UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

City of New York Project No. 13287-004-NY

NOTICE OF AVAILABILITY OF FINAL ENVIRONMENTAL ASSESSMENT

(January 28, 2014)

In accordance with the National Environmental Policy Act of 1969 and the Federal Energy Regulatory Commission's regulations, 18 CFR Part 380 (Order No. 486, 52 FR 47897), the Office of Energy Projects has reviewed the application for an original license for the proposed 14.08-megawatt (MW) Cannonsville Hydroelectric Project, to be located on the City of New York's existing Cannonsville Dam, which impounds its Cannonsville Water Supply Reservoir. The dam and reservoir are located on the West Branch of the Delaware River, near the Township of Deposit, in Delaware County, New York. Commission staff prepared a final Environmental Assessment (final EA) which analyzes the potential environmental effects of construction and operation of the project and concludes that issuing a new license for the project, with appropriate environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

A copy of the final EA is on file with the Commission and is available for public inspection. The final EA may also be viewed on the Commission's website at http://www.ferc.gov using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll-free at (866) 208-3676, or for TTY, (202) 502-8659.

You may also register online at http://www.ferc.gov/docs-filing/esubscription.asp to be notified via email of new filings and issuances related to this or other pending projects. For assistance, contact FERC Online Support.

For further information, contact John Mudre at (202) 502-8902.

Kimberly D. Bose,
Secretary.

FINAL ENVIRONMENTAL ASSESSMENT
FOR
HYDROPOWER LICENSE

Cannonsville Hydroelectric Project

FERC Project No. 13287-004

New York

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, NE
Washington, D.C. 20426

January 2014

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
cfs	cubic feet per second
City	City of New York
Commission or FERC	Federal Energy Regulatory Commission
CZMA	Coastal Zone Management Act
CZM Program	Coastal Zone Management Program
DO	dissolved oxygen
DRBC	Delaware River Basin Commission
EA	Environmental Assessment
EFH	essential fish habitat
ESA	Endangered Species Act
FPA	Federal Power Act
FWS or Service	United States Fish and Wildlife Service
HPMP	Historic Properties Management Plan
GWh	gigawatt-hours
Interior	U.S. Department of the Interior
kW	kilowatt
kWh	kilowatt-hours
MW	megawatt
MWh	megawatt-hours
mg/L	milligrams per liter
National Register	National Register of Historic Places
NERC	North American Electric Reliability Corporation
New York DEC	New York State Department of Environmental Conservation
New York SCORP	New York Statewide Comprehensive Outdoor Recreation Plan
New York SHPO	New York State Historic Preservation Officer
New York Parks	New York State Office of Parks, Recreation, and Historic Preservation
Park Service	National Park Service
PA	programmatic agreement
PCBs	polychlorinated biphenyls
SD1	initial scoping document
SD2	revised scoping document
USGS	U.S. Geological Survey
WQC	water quality certification

EXECUTIVE SUMMARY

Proposed Action

On February 29, 2012, the City of New York (City) filed an application for an original license to construct, operate and maintain its proposed 14.08-megawatt (MW) Cannonsville Hydroelectric Project. The project would be located at the City's existing Cannonsville Reservoir, located on the West Branch of the Delaware River, near the Township of Deposit, Delaware County, New York. The project would not occupy any federal lands.

Project Description

Cannonsville Reservoir serves as a part of the City's water supply system; the water supply intake is located on the reservoir about 5 miles upstream of Cannonsville Dam. Cannonsville Reservoir is also used to provide flows to the West Branch of the Delaware River.

In its license application, the City proposes to add hydroelectric generating equipment adjacent to the existing outlet structure where it currently releases water to the West Branch of the Delaware River. The magnitude and timing of these releases would not change as a result of the hydroelectric project's operation. The City's proposal involves constructing a powerhouse, excavating a tailrace, and constructing a transmission line and substation. The project would also include the existing Cannonsville Dam and reservoir.

Proposed Facilities and Operation

The City proposes to **c**onstruct the powerhouse on the downstream toe of the dam, adjacent to the existing outlet works. Project operation would use flows currently released downstream into the West Branch of the Delaware River. The proposed project would generate an estimated 42,281 megawatt-hours (MWh) of electricity annually.

Flow releases from the reservoir are subject to the jurisdiction of a 1954 Decree issued by the United States Supreme Court[1] and the Delaware River Basin Commission (DRBC), which was created in 1961 when the Decree Parties entered into a compact with the federal government. The DRBC has codified the management of the Delaware River Basin in its Comprehensive Plan, which is based on adaptive management principles. The Water Code of the River Basin, a component of the Comprehensive Plan, prescribes

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[1] *New Jersey v. New York*, 347 U.S. 995 (1954). The parties to the decree are the City of New York, the States of Delaware, New Jersey, and New York, and the Commonwealth of Pennsylvania (the "Decree Parties").

requirements for diversions, releases, flow objectives, and water quality that have been unanimously agreed upon by the Decree Parties. The current release protocol is the Flexible Flow Management Program (FFMP) with Operations Support Tool (FFMP-OST), which became effective June 1, 2011. The City proposes to generate electricity with the water it would continue to release from the reservoir in accordance with the applicable operating protocol agreed to by the Decree Parties, as may be modified from time to time.

Proposed Environmental Measures

For project construction, the City is proposing to:

- update its conceptual erosion and sediment control plan for project construction, contained in its license application, that includes using best management practices (BMPs), revegetating of disturbed areas with weed-free seed mixes, and minimizing the spread of invasive plant species, to reflect final project design;

- use signage to identify vernal pool areas to be avoided during construction and implement any wetlands mitigation that may be required by the U.S. Army Corps of Engineers (Corps);

- in accordance with its Flow Management Plan, deploy and operate flow management structures (i.e., siphons) to maintain flows of appropriate quantity (i.e., in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties) and quality (i.e., temperature) to the West Branch of the Delaware River during a 3-month period when construction renders the existing outlet works unusable; and

- include raptor protection measures in the design and construction of the proposed transmission lines to reduce the collision and electrocution risk for raptors, including bald eagles.

During project operation, the City would:

- continue to make reservoir releases in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties.

The City currently implements a number of environmental measures at its Cannonsville Water Supply Reservoir. The City does not propose these measures as part of its proposed hydroelectric project, but would continue to implement these measures at the reservoir. More specifically, the City would:

- continue to implement watershed protection measures (such as implementing agricultural BMPs, upgrading wastewater treatment plants, and funding stormwater retrofit projects) to preserve and enhance water quality in Cannonsville Reservoir;

- continue to monitor water quality in Cannonsville Reservoir;

- continue to monitor bald eagle populations around the reservoir, and consult with FWS and New York DEC regarding any bald eagle issues in the vicinity of the reservoir; and

- continue to provide and manage recreational opportunities at the reservoir.

Alternatives Considered

This final environmental assessment (EA) considers the following alternatives: (1) the City's proposal; (2) the City's proposal with staff modifications (staff alternative); and (3) no action.

Under the staff alternative, the project would include the City's proposed measures, with the following additions or modifications:

- update the Flow Management Plan to incorporate the conditions of New York DEC's Water Quality Certification (WQC) pertaining to siphon use;

- develop and implement a wetland avoidance and mitigation plan to formalize the City's proposal for identifying and avoiding vernal pool habitat and mitigating for the removal of 0.57 acre of emergent wetland within the tailrace;

- develop and implement an avian protection plan, to include the City's proposed and Interior's recommended avian protection measures following Avian Power Line Interaction Committee guidelines;

- develop and implement a bald eagle conservation plan for the monitoring and protection of bald eagles during project construction, operation, and maintenance; and

- notify the Commission and the New York SHPO if previously unknown archaeological resources are discovered during the term of the license. If such discovery occurs during construction, discontinue construction-related activities until the proper treatment of any potential archaeological or cultural resources is determined.

Public Involvement and Areas of Concern

Before filing its license application, the City conducted pre-filing consultation under the traditional licensing process. The intent of the Commission's prefiling process is to initiate public involvement early in the project planning process and encourage citizens, governmental entities, tribes, and other interested parties to identify and resolve issues prior to an application being formally filed with the Commission. After the application was filed, we conducted scoping to determine which issues and alternatives should be addressed. We distributed an initial scoping document to interested parties on May 14, 2012. We conducted a site visit on June 13, 2012, and held public scoping meetings in East Vestal and Walton, New York, also on June 13, 2012. Based on discussions during the site visit, oral comments received during the scoping meetings, and written comments filed with the Commission, we issued a revised scoping document on August 27, 2012. On November 2, 2012, we issued a notice that the application was ready for environmental analysis and requested comments, recommendations, terms and conditions, and prescriptions.

The Commission issued its draft EA for the proposed licensing of the Cannonsville Project on October 31, 2013. Staff requested that comments on the draft EA be filed within 30 days from the issuance date. Staff received comments from the U.S. Department of the Interior (Interior) and the City. In appendix A of this final EA, we summarize the written comments received; provide responses to those comments; and indicate, where appropriate, how we have modified the text for the final EA.

The primary issues associated with licensing this project are: (1) maintenance of appropriate flow releases to the West Branch of the Delaware River; (2) minimizing effects to aquatic resources due to construction of the proposed powerhouse; and (3) minimizing effects to terrestrial resources, including bald eagle due to construction of the proposed powerhouse, tailrace, switchyard, and associated transmission line.

Staff Alternative

Geology and Soils

Constructing the project would disturb about 5 acres of uplands and about 2 acres of wetland habitat. Updating its soil erosion and sedimentation control plan to reflect final project design would limit potential effects to terrestrial and aquatic habitat associated with the construction of the proposed project.

Aquatic Resources

Updating the Flow Management Plan to incorporate the WQC conditions for siphon use, including time-of-year and water temperature restrictions, would ensure

releases to the West Branch of the Delaware River are of sufficient quantity and quality to sustain downstream aquatic resources.

Operating the project in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties, would maintain the water supply, environmental conservation, and flood control benefits of the reservoir.

Terrestrial Resources

Constructing the project would remove 0.57 acre of emergent wetland and occur in the vicinity of other wetland habitat. Developing and implementing a wetland avoidance and mitigation plan to formalize the City's proposal for identifying and avoiding vernal pool habitat and mitigating for the removal of emergent wetland within the tailrace, would minimize effects to wetlands due to project construction activities within the project boundary and protect important wildlife habitat.

Developing and implementing a project-specific avian protection plan, to include the City's proposed and Interior's recommended avian protection measures following Avian Power Line Interaction Committee guidelines, would provide protection for migratory birds.

Threatened and Endangered Species

The northern wild monkshood has the potential to occur in Delaware County, New York. Northern wild monkshood was not found in the project vicinity during the City's surveys. Because northern wild monkshood does not occur within the area of project effects, the proposed action would have no effect on this species.

The endangered dwarf wedgemussel is known to occur 22 miles downstream of the Cannonsville dam, but was not found, nor was its habitat found, in the project vicinity during the City's surveys. Implementing the City's erosion and sedimentation control plan would minimize, but not eliminate, the potential for construction-related effects such as temporary increases in suspended sediment concentrations or sedimentation on dwarf wedgemussels that may exist downstream of the project. Therefore, we conclude, and Interior concurs, that the proposed action may affect, but would not be likely to adversely affect the dwarf wedgemussel.

Cultural Resources

Construction and operation of the proposed project would not affect any known historic properties. The existing Cannonsville Dam and outlet structure are less than 50 years old and thus not eligible for the National Register of Historic Places, and project construction would occur on land previously disturbed during construction of the dam.

However, if previously unknown archaeological or historic properties are discovered during the course of the license, notifying the Commission and the New York SHPO and temporarily halting construction, if such discovery occurs during construction, would ensure the proper treatment of any such archaeological or cultural resources.

No-action Alternative

The no-action alternative is license denial. Under the no-action alternative, the project would not be built and environmental resources in the project area would not be affected.

Conclusions

Based on our analysis, we recommend licensing the project as proposed by the City, with staff modifications.

In section 4.2, *Comparison of Alternatives*, we compare the total project cost of obtaining power from a likely alternative source of power in the region, for each of the alternatives identified above. Our analysis shows that during the first year of operation, under the City's proposal, the project power would cost $2,295,760, or $54.30/MWh more than the alternative cost of power. Under the staff-recommended alternative, project power would cost $2,307,130, or $54.57/MWh more than the alternative cost of power. Under the no-action alternative, there would be no power generated.

We chose the staff alternative as the preferred alternative because: (1) the project would provide a dependable source of electrical energy; (2) the 14.08 MW of electrical energy comes from a renewable resource which does not contribute to atmospheric pollution; and (3) the recommended environmental measures would protect water quality, aquatic and terrestrial habitat, threatened and endangered species, recreation, and historic properties.

On the basis of our independent analysis, we conclude that issuing a license for the project, with the environmental measures we recommend, would not be a major federal action significantly affecting the quality of the human environment.

FINAL ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
Washington, D.C.

Cannonsville Hydroelectric Project
Project No. 13287-004 – New York

1.0 INTRODUCTION

1.1 APPLICATION

On February 29, 2012, the City of New York (City or Applicant) filed an application for an original license for the proposed 14.08-megawatt (MW) Cannonsville Hydroelectric Project (Cannonsville Project or project). The proposed project would be located on the City's Cannonsville Reservoir, part of its water supply system, on the West Branch of the Delaware River, near the Township of Deposit, in Delaware County, New York (figure 1). The proposed project would not occupy any federal lands.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the proposed Cannonsville Project is to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a license to the City for the Cannonsville Project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, or water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

Issuing an original license for the proposed Cannonsville Project would allow the City to generate electricity at the project for the term of the license, making electric power from a renewable source available to the grid.

Figure 1. Location of the City's Cannonsville Water Supply Reservoir and proposed Cannonsville Project (Source: applicant).

In this final EA, we assess the effects of: (a) construction and operation of the project as proposed in the application (proposed action); (b) alternatives to the proposed action; and (c) no action. We also make recommendations to the Commission on whether to issue an original license, and if so, what conditions should be included in any license issued. The primary issues associated with licensing this project are:

(1) maintenance of flow releases to the West Branch of the Delaware River; (2) minimizing effects to aquatic resources due to construction of the proposed powerhouse; and (3) minimizing effects to terrestrial resources, including bald eagle due to construction of the proposed powerhouse and associated transmission line.

1.2.2 Need for Power

The Cannonsville Project would provide hydroelectric generation to meet part of New York's power requirements, resource diversity, and capacity needs. The project would have a total installed capacity of 14.08 MW and would generate approximately 42,281 megawatt-hours (MWh) of electricity annually.

To assess the need for power for the Cannonsville Project, staff looked at the needs in the operating region in which the project is located. The project is located in the New York Independent System Operator region of the Northeast Power Coordinating Council Region of the North American Electric Reliability Corporation (NERC).[2] According to NERC, summer peak demand in the region is expected to increase at an average rate of 0.81 percent per year over the 10-year planning period from 2013-2022 (NERC 2012). Also, according to NERC, the winter peak demand in the region is expected to increase at an average rate of 0.43 percent per year over the 10-year planning period from 2013-2022 (NERC 2012). Therefore, project power would help meet summer and winter peak demand. We conclude that power from the project would help meet a need for power in the region.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

A license for the proposed Cannonsville Project would be subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are summarized in table 1 and described below.

[2] The NERC is an international regulatory authority established to evaluate reliability of the bulk power system in North America. NERC develops and enforces reliability standards; assesses reliability annually via a 10-year assessment and winter and summer seasonal assessments; monitors the bulk power system; and educates, trains, and certifies industry personnel. NERC is the Electric Reliability Organization for North America, subject to oversight by the U.S. Federal Energy Regulatory Commission and governmental authorities in Canada (NERC 2012).

