Sprout Brook Road Study Area.....	42
Figure 10-13: Approximate Location of Oregon Road Study Area	42
Figure 10-14: Approximate Location of Chapman Road Study Area	42
Figure 10-15: Approximate Location of Croton Dam Road Study Area.....	42
Figure 10-16: Approximate Location of Kitchawan Road Study Area	42
Figure 10-17: Approximate Location of Station Place Study Area.....	42
Figure 10-18: Approximate Location of Chappaqua Road Study Area	42
Figure 10-19: Approximate Location of Pleasantville Treatment Facility Study Area.....	42

Figure 10-20: Approximate Location of WFF Shutdown System Operations: Delaware and Catskill Water Supply Systems Study Areas	53
Figure 10-21: Approximate Location of WFF Shutdown System Operations: Croton Water Supply System Study Areas.....	53
Figure 10-22: Approximate Location of Rondout Effluent Chamber Study Area	78
Figure 10-23: Approximate Location of Shaft 1 Study Area	78
Figure 10-24: Approximate Location of Shaft 2A Study Area.....	78
Figure 10-25: Approximate Location of Shaft 4 Study Area	78
Figure 10-26: Approximate Location of Shaft 8 Study Area	78
Figure 10-27: Approximate Location of Shaft 9 Study Area	78
Figure 10-28: Approximate Location of Roseton Study Area.....	78

List of Tables

Table 4-1: Summary of WFF Program Components and Supporting Independent DEP Projects and Environmental Review Status.....	10
Table 9-1: Summary of Potential Discretionary Permits, Approvals, and Consultations for Upstate Water Supply Resiliency	31
Table 10-1: Summary of Analyses of Proposed Upstate Water Supply Resiliency Project Component to be Presented in the DEIS	37
Table 10-2: Proposed Catskill Aqueduct Repair and Rehabilitation Study Areas and Work Activities.....	39
Table 10-3: Water Supply System Reservoirs and Receiving Waterbodies	52
Table 10-4: Proposed RWBT Inspection and Repair Project Study Areas.....	75

Chapter 1: Introduction

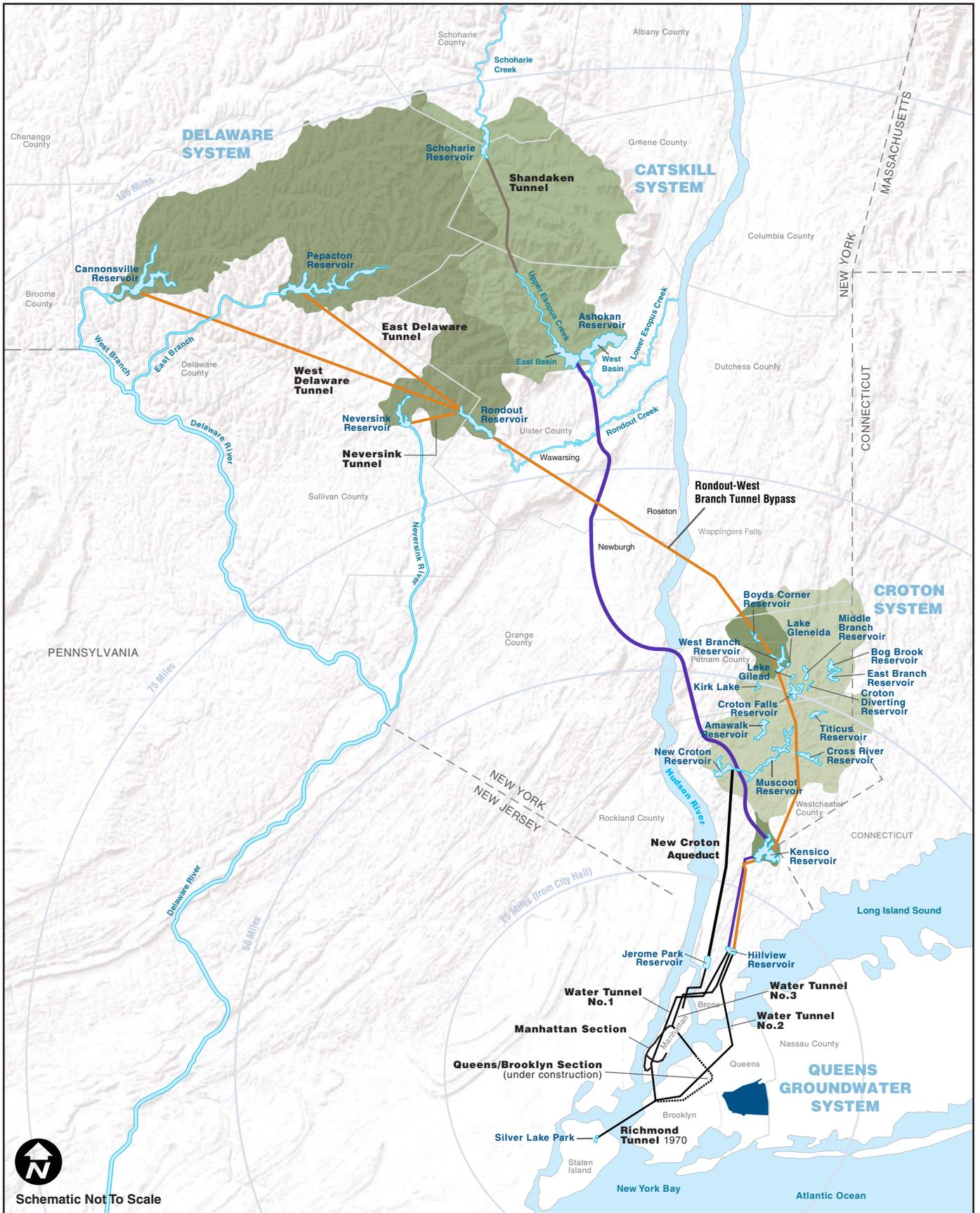
1.1 OVERVIEW OF WATER FOR THE FUTURE

The vast and complex New York City (City) water supply system was originally developed through the visionary planning of those who understood the importance of delivering an abundant and reliable supply of clean drinking water to the City. Described in greater detail in Chapter 6, “The Water Supply System” of this Draft Scope of Work (draft scope), the system was designed in the early 1800s, and has been able to expand, adapt, and modernize to keep pace with a growing population because City leaders have continued to follow the precedent set by early planning pioneers. Today, the City’s Department of Environmental Protection (DEP) is responsible for supplying clean drinking water to over eight million City residents and one million upstate customers in sufficient quantity to meet present water demands, and to maintain the water supply system to meet future water demands. This is achieved through careful and coordinated management of the City’s three surface water supply systems: the Catskill, Delaware, and Croton Systems (see **Figure 1-1**). Recognizing the need to protect the long-term viability and overall resilience of the water supply system, the City continues to make systematic and sustained investments in the critical infrastructure that provides water to approximately nine million people each day.

DEP developed the Water for the Future program (WFF) to address significant leakage in one of its most critical pieces of water supply infrastructure: the Delaware Aqueduct. The Delaware Aqueduct has been in operation since the 1940s and transports water a distance of approximately 85 miles from the Delaware water supply system. The Delaware water supply system is the source of approximately 50 percent of the City’s water supply. The Delaware Aqueduct is comprised of several segments, the longest of which is the Rondout-West Branch Tunnel (RWBT) that connects the Delaware water supply system’s Rondout Reservoir, located in Ulster and Sullivan Counties, New York, to the West Branch Reservoir in Putnam County, New York (see Figure 1-1). Repairing the RWBT is necessary for the City to continue to meet its water supply obligations, as it is the City’s only direct conduit to the source waters of the Delaware water supply system west of the Hudson River.¹

The RWBT segment of the Delaware Aqueduct is leaking up to 35 million gallons per day (mgd), primarily in the area known as the Roseton crossing under the Town of Newburgh, Orange County, New York; a second leaking section is located near the Town of Wawarsing, Ulster County, New York.

¹ In addition to the RWBT, critical segments of the Delaware Aqueduct include those between West Branch and Kensico Reservoirs and between Kensico Reservoir and the City’s distribution system.



Map Source: PlaNYC



Schematic Not To Scale

- Delaware Aqueduct
- Catskill Aqueduct
- Delaware System
- Catskill System
- Croton System
- Queens Groundwater System

To address these leaks, an iterative planning process involving complex modeling and considerations for both repair time and cost was undertaken to determine the optimal method of repair, as described later in Chapter 5, “Water for the Future Planning and Implementation Schedule.” As a result of this planning process, DEP elected to construct a bypass tunnel and two associated shafts to permanently circumvent the leaking section at the Roseton crossing, and to conduct internal repairs to the section in Wawarsing. The work undertaken to circumvent the leaking section in the Roseton crossing areas is referred to as “RWBT Bypass” (see **Figure 1-2**). The RWBT Bypass work was previously evaluated in a Final Environmental Impact Statement (FEIS) issued on May 18, 2012, and work on this project has commenced.

Once the bypass tunnel and shafts are completed in 2022, the RWBT would be temporarily shut down and drained to connect the bypass tunnel to the existing RWBT and to carry out internal repairs to the leaking section of the existing RWBT in Wawarsing. DEP estimates that the maximum shutdown duration would be approximately eight months. During this temporary shutdown of the RWBT, water from the Delaware System west of the Hudson River would be unavailable. To ensure the continued supply of clean drinking water during this time, DEP has developed projects and plans comprised of three main components: (1) supply augmentation consisting of rehabilitation of the Catskill Aqueduct and rehabilitation of groundwater supply stations in Queens; (2) WFF Shutdown System Operations,² which would allow DEP to rely more heavily on the Catskill and Croton Systems during the temporary shutdown; and (3) RWBT Inspection and Repair during connection of the bypass tunnel, including decommissioning the bypassed section of the RWBT.

The subject of this draft scope and the Draft Environmental Impact Statement (DEIS) is the rehabilitation of the Catskill Aqueduct, WFF Shutdown System Operations, and RWBT Inspection and Repair. These components are collectively referred to as Upstate Water Supply Resiliency in this draft scope and DEIS. The Queens Groundwater Rehabilitation project is referred to as In-City Water Supply Resiliency, which will be the subject of a subsequent EIS.

Separate environmental reviews of the Upstate and In-City Water Supply Resiliency components are appropriate because the actions have independent utility and, as discussed in detail below, their potential for impacts are entirely independent and would occur in entirely distinct locations and distinct watersheds that are not hydrologically connected. Each of these environmental reviews, like the May 2012 FEIS, will consider any potential cumulative impacts with the other components of WFF, to the extent possible based on available information. As anticipated in the May 2012 FEIS for the RWBT Bypass, environmental review of these components of the Water for the Future program is being completed as sufficient information is available to undertake the necessary analyses.

An overview of WFF (RWBT Bypass, Upstate Water Supply Resiliency, and In-City Water Supply Resiliency) is presented in **Figure 1-3** and described in greater detail below.

² DEP frequently modifies its operation of the water supply system for many reasons, in response to a variety of conditions, as routine management that would not be subject to environmental review under SEQRA or CEQR. In contrast, “WFF Shutdown System Operations” as analyzed in this environmental review refers to a specific and highly unusual protocol for operating the system designed solely for purposes of Upstate Water Supply Resiliency in connection with the Water for the Future program.

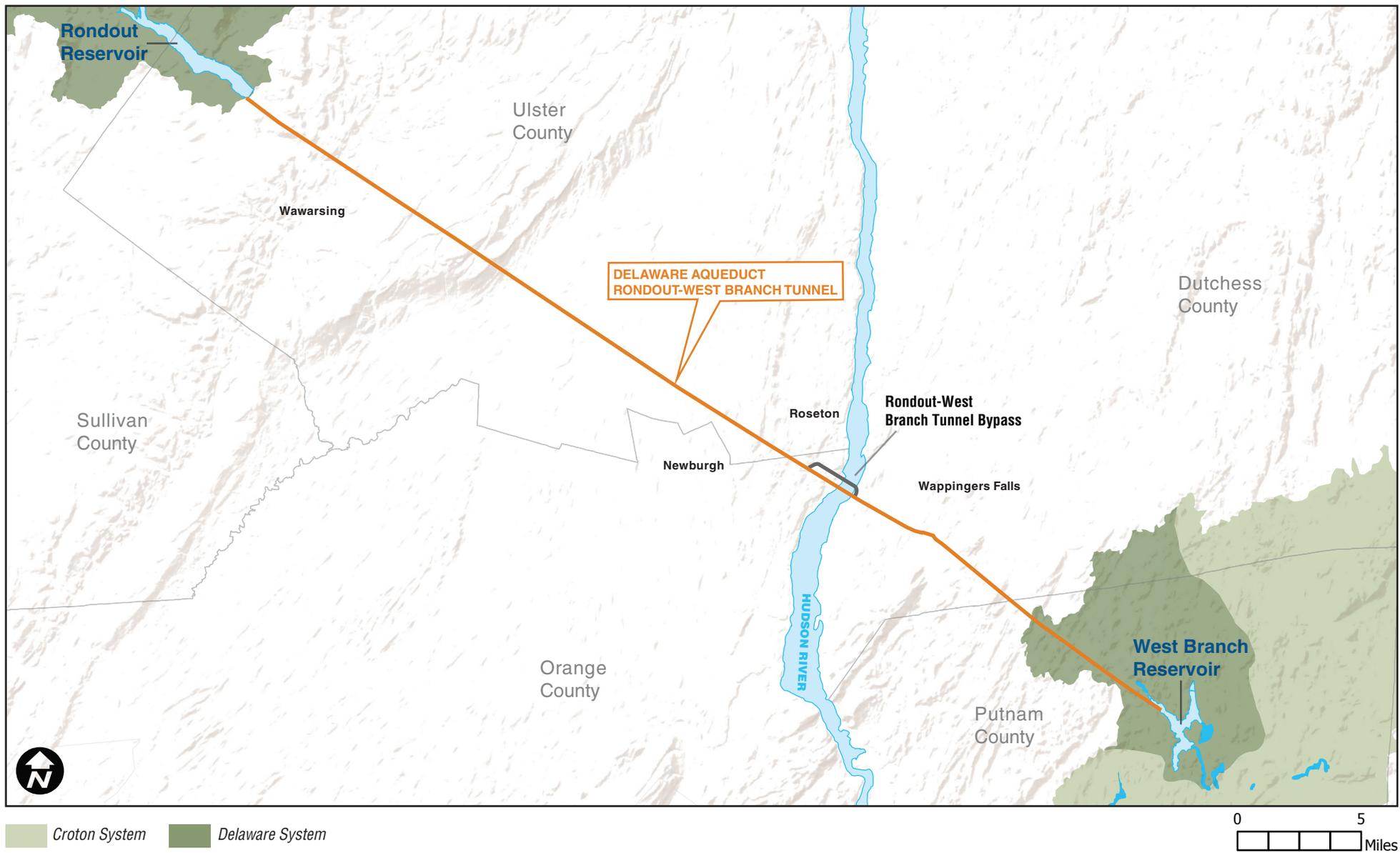
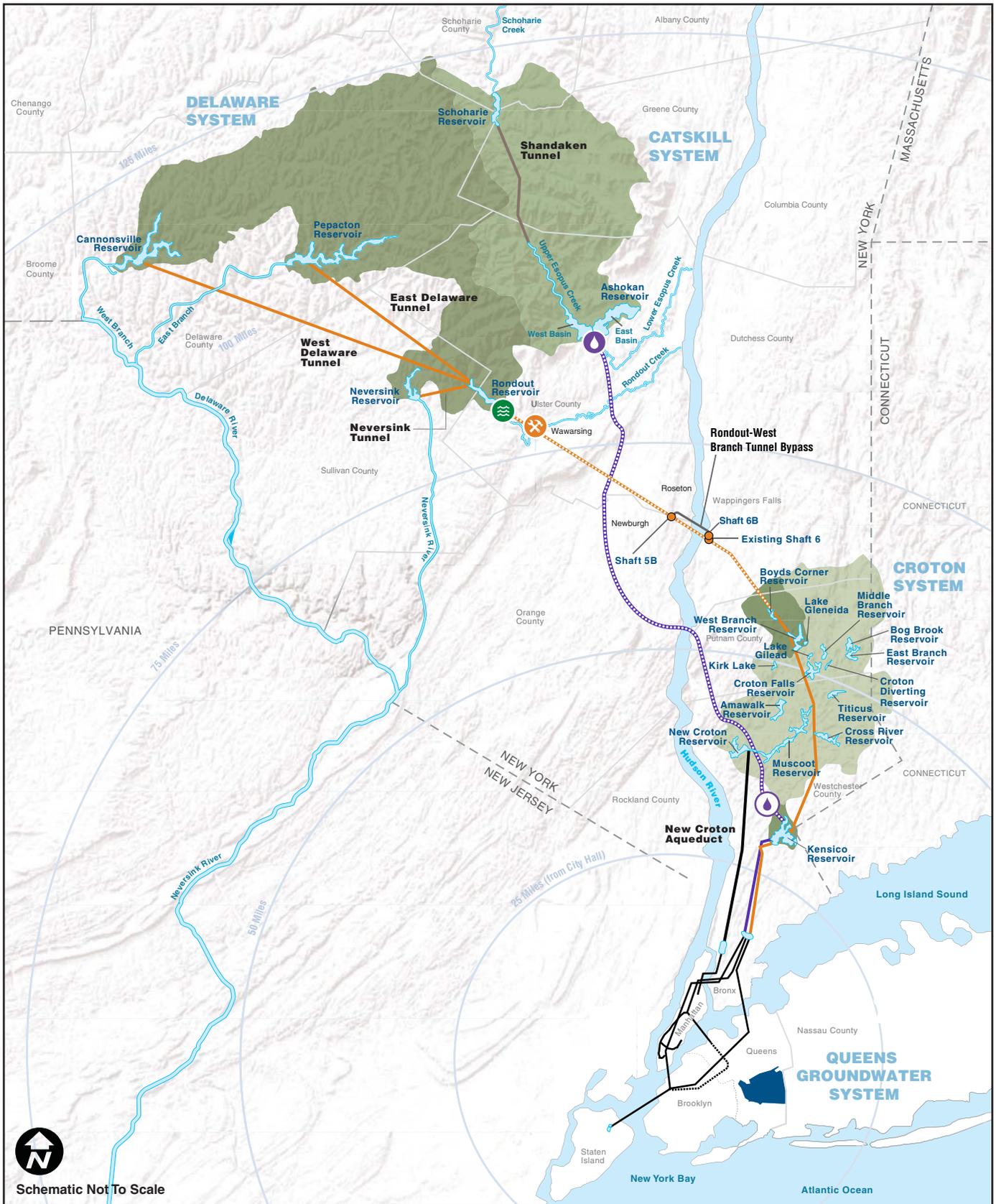


Figure 1-2
Delaware Aqueduct Rondout-West Branch Tunnel Location and Bypass



Map Source: PlaNYC



Schematic Not To Scale

- Delaware Aqueduct
- Catskill Aqueduct
- ⊙ Proposed Pleasantville Treatment Facility
- ⊙ Proposed Chlorination System at Ashokan Screen Chamber
- ⊙ Proposed Rondout Reservoir Siphons
- ⊗ Proposed Rondout-West Branch Tunnel Inspection and Repair
- ⊗ Proposed Catskill Aqueduct Repair and Rehabilitation
- ⊗ Proposed Rondout-West Branch Tunnel Repairs
- Queens Groundwater System



Figure 1-3
Water For The Future Program Overview

1.2 UPSTATE WATER SUPPLY RESILIENCY

1.2.1 CATSKILL AQUEDUCT REPAIR AND REHABILITATION PROJECT

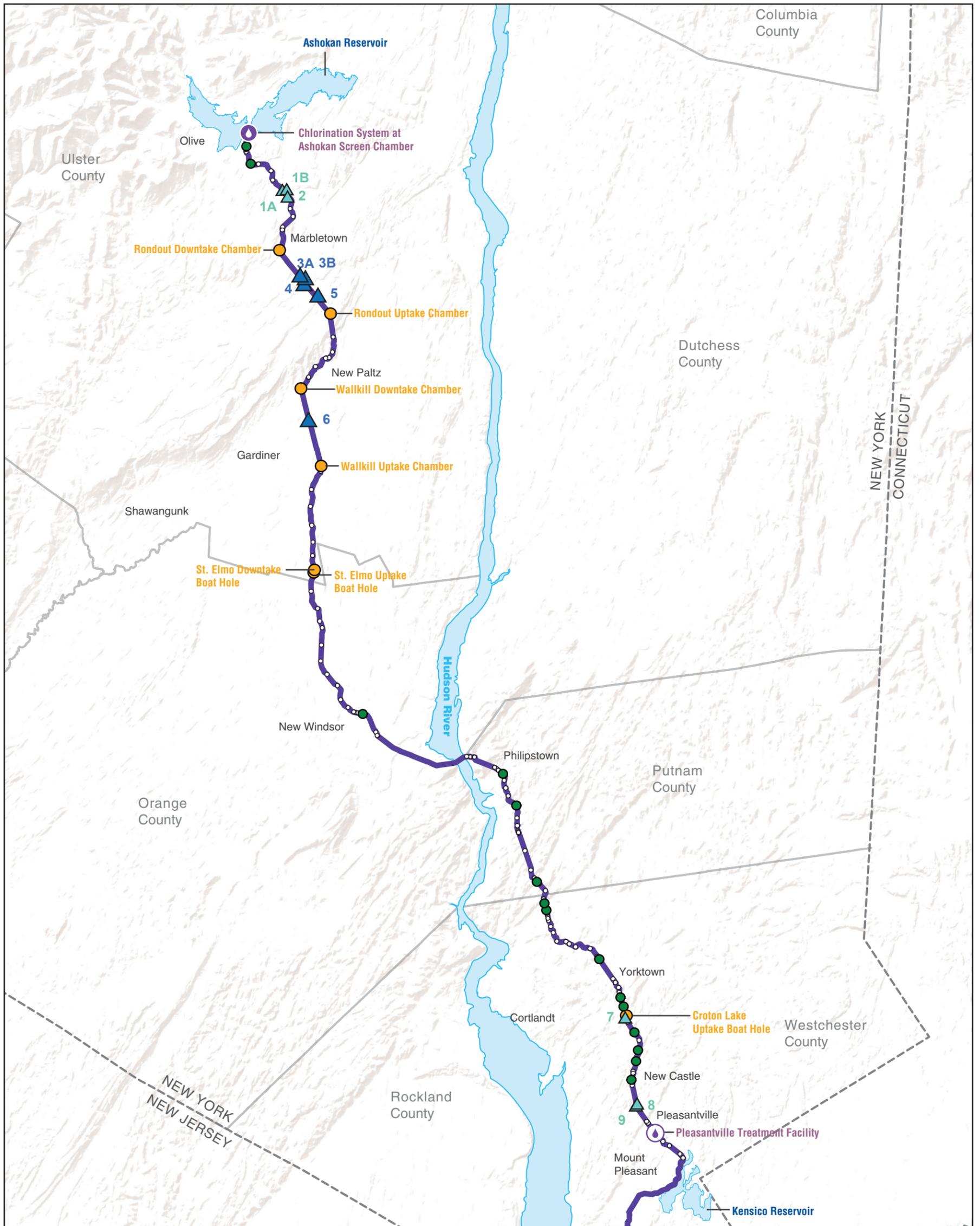
The proposed Catskill Aqueduct Repair and Rehabilitation would restore historical capacity to the upper portion of the Catskill Aqueduct between the Ashokan and Kensico Reservoirs. In addition, the Catskill Aqueduct Repair and Rehabilitation project would carry out additional repairs necessary as a result of age-related deterioration of the aqueduct, including repair or treatment of minor leaks and replacement of aging mechanical components. This would be coupled with temporary chlorine addition at the Ashokan Screen Chamber, located at the head of the Catskill Aqueduct, to maintain increased capacity; water would be dechlorinated before entering Kensico Reservoir (see **Figure 1-4**).

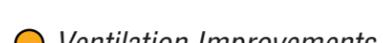
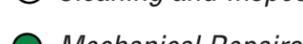
1.2.2 WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS

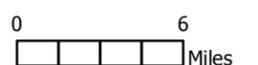
Once the augmentation program is in place, DEP would be ready to implement an operational protocol, referred to as WFF Shutdown System Operations (WSSO), during the temporary (eight-month) shutdown of the RWBT, which departs from DEP's normal operation of the Delaware, Catskill, and Croton Systems. The purpose of WSSO would be to: (1) prepare the water supply for the temporary shutdown of the RWBT; (2) continue to provide water to all upstate and in-city customers while the Delaware water supply is temporarily unavailable; and (3) return the system to normal operating conditions once the bypass tunnel connection is complete and the Delaware water supply system is again available. WSSO would substantially reduce the need for additional augmented supplies of water.

1.2.3 RONDOUT-WEST BRANCH TUNNEL INSPECTION AND REPAIR

In addition to supporting the connection of the bypass tunnel to the RWBT, WSSO program elements described above would allow DEP to completely drain and inspect the approximately 45-mile length of the RWBT and make necessary repairs (RWBT Inspection and Repair) during the shutdown (see **Figure 1-5**). Once RWBT repairs are completed and the bypass tunnel is successfully connected, the bypassed section of the RWBT that passes under the Hudson River would be plugged with concrete at either end of the bypass tunnel connection points and permanently taken out of service (decommissioning). As a result, water currently leaking from the RWBT is expected to permanently cease. Once repairs are complete, the water supply system would then return to normal operating conditions.



-  Proposed Pleasantville Treatment Facility
-  Proposed Chlorination System at Ashokan Screen Chamber
-  Leak - Repair
-  Leak - Local Dechlorination
-  Catskill Aqueduct
-  Ventilation Improvements
-  Cleaning and Inspection Access Locations
-  Mechanical Repairs



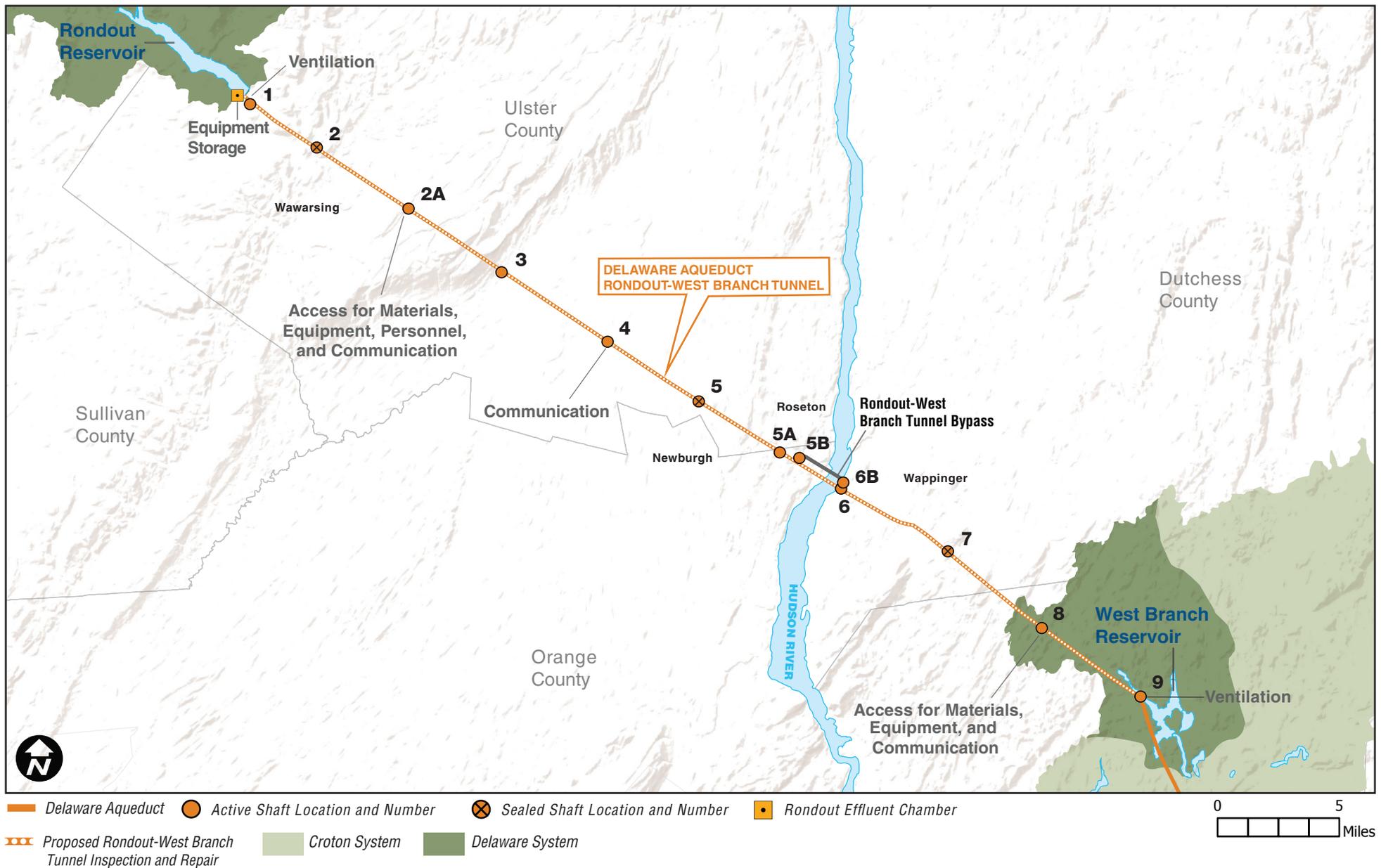


Figure 1-5
Proposed Rondout-West Branch Tunnel Inspection and Repair

1.3 IN-CITY WATER SUPPLY RESILIENCY

1.3.1 QUEENS GROUNDWATER REHABILITATION PROJECT

Queens Groundwater Rehabilitation would consist of upgrading treatment for up to 23 DEP-owned wells at 19 existing DEP-owned groundwater supply stations in southeastern Queens, New York. This project will be evaluated separately as part of the In-City Water Supply Resiliency EIS.

1.4 ORGANIZATION OF THE DRAFT SCOPE OF WORK

The following chapters of this draft scope include:

- **Chapter 2: Purpose and Need for Water for the Future.** As required by CEQR, this chapter presents the purpose and need for the program and why it is being undertaken.
- **Chapter 3: Environmental Review Approach.** This chapter presents how the environmental review will be undertaken, including the timing of the reviews for the various project components and opportunities for public comment.
- **Chapter 4: Overview of the Draft Scope of Work.** This chapter provides an overview of the components of WFF, the projects and programs undertaken as part of separate independent initiatives that will also serve to support WFF, and information on their associated environmental reviews, as applicable. It also outlines which components will be evaluated under this environmental review.
- **Chapter 5: Water for the Future Planning and Implementation Schedule.** This chapter describes the background and planning context for Upstate Water Supply Resiliency and In-City Water Supply Resiliency.
- **Chapter 6: The Water Supply System.** This chapter provides an overview of the New York City water supply system.
- **Chapter 7: DEP Water Supply System Programs and Projects Independent of Water for the Future.** This chapter describes DEP programs and projects that are not part of WFF, but which support or factor into WFF planning and operation.
- **Chapter 8: Description of Water for the Future.** This chapter describes the main components of Upstate Water Supply Resiliency and, to the extent they have been developed, In-City Water Supply Resiliency.
- **Chapter 9: Potential Major Discretionary Approvals, Coordination, and Consultations.** This chapter describes the potential major discretionary approvals, coordination, and consultations with regulatory authorities associated with Upstate Water Supply Resiliency.
- **Chapter 10: Organization and Scope of the Draft Environmental Impact Statement.** This chapter outlines the organization of the DEIS that will be prepared and presents methodologies and the scope of work for analyzing the potential for impacts from Upstate Water Supply Resiliency and its alternatives.

Chapter 2: Purpose and Need for Water for the Future

WFF was developed to respond to the need to recover capacity and improve resiliency in the RWBT, a vital piece of the City's overall water supply system. This program will ensure continued water supply service for current and future generations of DEP customers. The Catskill Aqueduct Repair and Rehabilitation project and WFF Shutdown System Operations (the first two components of the Upstate Water Supply Resiliency portion of WFF that will be evaluated in the DEIS), along with In-City Water Supply Resiliency (described below and to be evaluated in a subsequent EIS), would allow DEP to continue to meet water demand during the approximately eight-month temporary shutdown, and would support RWBT inspection and repair (the third Upstate Water Supply Resiliency component that will be evaluated in the DEIS). Each of these components was carefully selected to optimize existing City water resources and to enhance key infrastructure. Chapter 5, "Water for the Future Planning and Implementation Schedule" will briefly explain how these components were selected. The Alternatives section of the DEIS will present alternatives to these projects that are no longer being pursued by DEP.

The implementation of WFF would allow the City to meet and respond to variable water supply and demand conditions, even after WFF is complete and essential City infrastructure has been repaired. Cessation of leaks along the RWBT would reduce water losses in the Delaware water supply system, thus contributing to its long-term sustainability.

Furthermore, WFF is demonstrative of the water supply initiatives detailed in the 2007 Mayor's Office of Long-Term Planning and Sustainability's *PlaNYC: A Greener, Greater New York* report, enabling DEP to continue its mission to reliably deliver high quality water to upstate and City customers for years to come.³ Moreover, WFF supports initiatives to promote redundancy and flexibility of the City's water supply system outlined in the *Special Initiative on Rebuilding and Resiliency* report released by the City in 2013 in the wake of Hurricane Sandy, which occurred in 2012, by enhancing the reliability of the City's water supply and maintaining flexibility during normal operations, as well as during periods when the water supply system is depleted, or when water quality in other parts of the system is affected by heavy rain or heat waves.⁴

³ The *PlaNYC: A Greener, Greater New York* report is available here: <http://www.nyc.gov/html/planyc2030/html/theplan/the-plan.shtml>

⁴ The *Special Initiative on Rebuilding and Resiliency* is available here: <http://www.nyc.gov/html/sirr/html/report/report.shtml>

Chapter 3: Environmental Review Approach

DEP is ensuring that there is a comprehensive environmental review for WFF as the program is developed pursuant to the New York State Environmental Quality Review Act (SEQRA) and the City of New York's City Environmental Quality Review process (CEQR). A previous Environmental Impact Statement (EIS) assessed the potential for impacts associated with the RWBT Bypass.⁵ The previous EIS thoroughly assessed the potential for significant adverse impacts, addressed all pertinent comments received from the public, and found that the plans for construction of the RWBT Bypass and associated shafts minimize or avoid potential significant adverse impacts to the maximum extent practicable. DEP issued the previous EIS on May 18, 2012, and found the project to be consistent with essential considerations of State and City policy, including social and economic, after consideration of all reasonable alternatives available. A Statement of Findings issued on June 12, 2012, documented completion of that component of the WFF environmental review.⁶

The previous EIS included a preliminary discussion of the Upstate and In-City Water Supply Resiliency projects to the extent feasible given the information available at the time. The previous EIS also disclosed that projects would be evaluated in subsequent environmental reviews, as appropriate.

Separate environmental reviews of the Upstate and In-City Water Supply Resiliency components are appropriate because the actions have independent utility and their impacts are entirely independent and occur in entirely distinct locations and distinct watersheds which are not hydrologically connected. Each of these environmental reviews, like the May 2012 FEIS, will consider any potential cumulative impacts with the other components of the Water for the Future Program, to the extent possible based on available information concerning those components. As anticipated in the May 2012 FEIS for the RWBT Bypass, environmental review of these components of the Water for the Future Program is being completed as sufficient information is available to undertake the necessary analyses.

Therefore, Upstate Water Supply Resiliency and In-City Water Supply Resiliency, as described herein, will be evaluated as part of two subsequent environmental reviews which will assess both the individual components of Upstate Water Supply Resiliency and In-City Water Supply Resiliency as well as potential cumulative impacts. The DEIS for which this draft scope is

⁵ The EIS is available online at: http://www.nyc.gov/html/dep/html/environmental_reviews/rwb_tunnel_repair_project.shtml

⁶ In the previous EIS, Upstate and In-City Water Supply Resiliency components were titled "Project 2A, Water Supply Augmentation and Improvement," and "Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, Including Wawarsing"; however, as the project components have been refined, in this draft scope and in the associated DEIS, its components will be hereafter referred to as: Upstate Water Supply Resiliency – comprised of Catskill Aqueduct Repair and Rehabilitation, WFF Shutdown System Operations, and Rondout-West Branch Tunnel Inspection and Repair, and In-City Water Supply Resiliency – made up of the Queens Groundwater Rehabilitation project.

prepared will disclose all potential impacts associated with projects and programs associated with Upstate Water Supply Resiliency.

A subsequent EIS will be undertaken when sufficient information is available to adequately evaluate potential impacts associated with In-City Water Supply Resiliency: Rehabilitation of the Queens Groundwater System. Although the Queens Groundwater Rehabilitation project will be assessed as part of a subsequent EIS, it is described herein (to the extent such information is available) to ensure a comprehensive understanding and assessment of WFF.

3.1 ENVIRONMENTAL REVIEW PROCEDURE: NEW YORK STATE AND NEW YORK CITY ENVIRONMENTAL QUALITY REVIEW

Any proposed action funded, approved, or directly undertaken by a New York State or local agency must comply with the provisions of SEQRA and its implementing regulations (6 NYCRR Part 617). As a consequence, Upstate Water Supply Resiliency is subject to review under SEQRA. In addition, since Upstate Water Supply Resiliency is being undertaken by a New York City agency, it is also subject to review under CEQR requirements, as set forth in Executive Order 91 of 1977, CEQR regulations, and CEQR amendments, as well as the State Environmental Review Process (SERP), as required by the State Revolving Loan Fund Program. The City's *CEQR Technical Manual* provides guidelines for conducting environmental reviews performed under CEQR.⁷ The DEIS will evaluate Upstate Water Supply Resiliency, along with all relevant cumulative components of the RWBT Bypass, Upstate Water Supply Resiliency, and In-City Water Supply Resiliency, and will be prepared in conformance with applicable laws and regulations, including SEQRA and CEQR. To that end, all WFF environmental reviews will be prepared in accordance with Article 8 of the Environmental Conservation Law establishing the SEQRA and its implementing regulations as set forth in 6 NYCRR Part 617, and the New York CEQR process, as set forth in 62 RCNY Chapter 5 and Executive Order 91 of 1977 and its amendments.

A description of the specific methodologies applied in the DEIS is included in Chapter 10, "Organization and Scope of the Draft Environmental Impact Statement," of this draft scope.

3.2 PUBLIC OUTREACH PROCESS AND COORDINATION WITH LOCAL MUNICIPALITIES

Pursuant to SEQRA and CEQR, this draft scope is available for public review and comment.

To solicit public comments on Upstate Water Supply Resiliency, specifically on this draft scope, public meetings have been scheduled to provide a hearing for receipt of public comments on this document. Public meetings will be held at various locations in Westchester, Delaware, Orange, and Ulster Counties, New York. These meetings will be held on the following dates and times with informal information and listening sessions taking place one hour prior to the meeting times listed at the same location:

⁷ The CEQR Technical Manual is available online at: http://www.nyc.gov/html/oc/html/ceqr/technical_manual_2014.shtml

November 13, 2014 7 PM

Town of Newburgh Town Hall
1496 Route 300
Newburgh, NY 12550

November 14, 2014 7 PM

State University of New York (SUNY)
Sullivan County Community College
Paul Grossinger Dining Room
112 College Road
Loch Sheldrake, NY 12759

November 19, 2014 7 PM

Ellenville Government Center
2 Elting Court
Ellenville, NY 12428

November 20, 2014 7 PM

Yorktown Town Hall
Town Board Room
363 Underhill Avenue
Yorktown Heights, NY 10598

Written comments on the draft scope will be accepted by DEP until the close of business on December 5, 2014. Comments can be submitted in writing or via email and should be addressed to:

Attention: Jennifer Farmwald, Senior Project Manager

Address: New York City Department of Environmental Protection
59-17 Junction Blvd, 11th Floor
Elmhurst, New York 11373

Email: WFFComments@dep.nyc.gov

DEP will consider comments submitted on this draft scope and issue a final scope to address comments received during the public review and to finalize changes to assessment methodologies, if required.

Chapter 4: Overview of the Draft Scope of Work

This draft scope sets forth the timeline, public outreach process, purpose and need, project descriptions, and methodologies proposed to assess the potential for impacts associated with Upstate Water Supply Resiliency: Catskill Aqueduct Repair and Rehabilitation, WFF Shutdown System Operations, and Rondout-West Branch Tunnel Inspection and Repair. The potential for impacts will be disclosed in the DEIS. The DEIS will also provide details on changes to the RWBT Bypass since the issuance of the previous EIS.

Concurrent with WFF, DEP has independent programs and projects that will optimize the water supply system and support the goals of WFF. These efforts either do not require or have already undergone separate environmental reviews, and are described in Chapter 7, “Water Supply System Programs and Projects Independent of Water for the Future.” The components of WFF that were evaluated in the previous EIS and updates, the components that will be evaluated in the DEIS for Upstate Water Supply Resiliency, efforts with independent utility that factor into DEP’s future operations, and the Queens Groundwater Rehabilitation, which will be evaluated in a subsequent EIS as In-City Water Supply Resiliency, are listed in **Table 4-1**.

Table 4-1: Summary of WFF Program Components and Supporting Independent DEP Projects and Environmental Review Status

WFF PROGRAM COMPONENTS	Described Further in this Draft Scope
RWBT Bypass Components Evaluated In The Previous WFF EIS*	
<ul style="list-style-type: none"> • Construction of Shaft 5B (Newburgh) and Shaft 6B (Wappinger) and the Bypass Tunnel • Construction of the Bypass Tunnel Connection • Operation of the Bypass Tunnel 	N/A
Upstate Water Supply Resiliency Components That Will Be Evaluated In The DEIS	
Water Supply Augmentation <ul style="list-style-type: none"> • Catskill Aqueduct Repair and Rehabilitation 	Section 8.1.1
WFF Shutdown System Operations <ul style="list-style-type: none"> • WFF Shutdown System Operations prior to, during, and immediately following the temporary shutdown for the connection of the bypass to the RWBT • Addition of siphons to Rondout Reservoir • Changes to aluminum sulfate (alum) treatment at the Pleasantville Treatment Facility 	Section 8.1.2

Table 4-1: Summary of WFF Program Components and Supporting Independent DEP Projects and Environmental Review Status

WFF PROGRAM COMPONENTS	Described Further in this Draft Scope
Rondout-West Branch Tunnel Inspection and Repair <ul style="list-style-type: none"> • Inspection of non-bypassed segments of the RWBT • Repair of the RWBT, including internal repairs in Wawarsing • Decommissioning the bypassed section of the RWBT 	Section 8.1.3
Independent DEP Program(s) With Environmental Reviews Completed or Not Required	
<ul style="list-style-type: none"> • Demand Management • Shaft 4 Interconnection • Croton Water Filtration Plant • Croton and Cross River Pump Stations Related Municipal Projects with Independent Environmental Reviews <ul style="list-style-type: none"> • Water Supply District Expansions by the Towns of Wawarsing and Wappinger** • Water Supply Projects by Towns of New Windsor and Newburgh, Village of New Paltz, and the City of Newburgh*** 	Chapter 7
In-City Water Supply Resiliency Components That Will Be Evaluated In a Subsequent EIS	
<ul style="list-style-type: none"> • Queens Groundwater Rehabilitation 	Section 8.2
<p>* This includes changes to RWBT Bypass that are being evaluated separately and will be discussed in the DEIS.</p> <p>** DEP is working with the Town of Wawarsing and the Town of Wappinger to provide interconnecting taps from the RWBT once it is repaired. These taps would allow the towns to connect to a long-term source of potable water from the Delaware Aqueduct, and would be completed independently of WFF.</p> <p>*** Projects are being evaluated by these entities to augment their supplies during the temporary shutdowns of the Catskill and Delaware Aqueducts in support of the Catskill Aqueduct Repair and Rehabilitation and RWBT Inspection and Repair projects. These projects would be evaluated independent of WFF by each of the project sponsors.</p>	

Chapter 5: Water for the Future Planning and Implementation Schedule

The components of WFF are distinct and reflect an iterative planning effort to determine the optimal approach to address the RWBT leaks. These efforts sought to identify the components of WFF that would minimize the duration of and water supply need during a temporary shutdown of the Delaware Aqueduct.

5.1 WATER FOR THE FUTURE PLANNING BACKGROUND

An overview of the water supply system and relevant projects described in Chapter 6, “The Water Supply System,” provides the necessary context to understand the planning and implementation of WFF. Particularly noteworthy is that since releasing the previous EIS, DEP has optimized the scope and schedule associated with implementing WFF by refining the design of the bypass tunnel connection construction, thereby reducing the temporary shutdown period from the original estimate of up to 15 months disclosed in the previous EIS down to eight months.