Table 1. Major statutory and regulatory requirements for the proposed Cannonsville Project (Source: staff).

Requirement	Applicable Agencies	Status
Section 18 of the FPA (fishway prescriptions)	U.S. Department of the Interior (Interior)	On December 18, 2012, Interior reserved its authority to prescribe fishways during the course of the license.
Section 10(j) of the FPA	Interior, New York State Department of Environmental Conservation (New York DEC)	On December 18, 2012, Interior filed five recommendations pursuant to section 10(j).
Clean Water Act – Water Quality Certification (WQC)	New York DEC	New York DEC issued a WQC to the City on June 10, 2013 and a modified WQC on June 18, 2013.
Endangered Species Act (ESA) Consultation	Interior	No effect on northern wild monkshood. May affect, but not likely to adversely affect, dwarf wedgemussel.
Coastal Zone Management Act Consistency	New York State Department of State	Coastal zone certification is not required by New York, because the project is not located in the coastal zone.
Section 106 of the National Historic Preservation Act	New York State Historic Preservation Officer (New York SHPO)	No listed or eligible historic properties would be affected.
Magnuson-Stevens Fishery Conservation and Management Act	National Marine Fisheries Service	No Essential Fish Habitat in the West Branch of the Delaware River.

1.3.1 Federal Power Act

A license for the proposed project is subject to requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described below.

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA, 16 U.S.C. § 811, states that the Commission is to require the construction, operation and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the Interior. In a letter filed December 18, 2012, the U.S. Department of the Interior (Interior) requested that a reservation of authority to prescribe fishways under section 18 be included in any license issued for the project.

1.3.1.2 Section 10(j) Recommendations

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

On December 18, 2012, Interior timely filed five recommendations [3] under section 10(j), as summarized in table 13, in section 5.4, *Recommendations of Fish and Wildlife Agencies*. On November 21, 2013, in response to the draft EA, Interior revised one of its recommendations. In section 5.4, we also discuss how we address the agency recommendations and comply with section 10(j).

1.3.2 Clean Water Act

Under section 401(a) of the Clean Water Act, a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the CWA. On June 8, 2012, the City applied to the New York Department of Environmental Conservation (New York DEC) for a section 401 water quality certification (WQC) for licensing the proposed project. New York DEC received the application on June 11, 2012. The New York DEC timely issued the section 401 WQC for the project on June 10, 2013. On June 18, 2013, the New York DEC issued a modified WQC for the project (letter from William J. Clarke, Regional Permit Administer, New York DEC, Stamford, NY, June 18, 2013; filed on June 27, 2013).

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[3] Interior's letter included its reservation of authority to prescribe fishways under section 18 of the FPA as a sixth 10(j) recommendation. As noted in section 1.3.1.1 and elsewhere in this document, we consider this reservation of authority under section 18.

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act (ESA), 16 U.S.C § 1531, et seq., requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modifications of the critical habitat of such species. The City contacted Interior's Fish and Wildlife Service (FWS) during the licensing process and provided copies of the Initial Consultation Document, and draft and final license applications. The City relied on consultation with FWS, and online resources and information from the New York DEC's Natural Heritage Program to evaluate the potential occurrence of any federally listed threatened or endangered species or critical habitat within the project area.

In a December 18, 2012, letter, Interior indicated that there are two federally listed species, the endangered dwarf wedgemussel and the threatened northern wild monkshood, with the potential to occur in the project vicinity. Interior stated that, based on the City's survey results showing that northern wild monkshood was not located in the vicinity of the project, no further coordination or consultation would be required for that species.

Our analyses of the project impacts on threatened and endangered species are presented in section 3.3.4, *Threatened and Endangered Species.* We conclude that issuing an original license for the Cannonsville Project with the City's erosion and sedimentation control plan, Interior's 10(j) recommendation (No. 1), and several mandatory conditions from the New York DEC's water quality certification, would minimize, but not eliminate, the potential for any effects to any dwarf wedgemussels that may exist downstream of the project. Therefore, we find that the proposed action may affect, but would not be likely to adversely affect, the dwarf wedgemussel. In a letter filed November 21, 2013, Interior concurred with our finding.

1.3.4 Coastal Zone Management Act

Under section 307(c)(3)(A) of the CZMA, 16 U.S.C. § 1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZM agency concurs with the license applicant's certification of consistency with the state's CZM program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its request of the applicant's certification. The New York State Department of State is responsible for reviewing projects for consistency within New York's CZM Program.

The project is not located within the state-designated Coastal Management Zone, which includes coastal areas and extends inland along the Hudson River to the east of the project, and the project would not affect New York's coastal resources. Therefore,

the project is not subject to New York's coastal zone program review and no consistency certification is needed (see New York State Department of State letter dated January 23, 2012, included in license application).

1.3.5 National Historic Preservation Act

Section 106 of the National Historic Preservation Act requires federal agencies to "take into account" how its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (National Register).

Because the proposed project would be constructed on land previously disturbed during dam construction, construction activities would not likely have the potential to disturb cultural sites. Similarly, because no changes to reservoir operation are proposed, the proposed project would not affect any undiscovered cultural resources that may be present along the reservoir shoreline. Nevertheless, for any license that may be issued for the proposed project, staff would recommend, as part of that license, an article that would require the City to stop all activities and seek consultation with the New York SHPO if historic properties are encountered during project construction, operation, or maintenance.

Cannonsville Dam and its outlet works are less than 50 years old and thus not eligible for the National Register.

1.3.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with the Secretary of Commerce on all actions that may adversely affect Essential Fish Habitat (EFH). There is no designated EFH in the West Branch of the Delaware River or downstream in the freshwater portions of the Delaware River. We conclude the proposed project would not affect EFH.

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 CFR § 16.8(2013)) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, ESA, the National Historic Preservation Act, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

1.4.1 Scoping

Before preparing this final EA, we conducted scoping to determine what issues and alternatives should be addressed. We issued an initial scoping document (SD1) to interested agencies and others on May 14, 2012. Two scoping meetings were held on June 13, 2012 in East Vestal and Walton, New York to request oral comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and these are part of the Commission's public record for the project. In addition to comments received at the scoping meetings, the following entities provided written comments:

Entity	Filing Date
Pennsylvania Department of Environmental Protection	July 9, 2012
U.S. Fish and Wildlife Service	July 12, 2012
North Delaware River Watershed Conservancy, Ltd.	July 16, 2012
New York State Department of Environmental Conservation	July 19, 2012
National Marine Fisheries Service	July 24, 2012

We issued a revised scoping document (SD2), addressing these comments on August 27, 2012.

1.4.2 Interventions

On April 2, 2012, the Commission issued a notice that the City had filed an application for an original license for the proposed Cannonsville Project. This notice set June 1, 2012, as the deadline for filing protests and motions to intervene. In response to this notice, the following entities filed motions to intervene:

Intervenors	Date Filed
Interior	May 23, 2012
New York DEC	May 16, 2012
Friends of the Upper Delaware River, Inc.	June 5, 2012[4]

[4] Late intervention granted on July 18, 2012.

1.4.3 Comments on the Application

On November 2, 2012, the Commission issued a notice requesting conditions and recommendations. The following entities responded:

Agency	Date Filed
Interior	December 18, 2012
New York DEC	December 21, 2012

The City filed reply comments on February 15, 2013.

1.4.4 Comments on the Draft EA

On October 31, 2013, we issued a draft EA for the Cannonsville Project. Comments on the draft EA were due by December 2, 2013. Written comments on the draft EA were filed by the following entities:

Commenting Entity	Date Filed
Interior	November 21, 2013
City of New York	December 2, 2013

Appendix A summarizes the comments that were filed, includes our responses to those comments, and indicates where we made modifications to the draft EA.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

The no-action alternative is license denial. Under the no-action alternative, the project would not be built and environmental resources in the project area would not be affected.

2.2 APPLICANT'S PROPOSAL

2.2.1 Project Facilities

2.2.1.1 Existing Facilities

Dam and Spillway

The Cannonsville Dam was placed into service in 1964 for the purpose of providing water supply to the City of New York. It is located on the West Branch of the Delaware River in the Town of Deposit, Delaware County, New York. The dam is a zoned earthen embankment with a 2,800-foot-long, 45-foot-wide crest rising 175 feet above the valley floor to an elevation of 1,175.0 feet above mean sea level ("msl"). The dam is orientated in a north-south direction and is formed by two embankment sections.

An un-gated spillway is located at the right abutment on the north side of the valley. The spillway discharges into a channel that was excavated from bedrock and runs parallel to the spillway.

Reservoir

Cannonsville Reservoir is approximately 12 miles long, with a surface area, at the spillway crest elevation of 1,150.0 feet msl, of about 4,670 acres. The usable storage capacity of the reservoir is reported to be about 296,840 acre-feet. The mean depth of the impoundment, relative to the spillway crest elevation, is about 61 feet.

Low-Level Outlet Release Works

The low-level outlet release works are operated to convey flow to the West Branch of the Delaware River downstream of the dam and are located at the south end of the dam. Discharges are made through a concrete intake structure at the upstream toe of the dam and then through a 17.5-foot-diameter concrete diversion conduit that necks down to an 11.9-foot-diameter release conduit.

Water Supply Intake

The City's water supply withdrawals are made through an intake chamber located on the south shore of the impoundment, roughly 5 miles upstream of the dam. Water drawn from the Cannonsville Reservoir enters the West Delaware Tunnel and travels approximately 44 miles to the upper end of the Rondout Reservoir. From there, it is carried in the 85-mile-long Delaware Aqueduct and through other reservoirs before entering the City's water supply distribution system. This water supply intake is not part of the proposed hydroelectric project. Its water supply function would continue under any licensing alternative.

2.2.1.2 Proposed Facilities

The City proposes to modify existing facilities and construct additional facilities to generate electricity from flow releases currently made to the West Branch of the Delaware River. The proposed project facilities are shown in figure 2.

Penstocks

The existing conduit leading from the low-level release works would be bifurcated with a wye connection to a 12-foot-diameter steel pipe. The 12-foot-diameter pipe would run in a south-to-north direction and would be tapped with four individual wye connections to convey flow to individual steel penstocks leading to four turbines.

Powerhouse and Tailrace

The City proposes to construct a powerhouse approximately 168 feet long by 54 feet wide adjacent to the existing low-level release works building. The powerhouse would contain four turbines and generators, switchgear, generator phasing cabinets, control panels, station battery and charger, an oil/water separator sump with pump, and other related equipment. Movement and placement of power generating equipment inside the powerhouse would be accomplished by a 60-ton rail crane running the length of the building. One set of stoplogs per unit would be included in the powerhouse superstructure to allow dewatering of the draft tube exit chambers. Excavation would be required for both the powerhouse and tailrace channel.

Turbines and Generators

The powerhouse would house four horizontal-shaft, Francis-type turbine-generator units with a total hydraulic capacity of 1,500 cubic feet per second (cfs). Two turbines would have a maximum hydraulic capacity of 625 cfs, and two turbines would have a maximum hydraulic capacity of 125 cfs. The turbines would be capable of

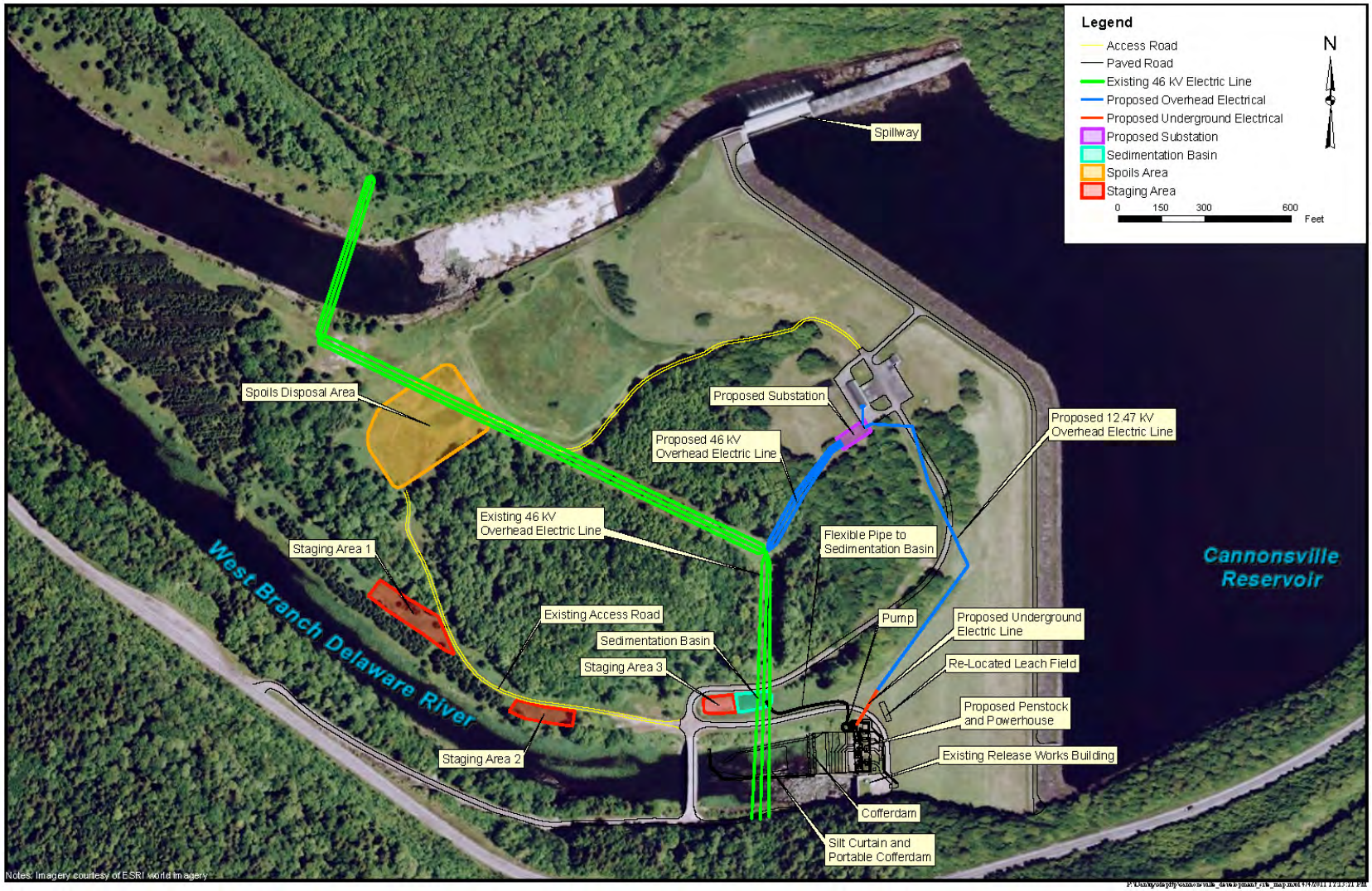

Figure 2. Project facilities for the proposed Cannonsville Hydroelectric Project (Source: Applicant).

operating down to approximately 40 percent of their respective maximum hydraulic capacities. Thus, the smaller turbines would be capable of operating down to approximately 50 cfs, while the larger turbines would operate down to approximately 250 cfs. The larger units have a rated capacity of 5.855 MW, while the smaller units have a rated capacity of 1.185 MW, for a total station capacity of 14.08 MW. The rated head, based on the headpond elevation at the spillway crest elevation, is approximately 122 feet.

The addition of the turbines would supplement and enhance the redundancy of the existing low-level release works in that additional options for release of water into the West Branch of the Delaware River would be available. The four separately-valved turbines would provide up to 1,500 cfs of release capacity.