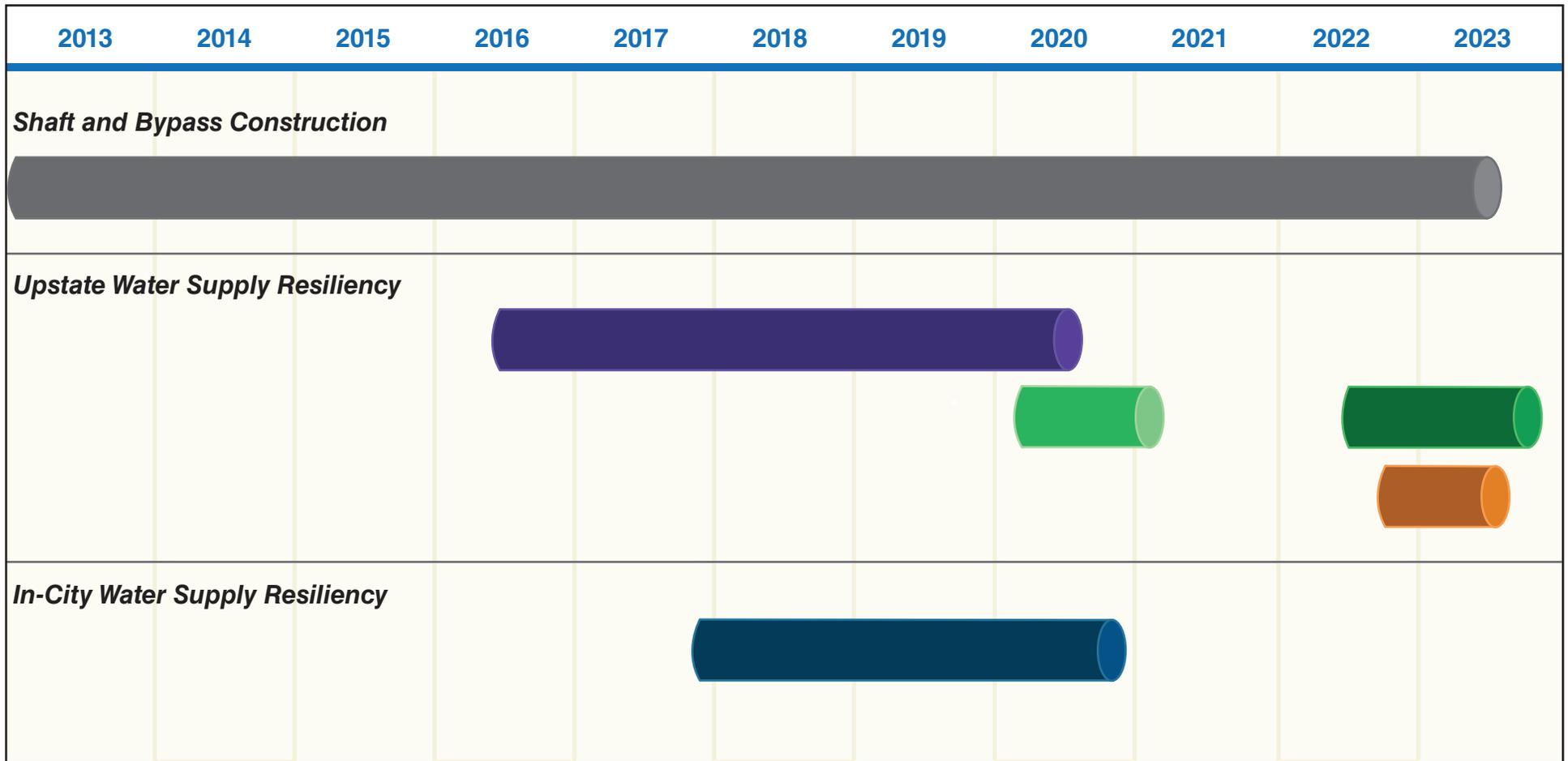
As a result of reducing the temporary shutdown period, less augmentation is required to ensure continued supply to DEP’s customers. The previous EIS identified four augmentation projects: New Jersey Interconnection, Nassau County Interconnection, Catskill Aqueduct Repair and Rehabilitation, and Queens Groundwater Rehabilitation. DEP has determined that implementing only the last two projects is necessary to meet the water supply need for the shutdown, and is no longer pursuing the New Jersey and Nassau County interconnection projects.

The DEIS will also provide background information on the decision-making involved in augmentation project selection, including the rationale for selecting Catskill Aqueduct Repair and Rehabilitation and Queens Groundwater Rehabilitation, as well as additional detail concerning how DEP anticipates operations during the temporary shutdown.

5.2 WATER FOR THE FUTURE IMPLEMENTATION TIMELINE

The timeline for WFF implementation spans nearly a decade, with construction for RWBT Bypass already underway and completion currently slated for 2023 (see **Figure 5-1**). In parallel with RWBT Bypass, construction of Catskill Aqueduct Repair and Rehabilitation is anticipated to begin in 2016, with all construction components of Upstate Water Supply Resiliency and In-City Water Supply Resiliency complete by 2021 to support the connection of the bypass tunnel and repairs in Wawarsing. Between June 2022 and September 2022, the final aspects of WFF would be underway, as DEP would prepare for the bypass connection and prepare the overall water supply system for shutdown operations. The connection of the bypass tunnel to the existing RWBT, and temporary shutdown (during which RWBT inspection and repair would occur) is anticipated to begin October 1, 2022, and be completed by June 2023. However; the

start of the shutdown is dependent on hydrologic conditions, and therefore may vary, but would be expected to commence in the fall and be completed in the summer of the following year. In June of 2023, the bypass connection and RWBT inspection and repair would be complete, and the water supply system would return to normal operating conditions. Demobilization would be completed by September 2023.



- Catskill Aqueduct Repair and Rehabilitation*
- Rondout-West Branch Tunnel Inspection and Repair*
- WFF Shutdown System Operations*
- Queens Groundwater Rehabilitation*
- Rondout Reservoir Siphons Construction*
- Shaft and Bypass Tunnel Construction*

Chapter 6: The Water Supply System

This chapter presents a detailed description of the three discrete but interconnected water supply systems that comprise the surface water component of the City's overall drinking water supply system (water supply system), including their geographical location and extent, the hydraulic connections between the various reservoirs, and the confluence of water from each of the systems before it enters the City's distribution system. In addition to the surface water supply, the City's water supply system also includes groundwater supply wells in southeastern Queens that draw water from underlying aquifers and are available during droughts and emergencies, but are not currently used to meet demand as part of normal system operations.

In addition to a description of the City's water supply system, this section provides a summary of the typical operational protocols DEP currently uses to manage the three water supply systems. The protocols strike an important balance to meet water supply and regulatory requirements. These descriptions provide the necessary background information and context within which to understand the development of WFF, as well as clarification of the project components of WFF.

6.1 SURFACE WATER SUPPLY SYSTEM OVERVIEW

The surface water portion of the City's water supply system is among the most complex in the world, with 19 reservoirs and three controlled lakes. The combined total water storage is approximately 580 billion gallons of water that can be managed via diversions, transfers, and releases, which are described in greater detail below. On average, more than 1.1 billion gallons of this water flows each day by gravity from upstate New York to meet the water supply needs of more than eight million City customers and one million residents north of the City, in addition to the millions of commuters and tourists who visit the City each day. The City manages this complex system to meet daily demand while achieving a careful balance of water quality and quantity, maintaining the aquatic environment, and complying with applicable regulations.

The reservoirs and lakes located in upstate New York make up the City's three surface water systems: the Catskill/Delaware, and Croton Systems.⁸ The Catskill/Delaware System together can provide up to 100 percent of the City's daily water supply. In times of drought, the Croton System can provide up to 30 percent. The Catskill and Delaware watersheds together cover approximately 1,600 square miles, while the Croton watershed covers approximately 380 square miles, for a combined total area of approximately 2,000 square miles (see Figure 1-1).

⁸ The Catskill/Delaware system consists of the independent Catskill and Delaware systems that are operated as one unfiltered water supply during normal system operations.

The Delaware water supply system includes four reservoirs: Pepacton, Cannonsville, Neversink, and Rondout. The Pepacton, Cannonsville, and Neversink Reservoirs are located in the Delaware River Basin. Within the Delaware water supply system, water flows from Pepacton, Cannonsville, and Neversink Reservoirs via the East Delaware Tunnel, West Delaware Tunnel, and Neversink Tunnel, respectively, to Rondout Reservoir, part of the Hudson River Basin. From Rondout Reservoir, water is transferred to West Branch Reservoir via the RWBT. The water then continues through the Delaware Aqueduct to Kensico Reservoir.

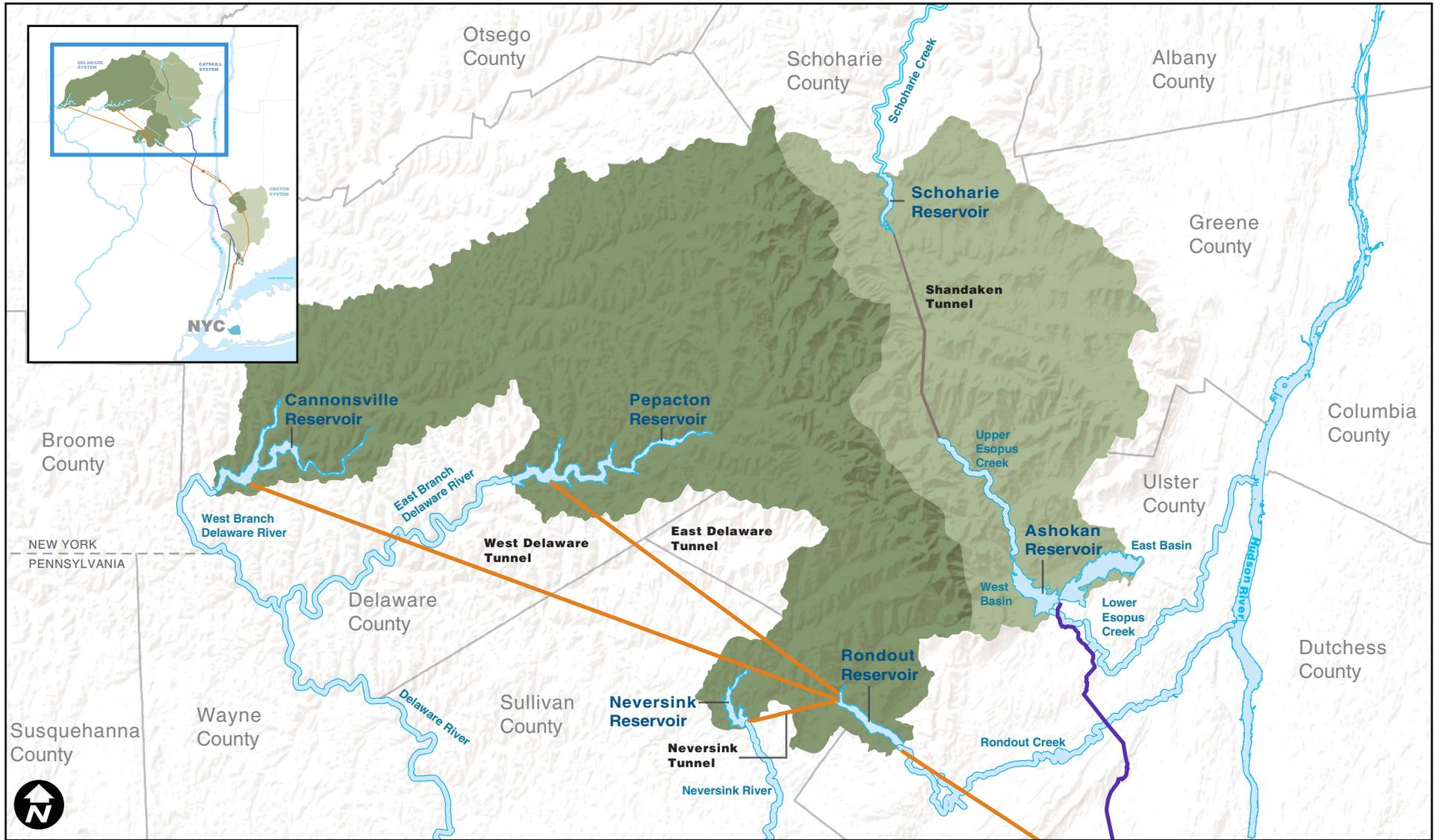
The Catskill water supply system, located in the Mohawk and Hudson River Basins, includes Schoharie and Ashokan Reservoirs (see **Figure 6-1**). Water from Schoharie Reservoir is diverted to Ashokan Reservoir via the Shandaken Tunnel into upper Esopus Creek. From Ashokan Reservoir, the water flows through the Catskill Aqueduct to Kensico Reservoir, where it combines with water from the Delaware water supply system.

Leaving Kensico Reservoir, this combined Catskill/Delaware water is chlorinated and fluoridated prior to traveling through the Delaware Aqueduct to the City's Catskill/Delaware Ultraviolet (UV) Disinfection Facility (UV Disinfection Facility) where ultraviolet light is used as an additional treatment method. From the UV Disinfection Facility, water is transferred to Hillview Reservoir through both the Catskill or Delaware Aqueducts before entering the City's water distribution system via three tunnels, referred to as City Tunnel Nos. 1, 2, and 3. The Delaware Aqueduct can provide water directly to the City Tunnels, bypassing Hillview Reservoir.

Lastly, the Croton water supply system is the City's oldest surface water supply network and consists of 12 reservoirs and three controlled lakes. The Croton reservoirs are connected primarily via open channel streams and rivers, ultimately flowing to New Croton Reservoir in Westchester County, New York (see **Figure 6-2**). The Croton water supply system is currently not in service, but will be reactivated once the Croton Water Filtration Plant becomes operational in 2015. At that time, water from the Croton System will be provided directly to the City's distribution system through the New Croton Aqueduct and via direct connections to the City water tunnels. The Croton Water Filtration Plant has a maximum design treatment capacity of approximately 290 mgd.

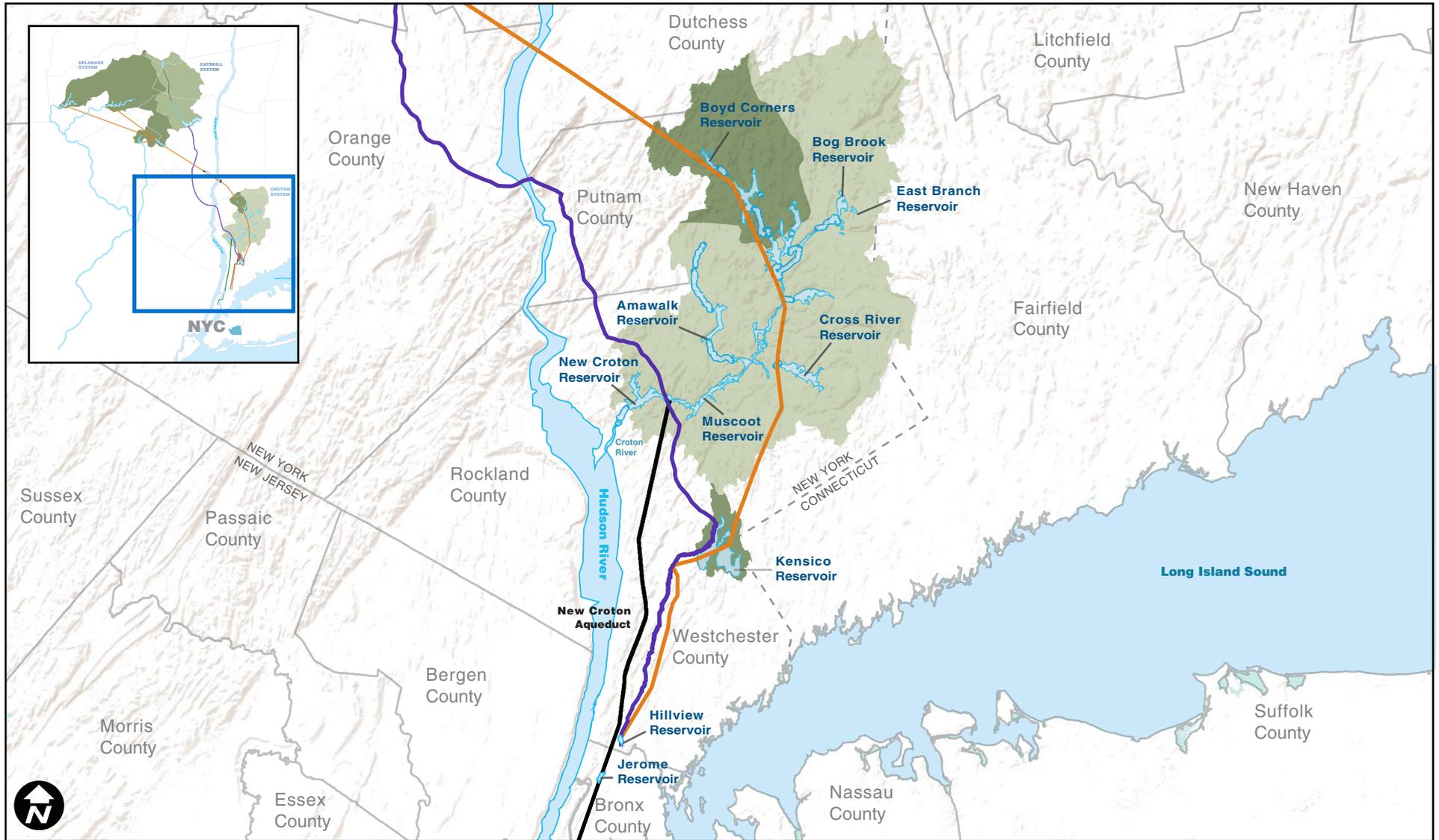
6.2 SURFACE WATER SUPPLY SYSTEM OPERATION

The primary objective of the City's surface water supply system is to store water in sufficient quantity and with appropriate flexibility to meet demand. DEP is also subject to regulatory requirements that dictate certain aspects of its water supply operations, such as reservoir releases. To balance demand with these regulatory requirements, DEP utilizes a range of operational and management techniques.



— Delaware Aqueduct — Catskill Aqueduct
 Catskill System Delaware System

0 9.5
 Miles



— Delaware Aqueduct — Catskill Aqueduct
 Croton System Delaware System

0 8.5
 Miles

DEP's operational and management techniques also protect the City's water supply system against potential adverse conditions, such as droughts and heavy precipitation events, through thoughtful planning and the implementation of carefully considered water supply storage goals. In general, DEP optimizes the amount of water stored in the City's reservoirs to ensure that demand can be met.

DEP moves water throughout the system to address both water supply needs and regulatory requirements using a combination of diversions (moving water between reservoirs or systems that would not otherwise be connected via natural flow paths), transfers (moving water between connected reservoirs for the purpose of supplying drinking water or meeting regulatory flow requirements), and releases (moving water to water bodies that are connected to the system, but in some cases, redirect water out of the system). Because of the interconnected nature of the system, operations applied at any single reservoir must be precisely coordinated with those at other reservoirs.

6.3 DELAWARE WATER SUPPLY SYSTEM OVERVIEW

Constructed between 1936 and 1964, the Delaware water supply system extends 125 miles northwest of the City. Water from the Cannonsville, Pepacton, and Neversink Reservoirs is diverted to Rondout Reservoir via the West Delaware, East Delaware, and the Neversink Tunnels, respectively (see Figure 6-1). The RWBT begins at Rondout Reservoir and extends east approximately 45 miles to West Branch Reservoir, located east of the Hudson River in Putnam County. From West Branch Reservoir, the Delaware Aqueduct proceeds south to Kensico Reservoir.

The RWBT segment of the Delaware Aqueduct is approximately 13.5 feet in diameter, lined with concrete, and varies in depth from approximately 300 to 2,300 feet below ground (crossing the Hudson River at approximately 600 feet below the water's surface). The tunnel is a deep rock pressurized aqueduct that operates by gravity and has been in nearly continuous service since it was brought online in 1944. It can convey up to approximately 900 mgd of water, although it typically delivers an average of 600 mgd on an annual basis. The last unwatering and physical inspection of the RWBT occurred in 1957–1958.

All water supplied to the City from the Delaware System flows through the RWBT. In addition to the City, two municipalities are supplied with water via the RWBT: the Town of Newburgh and the Town of Marlborough. The City is permitted to divert a yearly average of 800 mgd from the Cannonsville, Pepacton, and Neversink Reservoirs within certain legal and regulatory parameters. Specifically, the Delaware System reservoirs are operated in accordance with a 1954 U.S. Supreme Court Decree and commitments made by the parties to that Decree and adopted by the Delaware River Basin Commission, which is composed of representatives of the United States and the states of Delaware, New York, New Jersey, and Pennsylvania. In addition, DEP is required under State law to make certain releases from its reservoirs to protect downstream recreational uses; the requirements relating to the Delaware System reservoirs are codified in Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 671 and Section 672-2.

6.4 CATSKILL WATER SUPPLY SYSTEM OVERVIEW

Completed in 1928, the Catskill water supply system consists of two reservoirs, Schoharie and Ashokan, the latter of which is divided into east and west basins (see Figure 6-1). The Schoharie Reservoir diverts water to upper Esopus Creek via the Shandaken Tunnel. Esopus Creek subsequently flows into the west basin of Ashokan Reservoir. Water from Ashokan Reservoir is conveyed via the Catskill Aqueduct to Kensico Reservoir at a current capacity of up to approximately 590 mgd.

Although the Catskill System experiences episodic turbidity events, DEP is typically able to meet drinking water quality regulations for the Catskill water supply system with disinfection alone.⁹ This is due, in part, to the design of the Ashokan Reservoir. Water flows into the west basin first, allowing turbidity to settle out, before flowing into the east basin for distribution to the upper Catskill Aqueduct. However, during particularly heavy rainfall events, silt and clay deposits in the Catskill watershed streams are washed into the water supply system, leading to increased turbidity and overwhelming the natural settling processes in the reservoirs. During these events, DEP has historically treated Catskill water entering the Kensico Reservoir with alum to cause the suspended particles to settle out in sufficient measure to conform to water quality requirements. As part of a separate effort, DEP has implemented extensive turbidity control measures, and is implementing numerous infrastructure and operational improvements to further minimize the need for alum treatment.

More recently, DEP has studied alternatives for further controlling Catskill turbidity, and has expanded use of the Ashokan Release Channel, which routes flow from the Ashokan Reservoir to lower Esopus Creek. DEP operates the Ashokan Release Channel in accordance with an Interim Release Protocol, pursuant to an October 2013 Consent Order between New York State Department of Environmental Conservation (NYSDEC) and DEP. The Interim Release Protocol is currently being analyzed as part of a separate environmental review to support modification of the City's New York State Pollutant Discharge Elimination System (SPDES) permit for alum treatment at the Kensico Reservoir. Alum treatment is applied at Kensico Reservoir, if required, for water diverted from the Catskill water supply system.

In addition, DEP is required under State law to make certain releases from Schoharie Reservoir, the other reservoir that comprises the upstate portion of the Catskill System. The purpose of these releases is to protect and enhance the use of recreational use of waters in Esopus Creek; the requirements relating to the Catskill System are codified in Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 670.

⁹ Turbidity is an optical property of water influenced by the presence of higher concentrations of suspended particles that make water opaque or cloudy. This matter normally consists largely of suspended clay, silt, organic and inorganic material and microscopic organisms. Turbidity is of concern primarily due to its potential impact on public health by making disinfection less effective, as the cloudiness could interfere with chlorine and ultraviolet-light disinfection, and potential contaminants may adhere to, or be encapsulated by the suspended particles.

6.5 CROTON WATER SUPPLY SYSTEM OVERVIEW

Constructed in the late 1800s, the Croton water supply system is the oldest and smallest of the City's three systems. The Croton water supply system consists of a series of interconnected reservoirs and lakes in northern Westchester and Putnam counties that terminate at New Croton Reservoir. Water is diverted from New Croton Reservoir to Jerome Park Reservoir in the Bronx via the New Croton Aqueduct, where it continues to the City's distribution system (see Figure 6-2). The Croton System has been used only on a very limited basis since 2004, but once the Croton Water Filtration Plant becomes operational, currently anticipated for 2015, the Croton system will be available to supplement the Catskill/Delaware Systems as needed.

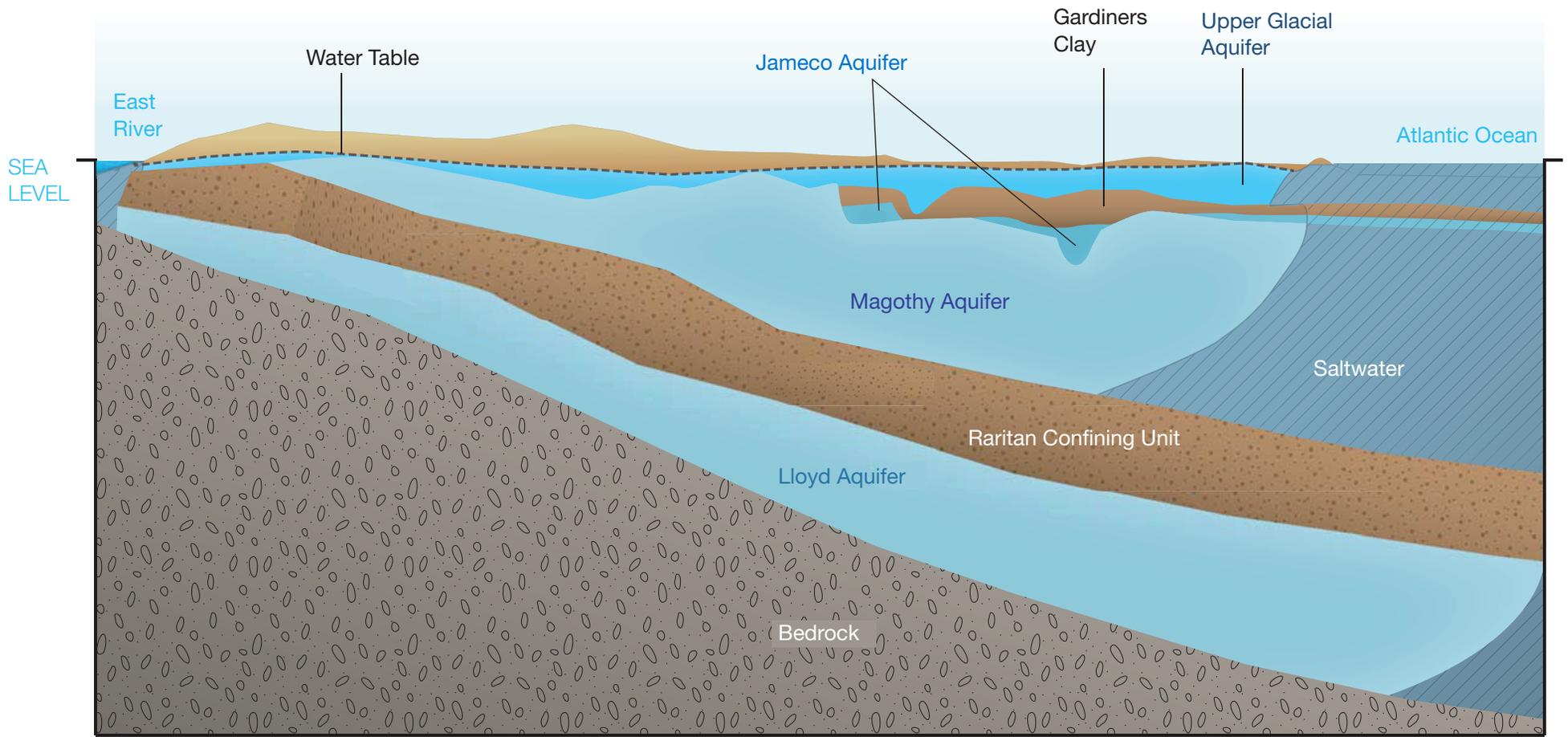
In addition to supplying water to the City, DEP must provide minimum flows downstream from each Croton System reservoir, as established by 6 NYCRR Part 672-3. Additionally, a number of communities in Westchester and Putnam Counties withdraw water directly from DEP reservoirs.

6.6 QUEENS GROUNDWATER SYSTEM OVERVIEW

In addition to the three surface water systems described above that are the City's primary sources of water supply, DEP has owned, maintained, and operated a groundwater supply system in southeastern Queens since 1996 (Queens groundwater system). This system was formerly owned and operated by the Jamaica Water Supply Company. The Queens groundwater system is comprised of 44 well stations, which house a total of 68 water supply wells (some stations include a single well; others include between two and four wells). DEP holds and maintains a Water Supply Permit from NYSDEC to pump approximately 68 mgd. All stations are located within an approximately three-square-mile area in the eastern section of Queens, near the border of Nassau County, New York. The stations are generally bounded by I-495 to the north, Route 27 to the south, Lefferts Boulevard to the west, and the Belt/Cross Island Parkways to the east.

The source water for these wells is the aquifers beneath the Queens section of Long Island.¹⁰ There are four main aquifers in Long Island: the Upper Glacial and Jameco, which are the shallowest; the Magothy, which is the middle layer; and the Lloyd, which is the deepest. Formed approximately 60 million years ago, the aquifers are generally separated by layers of clay, and groundwater moves through the aquifer systems under the influence of pressure and gravity. The source water for the Queens groundwater wells is largely extracted from the Magothy aquifer, though some wells extract from the Lloyd aquifer (see **Figure 6-3**).

¹⁰ An aquifer is a natural underground layer of porous, water-bearing materials (sand, gravel) usually capable of yielding a large supply of water.



Illustrative figure, not to scale.

Chapter 7: Water Supply System Programs and Projects Independent of Water for the Future

DEP has planned or is currently implementing several additional programs and projects that will support the operation of the water supply system. Each project will be undertaken for independent purposes and will have utility independent of WFF. However, these projects will also support the goals of WFF by enabling DEP to meet its water supply demand during the RWBT shutdown. Therefore, these projects are described below to assist in understanding of the overall WFF planning effort, which was outlined in Section 5.1, “Water for the Future Planning Background.”

7.1 DEMAND MANAGEMENT

DEP is in the process of implementing a City-wide Demand Management Plan under PlaNYC to reduce water consumption.¹¹ This effort was undertaken independent of WFF and was designed to better account for, manage, and protect the City’s water resources, thereby contributing to the long-term sustainability of the City’s water supply.

The Demand Management Plan was published in January 2014, and includes five strategies aimed at reducing City water consumption by five percent (50 mgd) by 2020. These strategies include:

- (1) A municipal water efficiency program aimed at reducing water use and consumption in City-owned properties;
- (2) A residential water efficiency program aimed at encouraging the adoption of low-flow toilets, a primary residential water use;
- (3) A non-residential water efficiency program, which includes a year-long program for private companies to match municipal water-saving goals on a voluntary basis;
- (4) Water distribution system optimization, which includes a variety of measures and programs to detect and reduce waste in the water supply distribution system; and
- (5) A water supply shortage management strategy for which DEP will formalize the City’s approach to water supply shortages in a revision to the City’s drought management plan and rule.

¹¹ The Demand Management Plan is available here: http://www.nyc.gov/html/dep/html/ways_to_save_water/index.shtml

In addition to reducing overall water demand, water savings achieved through the Demand Management Plan will directly offset water needs (and in turn, augmentation project needs and costs) during the temporary shutdown.

7.2 SHAFT 4 INTERCONNECTION

The Shaft 4 Interconnection, currently under construction, will provide for more flexibility in delivering the water supply from the Catskill and Delaware Systems, allowing delivery of a variable flow range of 50 mgd to 365 mgd from the Delaware Aqueduct to the Catskill Aqueduct, prior to reaching Kensico Reservoir. During turbidity events in the Catskill System, the Shaft 4 Interconnection will allow water from the Delaware System to be diverted to the Catskill Aqueduct, reducing or avoiding use of Catskill water during these turbid periods. This would improve water quality delivered to communities along the Catskill Aqueduct, and reduce the need for alum treatment of turbid Catskill water at Kensico Reservoir.

While this interconnection would not be in service during the temporary shutdown of the RWBT, it will allow maximized usage of the Delaware System during the preparation period prior to the temporary shutdown by allowing for increased withdrawals from the Rondout Reservoir.¹² This project will help ensure a sustainable, resilient water supply for the City and its customers in the long term.

7.3 CROTON WATER FILTRATION PLANT

The Croton System has provided high quality water to consumers for over 150 years. Pursuant to the Safe Drinking Water Act, the City is constructing the Croton Water Filtration Plant in the Bronx, New York. The plant was subject to a separate EIS in 2004, and is undergoing startup testing. It will be fully operational in 2015.

The Croton Water Filtration Plant has a maximum design treatment capacity of approximately 290 mgd. In addition to reducing reliance on the amount of water needed from the Catskill System during turbidity events and droughts, the Croton Water Filtration Plant will be a critical component of the City's water supply during the temporary shutdown, thereby reducing overall augmentation need.

7.4 CROSS RIVER AND CROTON FALLS PUMP STATIONS

Another example of DEP's continued efforts to improve the resiliency of its water supply system includes projects to rehabilitate the Cross River and Croton Falls Pump Stations. The Cross River Pump Station has already been completed, and it is anticipated that both pump stations will be online and operational by 2021, prior to the temporary RWBT shutdown. These pump stations will enable DEP to move water from Cross River Reservoir and Croton Falls Reservoir in the Croton watershed to the Delaware Aqueduct. The ability to move water from these Croton

¹² Note that operation of the Shaft 4 Interconnection would conform with the 1954 Supreme Court Decree and all Flexible-Flow Management Program parameters set forth by the Delaware River Basin Commission.

reservoirs to the Delaware Aqueduct will allow DEP to maximize its available water supply by diverting up to 240 mgd of additional water from the Croton water supply system. These upgrades will allow DEP to maximize access to Croton water during times of drought or emergencies in the Delaware watershed, as well as act as a supplemental water source during the temporary shutdown and repair of the RWBT. Currently, pumping is allowable only during water supply emergencies with permission from the New York State Department of Health (NYSDOH).

The Cross River Pump Station, located in Katonah, Westchester County, New York, pumps water from the Cross River Reservoir in the Croton watershed to the Delaware Aqueduct. DEP completed an upgrade to the Cross River Pump Station that has more than doubled its pumping capacity from 27 mgd to 60 mgd. The extensive rehabilitation work was completed in 2013.

Similar to the Cross River Pump Station, the Croton Falls Pump Station was constructed to transfer water from the Croton Falls Reservoir to the Delaware Aqueduct. The existing pump station is located in a one-story building near the base of the Croton Falls Reservoir Dam in the Town of Carmel, Putnam County, New York. DEP is planning to replace the existing hydraulically-driven pump, turbine system, and building at the Croton Falls Pump Station with a new electrically-powered pump system within a new structure on the same site. The pump replacement will increase transfer capacity from 65 to 180 mgd, resulting in more water available to transfer to the Delaware Aqueduct for water supply purposes.

Chapter 8: Description of Water for the Future

As previously described, the Upstate and In-City Water Supply Resiliency projects are intended to allow DEP to address leaks in the RWBT by enabling DEP to shut down the RWBT to connect the bypass tunnel, and to complete the internal repair of the RWBT in the vicinity of the Town of Wawarsing. During the shutdown, the Upstate Water Supply Resiliency project, along with the In-City Water Supply Resiliency project, would ensure ongoing supply to meet the needs of DEP's customers. At the conclusion of the connection, the bypassed section of the RWBT would be permanently decommissioned; the water currently leaking from the tunnel is expected to permanently cease. Chlorination of the Catskill Aqueduct, described further below, would cease and the rehabilitated groundwater well stations in Queens would remain available for future use, as needed.

The following sections provide additional detail on the components of Upstate and In-City Water Supply Resiliency.

8.1 UPSTATE WATER SUPPLY RESILIENCY

8.1.1 PROPOSED CATSKILL AQUEDUCT REPAIR AND REHABILITATION

The Catskill Aqueduct Repair and Rehabilitation would address reduction in the capacity of the Catskill Aqueduct over time, partly as a result of the accumulation of biofilm (a naturally-occurring layer of microorganisms) along the Catskill Aqueduct's interior surface. Though relatively thin, the rough surface of this biofilm layer has contributed to slowed flow of water from historical highs of 660 mgd to the current maximum capacity of 590 mgd. DEP seeks to restore the capacity of the upper segment of the aqueduct closer to its historical capacity by removing this layer of biofilm and possibly lining limited sections of the aqueduct (see Figure 1-4), to improve capacity to approximately 640 mgd. To maintain capacity improvements, chlorine would be added to the aqueduct to prevent the re-growth of biofilm.¹³ Therefore, a chlorination facility is proposed for construction at the Ashokan Screen Chamber in the Town of Olive, Ulster County, New York, with a dechlorination facility located at DEP's Pleasantville Treatment Facility in the Village of Pleasantville, Westchester County, New York.

In addition, the proposed rehabilitation would include a full inspection of the aqueduct, repair of leaks, repair of valves and other mechanical equipment, and the addition of air vents to facilitate the flow of the water. The proposed rehabilitation would begin in 2016 and is anticipated to be complete by 2019. Through a detailed inspection protocol, replacement of mechanical features,

¹³ This document refers to use of chlorine as a means to prevent re-growth of biofilm, but the use of chlorine dioxide and appropriate chemicals to remove chlorine dioxide before it enters the environment are also under consideration. Final chemical selection has yet to occur but will be disclosed and associated potential for impacts evaluated within the EIS.

leak repair, and restoration of the historical capacity of the Catskill System, this work would provide long-term benefits to the water supply system.

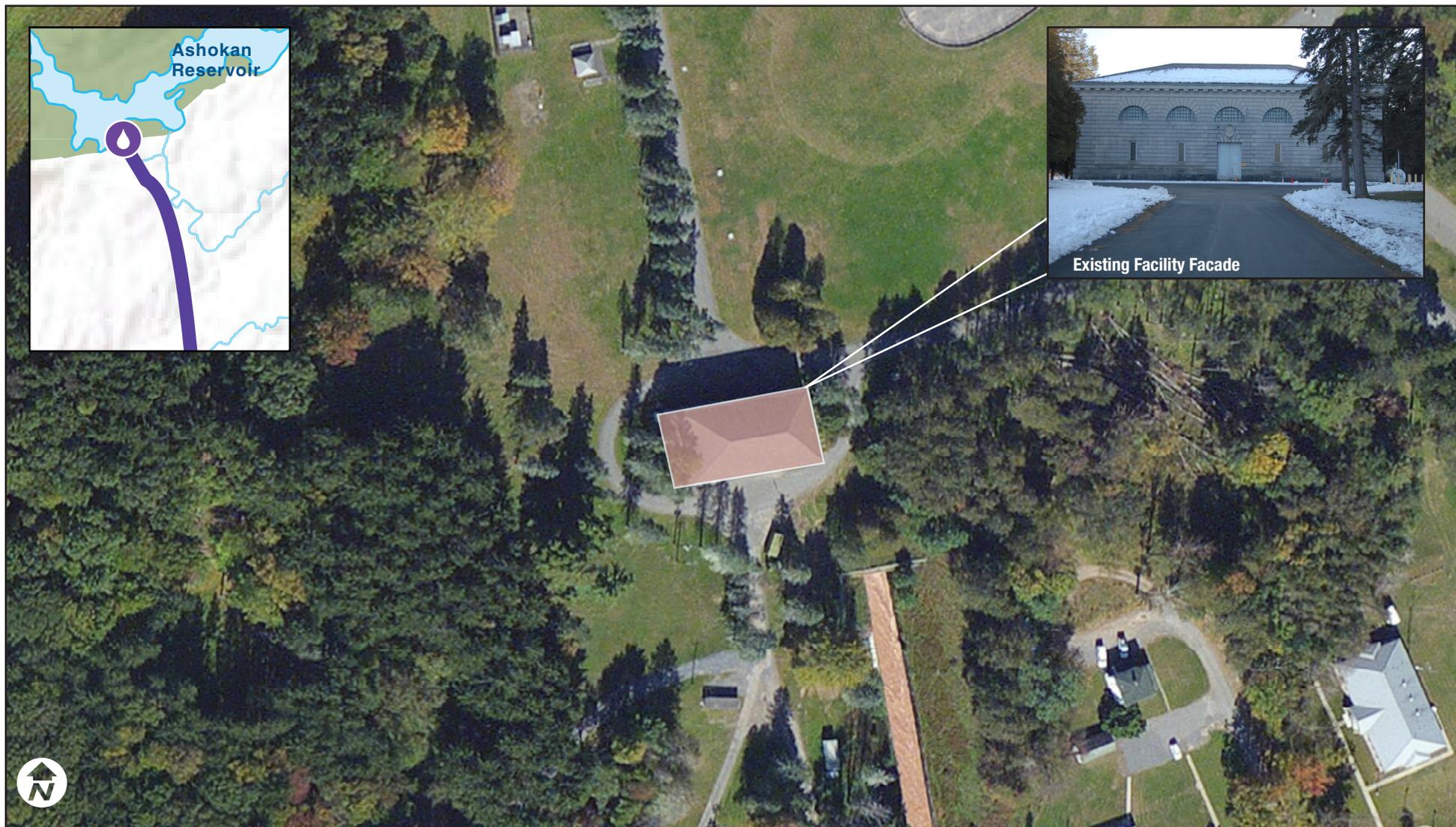
Components of the proposed project to improve the Catskill Aqueduct's current capacity between Ashokan and Kensico Reservoirs include:

- (1) Adding chemicals to control biofilm formation and operating dechlorination facilities at leaks and at the Pleasantville Treatment Facility;
- (2) Cleaning the aqueduct interior and performing limited lining to seal the concrete walls, repair leaks, and enhance flow characteristics in certain locations, then performing a detailed internal inspection program;
- (3) Repairing or replacing mechanical components along the aqueduct, including siphon drains, sluice gate drain valves, and other aqueduct drain valves, to ensure continued aqueduct service into the future; and
- (4) Constructing new vent structures at key points along the aqueduct to improve the ability to release air from the aqueduct, thereby ensuring smoother flow of water.

The project would require the addition of chlorine to the upper portion of the Catskill Aqueduct at the existing Ashokan Screen Chamber building. Adding an oxidant would prevent regrowth of biofilm in areas that have been cleaned, and potentially reduce biofilm in sections that are difficult to access with equipment and personnel. After treating the aqueduct, all water would then be dechlorinated at a dechlorination system that would be added at DEP's existing Pleasantville Treatment Facility to remove the residual chlorine before the water enters Kensico Reservoir (see **Figure 8-1** and **Figure 8-2**).

There are also several small leaks in the Catskill Aqueduct, which, though significantly smaller in magnitude than the leaks along the RWBT, provide pathways for water leakage from the aqueduct to the surrounding environment. These leaks include cracks, joints, or other gaps that have developed over time. Therefore, additional improvements to the aqueduct that would be undertaken include leak repair or, where repair is not feasible, construction of a local dechlorination system to neutralize chemically treated water before it enters the environment. The temporary addition of chemicals to the aqueduct would require a temporary SPDES permit for discharges from the leaks and into Kensico Reservoir.

The dechlorination system would involve construction of temporary, on-site facilities, likely a small, passive dechlorination system. However, one or more sites may require a small shed to house the dechlorination equipment, a generator to power the operation, and chemical storage. Leak repair would involve temporary staging areas along the aqueduct and storage and use of equipment necessary to repair the leaks. These systems are anticipated to be temporary and would be removed following the completion of temporary shutdown. Should long-term chlorination of the aqueduct be necessary after the conclusion of this project, additional repairs or permanent dechlorination facilities at leak sites would be required, the existing SPDES permit for the Catskill Influent Chamber would need to be modified, and an environmental review would be required.