Transmission Lines

From the powerhouse, generated electricity would run through a 150-foot-long 12.47-kilovolt (kV) underground line, then a 1,200-foot-long aerial 12.47-kV line to a proposed project step-up substation. This substation would contain a 20/26.6-megavolt-ampere (MVA) oil-filled transformer with concrete containment pad and associated equipment. The substation equipment would be located in a chain link fenced area with a gravel base. The electrical interconnection between the substation and the New York State Electric & Gas Corporation ("NYSEG") transmission system would be via a new 460-foot-long, 46-kV aerial line.

Project Boundary

The City's proposed project boundary follows the reservoir shoreline at the 1,150 elevation contour (i.e., spillway elevation), with a 25-foot linear buffer on the upland side. The project boundary also extends from 1,450 feet (at the south abutment) to 100 feet (at the north abutment) downstream of the dam to encompass the proposed project facilities, including the powerhouse, tailrace, transmission lines, and spoils area. In all, the project boundary encompasses 4,954 acres, all of which is owned by the City. No federal or tribal lands are present within the project boundary.

2.2.2 Project Safety

As part of the licensing process, the Commission would review the adequacy of the proposed project facilities. Special articles would be included in any license issued, as appropriate. Commission staff would inspect the licensed project both during and after construction. Inspection during construction would concentrate on adherence to Commission-approved plans and specifications, special license articles relating to construction, and accepted engineering practices and procedures. Operational inspections would focus on the continued safety of the structures, identification of unauthorized

modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, any license issued would require an inspection and evaluation every 5 years by an independent consultant and submittal of the consultant's safety report for Commission review.

2.2.3 Project Operation

2.2.3.1 Existing Reservoir Operation

Diversions, releases, flow objectives, and water quality at the Cannonsville Reservoir are subject to the jurisdiction of a 1954 Decree issued by the United States Supreme Court,[5] and the Delaware River Basin Commission (DRBC), which was created in 1961 when the Decree Parties entered into a compact with the federal government. The DRBC has codified the management of the Delaware River Basin in its Comprehensive Plan, which is based on adaptive management principles. The Water Code of the River Basin, a component of the Comprehensive Plan, prescribes requirements for diversions, releases, flow objectives, and water quality that have been unanimously agreed upon by the Decree Parties and have gone through the DRBC's public process. The DRBC Comprehensive Plan and Water Code have undergone several revisions since 1962, the last of which occurred in 1983, although the Decree Parties have temporarily modified provisions of the Comprehensive Plan and Water Code since then.

The current operating protocol for the reservoir, referred to as the Flexible Flow Management Program (FFMP) with Operations Support Tool (FFMP-OST), is currently slated to remain in effect until May 31, 2014. It provides an option for the Decree Parties, by unanimous consent, to extend operation of the FFMP-OST for an additional year (i.e., until May 31, 2015). A copy of the FFMP-OST is available through the Office of the Delaware River Master's web site at http://water.usgs.gov/osw/odrm/documents/FFMP_2013_Agreement.pdf.

2.2.3.2 Proposed Project Operation

The City proposes to operate the project such that existing water supply withdrawals to its water supply system and its flow releases to the West Branch of the Delaware River are not changed from existing protocols. As noted above, the City's water supply intake is located about 5 miles upstream of the existing dam and proposed powerhouse. The intake is not proposed to be a project feature and would not serve any project purpose. The releases made to the West Branch of the Delaware River would

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[5] *New Jersey v. New York*, 347 U.S. 995 (1954). The parties to the decree are the City of New York, the States of Delaware, New Jersey, and New York, and the Commonwealth of Pennsylvania (the "Decree Parties").

continue to be made in accordance with the requirements of the applicable operating protocol agreed to by the Decree Parties, as may be modified from time to time.

Generation would be accomplished by passing the water currently being released through the outlet works through the proposed powerhouse before passing it downstream in approximately the same location as currently occurs. The water available for generation at the project would be as stipulated in the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties, and consist of conservation releases, directed releases, and water that would otherwise spill, to the extent that such releases are consistent with the operating protocol's discharge mitigation releases.

The estimated average annual generation at the project would be 42,281 MWh and the annual plant factor is estimated to be about 34 percent. The dependable capacity of the project, defined as "*the load-carrying ability of a power plant under adverse load and flow conditions*," [6] which would occur during a period of high demand (generally August) and low flow (generally November) is estimated to vary from approximately 1.586 MW to 5.088 MW, in November and August, respectively.

2.2.4 Proposed Environmental Measures

The City proposes to implement the following environmental measures in association with construction of the proposed project:

- update its conceptual erosion and sediment control plan for project construction, contained in its license application, that includes using best management practices (BMPs), revegetating of disturbed areas with weed-free seed mixes, and minimizing the spread of invasive plant species, to reflect final project design;

- use signage to identify vernal pool areas to be avoided during construction and implement any wetlands mitigation that may be required by the U.S. Army Corps of Engineers (Corps);

- in accordance with its Flow Management Plan, deploy and operate flow management structures (i.e., siphons) to maintain flows of appropriate quantity (i.e., in accordance with the FFMP-OST or subsequent operating protocol agreed to by the Decree Parties,) and quality (i.e., temperature) to the West Branch of the Delaware River during a 3-month period when construction renders the existing outlet works unusable; and

[6] Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, published by the American Society of Civil Engineers (1989).

- include raptor protection measures in the design and construction of the proposed transmission lines to reduce the collision and electrocution risk for raptors, including bald eagles.

The City proposes to implement the following environmental measures in association with operation of the proposed project:

- continue to make reservoir releases in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties.

The City currently implements a number of environmental measures at its Cannonsville Water Supply Reservoir. The City does not propose these measures as part of its proposed hydroelectric project, but would continue to implement these measures at the reservoir. More specifically, the City would:

- continue to implement watershed protection measures (such as implementing agricultural BMPs, upgrading wastewater treatment plants, and funding stormwater retrofit projects) to preserve and enhance water quality in Cannonsville Reservoir;

- continue to monitor water quality in Cannonsville Reservoir;

- continue to monitor bald eagle populations around the reservoir, and consult with FWS and New York DEC regarding any bald eagle issues in the vicinity of the reservoir; and

- continue to provide and manage recreational opportunities at the reservoir.

2.2.5 Modifications to Applicants Proposal – Mandatory Conditions

The following mandatory conditions have been provided and are evaluated as part of the Applicant's proposal.

Section 18 Fishway Prescriptions

Interior, in its December 18, 2012 letter, stated that upstream and downstream fish passage at the project is not needed at this time. However, Interior stated that it reserved its authority to prescribe the construction, operation, and maintenance of fishways during the term of any license that may be issued for the project.

Water Quality Certification Conditions

The New York DEC's WQC for the project (appendix A) contains 12 General Conditions and 22 Special Conditions. The General Conditions are administrative in

nature. The Special Conditions address six subject areas: 1) conformance with plans; 2) construction requirements; 3) operational requirements - siphons; 4) facility operation requirements; 5) fish studies and mitigation; and 6) threatened/endangered species requirements. These Special Conditions are summarized below.

Conformance With Plans - work shall be done in strict conformance with:

- Application documents
- Agreement of the Parties to the 1954 U.S. Supreme Court Decree effective June 1, 2013 (Flexible Flow Management Program-Operational Support Tool)

Construction Requirements

- No less than 90 days prior to the start of construction, the permittee must provide plans and specifications for the facilities, including a Stormwater Pollution Prevention Plan and Best Management Practices for maintaining water quality during construction.
- The work area shall be isolated from the flowing stream by use of sandbags, cofferdam, or piping or pumping around the work area. Return waters must be as clear as the flowing water upstream from the work area.
- No discharge of sediment or turbid waters to wetlands or water bodies is permitted.
- No wet or fresh concrete, leachate, or equipment washings shall be allowed to escape into the waters of New York State.
- Equipment operation, other than for the construction of the cofferdam, in the water is prohibited.
- Disturbance to the bed and banks of the stream shall be kept to the minimum necessary to complete the project.
- Methods to control erosion are to be put in place before ground disturbance and maintained until final grading has been completed and final seeding has been established.
- Excavated soil shall be suitably retained and covered so that there is no turbid runoff discharged either directly or indirectly into any waterway or wetland.
- Upon completion of construction, unused excavated materials and construction debris, shall be removed a minimum of 100 feet from the waterbody or wetland or flood plain.
- Areas of soil disturbance resulting from this project shall be shaped/graded, and seeded with an appropriate perennial grass seed and mulched within one

week of final grading. Mulch shall be maintained until a suitable vegetative cover is established.

- If seeding is impracticable due to the time of year, a temporary mulch shall be applied and final seeding shall be performed at the earliest opportunity when weather conditions favor germination and growth.
- The Permittee shall notify the Department 3 to 5 days prior to the commencement of work on the project.

Operational Requirements –Siphons

- Use of siphons is limited to October 1 to May 15.
- Siphon discharge temperature of 60 degrees or colder shall be maintained unless ambient temperature at the intake for the Cannonsville Reservoir outlet is greater.
- The permittee shall develop and submit a stream flow and temperature monitoring plan for review and approval no less than 90 days prior to operation of the siphons.

Facility Operation Requirements

- Releases from the reservoir shall be governed by the document entitled Agreement of the Parties to the 1954 U.S. Supreme Court Decree effective June 1, 2013 (Flexible Flow Management Program-Operational Support Tool). Each successor agreement as modified and approved by the Decree Parties shall be submitted to the Department by the Permittee for modification of this permit to incorporate by reference said successor agreement.

Fish Studies and Mitigation

- If the City proposes any changes in project operation, the City will address any potential impacts such as fish mortality unanticipated by the City's studies and the need for mitigation to reduce or compensate for such unanticipated fish mortality.
- If the City's study reveals fish congregation at the intake and unanticipated concurrent fish mortality downstream of the dam, then the City will consult with the New York DEC on the design of a study to determine incremental turbine entrainment over and above existing non-turbine conditions.
- During project operation, if unanticipated fish mortality is observed downstream of the outlet, the New York DEC reserves the right to require

additional studies and if necessary mitigation measures to reduce such fish mortality.

Threatened/Endangered Species Requirements

- The permittee shall follow the conditions contained in its Part 182 Threatened and Endangered Species taking permit 4-1230-00089/00011.
- Prior to construction, the City is required to submit for New York DEC review and approval, the final plans for electrical facilities incorporating any necessary avian protection measures as part of a Part 182 permit modification.
- No construction activity is permitted within 330 feet of a bald eagle nest site between January 1 and July 31st unless the Department determines in writing that breeding activity for the year has ceased.
- The project shall be carried out in strict accordance with the plans and documents prepared by the permittee as fully described above in the Species Conservation and Implementation Plans prepared by the permittee.
- Work within 660 feet of a nest tree shall be limited as follows unless the Department determines in writing that breeding activity for the year has ceased: (a) No work prior to June 1 of any calendar year or at least 3 weeks after hatching, whichever is later; (b) All other work within 660 feet of the nest is limited to August 1st to December 31st.
- If any dead or injured state listed threatened or endangered species are discovered by the City, the permittee shall contact the New York DEC to arrange for recovery and transfer of the specimen(s).
- This permit is required because the project may result in an incidental "take" or "taking" of the bald eagle, which is listed as threatened under state law. The Department has determined that any taking will be offset through compliance with the measures identified in the conditions of this permit, resulting in a net conservation benefit to the threatened species.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include the City's proposed measures for the following:

- update its conceptual erosion and sediment control plan for project construction, contained in its license application, that includes using best management practices (BMPs), revegetating of disturbed areas with weed-free seed mixes, and minimizing the spread of invasive plant species, to reflect final project design;

- use signage to identify vernal pool areas to be avoided during construction and implement any wetlands mitigation that may be required by the U.S. Army Corps of Engineers (Corps);

- in accordance with its Flow Management Plan, deploy and operate flow management structures (i.e., siphons) to maintain flows of appropriate quantity (i.e., in accordance with the FFMP-OST or subsequent operating protocol agreed to by the Decree Parties,) and quality (i.e., temperature) to the West Branch of the Delaware River during a 3-month period when construction renders the existing outlet works unusable;

- include raptor protection measures in the design and construction of the proposed transmission lines to reduce the collision and electrocution risk for raptors, including bald eagles; and

- continue to make reservoir releases in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties.

The staff alternative would also include the WQC conditions and the following additions or modifications to the City's proposed measures:

- update the Flow Management Plan to incorporate the conditions of New York DEC's Water Quality Certification (WQC) pertaining to siphon use;

- develop and implement a wetland avoidance and mitigation plan to formalize the City's proposal for identifying and avoiding vernal pool habitat and mitigating for the removal of 0.57 acre of emergent wetland within the tailrace;

- develop and implement an avian protection plan, to include the City's proposed and Interior's recommended avian protection measures following Avian Power Line Interaction Committee guidelines;

- develop and implement a bald eagle conservation plan for the monitoring and protection of bald eagles during project construction, operation, and maintenance; and

- notify the Commission and the New York SHPO if previously unknown archaeological resources are discovered during the term of the license. If such discovery occurs during construction, discontinue construction-related activities until the proper treatment of any potential archaeological or cultural resources is determined.

3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and recommended environmental measures. Sections are organized by resource area (aquatic, recreation, etc.). Under each resource area, historic and current conditions are first described. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives.[7] Staff conclusions and recommendations are discussed in section 5.2, *Comprehensive Development and Recommended Alternative*.

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The watershed for the proposed Cannonsville Project is located in the eastern portion of the Allegheny Plateau physiographic province, which is the northern part of the Appalachian Plateau that extends from southern New York to central Alabama. Locally, the Allegheny Plateau extends throughout southern New York and includes the Catskill Mountains and southern sections of the Mohawk River Basin (Isachsen et al., 1991). Rivers and their tributaries have cut the originally level plateau into hilly uplands. The plateau surface is evident in the pattern of hilltops all tending to reach the same elevations in their respective locations in the watershed, creating a dissected plane that slopes gradually upward from northwest to southeast (Delaware Co. SWCD, 2004).

The West Branch of the Delaware River is the principal drainage channel for the basin and delivers flows from northeast to southwest through a relatively narrow, flat-floored valley. The valley is approximately one mile across at its maximum width, which is in the Village of Walton. Hillsides along the West Branch of the Delaware River valley tend to be asymmetric with steeper slopes facing north and gentler slopes facing south. Tributary streams typically occupy very narrow valleys, or hollows, that generally intersect the West Branch of the Delaware River at right angles (Delaware Co. SWCD, 2004).

3.1.1 Climate

The climate of the Catskill Mountains is considered primarily humid continental, which tends to dominate the northeastern states. Cool, dry air masses generally move eastward through the area throughout the year, while warm, humid maritime air masses generally move northeastward in the summer (Delaware Co. SWCD, 2007). The

[7] Unless otherwise noted, the sources for our information are The City's license application filed on February 29, 2012, as modified by The City's additional information request response, filed on October 30, 2012.

summers are cool, with relatively few hot days. Cold winter temperatures prevail whenever Arctic air masses flow southward from central Canada. Mean daily temperatures range from about 20 degrees Fahrenheit (°F) in the winter to the upper 60's in the summer. Rainfall is usually adequate during the growing season (May – September) but deficiencies of precipitation may occur periodically. Mean annual precipitation is approximately 47 inches in nearby Walton, New York. Average snowfall in the valleys is near 65 inches, with higher terrains receiving slightly more.

3.1.2 Land Uses

The area surrounding the dam and reservoir is generally remote and undeveloped, consisting primarily of forests or shrubland; little to no development is present throughout the watershed above the dam. The areas proposed for disturbance resulting from the proposed project consist of mowed lawn along the earthen dam and City roads to access the maintenance building and low-level release works building.

Historically, the entire area was covered by forests. As a result, forest materials were used for construction of equipment and housing. Certain trees were utilized for making fine furniture, while the bark of other trees was used in tanneries. Sugar maple trees were tapped for syrup and sugar (Greene Co. SWCD, 2007).

As the forests were cleared, the rocks and stumps were pulled to make way for farmland. The shallow, infertile soil proved not to be conducive to sustained grain farming; however, the abundance of cold-hardy grasses and water supported dairy farming (Delaware Co. SWCD, 2007). Dairy farming and forestry remain the dominant land uses.

3.1.3 Wetlands

Cannonsville Reservoir is classified as a palustrine limnetic, permanently flooded impoundment with an unconsolidated bottom. Because of the topography, the land surrounding the reservoir is generally not conducive to supporting wetlands. The wetlands that are present tend to be associated with the areas where tributary streams feed the reservoir. There are several small wetlands near the upper end of the impoundment. A few larger wetlands are present at the upper tip of the large north-facing finger bay of the reservoir.

3.1.4 Vegetative Cover

The periphery of the reservoir is generally remote and undeveloped with the exception of a few roads. The dominant vegetation cover type throughout the basin is

deciduous tree forest, with some north facing hill-slopes dominated by coniferous species. Deciduous tree species include maples, beech, birches, oaks, ash, and cherries. Eastern hemlock is the predominant conifer; some eastern white pine stands exist, as well as many fields that have been planted with various spruce and pine species. These forests encompass the majority of the upland area, and the timber is frequently harvested.

Along watercourses and the adjacent hillsides, cover types range from grass to a mix of grass and shrub, corn, and alfalfa. These cover types are indicative of the agricultural character of the basin. The grass and shrub component represents successional land composed of grasses, forbs, and woody plants, with hawthorns being common. The grass component includes turf, pasture, and hay land.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing NEPA (40 CFR, section 1508.7), a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

In SD2, we stated that, based on our review of the license application, scoping comments, and preliminary staff analysis, we were making the preliminary determination that there would be no cumulative impacts as a result of the proposed construction, operation and maintenance of the Cannonsville Project. Our analyses since that time confirm that determination. The City is proposing no changes in the quantity or timing of flow releases to the West Branch of the Delaware River during hydroelectric generation, nor changes to reservoir operation. Although there may be short-term effects on water quality during project construction, as discussed below, we are not aware of any other activities in the watershed that would concurrently affect this resource.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the site-specific environmental issues.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this final EA. Based on this, we have determined that geology and soils, aquatic resources, terrestrial resources, threatened and endangered species, recreation and land use, aesthetics, cultural resources, and socioeconomics may

be affected by the proposed action and action alternatives. We present our recommendations in section 5.2, *Comprehensive Development and Recommended Alternative*.

3.3.1 Geology and Soils

3.3.1.1 Affected Environment

The proposed project is located along the West Branch of the Delaware River in the eastern portion of the Allegheny Plateau, which is a part of the Appalachian Plateau physiographic province within the Northeastern Highlands region. The Appalachian Plateau is a large natural region lying west of the Hudson lowlands and south of the Mohawk River Valley and the Lake Ontario-Lake Erie plains. The Appalachian Plateau is underlain with nearly horizontal rock strata, and all of it was covered by a glacier as recently as 10,000 to 12,000 years ago. Ice and the force of rivers have dissected or cut into the bedrock, giving the whole region a rugged, hilly aspect. The Appalachian Plateau is highest in the eastern part of the state, where it forms the Catskill Mountains.

Generally, the bedrock underlying the region is of sedimentary origin resulting from the erosion of an ancient high peaks Taconic mountain range that existed to the east approximately 370 million years ago in the Devonian Period. The sediments that form the Devonian Period bedrock are interpreted to be the deposits of a vast deltaic river system that are often referred to as Catskill Delta deposits. The Catskill Delta deposits were buried beneath younger sediments and then uplifted as a plateau. Prior to and during the uplifting, intersecting sets of vertical fractures formed. As the overlying rock was eroded away over time, streams incised multiple channels in the slowly rising plateau.

Long periods of glaciation deposited varying layers of glacial till in the valleys and uplands of the project area. The retreating glaciers left ice deposits in the valleys, sometimes long after the uplands were relatively ice-free. Meltwater flowed around and beneath the remaining ice, removing much of the silt and clay from the sand and gravel. As a result, gravelly terraces and kame (ice-contact sand and gravel) deposits tend to occur along valley margins where they were left when the ice sheets began their retreat. Lakes impounded by ice and recessional moraines allowed silt and clay to settle and form thick deposits. Other areas were scoured by the glacial runoff.

Soils within the proposed project area are characteristically nutrient poor and well drained. Soil depth is variable; some areas have bedrock at depths of 10 to 20 inches. The soils support successional communities composed of northern hardwood and spruce-fir forests.

3.3.1.2 Environmental Effects

Land-disturbing activities associated with construction of the project's powerhouse, tailrace, transmission lines, substation, and a spoils area that would contain 23,000 cubic yards of excavated material has the potential to cause erosion and sedimentation.

During construction, the City proposes to implement erosion and sediment control measures to minimize erosion and sedimentation. The City states that all erosion and sediment control measures would be developed and implemented in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (New York DEC, 2005). The City also states that a New York DEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharge would be required for the project and that the project would also be required to comply with the City's erosion control rules and regulations. The City would update the conceptual erosion and sediment control plan contained in the license application once the final project design plans are completed.

The New York DEC's WQC has a number of conditions relating to the prevention and minimization of erosion and mobilization of sediment during project construction. These include development of a Stormwater Pollution Prevention Plan and the use of BMPs, and regrading and reseeding disturbed areas.

Staff Analysis

The proposed project construction would result in ground and riverbed disturbance, and could potentially result in sediment reaching the West Branch of the Delaware River. However, the City's development of an updated erosion and sediment control plan incorporating New York State Standards and Specifications for Erosion and Sediment control and the provisions of a SPDES would minimize erosion and sedimentation associated with construction-related activities. The use of cofferdams during excavation of the tailrace would contain sediment-laden water and allow it to be pumped to settling basins for sediment removal.

3.3.2 Aquatic Resources

3.3.2.1 Affected Environment

Water Usage and Quantity

Cannonsville Reservoir is one of several water supply reservoirs that are owned and operated by the City and provide potable water for New York City and four nearby counties. The entire water supply system currently provides approximately 1.1 billion gallons (BG) of unfiltered high quality drinking water daily to approximately nine million

New York State residents (approximately 50 percent of the state's total population), as well as the millions of tourists and commuters who visit New York City annually.

The annual withdrawal volume varies, ranging from a low of 14,687 million gallons ("MG") in 2006 to a high of 105,536 MG in 1992. The average annual withdrawal volume over the period 1982-2007 was 55,492 MG. The variation in annual withdrawal volumes is a function of many variables, including storage capacity, precipitation, snowfall, water quality in the City's water supply reservoirs, and demand.

In 1977, the New York DEC issued regulations that required minimum releases from the City's Delaware River Basin reservoirs for conservation purposes. The City operates the Cannonsville Reservoir to maintain conservation flows in the West Branch of the Delaware in accordance with the operating protocol agreed to by the Decree Parties. The conservation flow requirements of the FFMP-OST ensure compliance with such New York DEC release requirements.

Flows released from the dam to the West Branch of the Delaware River are measured by the U.S. Geological Survey (USGS) gage at Stilesville (No. 01425000). The drainage area at this gage is 456 square miles. Average monthly discharge ranges from 346 cfs (November) to 1,270 cfs (April), but is highly variable due to reservoir operation.

Water Quality

As noted above, Cannonsville Reservoir supplies New York City with high quality unfiltered drinking water. New York State classifies Cannonsville Reservoir as either Class AA or Class A and the West Branch of the Delaware River entering the reservoir and downstream from the reservoir to the Pennsylvania state line as Class B (table 2). In addition, all of these waters are also designated and protected as trout waters.

Table 2. Relevant New York fresh surface water quality classifications.

Class	Description and Designated Uses
AA	The best usages of Class AA waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish, shellfish, and wildlife propagation and survival. This classification may be given to those waters that, if subjected to approved disinfection treatment, with additional treatment if necessary to remove naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.
A	The best usages of Class A waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish, shellfish, and wildlife propagation and survival. This classification may be given to those waters that, if subjected to approved treatment equal to coagulation, sedimentation, filtration and disinfection, with additional treatment if necessary to reduce naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.
B	The best usages of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival.

Numerical water quality criteria applicable to Cannonsville Reservoir and the West Branch of the Delaware River are presented in table 3.

Table 3. Summary of New York State surface water quality criteria.

Parameter	Standard
Turbidity	No increase that will cause a substantial visible contrast to natural conditions.
Phosphorus and nitrogen	None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.
Thermal discharges	See 6 NYCRR Part 704, Criteria Governing Thermal Discharges.
Flow	No alteration that will impair the waters for their best usages.
pH	Shall not be less than 6.5 nor more than 8.5.
Dissolved oxygen (DO)	For trout waters (T), the minimum daily average shall not be less than 6.0 mg/L, and at no time shall the concentration be less than 5.0 mg/L. In rivers and upper waters of lakes, not less than 6.0 mg/L at any time. In hypolimnetic waters, it should not be less than necessary for the support of fish life, particularly cold water species.

Source: NYSDEC, 2008b

Cannonsville Reservoir – Dissolved Oxygen and Temperature Profiles

From a limnological standpoint, Cannonsville Reservoir is considered to be mesotrophic.[8] In recent years, water quality, in particular total phosphorus concentrations, has improved as the City has continued to implement nutrient reduction strategies in the watershed.

Limnological surveys of Cannonsville Reservoir have historically been performed by the City twice monthly from April through November. Since 2009, the sampling frequency has been reduced to once-per-month during those months. The surveys include dissolved oxygen concentration (DO) and temperature profiles at various locations in the reservoir. Water temperature and dissolved oxygen concentration "profiles" taken mid-channel near the dam and near the low-level intake in 2006 are shown in figures 3 and 4, respectively.

As the temperature profiles show, a thermocline generally develops during May and June. As the summer progresses, the thermocline moves lower in the reservoir and there are greater thermal differences between surface water temperatures and bottom temperatures. Near the intake to the low-level release works, the water temperatures

[8] Mesotrophic lakes are lakes with an intermediate level of productivity. These lakes are commonly clear water lakes and ponds with beds of submerged aquatic plants and medium levels of nutrients.

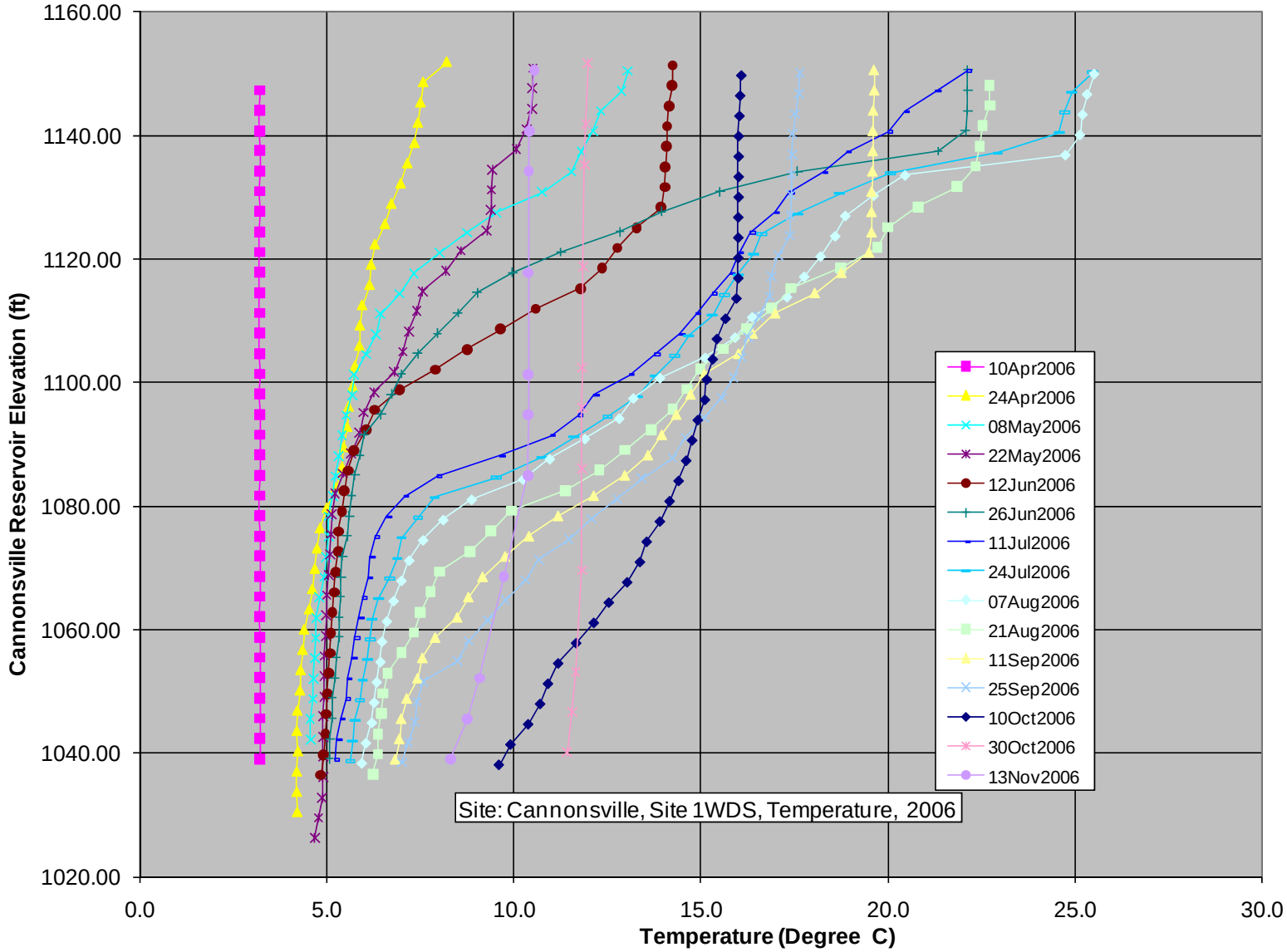

Figure 3. Cannonsville Reservoir - 2006 temperature profiles, mid-channel at Cannonsville Dam (Source: applicant).