Map Source: Google.com



- Ashokan Screen Chamber Building
- Catskill Aqueduct
- Proposed Chlorination System at Ashokan Screen Chamber
- Catskill System

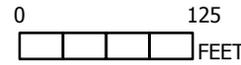
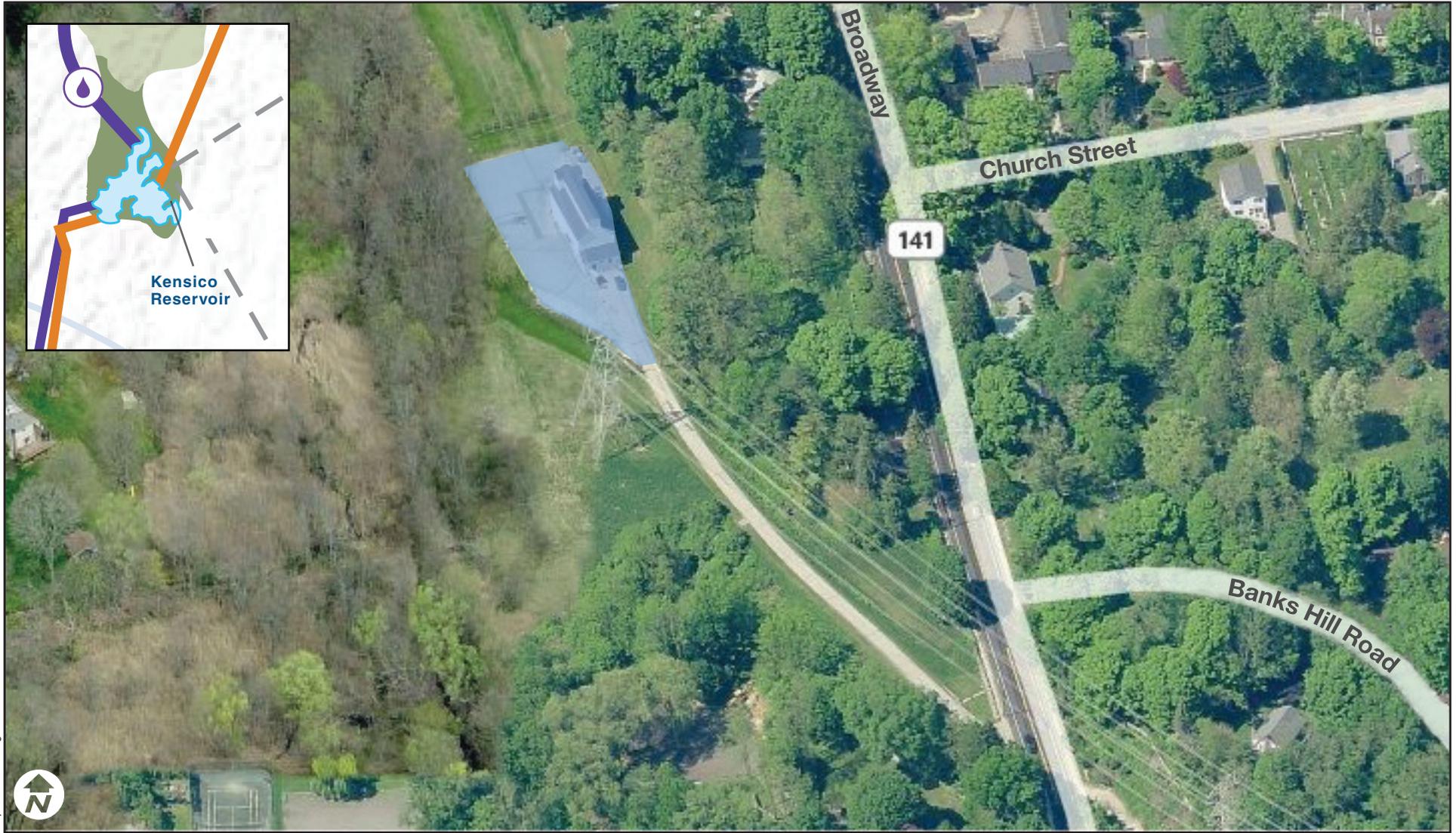


Figure 8-1
Proposed Chlorination System at Ashokan Reservoir Screen Chamber Building



Map Source: Bing.com



- Approximate Location of Proposed Dechlorination System
- Delaware Aqueduct
- Catskill Aqueduct
- Proposed Pleasantville Treatment Facility

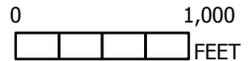


Figure 8-2
Proposed Dechlorination System at Pleasantville Treatment Facility

Options to address the second component of the proposed rehabilitation, removal of the existing biofilm deposits that have adhered to the interior walls, include manually scraping or brushing the walls, using highly pressurized air or water, utilizing an automated self-propelling system, or some combination of these methods. Treatment of the biofilm wash water would be accomplished via settling, filtration, and possibly ultraviolet disinfection of the water, which will be confirmed through a pilot program conducted during project planning. Any biofilm solids would be hauled to a permitted off-site disposal area. Following the interior cleaning operation, crews would assess the condition of the aqueduct to document defects and evaluate repairs to be carried out.

To further ensure optimal operation of the Catskill Aqueduct, mechanical components of the aqueduct infrastructure would be repaired or replaced, including siphon drain valves and sluice gate drain valves at multiple locations and valves at the Croton Lake Downtake Chamber in the Village of Croton-on-Hudson, Westchester County, New York. These valves allow DEP to divert water and drain the aqueduct for inspection or repair. Water in the Catskill Aqueduct is typically soft with low alkalinity, which can result in corrosion of cast iron, steel, and galvanized steel components of the aqueduct infrastructure. Recent inspections have determined that, as a result of this corrosion, some mechanical components may be approaching or have exceeded their usable design life. Therefore, DEP plans to replace these components, further enhancing DEP's ability to continue to operate the Catskill Aqueduct into the future.

Similar to cleaning and inspection, mechanical replacement would require access to unwatered tunnel segments. Excess water that cannot be properly drained would be pumped to the surface and managed (discharged). Work at each repair site would generally be performed by one or two staff members within the aqueduct using a variety of smaller pieces of equipment. These one or two individuals would be supported by a larger crew equipped with hoists or a cherry picker at the ground surface. Temporary staging areas along the aqueduct would be required for equipment to support repair activities and/or manage water discharged at existing access points along the aqueduct.

To complete the project's second and third components, physically cleaning and performing limited lining along with an inspection program and repairing/replacing mechanical components, would require either one or two short-term shutdown periods (i.e., approximately 10 weeks), or a series of shorter shutdowns of the aqueduct. During the temporary shutdown periods, DEP customers who obtain supply from the Ashokan to Kensico Reservoir segment of the Catskill Aqueduct would need to use alternate water supplies. DEP is working with customers who currently do not have sufficient back-up supply to develop alternate water supply for use during the shutdown(s).¹⁴ The Catskill Aqueduct would not be taken out of service until all customers have sufficient back up water supplies. In either shutdown situation, several different teams of workers would access the interior of the aqueduct through existing boatholes and manholes to accomplish these tasks.

Finally, adequate ventilation is also critical to achieve enhanced capacity and flow in the Catskill Aqueduct because water in the aqueduct is gravity driven open channel flow. When the aqueduct

¹⁴ Table 4-1 identifies the affected customers. The DEIS will provide additional detail on the customers' projects.

is at full capacity, trapped air can create pockets that reduce the ability of the aqueduct to convey water. These air pockets reduce the aqueduct's overall flow and capacity. Adding ventilation at key locations would allow trapped air to escape and promote unobstructed flow within the aqueduct. The vents would be removable to allow for future entry into the aqueduct and consist of double 90-degree elbows constructed of standard 30-inch diameter steel pipes ("gooseneck").

8.1.2 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS

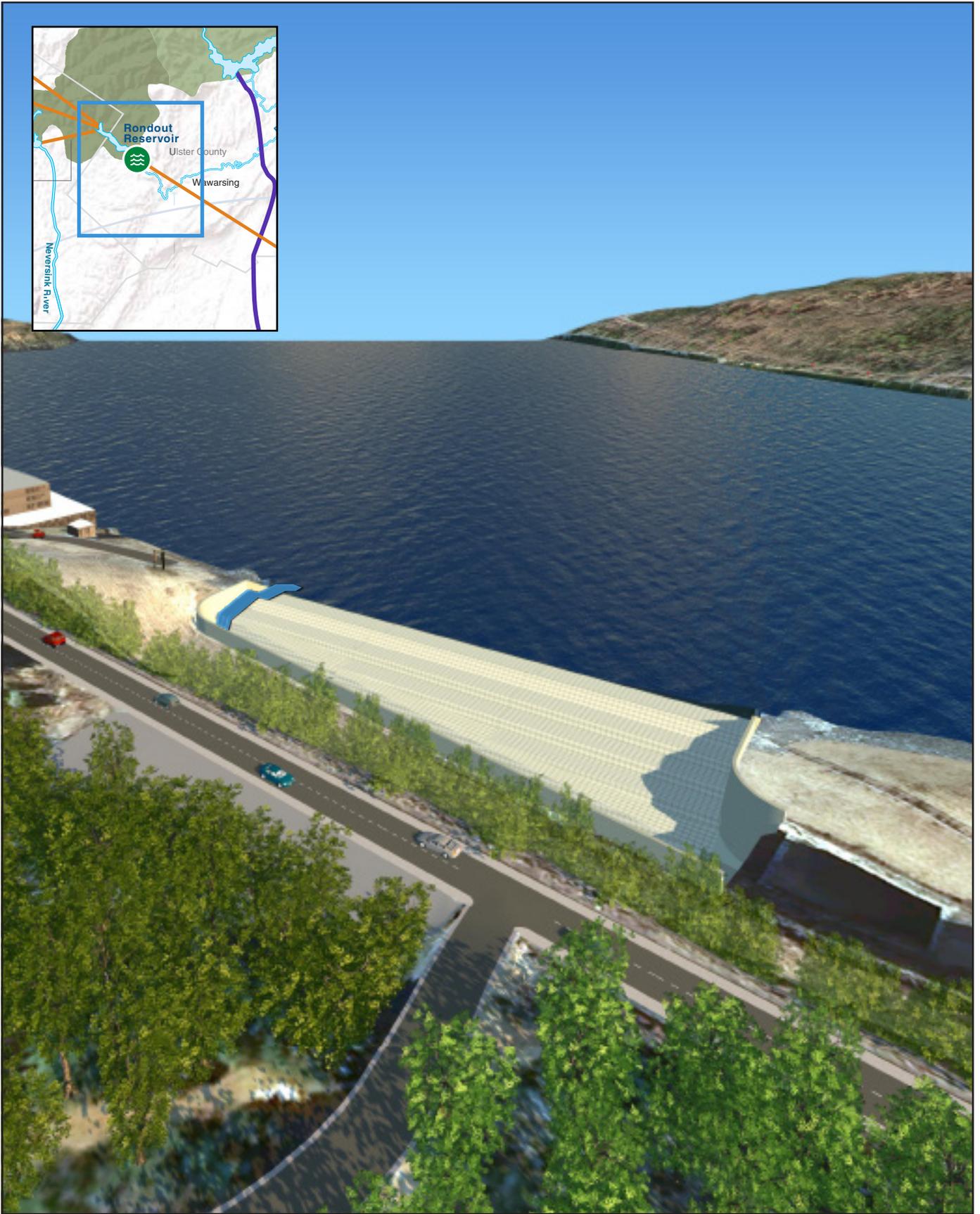
Prior to and during the temporary shutdown of the RWBT, DEP would implement Water for the Future Shutdown System Operations (WSSO), a specific and highly unusual operating protocol that departs significantly from the operating rules typically used to manage the Delaware, Catskill, and Croton water supply systems. WSSO, the second component of Upstate Water Supply Resiliency, has been designed based on modeling of the water supply system as DEP expects it to be operated both immediately prior to and during the temporary shutdown.

Implementation of WSSO would begin in advance of the shutdown to prepare the water supply system for heavier reliance on the Catskill and Croton Systems while the Delaware System is temporarily unavailable. To ensure the Catskill and Croton Systems are prepared to operate at peak capacity once the temporary shutdown begins, DEP would preferentially divert water from the Delaware System to the City to meet demand between June 1 and September 30, 2022, if the hydrologic conditions to do so are favorable. During this same period, DEP would reduce flow to the City from the Catskill and Croton Systems, thereby increasing the amount of water stored in those systems.

Of note, however, the temporary shutdown would only commence if hydrologic conditions are favorable (i.e., the water supply system is not in or heading towards a drought). Therefore, DEP established real-time parameters (inflow and runoff) that would be used to ensure that supply would be adequate to support the temporary shutdown. Once it had been established that sufficient supply exists to support the temporary shutdown, unwatering of the RWBT would begin on October 1, 2022.

Once the temporary shutdown is initiated, all flow through the RWBT would be stopped. WSSO for the Delaware System during this time period would focus on management of water surface elevations in Pepacton, Cannonsville, and Neversink Reservoirs. All of the Delaware System reservoirs would be drawn down in advance of the temporary shutdown, and an increase in releases for these reservoirs would be required during the temporary shutdown to maintain reservoir elevations at their normal levels and reduce the likelihood of spills. All requirements as guided by the 1954 U.S. Supreme Court Decree and pursuant to the Delaware River Basin Commission's Flexible-Flow Management Program would be met in advance of and during the temporary shutdown.

While Rondout Reservoir (part of the Delaware System) would be drawn down in advance of the temporary shutdown, this reservoir has limited release capacity compared to other Delaware reservoirs. Therefore, three temporary siphons would be constructed over Merriman Dam at the southern end of Rondout Reservoir to transfer water from the reservoir to Rondout Creek and thus provide additional release capacity (see **Figure 8-3**). Two siphons would be active with a combined total release capacity of up to 240 mgd; the third siphon would be in place as backup



Map Source: PlanNYC

- Siphons
- Delaware Aqueduct
- Catskill Aqueduct
-  Proposed Rondout Reservoir Siphons

Figure 8-3
WSSO Rondout Reservoir Siphons Rendering

in the event of a malfunction of one of the two active siphons. Construction of the siphons is anticipated to begin in 2020, and the siphons would be placed online at the onset of the temporary shutdown on October 1, 2022. Use of these siphons would require a waiver from a 1980 Stipulation of Discontinuance with the NYSDEC regarding releases from Merriman Dam.¹⁵

WSSO for the Catskill and Croton Systems during the temporary shutdown would require DEP to rely more heavily on these systems for supply. As a result, all Catskill and Croton Reservoirs would be drawn down as needed during the temporary shutdown, with the exception of West Branch and Kensico Reservoirs. These two reservoirs would be kept full to protect drinking water quality.

While natural conditions and DEP's watershed protection programs generally ensure the high quality of the City's water supply, DEP must be prepared to manage episodic water quality events associated with turbidity, typically produced by major storm events. The Catskill System is most vulnerable to turbidity events due to the underlying soils and clays that make up the stream beds in the Catskill region. During these typically short-term periods of episodic turbidity, DEP has been able, in most instances, to temporarily reduce daily flows from the Catskill System to the City and to treat any turbidity in the aqueduct with alum at the Pleasantville Treatment Facility until the Ashokan Reservoir returns to higher water quality. However, because of the need to rely heavily on the Catskill System during the temporary shutdown, DEP would likely be precluded from reducing flows in the Catskill Aqueduct. Therefore, DEP would need to temporarily expand the alum treatment facilities at the Pleasantville Treatment Facility to increase the rate of alum treatment during the temporary shutdown.

DEP would also seek exemptions from release requirements set forth in the New York State regulations for the West Branch and New Croton Reservoirs to maximize retention of water for water supply purposes during the shutdown (6 NYCRR Part. 672.3-3). DEP would also reduce or eliminate releases from the Ashokan Release Channel in accordance with section 7.c. of the Interim Release Protocol.

Throughout the temporary shutdown, the potential for water supply to meet demand would be continuously evaluated. If, at any given time, system demand exceeds predicted available supply from each of the available systems, a demobilization protocol would be initiated: the RWBT would be brought back into service and the water supply systems would be allowed return to normal conditions. The repair would be continued when the hydrologic condition of the water supply system allows.

Following the end of the temporary shutdown, the components of WSSO would continue for a short time period to allow the water supply system to equilibrate to the reservoir conditions that existed prior to the temporary shutdown.

¹⁵ The 1980 Stipulation of Discontinuance set in place an agreement between New York City and New York State that established reservoir release schedules for Rondout Reservoir under both normal and drought conditions. The release schedules were subsequently incorporated in the New York State Environmental Conservation Law as part of Chapter 10, Part 672-2.3.

8.1.3 PROPOSED RONDOUT-WEST BRANCH TUNNEL INSPECTION AND REPAIR

Both the Catskill Aqueduct Repair and Rehabilitation and Queens Groundwater Rehabilitation, along with the WSSO would be put into place to support the proposed RWBT Inspection and Repair, described further in this section, as well as the decommissioning of the bypassed portion of the RWBT, described later in this draft scope. The proposed inspection and repair would include an initial inspection of the sections of the RWBT upstream and downstream of the bypass connection points and internal repairs to the RWBT in the section where the RWBT crosses through the Town of Wawarsing, Ulster County, New York. Should any areas outside of the Wawarsing crossing be identified during the inspection as requiring repair, the appropriate repairs would be performed during the shutdown period. The goal of these repairs would be to reduce tunnel leakage throughout the full 45-mile length of the RWBT. Lastly, once the inspection and repairs have been completed and the bypass tunnel is connected, the bypassed section of the RWBT would be permanently decommissioned.

During the temporary shutdown, RWBT inspection and repair would advance concurrently. During this time, repairs would be made at the leaking area in Wawarsing. The Rondout Effluent Chamber (REC) and Shafts 1, 2A, 4, 8, and 9 of the Delaware Aqueduct would be used during RWBT inspection and repair for communications throughout, ventilation of, or access to the RWBT (see Figure 1-5). Specifically, the REC would be used for equipment storage; Shafts 1 and 9 would be used for ventilation; Shaft 2A would provide access for materials, equipment, and personnel to repair the existing leak in Wawarsing (DEP's contractor would be responsible for preparing and maintaining the Shaft 2A site); Shaft 4 would be used to assist with communication; and Shaft 8 would provide emergency egress and access for tunnel inspection. Site improvements were completed under a previous project to prepare these sites for use during the repair work.

Shaft 2A, located in the Town of Wawarsing, would be used for access and for conducting internal repairs of the Wawarsing section of the RWBT. This section is anticipated to be the section of the RWBT that requires the most extensive repairs, aside from the Roseton area to be bypassed. In the Wawarsing area, the methods of repair could include crack repair, contact grouting, or cut-off grouting.

Crack repair would include tunnel liner repairs, such as patching and grouting existing grout holes and sealing construction joints and other openings. Structural cracks could be repaired using rigid epoxy injection systems if the crack is not actively leaking. Contact grouting would fill the void space immediately between the tunnel liner and rock mass along the tunnel. Grout holes would be drilled into the rock along the tunnel. Grout would then be injected between the liner and the rock mass to achieve tight contact. Grouting would decrease permeability and improve rock strength. Grouting that extends 10 feet beyond the rock line around the tunnel would fill open joints, fractures, faults, and other defects in the rock mass. Finer rock fractures would require ultrafine cement grout.

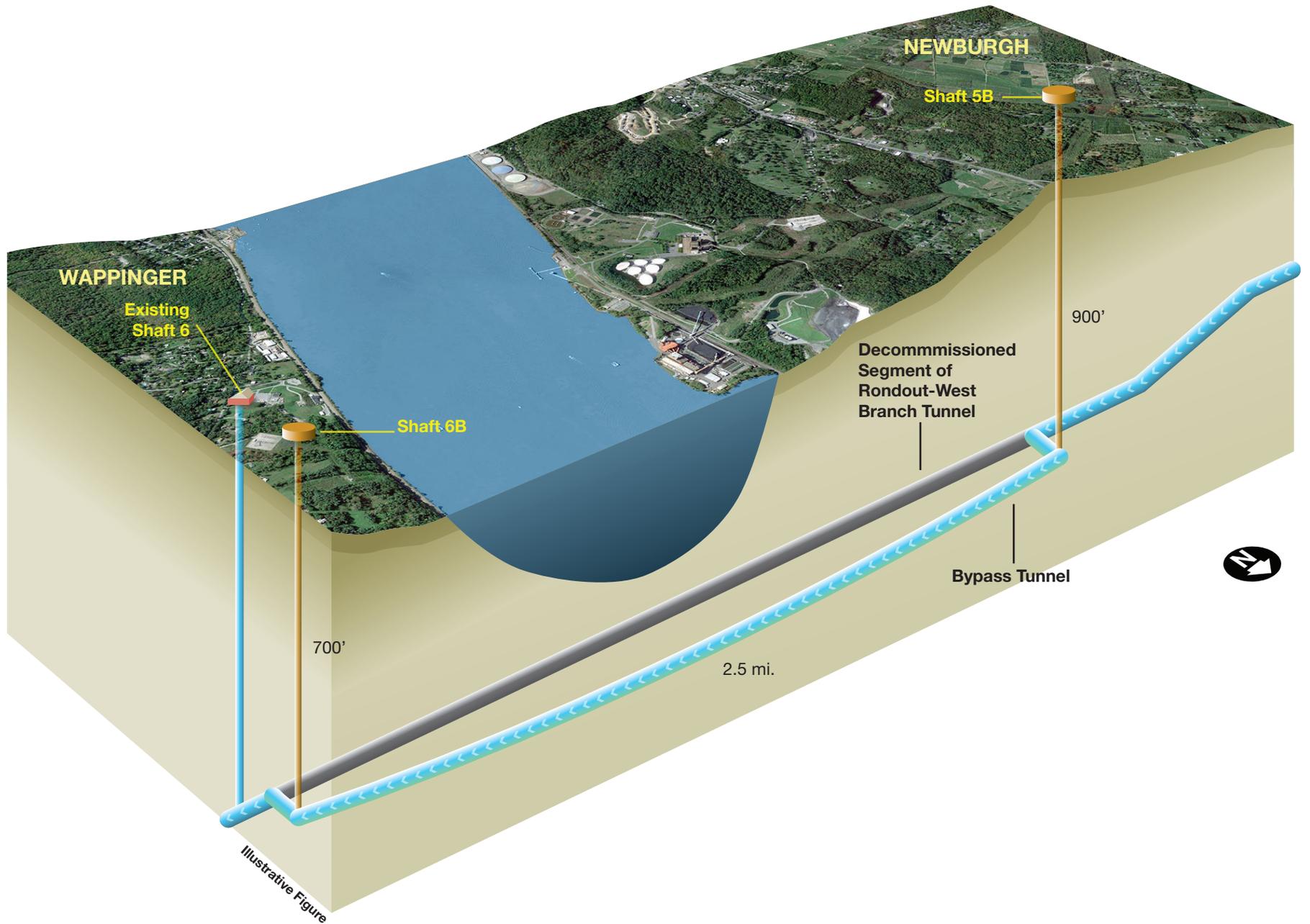
During RWBT Inspection and Repair, DEP customers on this segment of the Delaware Aqueduct would be required to temporarily use alternate water supplies. DEP is working with customers

who currently would not have sufficient supply during the temporary shutdown to ensure they would have sufficient water supplies in advance of the temporary shutdown.¹⁶

8.1.3.1 Rondout-West Branch Tunnel Decommissioning

Once inspections and repairs to the RWBT are complete and the bypass tunnel is connected to the existing RWBT, the bypass tunnel would become a permanent component of the RWBT. At that time, the leaking segment that was bypassed would be permanently decommissioned, all existing leaks are expected to cease, and DEP's water supply system would be operated in the same manner as it was prior to WFF. When the connection and the repairs are completed, water flow would be restored to the Delaware Aqueduct, and water would flow through the RWBT and the newly constructed bypass tunnel (see **Figure 8-4**).

¹⁶ Table 4-1 notes the affected customers. The DEIS will provide additional detail on the customers' projects.



8.2 PROPOSED IN-CITY WATER SUPPLY RESILIENCY

In addition to the Upstate Water Supply Resiliency, DEP is also proposing the In-City Water Supply Resiliency to provide additional supply during the temporary shutdown. The proposed In-City Water Supply Resiliency, which will be the subject of a subsequent EIS, would consist of upgrading treatment for up to 23 DEP-owned wells at 19 existing stations in southeast Queens, the construction of a central water treatment center for a few of the well stations, and a central control facility for the groundwater supply system. Together, these wells are expected to provide up to 33 mgd of continuous supply during the temporary shutdown. These stations are currently in various states of operational readiness; however, all would receive treatment system upgrades, including replacing mechanical equipment (e.g., pumps) and constructing buildings for new treatment facilities. Once treatment upgrades are complete, the wells would provide more robust resiliency to the water supply during droughts, repairs, or emergencies.

Finished water quality at all stations would meet or exceed all applicable NYSDOH and New York City Department of Health and Mental Hygiene (NYCDOHMH) water quality standards. Based on the raw water quality of the groundwater system and existing and anticipated future drinking water regulations, the following types of treatment are currently anticipated: (1) iron and manganese removal; (2) volatile organic chemical (VOC) removal; and (3) chemical treatment (i.e., chlorine, fluoride, orthophosphate and pH adjustment).

Construction of all stations would be anticipated to commence in 2017 and to be completed by late 2019, followed by a rigorous testing program of all WFF targeted stations to ensure their operability and effective distribution to areas within and beyond southeast Queens. This would be completed in 2020 in advance of the temporary shutdown. Use of the Queens groundwater supply system under the WFF Program could continue for a short time after the completion of the bypass tunnel connection to facilitate rebalancing the reservoir systems.

*Chapter 9: Potential Major Discretionary Approvals,
Coordination, and Consultations*

Upstate Water Supply Resiliency would require permits and approvals from federal, State, and local agencies. Anticipated permits and approvals are listed in **Table 9-1**, and are organized by project component.

Table 9-1: Summary of Potential Discretionary Permits, Approvals, and Consultations for Upstate Water Supply Resiliency

Involved Agency	Permit/Approval/Consultation	Proposed Catskill Aqueduct Repair and Rehabilitation	Proposed WFF Shutdown System Operations	Proposed RWBT Inspection and Repair and Decommissioning
U.S. Army Corps of Engineers	Section 10	✓	✓	✓
	Section 404	✓	✓	✓
U.S. Fish & Wildlife Service	Consultation	✓	✓	✓
NYS Department of Environmental Conservation	Freshwater Wetlands	✓	✓	✓
	Protection of Waters (including Dam Safety permits)	✓	✓	-
	Section 401 Water Quality Certification	✓	✓	✓
	SPDES Permit (General Permit for Stormwater Associated with Construction Activities)	✓	-	-
	SPDES Permit (MSGP for Stormwater Associated with Industrial Activities)	✓	-	-
	Individual SPDES Permit (Form NY-2C)	✓	-	-
	Air Emissions (201 Permit/Registration)	✓	-	-
	Natural Heritage Program Consultation	✓	✓	✓
NYS Department of State	Coastal Zone Consistency Assessment	✓	✓	-
NYS Department of Transportation	Roadway or ROW Use/Easement	✓	-	-
NYS Department of Health	Public Water Supply Improvement	✓	✓	✓
NYS Office of Parks, Recreation and Historic Preservation	Historic Resources Consultation	✓	✓	-
New York City (NYC) Department of Environmental Protection	CEQR Review	✓	✓	✓
NYC Department of Health and Mental Hygiene	Water Supply Improvement Approval	✓	✓	✓
Public Design Commission	Design Review	✓	✓	✓
Various Counties/Towns/Villages	Local Site Plan Approval	✓	✓	✓

Chapter 10: Organization and Scope of the Draft Environmental Impact Statement

The table of contents for the DEIS is as follows. This chapter of the draft scope describes what will be presented within each chapter of the DEIS:

- DEIS Executive Summary
- Chapter 1: Introduction
- Chapter 2: Program Description
- Chapter 3: Purpose and Need for the Proposed Upstate Water Supply Resiliency Project
- Chapter 4: The Water Supply System
- Chapter 5: Water for the Future Background and Planning and Implementation Schedule
- Chapter 6: Description of Proposed Upstate Water Supply Resiliency Project
- Chapter 7: Potential Major Discretionary Approvals, Coordination, and Consultations
- Chapter 8: Analytical Framework for the Draft Environmental Impact Statement
- Chapter 9: Proposed Catskill Aqueduct Repair and Rehabilitation
- Chapter 10: Proposed Water for the Future Shutdown System Operations
- Chapter 11: Proposed Rondout-West Branch Tunnel Inspection and Repair
- Chapter 12: Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project
- Chapter 13: Mitigation
- Chapter 14: Alternatives Analysis
- Chapter 15: Unavoidable Adverse Impacts
- Chapter 16: Irreversible and Irrecoverable Commitment of Resources

10.1 DEIS EXECUTIVE SUMMARY

The DEIS will include an executive summary providing a clear overview of the information presented in the body of the DEIS. The executive summary will include a description of the proposed Upstate Water Supply Resiliency project, list of agencies and required permits and approvals, a summary of any identified potential significant adverse impacts associated with construction and operation of the proposed Upstate Water Supply Resiliency project and proposed mitigation measures for any potential impacts identified, as applicable. Specifically, the executive summary will include:

- A brief description of the proposed project, including background information describing its development, as well as its relationship to the previous EIS, its role within WFF, and its implementation relative to the WFF timeline;
- A list of involved and interested agencies and required approvals/permits;
- A summary of any anticipated potential significant adverse impacts resulting from the proposed project and any related mitigation measures; and
- A summary of alternatives to the proposed Upstate Water Supply Resiliency project considered in the DEIS, along with a comparison of their potential significant adverse impacts to those of the proposed project.

10.2 DEIS CHAPTER 1: INTRODUCTION

As described in Chapter 1, “Introduction,” of this draft scope, the first chapter of the DEIS will introduce WFF, including the three projects that comprise it: Shaft and Bypass Tunnel Construction, which was disclosed in a previous EIS, the proposed Upstate Water Supply Resiliency project, which is the subject of this DEIS, and the In-City Water Supply Resiliency project, which will be subject of a future EIS. Chapter 1 of the DEIS will provide the public and decision-makers with an understanding of the proposed Upstate Water Supply Resiliency project components, the impact assessment process, the criteria with which it will be evaluated, and alternatives that will be considered in the alternatives analysis.

Specifically, this chapter will contain a brief background of WFF; a brief description of the proposed Upstate Water Supply Resiliency project and its components; figures depicting site locations and the approximate location of their associated study areas associated with Upstate Water Supply Resiliency; a discussion of the approvals required and procedures to be followed for evaluation of Upstate Water Supply Resiliency; and a description of the future without proposed Upstate Water Supply Resiliency. Involved agencies, designated pursuant to SEQRA and CEQR, will be identified in the DEIS. The role of DEP, as Lead Agency under SEQRA and CEQR, will also be described, as well as the environmental review process to aid in decision-making.

10.3 DEIS CHAPTER 2: PROGRAM DESCRIPTION

Chapter 2 of the DEIS will contain a more detailed description of WFF, the proposed Upstate Water Supply Resiliency project and its components, and a high-level overview of updates to the RWBT Bypass project since issuance of the previous EIS.

10.4 DEIS CHAPTER 3: PURPOSE AND NEED FOR THE PROPOSED UPSTATE WATER SUPPLY RESILIENCY PROJECT

The purpose and need for the proposed Upstate Water Supply Resiliency project will be provided in Chapter 3 of the DEIS. For reference, the purpose and need for the overall WFF Program is provided in Chapter 2, “Purpose and Need for Water for the Future”, of this draft scope.

10.5 DEIS CHAPTER 4: WATER SUPPLY SYSTEM

A description of the City’s water supply system will be provided in Chapter 4 of the DEIS. This section will also describe the programs and projects with independent utility that will nonetheless support the goals of WFF and factor into DEP future operations. For reference, an overview of the City’s water supply system is provided in Chapter 6, “The Water Supply System,” of this draft scope.

10.6 DEIS CHAPTER 5: WATER FOR THE FUTURE PLANNING AND IMPLEMENTATION SCHEDULE

Background information on WFF, including the proposed Upstate Water Supply Resiliency project development process, water supply augmentation planning, augmentation modeling, and selection of final augmentation projects will be further described in Chapter 5 of the DEIS. For reference, a high-level overview of this background information is described in Chapter 5, “Water for the Future Planning and Implementation Schedule,” of this draft scope.

10.7 DEIS CHAPTER 6: DESCRIPTION OF PROPOSED UPSTATE WATER SUPPLY RESILIENCY PROJECT

A description of the proposed Upstate Water Supply Resiliency project and its components, Catskill Aqueduct Repair and Rehabilitation, WFF Shutdown System Operations (WSSO), RWBT Inspection and Repair and decommissioning of the bypassed segment of the RWBT will be provided in Chapter 6 of the DEIS in greater detail than in Chapter 8, “Description of Water for the Future,” of this draft scope.

10.8 DEIS CHAPTER 7: POTENTIAL MAJOR DISCRETIONARY APPROVALS, COORDINATION, AND CONSULTATIONS

Actions associated with the proposed Upstate Water Supply Resiliency project will be identified, including, but not limited to, permits and approvals. Coordination and consultations will be further described in Chapter 7 of the DEIS. For reference, see Chapter 9, “Potential Major Discretionary Approvals, Coordination, and Consultations”, of this draft scope.

10.9 DEIS CHAPTER 8: ANALYTICAL FRAMEWORK FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Chapter 8 of the DEIS will describe the analytical framework used to determine the potential for impacts associated with all components of the proposed Upstate Water Supply Resiliency project. It will describe and define the assessment conditions, analysis years, impact assessment categories, and analysis thresholds for the impact assessments. At a minimum, a screening-level assessment for the proposed Upstate Water Supply Resiliency project will be provided in the DEIS for all relevant environmental impact assessment categories where more detailed assessments are not required. Using the methodology described in this draft scope, applicable environmental impact assessment categories (e.g., land use, transportation, etc.) will be evaluated for each component of the proposed Upstate Water Supply Resiliency project. In some cases, specific assessment categories may be evaluated cumulatively for the proposed Upstate Water Supply Resiliency project with respect to both construction and operation, as applicable and as described in Section 10.13, “Cumulative Impacts of the Proposed Upstate Water Supply Resiliency Project” of this draft scope (Chapter 12 of the DEIS). This includes those assessments that do not warrant study area-specific assessments. **Table 10-1** summarizes the impact categories where preliminary and/or detailed analysis will be conducted and presented in the DEIS to identify the potential for impacts from construction and/or operation of each component of the proposed Upstate Water Supply Resiliency project, as applicable. For the DEIS, when construction activities associated with a component would occur over short periods (e.g., months versus years), a construction period assessment will be included for applicable assessment categories. The following described the framework used for the DEIS assessment.

Baseline Conditions. Baseline conditions are those that are observed and assessed, establishing a reference point against which future conditions can be projected. Generally, these conditions will be assessed for the time periods that represent existing conditions at the time of publication of the EIS in the study areas that are most likely to be affected by the project.

Future Condition Without the Proposed Project. In this section, the analysis year conditions known to occur or expected to occur in the future, regardless of the proposed project, are compared to Baseline Conditions for the proposed program’s construction and operation. This is the Future Condition Without the Proposed Project condition.

Probable Impacts with the Proposed Project. Potential changes to the environment resulting from construction or temporary and long-term operation of the proposed Upstate Water Supply Resiliency project are compared to the Future Condition Without the Proposed Project to assess the potential for significant adverse impacts. This comparison provides for an understanding of the potential impacts that could result with the proposed project condition.

Analysis Year(s). For a proposed project with several components, the analysis year(s) refers to future year(s) when the proposed project is likely to affect its environmental setting. There could be a number of analysis years, depending on the technical analysis area under consideration. For example, where the construction period for a proposed Upstate Water Supply Resiliency project component is greater than two years or is intensive, CEQR/SEQRA requires analysis of the construction period. This would require use of separate analysis years since construction would occur ahead of the project component becoming operational. Short-term construction activities

generally do not warrant a detailed construction analysis and will not be evaluated in detail in the DEIS.

As described previously, the Upstate Water Resiliency project is comprised of several components that will be constructed and begin operating over different years, culminating in connection of the bypass tunnel to the RWBT beginning in 2022. As such, there will be several analysis years in the DEIS. For the proposed Upstate Water Supply Resiliency project, the analysis years associated with (1) Baseline Conditions will include observations and assessments collected between late 2012 and early 2015, as applicable; (2) the Future Without the Proposed Project will be based on different years associated with construction and operation of the components of the proposed Upstate Water Supply Resiliency project, ranging between 2016 and 2023; and (3) Probable Impacts with the Proposed Project will be assessed for future conditions for the same analysis years as the Future Without the Proposed Project, further described below.

Future conditions associated with construction of the proposed Upstate Water Supply Resiliency project components will be evaluated for peak periods of construction that represent a “reasonable worst case scenario”. Operation of the proposed Upstate Water Supply Resiliency project components will be evaluated for both temporary operational conditions during the shutdown and long-term operation, further described in this draft scope.

Table 10-1: Summary of Analyses of Proposed Upstate Water Supply Resiliency Project Component to be Presented in the DEIS

Assessment Categories Requiring Preliminary and/or Detailed Analysis	Catskill Aqueduct Repair and Rehabilitation	WFF Shutdown System Operations		RWBT Inspection and Repair		Cumulative Assessment
		WFF Shutdown System Operation: Delaware System	WFF Shutdown System Operations: Catskill and Croton Systems	RWBT Inspection and Repair	Decommissioning	
Land Use, Zoning and Public Policy	✓	✓	✓	✓	✓	-
Socioeconomic Conditions	✓	✓	✓	✓	✓	✓
Community Facilities and Services	✓	✓	✓	✓	✓	-
Open Space and Recreation	✓	✓	✓	✓	✓	-
Critical Environmental Areas	✓	✓	✓	✓	-	-
Shadows	-	-	-	-	-	-
Historic and Cultural Resources	✓	✓	✓	✓	✓	-
Visual Resources	✓	✓	✓	✓	✓	-
Natural Resources	✓	✓	✓	✓	✓	✓
Hazardous Materials	✓	✓	✓	✓	✓	-
Water and Sewer Infrastructure	✓	✓	✓	✓	✓	✓
Solid Waste and Sanitation Services	-	-	-	-	-	-
Energy	✓	-	-	✓	-	✓
Transportation	✓	✓	✓	✓	-	-
Air Quality	✓	✓	✓	✓	-	-
Greenhouse Gas Emissions and Climate Change	-	-	-	-	-	✓
Noise	✓	✓	✓	✓	-	-
Neighborhood Character	✓	✓	✓	✓	✓	-
Public Health	✓	✓	✓	✓	✓	-

Note: Where a preliminary or detailed analysis is identified for a particularly project component and assessment area, the analysis will include both a construction and operational assessment, where applicable.

10.10 DEIS CHAPTER 9: PROPOSED CATSKILL AQUEDUCT REPAIR AND REHABILITATION

10.10.1 PROPOSED CATSKILL AQUEDUCT REPAIR AND REHABILITATION OVERVIEW

This section of the DEIS will introduce the proposed Catskill Aqueduct Repair and Rehabilitation, described previously in Chapter 8.1.1, “Proposed Catskill Aqueduct Repair and Rehabilitation,” of this draft scope. This section of the DEIS will contain a brief background of the proposed Catskill Aqueduct Repair and Rehabilitation (proposed rehabilitation), and type of work to be conducted along the aqueduct, as well as figures depicting locations of activities associated with the proposed rehabilitation. This section will also describe activities associated with rehabilitation by municipality. The description will include an overview figure of work to be conducted in each municipality, as well as a discussion of the required approvals for the proposed rehabilitation within that municipality. The location of the project sites and a summary of the activities within each municipality along segments of the Catskill Aqueduct that will be assessed in the DEIS are provided in **Table 10-2**.

10.10.2 SCHEDULE

This section of the DEIS will include an overview of the construction schedule for the proposed rehabilitation, including site preparation, mobilization, construction duration, and demobilization, as appropriate.

10.10.3 GENERAL DESIGN FEATURES OF PROPOSED CATSKILL AQUEDUCT REPAIR AND REHABILITATION PROJECT

This section of the DEIS will discuss the types of activities that would occur along the aqueduct in greater detail. For example, it will describe the proposed chemical system that would be added to inject a chlorine to the headworks of the Ashokan Reservoir Screen Chamber; temporary access points and staging areas associated with the proposed rehabilitation; proposed methods of leak repair or treatment; activities and disposal of water associated with aqueduct cleaning; typical activities required to support installation of new vents and to make mechanical repairs; proposed dechlorination system that would be added adjacent to the Pleasantville Treatment Facility; and how the Catskill Aqueduct would be operated once construction is complete.

Table 10-2: Proposed Catskill Aqueduct Repair and Rehabilitation Study Areas and Work Activities

County	Municipality	Study Area	Work Activities
Ulster	Town of Olive	Ashokan Screen Chamber	<ul style="list-style-type: none"> • Construct Catskill Chlorination Facility • Perform cleaning and inspection at 1 location.
	Town of Marbletown	Vly Atwood Road	<ul style="list-style-type: none"> • Repair 3 leaks or install dechlorination systems if necessary: Leaks 1A, 1B, 2
		Pine Bush Road	<ul style="list-style-type: none"> • Install 1 air vent: Rondout Downtake • Perform cleaning and inspection at 2 locations.
		Warrens Way	<ul style="list-style-type: none"> • Install 5 dechlorination systems: Leaks 3A, 3B, 4
		Canal Road	<ul style="list-style-type: none"> • Install 1 dechlorination system: Leak 5
		Lower Knolls Road	<ul style="list-style-type: none"> • Install 1 air vent: Rondout Uptake • Perform cleaning and inspection at 2 locations.
	Town of New Paltz	New Paltz–Minnewaska Road	<ul style="list-style-type: none"> • Install 1 air vent: Wallkill Downtake • Perform cleaning and inspection at 2 locations.
	Town of Gardiner	Forest Glen Road	<ul style="list-style-type: none"> • Install 1 dechlorination system: Leak 6
		Le Ferve Lane	<ul style="list-style-type: none"> • Install 1 air vent: Wallkill Uptake • Perform cleaning and inspection at 2 locations.
	Town of Shawangunk	Strawridge Road	<ul style="list-style-type: none"> • Install 2 air vents: St. Elmo Downtake Boat Hole, St. Elmo Uptake Boat Hole • Perform cleaning and inspection at 3 locations.
Orange	Town of New Windsor	Passaro Drive	<ul style="list-style-type: none"> • Perform cleaning and inspection at 1 location.
Putnam	Town of Philipstown	Sprout Brook Road	<ul style="list-style-type: none"> • Perform cleaning and inspection at 6 locations. • Replace 3, 12-inch blow-off valves.

Table 10-2: Proposed Catskill Aqueduct Repair and Rehabilitation Study Areas and Work Activities

County	Municipality	Study Area	Work Activities
Westchester	Town of Cortlandt	Oregon Road	<ul style="list-style-type: none"> • Perform cleaning and inspection at 30 locations. • Replace 6, 12-inch blow-off valves.
	Town of Yorktown	Chapman Road	<ul style="list-style-type: none"> • Perform cleaning and inspection at 7 locations.
		Croton Dam Road	<ul style="list-style-type: none"> • Repair 1 leak or install dechlorination system if necessary: Leak 7 • Install 1 air vent: Croton Lake Uptake Boat Hole • Perform cleaning and inspection at 3 locations.
		Kitchawan Road	<ul style="list-style-type: none"> • Perform cleaning and inspection at 2 locations. • Replace 1, 10-inch culvert drain.
	Town of New Castle	Station Place	<ul style="list-style-type: none"> • Perform cleaning and inspection at 3 locations.
	Town of Mount Pleasant	Chappaqua Road	<ul style="list-style-type: none"> • Repair 2 leaks or install dechlorination systems if necessary: Surface Expressions 8, 9
	Village of Pleasantville	Pleasantville Treatment Facility	<ul style="list-style-type: none"> • Construct Pleasantville Dechlorination Facility
<p>Note that ongoing inspections and design related activities may identify additional work activities related to the proposed Catskill Aqueduct Repair and Rehabilitation Project. All relevant work associated with the proposed project will be evaluated in the DEIS.</p>			

10.10.3.1 Construction

The description of construction activities and equipment will include mobilization, site preparation, demolition, construction, and demobilization, as appropriate, as well as the types of equipment that will be present at the sites to carry out these activities. The estimated construction schedule for the proposed rehabilitation (including staging and phasing), an estimate of on-site activity (e.g., type of equipment, number of construction workers, construction hours, etc.) and peak activity period for analysis will be described in the DEIS.

Construction associated with the installation of vents, management of discharged materials, and mechanical repairs is expected to occur via access points and temporary staging areas that could be used to stage equipment with minimal disturbance. These staging areas would be located at existing cleared areas along the Catskill Aqueduct, many of which are existing aqueduct access sites. Therefore, the DEIS will include a construction analysis for applicable assessment areas, to be included with the areas as described in Table 10-2. This section of the DEIS will also provide a brief summary of any identified construction-related impacts and mitigation for the proposed rehabilitation based on results of the analyses presented in the DEIS.

10.10.3.2 Operation

This section of the DEIS will describe operations of the Catskill Aqueduct and its associated facilities for the shutdown and once the repairs are completed. This will include a description of the proposed operation prior to and during temporary shutdown of the RWBT, which would include planned operations for the Catskill Chlorination Facility at the Ashokan Screen Chamber as well as temporary dechlorination facilities at leak sites along the aqueduct and at the Pleasantville Treatment Facility. This section will also describe the proposed operation of the Catskill Aqueduct following the temporary shutdown once the bypass connection to the existing RWBT is complete.

10.10.4 PROPOSED CATSKILL AQUEDUCT REPAIR AND REHABILITATION PROJECT IMPACT METHODOLOGY AND ASSESSMENT

This section of the DEIS will provide an overview of the assessment categories that will be analyzed in the DEIS and describe the methodologies that will be used to assess potential environmental impacts; it will also describe baseline conditions, the future without the proposed rehabilitation, and the analysis of the potential for construction and potential impacts of the proposed rehabilitation and identified mitigation, as applicable.