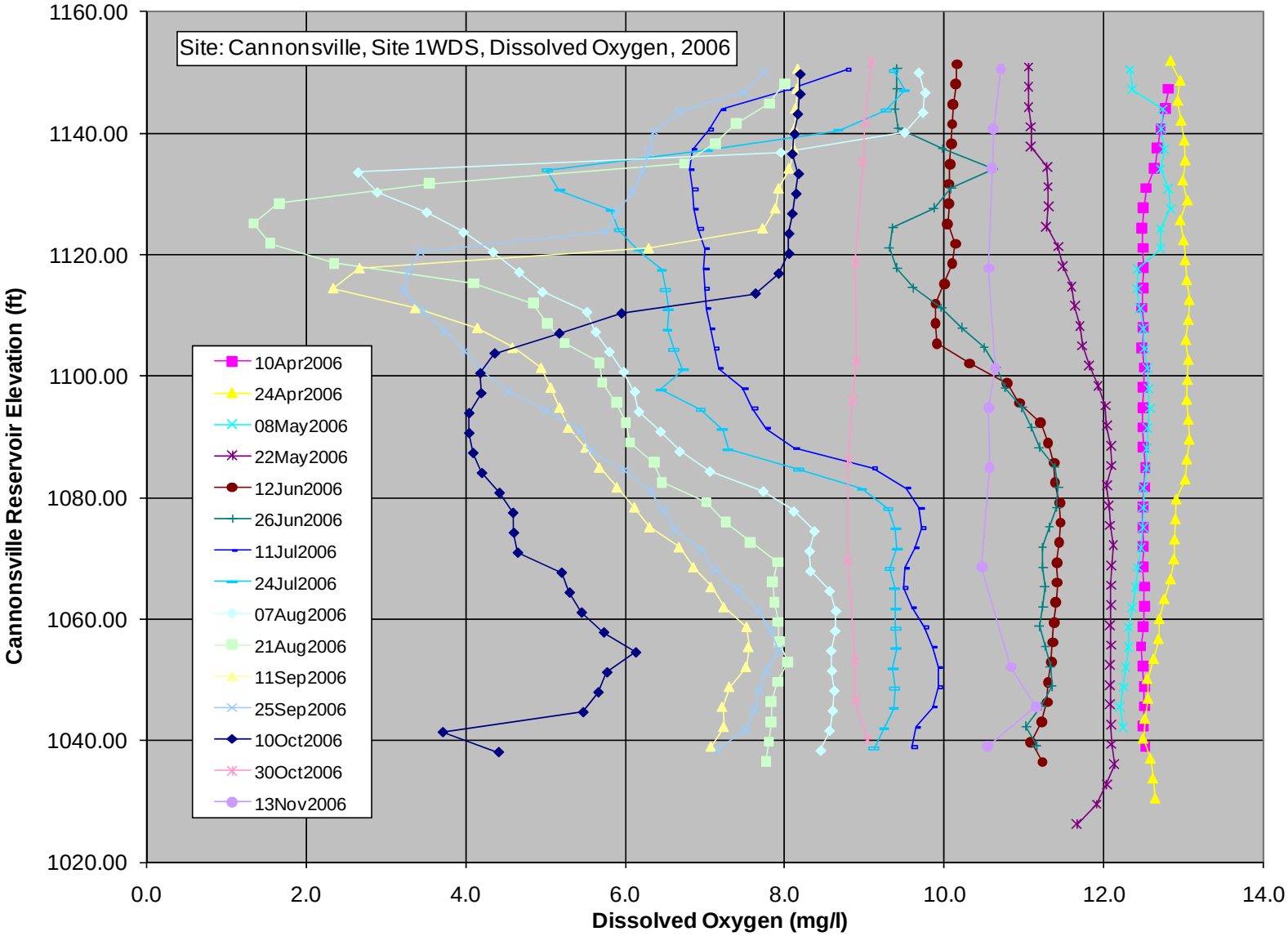

Figure 4. Cannonsville Reservoir - 2007 dissolved oxygen profiles, mid-channel at Cannonsville Dam (Source: applicant).

ranged from 6-10 degrees Celsius ("ºC"), which is much colder than the surface water temperatures (which could be as high as 25ºC in the summer). As described later, the water temperatures in the West Branch of the Delaware River, just below the dam, are typically less than 10ºC when the flow is composed only of the low-level release works discharge.

As the DO profiles show, in the spring the DO concentrations are relatively uniform throughout the water column. As summer begins and air temperatures warm, DO concentrations become stratified, with generally lower concentrations in the lower depths of the reservoir. A metalimnetic oxygen minima [9] is apparent in late summer and is consistently observed in this reservoir (Effler, et al. 1998). As described below, the DO concentrations in the West Branch of the Delaware River, immediately below the dam, are well above New York State water quality standards.

Cannonsville Dam Release – West Branch of the Delaware River – DO and Temperature

Conservation flow releases and directed releases are maintained through the low-level release works and into the West Branch of the Delaware River. In addition, when the spillway crest is exceeded, spill flows are passed to the West Branch of the Delaware River. The City obtains temperature and DO data below the dam near the USGS gage at Stilesville, which represents a combination of conservation flow releases, directed releases, and spillage flows.

Water temperature and DO concentration data for 2006 and 2007 are shown in figures 5 and 6, respectively. These figures also show total discharge on the dates the samples are taken. Flows over 1,500 cfs represent spillage at the dam. During periods of spillage, water temperature may rise, as warmer water from the reservoir surface mixes with the cooler low-level outlet releases.

As figure 5 shows, water temperatures at the USGS gage are cool throughout the year due to the deep intake leading to the low-level release works. The highest measured water temperature during the two years was 16.7 ºC and occurred on September 5, 2006. However, releases were generally less than 10ºC throughout the year.

As figure 6 shows, DO concentrations are relatively high in the spring and gradually decline to a low point in the early fall before rebounding again. This phenomenon was observed in 2006 and 2007, and is due to warming of the hypolimnion as the summer season progresses. Generally, DO concentrations were well above state standards (i.e., 6.0 mg/L as a daily average, 5.0 mg/l instantaneous); the lowest reading,

[9] Metalimnetic oxygen minima are depressions in the DO concentration in the metalimnion of lakes and reservoirs which can result from oxygen consumption from respiration or decomposition of phytoplankton or respiration of zooplankton concentrated in that area by water density gradients.

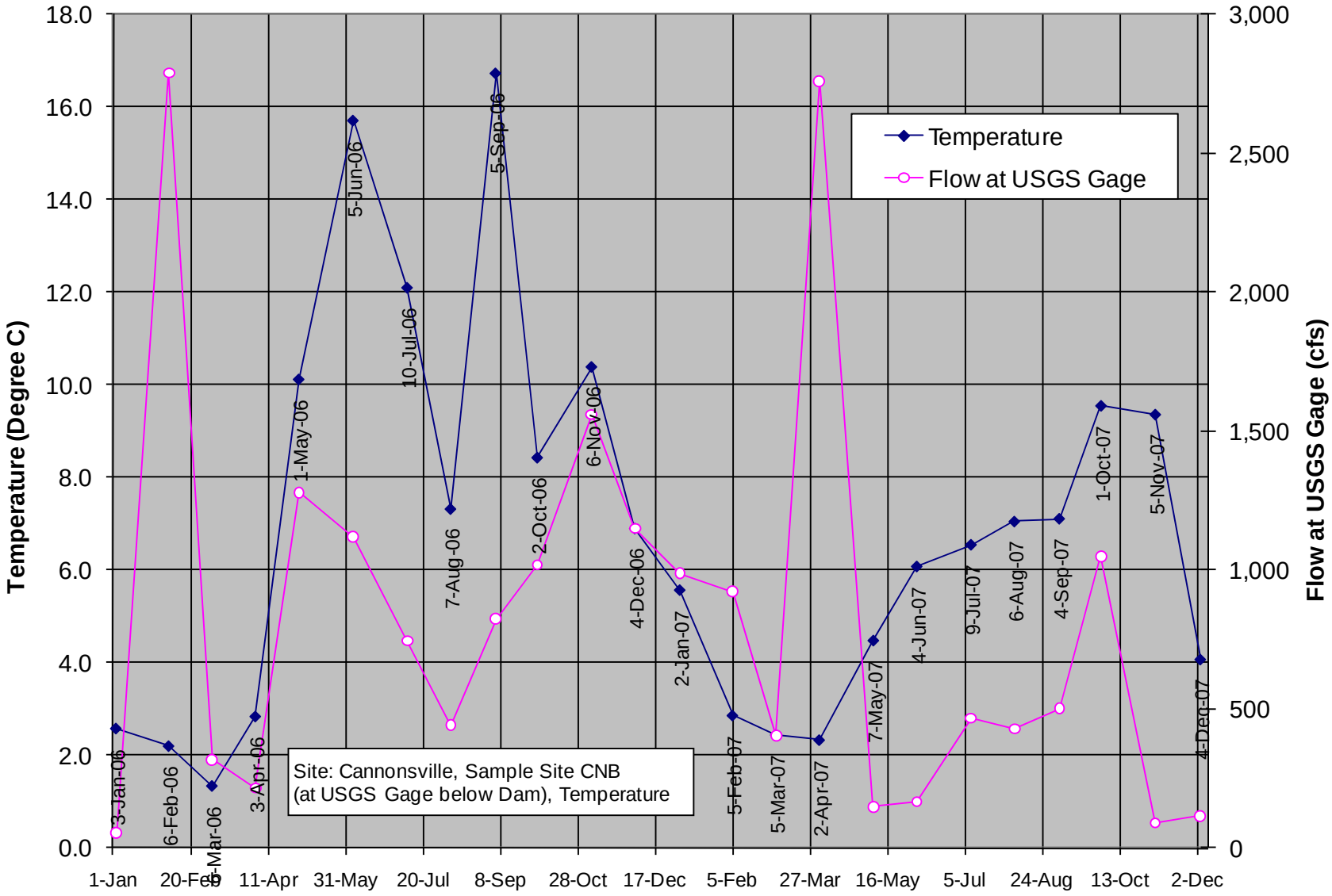

Figure 5. Cannonsville Release - 2006 & 2007 water temperature data collected at USGS gage at Stilesville (Source: applicant).

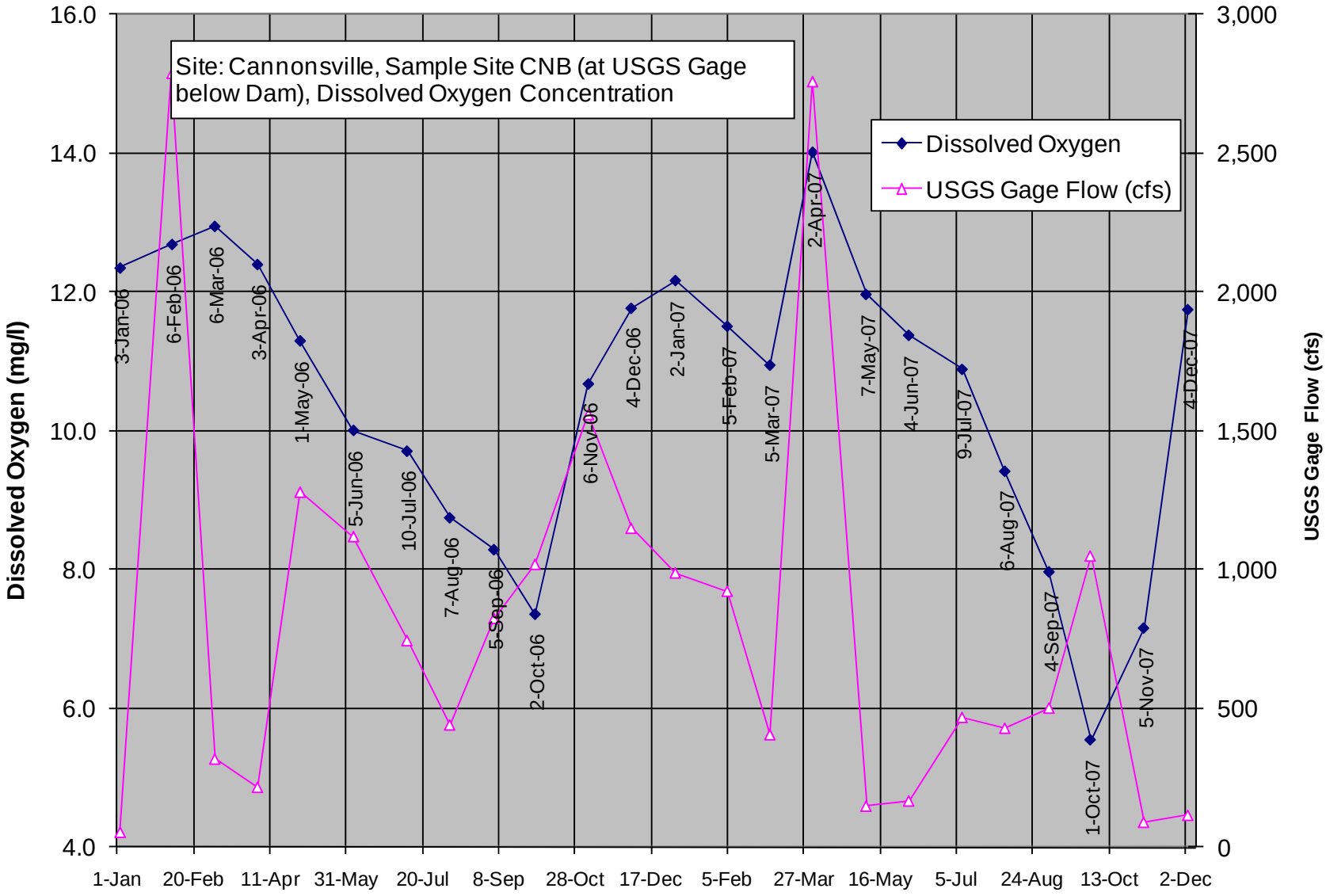

Figure 6. Cannonsville Release - 2006 & 2007 water temperature data collected at USGS gage at Stilesville (Source: applicant).

which occurred on October 1, 2007, was 5.6 milligrams per liter ("mg/L") - all other measurements were above 7 mg/L.

Fishery Resources

This section describes the fisheries resources found in the West Branch of the Delaware River upstream of Cannonsville Reservoir, in Cannonsville Reservoir, and in the West Branch of the Delaware River downstream from Cannonsville Reservoir.

West Branch of the Delaware River above Cannonsville Reservoir

From its headwaters in Schoharie County to the Cannonsville Dam, the West Branch of the Delaware River runs approximately 43 miles and passes through mostly farmland. Brown trout are stocked by the New York DEC in mid-April and again in mid-May. About one-third of the brown trout in this reach are wild fish. Some wild brook trout exist in tributary streams. Largemouth and smallmouth bass, chain pickerel, and yellow perch also are present in this reach of the river.

Cannonsville Reservoir

Cannonsville Reservoir supports both warm and coldwater fish communities. Fish species found in the reservoir are listed in table 4. The New York DEC manages the reservoir as a coldwater trout fishery and has been monitoring trout populations in the reservoir through angler creel surveys and angler diaries. Brown trout were stocked in the reservoir from 2005 to 2008 to determine whether the population would respond to enhancement efforts. The study results indicated that the population has responded well to the stocking and has provided additional opportunities to catch trout. Through angler diaries recorded since the inception of the reservoir stocking program, the trout fishery has been monitored and will continue to be monitored (NYSDEC 2005; 2007a; 2007b, 2008b).

Table 4. Fish species found in Cannonsville Reservoir.

Common Name	Scientific Name	Common Name	Scientific Name
Brown trout	*Salmo trutta*	White sucker	*Catostomus commersonii*
Brook trout	*Salvelinus fontinalis*	Slimy sculpin	*Cottus cognatus*
Smallmouth bass	*Micropterus dolomieu*	Fallfish	*Semotilus corporalis*
Yellow perch	*Perca flavescens*	Creek chub	*Semotilus atromaculatus*
Alewife	*Alosa pseudoharengus*	Blacknose dace	*Rhinichthys atratulus*
Rock bass	*Ambloplites rupestris*	Longnose dace	*Rhinichthys cataractae*
Pumpkinseed	*Lepomis gibbosus*	Common shiner	*Luxilus cornutus*
Bluegill	*Lepomis macrochirus*	Golden shiner	*Notemigonus crysoleucas*
Chain pickerel	*Esox niger*	Tessellated darter	*Etheostoma olmstedi*
Brown bullhead	*Ameiurus nebulosus*	Goldfish	*Carassius auratus*
Common carp	*Cyprinus carpio*	Rudd	*Scardinius erythrophthalmus*
Black crappie	*Pomoxis nigromaculatus*		

West Branch of the Delaware River below Cannonsville Dam

Cold water releases in the summer from the Cannonsville Reservoir provide suitable temperatures for trout to reside in the entire 17.7 miles of the West Branch of the Delaware River to its confluence with the East Branch of the Delaware River. Consequently, the West Branch of the Delaware River below the Cannonsville Reservoir supports a renowned trout fishery. Fish population sampling showed that brown trout are the most abundant species followed by rainbow trout and lastly a small component of brook trout. Trout abundance is higher in the upper reaches (near the dam) than in the lower 12 miles leading to the confluence with the East Branch of the Delaware River (New York DEC 2008a).

3.3.2.2 Environmental Effects

This section assesses the potential effects of the construction and operation of the City's proposed Cannonsville Project and alternatives on aquatic resources.

Project Operation – Flow Releases

The City proposes to continue to operate the reservoir/project in accordance with the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties, during both project construction and project operation. Electricity would be generated using the flow releases made to the West Branch of the Delaware River. The City's water supply diversions would continue to be made from the reservoir. The reservoir elevation would continue to vary as a function of inflows and outflows.

Interior's 10(j) recommendation No. 1 states that the project be operated in strict compliance with the FFMP-OST. New York DEC's WQC conditions AP1B and FO1 specify that the project be operated in accordance with the FFMP-OST. Condition FO1 acknowledges that the Decree Parties may change the operating protocol and that the WQC would incorporate the new protocol.

Staff Analysis

Because flow releases during project construction and subsequent operation would continue to be made in accordance with the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties, there would be no effects on flow releases from Cannonsville Reservoir as a result of construction and operation of the project. Operation of the project in accordance with the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties, would ensure that the municipal water supply system and downstream releases are maintained, and that the reservoir would continue to provide flood control benefits.

Flow Management during Construction

During construction, there would be an approximately 3-month period during which no water is conveyed to the tailrace channel, when the pipe leading to the low-level release works is bifurcated to accommodate the powerhouse. During this period, conservation releases to the West Branch of the Delaware River would be maintained in the spillway channel via two temporary siphons installed over the spillway crest. The temporary siphons would have the capacity to convey up to 400 cfs into the spillway channel. The City prepared a Flow Management Plan, included as Volume 11 to its license application, that would be implemented during the estimated 3-month period of siphon operation that addresses maintenance of flow quantity and quality during project construction.

In addition to its specifications regarding flow releases discussed above, the New York DEC's WQC includes several conditions (CO1, CO2, CO3) that address the use of siphons for flow management during this period. These conditions address water temperature issues that could arise if the siphons transported warm reservoir surface waters into the West Branch of the Delaware River, as discussed in the next section.

Staff Analysis

The City's Flow Management Plan describes its proposed measures to ensure the continuation of the required downstream flow releases during a portion of the construction period. The City proposes to pass the required flows via siphons into the spillway channel when neither the low-level outlet works nor the proposed powerhouse is available for this purpose. The City's Flow Management Plan and the relevant WQC conditions would ensure flows of the appropriate quantity (i.e., in accordance with the applicable operating protocol as agreed to by the Decree Parties) and quality (i.e., temperature) are passed downstream during construction when the outlet works are unusable. Because the City's Flow Management Plan was prepared prior to issuance of the WQC, it would be appropriate to update the plan to incorporate the WQC conditions.

Effects of Project Construction on Water Quality and Fishery Resources

The City proposes to implement BMPs to minimize erosion and sediment transport from areas of disturbed ground on the downstream side of Cannonsville Dam to the West Branch of the Delaware River. As mentioned above, the City would be passing water downstream via siphons during a 3-month period when the outlet works are unavailable, and has prepared a Flow Management Plan to ensure the required flows are of the appropriate quantity and quality to support downstream resources and meet regulatory requirements.

The City conducted a modeling study of flow conditions that would occur in the tailrace channel[10] while the siphons were in use. The study showed that at a 200-cfs flow (one siphon at maximum capacity) a backwater extends up the tailrace channel to the low-level release works outlet. However, the water depth and channel width would be reduced and there would be no current. The City states that while the tailrace channel would be subject to increased heating during this period, the cooler air temperatures at the time of year (October – December) siphons are in use would minimize this effect.

As mentioned above, both Interior (10(j) recommendation No. 1) and New York DEC (WQC conditions AP1B and FO1) would have the City continue to release water from the reservoir in accordance with the FFMP-OST.

New York DEC's WQC for the project has 3 conditions (CO1, CO2, and CO3) that address siphon use for flow maintenance during construction. The purpose of these conditions is to ensure that during the period that siphons are in use that the temperature of water released downstream is fully supportive of the coldwater (i.e., trout) fishery downstream. The conditions limit siphon use to the October 1 – May 15 time period and a maximum water discharge temperature of 60 degrees, or the water temperature at the low-level intake, if warmer.

Staff Analysis

During construction of the new powerhouse and related facilities, including excavation of the tailrace, water quality in the West Branch of the Delaware River could be affected by erosion and sedimentation from disturbed areas at the base of the downstream side of the dam, and by the passage of downstream flows via siphons into the tailrace channel instead of through the existing outlet into the tailrace channel. Any significant changes in water quality could result in effects to fisheries resources in the West Branch of the Delaware River.

As discussed in section 3.3.1.2, implementation of the City's Erosion and Sediment Control Plan, including the use of cofferdams and BMPs, would minimize the erosion of disturbed land and sediment transport into the West Branch of the Delaware River. This would limit the potential for the introduction of suspended sediments into the tailrace channel. Any suspended sediments that are introduced would be likely to settle out in the tailrace channel, and not be transported downstream, especially when the siphons are in use and there is no flow in the tailrace channel.

Although diversion of downstream flows into the tailrace channel would minimize sediment transport from the tailrace channel, it raises the possibility of water quality

[10] The tailrace channel is defined as the reach from the low-level release works discharge point to the confluence with the spillway channel.

effects resulting from the temporary cessation of flow through the tailrace channel. Cessation of flow in the tailrace channel would reduce water depths somewhat and allow for increased heating of water in the tailrace channel and potentially reduced DO concentrations. However, the time of year restrictions on siphon use would minimize these effects.

Because the temporary effects of project construction on water quality in the West Branch of the Delaware River below the dam are expected to be minimal, there is no reason to expect significant effects to fishery resources below the dam. If water temperature or flow changes in the tailrace channel do occur, or if reduced water depth renders the habitat to a less than desirable state, it is expected that fish would move downstream below the confluence of the tailrace and spillway channels.

Because all construction and ground disturbance would occur on the downstream side of Cannonsville Dam, effects on Cannonsville Reservoir water quality and fisheries are not expected to occur.

Water Quality Effects during Project Operation

The City proposes no new measures to benefit water quality during project operation. However, the City proposes to continue its current programs regarding the protection of water quality in its Cannonsville water supply reservoir. These include continuation of flow releases pursuant to the FFMP-OST or subsequent operating protocol agreed to by the Decree Parties, watershed protection activities, limitations on the use of gasoline motors, and the prohibition of shoreline development. The City would also continue to perform water quality monitoring pursuant to its water supply operations.

Interior provided a 10(j) recommendation (No. 1) that the project be operated in accordance with the FFMP-OST. New York DEC's WQC conditions FO1 and AP1B stipulate that the project be operated in accordance with the FFMP-OST.

Staff Analysis

During operation of the proposed project, reservoir operation including water supply withdrawals, releases to the West Branch of the Delaware River, and reservoir fluctuations would continue to be dictated by the requirements of the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties. Releases from the reservoir to the West Branch of the Delaware River would be made through the same intake structure, at the same depths, and at the same rates as currently occur. As a result, there is no reason to expect any changes in water quality due to project operation. Water quality would continue to vary among years; however, this variance would be due to

variations in weather events, inflow, water supply demands, and downstream water releases.

Although the City is not proposing any measures for the protection, mitigation, or enhancement of water quality following project construction, it does not appear that the project would have any potential to affect water quality in Cannonsville Reservoir or the West Branch of the Delaware River downstream of the project. Water would continue to be drawn from the reservoir through the same structure, and in quantities and timing that are the same as currently occur. Although not part of the proposed project, the City would continue its watershed protection and water quality programs that are incidental to its water supply operations.

Fish Impingement and Entrainment

In support of its license application, the City conducted a desktop evaluation of the potential effects of project operation on fish entrainment and mortality. The study found that based on the habitat and life history requirements and swimming speeds of the fish species found in the Cannonsville Reservoir, fish entrainment is expected to be low for all species. The City further stated that the deep-water location of the intake away from shoreline areas would further limit the risk of entrainment for fry and juvenile fishes, regardless of their swimming capabilities. The City states that only one large-scale entrainment event has ever been recorded by the City at Cannonsville; it occurred during 2005 when the reservoir level was very low. For fish that are entrained, the study concluded that the mortality rate would likely be 100 percent as a result of pressure changes experienced by the fish as they are entrained through the low-level intake and discharged into the tailrace.

In its December 18, 2012 letter, Interior stated that the City's study indicated that the likelihood of fish being entrained into the powerhouse intake is extremely low, due to the location of the intake relative to potential fish habitat. Interior further stated that the mortality rate for fish currently entrained at the project is likely 100 percent due to pressure changes that fish experience as they are transported downstream from the intake to the outlet and that the installation of turbines at the outlet is not likely to exacerbate this condition.

In a December 8, 2010 correspondence, the New York DEC stated that the addition of the proposed hydroelectric facilities would not have a significant impact on fisheries mortality at Cannonsville Reservoir. Later, however, in its December 21, 2012 comments on the license application, the New York DEC requested that the City perform additional studies to quantify and characterize the species and numbers of fishes entrained through the Cannonsville release works under existing and post turbine installation conditions. WQC conditions AP1.A.n., FSM1, FSM 2, and FSM3 require the

City to study and address any potential impacts such as fish mortality that may arise from proposed changes in operating parameters, or any unanticipated mortality that may be observed downstream of the outlet.

In its reply comments, the City provided additional explanation of why fish entrainment at the project is not a material concern. Nonetheless, in response to the New York DEC's request and the subsequent WQC conditions, the City has agreed to perform a field study during 2013 to provide site-specific fish entrainment information. The study is ongoing. In its comments on the draft EA, the City states that preliminary results from the study have found very few entrained fish.

Staff Analysis

When the project is operating, water would continue to be drawn through the existing low-level intake, and passed to the West Branch of the Delaware River. Under project operation, however, water would pass through turbines before being discharged to the river. Because the quantity of water being withdrawn would be the same as currently occurs, and because there would be no changes to water levels or the intake structure, there would be no change in water velocities at the intake. Consequently, there is no basis for any changes to the number of fish entrained due to operation of the project.

In many cases, the passage of entrained fish through hydroelectric turbines can result in injury or mortality to the entrained fish. In this case, however, at present, mortality of entrained fish is likely 100 percent. The addition of the proposed turbines at the reservoir outlet would not increase that percentage. Therefore, staff concludes that turbine entrainment and mortality would not change as a result of project operation.

3.3.3 Terrestrial Resources

3.3.3.1 Affected Environment

Cannonsville Reservoir is located to the west of the Catskills Mountains within the northern Allegheny Plateau (Bryce et al. 2010). In general, this region is characterized by areas of moderate to high elevation, typically above 1,200 feet, and numerous streams draining into several major river valleys, including the Delaware River (The Nature Conservancy 2000). Much of this region was cleared for farming in the 18th century, and the subsequent decline in farming has led to the return of forested communities, including the deciduous and mixed forests in the vicinity of the proposed Cannonsville Project (U.S. Geological Survey 2012).

The City conducted field surveys in June 2010 and April 2011 to determine the presence of botanical and wildlife resources, including rare species, in the portions of the project boundary that would be affected by construction of the proposed project.

Upland habitat

Upland habitat within the project boundary was substantially modified by the construction of the Cannonsville dam and reservoir, completed in 1964. Presently, land within the project boundary includes various forest community types (hemlock-northern hardwood forest, mixed mesophytic forest, and spruce-fir plantation), as well as open uplands, successional shrublands, and regularly maintained areas (mowed turf and access roads).[11]

The City describes forest habitat along the periphery of the reservoir as dominated by deciduous trees (including various maples, oaks, birches, cherries, ash species, and American beech) with some north-facing slopes dominated by coniferous species, principally eastern hemlock, with eastern white pine stands, and many planted stands of Norway spruce and other pine species.

Invasive plant species

The City observed several areas within the proposed disturbance area that have been colonized by invasive plant species (figure 7). Species observed include some species that readily colonize open and wetland habitat and can form large, monotypic stands (Japanese knotweed, multiflora rose, Japanese knotweed, honeysuckle spp., Japanese barberry, autumn olive, hairy willow herb, and reed canary grass) and introduced species that are relatively common in human-modified uplands (common mullein, common mugwort, and black locust).

[11] See table E-16 in the final license application.

Figure 7. Invasive plant species within the proposed project area (Source: license application).

Wetland and Riparian Habitat

National Wetlands Inventory (NWI) maps indicate the presence of wetland habitat within the proposed project boundary, including Cannonsville Reservoir, numerous emergent and forested wetlands connected to the reservoir,[12] and the dam's spillway and tailrace channels that combine to form the West Branch of the Delaware River (figure 8).

Cannonsville Reservoir is classified as permanently flooded and impounded limnetic, lacustrine habitat with an unconsolidated bottom (L1UBHh). Riverine habitat to the east of the dam includes: the higher gradient portion of the spillway channel adjacent to the dam, classified as permanently flooded, upper perennial riverine habitat with an unconsolidated bottom (R3RBH); and the lower gradient portion of the spillway channel and all of the tailrace channel, classified as permanently flooded, lower perennial riverine habitat with an unconsolidated bottom (R2UBH) (figure 9). There are no mapped New York State-regulated wetlands present in or adjacent to portions of the project boundary that would be disturbed by construction.

The City located unmapped wetland habitat present within the project boundary during its habitat surveys (figure 10), including: (1) an approximately 0.57-acre area along the north bank of the western end of the tailrace channel, described as persistent, seasonally-flooded, palustrine emergent wetland (PEM1E), with wetland plants including jewelweed, unidentified shrub willows, and reed canary grass; (2) an approximately 0.1-acre, spring-fed depression described as a saturated, persistent palustrine emergent wetland (PEM1B), with wetland plants including jewelweed, sensitive fern, and others; (3) a 0.6-acre floodplain area along the north bank of the tailrace, described as seasonally flooded, persistent palustrine emergent wetland (PEM1E), with plants including reed canary grass, jewelweed, and spotted joe pye weed; and (4) three vernal pools, observed during the City's April 2011 field surveys, including (i) a 200-square-foot pool in a mixed upland forest connected to a drainage ditch, (ii) a 600-square-foot pool adjacent to the proposed transmission line route that supported Northern red-backed salamanders, and (iii) a 7,500-square-foot linear pool fed by groundwater seepage, containing 20 amphibian egg masses.

[12] The largest of these is at the opposite end of the reservoir from the proposed project, including a 52-acre, seasonally flooded palustrine emergent wetland (PEM1E) at the upper reaches of the reservoir, and a 12-acre deciduous, semi-permanent palustrine scrub-shrub/emergent wetland located at the mouth of Trout Creek (PSS1/EM1E).