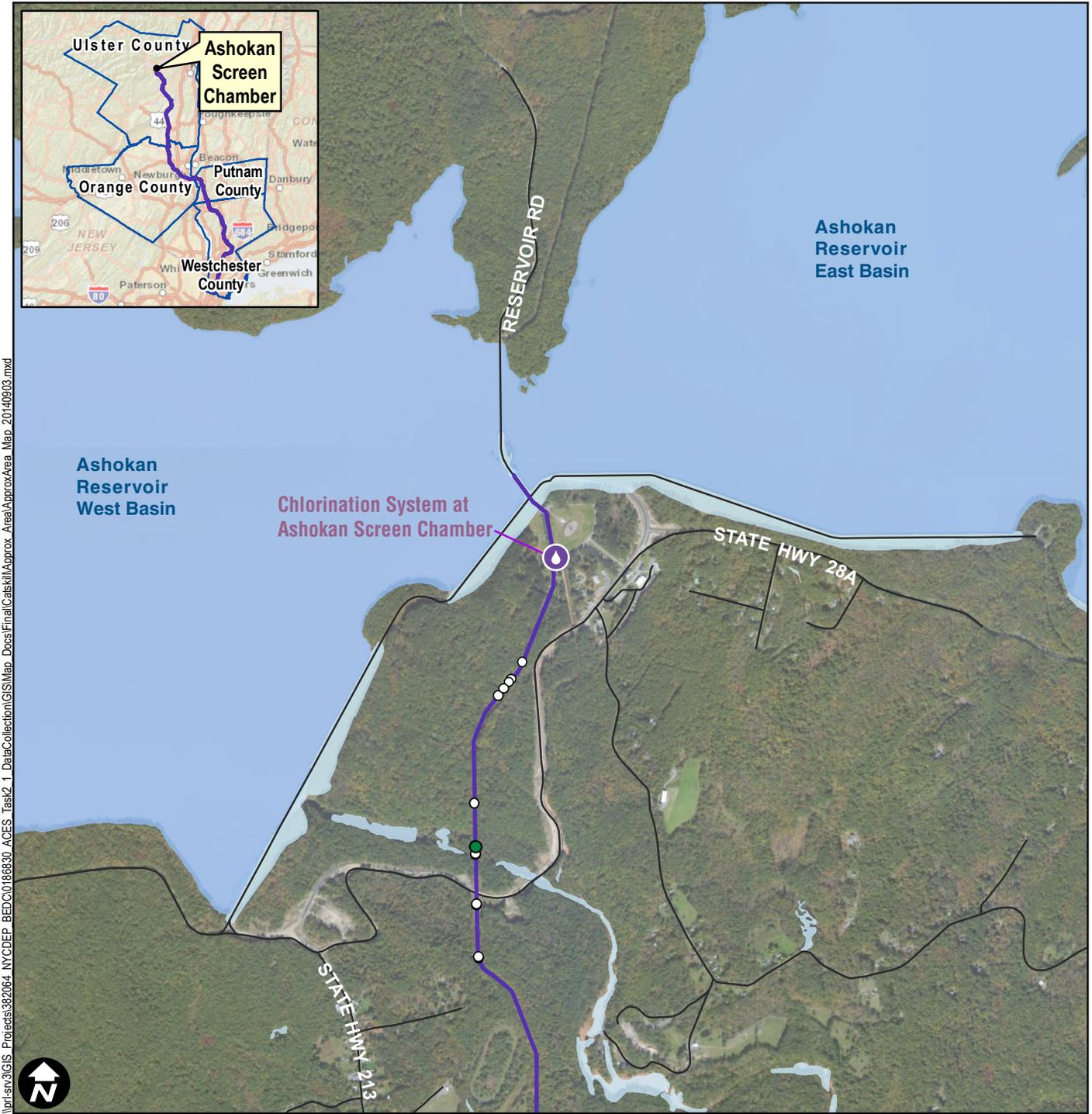
This section of the DEIS will also identify any impact categories for which the proposed rehabilitation did not meet applicable CEQR/SEQRA thresholds, thereby screening out those analyses. Construction and operation of the proposed rehabilitation would not result in new structures or additions to existing structures greater than 50 feet, or be located adjacent to, or across from, a sunlight-sensitive resource; result in the generation of 50 tons per week or more of solid waste, or in any significant generation of greenhouse gases (GHGs). Therefore, it is anticipated that the following impact categories will not be evaluated in the DEIS for proposed rehabilitation: shadows; solid waste and sanitation services; and GHGs and climate change. However, GHGs and climate change will be evaluated cumulatively for the proposed Upstate

Water Supply Resiliency and will include any potential contribution from the proposed rehabilitation.

10.10.5 PROPOSED CATSKILL AQUEDUCT REPAIR AND REHABILITATION IMPACT ASSESSMENT

This section of the DEIS will provide an assessment of the potential for impacts of the proposed rehabilitation in all relevant assessment categories by study area. As described, study areas will be defined based on the location of proposed activities along the aqueduct and will be grouped geographically within municipalities (i.e., towns) along segments of the Catskill Aqueduct. For example, if there are three locations within a single municipality where proposed rehabilitation activities are anticipated (e.g., mechanical and leak repairs) and would be located in relatively close geographic proximity, the assessment study area will be circumscribed around those three sites for purposes of analysis in the DEIS. Table 10-2 provides a summary of proposed rehabilitation activities within each municipality, and **Figure 10-1** through **Figure 10-19** display approximate site locations where activities will be assessed in the DEIS.

This section of the DEIS will include site and study area descriptions, locations, and more detailed descriptions of activities that would occur within the study areas of each town along segments of the Catskill Aqueduct associated with the proposed rehabilitation, as well as construction activities and equipment that pertain to each study area, as appropriate. All categories not screened from the analysis will be evaluated in this manner.

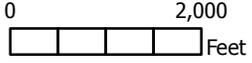


\ppl-sm\3\GIS_Protects\382064_NYCDEP_BEDC\0166830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd



Legend

- Catskill Aqueduct
- ⊕ Proposed Chlorination System at Ashokan Screen Chamber
- Mechanical Repairs
- Cleaning and Inspection Access Locations

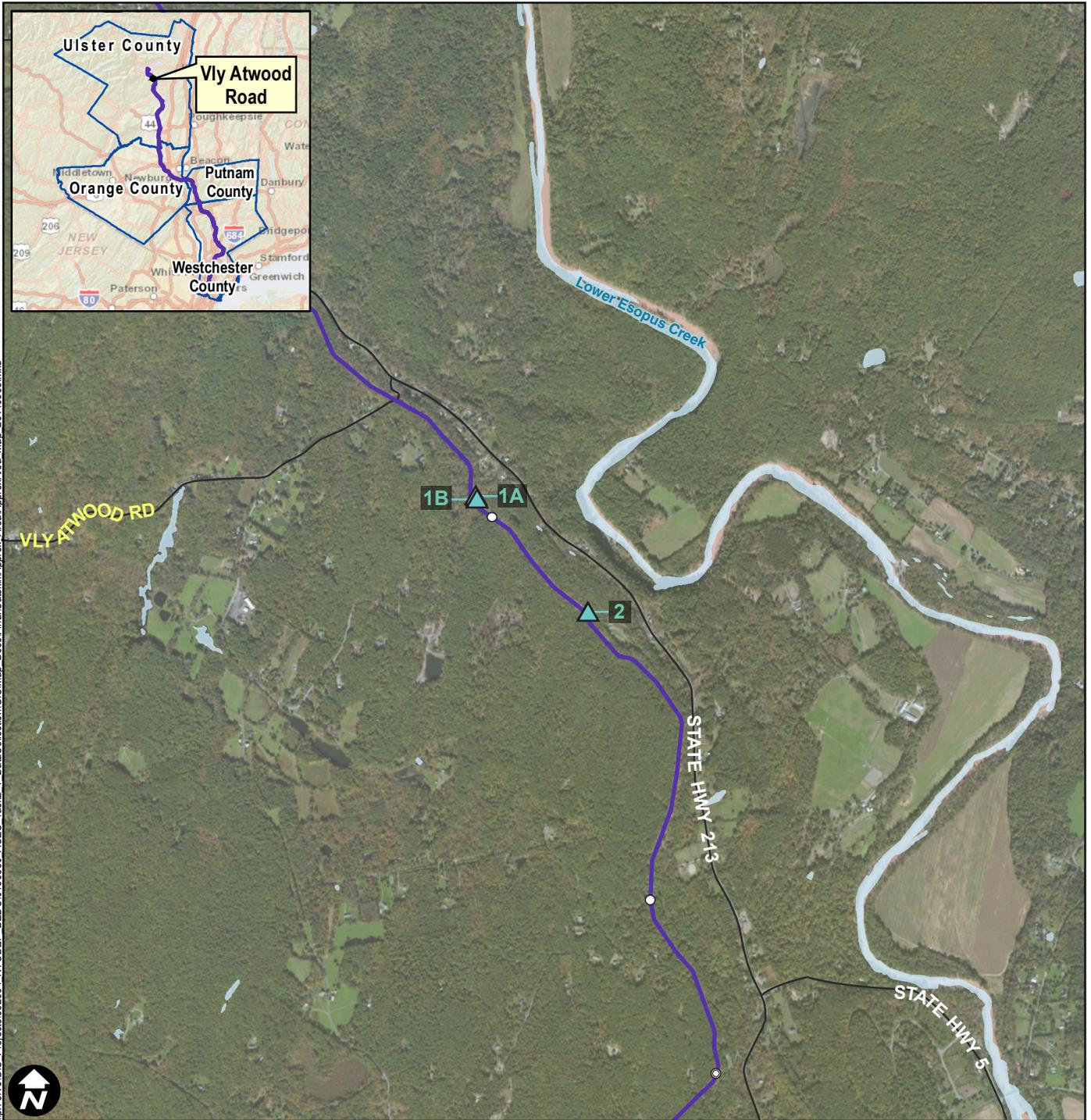


Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)



Aqueduct Connection Environmental Support (ACES)

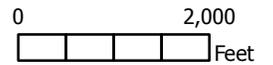
Figure 10-1
**Approximate Location of Ashokan Screen Chamber Study Area:
 Town of Olive, Ulster County**



I:\p1-srv\3\GIS_Protects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Areal\ApproxArea_Map_2014\09\03.mxd

Legend

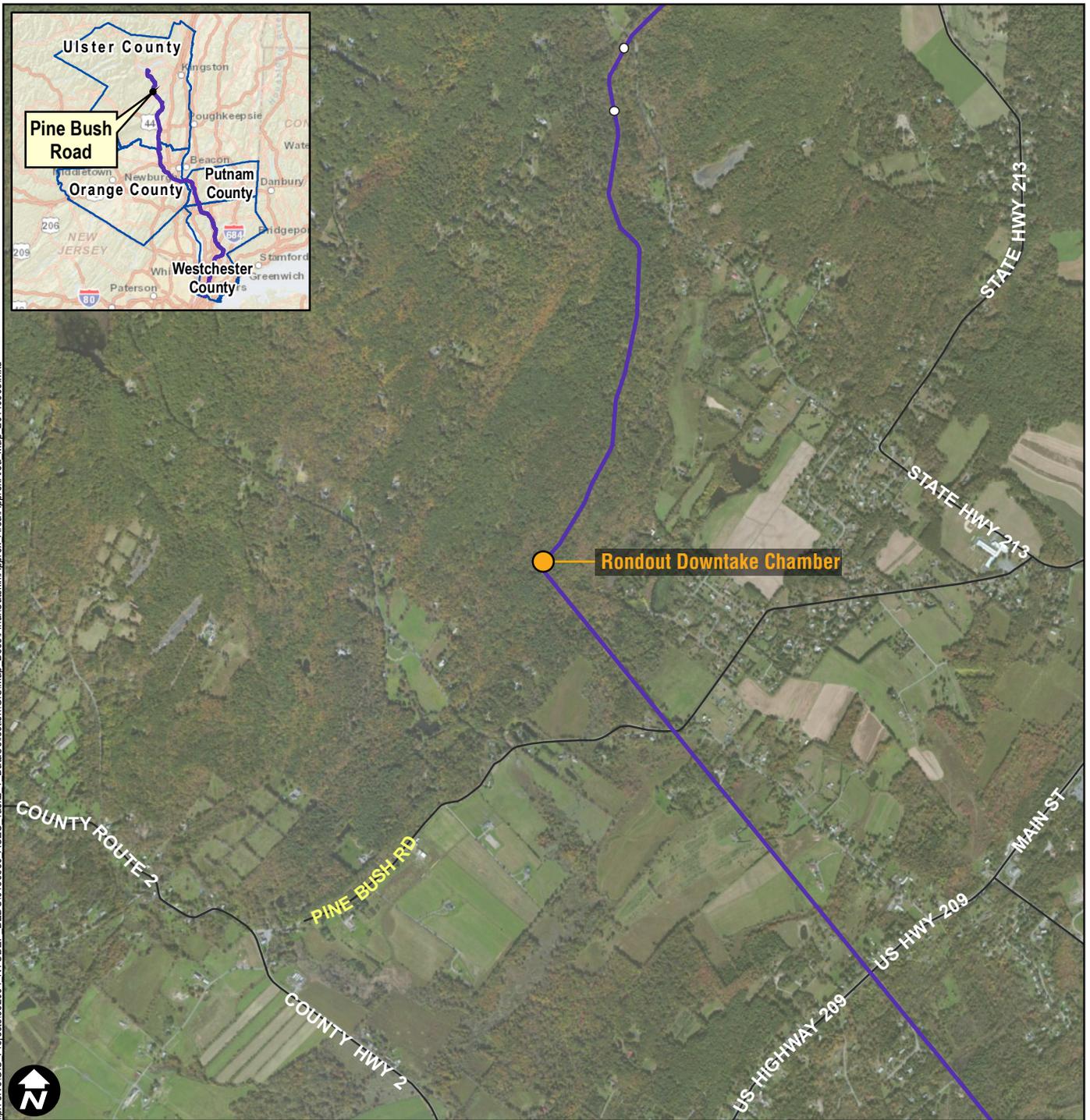
- Catskill Aqueduct
- ▲ Leak – Repair
- Cleaning and Inspection Access Locations



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-2

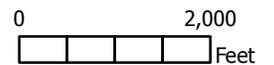
**Approximate Location of Vly Atwood Road Study Area:
 Town of Marbletown, Ulster County**



\pfr-sm\GIS\Projects\382064_NYCDWP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

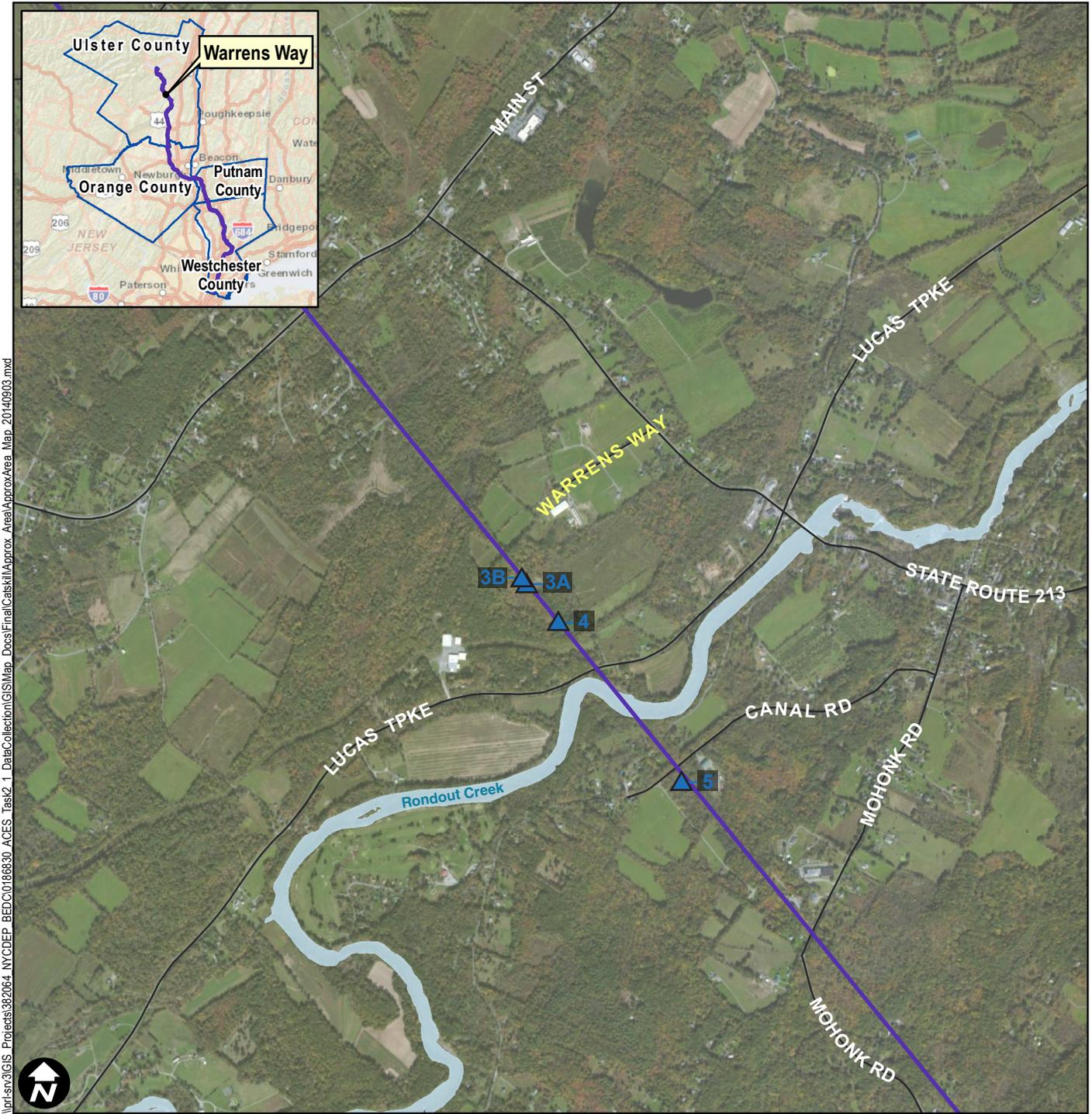
Legend

- Catskill Aqueduct
- Ventilation Improvements
- Cleaning and Inspection Access Locations



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

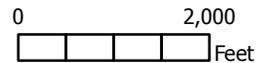
Figure 10-3
**Approximate Location of Pine Bush Road Study Area:
 Town of Marbletown, Ulster County**



I:\p1-sm\3\GIS - Projects\382064_NYCDEP - BED\0186630 - ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Areal\ApproxArea_Map_2014\0903.mxd

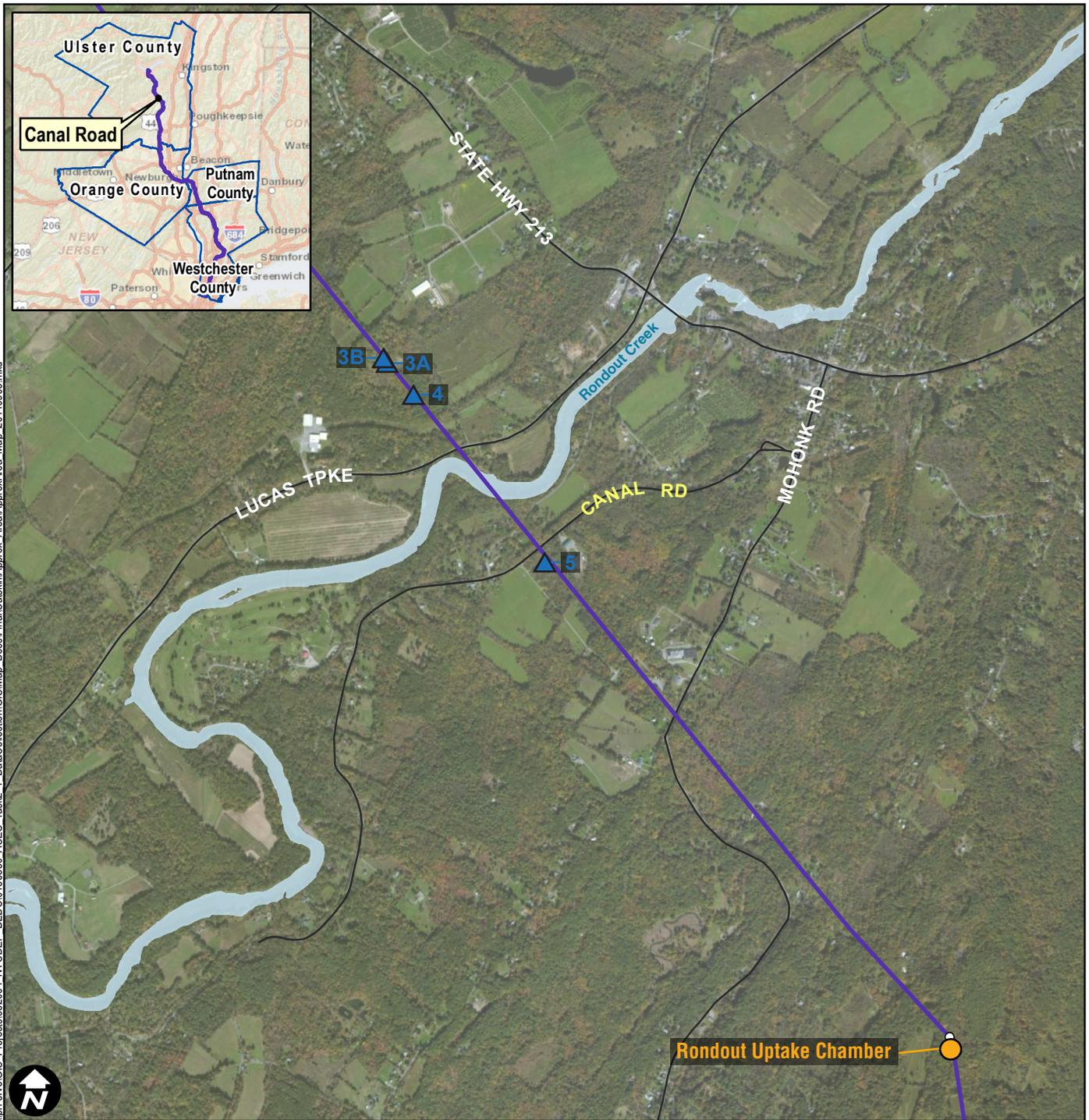
Legend

- Catskill Aqueduct
- ▲ Leak – Local Dechlorination



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

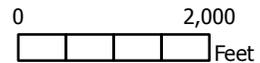
Figure 10-4
**Approximate Location of Warrens Way Study Area:
 Town of Marbletown, Ulster County**



I:\prj-sm\3\GIS_Protects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

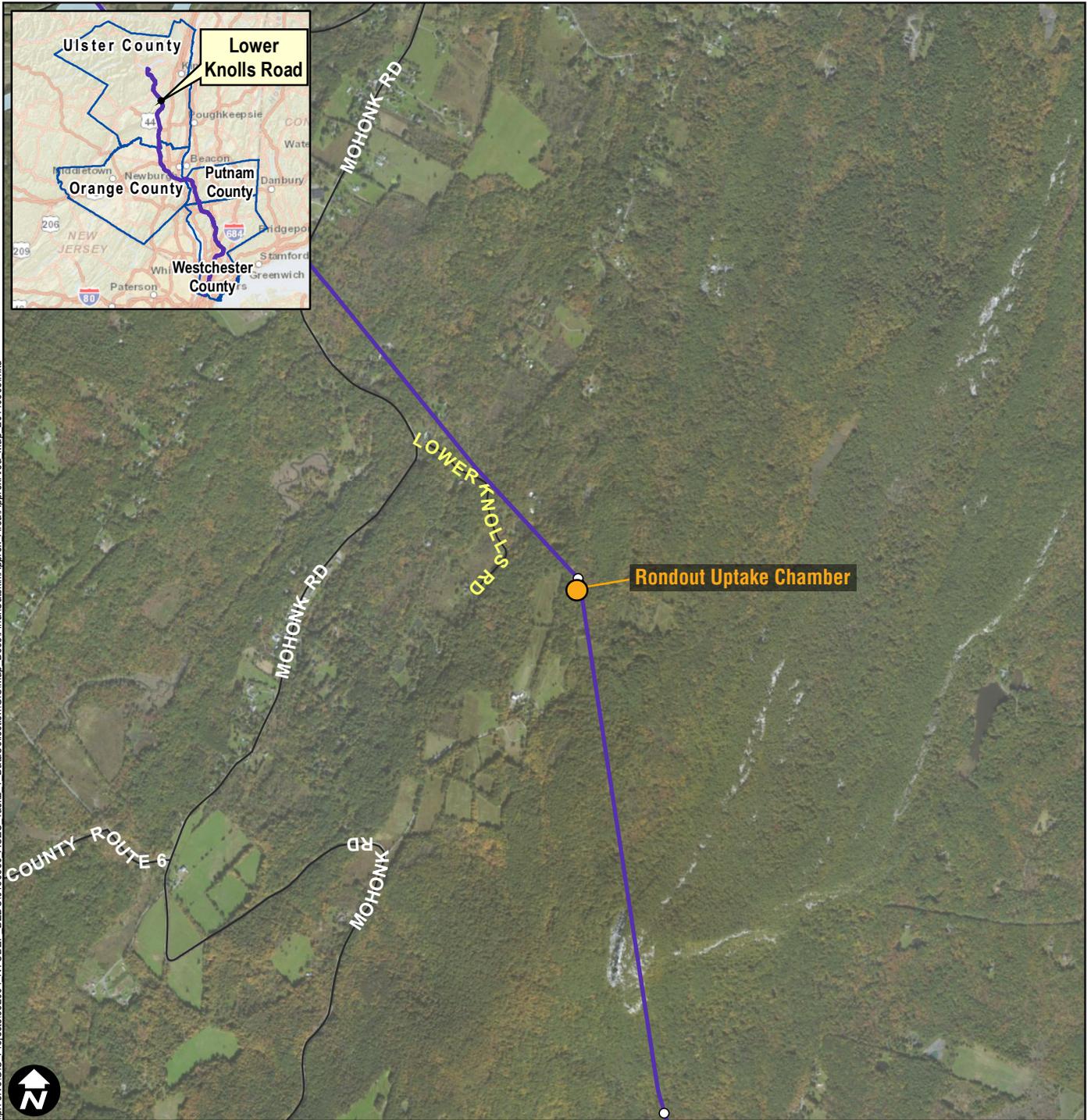
Legend

- Catskill Aqueduct
- ▲ Leak – Local Dechlorination
- Ventilation Improvements
- Cleaning and Inspection Access Locations



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

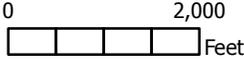
Figure 10-5
**Approximate Location of Canal Road Study Area:
 Town of Marbletown, Ulster County**



\\pr1-srv3\GIS_Protects\382064_NYCDP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Areal\ApproxArea_Map_2014\0903.mxd

Legend

- Catskill Aqueduct
- Ventilation Improvements
- Cleaning and Inspection Access Locations



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-6
**Approximate Location of Lower Knolls Road Study Area:
 Town of Marbletown, Ulster County**



\proj-srv\GIS\Projects\382064_NYCDEP_BEDC\0186630_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

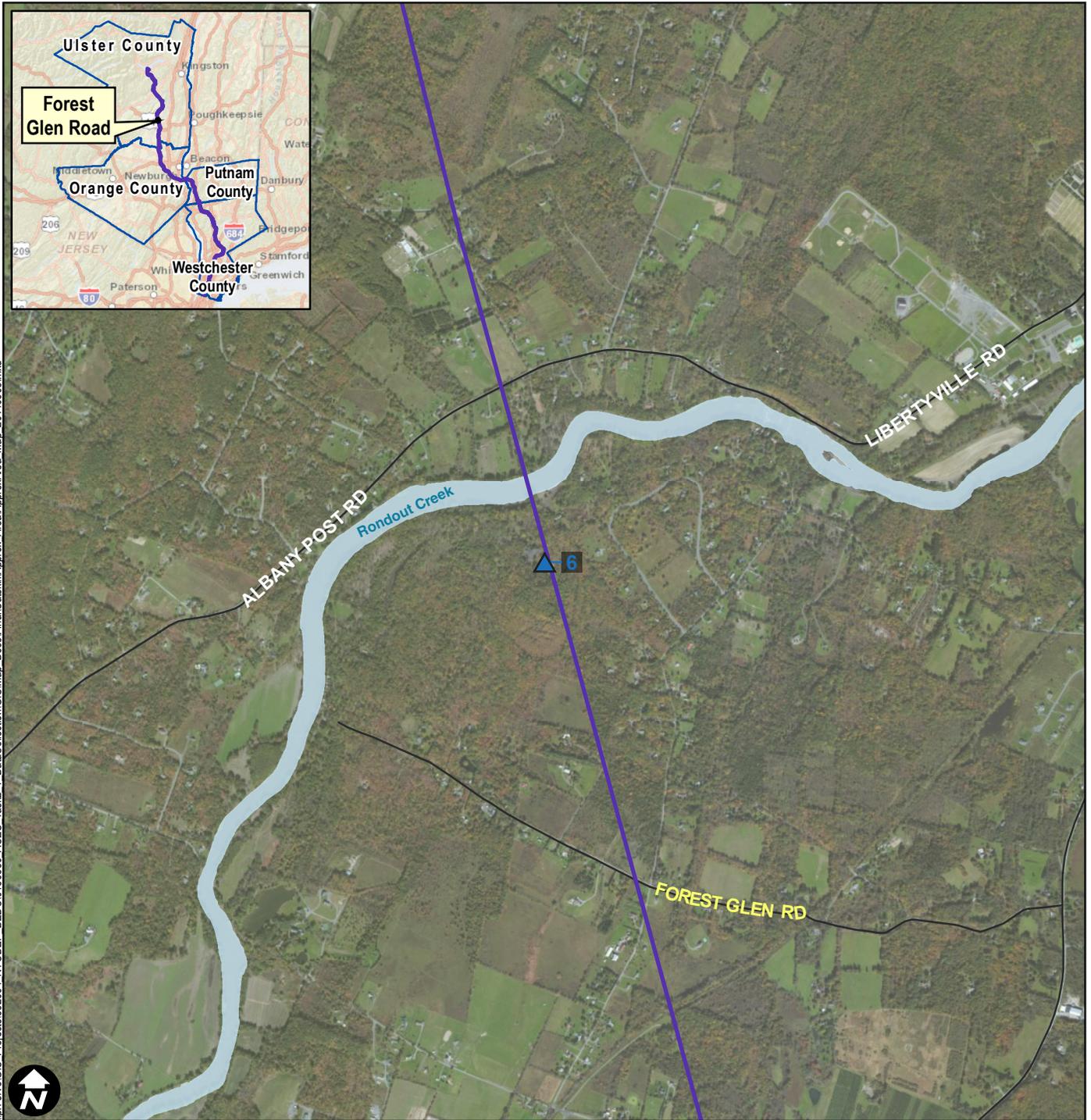
Legend

- Catskill Aqueduct
- Ventilation Improvements
- Cleaning and Inspection Access Locations

0 2,000
 Feet

Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-7
**Approximate Location of New Paltz-Minnewaska Road Study Area:
 Town of New Paltz, Ulster County**

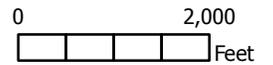


\\pr1-sm3\GIS\Projects\382064_NYCDWP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\09\03.mxd



Legend

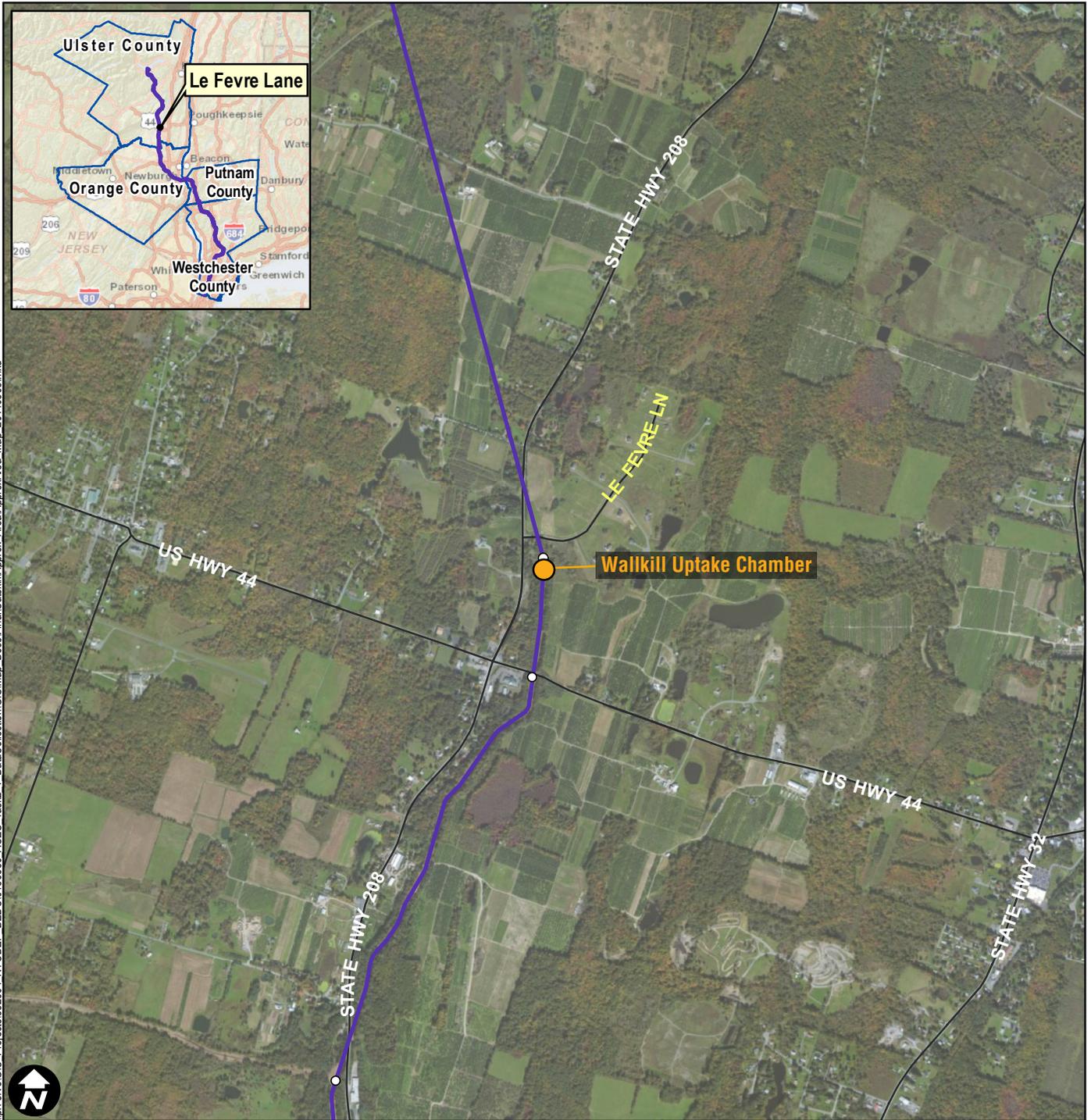
- Catskill Aqueduct
- ▲ Leak - Local Dechlorination



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-8

**Approximate Location of Forest Glen Road Study Area:
 Town of Gardiner, Ulster County**

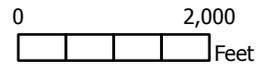


\\pr1-sm3\GIS\Projects\382064_NYCDPEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd



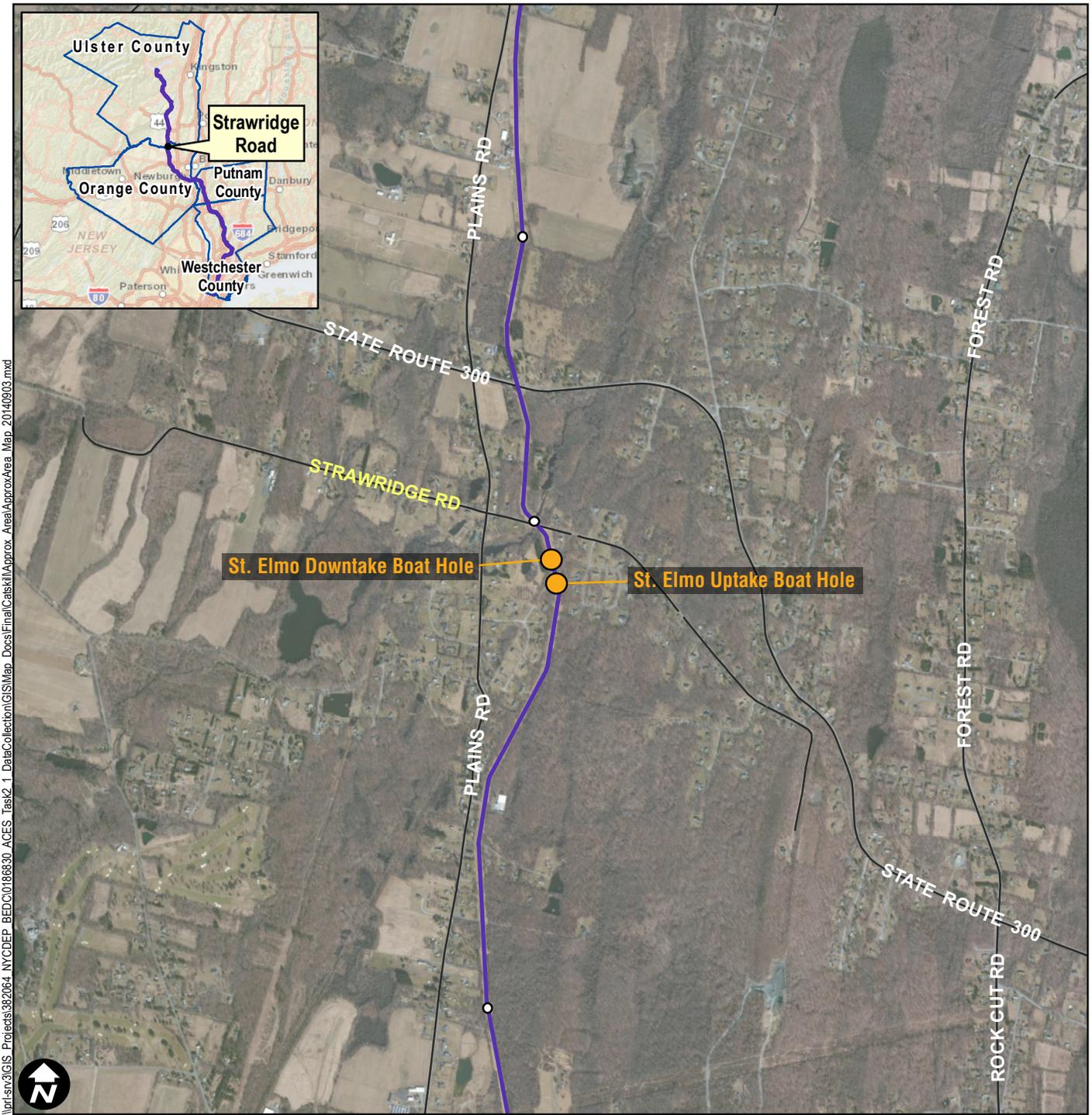
Legend

- Catskill Aqueduct
- Ventilation Improvements
- Cleaning and Inspection Access Locations



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

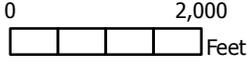
Figure 10-9
**Approximate Location of Le Fevre Study Area:
 Town of Gardiner, Ulster County**



\\pr1-sm3\GIS_Protects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Areat\ApproxArea_Map_2014\0903.mxd



- Legend**
- Catskill Aqueduct
 - Ventilation Improvements
 - Cleaning and Inspection Access Location

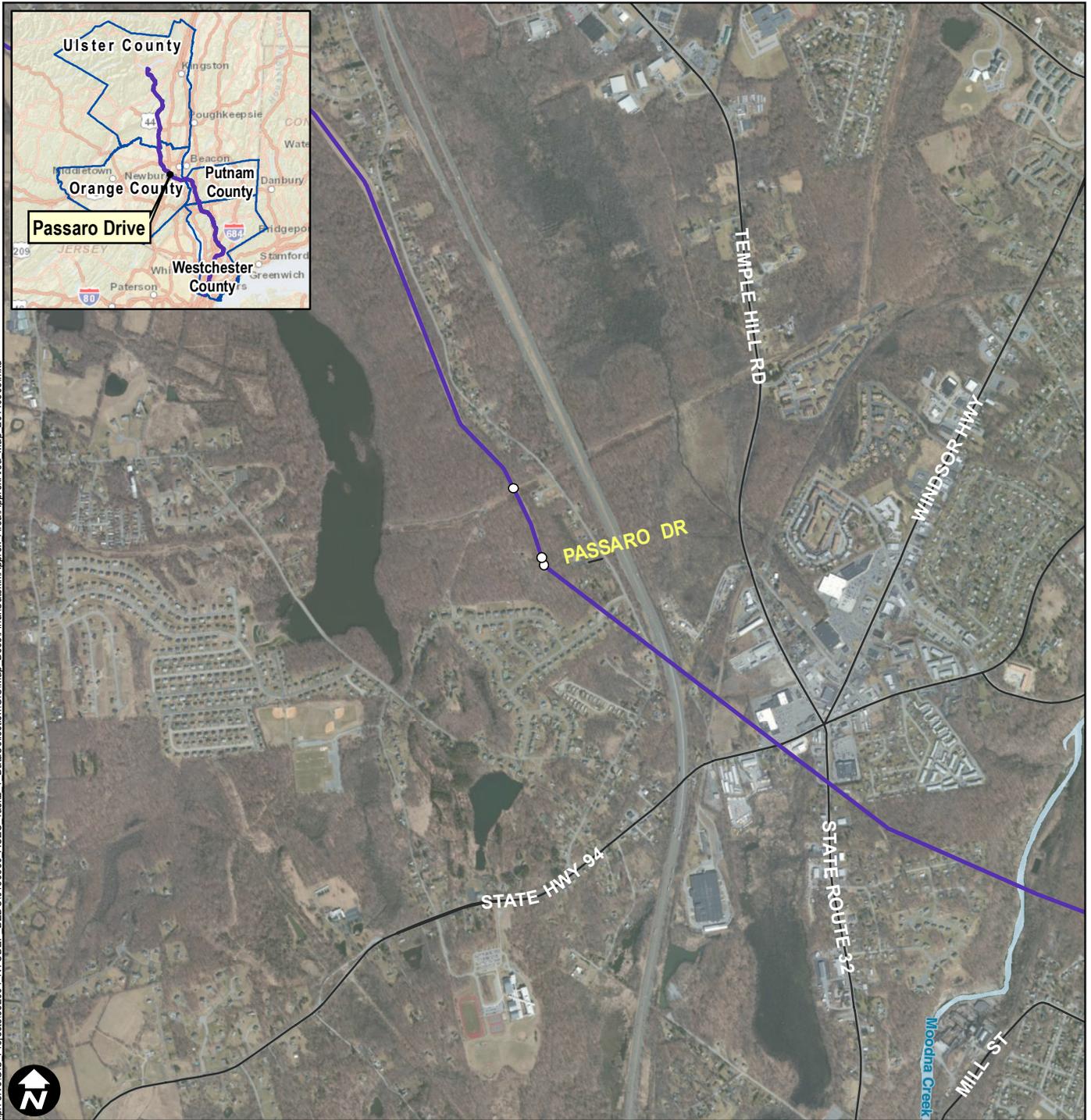


Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)



Aqueduct Connection Environmental Support (ACES)

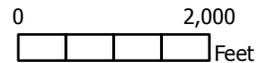
Figure 10-10
Approximate Location of Strawridge Road Study Area:
Town of Shawangunk, Ulster County



\\pr1-srv3\GIS_Protects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

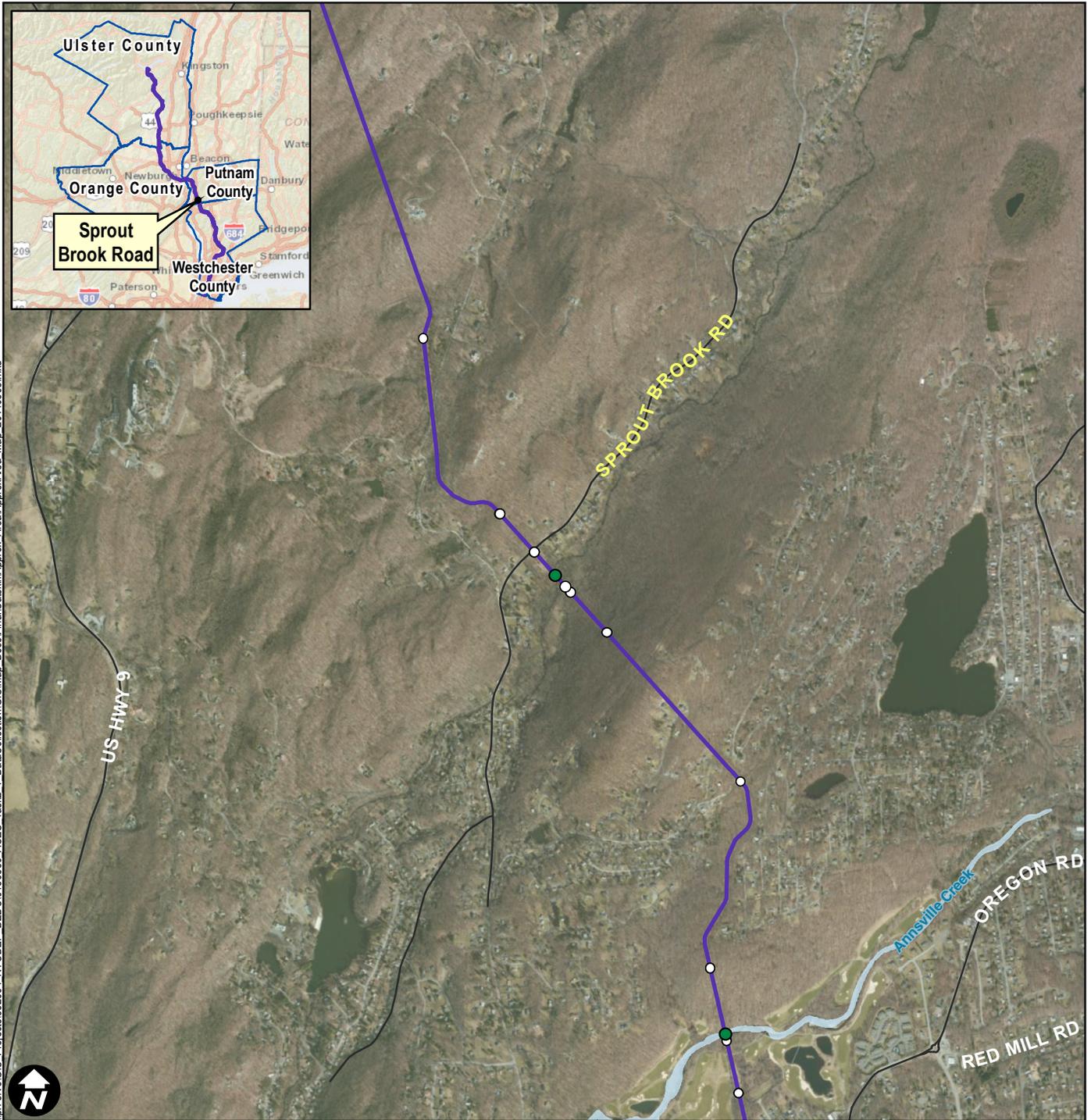
Legend

- Catskill Aqueduct
- Cleaning and Inspection Access Location



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-11
Staging Area
Approximate Location of Passaro Drive Study Area:
Town of New Windsor, Orange County

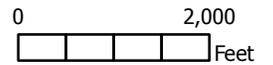


\\pr1-sm3\GIS-Projects\382064_NYCDWP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Areaf\ApproxArea_Map_2014\0903.mxd



Legend

- Catskill Aqueduct
- Mechanical Repairs
- Cleaning and Inspection Access Location



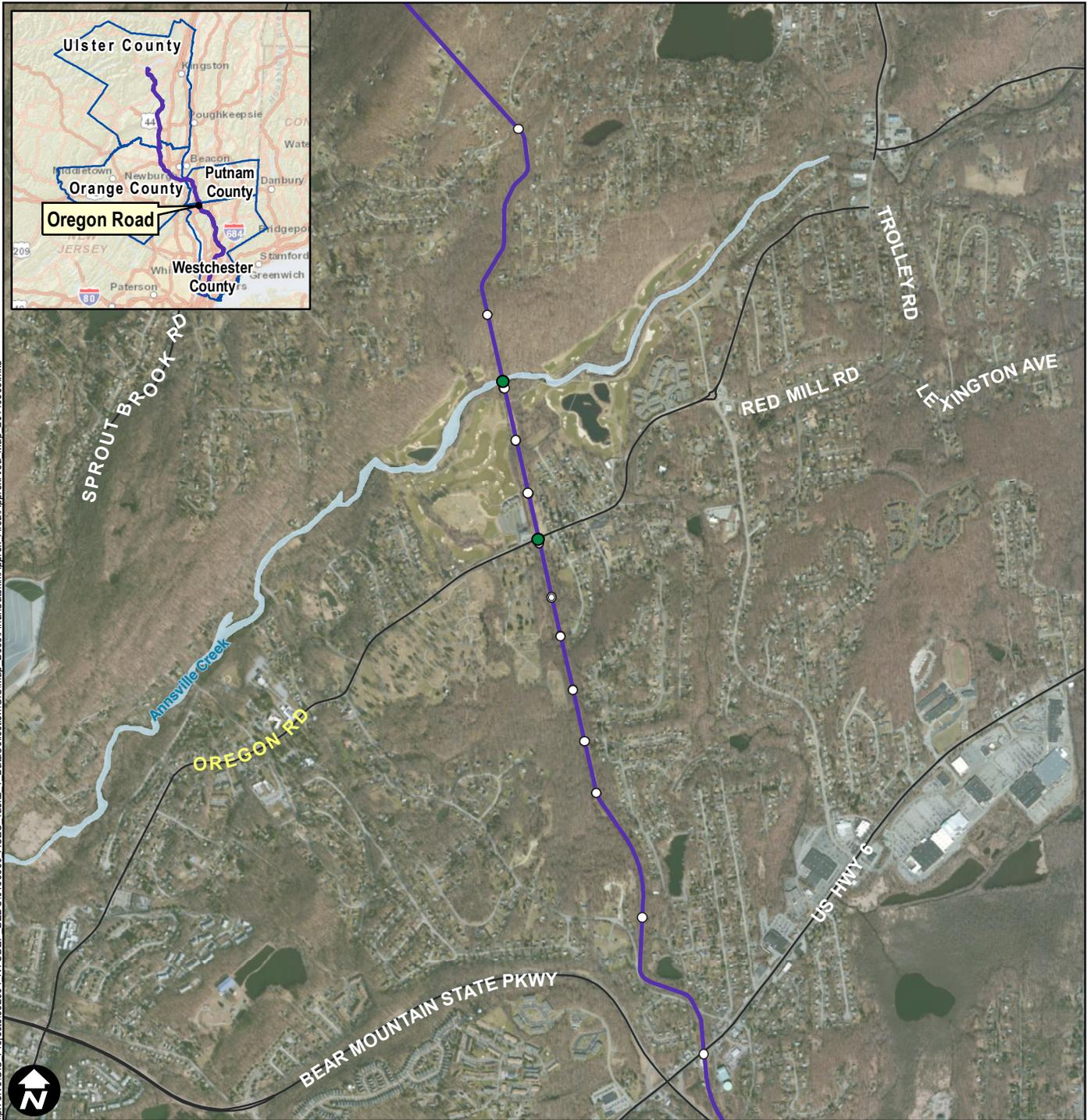
Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-12
Staging Area

**Approximate Location of Sprout Brook Road Study Area:
 Town of Philipstown, Putnam County**



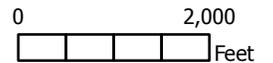
Aqueduct Connection Environmental Support (ACES)



I:\p1-sm\GIS\Projects\382064_NYCDWP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

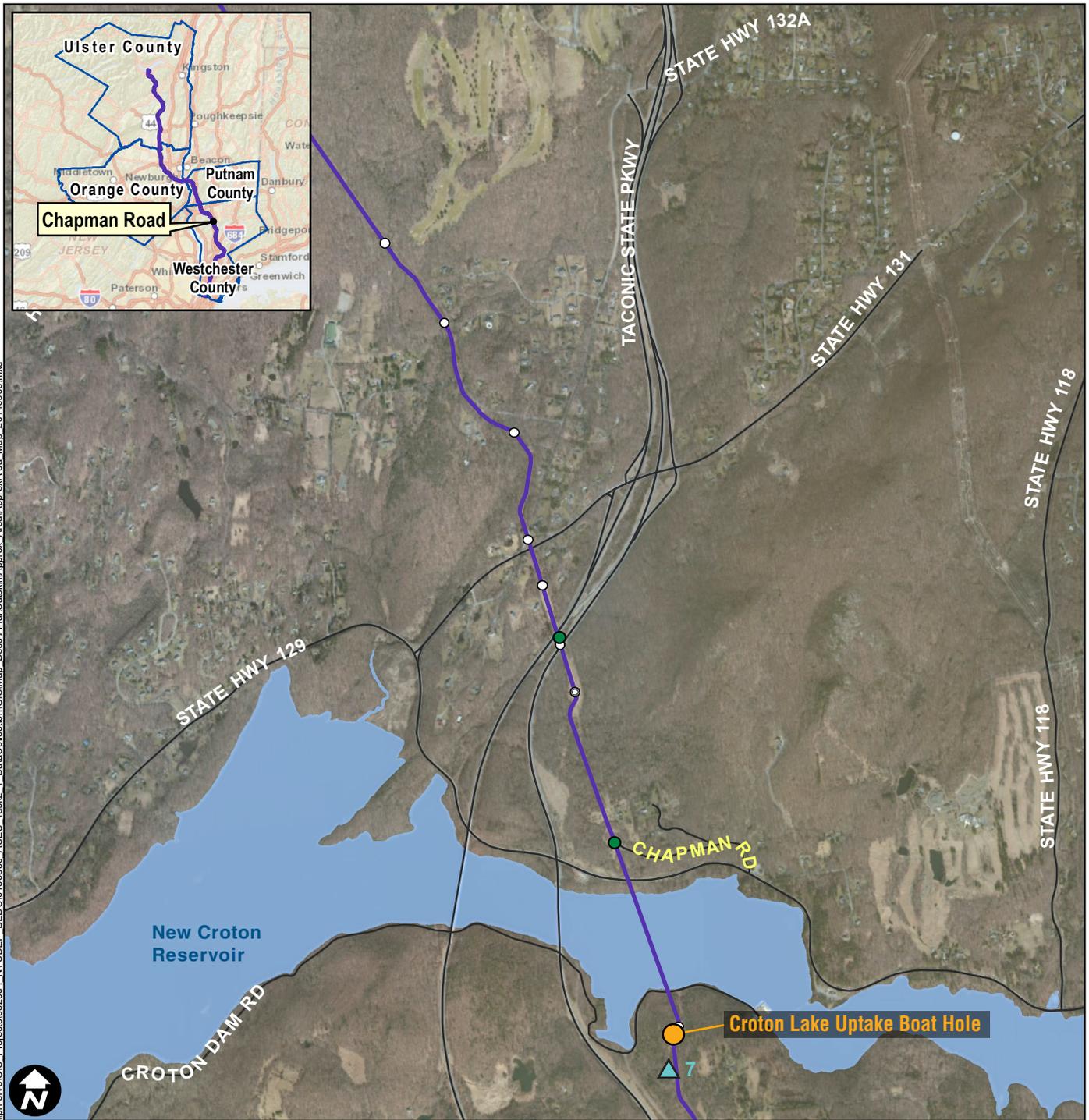
Legend

- Catskill Aqueduct
- Mechanical Repairs
- Cleaning and Inspection Access Location



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

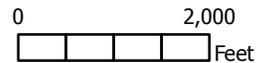
Figure 10-13
Staging Area
Approximate Location of Oregon Road Study Area:
Town of Cortlandt, Westchester County



\\pr1-sm3\GIS\Projects\382064_NYCDWP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

Legend

- Catskill Aqueduct
- ▲ Leak – Repair
- Ventilation Improvements
- Mechanical Repairs
- Cleaning and Inspection Access Location



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

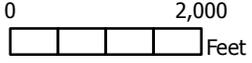
Figure 10-14
Staging Area
Approximate Location of Chapman Road Study Area:
Town of Yorktown, Westchester County



\pfrt-sm\3\GIS_Protects\382064_NYCDPEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Areal\ApproxArea_Map_2014\09\03.mxd



- Legend**
- Catskill Aqueduct
 - ▲ Leak – Repair
 - Ventilation Improvements
 - Mechanical Repairs
 - Cleaning and Inspection Access Location

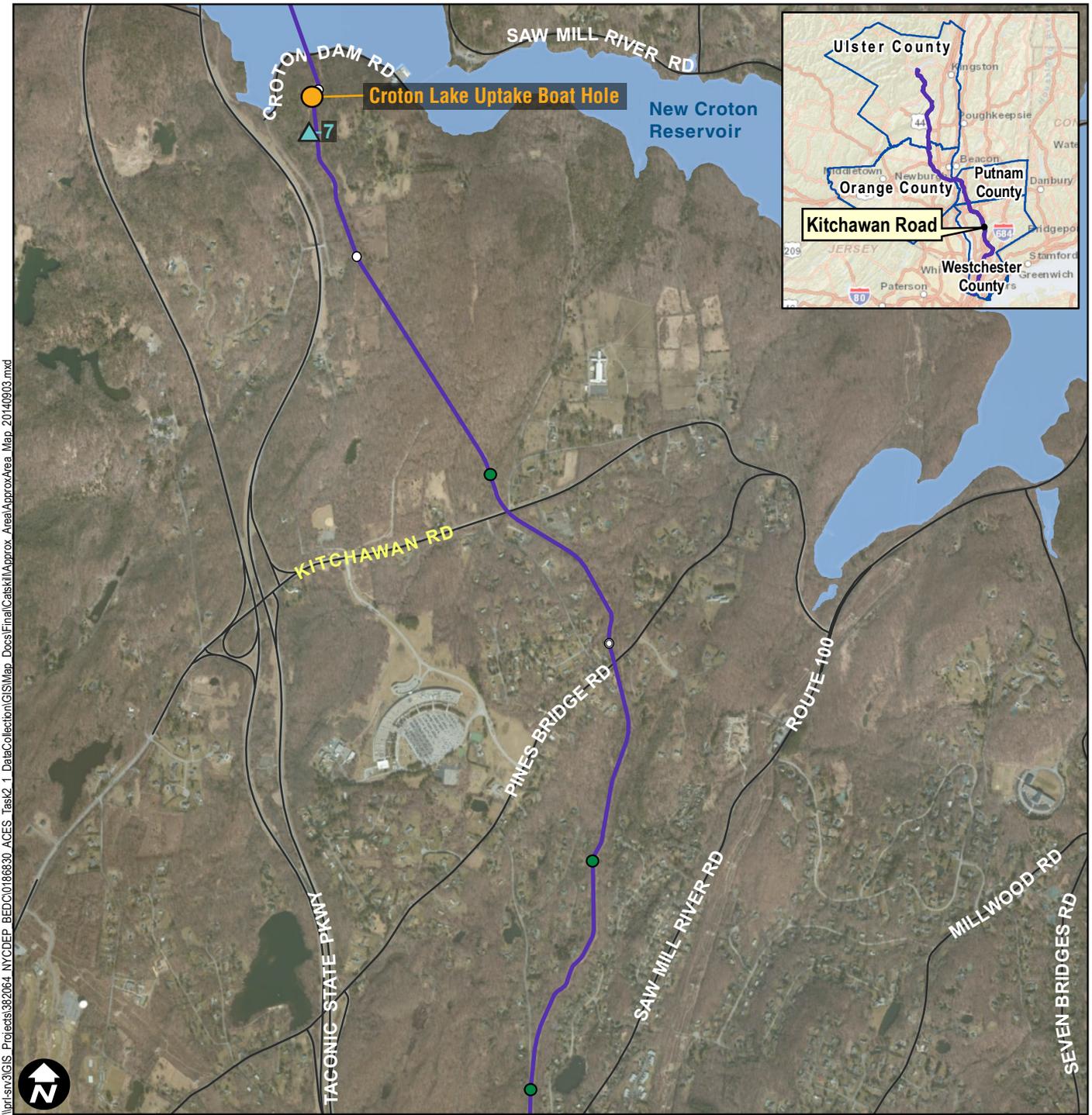


Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)



Aqueduct Connection Environmental Support (ACES)

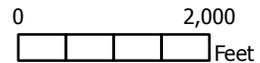
Figure 10-15
Approximate Location of Croton Dam Road Study Area:
Town of Yorktown, Westchester County



I:\p1-sm\3\GIS_Protects\382064_NYDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Areat\ApproxArea_Map_2014\0903.mxd

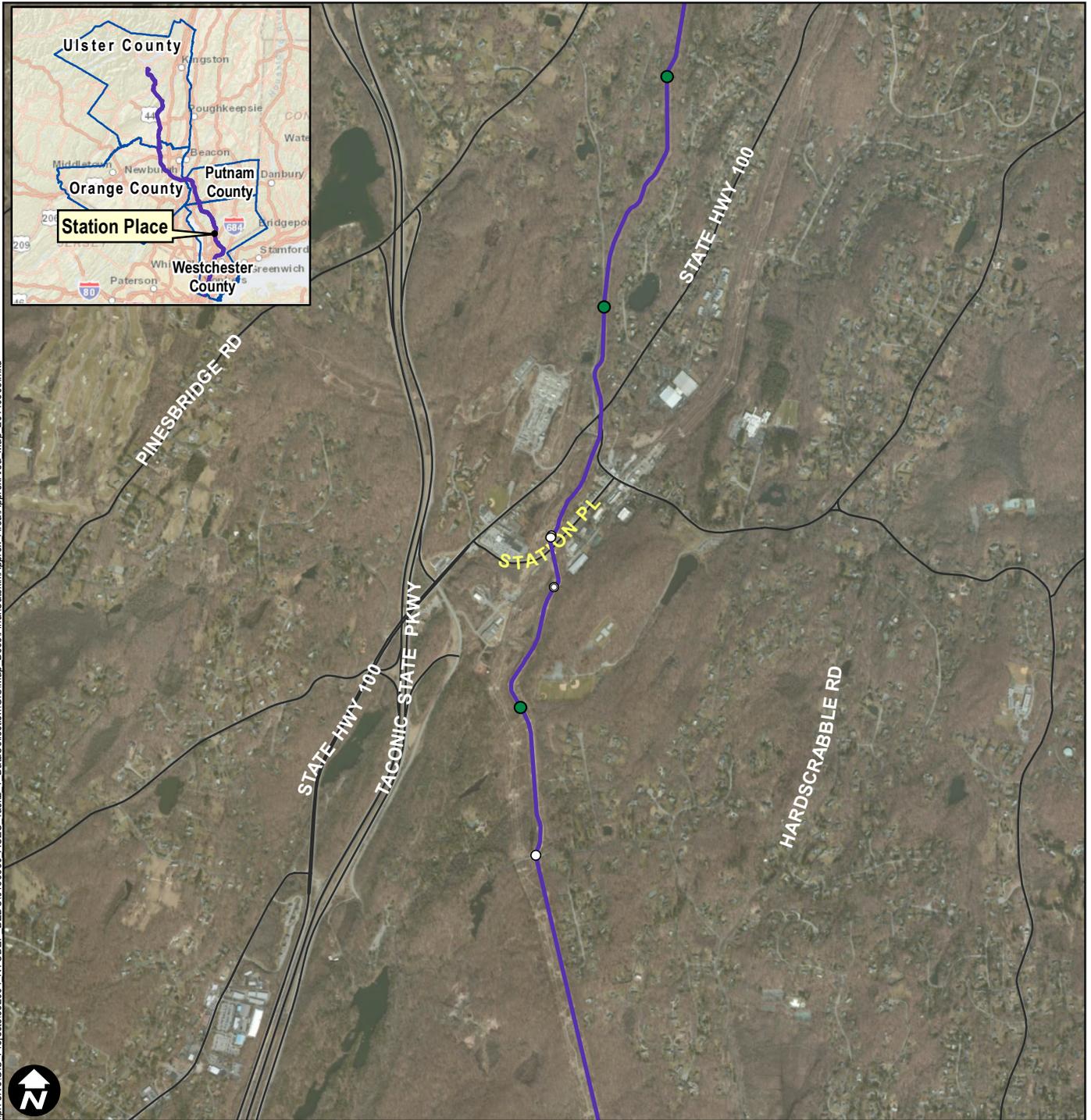
Legend

- Catskill Aqueduct
- ▲ Leak – Repair
- Ventilation Improvements
- Mechanical Repairs
- Cleaning and Inspection Access Location



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

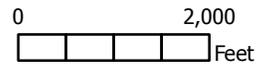
Figure 10-16
**Approximate Location of Kitchawan Road Study Area:
 Town of Yorktown, Westchester County**



\proj-srv\3\GIS_Protects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApprovArea_Map_2014\0903.mxd

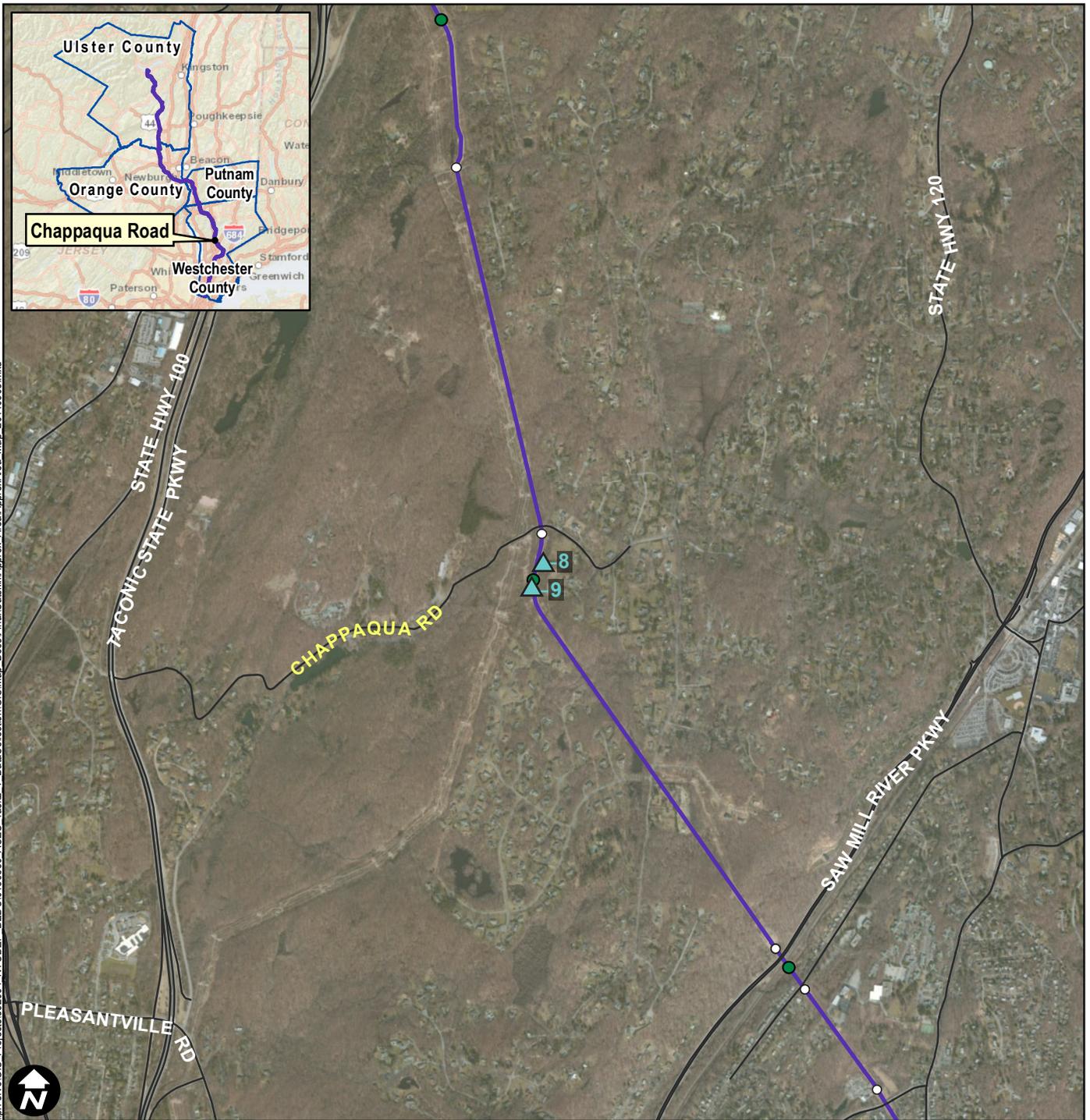
Legend

- Catskill Aqueduct
- Mechanical Repairs
- Cleaning and Inspection Access Location



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

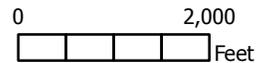
Figure 10-17
**Approximate Location of Station Place Study Area:
 Town of New Castle, Westchester County**



\pfr-sm\3\GIS_Protects\382064_NYCEP_BEDC0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

Legend

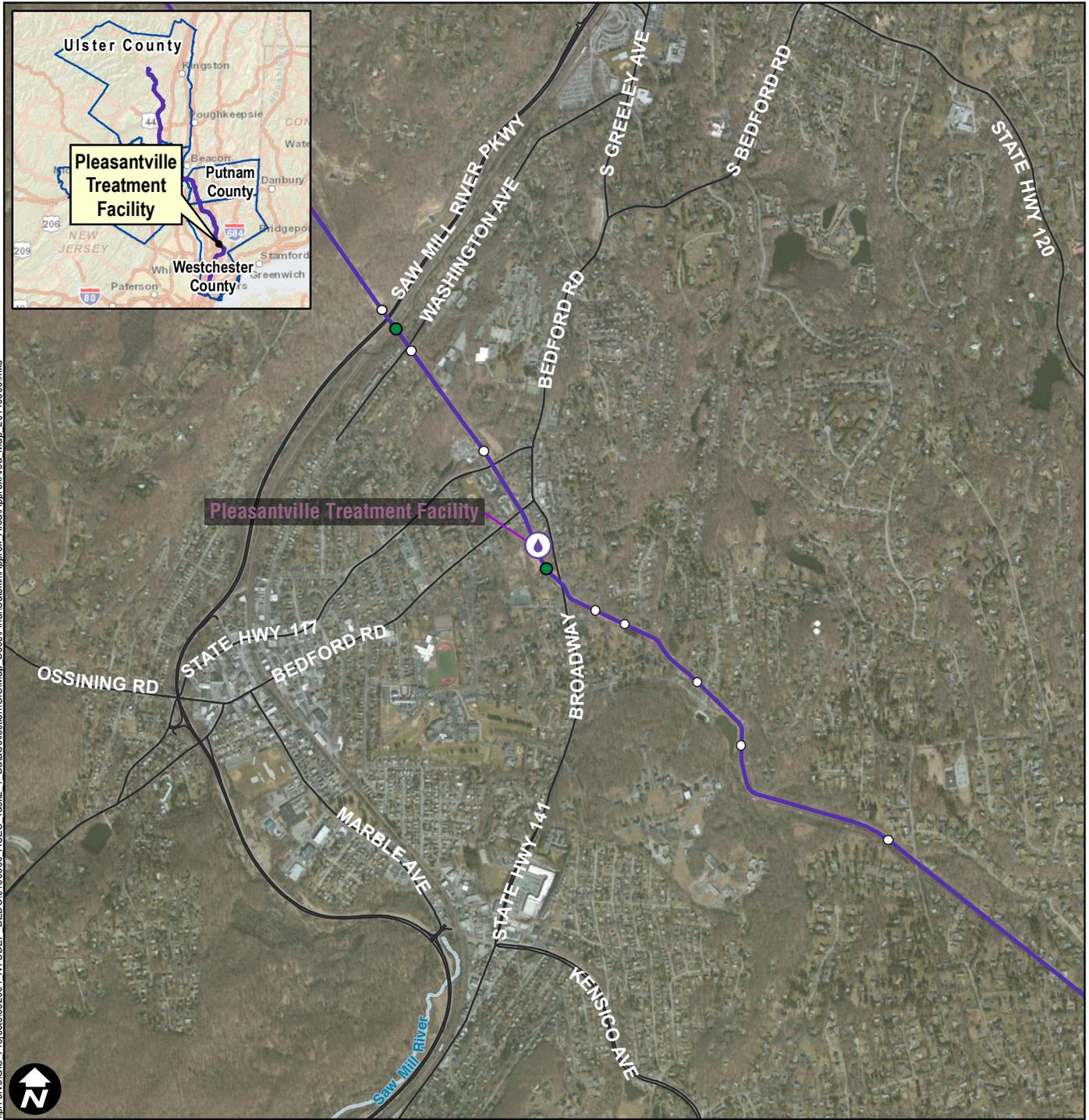
- Catskill Aqueduct
- ▲ Leak – Repair
- Mechanical Repairs
- Cleaning and Inspection Access Location



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-18

**Approximate Location of Chappaqua Road Study Area:
 Town of Mount Pleasant, Westchester County**



\proj-srv\3\GIS_Protects\382064_NYCDEP_BEDCO186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Catskill\Approx_Area\ApproxArea_Map_2014\0903.mxd

Legend

- Catskill Aqueduct
- Proposed Pleasantville Treatment Facility
- Mechanical Repairs
- Cleaning and Inspection Access Location



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-19
**Approximate Location of Pleasantville Treatment Facility Study Area:
 Town of Pleasantville, Westchester County**

10.10.5.1 Land Use, Zoning and Public Policy

Some of the activities associated with proposed rehabilitation of the aqueduct may potentially affect land use or zoning within a study area. An assessment of the potential for construction or operation of the proposed rehabilitation to affect land use, zoning, or public policy will be included in the DEIS.

The land use analysis will describe existing land uses within each study area. Land use information will be compiled and mapped from published data, and supplemented with field surveys and aerial photography, as appropriate. The land use analysis will also provide a baseline for other analyses such as neighborhood character, where applicable. The zoning analysis will describe existing zoning regulations that apply to the study areas, including information on allowed uses within the zoning districts. Any pending zoning actions that may affect land use patterns in the study areas will also be identified. Lastly, the public policy analysis will outline public policies that may apply to each study area, including any adopted or proposed neighborhood or community plans, Local Waterfront Revitalization Programs (LWRP), Scenic Areas of Statewide Significance (SASS), Significant Coastal Fish and Wildlife Habitats (SCFWH), and landward coastal boundaries.

Therefore, in general, this DEIS chapter will: (1) demarcate study areas within each municipality associated with the proposed rehabilitation; (2) describe existing conditions in the study areas, including existing land uses and zoning; (3) describe current predominant land use patterns in the study areas, including recent development trends; (4) summarize other public policies that may apply to the proposed sites and study areas, including any adopted or proposed neighborhood or community plans; and (5) provide an assessment of the potential for impacts from the proposed rehabilitation on land use and land use trends, zoning, and public policy.

The descriptions of future conditions without the proposed rehabilitation will be based upon information on planned improvements obtained from DEP and the local counties and municipalities in which the study areas are located. In addition, the DEIS will include an assessment of any property access that would be required by DEP associated with the proposed rehabilitation.

10.10.5.2 Socioeconomic Conditions

The socioeconomic assessment in the DEIS will provide a screening assessment against applicable CEQR guidelines to describe and document existing socioeconomic conditions and trends in the study areas associated with the proposed rehabilitation that could potentially be affected and result in significant impacts due to (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; and (5) adverse effects on a specific industry.

The socioeconomic analysis pertaining to the costs associated with the proposed Upstate Water Supply Resiliency project, including the proposed rehabilitation, would be addressed through a shared distribution of costs across DEP's water supply network, including City and upstate customers, through changes in the water rate due to project costs. Therefore, potential changes to the water rate as a result of the proposed Upstate Water Supply Resiliency project, and those

evaluated in the previous EIS, will be described in Chapter 12, “Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project”, of the DEIS.

10.10.5.3 Community Facilities and Services

There may be temporary changes to community services associated with the proposed rehabilitation (e.g., police associated with traffic control during construction or equipment deliveries associated with inspection and/or cleaning). Therefore, as applicable, the community facilities and services assessment will: (1) identify the local community facilities within the study areas and service providers that would service these study areas within each municipality; (2) describe any expected uses of those community facilities and services; and (3) provide an assessment of the potential for impacts from the proposed rehabilitation on those community facilities and services.

10.10.5.4 Open Space and Recreation

A screening level assessment will be prepared to determine whether construction or operation of the proposed rehabilitation has the potential to adversely affect open space and recreation, thereby warranting further analysis. Specifically, an inventory of existing open space and recreational resources will be conducted within the study areas to determine if any resources would potentially be displaced or are located in close enough proximity to potentially affected areas, such as those where leaks will be treated or repaired, to warrant an analysis of potential impacts. Results of the open space and recreation screening assessment and analysis will be presented in the DEIS, as applicable.

10.10.5.5 Critical Environmental Areas

There are a total of six Critical Environmental Areas (CEAs) in the vicinity of the Catskill Aqueduct between Ashokan and Kensico Reservoirs: two in Ulster County and four in Westchester County. In Ulster County, the two CEAs near the Catskill Aqueduct are the Woodstock Wetlands CEA, which is located north of the Ashokan Reservoir within the DEP watershed, and the Wallkill Public Water Supply, Watershed, and Aquifer CEA in the Town of Shawangunk, Ulster County, New York. In Westchester County, the Catskill Aqueduct runs through the County and State Parklands CEA just north and south of New Croton Reservoir. The second CEA in Westchester County is the Croton Point Park CEA near New Croton Reservoir. Near Kensico Reservoir, under which the Catskill Aqueduct travels, are the Westchester County Airport 60 Ldn Noise Contour CEA, the County Designated Watershed CEA, and the County and State Parklands CEA. A screening assessment will be included in the DEIS to determine whether any study areas are located within a CEA. The potential for construction or operation activities associated with the proposed rehabilitation to affect or be affected by the environmental characteristics of these CEAs will be assessed in the DEIS.

10.10.5.6 Historic and Cultural Resources

This section of the DEIS will include an assessment of the potential for impacts to historical and cultural resources that could occur as a result of construction activities associated with the proposed rehabilitation. Many of the activities associated with the proposed rehabilitation would occur in areas that were previously disturbed during construction of the Catskill Aqueduct or are

located on steep slopes (greater than 12 percent) or in areas of standing water. As required, this analysis will include identification of cultural and archaeological resources and architectural resources with historic significance that could potentially be affected by the proposed rehabilitation, and will also include consultation with the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP). The consultation request will be comprised of site location maps and photographic documentation of the existing study areas and surroundings.

If any resources of potential historic and/or cultural significance are identified in specific study areas, an inspection of the identified sites and study areas, by way of additional field surveys and documentary research, may be required. If required, the assessment will include preparation of a Phase I Archaeological Survey consisting of a Phase IA Literature Review and Sensitivity Assessment and a Phase IB Archaeological Field Reconnaissance Survey. The Phase IB Archaeological Field Reconnaissance Survey would consist of shovel tests to evaluate the potential impact of the project on archaeological resources, as required. Shovel tests would not occur in standing water, slopes of greater than 12 percent, or areas of previous disturbance. During the Phase IB survey, any precontact (Native American) cultural material and any significant historic artifacts such as glass, ceramics, food remains, and hardware identified during the fieldwork would be identified and collected. Results of the historic and cultural resources assessment will be presented in the DEIS.

10.10.5.7 Visual Resources

This section of the DEIS will assess the potential for impacts on visual resources from construction or operation of the proposed rehabilitation, as some components of the proposed rehabilitation may result in construction of new structures that may alter existing view corridors (i.e., leak dechlorination systems and a dechlorination system at the Pleasantville Treatment Facility). The assessment will focus on the potential observable changes to the view corridor visible by the general public. The study area for the assessment of visual resources will be consistent with that of the study areas used for the analysis of land use, zoning, and public policy, but may also include view corridors that extend beyond those study areas based on the locations that are publicly accessible, as required.

A screening assessment will be included in the DEIS to determine whether a visual assessment pursuant to the NYSDEC policy, "Assessing and Mitigating Visual Impacts," and CEQR criteria is warranted at those sites where new structures associated with the proposed rehabilitation would be built. If required, a visual assessment will be prepared in conformance with the applicable NYSDEC and CEQR criteria. In this assessment, an inventory of sensitive visual resources will be compiled to determine the potential for views towards the site and study areas. In addition, the incremental changes to views that are deemed to have aesthetic value from sensitive visual resources will be characterized in the DEIS both in a narrative format and through the use of images depicting conditions in the future with and without the proposed project. This will be completed using images depicting conditions in the future with and without the new structures, as warranted.

10.10.5.8 Natural Resources

It is anticipated that there would be disturbance to some natural resources associated with construction and/or operation of components of the proposed rehabilitation. Disturbance to natural resources associated with some of the planned activities (e.g., mechanical repairs or addition of vents) are expected to be minimal and/or temporary and may warrant only a screening level assessment, while others may require more detailed assessments. Effects on natural resources could result from construction of facilities, leak treatment, and preparation of access and staging areas at points along the Catskill Aqueduct. Effects on natural resources could also result from repairs that would eliminate contributions of water leaking from the aqueduct in the vicinity of some natural resources (e.g., wetlands) and in downstream areas and receiving waterbodies. Natural resources encompass geology and soils, water resources, aquatic resources, terrestrial resources, and endangered, threatened, and species of special concern. Desktop review, agency consultations, and field surveys will be conducted, as applicable, to identify and map locations and types of natural resources within study areas that have the potential to be affected. Once natural resources are identified, a screening level assessment will be conducted to determine the potential for significant adverse impacts to these resources based on the type and location of activity associated with the proposed rehabilitation. Based on the results of the screening assessment, a detailed analysis will be prepared and presented in the DEIS, as applicable.

The desktop analyses and agency consultations will be used to identify existing natural resources within the study areas associated with activities that could affect natural resources, and will include:

- Reviewing U.S. Geological Survey (USGS) Topographic Maps, Federal Emergency Management Agency (FEMA) Floodplain Maps, NYSDEC Wetland Maps, NYSDEC Waters Index Numbers and Priority Waterbodies List, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Maps, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil maps, and aerial photos;
- Coordinating with the New York Natural Heritage Program (NYNHP), NYSDEC Central and Regional Offices, U.S. Army Corps of Engineers (USACE), USFWS, and National Marine Fisheries Service (NMFS), as applicable, to determine whether further on-site analyses will be necessary as well as county and local offices;
- Contacting NYNHP to determine whether endangered, threatened, species of special concern, as well as candidate, proposed or rare species of plants and wildlife or unique and critical habitats were reported as occurring on or adjacent to the study areas that could be affected by the proposed rehabilitation. NYNHP provides a database listing that identifies the species and/or habitats with state, heritage and global rankings, along with other information related to the species. NYSDEC Central and Regional offices and NMFS may be contacted to provide additional information on species, locations, and habitats identified;
- Consultation with USFWS, as necessary, based on species identified. USFWS provides an online report of any federally listed endangered, threatened, candidate, or proposed for

listing species known to exist within the county of the proposed project. A USFWS online project review will be conducted and submitted to the USFWS. In addition, local and county legislation related to endangered, threatened, and species of special concern will be reviewed and species lists compared with State and federal species information to ensure relevant flora and fauna will be identified. Species provided protection under the Migratory Bird Treaty Act of 1918, and other protective legislation such as the Bald and Golden Eagle Protection Act, will be evaluated if documented to occur within the project area. Pertinent species information provided by these agencies and sources will be included in the study area descriptions in the DEIS and will inform the DEIS analysis; and

- Where they may be affected, conducting Bald Eagle breeding and nonbreeding desktop analyses, and assessing available DEP data to determine if a buffer restriction would be required in accordance with the USFWS's "National Bald Eagle Management Guidelines."

Based on these results, natural resources field surveys for regulated habitats and listed, proposed, and candidate species or habitats identified as potentially occurring in the study areas will be conducted to establish baseline conditions. The study areas for these surveys will be determined based on proposed site-specific activities and potential for impacts. Based on conceptual level plans, the temporary dechlorination facilities are expected to be either small enclosures containing minimal electric equipment or passive chemical addition systems; they would be located within the study area boundary. However, in some cases, where suspected leak flowpaths travel a distance from the Catskill Aqueduct, or have the potential to influence downstream resources, certain natural resources surveys may require a larger study area (e.g., Phase II surveys of bog turtle habitat to assess the full extent of potential habitat).

Field surveys that will be conducted to identify existing natural resources within the study areas, as applicable, include:

- Delineation and characterization of wetlands and watercourses within the study areas. The wetland delineations will follow USACE's three parameter methodology as described in the 1987 USACE wetland delineation manual (Environmental Laboratory 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (USACE 2012). The watercourses will be delineated using indicators of ordinary high water marks as described in 33 Code of Federal Regulations (CFR) 328.3. Additionally, surveys of flowpaths from the Catskill Aqueduct will be conducted to provide information on the potential connectivity of leak flows to existing Waters of the United States;
- Conducting terrestrial surveys to identify existing habitats and species occurring within and near or adjacent to each study area. Surveys of sites that require upland disturbance will include identifying ecological communities and making incidental observations of mammal, avian, and amphibians and reptiles;

- Conducting benthic macroinvertebrate surveys, as necessary, for existing watercourses identified as having a potential to be adversely affected by the proposed rehabilitation within or downstream of the study areas; and
- For protected species or their habitats that may be affected by the project, conducting field investigations of the study areas by biologists to document the extent of the habitat, the context of its surroundings, and the area that may be affected by the proposed rehabilitation activities. These field surveys may include habitat assessments (e.g., Phase I bog turtle habitat survey, Phase I Indiana bat summer habitat surveys, NYNHP Rare Plant Survey), or more detailed visual assessments for the species (e.g., Phase II bog turtle visual survey). Surveyor qualifications and survey methodologies for endangered, threatened, species of special concern, and proposed and candidate species will be consistent with federal and state guidelines, as applicable.

The potential for direct or indirect physical effects of the proposed rehabilitation activities on these natural resources will be assessed. In study areas where flows from leaks that would be considered for repair contribute to downstream waterbodies, estimates of the flow contribution from the leaks will be prepared and compared to naturally occurring flows. The assessment will include a summary of the affected resources, whether the resource is state or federally regulated, if the impacts are direct or indirect, the duration of the impact whether temporary or permanent, and the severity of the impact. These items would be taken into consideration when determining whether an effect would be considered an impact, and if the impacts can be mitigated. The results of the assessment will be included in the DEIS.

10.10.5.9 Hazardous Materials

There is the potential for ground disturbance associated with the proposed rehabilitation along temporary access roads and staging areas or where chlorination/dechlorination systems are constructed. The following will be prepared for study areas where subsurface disturbance would occur: a Phase I ESA in accordance with the most recent ASTM 1527-13 Standard, and, if appropriate, a Phase II ESA in accordance with ASTM E-1903, including physical sampling of media (e.g., soil, groundwater, and soil gas) on a proposed site of concern identified in a Phase I ESA. Results of the Phase II ESA will be used to determine the need for contaminant mitigation prior to commencing construction. Results of the Phase I and any Phase II ESAs will be presented in the DEIS.

In addition, the project will require storing or using chemicals on-site, particularly at the Ashokan Screen Chamber and Pleasantville Treatment Facility. An assessment of the potential for the proposed rehabilitation to result in impacts related to hazardous materials, including chemicals stored or used for the project during operation, will be included in the DEIS. The DEIS will also include a summary of protocols to be implemented during construction of the rehabilitation project components to limit public and construction workers' exposure to potential contaminants, if required.

10.10.5.10 Water and Sewer Infrastructure

A water and sewer infrastructure assessment will be conducted to determine if construction or operation associated with the proposed rehabilitation, including temporary Catskill Aqueduct shutdowns or discharges from the project during both phases has the potential to cause a significant adverse impact to water and sewer infrastructure.

An evaluation of the potential for aqueduct shutdowns to impact the 14 community users who draw water from the aqueduct will also be conducted and presented in the DEIS. DEP has an ongoing program working with these water suppliers, and the shutdowns will be temporary and coordinated with these users. The analysis will include an inventory and review of the water suppliers that rely upon the Catskill Aqueduct for water supply.

Discharges during construction and operation activities associated with the proposed rehabilitation would be directed to a stormwater and/or sewer system, trucked and hauled, or treated for permitted discharge into local waterbodies in the vicinity of each site, as applicable. If warranted, a stormwater and/or sewer infrastructure assessment will be prepared and presented in the DEIS. The assessment will include:

- An inventory of existing water and sewer infrastructure servicing each study area where these activities would occur;
- Estimates of increased water use and any changes to impervious areas for each study area to confirm the project would not exceed CEQR thresholds for stormwater, including any changes resulting from the addition of impervious surfaces for parking areas (including gravel areas) and building roofs;
- The addition of new stormwater and drainage features surrounding the study areas;
- Estimates of increased discharges to the sewer system for each study area;
- A comparison of estimated project-generated water supply demand, stormwater and sewage systems with the infrastructure available to meet these demands; and
- An examination of the need for additional infrastructure and utilities to support the proposed rehabilitation.