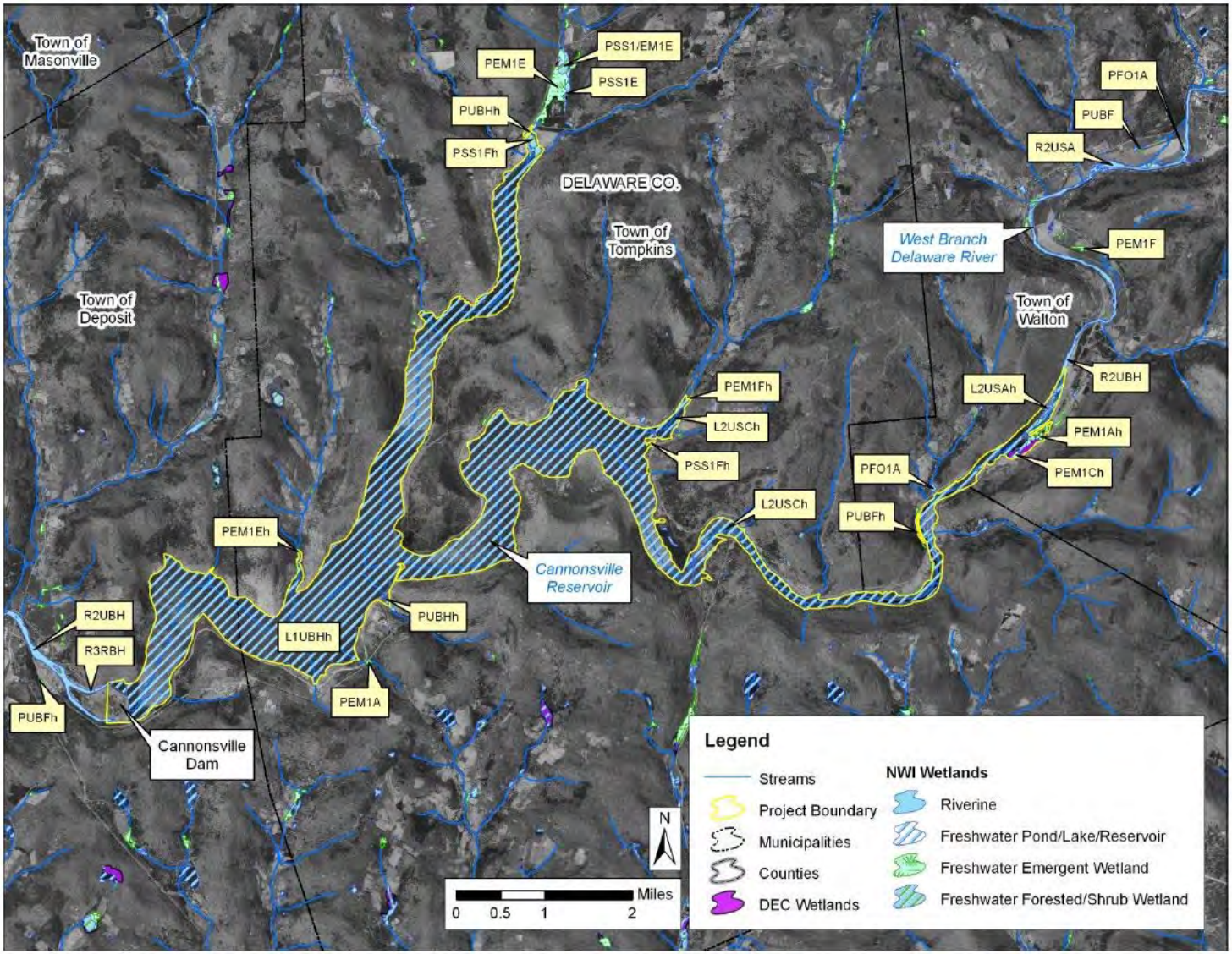

Figure 8. Freshwater wetlands mapped by New York DEC and the National Wetlands Inventory (NWI) near Cannonsville Reservoir (Source: license application).

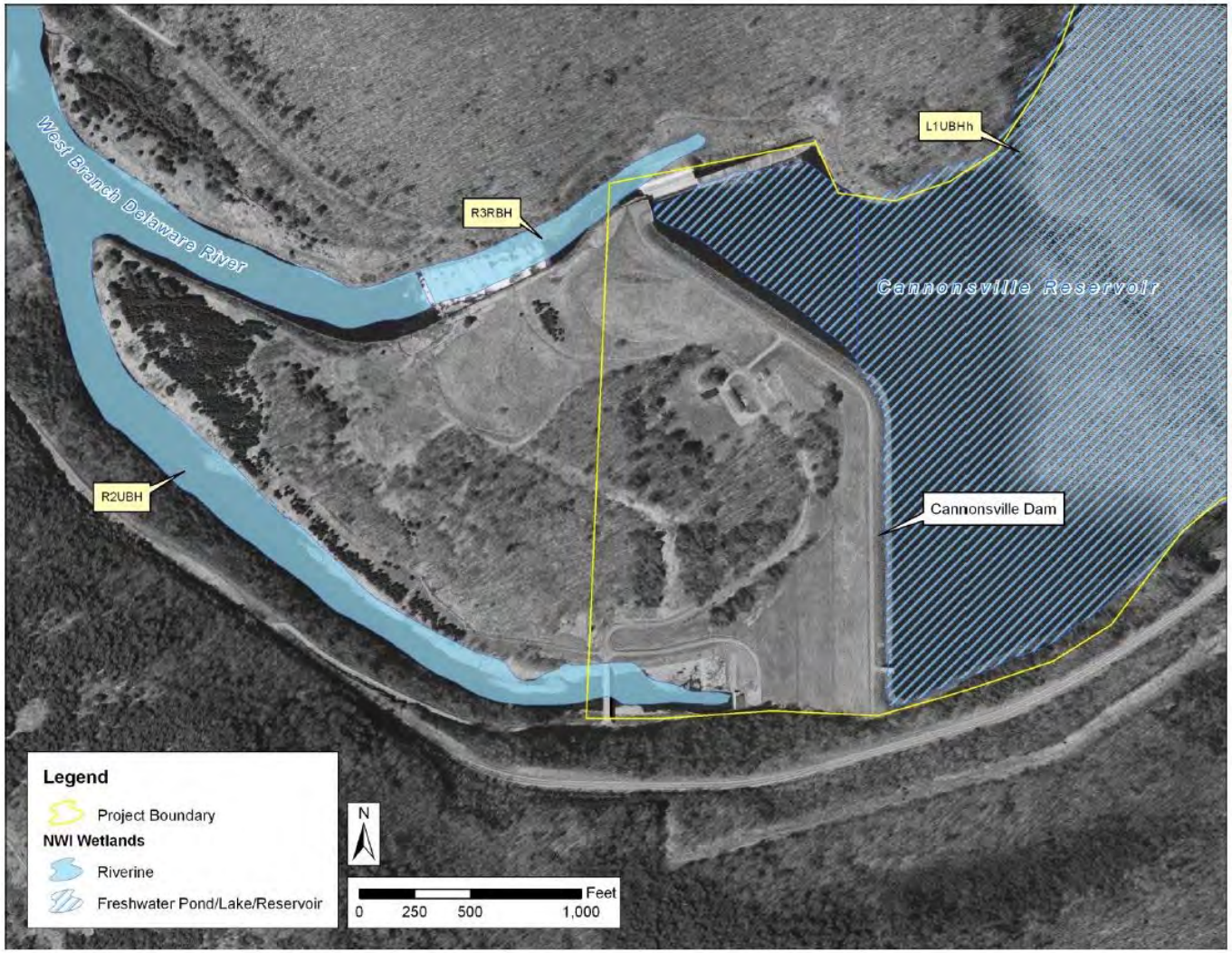

Figure 9. National Wetlands Inventory-mapped wetlands within the proposed construction area (Source: license application).

Figure 10. Wetlands and vernal pools within the proposed project boundary (Source: license application).

Little riparian habitat exists within the area proposed for project construction to the west of the Cannonsville Dam. The shoreline is engineered with rip-rap in the vicinity of the dam, the entire length of the spillway channel to the confluence with the tailrace channel, and within the tailrace channel between the existing low-level release works and an existing access bridge to the site. Downstream of the access bridge, the northern bank of the tailrace is moderately sloped and contains herbaceous vegetation (dominated by reed canary grass) and trees including sycamore, black locust, Norway spruce, and white pine. The northern bank slope flattens out and the riparian vegetation transitions to herbaceous cover closer to the confluence with the spillway channel. The southern bank of the tailrace channel below the access bridge is steep and forested. The spillway channel riparian zone of both riversides consists of riprap banks. East of the dam, Cannonsville Reservoir's approximately 61 miles of shoreline may support some riparian habitat, but it is varied in terms of slope, bank stabilization, shoreline vegetation, and fluctuations in water level.

Wildlife

Because of the relatively sparse human population and substantial forest resources surrounding Cannonsville Reservoir, it is likely that substantial and diverse wildlife populations exist in the project area. The area also likely supports transient wildlife during migration, breeding, and overwintering periods. The City conducted wildlife surveys in June 2010 and April 2011 within areas of the proposed project boundary where construction would occur.

Birds

During field surveys in the vicinity of the dam, the City observed waterbirds (including Canada goose and common merganser), wetland-associated species (red-winged blackbird) and forest-associated species (American crow, northern flicker, pileated woodpecker, hermit thrush, and black-capped chickadee), and species commonly found in human-modified landscapes (American robin).

Survey data from the 2000-2005 New York State Breeding Bird Atlas, for the area that includes the western portion of the reservoir, indicates the presence of various breeding birds, including waterfowl (wood duck, American black duck, mallard, and common merganser), other water-dependent species (great blue heron, spotted sandpiper, belted kingfisher, and various swallows), raptors (red-tailed hawk, American kestrel, bald eagle [discussed in detail below]), grassland species (savannah sparrow), and numerous species that require substantial forested habitat (ruffed grouse, blue-headed vireo, veery, magnolia, chestnut-sided, and black-throated blue warblers, ovenbird, dark-eyed junco, scarlet tanager, and rose-breasted grosbeak) (New York DEC 2013).

Additionally, various waterbird species, including waterfowl, herons, and gulls would be expected to use Cannonsville Reservoir and the West Branch during migratory and wintering periods, and the forest habitat within the project boundary would be used as stopover habitat during migration by a wide variety of passerine species. Most of the species expected to occur within the project boundary would be protected species under the federal Migratory Bird Treaty Act, with the exception of certain native species in families not covered by conventions implemented by the Migratory Bird Treaty Act (e.g., ruffed grouse, wild turkey) and non-native species (European starling and house sparrow).[13]

Mammals

The City observed eastern cottontail and white-tailed deer during its surveys. Based on the forested and open habitat present within the proposed construction area, and the sparse human population in the vicinity of the project, it is likely that many mammal species could use lands within the project boundary. These include aquatic mammals (American beaver, mink, river otter, muskrat, and long-tailed weasel), forest-dependent species (eastern coyote, black bear, bobcat, and fisher), and various bats and rodents. It is also likely that species adapted to human-modified habitats (raccoon and Virginia opossum) would be found in the vicinity of existing structures at the reservoir.

Reptiles and Amphibians

The City observed Northern red-backed salamanders and unidentified amphibian egg masses within vernal pools in the proposed construction area. As a mosaic of wetland and upland habitat is present within the proposed project boundary, it is likely that several reptiles (wood turtle, box turtle, and various snakes) and amphibians (various salamanders, and wood and pickerel frogs) would be present within the project boundary. In addition, the City found that the largest vernal pool observed to the north of the proposed powerhouse could serve as suitable habitat for state-listed species of special concern, including Jefferson and longtail salamanders.

Special Concern Species

The City conducted surveys for several wildlife and plant species and associated habitat that may occur at the project, including Bicknell's thrush, timber rattlesnake, brook floater, Jefferson and longtail salamander, and bald eagle. The City also surveyed for two federally listed species, northern wild monkshood and dwarf wedgemussel, which are discussed below in section 3.3.4, *Threatened and Endangered Species*.

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[13] See http://www.fws.gov/migratorybirds/regulationspolicies/mbta/mbtaprotectednonprotected.html.

Jefferson and Longtail Salamanders

The range for Jefferson and longtail salamanders includes southern New York. Jefferson salamanders are mole salamanders (*Ambystoma*), characterized by adults that spend most of the year underground and emerge in spring to breed (Ford and Johnson undated). Jefferson salamanders live within well-drained deciduous or mixed forest in proximity to vernal pools, surrounded by red maple, alder, buttonbush, or dogwoods. Longtail salamanders are typically found along borders of streams and seeps (New York Natural Heritage Program [NHP] 2013a). They typically breed in fall and winter, laying eggs over the winter period in stream or seep habitat.

The City observed vernal pool and other wetland habitat within the proposed construction area, particularly a 7,500-square-foot vernal pool that could support these and other salamander species.

Bald Eagle

Bald eagles are a state-threatened species in New York, and are protected under the federal Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. They forage primarily on fish (both live caught and scavenged), and also take some mammals and waterfowl during winter (New York DEC undated). For breeding birds, courtship and nest-building typically occurs from winter to early spring, and egg laying, incubation, hatching, and fledging from March through August (New York DEC 2013). Breeding eagles defend territories surrounding the active nest and one or more alternate nests used in other breeding seasons (FWS 2011). Communal wintering roosts, including adult and immature birds, are established in proximity to feeding areas during the fall and winter months.

Bald eagles are known to occur at Cannonsville Reservoir and the West Branch of the Delaware River during both breeding and wintering periods (New York DEC 2010). There are eight nests located on the reservoir, including two new nests in the 2012 breeding season adjacent to the proposed transmission line path. Bald eagles also forage and overwinter at the reservoir and are frequently found foraging immediately downstream of the dam in the vicinity of the proposed tailrace.[14]

Habitat alteration and loss of forested habitat adjacent to water bodies, particularly breeding habitat, continues to be a major threat to this species. Energy development, particularly wind turbines, towers, and electrical lines, increase the risk of mortality due to collision or electrocution (New York NHP 2013b). On the June 13, 2012 site visit, the City stated that a bald eagle had recently been electrocuted through contact with existing powerlines within the proposed project boundary.

[14] See Interior's letter dated December 18, 2012.

3.3.3.2 Environmental Effects

Project Operation – Flow Releases

As noted previously, the City would operate the proposed project in strict accordance with the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties. Operation of the project would be dependent on anticipated inflow, reservoir elevation, and the river stage on the West Branch of the Delaware River, and flow releases would be directed through monitoring of the USGS gage at Hale Eddy, New York (number 01426500) approximately 8 miles downstream of Cannonsville Dam.

New York DEC's WQC condition number FO1, and Interior's 10(j) recommendation (No. 1), both direct the City to operate the Cannonsville Project in strict compliance with the FFMP-OST.

Staff analysis

Operation of the proposed project under the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties, would be a continuance of existing reservoir operation. Terrestrial resources within the proposed project boundary, such as wetlands and riparian habitat, would continue to experience natural fluctuations in flows (e.g., higher flows due to storm events and lower flows during periods of drought) and water levels. Downstream flow releases would continue to vary in accordance with the operating protocol. Therefore, operation of the proposed Cannonsville Project is not expected to affect terrestrial resources.

Site Restoration following Construction

As noted above in section 3.3.1, *Geology and Soils*, land-disturbing activities would include construction of a penstock, intake, powerhouse and tailrace, and a transmission line and substation. Additionally, three staging areas north of the tailrace would be established, and a spoils area for holding 23,000 cubic yards of excavated material would be placed to the west of the proposed powerhouse (see figure 10).

In terms of the transmission line, the City proposes to construct: (1) a new 1,350-foot-long, 12.47-kV line (1,200 feet long above-ground, 150 feet long underground) with an approximately 30-foot-wide right-of-way leading from the powerhouse to a new substation; and (2) a new 460-foot-long, 46-kV above-ground line with an approximately 100-foot-wide right-of-way leading from the substation to an interconnection with the existing New York State Electric & Gas Corporation 46-kV transmission line. The 12.47-kV line would be constructed on 30-foot-high poles, and the 46-kV line on 45-foot-high poles.

The City proposes to deposit excavated material in a spoils area, and minimize the spread of invasive plant species during revegetation by: (1) covering excavated material with clean, weed-free top soil and mulch before seeding; (2) watering seeded areas as needed to establish grass; (3) placing a temporary cover such as straw if grass is not established due to the season in which the work takes place; and (4) using other best management practices, such as cleaning vehicles, boots, and tools prior to use on-site or movement off-site. The City proposes to include such measures in a detailed erosion and sediment control plan and stormwater pollution plan once the final design plans are completed.