10.10.5.11 Energy

Energy use associated with the proposed rehabilitation would primarily be related to operation of the chlorination and dechlorination facilities prior to and during the temporary shutdown. The total amount of energy use at each site will be minimal, and, as a result, a screening level assessment will be prepared to determine whether operation of the proposed rehabilitation has the potential to adversely affect energy, thereby warranting further analysis. Specifically, a review of onsite energy sources and a description of any new energy sources (e.g., generators) will be conducted within the study areas to determine if any energy resource would potentially be affected, or require the need for additional infrastructure and electric or gas utilities. Results of the energy screening assessment and analysis will be presented in the DEIS.

10.10.5.12 Transportation

This assessment will consider the extent and duration of any increase in vehicle trips from temporary workers and equipment associated with construction and operation of chlorination and dechlorination facilities and systems, inspection and cleaning, and repair and vent installation activities, as applicable; any street, roadway, or sidewalk closure; potential for impacts on the parking supply; and any loss in other transportation services during the various phases of construction and operation of the proposed rehabilitation. Results of the transportation analysis will be presented in the DEIS.

10.10.5.13 Air Quality

The air quality analysis section will contain a discussion of both mobile source emissions from temporary equipment and worker and delivery vehicles from construction and operation of chlorination and dechlorination facilities and systems; inspection and cleaning; repair; and vent installation activities, as applicable. A screening assessment will be prepared for emissions from construction equipment and construction-related mobile sources. Results of the construction air quality screening assessment and analysis will be presented in the DEIS. The assessment in the DEIS will also evaluate the potential for odors from discharge of materials associated with treating and/or cleaning biofilm from the Catskill Aqueduct, as applicable.

10.10.5.14 Noise

A noise screening analysis will be conducted to determine if construction or operation associated with the proposed rehabilitation, including chlorination and dechlorination facilities and systems, inspection and cleaning, or repair and vent installation activities, have the potential to cause a significant adverse noise impact at noise-sensitive receptors. For vehicular noise sources, a noise impact screening analysis will be conducted based on the estimated change in project-generated vehicles. If proposed changes to the Ashokan Screen Chamber, Pleasantville Treatment Facility or at temporary staging or access areas would result in a doubling of existing noise Passenger Car Equivalent (PCEs), a detailed vehicular noise analysis will be prepared. Intensive noise levels would be anticipated to only be generated during a portion of the construction period. Therefore, a detailed construction analysis may not be warranted if it is demonstrated that construction activities would not result in periods with noise levels that would be long term (i.e., more than two years) or potentially intrusive. Results of the noise screening assessment and analysis will be presented in the DEIS.

10.10.5.15 Neighborhood Character

An assessment of the potential for construction or operation of the proposed rehabilitation to affect neighborhood or community character within each municipality where activities would occur will be included in the DEIS. The conditions, as they exist in the study areas, will be described. The neighborhood character assessment will be conducted as follows:

- Based on planned development and/or projects in the vicinity of the study areas, public policy initiatives, and planned public improvements, anticipated changes in the character of the area in the future without the proposed rehabilitation will be summarized; and

- Based on other technical analyses, the predominant factors that contribute to defining the character of the neighborhood surrounding the study areas will be described. The degree and type of change from the proposed rehabilitation's effect on neighborhood character using the analysis of the potential for impacts as presented in other relevant analyses (this could include, but not be limited to visual resources, historic resources, traffic, and noise) will be assessed and described.

10.10.5.16 Public Health

A public health assessment is not warranted if a project does not result in a significant unmitigated adverse impact in other analysis areas, such as air quality, water quality, hazardous materials, or noise. If an unmitigated significant adverse impact is identified in the relevant technical areas of the DEIS for either construction or operation of the proposed rehabilitation, a public health assessment will be presented in the DEIS.

10.10.6 MITIGATION

This section of the DEIS will provide a brief summary of any identified impacts and mitigation for the proposed rehabilitation based on results of the analyses presented in the DEIS.

10.11 DEIS CHAPTER 10: PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS

10.11.1 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS OVERVIEW

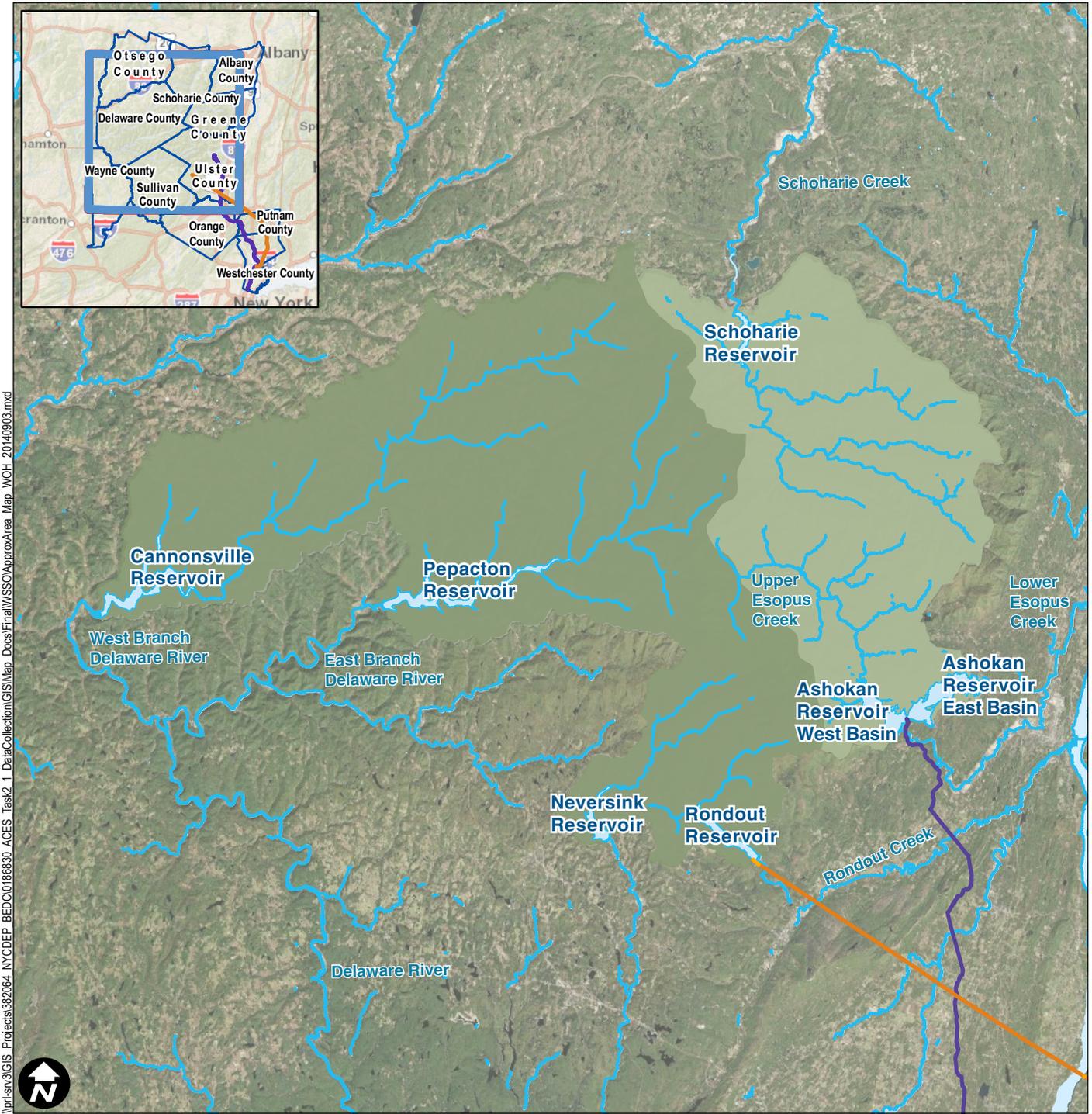
This section of the DEIS will introduce the proposed WSSO component of WFF as described in Section 8.1.2, "Proposed Water for the Future Shutdown System Operations," of this draft scope. This section of the DEIS will contain a background description of WSSO and include figures depicting relevant locations. The WSSO would involve a unique alteration of the operations of the City's Delaware, Catskill, and Croton Systems in advance of, during, and after the eight-month temporary shutdown. During this temporary period, the City's reservoirs and receiving waterbodies would be operated at higher or lower levels than on average. The locations of water supply system reservoirs and receiving waterbodies, as well as a listing of the communities where these water bodies are located, are provided in **Table 10-3**, **Figure 10-20**, and **Figure 10-21**. Construction and operation of facilities required to support WSSO will also be evaluated in the DEIS, including the use of siphons at Rondout Reservoir to manage the Rondout Reservoir releases during the temporary shutdown, and augmented alum treatment at the Pleasantville Treatment Facility required to manage episodic high turbidity events to ensure continued reliance on the Catskill System during the temporary shutdown. The DEIS will also include an analysis of additional alum floc deposition that may occur within Kensico Reservoir from augmented temporary alum treatment.

Table 10-3: Water Supply System Reservoirs and Receiving Waterbodies

County	Municipalities¹	Reservoir	Receiving Water Body
DELAWARE WATER SUPPLY SYSTEM			
Delaware and Broome	Deposit, Village of Deposit, Tompkins, Walton, Hancock, Village of Hancock, Sanford	Cannonsville Reservoir	West Branch Delaware River West Delaware Aqueduct
Delaware, Sullivan, and Orange	Colchester, Andes, Middletown, Hancock, Village of Hancock, Fremont, Delaware, Cohecton, Tusten, Highland, Lumberland, Deerpark, City of Port Jervis	Pepacton Reservoir	East Branch Delaware River East Delaware Aqueduct
Sullivan and Orange	Neversink, Fallsburg, Thompson, Forestburgh, Deerpark, City of Port Jervis	Neversink Reservoir	Neversink River Neversink Tunnel
Ulster and Sullivan	Neversink, Wawarsing, Rochester, Marbletown, Rosendale, Esopus, Ulster, City of Kingston	Rondout Reservoir	Rondout Creek Delaware Aqueduct/ RWBT
CATSKILL WATER SUPPLY SYSTEM			
Schoharie, Delaware and Greene	Gilboa, Conesville, Prattsville, Roxbury, Olive, Shandaken, Prattsville, Lexington, Blenheim	Schoharie Reservoir	Shandaken Tunnel/ Upper Esopus Creek Schoharie Creek
Ulster	Olive, Marbletown, Hurley, Ulster, City of Kingston, Saugerties, Village of Saugerties	Ashokan Reservoir	Lower Esopus Creek Catskill Aqueduct
CROTON WATER SUPPLY SYSTEM			
Putnam and Westchester	Kent, Carmel, Somers	Boyds Corners Reservoir	West Branch Croton River
Putnam and Westchester	Kent, Carmel, Somers	West Branch Reservoir	Delaware Aqueduct West Branch Croton River
Putnam	Southeast	Bog Brook Reservoir	Bog Brook Connecting Tunnel to East Branch Reservoir
Putnam and Westchester	Southeast, Village of Brewster, Somers, North Salem	East Branch Reservoir	East Branch Croton River
Putnam and Westchester	Carmel, Southeast, Village of Brewster, Somers, North Salem	Croton Falls Diverting Reservoir	East Branch Croton River Rock Connecting Channel to Croton Falls Reservoir
Putnam	Southeast, Carmel	Middle Branch Reservoir	Middle Branch Croton River

Table 10-3: Water Supply System Reservoirs and Receiving Waterbodies

County	Municipalities¹	Reservoir	Receiving Water Body
Putnam and Westchester	Carmel, Southeast, Kent, Somers	Croton Falls Reservoir	Croton Falls Hydraulic Pump Station to Delaware Aqueduct Rock Connecting Channel to Croton Falls Diverting Reservoir West Branch Croton River
Westchester	North Salem	Titicus Reservoir	Titicus River
Westchester and Putnam	Somers	Amawalk Reservoir	Muscoot River
Westchester	Bedford, Lewisboro, Pound Ridge	Cross River Reservoir	Cross River Hydraulic Pump Station to Delaware Aqueduct Cross River
Westchester	Lewisboro, Somers, Bedford, North Salem	Muscoot Reservoir	New Croton Reservoir
Westchester	Cortlandt, Yorktown, Somers, New Castle, Bedford, Lewisboro, Village of Ossining, Ossining, Village of Croton-on-Hudson	New Croton Reservoir	Croton River New Croton Aqueduct
Westchester	Mount Pleasant, North Castle, Town/Village of Harrison	Kensico Reservoir	Delaware Aqueduct
Note:			
¹ All municipalities listed are towns unless otherwise noted. The listed municipalities represent those which surround the water bodies and may ultimately fall within the WSSO study area.			

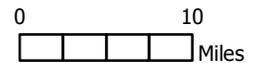


\\pr1-srv3\GIS_P\Projects\382064_NYCD\BDC\0166630_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\WSSO\ApprovArea_Map_WOH_20140903.mxd



Legend

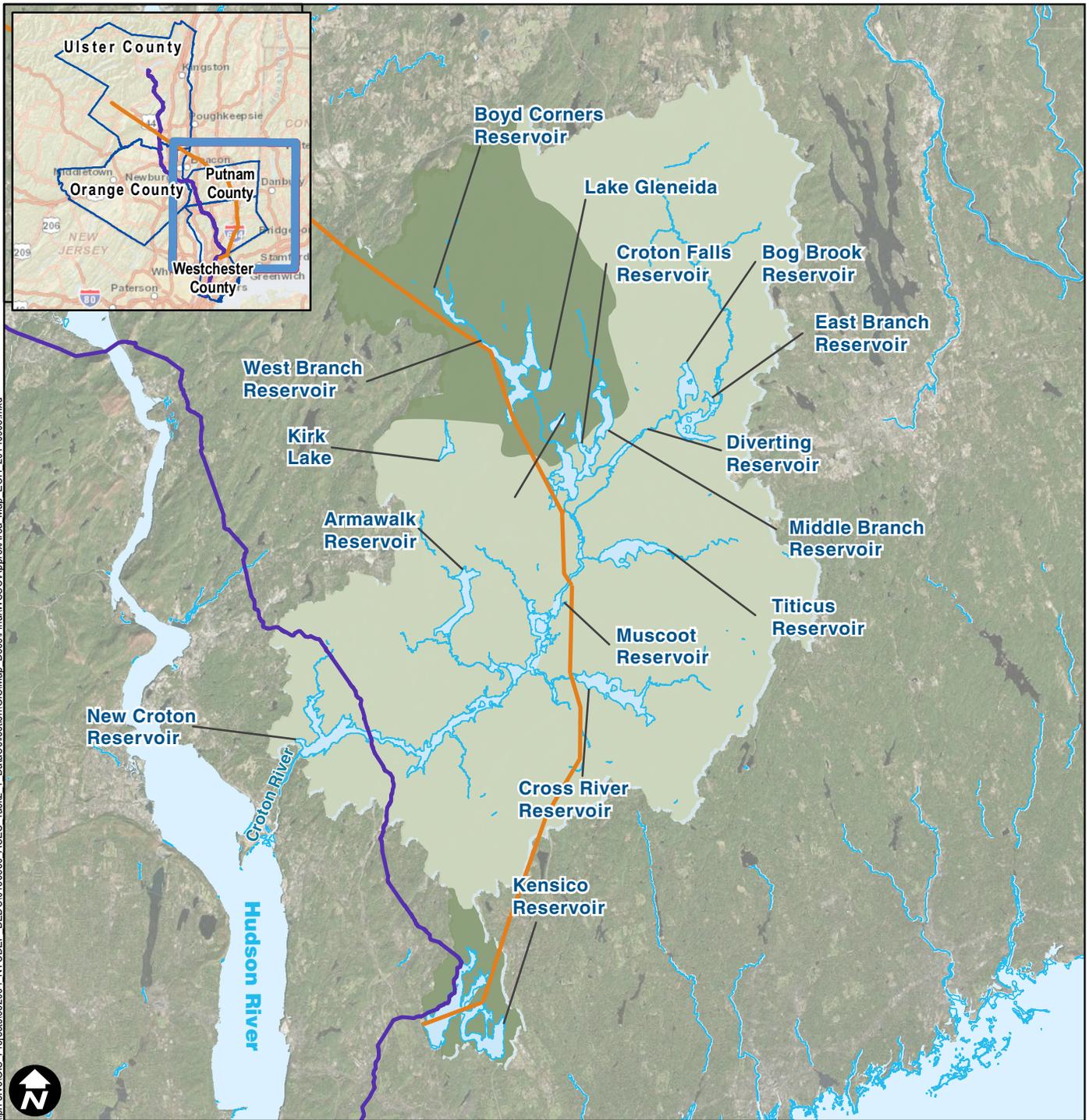
- Delaware Aqueduct
- Catskill Aqueduct
- Catskill System
- Delaware System



Basemap Sources:
Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
reets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-20

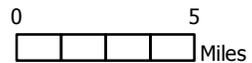
**Approximate Location of WFF Shutdown System Operations:
Delaware and Catskill Water Supply System Study Areas**



\proj-srv\3\GIS_Protects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\WSSO\ApprovArea_Map_EOH_20140903.mxd

- Legend**
- Delaware Aqueduct
 - Catskill Aqueduct
 - Croton System
 - Delaware System

Note: Study area will include interconnecting and downstream water bodies as appropriate



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets - Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

Figure 10-21
**Approximate Location of WFF Shutdown System Operations:
 Croton Water Supply System Study Area**

10.11.2 SCHEDULE

This section of the DEIS will include an overview of the schedule for proposed WSSO that includes activities associated with preparation for, and implementation of modified operations of the water supply system during the temporary shutdown.

10.11.3 GENERAL DESIGN FEATURES OF PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS

This section of the DEIS will include a synopsis of the general techniques DEP will use to support the proposed WSSO, including timing of the changed operations, interactions between the City's three surface water supply systems during the temporary shutdown, techniques that would be employed to move water into and out of the water supply system, and new facilities that would be required to support the proposed WSSO. The rest of this chapter of the DEIS will be organized into two parts, one analyzing changes to the Delaware System, and the other analyzing changes to the Catskill and Croton Systems.

10.11.3.1 Construction

This section of the DEIS will include a description of the construction activities and equipment associated with the installation of siphons at Rondout Reservoir and a facility to supplement alum treatment at the Pleasantville Treatment Facility. The description of construction activities and equipment will include mobilization, site preparation, construction and demobilization, as appropriate, as well the types of equipment that will be present on-site to carry out these activities.

10.11.3.2 Operation

This section of the DEIS will describe how DEP would operate its three surface water supply systems to support the temporary shutdown. It will include a description of operations necessary to prepare for the temporary shutdown. In advance of the temporary shutdown, DEP will rely on the Delaware System to maximize storage in the Catskill and Croton Systems. During the temporary shutdown (when the Delaware System is unavailable), DEP would rely more heavily on the Catskill and Croton Systems in conjunction with managing of releases from the Delaware System. Following the temporary shutdown, DEP would operate the entire system to ensure a full recovery from the temporary shutdown, including balancing the system once the Delaware System is back online.

10.11.4 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS: DELAWARE SYSTEM DESCRIPTION

This section of the DEIS will introduce WSSO of the Delaware System, which would result in temporary changes to water levels. As described in Section 8.1.2, "Proposed Water for the Future Shutdown System Operations," of this draft scope, the first element of the proposed WSSO analyzed in the DEIS will focus on management of Delaware System releases. The DEIS will describe altered discharges from the Pepacton, Cannonsville, Neversink, and Rondout Reservoirs

to tributaries of the Delaware River (West and East Branches of the Delaware River and Neversink River) and Rondout Creek, respectively. Pepacton, Cannonsville, and Neversink Reservoirs have sufficient release capacities to manage reservoir levels, but Rondout Reservoir would require the construction of temporary siphons to manage releases into Rondout Creek during the temporary shutdown. To that end, this section will provide information on the installation and operation of siphons at Rondout Reservoir during the temporary shutdown.

The section will contain a brief background on the Delaware Aqueduct and the Delaware watershed; figures depicting locations of DEP's reservoirs and receiving waterbodies in the Delaware System that will experience changes during the proposed WSSO associated with the temporary shutdown; relevant study areas; and a discussion of required approvals.

10.11.5 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS: DELAWARE SYSTEM IMPACT METHODOLOGY AND ASSESSMENT

This section of the DEIS will discuss the proposed WSSO of the Delaware System that would result in changes during the temporary shutdown, including construction of the temporary siphons. The DEIS will (1) provide an overview of the assessment categories that will be analyzed in the DEIS and describe the methodologies that will be used to assess potential environmental impacts; and (2) describe baseline conditions, the future without WSSO, and the analysis of the potential for construction and operational impacts of WSSO and identified mitigation, as applicable. This section of the DEIS will also identify any impact categories for which the proposed WSSO did not meet applicable CEQR/SEQRA thresholds, thereby screening out those analyses. Proposed WSSO of the Delaware System, including construction of temporary siphons at Rondout Reservoir, are not anticipated to result in new structures or additions to existing structures with heights greater than 50 feet, or be located adjacent to, or across from, a sunlight-sensitive resource; result in the generation of 50 tons per week or more of solid waste, or any significant energy use or generation of GHGs. Therefore, it is anticipated that the following impact categories will not be evaluated in the DEIS for proposed WSSO of the Delaware System: shadows; solid waste and sanitation services; energy; and GHGs and climate change. However, energy, GHGs, and climate change will be evaluated cumulatively for the proposed Upstate Water Resiliency project and will include any potential contribution from the proposed WSSO of the Delaware System.

10.11.6 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS: DELAWARE SYSTEM IMPACT ASSESSMENT

This section of the DEIS will provide an assessment of the potential for impacts associated with WSSO of the Delaware System during the temporary shutdown, which will include increased releases into receiving waterbodies, and construction and operation of temporary siphons on Merriman Dam at Rondout Reservoir. This section of the DEIS will include a description of the Delaware System reservoirs and receiving waterbodies study areas where there is the potential for impacts, construction activities and equipment related to construction and operation of the siphons, as well as activities associated with the proposed WSSO, as appropriate, and provide an assessment of the potential for impacts in relevant assessment categories. The study area for this work will encompass the properties within which incremental changes to the vertical and horizontal areas of inundation around project waterways are anticipated as a result of WSSO

(See Figure 10-20). The incremental changes will be defined as those between that which would be typically inundated by natural flow and operational conditions and that which would be inundated or exposed under implementation of WSSO within or downstream of the Delaware System.

10.11.6.1 Land Use, Zoning and Public Policy

There may be temporary changes to the receiving waterbodies in the Delaware System as a result of increased releases during the temporary shutdown and during construction of the proposed siphons. As applicable, an assessment of the potential for the proposed WSSO of the Delaware System and construction of the siphons to affect land use, zoning, or public policy will be included in the DEIS. As applicable, the assessment in the land use and zoning chapter will evaluate the potential for impacts within the WSSO Delaware System study area and approximately 400 feet around the location of the proposed temporary siphons at Rondout Reservoir. An assessment of the potential for the proposed WSSO and siphons to affect land use will be included in the DEIS. More specifically, the land use analysis will describe existing land uses within each study area. Land use information will be compiled and mapped from published data, supplemented with field surveys and aerial photography, as appropriate. A general description of land use patterns using existing published sources of information and field reconnaissance will also be provided. The zoning analysis will describe existing zoning regulations that apply to the study areas, including information on allowed uses within the zoning districts. Any pending zoning actions that may affect land use patterns in the study areas will also be identified. Lastly, the public policy analysis will outline public policies that may apply, including any adopted or proposed neighborhood, community plans, LWRP, SASS, SCFWH, and landward coastal boundaries.

The descriptions of future conditions without the proposed WSSO will be based upon information obtained from DEP and the local counties and municipalities in which the waterbodies and Rondout Reservoir are located. In addition, the DEIS will include an assessment of any temporary property access that would be required by DEP to implement the proposed WSSO of the Delaware System and construct the proposed siphons.

10.11.6.2 Socioeconomic Conditions

During the temporary shutdown, increased flows to the Delaware River and Rondout Creek will be assessed for the potential to affect local businesses that rely on its resources (e.g., fishing). The socioeconomic assessment in the DEIS will provide a screening assessment against applicable CEQR guidelines to describe and document existing socioeconomic conditions and trends in the study areas of the East and West Branches of the Delaware River, Neversink River, and Rondout Creek, as well as changes to operation of hydroelectric facilities that are powered by flows through the Delaware System tunnels that could potentially be affected by the temporary shutdown and result in significant impacts due to (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; and (5) adverse effects on a specific industry.

The socioeconomic analysis pertaining to the costs associated with the proposed Upstate Water Supply Resiliency project, including the proposed WSSO of the Delaware System, would be

addressed through a shared distribution of costs across DEP's water supply network, including City and upstate customers, through changes in the water rate due to project costs. Therefore, potential changes to the water rate as a result of the proposed Upstate Water Supply Resiliency project, and those evaluated in the previous EIS, will be described in Chapter 12, "Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project," of the DEIS.

10.11.6.3 Community Facilities and Services

There may be temporary changes to community services associated with the Delaware System during the temporary shutdown related to WSSO of the Delaware System and construction of the proposed temporary siphons at Rondout Reservoir. Therefore, as applicable, the community facilities and services assessment will (1) identify the local community facilities within the study areas identified in the land use, zoning and public policy section and service providers that would service these study areas; (2) describe any temporary expected uses of those community facilities and services; and (3) provide an assessment of the potential for impacts from the proposed WSSO of the Delaware system on those community facilities and services.

10.11.6.4 Open Space and Recreation

Recreational activities near the Delaware System reservoirs and receiving waterbodies will be assessed for the potential to be affected by the temporary changes in release flows or reservoir elevation associated with the proposed temporary shutdown and construction and operation of the siphons.

This section of the DEIS will present data on open spaces and recreational activities near the Delaware reservoirs and receiving waterbodies that may be temporarily affected by the proposed WSSO. A screening level assessment will be prepared to determine whether the temporary Delaware System releases to the receiving waterbodies within these systems or operation of the proposed siphons would have the potential to result in adverse impacts on open space and recreation, thus warranting further analysis. The open space and recreation assessment will consist of the following steps:

- Map and describe existing open spaces and recreation areas in the relevant study areas, including those identified in local open space plans;
- Identify and describe predominant open space patterns and recreational activities in the study areas (e.g., fishing, boating, bathing beaches and marinas) based on discussions with DEP staff who manage recreation on the reservoirs, existing information included in GIS for the area, and compiled field surveys;
- Use the results of system modeling that describes the amounts and timing of releases and spills in the Delaware System reservoirs and receiving waterbodies to superimpose flows and elevations from the reservoir and receiving waterbodies against those typically observed, and identify potential differences that may have an impact on accessibility or use of these waterbodies; and

- Specifically for Rondout Creek, use hydrologic and hydraulic modeling conducted by DEP as described in the natural resources assessment section (Section 10.11.6.8, “Natural Resources”) to assess how releases and spills from Rondout Reservoir may impact water levels within Rondout Creek during the temporary shutdown and any associated effect on open space and recreation (e.g., fishing or boating within Rondout Creek).

10.11.6.5 Critical Environmental Areas

There are no CEAs in the vicinity of the Delaware System associated with the Cannonsville, Pepacton, Neversink and Rondout Reservoirs. Therefore, no analysis will be undertaken.

10.11.6.6 Historic and Cultural Resources

This section of the DEIS will include an assessment of the potential for impacts to historic and cultural resources that could occur as a result of the proposed WSSO or construction or operation of the siphons in Rondout Reservoir. Many of the temporary changes associated with the proposed WSSO of the Delaware System would occur in areas that were previously disturbed during construction of the City’s reservoir system, are located on steep slopes (greater than 12 percent), or in areas of standing water. This analysis will include identification of cultural and archaeological resources and architectural resources with historic significance that could potentially be affected by proposed changes in flows in the waterbodies downstream of the Delaware System reservoirs and construction and operation of the proposed siphons, and will also include consultations with the OPRHP. The consultation requests will be comprised of site location maps and photographic documentation of the existing sites and surroundings. The consultation and DEIS analysis will also include results of HEC-RAS modeling (a hydraulic model for natural and constructed channels) to identify areas where identified historic resources may be potentially affected in association with temporary releases along the East and West Branch of the Delaware River, Neversink River, and Rondout Creek.

If any resources of potential historic and/or cultural significance are identified, an inspection of the identified sites and study areas, by way of additional field surveys and documentary research, may be required. If required, the assessment will include preparation of a Phase I Archaeological Survey consisting of a Phase IA Literature Review and Sensitivity Assessment and a Phase IB Archaeological Field Reconnaissance Survey. The Phase IB Archaeological Field Reconnaissance Survey would consist of shovel tests to evaluate the potential impact of the project on archaeological resources. Shovel tests would not occur in standing water, slopes of greater than 12 percent, or areas of previous disturbance. During the Phase IB survey, any precontact (Native American) cultural material and any significant historic artifacts, such as glass, ceramics, food remains, and hardware, identified during the fieldwork would be identified and collected. Results of the historic and cultural resources assessment will be presented in the DEIS.

10.11.6.7 Visual Resources

This section of the DEIS will assess the potential for impacts on visual resources from the proposed WSSO of the Delaware System as temporary water level changes in reservoirs and waterbodies would be visible from publicly accessible areas and the siphons would be a new

visible feature at Merriman Dam. The assessment will focus on the potential observable changes to the view corridor visible by the general public. The study area for the assessment of visual resources will be consistent with that of the study areas that will be used for the analysis of land use, zoning, and public policy, but may include view corridors that extend beyond those study areas based on the locations that are publicly accessible, as required.

A screening assessment will be included in the DEIS to determine whether a visual assessment pursuant to the NYSDEC policy, “Assessing and Mitigating Visual Impacts,” and CEQR criteria is warranted, as appropriate. If required, a visual assessment will be prepared in conformance with the applicable NYSDEC and CEQR criteria. In this assessment, an inventory of sensitive visual resources will be compiled to determine the potential for views towards the study areas. In addition, the incremental changes to views that are deemed to have aesthetic value from sensitive visual resources will be characterized in the DEIS both in a narrative format and through the use of images depicting conditions in the future with and without the proposed WSSO of the Delaware System and temporary siphons, as warranted, along with results of the hydrologic and hydraulic modeling along Rondout Creek (described in Section 10.11.6.8, “Natural Resources”) that will identify potential temporary inundated extents along Rondout Creek.

10.11.6.8 Natural Resources

This section of the DEIS will include an assessment of the potential for the proposed WSSO of the Delaware System or construction and operation of the proposed siphons to affect natural resources in the study areas. Effects on natural resources could occur as a result of temporary water level changes in reservoirs and waterbodies. Specifically, WSSO from Rondout Reservoir into Rondout Creek and the potential for changed spill and release patterns from the Cannonsville, Pepacton, and Neversink Reservoirs will be assessed with the following steps:

- Use of the City’s system-specific reservoir modeling software to identify potentially affected Delaware System reservoirs and receiving waterbodies;
- Use of the City’s system-specific reservoir model to determine how proposed releases and spills from the Delaware System reservoirs are anticipated to change during the temporary shutdown compared to flows and elevations typically observed in the reservoirs and receiving waterbodies. This comparison will be used to identify changes in the timing, amount, or seasonality of releases as compared to the historic record to identify potential for changed conditions within the receiving water bodies that may inundate or alter the habitat of adjacent natural resources. Field surveys or additional modeling, such as hydraulic analysis, will be conducted, as applicable; and
- Conducting an assessment of the potential changes to temperature and water quality from WSSO of the Delaware System considering the changed flows and water levels identified using the model and resulting potential impacts to resources in the affected waterbodies.

Furthermore, based on results of this analysis, the natural resources assessment may identify existing natural resources that could be temporarily affected by the increased flows within a study area for each receiving waterbody analyzed. The assessment will also include a discussion of the potential for impacts to fish and other resources within the affected waterbodies and in Rondout Reservoir from construction and operation of the proposed temporary siphons.

The desktop analyses and agency consultations will be used to identify existing natural resources study areas that could be temporarily affected by WSSO of the Delaware System, and will include:

- Reviewing USGS Topographic Maps, FEMA Floodplain Maps, NYSDEC Wetland Maps, NYSDEC Waters Index Numbers and Priority Waterbodies List, USFWS NWI Maps, USDA NRCS soil maps, and aerial photos;
- Coordinating with the NYNHP, NYSDEC Central and Regional Offices, USACE, USFWS, and NMFS, as well as county and local offices, as applicable, to determine whether further on-site analyses will be necessary;
- Contacting NYNHP to determine whether endangered, threatened, species of special concern, as well as candidate, proposed or rare species of plants and wildlife or unique and critical habitats were reported as occurring on or adjacent to the study areas that could be affected by the proposed WSSO. NYNHP provides a database listing that identifies the species and/or habitats with state, heritage and global rankings, along with other information related to the species. NYSDEC Central and Regional offices and NMFS may be contacted to provide additional information on species, locations, and habitats identified;
- Consultation with USFWS, as necessary, based on species identified. USFWS provides an online report of any endangered or threatened species that are federally listed, proposed for listing, and/or candidates for listing known to exist within each county. A USFWS online project review will be conducted and submitted to the USFWS. In addition, local and county legislation related to threatened and endangered species will be reviewed and species list compared with State and federal species information to ensure all relevant flora and fauna will be identified. Species provided protection under the Migratory Bird Treaty Act of 1918, and other protective legislation such as the Bald and Golden Eagle Protection Act, will be evaluated if documented to occur within the project area. Pertinent species information provided by these agencies and sources will be included in study area descriptions in the DEIS and will inform the DEIS analysis; and
- Where they may be affected, Bald Eagle breeding and nonbreeding desktop analyses, including available DEP data will be assessed to determine if a buffer restriction would be required in accordance with the USFWS's "National Bald Eagle Management Guidelines."

Based on these results, natural resources field surveys for regulated habitats and listed, proposed, and candidate species or habitats identified as potentially occurring in the project area will be conducted to establish baseline conditions. The field surveys that will be conducted as needed to identify existing natural resources within the study areas, as applicable, include:

- Delineation and characterization of wetlands and tributary watercourses within the study areas. The wetland delineations will follow USACE's three parameter methodology as described in the 1987 USACE wetland delineation manual (Environmental Laboratory 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation

Manual: Northcentral and Northeast Region (Version 2.0) (USACE 2012). The watercourses will be delineated using indicators of ordinary high water marks as described in 33 Code of Federal Regulations (CFR) 328.3;

- Conducting terrestrial or aquatic surveys to identify existing habitats and species occurring within or adjacent to each study area. Any surveys that are conducted will include identifying ecological communities and making incidental observations of mammal, avian, fish, and amphibian and reptile species; and
- For protected species or their habitats that may be affected by the project, conducting field investigations of the study areas by biologists to document the extent of the species and/or its habitat, the context of its surroundings, and the area that may be affected by the proposed WSSO. These field surveys may include habitat assessments (e.g., Phase I bog turtle habitat survey, Phase I Indiana bat summer habitat surveys), or more detailed visual assessments for the species (e.g., Dwarf Wedgemussel Survey). Surveyor qualifications and survey methodologies for endangered, threatened, proposed, and candidate species will be consistent with federal and State guidelines.

The potential for temporary direct or indirect physical effects of the proposed WSSO of the Delaware System on each affected resource within the applicable study areas will be assessed, including the potential for effects from operating the proposed temporary siphons at Rondout Reservoir on the aquatic community within the reservoir. The assessment will include a description of the existing conditions of the potentially affected resources, whether the resource is State or federally regulated, if the impacts are direct or indirect, the duration of the temporary impact during proposed WSSO of the Delaware System, the severity of the impact (e.g., extent that will be affected from increased flows) whether insignificant or significant, and if the impacts can be mitigated. The results of the assessment will be included in the DEIS.

10.11.6.9 Hazardous Materials

If applicable, as part of the DEIS, a Phase I ESA in accordance with the most recent ASTM 1527-13 Standard, will be prepared for locations or stream banks where in-ground disturbance associated with the proposed WSSO of the Delaware System would occur. Specifically, the Phase I ESA would be prepared for those areas associated with construction of the siphons or those along the receiving water bodies that might be temporarily disturbed based on results of the hydraulic modeling described in Section 10.11.6.8, “Natural Resources.” Findings of the Phase I ESA, and the potential for impacts from hazardous materials, if any, and related mitigation and/or remediation will be presented in the DEIS. The potential for impacts associated with storage and use of potentially hazardous chemicals associated with operation of siphons in Rondout Reservoir will also be assessed and presented in the DEIS. The DEIS will also include a summary of actions to be taken during construction of the proposed siphons to limit exposure of construction workers to potential contaminants, as required.

10.11.6.10 Water and Sewer Infrastructure

A water and sewer infrastructure assessment will be conducted to determine if construction or operation associated with WSSO of the Delaware System, including temporary reservoir

drawdown or discharges from the proposed project during construction and operation, has the potential to cause a significant adverse impact to water and sewer infrastructure. An evaluation will be conducted to confirm there are no community users who draw water from the Delaware System that could be affected by temporary reservoir drawdown.

Discharges from the proposed construction and operation of the siphons would be directed to a stormwater system or treated for permitted discharge. If warranted, a stormwater and/or sewer infrastructure analysis will be prepared and presented in the DEIS and will include:

- An inventory of existing water and sewer infrastructure servicing facilities at Rondout Reservoir or other areas within the Delaware watershed that will be potentially affected by construction or operation of the proposed siphons or WSSO of the Delaware System;
- Estimates of increased water use and any changes to impervious areas at Rondout Reservoir from installation of the siphons to confirm the proposed WSSO would not exceed any thresholds for analyses of stormwater, such as changes resulting from the addition of impervious surfaces (including gravel areas);
- The addition of new stormwater and drainage features near the siphons at Rondout Reservoir, including those implemented during the construction phase;
- Estimates of increased sewer demand;
- A comparison of estimated project-generated water supply demand, and stormwater and sewage system capacities with the infrastructure available to meet these demands during the proposed WSSO and construction and operation of the siphons; and
- An examination of the need for additional infrastructure and utilities needed to support the proposed WSSO and construction and operation of the siphons.

An assessment of the potential for the proposed WSSO and the proposed siphons to affect water supply, stormwater, and sewer infrastructure will be included in the DEIS.

10.11.6.11 Transportation

This assessment will include a summary of any increase in vehicle trips in the area from construction workers and equipment; the extent and duration of any street, roadway, or sidewalk closure; any potential for impacts on the parking supply; and any loss in other transportation services during construction of the proposed siphons. Results from the construction transportation screening assessment of the proposed siphons and analysis will be presented in the DEIS. No changes to transportation from operation of the siphons are anticipated. This temporary infrastructure, which would operate by gravity, would be largely unmanned and, therefore, no new workers or traffic would be associated with their operation. As a result, an operational assessment will not be provided in the DEIS.

10.11.6.12 Air Quality

The air quality impact section will contain a discussion of both mobile source emissions from construction equipment, worker and delivery vehicles, and fugitive dust emissions associated

with construction of the proposed siphons. A screening assessment will be prepared for emissions from construction equipment and construction-related mobile sources. Results from the construction air quality screening assessment and analysis will be presented in the DEIS. There are no changes to air quality that would result from project operation, and therefore an operational assessment will not be provided in the DEIS.

10.11.6.13 Noise

A noise screening analysis will be conducted to determine if construction or operation of the siphons at Rondout Reservoir has the potential to cause a significant adverse noise impact at noise-sensitive receptors. A screening assessment will be conducted to determine if the potential for temporary changes to noise levels from the release of Rondout Reservoir water through the siphons could affect nearby sensitive receptors, warranting further analysis. For mobile noise sources, a noise impact screening analysis will be conducted based on the estimated change in construction-related vehicles. If construction of the siphons at Rondout Reservoir would result in a doubling of existing noise PCEs, a detailed vehicular noise analysis will be prepared. Results of the construction and operation noise screening assessment and analysis of the temporary siphons will be presented in the DEIS.

10.11.6.14 Neighborhood Character

An assessment of the potential for the proposed WSSO or construction or operation of the proposed siphons to affect the character of the neighborhood or communities near the affected reservoirs and waterbodies will be included in the DEIS. The neighborhood character assessment will be conducted as follows:

- Based on other technical analyses, describe the predominant factors that contribute to defining the character of the community surrounding the reservoirs and waterbodies where there may be temporary effects;
- Summarize changes that can be expected in the character of the associated study areas, as applicable, in the future without the proposed WSSO; and
- Assess and summarize the degree and type of change from the proposed WSSO on the community using the analysis of the potential for impacts as presented in other relevant analyses (this could include, but not be limited to visual resources and open space and recreation).

10.11.6.15 Public Health

A public health assessment is not warranted if a proposed project does not result in a significant unmitigated adverse impact in other analysis areas, such as air quality, water quality, hazardous materials, or noise. If an unmitigated significant adverse impact is identified in the relevant technical areas of the DEIS during the temporary shutdown, a public health assessment will be prepared.

10.11.7 MITIGATION

This section of the DEIS will provide a brief summary of any identified impacts and mitigation in the Delaware System from the proposed WSSO of the Delaware System and construction and operations of the siphons based on results of the analyses presented in the DEIS.

10.11.8 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS: CATSKILL AND CROTON SYSTEMS DESCRIPTION

The second element of the proposed WSSO analyzed in the DEIS will focus on the proposed WSSO of the Catskill and Croton Systems. This section of the DEIS will introduce the proposed WSSO of the Catskill and Croton systems prior to, during and following the temporary shutdown and will provide baseline conditions against which the potential for impacts would be assessed. The section will contain a brief background of the Catskill and Croton aqueducts and watersheds; figures depicting locations of DEP's reservoirs and receiving waterbodies that would experience changes during the proposed WSSO; a description of the study areas associated with the proposed WSSO, including augmented alum treatment at the Pleasantville Treatment Facility; and a discussion of required approvals (see Figure 10-20 and Figure 10-21).

While Delaware System modifications would see an increase in releases, the Catskill and Croton Systems reservoirs would be temporarily lowered as a result of maximizing use of these systems during the temporary shutdown in order to meet water demands. An increased reliance on the Catskill System would also include a temporary increase in alum treatment via additional liquid alum deliveries in tanker trucks to the existing Pleasantville Treatment Facility during the temporary shutdown to ensure optimal use of the Catskill System. Increased alum treatment would be required during the temporary shutdown as DEP would not implement its normal practice of reducing flow through the Catskill Aqueduct during turbidity events. Additional alum treatment needs would also be met by an expansion of the existing treatment facility, as required.

10.11.9 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS: CATSKILL AND CROTON SYSTEMS IMPACT METHODOLOGY AND ASSESSMENT

This section of the DEIS will discuss the proposed WSSO of the Catskill and Croton Systems that would result in temporary changes to water levels, and includes additional alum treatment at the Pleasantville Treatment Facility during the temporary shutdown. The DEIS will (1) provide an overview of the assessment categories that will be analyzed in the DEIS and describe the methodologies that will be used to assess potential environmental impacts; and (2) describe baseline conditions, the future without WSSO, and the analysis of the potential for construction and operational impacts of WSSO of the Catskill and Croton Systems and identified mitigation, as applicable. This section of the DEIS will also identify any impact categories for which the proposed WSSO did not meet applicable CEQR/SEQRA thresholds, thereby screening out those analyses. Of note, DEP has numerous, independent, projects described in Chapter 7, "Water Supply System Programs and Projects Independent of Water for the Future," that will be operational in advance of the proposed Upstate Water Supply Resiliency project and have helped to establish the operational conditions for the Catskill and Croton systems during the temporary

shutdown. Therefore, the Future Without the Proposed Project will be based on operation of these projects during the proposed WSSO of the Catskill and Croton Systems.

Proposed WSSO of the Catskill and Croton Systems, including additional alum treatment at the Pleasantville Treatment Facility, are not anticipated to result in new structures or additions to existing structures with heights greater than 50 feet, or be located adjacent to, or across from, a sunlight-sensitive resource; result in the generation of 50 tons per week or more of solid waste; or any significant generation of GHGs. Therefore, it is anticipated that the following impact categories will not be evaluated in the DEIS for proposed WSSO of the Catskill and Croton Systems: shadows; solid waste and sanitation services; and GHGs and climate change. However, GHGs and climate change will be evaluated cumulatively for the proposed Upstate Water Supply Resiliency project, and will include any potential contribution from the proposed WSSO of the Catskill and Croton Systems.

10.11.10 PROPOSED WATER FOR THE FUTURE SHUTDOWN SYSTEM OPERATIONS: CATSKILL AND CROTON SYSTEMS IMPACT ASSESSMENT

This section of the DEIS will provide an assessment of the potential for operational impacts associated with WSSO of the Catskill and Croton Systems and increased alum treatment at Kensico Reservoir during the temporary shutdown. The analysis will assess changes in reservoir levels and releases into receiving waterbodies and associated with increased alum deliveries to the Pleasantville Treatment Facility, as well as expansion of the treatment facility, if one is needed. This section of the DEIS will provide an assessment of the potential for impacts in relevant assessment categories. All categories not screened from the analysis will be evaluated in this manner.

10.11.10.1 Land Use, Zoning and Public Policy

There may be temporary changes to the reservoirs and receiving waterbodies in the Catskill and Croton Systems during the temporary shutdown. Therefore, as applicable, an assessment of the potential for WSSO to affect land use, zoning, or public policy will be included in the DEIS. As applicable, the assessment in the land use and zoning chapter will evaluate the potential for impacts within a study area around each reservoir and waterbody in the Catskill and Croton Systems that may be temporarily be affected, and which will provide a baseline for other analyses. The land use and zoning analysis will describe existing land uses within each identified study area. Land use and zoning information will be compiled and mapped from published data, supplemented with field surveys and aerial photography, as appropriate. A general description of land use patterns using existing published sources of information and field reconnaissance will also be provided.

The descriptions of future conditions without the proposed WSSO will be based upon information obtained from the local counties and municipalities in which the reservoirs and waterbodies are located concerning improvements planned and programmed for implementation. In addition, the DEIS will include an assessment of any temporary property access that would be required by DEP during the WSSO of the Catskill and Croton Systems and during increased alum treatment. Lastly, the public policy analysis will outline public policies that may apply,

including any adopted or proposed neighborhood, community plans, LWRP, SASS, and SCFWH, and landward coastal boundaries.

The descriptions of future conditions without the proposed WSSO will be based upon information obtained from DEP and the local counties and municipalities in which the waterbodies and Catskill and Croton Systems are located. In addition, the DEIS will include an assessment of any temporary property access that would be required by DEP to implement the proposed WSSO of the Catskill and Croton Systems.

10.11.10.2 Socioeconomic Conditions

During the temporary shutdown, decreased flows in the Catskill and Croton Systems' rivers will be assessed for the potential to affect local businesses that rely on its resources (e.g., fishing). The socioeconomic assessment in the DEIS will provide a screening assessment against applicable CEQR guidelines to describe and document existing socioeconomic conditions and trends in the study areas of the Catskill and Croton Systems' rivers that could potentially be affected by the temporary shutdown and result in significant impacts due to (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; and (5) adverse effects on a specific industry (e.g. recreational businesses).

The socioeconomic analysis pertaining to the costs associated with the proposed Upstate Water Supply Resiliency project, including WSSO of the Catskill and Croton Systems and increased alum treatment, would be addressed through a shared distribution of costs across DEP's water supply network, including City and upstate customers, through changes in the water rate due to project costs. Therefore, potential changes to the water rate as a result of the proposed Upstate Water Supply Resiliency project, and those evaluated in the previous EIS, will be described in Chapter 12, "Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project," of the DEIS.

10.11.10.3 Community Facilities and Services

There may be temporary changes to community services during the temporary shutdown as a result of the proposed WSSO of the Catskill and Croton Systems or during temporary increased alum treatment. Therefore, as applicable, the community facilities and services assessment will (1) identify the local community facilities within the study areas and service providers that would service these study areas; (2) describe any temporary changes to expected uses of those community facilities and services as a result of changed water levels in reservoirs or water bodies and increased deliveries at the Pleasantville Treatment Facility; and (3) provide an assessment of the potential for impacts from the proposed WSSO on those community facilities and services.

10.11.10.4 Open Space and Recreation

Recreational activities near and within the Catskill and Croton Systems' reservoirs and receiving waterbodies will be assessed for the potential to be affected by the temporary changes in flows or decreased reservoir elevations associated with the proposed temporary shutdown, taking into

account any potential conditions in the future associated with operation of the Croton Water Filtration Plant. This section of the DEIS will present data on open spaces and recreational activities near the Catskill and Croton reservoirs and their associated receiving waterbodies that may be impacted by the proposed WSSO. A screening level assessment will be prepared to determine whether the temporary Catskill and Croton System drawdowns and changes in releases to the receiving waterbodies within these systems would have the potential to result in adverse impacts on open space and recreation, warranting further analysis. The open space and recreation assessment will consist of the following steps:

- Map and describe existing open spaces and recreation areas in the study areas, including those identified in local open space plans;
- Identify and describe predominant open space patterns and recreational activities in the study areas (e.g., fishing, boating, bathing beaches and marinas) based on discussions with DEP staff who manage recreation on the reservoirs, existing information included in GIS for the area, and compiled field surveys;
- Use the results of system modeling that describes the amounts and timing of releases and spills and the amount of anticipated drawdown in the Catskill and Croton Systems' reservoirs and receiving waterbodies to superimpose flows and elevations from the reservoir against those typically observed, and identify potential differences that may have an impact on accessibility or use of these waterbodies; and
- Use hydrologic and hydraulic modeling conducted by DEP as described in the natural resources assessment section (Section 10.11.10.8, "Natural Resources") to assess how releases and spills from system reservoirs or drawdowns may impact water levels during the temporary shutdown and any associated effect on open space and recreation (e.g., fishing or boating).

10.11.10.5 Critical Environmental Area

There are ten CEAs in the vicinity of the Catskill and Croton Systems: one in the Catskill System in Ulster County and nine in the Croton System in Putnam and Westchester County:

- The Woodstock Wetlands CEA is located just north of Ashokan Reservoir in Ulster County within DEP's watershed;
- The Great Swamp CEA is located in the vicinity of the East Branch and Bog Brook Reservoirs;
- The County and State Parklands CEA is located near DEP's New Croton, Cross River, and Muscoot Reservoirs. An aquifer in the Town of Bedford CEA includes this same area;
- There are three CEAs near Kensico Reservoir: the Westchester Airport 60 Ldn Noise Contour CEA, the County Designated Watershed CEA, and the County and State Parklands CEA;

- There are two CEAs located near the Amawalk Reservoir: one CEA encompasses the Amawalk Reservoir and all land within 500 feet of the reservoir boundary, and the other CEA is the Baldwin Place CEA; and
- The Croton Point Park CEA is near New Croton Reservoir and the Croton River.

A screening assessment will be included in the DEIS to determine whether any study areas or receiving waterbodies are located within a CEA. The potential for the proposed WSSO of the Catskill and Croton Systems to impact environmental characteristics of these CEAs will be assessed in the DEIS. Results of the CEA assessment will be presented in the DEIS.

10.11.10.6 Historic and Cultural Resources

This section of the DEIS will include an assessment to determine whether the proposed temporary shutdown would result in effects on historic or cultural resources. Many of the temporary changes associated with the proposed WSSO of the Catskill and Croton Systems would occur in areas that were previously disturbed during construction of the City's reservoir system, are located on steep slopes (greater than 12 percent), or are in areas of standing water.

The historic and cultural resources assessment will evaluate existing databases and correspondence from OPRHP, local preservation plans, and information from the land use, zoning, and public policy analysis to identify potential historic and cultural resources near and along the affected reservoirs and waterbodies. If any resources of potential historic and/or cultural significance are identified, an inspection of the identified sites and study areas, by way of additional field surveys and documentary research, may be required. If required, the assessment will include preparation of a Phase I Archaeological Survey consisting of a Phase IA Literature Review and Sensitivity Assessment and a Phase IB Archaeological Field Reconnaissance Survey. The Phase IB Archaeological Field Reconnaissance Survey would consist of shovel tests to evaluate the potential impact of the project on archaeological resources. Shovel tests would not occur in standing water, slopes of greater than 12 percent, or areas of previous disturbance. During the Phase IB survey, any precontact (Native American) cultural material and any significant historic artifacts such as glass, ceramics, food remains, and hardware identified during the fieldwork would be identified and collected. Results of the historic and cultural resources assessment of the WSSO of the Catskill and Croton Systems will be presented in the DEIS.

10.11.10.7 Visual Resources

This section of the DEIS will assess the potential for impacts on visual resources from the proposed WSSO of the Catskill and Croton Systems since temporary water level changes in reservoirs and waterbodies during the temporary shutdown would be visible from publicly-accessible areas that are used for recreation (in the case of reservoirs, by DEP-issued permits). The assessment will focus on the potential observable changes to the view corridor visible by the general public. The study area for the assessment of visual resources will be consistent with that of the study areas that will be used for the analysis of land use, zoning, and public policy, but may also include view corridors that extend beyond those study areas based on the locations that are publicly accessible, as required.

A screening assessment will be included in the DEIS to determine whether a visual assessment pursuant to the NYSDEC policy, “Assessing and Mitigating Visual Impacts,” and CEQR criteria is warranted. If required, a visual assessment will be prepared in conformance with the NYSDEC and CEQR criteria, as appropriate. In this assessment, an inventory of sensitive visual resources will be compiled to determine the potential for views towards the study areas. In addition, the incremental changes to views that are deemed to have aesthetic value from sensitive visual resources will be characterized in the DEIS both in a narrative format and through the use of images depicting conditions in the future with and without the proposed project.

10.11.10.8 Natural Resources

The DEIS will include an assessment of potential for impacts to natural resources due to the water level changes in reservoirs and waterbodies during the temporary shutdown and increased alum treatment at the Pleasantville Treatment Facility. Desktop review, agency consultations and field surveys will be conducted to identify and map locations and types of natural resources within the study areas that have the potential to be affected by the proposed WSSO. Once these natural resources are identified, a screening level assessment will be conducted to determine the potential for significant adverse impacts to these resources based on the type and location of activity associated with the proposed WSSO. Based on the results of the screening assessment, a detailed analysis will be prepared, as required and presented in the DEIS. The assessment will consist of the following steps:

- Use the City’s system-specific reservoir modeling software, identify potentially affected Catskill and Croton Systems’ reservoirs and receiving waterbodies, as listed in Table 10-3;
- Use the City’s system-specific reservoir model to determine how proposed releases and spills from the Catskill and Croton Systems’ reservoirs are anticipated to change during the temporary shutdown compared to flows and elevations typically observed in the reservoirs and receiving waterbodies. This comparison will be used to identify changes in the timing, amount, or seasonality of releases as compared to the historic record to identify potential for changed conditions within the receiving water bodies that may inundate or alter the habitat of adjacent natural resources. Field surveys or additional modeling, such as hydraulic analysis to identify the incremental changes in vertical or horizontal extents that will define the study areas, will be conducted as applicable; and
- Assess the potential changes to temperature and water quality from WSSO of the Catskill and Croton Systems considering the changed flow and water levels identified using the model and resulting potential impacts resources in the affected waterbodies.

Based on results of the screening assessment, the potential for the proposed drawdown to affect natural resources will be assessed and a detailed analysis will be prepared, if required. Desktop analyses and agency consultations will be used to identify existing natural resources within the associated study areas that could be temporarily affected by WSSO, and will include:

- Reviewing USGS Topographic Maps, FEMA Floodplain Maps, NYSDEC Wetland Maps, NYSDEC Waters Index Numbers and Priority Waterbodies List, USFWS NWI Maps, USDA NRCS soil maps, aerial photos, and other local sources when available;
- Coordinating with the NYNHP, NYSDEC Central and Regional Offices, USACE, USFWS, and NMFS, as well as county and local offices, as applicable, to determine whether further on-site analyses will be necessary;
- Contacting NYNHP to determine whether endangered, threatened, species of special concern, as well as candidate, proposed or rare species of plants and wildlife or unique and critical habitats were reported as occurring on or adjacent to the study areas that could be affected by the proposed WSSO. NYNHP provides a database listing that identifies the species and/or habitats with state, heritage and global rankings, along with other information related to the species. NYSDEC Central and Regional offices and NMFS may be contacted to provide additional information on species, locations, and habitats identified;
- Consultation with USFWS, as necessary, based on species identified. USFWS provides an online report of any endangered or threatened species federally listed, proposed for listing, and/or candidates for listing known to exist within each county. A USFWS online project review will be conducted and submitted to the USFWS. In addition, local and county legislation related to threatened and endangered species will be reviewed and species list compared with State and federal species information to ensure that all relevant flora and fauna will be identified. Species provided protection under the Migratory Bird Treaty Act of 1918 and other protective legislation, such as the Bald and Golden Eagle Protection Act, will be evaluated if documented to occur within the project area. Pertinent species information provided by these agencies and sources will be included in study area descriptions in the DEIS and will inform the DEIS analysis; and
- Where they may be affected, Bald Eagle breeding and nonbreeding desktop analyses, including available DEP data will be assessed to determine if a buffer restriction would be required in accordance with the USFWS's "National Bald Eagle Management Guidelines."

Based on these results, natural resources field surveys for regulated habitats and listed, proposed, and candidate species or habitats identified as potentially occurring in the project area will be conducted, as necessary, to establish baseline conditions, as required. The field surveys that will be conducted to identify existing natural resources within the study areas and could include:

- Delineation and characterization of wetlands and watercourses within the study areas. The wetland delineations will follow USACE's three parameter methodology as described in the 1987 USACE wetland delineation manual (Environmental Laboratory 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (USACE 2012). The watercourses will be delineated using indicators of ordinary high water marks as described in 33 Code of Federal Regulations (CFR) 328.3,

- Conducting terrestrial or aquatic surveys to identify existing habitats and species occurring within or adjacent to each study area. Any surveys that are conducted will include identifying ecological communities and making incidental observations of mammal, avian, fish, and amphibian and reptile species; and
- For protected species or their habitats that may be affected by the project, conducting field investigations of the study areas by biologists to document the extent of the species and/or its habitat, the context of its surroundings, and the area that may be affected by the proposed WSSO. These field surveys may include habitat assessments (e.g., Phase I bog turtle habitat survey, Phase I Indiana bat summer habitat surveys,), or more detailed visual assessments for the species (e.g., button bush dodder survey). Surveyor qualifications and survey methodologies for endangered, threatened, proposed, and candidate species will be consistent with federal and State guidelines.

Finally, additional alum treatment would be necessary to safeguard water quality at Kensico Reservoir should a turbidity event occur in the Catskill System during the temporary shutdown of the Delaware Aqueduct when DEP would be unable to reduce flows in the Catskill Aqueduct. Alum could be added to the Catskill Aqueduct just upstream of Kensico Reservoir at the Pleasantville Treatment Facility. As assessment of the potential for impacts as a result of temporarily increased alum treatment would consist of the following steps:

- Identify whether activities associated with construction of any required treatment facility expansion have the potential to effect natural resources;
- Identify potential areal deposition of alum floc depth and extent near the Catskill Influent Chamber (CATIC) in Kensico Reservoir from increased temporary alum treatment;
- Conduct habitat surveys for species and communities identified as having a potential to be adversely affected by the additional alum treatment;
- Summarize aquatic (fish and benthic macroinvertebrate) resources that are present in the vicinity of the potential floc based on previous DEP studies and any additional surveys; and
- Describe the potential changes that would result from deposition of additional alum floc during the temporary shutdown on the identified aquatic resources.

The potential for temporary direct or indirect physical effects of the proposed WSSO on each affected resource will be assessed. The assessment will include a summary of the affected resources, whether the resource is State or federally regulated, if the impacts are direct or indirect, the duration of the temporary impact during WSSO of the Catskill and Croton Systems, the severity of the impact (e.g., extent that will be affected from decreased flows and additional alum treatment) whether insignificant or significant, and if the impacts can be mitigated. The results of the natural resources assessment will be included in the DEIS.

10.11.10.9 Hazardous Materials

If applicable, as part of the DEIS, a Phase I ESA in accordance with the most recent ASTM 1527-13 Standard, will be prepared for locations or stream banks where in-ground disturbance

would occur associated with the proposed WSSO. Specifically, the Phase I ESA would be prepared for those areas along the receiving water bodies that might be temporarily disturbed based on results of the hydraulic modeling described in Section 10.11.10.8, “Natural Resources,” as required. During the temporary shutdown, DEP would need to augment alum treatment at the Pleasantville Treatment Facility should a turbidity event occur. The potential for impacts from management of hazardous materials, if any, including those associated with storage and use of alum or any potentially hazardous chemicals during the temporary shutdown, and related mitigation and/or remediation will be presented in the DEIS.

10.11.10.10 Water and Sewer Infrastructure

A water and sewer infrastructure assessment will be conducted to determine if construction or operation associated with WSSO, including temporary reservoir drawdown or discharges from the project during both construction and operation, has the potential to cause a significant adverse impact to water and sewer infrastructure.

An evaluation of the potential for reservoir drawdowns to impact community users who draw water from the Catskill and Croton Systems will also be conducted and presented in the DEIS. This will include an inventory of DEP’s own intakes and its customers’ intakes at the various reservoirs. The analysis will include an inventory and review of the water suppliers that use the Catskill and Croton reservoirs for water supply, including the level of their intakes within the reservoir or in downstream waterbodies where changes in flow within these waterbodies has the potential to impact water supply intakes or groundwater elevation.

Discharges from the proposed project during both construction and operation of activities associated with expanding the capacity of the Pleasantville Treatment Facility would be directed to a stormwater system or treated for permitted discharge. If warranted, a stormwater and/or sewer infrastructure analysis will be prepared and presented in the DEIS. The analysis will include:

- An inventory of existing water and sewer infrastructure servicing the Pleasantville Treatment Facility or other areas that will be potentially affected by WSSO, including groundwater wells in the vicinity of potentially effected waterbodies, as applicable;
- Estimates of increased stormwater and any changes to impervious areas;
- Estimates of potential change to groundwater levels;
- Estimates of increased sewer demand;
- The addition of any new stormwater and drainage features near the potentially affected reservoirs and receiving waterbodies;
- A comparison of estimated WSSO-generated water supply and sewer demand, potential changes to groundwater levels, as required, and capacity of stormwater and sewage system with the infrastructure available to meet these demands during WSSO; and
- An examination of the need for additional infrastructure and utilities needed to support the proposed WSSO of the Catskill and Croton Systems.

An assessment of the potential for the proposed WSSO to affect water supply, stormwater and sewer infrastructure will be included in the DEIS.

10.11.10.11 Transportation

This assessment will include a summary of any increase in vehicle trips from construction workers and equipment; the extent and duration of any street, roadway, or sidewalk closure; any potential for impacts on the parking supply; any loss in other transportation services during construction of any modifications to the Pleasantville Treatment Facility; and operations related to additional chemical deliveries of alum during WSSO to the Pleasantville Treatment Facility. Results of the transportation screening assessment and any analysis will be presented in the DEIS.

10.11.10.12 Air Quality

The air quality analysis section will contain a discussion of both stationary and mobile source emissions associated with temporary increased alum treatment at the Pleasantville Treatment Facility, as applicable. A screening assessment will be prepared for emissions from stationary and mobile sources associated with the potential increased alum treatment at the Pleasantville Treatment Facility.

An assessment of potential effects related to odors resulting from decreased reservoir levels will also be included. Results of the air quality screening assessment and analysis will be presented in the DEIS.

10.11.10.13 Noise

Increased alum deliveries may result in a change in onsite noise levels at the Pleasantville Treatment Facility. A noise screening analysis will be conducted to determine if the temporary increased use of alum at the Pleasantville Treatment Facility has the potential to cause a significant stationary or mobile adverse noise impact at noise-sensitive receptors. For vehicular noise sources, a noise impact screening analysis will be conducted based on the estimated change chemical delivery vehicles. If the increased use would temporarily result in a doubling of existing noise PCEs, a detailed vehicular noise analysis will be prepared. Results of the noise screening assessment and analysis will be presented in the DEIS.

10.11.10.14 Neighborhood Character

An assessment of the potential for proposed WSSO of the Catskill and Croton Systems to affect the character of the neighborhood or communities near the affected reservoirs and waterbodies will be included in the DEIS. The neighborhood character assessment will be conducted as follows:

- Based on other technical analyses, describe the predominant factors that contribute to defining the character of the community surrounding the reservoirs and waterbodies and the Pleasantville Treatment Facility where there may be temporary effects;

- Summarize changes that can be expected in the character of the area in the future without the proposed WSSO; and
- Assess and summarize the degree and type of change from the proposed WSSO on the community using the analysis of the potential for impacts as presented in other relevant analyses (this could include, but not be limited to visual resources and open space and recreation).

10.11.10.15 Public Health

A public health assessment is not warranted if a proposed project does not result in a significant unmitigated adverse impact in other analysis areas, such as air quality, water quality, hazardous materials, or noise. If an unmitigated significant adverse impact is identified in the relevant technical areas of the DEIS during the temporary shutdown, a public health assessment will be prepared and will include a description of potential for impact from increased mosquito breeding grounds. The DEIS will also assess whether the temporary lowering of water levels would have the potential to provide a breeding habitat for mosquitoes.

10.11.11 MITIGATION

This section of the DEIS will provide a brief summary of any identified impacts and mitigation in the Catskill and Croton Systems from the proposed WSSO and temporary increased alum treatment based on results of the analyses presented in the DEIS.

10.12 DEIS CHAPTER 11: PROPOSED RONDOUT-WEST BRANCH TUNNEL INSPECTION AND REPAIR

10.12.1 PROPOSED RONDOUT-WEST BRANCH TUNNEL INSPECTION AND REPAIR OVERVIEW

This section of the DEIS will introduce the proposed RWBT Inspection and Repair under the proposed Upstate Water Supply Resiliency project, a description of which is provided in Section 8.1.3, “Proposed Rondout-West Branch Tunnel Inspection and Repair” of this draft scope. This section of the DEIS will contain (1) a brief background of the proposed RWBT Inspection and Repair; (2) a description of the sites and study areas and their locations; (3) figures depicting the sites and study areas; and (4) a discussion of the anticipated approvals and permits required for the project. This section of the DEIS will also introduce the reader to the proposed RWBT Inspection and Repair and its potential for any construction or operational impacts. This section of the DEIS will also introduce the potential for long-term operational impacts in Roseton, NY associated with the proposed decommissioning of the leaking portion of the RWBT. Since the activities support each other but would affect different locations during different time periods, the potential for impacts associated with decommissioning will be evaluated separately from those associated with RWBT inspection and repair within the DEIS, as described further below.

Activities associated with the proposed inspection and repair would occur at up to five of the nine shaft sites and the Rondout Effluent Chamber (REC). These sites would be used to access

the RWBT in Ulster and Putnam Counties, and would include inspection of and internal repairs to the RWBT, namely the section in Wawarsing, and then, once inspection and repairs are completed, decommissioning the bypassed section of the RWBT. The locations of the five shafts and the Rondout Effluent Chamber (REC) that would be used during inspection and repair activities, as well as the study areas associated with locations that could be affected by lowered groundwater levels once the leaking RWBT is repaired and the bypassed section of the RWBT is decommissioned, are provided below (see **Table 10-4** and **Figure 10-22** to **Figure 10-28**).

Table 10-4: Proposed RWBT Inspection and Repair Project Study Areas

Description	Location	Proposed Project Component	Description of Proposed Project Component
Rondout Effluent Chamber	Town of Wawarsing, Ulster County	Inspection, Repair	Equipment storage; valve replacement
Shaft 1	Town of Wawarsing, Ulster County	Inspection, Repair, Construction	Minor clearing; installation of telephone services; ventilation; bulk fuel storage; generator; restore site grading to original state
Shaft 2A	Town of Wawarsing, Ulster County	Inspection, Repair, Construction	Tunnel repair; installation of phone services; security guard house; ventilation; lighting; debris removal; bulk fuel storage; generator; in-tunnel grout plant; restore site grading to original state
Shaft 4	Town of Plattekill, Ulster County	Inspection	Communication
Shaft 8	Town of Putnam Valley, Putnam County	Inspection, Construction	Subsurface tunnel easement; sliding gate, security guard house; installation of phone services; debris removal; generator; restore site grading to original state
Shaft 9	Town of Kent, Putnam County	Inspection, Construction	Ventilation and communication; generator
Roseton (Shaft 5B)	Town of Newburgh, Orange County	Decommissioning	Permanent Decommissioning of the bypassed section of the RWBT below the Hudson River once the bypass tunnel is connected

As a result of the internal repairs, leaks suspected to originate from the RWBT and influence water levels in the Wawarsing area would be repaired, and any potential to impact water supply in the Wawarsing area would be assessed in the DEIS. DEP is also supporting independent groundwater supply in the Town of Wawarsing.

In addition, during inspection of the RWBT, up to five locations could be used for temporary staging of equipment: REC, Shaft 1, and 2A in Wawarsing, Ulster County; Shaft 8 in Putnam Valley, Putnam County; and Shaft 9 in Kent, Putnam County. Two locations, Shaft 2A and 8, would be used for access for personnel and construction-related equipment needed for grouting (e.g., cement grout mixers and agitators, cement grout pumps, packers, shut-in valves, pressure gauges, etc.).

After inspection of the RWBT is completed, connection of the bypass tunnel would begin, and internal repairs would commence. Upon completion of the connection, the bypassed section of the RWBT would be permanently decommissioned (taken out of service).¹⁷ As described, once the bypass tunnel is decommissioned, the Roseton area, located near the leaking section of the bypass tunnel on the west side of the Hudson River, could be affected by lowered groundwater levels. This section of the DEIS will also contain (1) a brief background of the tunnel decommissioning activities; (2) a description of the sites where construction activities associated with decommissioning would occur (previously evaluated in the RWBT Bypass EIS); (3) figures depicting the sites and study areas that will be evaluated in this DEIS that could be affected by the proposed decommissioning; and (4) a discussion of the anticipated approvals and permits required for the decommissioning activities.

10.12.2 SCHEDULE

This section of the DEIS will include an overview of the construction schedule for the proposed RWBT Inspection and Repair that includes mobilization, site preparation, construction and demobilization. The estimated construction schedule for the project (including the staging and phasing), an estimate of on-site activity (equipment, employees and operating hours) and a peak activity period for analysis will be described in the DEIS.

10.12.3 GENERAL DESIGN FEATURES OF THE PROPOSED RONDOUT-WEST BRANCH TUNNEL INSPECTION AND REPAIR PROJECT

This section of the DEIS will discuss the general types of activities that would occur along the RWBT and at the shaft sites during the proposed inspection and repair. This section will include site descriptions, locations, and project descriptions for each shaft site where inspection and repair activities would occur, including standard methods of ventilation, communication, inspection, and repair, as well as construction activities and equipment that pertain to each shaft site, as appropriate. It will also include a description of the final project component, decommissioning of the bypassed section of the RWBT, activities associated with decommissioning, and a description of the Roseton study area where there is the potential for impacts. This section of the DEIS will also provide a brief summary of any identified impacts and mitigation for the proposed inspection and repair based on results of the analyses presented in the DEIS.

10.12.3.1 Construction

This section of the DEIS will include a description of the construction activities and equipment associated with the proposed inspection and repair. The description of construction activities and equipment will include mobilization, site preparation, construction, and demobilization, as appropriate, as well the types of equipment that will be present on-site to carry out these activities. Construction will largely involve the installation of commination and ventilation systems and use of hoisting systems since two of the shafts will serve as entrance/exit points for

¹⁷ Construction activities associated with connection of the bypass tunnel to the RWBT were evaluated in the previous EIS.

equipment and personnel during the proposed inspection and repair. After construction is complete, the sites will be cleared and all equipment used during the course of the work will be removed. Sites will be restored to their pre-construction conditions. This work would be located at existing DEP-owned access points along the Delaware Aqueduct.

This section of the DEIS will describe how the shaft sites will be used once the proposed inspection and repair is underway. This will focus on proposed shaft activities during the temporary shutdown of the RWBT, which would include the entrance of personnel and equipment into and out of the aqueduct, and operation of the communication and ventilation systems. This section of the DEIS will also describe include a description of the activities and equipment associated with the proposed inspection and repair activities during the temporary shutdown. This section will also include a description of how the shaft sites will be returned to their original state. The DEIS will include a construction analysis for applicable assessment categories, as described below.

10.12.3.2 Operation

This section of the DEIS will also describe any changes to water levels in Wawarsing and Roseton from cessation of the leaks once the RWBT inspection and repairs and concurrent decommissioning of the bypass tunnel are completed.

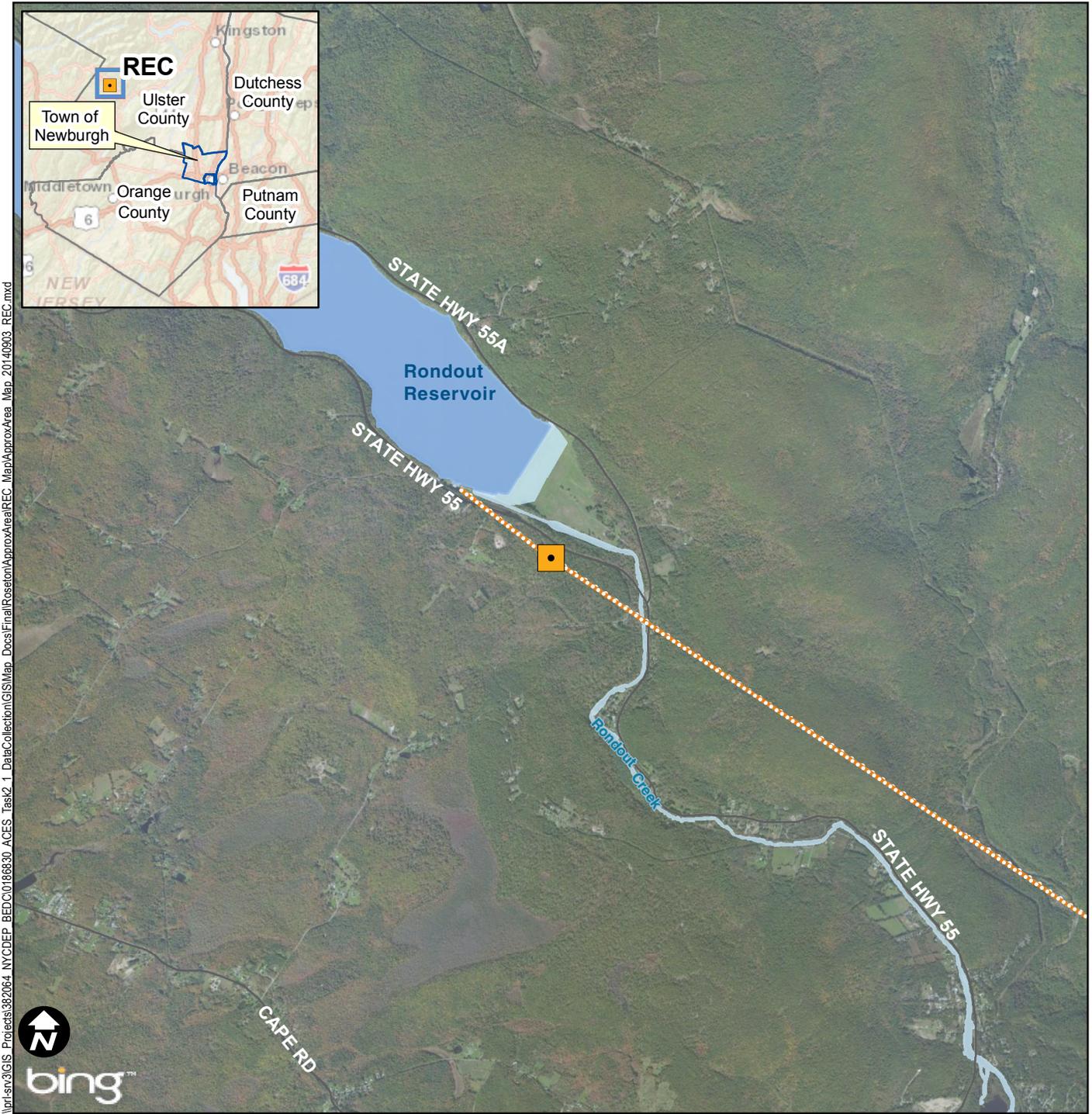
10.12.4 PROPOSED RONDOUT-WEST BRANCH TUNNEL INSPECTION AND REPAIR IMPACT METHODOLOGY AND ASSESSMENT

This section of the DEIS will (1) provide an overview of the assessment categories that will be analyzed for the proposed Rondout-West Branch Tunnel Inspection and Repair in the DEIS and describe the methodologies that will be used to assess potential environmental impacts; and (2) describe baseline conditions, the future without inspection and repair, and the analysis of probable construction and operational potential impacts of inspection and repair and identified mitigation, as applicable. This section of the DEIS will also identify any impact categories for which the proposed inspection and repair did not meet applicable CEQR/SEQRA thresholds, thereby screening out those analyses.

Construction and operation of the proposed inspection and repair would not result in new structures or additions to existing structures with heights greater than 50 feet, or be located adjacent to, or across from, a sunlight-sensitive resource; result in the generation of 50 tons per week or more of solid waste or any significant energy use or generation of GHGs. Therefore, it is anticipated that the following impact categories will not be evaluated in the DEIS for proposed inspection and repair: shadows; solid waste and sanitation services; and GHGs and climate change. However, GHGs and climate change will be evaluated cumulatively for the proposed Upstate Water Supply Resiliency project and will include any potential contribution from the proposed inspection and repair.

**10.12.5 PROPOSED RONDOUT-WEST BRANCH TUNNEL INSPECTION AND REPAIR
IMPACT ASSESSMENT**

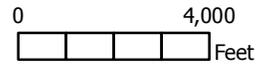
This section of the DEIS will provide an assessment of the potential for impacts associated with the proposed inspection and repair during the temporary shutdown. This section of the DEIS will provide an assessment of the potential for impacts in all relevant assessment categories. All categories not screened from the analysis will be evaluated in this manner.



\\pr1-sm-3\GIS_P\Projects\382064_NYCD\BDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Reservoir\ApproxArea\REC_Map\20140903_REC.mxd

Legend

- Rondout Effluent Chamber Location
- Rondout-West Branch Tunnel Inspection and Repair



Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

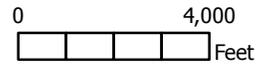


\proj-srv\GIS\Projects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Reservoir\ApproxArea\Sheets\Map\ApproxArea_Map_20140903_Shaft.mxd

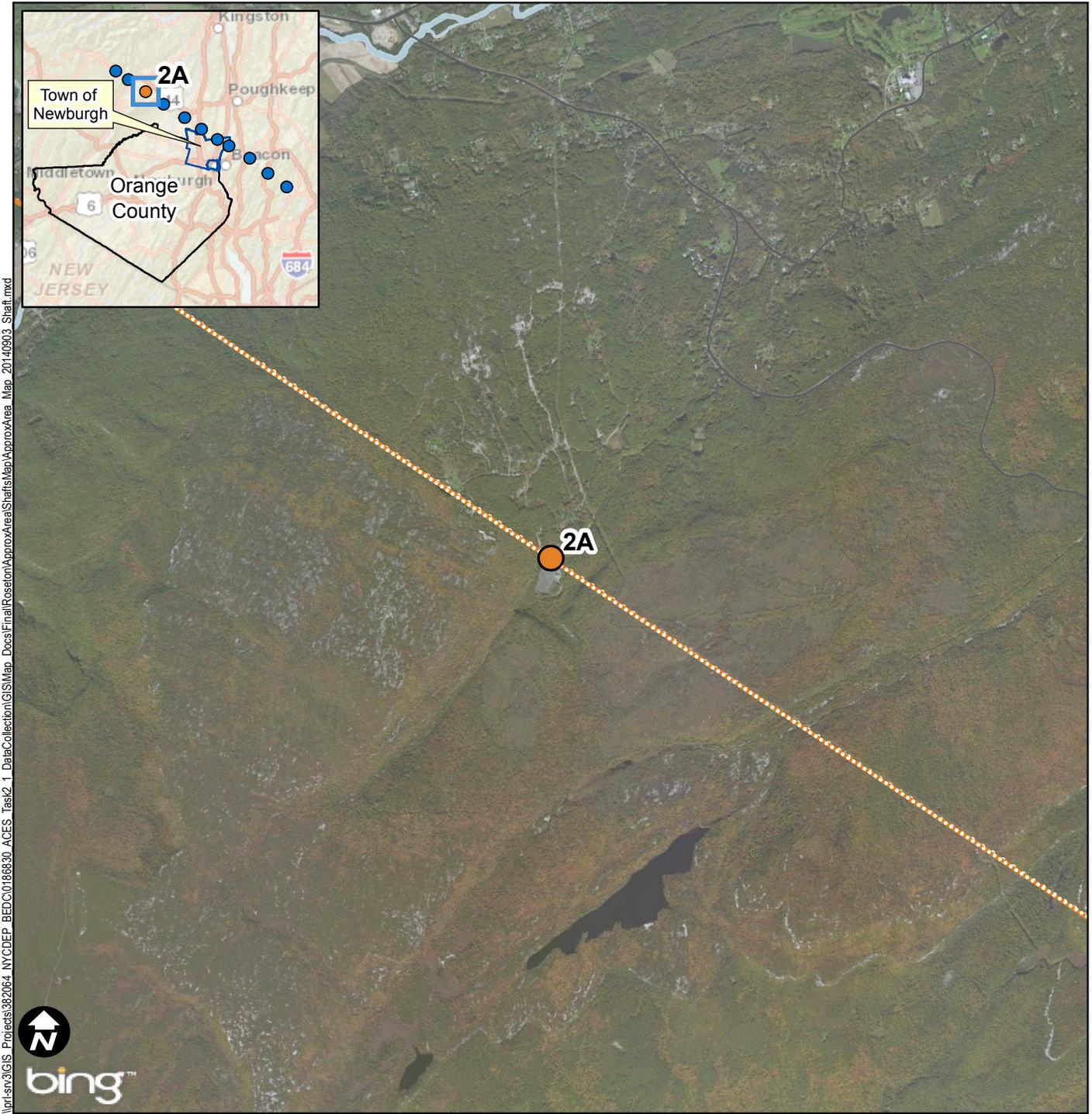


Legend

- Shaft Location
- - - - - Rondout-West Branch Tunnel Inspection and Repair



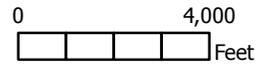
Basemap Sources:
 Bing Aerial - © 2010 Microsoft Corporation and its data suppliers
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)



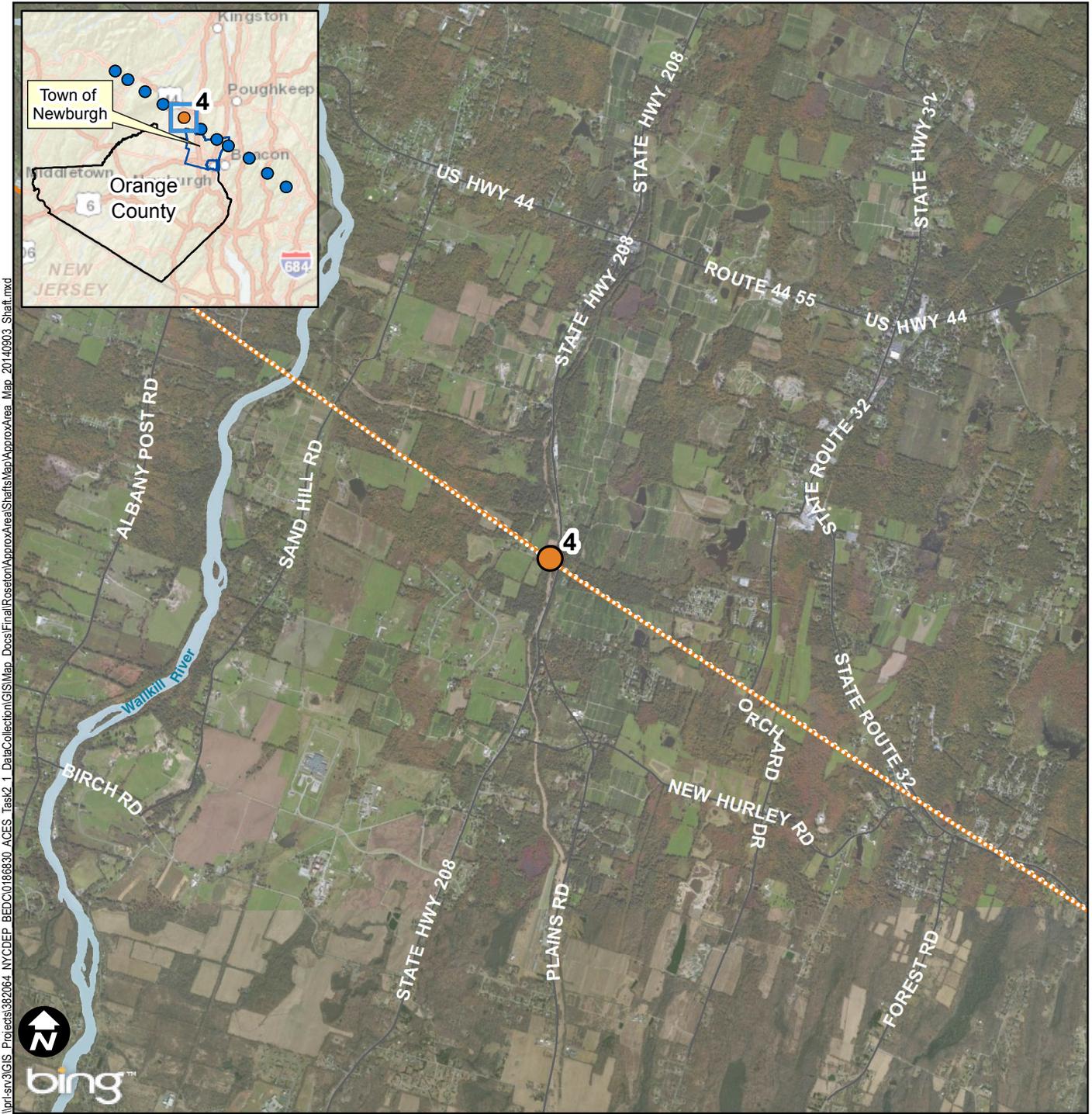
\\pr1-srv3\GIS_P\Projects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Roseston\ApproxArea\Sheets\Map\ApproxArea_Map_20140903_Shaft.mxd

Legend

-  Shaft Location
-  Rondout-West Branch Tunnel Inspection and Repair



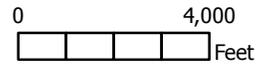
Basemap Sources:
Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)



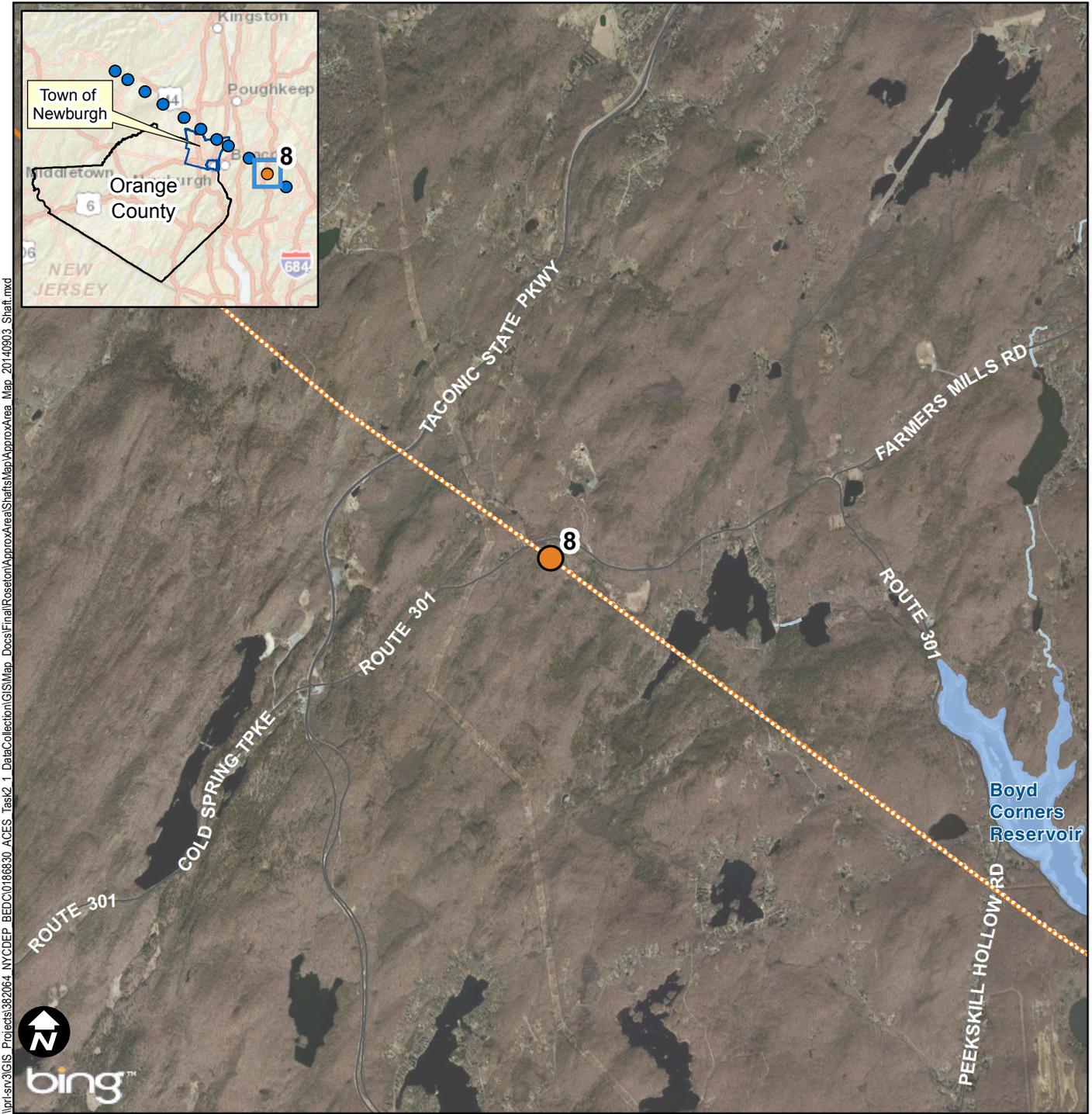
\\pr1-sm3\GIS_P\Projects\382064_NYCEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Roseston\ApproxArea\Sheets\Map\ApproxArea_Map_20140903_Shaft.mxd

Legend

-  Shaft Location
-  Rondout-West Branch Tunnel Inspection and Repair



Basemap Sources:
bing Aerial - © 2010 Microsoft Corporation and its data suppliers
Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

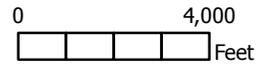


\proj-srv\GIS\Projects\382064_NYCDEP_BEDC0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Roseston\ApproxArea\Sheets\Map\ApproxArea_Map_20140903_Shaft.mxd



Legend

-  Shaft Location
-  Rondout-West Branch Tunnel Inspection and Repair



Basemap Sources:
 bing Aerial - © 2010 Microsoft Corporation and its data suppliers
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)



Aqueduct Connection Environmental Support (ACES)

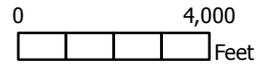
Figure 10-26
Approximate Location of Shaft 8 Study Area



I:\prj\sn\GIS\Projects\382064_NYCDEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Roseston\ApproxArea\Sheets\Map\ApproxArea_Map_20140903_Shaft.mxd

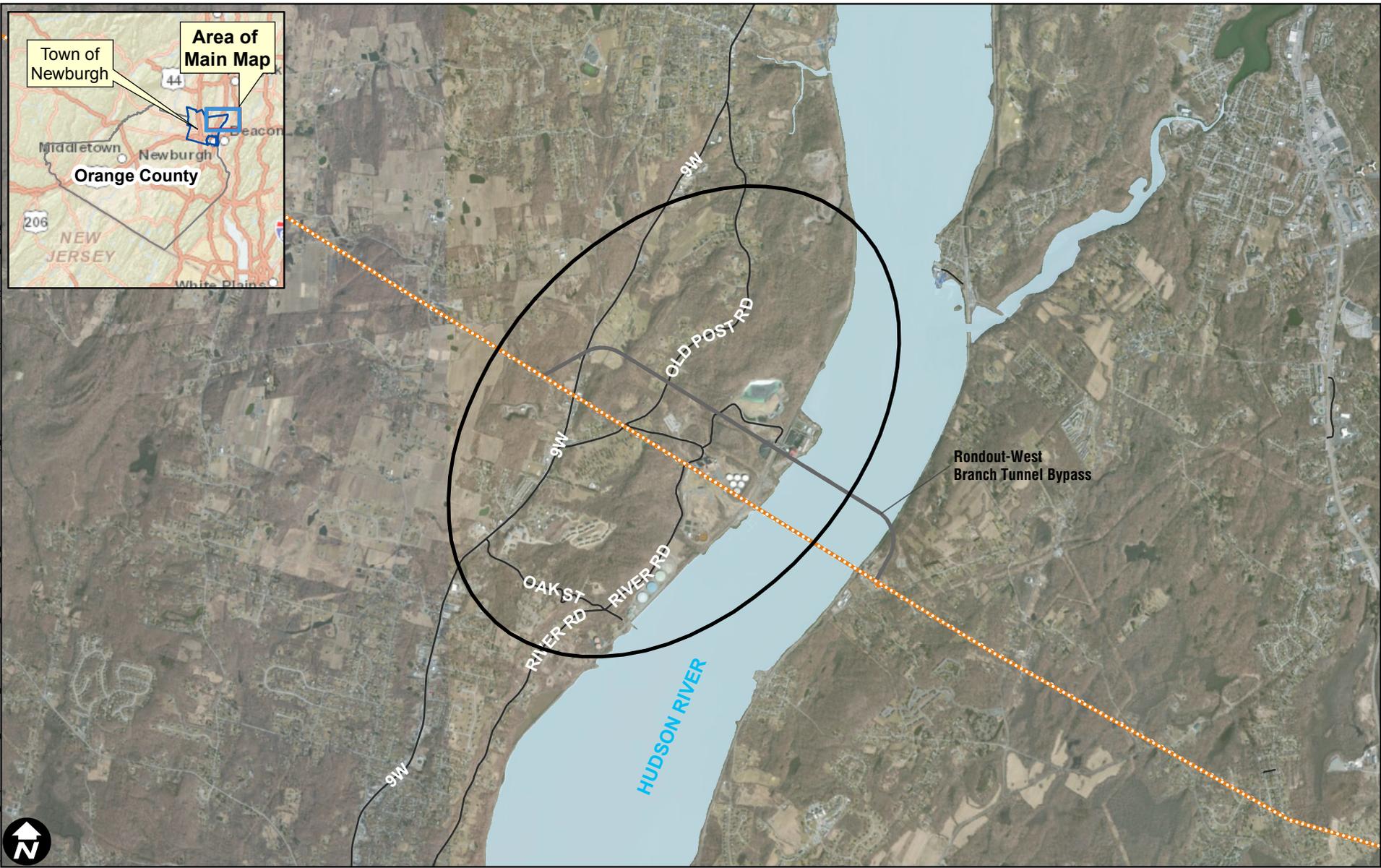
Legend

-  Shaft Location
-  Rondout-West Branch Tunnel Inspection and Repair



Basemap Sources:
 bing Aerial - © 2010 Microsoft Corporation and its data suppliers
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)

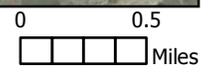
\\n1-sm\GIS\Projects\382064_NYCEP_BEDC\0186830_ACES_Task2_1_DataCollection\GIS\Map_Docs\Final\Roseton\ApproxArea\ApproxArea_Map_20140908.mxd



 Approximate Location of Roseton Study Area

Rondout-West Branch Tunnel Inspection and Repair

Basemap Sources:
 Aerial - Esri, DigitalGlobe, GeoEye, i-cubed, USDA and others
 Streets: Esri, DeLorme, NAVTEQ, USGS, Intermap, and others (2013)



Aqueduct Connection Environmental Support (ACES)

Figure 10-28
Approximate Location of Roseton Study Area

10.12.5.1 Land Use, Zoning and Public Policy

There may be temporary changes to the sites around the shafts during the proposed inspection and repair activities. Therefore, as applicable, an assessment of the potential for inspection and repair activities to affect land use, zoning, or public policy will be included in the DEIS. The assessment in the land use and zoning chapter will (1) demarcate a study area that will include each shaft and the area within an approximately 400-foot radius of the shaft sites; (2) describe conditions in the study areas, including existing land uses and the current zoning; (3) describe predominant land use patterns in the study areas, including recent development trends; (4) summarize other public policies that may apply to the proposed project sites and study areas, including any formal neighborhood or community plans; and (5) provide an assessment of the potential for impacts from the project on land use and land use trends, zoning, and public policy. The assessment will consider the effects for proposed inspection and repair activities related to compatibility with surrounding land use, zoning, and other public policy initiatives, and the effect on development trends and conditions in the area.

More specifically, the land use and zoning analysis will describe existing land uses and zoning within each study area around the shaft sites. Land use and zoning information will be compiled and mapped from published data, supplemented with field surveys and aerial photography, as appropriate. A general description of land use patterns using existing published sources of information and field reconnaissance will also be provided. Lastly, the public policy analysis will outline public policies that may apply, including any adopted or proposed neighborhood, community plans, LWRP, SASS, SCFWH, and landward coastal boundaries.

The descriptions of future conditions without the proposed inspection and repair will be based upon information obtained from DEP and the local counties and municipalities in which the shaft sites are locations where improvements are planned and programmed for implementation. The DEIS will include an assessment of any temporary property access that would be required with the proposed inspection and repair activities. In addition, the DEIS will include an assessment of the potential for the proposed inspection and repair to affect land use or public policy.

10.12.5.2 Socioeconomic Conditions

The socioeconomic assessment in the DEIS will provide a screening assessment of the proposed inspection and repair against applicable CEQR guidelines to describe and document existing socioeconomic conditions and trends in the study area of the shaft sites that could potentially be affected by inspection and repair activities and result in significant impacts due to (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; and (5) adverse effects on a specific industry. The assessment will include whether changes to the water levels in Wawarsing have the potential to effect existing water supply wells.

The socioeconomic analysis pertaining to the costs associated with the proposed Upstate Water Supply Resiliency project, including the proposed inspection and repair, would be addressed through a shared distribution of costs across DEP's water supply network, including City and upstate customers, through changes in the water rate due to project costs. Therefore, potential changes to the water rate as a result of the proposed Upstate Water Supply Resiliency project,

and those evaluated in the previous EIS, will be described in Chapter 12, “Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project,” of the DEIS.

10.12.5.3 Community Facilities and Services

There may be temporary changes to community services around the shaft sites during proposed inspection and repair activities (e. g. police associated with traffic control during major equipment deliveries). Therefore, as applicable, the community facilities and services assessment will (1) identify the local community facilities within an approximate 400-foot radius of the shaft sites and service providers that would service the sites; (2) describe any temporary changes to expected uses of those community facilities and services; and (3) provide an assessment of the potential for impacts from the project on those community facilities and services.

10.12.5.4 Open Space and Recreation

This section of the DEIS will present data on open space and recreational activities near shaft sites that may be impacted by the proposed inspection and repair. A screening level assessment will be prepared to determine whether the proposed inspection and repair would have the potential to result in adverse impacts on open space and recreation, including temporary impacts from activities at the shaft sites, warranting further analysis. The open space and recreation assessment will consist of the following steps:

- Map and describe existing open spaces and recreation areas in the shaft study areas, including those identified in local open space plans;
- Identify and describe predominant open space patterns and recreational activities in the shaft study areas based on existing information included in GIS for the area and compiled field surveys; and
- Assess how the proposed inspection and repair would affect open space and recreation.

10.12.5.5 Critical Environmental Areas

There are two CEAs in the vicinity of the Delaware Aqueduct. The aqueduct runs beneath the Shawangunk Ridge CEA in the Town of Shawangunk, Ulster County, and the Fishkill Aquifer Protection CEA in two locations in the Town of Fishkill, Dutchess County. A screening assessment will be included in the DEIS to determine whether any study areas are located within a CEA. The potential for the proposed inspection and repair to affect or be affected by the environmental characteristics of these CEAs will be assessed in the DEIS.

10.12.5.6 Historic and Cultural Resources

DEP previously prepared the shaft sites for the proposed inspection and repair activities. Therefore, no construction and ground disturbance is anticipated associated with the proposed inspection and repair at the shaft sites that could disturb historic or cultural resources. Therefore, historic and cultural resources will not be analyzed in the DEIS.

10.12.5.7 Visual Resources

This section of the DEIS will assess the potential for impacts on visual resources from the proposed inspection and repair. Some components of the proposed inspection and repair may result in addition of new temporary structures or equipment such as construction trailers and ventilation equipment. The assessment will focus on the potential observable changes to the view corridor as seen by the general public. The study area for the assessment of visual resources will be consistent with that of the study areas used for the analysis of land use, zoning, and public policy, but may also include view corridors that extend beyond those study areas based on the locations that are publicly accessible, as required.

A screening assessment will be included in the DEIS to determine whether a visual assessment pursuant to the NYSDEC policy, “Assessing and Mitigating Visual Impacts,” and CEQR criteria, as appropriate. If required, a visual assessment will be prepared in conformance with the applicable NYSDEC and CEQR criteria. In this assessment, an inventory of sensitive visual resources will be compiled to determine the potential for views towards the study areas. In addition, the incremental changes to views which are deemed to have aesthetic value from sensitive visual resources will be characterized in the DEIS, both in a narrative format and through the use of images depicting conditions in the future with and without the proposed inspection and repair, as warranted.

10.12.5.8 Natural Resources

DEP previously prepared the shaft sites for the proposed inspection and repair activities. Therefore, disturbance to natural resources associated with the proposed inspection and repair are expected to be minimal and temporary and may warrant only a screening assessment. Results of the screening assessment will be presented in the DEIS.

This section of the DEIS will also assess the potential for impacts from the repair as a result of the cessation of leaks in Wawarsing that could result in reduced flows to local, deep groundwater aquifers in the Wawarsing area. These changes in water levels associated with cessation of the leaks could affect natural resources, specifically surface water and groundwater, in the Wawarsing area. USGS has monitored surface water and groundwater in the Wawarsing study area since 2008; the most intensive monitoring period took place between 2008 and 2010. The USGS monitoring covered a 12-square-mile study area, consisting of an array of 41 wells and two surface water locations, to evaluate the hydrogeologic response to four separate RWBT shutdowns. The DEIS will present an assessment of existing public water supplies in Wawarsing, and the USGS monitoring data that includes:

- Water level and groundwater temperature data collected during the monitoring periods;
- Water level and temperature observations in wells from both the unconsolidated and bedrock aquifers in the context of long-term regional precipitation trends (a 141-year record from Central Park, New York) compared to normal annual precipitation and seasonal variations in precipitation (daily precipitation from National Oceanic and Atmospheric Administration station in Central Park, New York);

- Influences to water level fluctuations in both unconsolidated and bedrock wells from seasonal precipitation patterns and groundwater flow from the tunnel leakage; and
- Data as it relates to the conceptual flow model for the study area (dominant flow paths were solution enhanced fractures in carbonate rock and presence of significant vertical [upward] potentiometric gradients).

As part of the assessment, a potential zone of groundwater influence will be developed based on local geology. The assessment will focus on those properties with groundwater supply wells that would fall within this zone of influence and do not have public water service. The DEIS will assess the potential for impacts to those groundwater supply wells.

10.12.5.9 Hazardous Materials

During inspection and repair, DEP may need to temporarily store or use hazardous materials at the shaft sites. The potential for impacts associated with storage and use of potentially hazardous chemicals associated with inspection and repair activities will also be presented in the DEIS.

10.12.5.10 Water and Sewer Infrastructure

A water and sewer infrastructure assessment will be conducted to determine if construction or operation associated with inspection and repair have the potential to cause a significant adverse impact to water and sewer infrastructure.

An evaluation of the potential for aqueduct shutdowns and repairs to impact the two community users who draw water from the aqueduct, as well as any private wells, will also be conducted and presented in the DEIS. The analysis will include

- An inventory and review of the water suppliers that use the RWBT for water supply, including their availability of back-up supply along with an assessment of the ability of these users to accommodate reduced or limited access to the RWBT during the temporary shutdown. DEP has developed an ongoing program to work with these water suppliers, and the shutdowns will be temporary and coordinated to minimally affect these users;
- An inventory of existing water and sewer infrastructure servicing each shaft site, and private groundwater wells in Wawarsing; and
- A comparison of estimated project-generated water supply demand, potential changes to groundwater levels, and capacity of stormwater and sewage system capacities with the infrastructure available to meet these demands; and
- Discharges from the proposed project during both construction and operation of activities associated with the proposed inspection and repair would be directed to a stormwater, combined sewer system, trucked and hauled, or treated for discharge into local streams in the vicinity of each site. If warranted, a stormwater and/or sewer infrastructure analysis will be prepared and presented in the DEIS. The analysis will include: Estimates of increased stormwater and any impervious areas at each shaft site to confirm the proposed inspection and repair would not exceed any thresholds for analyses of stormwater, such

as changes resulting from the addition of impervious surfaces for parking areas (including gravel areas) and building roofs (including temporary construction trailers);

- The addition of new stormwater and drainage features near the shaft sites;
- Estimates of increased sewer demand; and
- An examination of the need for additional infrastructure and utilities needed to support the proposed inspection and repair activities.

An assessment of the potential for the proposed inspection and repair to affect water supply, stormwater and sewer infrastructure will be included in the DEIS.

10.12.5.11 Energy

Energy use associated with the proposed inspection and repair would primarily be related to operation of the ventilation and communication systems and any grouting operations during inspection and repair. The total amount of energy use at the shafts will be minimal, and, as a result, a screening level assessment will be prepared to determine whether operation of the proposed project has the potential to adversely affect energy, thereby warranting further analysis. Specifically, a review of on-site energy sources and a description of any new energy sources (i.e., generators) will be conducted within the study areas to determine if any energy resource would potentially be affected or require the need for additional infrastructure and electric or gas utilities. Results of the energy screening assessment and analysis will be presented in the DEIS.

10.12.5.12 Transportation

This assessment will consider the extent and duration of any increase in vehicle trips from construction workers and equipment; any street, roadway, or sidewalk closure; potential for impacts on the parking supply; and any loss in other transportation services during the various phases of activities at the shaft sites. Results of the construction transportation screening assessment and relevant analyses will be presented in the DEIS. There would be no long-term inspection and repair operations at the shaft sites, and therefore, an operational assessment will not be provided in the DEIS.

10.12.5.13 Air Quality

The construction air quality impact section will contain a discussion of stationary and mobile source emissions from construction equipment, worker and delivery vehicles, and fugitive dust emissions associated with proposed inspection and repair activities, including those associated with grouting. A screening assessment will be prepared for emissions from construction equipment and construction-related mobile sources. Results from the construction air quality screening assessment and analysis will be presented in the DEIS. There would be no long-term inspection and repair operations at the shaft sites, and therefore, an operational assessment will not be provided in the DEIS.

10.12.5.14 Noise

Some components of the proposed inspection and repair may result in temporary noise-generating sources, such as vehicular traffic, generators, and ventilation equipment. A noise screening analysis will be conducted to determine if temporary activities associated with the proposed inspection and repair has the potential to cause a significant adverse noise impact at noise-sensitive receptors from these sources.

For mobile noise sources, an analysis will be performed. A quantitative analysis is not required due to the short-duration of proposed inspection and repair activities. For stationary noise sources, a noise impact screening analysis will be conducted to determine whether there are nearby receptors that could be temporarily affected based on the proposed equipment related to the proposed inspection and repair activities. If the proposed equipment has the potential to result in an increase above CEQR thresholds, a detailed stationary noise analysis will be prepared. There would be no long-term inspection and repair operations at the shaft sites, and therefore an operational assessment will not be provided in the DEIS. If a detailed noise analysis is warranted, the following analysis protocols will be followed:

Mobile Source Noise Analysis

Due to the short duration of inspection and repair activities, a quantitative mobile noise analysis is not required.

Stationary Source Noise Analysis

If required, stationary source noise levels associated with the proposed inspection and repair will be predicted at the nearest noise-sensitive receptors using a spreadsheet analysis or CadnaA software. Noise levels due to on-site noise sources related to the proposed inspection and repair are a function of the noise emission level of equipment, the distance between the equipment and the noise-sensitive receptor, topography and ground attenuation, and shielding between the equipment and the noise-sensitive receptor. In addition, noise sources may only emit noise for a portion of the period of time that is being assessed (e.g., one hour). A utilization factor will therefore be applied to account for this fluctuation. Using representative noise emission reference levels and a utilization factor for equipment, the on-site noise level at the noise-sensitive receptors would be determined for the peak period, and would account for distance attenuation. The predicted noise levels from the proposed inspection and repair would be compared with the applicable CEQR criteria and applicable local noise codes to determine whether a potential significant adverse impact would occur. Results of the noise screening assessment and analysis will be presented in the DEIS.

10.12.5.15 Neighborhood Character

An assessment of the potential for the proposed inspection and repair to affect neighborhood or community character at the shafts will be included in the DEIS. The neighborhood character assessment will be conducted as follows:

- Based on other technical analyses, describe the predominant factors that contribute to defining the character of the community surrounding the shaft sites where there may be temporary effects;
- Summarize changes that can be expected in the character of the shaft sites in the future without the proposed inspection and repair; and
- Assess and summarize the degree and type of change from the proposed inspection and repair on the community using the analysis of the potential for impacts presented in other relevant analyses (this could include, but not be limited to visual resources and open space and recreation).

10.12.5.16 Public Health

A public health assessment is not warranted if a proposed project does not result in a significant unmitigated adverse impact in other analysis areas, such as air quality, water quality, hazardous materials, or noise. If an unmitigated significant adverse impact is identified in the relevant technical areas of the DEIS for either project construction or operation, a public health assessment will be performed.

10.12.5.17 Mitigation

This section of the DEIS will provide a brief summary of any identified impacts and mitigation from the proposed inspection and repair based on results of the analyses presented in the DEIS.

10.12.6 PROPOSED DECOMMISSIONING IMPACT METHODOLOGY AND ASSESSMENT

This section of the DEIS will (1) provide an overview that will list the assessment categories that will be analyzed and a brief summary of potential impacts associated with the proposed decommissioning and identified mitigation; (2) describe the methodologies that will be used in the DEIS to assess potential environmental impacts; and (3) describe baseline conditions, the future without the proposed decommissioning, and the analysis of the probable impacts as applicable, described further below. This section of the DEIS will identify any impact categories for which proposed decommissioning did not meet applicable CEQR/SEQRA thresholds, thereby screening out those analyses. As a result of the decommissioning, leaks suspected to originate from the RWBT and influence water levels in the Roseton area on the west side of the Hudson River in the vicinity of the RWBT would be significantly reduced or eliminated (Roseton study area). However, decommissioning the bypassed section of the RWBT would not result in new structures or additions to existing structures greater than 50 feet, or be located adjacent to, or across from, a sunlight-sensitive resource; not result in the generation of 50 tons per week or more of solid waste; nor result in any significant generation of traffic or transportation demand, air emissions, noise sources or introduce a noise-sensitive receptor; nor any significant energy use or generation of GHGs or involve construction activities.

Therefore, it is anticipated that the following impact categories will not be evaluated in the DEIS for the proposed decommissioning: shadows; solid waste and sanitation services; energy; transportation; air quality; GHGs and climate change; and noise. In addition, none of the

assessment categories will be evaluated for potential construction impacts as there is no construction component of the proposed decommissioning. However, energy and GHGs and climate change will be evaluated cumulatively for the proposed Upstate Water Supply Resiliency project and will include any potential contribution from the proposed decommissioning.

10.12.7 PROPOSED DECOMMISSIONING IMPACT ASSESSMENT

This section of the DEIS will present an assessment of the potential for impacts from decommissioning of the bypassed section of the RWBT that is expected to result in the permanent cessation of leaks in the Roseton area. All categories not screened from the analysis will be evaluated in this manner.

10.12.7.1 Land Use, Zoning and Public Policy

The analysis will evaluate the potential for impacts to land uses within the Roseton study area and will provide a baseline for other analyses. The assessment in the land use and zoning chapter will (1) demarcate the Roseton study area; (2) describe conditions in the Roseton study area, including existing land uses; (3) describe predominant land use patterns in the study area, including recent development trends; (4) summarize other public policies that may apply to the study area, including any formal neighborhood or community plans; and (5) provide an assessment of the potential for impacts from decommissioning on land use and land use trends and public policy. The assessment will consider the effects of decommissioning related to compatibility with surrounding land use, zoning, and other public policy initiatives, and the effect on development trends and conditions in the area.

More specifically, the land use analysis will describe existing land uses and zoning within the Roseton study area. Land use and zoning information will be compiled and mapped from published data, supplemented with field surveys and aerial photography, as appropriate. A general description of land use patterns using existing published sources of information and field reconnaissance will also be provided. Lastly, the public policy analysis will outline public policies that may apply, including any adopted or proposed neighborhood, community plans, LWRP, SASS, SCFWH, and landward coastal boundaries.

The descriptions of future conditions without the proposed decommissioning will be based upon information obtained from DEP and the Town of Newburgh and Orange County concerning improvements planned and programmed for implementation. In addition, the DEIS will include an assessment of any property access that would be required by DEP for the proposed decommissioning.

10.12.7.2 Socioeconomic Conditions

The socioeconomic assessment in the DEIS will provide an assessment of the proposed decommissioning against applicable CEQR guidelines to describe and document existing socioeconomic conditions and trends in the Roseton study area that could potentially be affected by decommissioning and result in significant impacts due to (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; and (5) adverse effects on a specific industry. The assessment will include whether

changes to the water levels in the Roseton study area have the potential to effect existing water supply wells.

The socioeconomic analysis pertaining to the costs associated with the proposed Upstate Water Supply Resiliency project, including the proposed decommissioning, would be addressed through a shared distribution of costs across DEP's water supply network, including City and upstate customers, through changes in the water rate due to project costs. Therefore, potential changes to the water rate as a result of the proposed Upstate Water Supply Resiliency project, and those evaluated in the previous EIS, will be described in Chapter 12, "Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project," of the DEIS.

10.12.7.3 Community Facilities and Services

There may be temporary changes to community services in the Roseton study area during decommissioning. Therefore, as applicable, the community facilities and services assessment will (1) identify the local community facilities within the Roseton study area that would service the sites; (2) describe any temporary changes to expected uses of those community facilities and services; and (3) provide an assessment of the potential for impacts from the proposed decommissioning on those community facilities and services.

10.12.7.4 Open Space and Recreation

This section of the DEIS will present data on recreational activities near the Roseton study area that may be impacted by the proposed decommissioning (e.g. fishing). A screening level assessment will be prepared to determine whether the proposed decommissioning would have the potential to result in adverse impacts on open space and recreation, warranting further analysis. The open space and recreation assessment will consist of the following steps:

- Map and describe existing open spaces and recreation areas in the Roseton study area, including those identified in local open space plans;
- Identify and describe predominant open space patterns and recreational activities in the Roseton study area based on existing information included in GIS for the area and compiled field surveys; and
- Assess how the proposed decommissioning would affect open space and recreation.

Results of the open space and recreation assessment will be presented in the DEIS.

10.12.7.5 Critical Environmental Areas

Though there are two CEAs in the vicinity of the Delaware Aqueduct, there are no CEAs in the vicinity of the Roseton area. Therefore, no analysis will be undertaken.

10.12.7.6 Historic and Cultural Resources

This section of the DEIS will include an assessment of the potential for impacts to historic and cultural resources that could occur as a result of decommissioning. Many of the changes

associated with decommissioning would occur in areas that are in areas of standing water. As required, this analysis will include identification of resources that could potentially be affected in the Roseton study area in consultation with OPRHP. A consultation request will be submitted that includes site location maps and photographic documentation of the existing study area and surroundings. If any resources are identified, an inspection of identified sites and additional field survey and documentary research may be required.

10.12.7.7 Visual Resources

This section of the DEIS will assess the potential for impacts on visual resources from decommissioning due to changes in water levels in the Roseton study area. The assessment will focus on the potential observable changes to the view corridor as seen by the general public. The study area for the assessment of visual resources would be consistent with that of the study area used for the analysis of land use, zoning, and public policy, and may also include view corridors that extend beyond that study area, as required.

A screening assessment will be prepared to determine whether a visual assessment pursuant to the NYSDEC policy, “Assessing and Mitigating Visual Impacts,” and CEQR criteria is warranted, as appropriate. If required, a visual assessment will be prepared in conformance with the applicable NYSDEC and CEQR criteria. In this assessment, an inventory of sensitive visual resources will be compiled to determine the potential for views towards the Roseton study area. In addition, identification of the magnitude of change for the project to eliminate or substantially limit views which are deemed to have aesthetic value from sensitive visual resources. In addition, the incremental changes to views which are deemed to have aesthetic value from sensitive visual resources will be characterized in the DEIS in a narrative format and through the use of images depicting conditions in the future with and without the project, as warranted.

10.12.7.8 Natural Resources

Based on previous DEP observations and information included in the first EIS, decommissioning of the bypassed section of the RWBT could potentially result in changes to natural resources in the Roseton study area. This section of the DEIS will include an assessment of the potential for the proposed decommissioning to affect natural resources, including: terrestrial, wetland, and aquatic biota and habitats; surface water and groundwater resources; and geology. Desktop review, agency consultations and field surveys will be conducted to identify and map locations and types of natural resources within the Roseton study area that have the potential to be affected. Once these natural resources are identified, an assessment will be conducted to determine the potential for significant adverse impacts to these resources, as required, and presented in the DEIS.

Terrestrial, Wetland, and Aquatic Biota and Habitats

The assessment will include a description of the existing natural resources within the Roseton study area, based on results of field surveys and desktop analyses, as applicable, including:

- Reviewing USGS Topographic Maps, FEMA Floodplain Maps, NYSDEC Wetland Maps, NYSDEC Waters Index Numbers and Priority Waterbodies List, USFWS NWI

Maps, USDA NRCS soil maps, available DEP and the previous EIS data, and aerial photos;

- Coordinating with the NYNHP, NYSDEC Central and Regional Offices, USACE, USFWS, and NMFS, as applicable, to determine whether further on-site analysis will be necessary as well as county and local offices;
- Contacting NYNHP to determine whether endangered, threatened, species of special concern, as well as candidate, proposed, or rare species of plants and wildlife or unique and critical habitats were reported as occurring on or adjacent to the study areas that could be affected by the proposed decommissioning. NYNHP provides a database listing that identifies the species and/or habitats with state, heritage and global rankings, along with other information related to the species. NYSDEC Central and Regional offices and NMFS may be contacted to provide additional information on species, locations, and habitats identified; and
- Consultation with USFWS, as necessary, based on species identified. USFWS provides an online report of any federally listed endangered, threatened, candidate, or proposed for listing species known to exist within the county of the proposed project. A USFWS online project review will be conducted and submitted to the USFWS. Consultation with USFWS will be conducted, as necessary based on species identified. In addition, local and county legislation related to threatened and endangered species will be reviewed and species list compared with State and federal species information to ensure relevant flora and fauna will be identified. Species provided protection under the Migratory Bird Treaty Act of 1918, and other protective legislation such as the Bald and Golden Eagle Protection Act, will be evaluated if documented to occur within the project area. Pertinent species information provided by these agencies and sources will be included in the Roseton study area existing conditions description in the DEIS and will inform the DEIS analysis.

Based on these results, natural resources field surveys for regulated habitats and listed, proposed, and candidate species or habitats identified as potentially occurring in the Roseton study area will be conducted to establish baseline conditions. Field surveys that will be conducted to identify existing natural resources within the study area, as applicable, include:

- Delineation and characterization of wetlands and watercourses within the Roseton study area. The wetland delineations will follow the USACE three-parameter methodology as described in the 1987 USACE wetland delineation manual (Environmental Laboratory 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (USACE 2012). The watercourses will be delineated using indicators of ordinary high water marks as described in 33 Code of Federal Regulations (CFR) 328.3.
- Habitat assessments and surveys to identify existing habitats and species occurring within the Roseton study area identified as having a potential to be adversely affected by proposed decommissioning, which may include:

- Characterization of ecological communities within the Roseton study area;
- Incidental observations of mammal, avian, and herptile species;
- Fisheries and benthic macroinvertebrate surveys of stream segments within the Roseton study area; and
- For protected species or their habitats, field investigations of the Roseton study area conducted by biologists to document the extent of the resource, the context of its surroundings, and the area potentially affected by the project decommissioning. These field surveys may include habitat assessments (e.g., Phase I bog turtle habitat survey), or more detailed visual assessments for the species (e.g., Phase II bog turtle visual survey). Surveyor qualifications and survey methodologies for endangered and threatened species will be consistent with federal and State guidelines.

The potential for direct or indirect physical effects of the proposed decommissioning on each affected resource within the Roseton study area will be assessed. The assessment will include a summary of the affected resources, whether the resource is State or federally listed, if the impacts are direct or indirect, the duration of the impact whether short or long term, the severity of the impact (e.g., extent) whether insignificant or significant, and if the impacts can be mitigated. The potential for impacts will be assessed using the following approach:

- The results of the surface water and groundwater assessment will be used to prepare an evaluation of potential changes to wetland extent and vegetation composition, and stream biotic resources (i.e., benthic and fish) within stream segments potentially affected by decommissioning, based on output from the assessment of potential impacts to streamflow and water quality, and data/literature review. An evaluation of the potential for beneficial effects on stream biota will also be completed;
- Communities that are suspected to be influenced by the leaking RWBT and observed surface expressions will be compared to “reference” communities in the same watershed where no influence from leaks and surface expressions are thought to exist based on review of previous shutdown and long-term surface monitoring data and observations. The reference conditions for comparison are assumed to be representative of the future surface water levels and conditions that could occur, and the natural resources communities that would exist and/or be influenced by these water levels following the RWBT decommissioning.

Surface Water and Groundwater

The natural resources assessment will also assess the potential for impacts to groundwater and surface water in the Roseton study area. A long-term monitoring network for surface water, shallow groundwater, and bedrock groundwater has been established to evaluate the seasonal trends in streamflow, water quality, and groundwater elevation, trends in response to precipitation events, to RWBT flow, and to better characterize the areal and vertical groundwater flow in the bedrock aquifer. The network consists of several streamflow and surface water quality monitoring locations, shallow groundwater monitoring wells, bedrock residential supply

wells, several geotechnical borings associated with the RWBT boring program, and two monitoring wells previously used during a geophysical investigation of the area. A shallow overburden well previously observed to be not associated with a nearby stream or surface expression is also included in this long-term monitoring as a basis for comparing the fluctuation of water levels in the bedrock aquifer to that in shallow groundwater not closely correlated with a surface water body.

The data collected from the long-term monitoring network will be compared to the water level and water quality data collected during previous short-term shutdowns of the RWBT to establish a range for the potential impacts to streamflow, stream water quality, groundwater levels, and natural resources (i.e., wetlands, surface waters, aquatic, and terrestrial biota). Specifically, the surface water and groundwater assessment will focus on the area where the decommissioning has the potential to influence surface and groundwater. The assessment of potential impacts to these resources from decommissioning will be completed using the following approach:

- Long-term surface water monitoring and prior RWBT shutdown monitoring data will be used to determine the stream segments and associated wetlands with the greatest potential to be influenced by the leaking RWBT. Data will be used to determine the potential range of changes to streamflow and shallow groundwater elevation that could be expected following decommissioning. Using the potential range of changes, projections of streamflow and shallow groundwater elevations following decommissioning will be disclosed for the stream segments and wetlands that are influenced by the leaking RWBT. Using the projected changes to streamflow, an assessment of potential impacts to water quality will be completed. The results of the surface water assessment will be used to assess potential impacts to stream and wetland biota as described above.
- A maximum zone of groundwater influence will be developed based on the local geology and data collected during previous shutdowns. The bedrock aquifer is used as a source of drinking water for those properties within the zone of influence that do not have public water service. The long-term monitoring program of these wells and other deep groundwater monitoring points will be used to establish the baseline conditions for those locations.
- An assessment of the influence of the RWBT on groundwater levels will be completed based on the long-term monitoring data and the prior RWBT shutdown monitoring data to establish the potential range of changes in the groundwater levels following decommissioning. The potential range of changes will be compared to the residential well baseline data to assess potential impacts to the residential drinking water wells within the zone of influence.
- The potential for changes in groundwater quality will be assessed by comparing the available groundwater quality data in the Roseton study area to the typical background groundwater quality for similar bedrock aquifers in Orange County. The comparison will be used to identify those water quality parameters that may change following decommissioning.

Geology

The potential for changes to geology will be evaluated in the DEIS through field surveys and desktop analysis. This will include review of previous investigations and observations, evaluation of geologic and hydrogeologic conditions, identification of existing conditions (topography, features), conceptualization, and numerical assessment to determine the area or areas where changes could occur and the potential extent of those changes.

10.12.7.9 Hazardous Materials

During decommissioning, DEP may need to temporarily store or use hazardous materials in the vicinity of the Roseton study area. The potential for impacts associated with storage and use of potentially hazardous chemicals associated with decommissioning will be assessed and presented in the DEIS.

10.12.7.10 Water and Sewer Infrastructure

An assessment of the potential for the proposed decommissioning to affect water supply, stormwater and sewer infrastructure will be included in the DEIS

The potential water supply impacts to the private drinking water supply wells in the Roseton study area will be based on the results of the natural resources assessment of potential changes to groundwater levels. The natural resources assessment will establish the baseline conditions, maximum zone of groundwater influence, and the potential range of changes in the groundwater levels following decommissioning. By comparing the baseline data to the potential range of changes in the groundwater levels the affect on the available groundwater supply will be assessed.

The infrastructure analysis will be prepared and will include:

- An inventory of existing water and sewer infrastructure, including private groundwater wells within the Roseton study area;
- A comparison of estimated project-generated water supply demand and potential changes to groundwater levels;
- Estimates of increased stormwater and any changes to impervious areas to confirm that the proposed decommissioning would not exceed any thresholds for analyses of stormwater, such as changes resulting from the addition of impervious surfaces for parking areas (including gravel areas);
- Estimates of potential change to groundwater levels;
- Estimates of increased sewer demand;
- The addition of new stormwater and drainage features in the Roseton study area;
- Capacity of stormwater and sewage systems with the infrastructure available to meet these demands; and

- An examination of the need for additional infrastructure and utilities needed to support the proposed decommissioning activities.

10.12.7.11 Neighborhood Character

An assessment of the potential for the proposed decommissioning to affect neighborhood or community character in the Roseton study area will be included in the DEIS. The neighborhood character assessment will be conducted as follows:

- Based on other technical analyses, the predominant factors that contribute to defining the character of the neighborhood surrounding the Roseton study area where there may be effects;
- Summarize changes that can be expected in the character of the area in the future without the proposed decommissioning; and
- Assess and summarize the degree and type of change from the proposed decommissioning on the community using the analysis of the potential for impacts as presented in other relevant analyses (this could include, but not be limited to visual resources and open space and recreation).

10.12.7.12 Public Health

A public health assessment is not warranted if a proposed project does not result in a significant unmitigated adverse impact in other analysis areas, such as air quality, water quality, hazardous materials, or noise. If an unmitigated significant adverse impact is identified in the relevant technical areas of the DEIS for the proposed decommissioning, a public health assessment will be performed.

10.12.8 MITIGATION

This section of the DEIS will provide a brief summary of any identified impacts and mitigation from the proposed decommissioning based on results of the analyses presented in the DEIS.

10.13 DEIS CHAPTER 12: CUMULATIVE IMPACTS OF PROPOSED UPSTATE WATER SUPPLY RESILIENCY PROJECT

10.13.1 OVERVIEW

This section of the DEIS will provide an overview of the following five assessment categories that are linked systemically across the individual components that comprise the proposed Upstate Water Supply Resiliency project, and therefore, require analysis for potential combined effects of these individual components: socioeconomic conditions, open space and recreation, infrastructure, natural resources, and GHGs and climate change.

As described in Section 8.1, “Upstate Water Supply Resiliency” of this draft scope, the proposed Upstate Water Supply Resiliency project consists of geographically disparate projects and

operations spanning between Westchester County just north of the City to Schoharie County in upstate New York. Therefore, a cumulative assessment is not anticipated for the following impact categories that are either not applicable or that require project-specific analyses: land use, zoning, and public policy; community facilities and services; shadows; historic and cultural resources; visual resources; hazardous materials; sewer infrastructure; solid waste and sanitation services; transportation; air quality; noise; public health; neighborhood character and construction.

10.13.2 POTENTIAL CUMULATIVE IMPACTS ANALYSES

10.13.2.1 Socioeconomic Conditions

The costs associated with the proposed Upstate Water Supply Resiliency project would be shared across DEP's water supply network, including City and upstate customers, through changes in the water rates. Therefore, potential changes to the water rate as a result of the proposed Upstate Water Supply Resiliency project and those of Shaft and Bypass Tunnel Construction evaluated in the previous EIS, will be described in Chapter 12, "Cumulative Impacts of Proposed Upstate Water Supply Resiliency Project," of the DEIS. The assessment will be based on the estimated cost of Shaft and Bypass Tunnel Construction and the proposed Upstate Water Supply Resiliency project and the potential incremental costs to City water and sewer rates of upstate customers. The cumulative assessment will include the potential for those changes to result in adverse impacts on economic and operational conditions on specific businesses or processes that may affect socioeconomic conditions. Results of the socioeconomic assessment will be presented in the DEIS.

10.13.2.2 Natural Resources

A cumulative assessment of the potential for the proposed Upstate Water Supply Resiliency Project to affect natural resources during the temporary shutdown period and over the long term may be included in the DEIS, as applicable.

10.13.2.3 Water Infrastructure

The cumulative assessment of infrastructure will focus on the potential of the proposed Upstate Water Supply Resiliency project to benefit the City's water supply system during the temporary shutdown period and the benefits of the project to the overall goals of WFF. This assessment will be included in the DEIS.

10.13.2.4 Energy

The DEIS will include an analysis of energy use associated with the proposed Upstate Water Supply Resiliency project. In addition to an analysis of the limited energy required to operate the siphons or chemical addition facilities, the DEIS will also assess changes in energy production associated with water normally transferred between the Delaware System reservoirs. During the temporary shutdown, water would be released downstream. Brookfield Power currently operates small turbines between Cannonsville and Rondout reservoirs via the West Delaware Tunnel, which would not be operational during the temporary shutdown. DEP also has hydropower facilities in the East Delaware Tunnel and Neversink Tunnel that connect Pepacton and

Neversink reservoirs, respectively, to Rondout Reservoir. During the temporary shutdown, these facilities would also be offline.

The estimated annual energy consumption as a result of the proposed Upstate Water Supply Resiliency project will be disclosed in the DEIS, along with an assessment of the potential of the project to significantly impact energy supply through reduction in hydropower generation. If required, the analysis will include a comparison of the estimated typical energy production of electric and gas systems and an examination of the need for additional temporary utilities.

10.13.2.5 Greenhouse Gas Emissions and Climate Change

Since the proposed Upstate Water Supply Resiliency project is subject to environmental review, an assessment of its consistency with NYC Executive Order 109 of 2007 during project construction and operation will be undertaken. Executive Order 109 mandates formulation of a GHG reduction plan to reduce City building and operational emissions by 30 percent below Fiscal Year 2006 levels by 2017. Estimated GHG emissions related to the proposed Upstate Water Supply Resiliency project would be disclosed in the DEIS for comparison to Executive Order 109. In addition, the DEIS will discuss the potential for impact of the proposed Upstate Water Supply Resiliency project's GHG emissions on climate change. However, it is not anticipated that the timeframe for the proposed Upstate Water Supply Resiliency project would be such that any impacts would be realized.

10.14 DEIS CHAPTER 13: MITIGATION

If any potential for significant adverse impacts resulting from construction or operation of the proposed Upstate Water Supply Resiliency project are identified in the analysis areas discussed above, any practicable measures that could avoid or mitigate those impacts will be identified. Chapter 13 of the DEIS will summarize the findings of the relevant analyses, any identified impacts and mitigation measures for the proposed Upstate Water Supply Resiliency project based on results of the analyses presented in the DEIS. If any adverse impacts cannot be mitigated, they will be described as unavoidable adverse impacts in Chapter 16, "Irreversible and Irrecoverable Commitment of Resources" of the DEIS.

10.15 DEIS CHAPTER 14: ALTERNATIVES ANALYSIS

The purpose of an alternatives section in an EIS is to provide a comparison of conditions under a proposed project that are then compared with conditions under alternatives to the proposed project. An alternatives analysis will be conducted for the DEIS to examine alternatives that may reduce impacts while substantively meeting the goals and objectives of the proposed Upstate Water Supply Resiliency project. For this reason, the full range of alternatives will not be fully defined until the extent of impacts has been identified as part of the DEIS. As part of the DEIS, an analysis of a No-Action Alternative will be conducted, which assumes that Water for the Future would not be implemented. Chapter 14 of the DEIS will include an assessment of Alternative components to the proposed Upstate Water Supply Resiliency project, as discussed in Chapter 8, "Description of Water for the Future," of this draft scope. Other alternatives currently under consideration for the proposed Upstate Water Supply Resiliency project include:

- *Alternative 1:* Interconnections to Water Supplies in New Jersey
- *Alternative 2:* Leak Stabilization

10.16 DEIS CHAPTER 15: UNAVOIDABLE ADVERSE IMPACTS

Chapter 15 of the DEIS will identify those impacts, if any, that could not be avoided or be practicably mitigated. Specifically, the potential for impacts from the permanent cessation of leaks from repair of the RWBT will be discussed in this chapter of the DEIS.

10.17 DEIS CHAPTER 16: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Chapter 16 of the DEIS will discuss those resources, such as energy and construction materials, that would be irretrievably committed should the proposed Upstate Water Supply Resiliency project be implemented.

10.18 TECHNICAL APPENDICES

A technical appendix to the DEIS that includes necessary SEQRA/CEQR documentation will be provided.