New York DEC's WQC provided construction requirements, including condition numbers C10 and C11, addressing the use of appropriate seed material and mulch free of invasive species (such as purple loosestrife), and other best management practices.

Staff analysis

Construction of the Cannonsville Project would result in the disturbance of about 3 acres of existing open habitat (meadows and landscaped areas) for the approximately 2.3-acre spoils area and three staging areas, and the removal of approximately 2 acres of forested habitat for construction of the substation and transmission line within an area currently fragmented by existing transmission lines, roads, parking areas, and other structures.[15] Much of the open area is currently maintained by the City for reservoir operations or used for access roads and parking. Although removal of forested habitat may impact wildlife (as discussed below), it is unlikely that it represents a major effect on forested resources in the region. Implementation of its updated erosion and sediment control plan, as proposed by the City, including measures to minimize the spread of invasive plant species, would be adequate to minimize impacts to upland habitat within the construction area.

Construction Impacts on Wetlands and Vernal Pool Habitat

The City proposes to minimize impacts to wetland habitat, including vernal pools, within upland areas during construction by placing signage to identify areas to be avoided. The City does not currently propose to mitigate for the loss of emergent wetland within the proposed tailrace area, as it considers this activity to be a conversion of emergent marsh to open water habitat. However, the City included a line item cost for wetland mitigation in its license application to address mitigation if it is required following consultation with the Corps.

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[15] Acreage estimated by staff from aerial imagery and information provided in the City's application.

In its August 14, 2012, letter, the Corps states that if the proposed project will result in the loss of greater than 0.10 acre of waters of the United States, including wetlands, the City should provide wetland mitigation to compensate for the losses of waters of the United States. No other entities commented on construction-related impacts on wetlands.

Staff analysis

Construction of the project would involve: 1) tailrace excavation that would remove 0.57 acre of palustrine emergent marsh; and 2) construction of project features, including a transmission line and spoils pile, in the vicinity of wetland habitat, including vernal pool habitat, that occur within 100 feet of these proposed project features.

Although the City has proposed placing signage adjacent to vernal pool habitat to be avoided during construction, it appears that other wetland areas (see parcels C-10 and C-4a in figure 10) are located adjacent to proposed project features, and impacts to these wetlands could also be minimized by similar avoidance measures. Additionally, the project would permanently remove emergent marsh within the tailrace. Therefore, the development of a wetland avoidance and mitigation plan that formalizes measures to avoid impacts to wetlands, including vernal pool habitat, adjacent to project features, and identifies on-site mitigation opportunities for the loss of wetlands due to construction (such as restoration or enhancement of existing emergent wetlands adjacent to the tailrace channel), would assist in reducing impacts to wetland habitat associated with the proposed project.

In its comments on the draft EA, the City stated that it was preparing a Compensatory Mitigation Plan as part of the section 404 permitting process. It states that the plan would include the wetlands avoidance and mitigation measures and agency consultation recommended by staff in the Draft EA.

Bald Eagle Protection

As noted above, the City proposes to construct new facilities for the Cannonsville Project, including 1,810 feet of transmission lines,[16] a substation, and a spoils pile. The City currently monitors bald eagle populations at the Cannonsville Reservoir, and currently participates in New York DEC's Eagle Conservation Plan, relative to the site's function as a City-owned water supply reservoir.

[16] Consisting of 460 feet of overhead 46-kV line, 1,200 feet of overhead 12.47-kV line, and 150 feet of underground 12.47-kV line.

New York DEC's WQC condition T/E4 and Interior's 10(j) recommendation no. 5 both would have the City develop an eagle conservation plan to address construction impacts on bald eagles, including the identification of activities that can occur within 330 feet and 660 feet of any bald eagle nest during the breeding season (January 1 to July 31), use of avian protection measures in the design of electrical facilities, and other elements. Interior's 10(j) recommendation nos. 3 and 4 (see below) address the protection of migratory birds in general, including bald eagles.

Staff analysis

Presently, eight bald eagle nests have been identified within the project boundary, including at least two within or adjacent to the proposed construction area. Construction of the project has the potential to affect bald eagles by disturbing nesting, roosting, or foraging activity through: avoidance or nest failure due to construction noise and human presence during the breeding season; removal of habitat used for nesting or roosting; direct mortality at power lines through collision or electrocution; and other factors.

As noted, the City has an established protocol for monitoring bald eagles at Cannonsville Reservoir. By continuing such monitoring activity, developing a site-specific bald eagle conservation plan in consultation with FWS and New York DEC, and following the terms of its New York DEC's threatened and endangered species take permit, we conclude that impacts to bald eagles associated with the project would be minimized. Following the additional recommendations discussed below, including development of an avian protection plan for the project and following Avian Power Line Interaction Committee (APLIC)[17] guidelines for constructing all above-ground transmission line structures, would provide further protection for bald eagles, as well as other migratory bird species.

Migratory Bird Protection

The City has proposed to include raptor protection measures when developing the project transmission line, such as overhead grounded static wires on the transmission lines, cross arms installed on the new supply line poles, and other guidelines recommended by APLIC (APLIC 2006).

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[17] APLIC is a collaboration among numerous electrical utilities and research groups and the FWS that was formed to identify the causes of, and develop methods and designs to minimize, avian electrocutions and collisions at power lines. APLIC has released guidelines to address avian electrocution (APLIC 2006), collision (APLIC 2012), and the development of national Avian Protection Plan guidelines (APLIC and FWS 2005).

Interior's revised 10(j) recommendation no. 2 would have the City protect and enhance migratory birds by taking all practical measures to avoid take and minimize disturbance during project construction and operation. Interior's 10(j) recommendation no. 3 states that the City should construct its transmission lines underground, or follow APLIC guidelines for construction of above-ground lines to reduce mortality caused by collision or electrocution. Interior's 10(j) recommendation no. 4 states that the City should develop an avian protection plan for the protection of migratory birds, including bald eagles, in consultation with New York DEC and FWS. Additional discussion of Interior's 10(j) recommendations is contained in section 5.4, *Fish and Wildlife Agency Recommendations.*

Staff analysis

Migratory birds may be affected by vegetation removal during project construction or maintenance that would disturb or eliminate nests (resulting in the loss of nestling or adult birds) during the breeding season, or by mortality of birds that come into contact with transmission lines and associated electrical structures. Raptors, including bald eagles, and other large-bodied birds such as waterbirds, may be at higher risk for collision or electrocution due to their large size, hunting strategies, and nesting preferences (APLIC 2006).

As described above, construction of the Cannonsville Project would involve the disturbance or removal of approximately 3 acres of open land and approximately 2 acres of forested land. A portion of the affected open land is maintained lawn, and thus unlikely to support migratory bird breeding activity. The remaining open and forested habitat to be disturbed by construction would support several migratory bird species during the breeding season, which would be approximately May through August for bird species other than bald eagles and other raptors. During project operation, the City would maintain areas around the proposed project facilities, including transmission line corridors, by mowing.

We note that Interior's recommendations and New York DEC's requirements regarding bald eagle protection would restrict the City's construction and maintenance activity in proximity to bald eagle nests. The City, under the terms of its New York DEC incidental take permit for bald eagles and WQC conditions T/E 1 through 7, would have restrictions on vegetation clearing in proximity to bald eagle nests between January 1 and July 31. In addition, the City states that due to bald eagle nesting activity, the substation, powerlines, and related structures would be constructed towards the end of each year (approximately October through December) in which construction occurs, and thus would not overlap with the breeding season for migratory bird species expected to occur within the construction area. Thus, the City's proposed and the New York DEC's required bald eagle protection measures would also benefit other migratory bird species within the project boundary.

The City proposes, and Interior recommends, raptor protection measures to be applied to the project transmission line, following APLIC's 2006 guidelines focusing on electrocution at electrical facilities. We conclude that following such a measure would minimize bird mortality due to electrocution. As collision with power lines is also a potential source of mortality, particularly for large-bodied birds and waterfowl that may be in transit between the reservoir and the West Branch of the Delaware River, including measures recommended in APLIC (2012) to minimize collision-related mortality would further minimize the effects of the proposed transmission line on wildlife, particularly birds. Further, incorporation of Interior's 10(j) recommendation nos. 3 and 4, which direct the City to follow APLIC guidelines in the design of its transmission line (for areas where underground placement of the transmission line is not feasible) and develop an avian protection plan for the protection of migratory birds in consultation with the FWS and New York DEC. These recommendations would be beneficial, as they would result in a formal description of avian protection measures for the project.

3.3.4 Threatened and Endangered Species

3.3.4.1 Affected Environment

Interior's December 18, 2012 letter stated that two federally listed species protected under the ESA are known, or have the potential, to occur in Delaware County, New York: the threatened northern wild monkshood (*Aconitum noveboracense*) and the endangered dwarf wedgemussel (*Alasmidonta heterodon*). The City conducted field surveys for northern wild monkshood in 2010 and 2011, and both desktop and field surveys for dwarf wedgemussel within the proposed project tailrace in 2010 and 2012, respectively.

Northern Wild Monkshood

Northern wild monkshood was listed for protection under the ESA in 1978. It is an upright herbaceous plant with blue, "hooded" flowers (New York NHP 2013c). It flowers between July and August, with fruits present through the fall. In New York, this species occurs along streams or seeps in forests with beech, sugar maple, yellow birch, eastern hemlock, and other species.

About five viable populations are known to occur in the Catskill Mountains of New York (New York NHP 2013c). All occurrences in New York have been found in rocky or sandy soils, between approximately 1,300 and 3,300 feet in elevation.[18] Threats to the survival of northern wild monkshood include fluctuating conditions along

[18] The Cannonsville Project is located at approximately 1,400 feet in elevation.

stream banks (including severe flooding, trout stream improvements, and flood control projects) and possible direct damage by recreationists.

The City conducted surveys for northern wild monkshood in June 2010 and April 2011, and surveyors observed no individuals within the proposed construction area or buffer areas that would surround proposed project features.

Dwarf Wedgemussel

The dwarf wedgemussel was listed for protection under the ESA in 1990. It is a small mussel, typically less than 1.75 inches long (Nedeau 2008). It is found in both small and large waterways (although it does not occur in large reservoirs or lakes), in a variety of substrate types (clay, sand, gravel, pebble, or large amounts of silt), and at variable depth (from stream banks to depths of 25 feet). Thresholds for water temperature and flows are not well understood for the dwarf wedgemussel, and those thresholds indicated through modeling have not yet been verified through laboratory testing (Castelli et al. 2012). However, stable flows and stable substrate may be critical factors for the presence and persistence of this species (Strayer and Ralley 1993, Strayer 1999, Baldigo et al. 2004 as cited in in Nedeau 2008). Host fish species for dwarf wedgemussels are still under review (New York NHP 2013d), but are known to include the tessellated darter, slimy sculpin, mottled sculpin, Atlantic salmon (parr), striped bass, and banded killifish in various parts of its range (Nedeau 2008).

Three dwarf wedgemussel populations are present within the mainstem of the Upper Delaware River Basin between Hancock, New York and Callicoon, New York (Moloney et al. 2012). The closest known population is about 22 miles downstream from Cannonsville Dam. These populations are located in shallow water, with slow and less variable flow than adjacent locations. These sites are thought to be susceptible to temperature fluctuations, with the Callicoon mussel site considered the most sensitive of the three (Cole et al. 2008).

Threats to the survival of this species include water pollution, flow alteration, and sedimentation due to impoundments. Castelli et al. (2012) and Maloney et al. (2012) note that existing flow management practices in the Delaware River influence the distribution, timing, and duration of water temperatures within the mainstem of the Upper Delaware River, and results in potentially unfavorable thermal conditions for dwarf wedgemussels within the Upper Delaware River Basin.

The City's snorkel, SCUBA, and shoreline surveys did not find dwarf wedgemussels, other mussel species, or shells of any species within the 4,000-foot tailrace channel. The City stated that the presence of low water temperatures and dense plant and algal growth in the tailrace channel make it unfavorable habitat for dwarf wedgemussels.

In its December 18, 2012 letter, Interior stated that it had neither received nor reviewed the City's findings on the lack of dwarf wedgemussel habitat within the project boundary. Interior noted that even though dwarf wedgemussels apparently do not occur in the project area, the species is known to occur 22 river miles downstream, and may occur within unsurveyed habitat between the project site and the known populations. Interior noted that if dwarf wedgemussels are present in the West Branch of the Delaware River below the project boundary, "take" of the species may occur during dewatering periods. Although Interior provided no 10(j) recommendations specific to dwarf wedgemussels, it recommended that the Commission determine the extent of the Cannonsville Project's Action Area, and whether dwarf wedgemussels are present therein.

3.3.4.2 Environmental Effects

Project Operation – Flow Releases

As noted previously, the City would operate the proposed project in strict accordance with the FFMP-OST or subsequent operating protocol agreed to by the Decree Parties. Operation of the project would be dependent on anticipated inflow, reservoir elevation, and the river stage on the West Branch of the Delaware River, and flow releases would be directed through monitoring of the USGS gage at Hale Eddy, New York (number 01426500) approximately 8 miles downstream of Cannonsville Dam.

New York DEC's WQC condition number FO1, and Interior's 10(j) recommendation (No. 1), both would have the City operate the Cannonsville Hydroelectric Project in strict compliance with the FFMP-OST.

Staff analysis

Northern wild monkshood populations can be greatly affected by water level fluctuations, as they are predominantly found along stream banks. However, the City did not observe any northern wild monkshood populations during its surveys. In its December 18, 2012 letter, Interior accepted the City's survey findings that northern wild monkshood does not occur in the project area, and stated that no further coordination or consultation would be required for this species. Therefore, the proposed project is expected to have no effect on northern wild monkshood.

In its December 18, 2012 letter Interior stated that dwarf wedgemussels could be present between the project and the nearest known population, located approximately 22 river miles downstream of the project.

In terms of habitat suitability, it does not appear that water temperatures are suitable for dwarf wedgemussels between the project boundary and the known populations occurring 22 and more miles downstream. The City's September 28, 2012 mussel survey report noted that nearly all water flowing into the proposed tailrace (which is drawn from the Cannonsville Reservoir's hypolimnion) has a narrow mean thermal range of 46 to 53 degrees Fahrenheit (°F) during the period from June to September, which is well below the preferred thermal range for most mussel species and potential cool- and warm-water host fish species that occur in the Delaware River. These temperatures are also well below the mean daily water temperatures for that time period within the mainstem Delaware River where known dwarf wedgemussel populations occur (USGS gages on the Delaware River at Hancock [number 01427000] mean of 55 to 66°F; and Callicoon, New York [number 01427510], mean of 65 to 74°F). If dwarf wedgemussels do occur within the 22-mile unsurveyed reach, they would be more likely to occur in the more downstream areas, where water temperatures are more suitable.

Because the proposed project would continue to be operated under the FFMP-OST, or subsequent operating protocol agreed to by the Decree Parties, conditions downstream of the project would be expected to be the same as existing conditions, because the frequency and distribution of flow releases, and the resulting influence on downstream water temperatures, would not change due to project operation. Therefore, we conclude that operation of the proposed project would have no effect on dwarf wedgemussels.

Construction-related Sedimentation and Dewatering

As noted above in section 3.3.1, *Geology and Soils*, land-disturbing activities would include construction of the penstock, an intake, a powerhouse and tailrace, an 1,810-foot-long transmission line, and a substation. Additionally, a spoils area for 23,000 cubic yards of excavated material would be placed to the west of the proposed powerhouse. These activities could result in the release of sediment into waters below the project, with the potential to affect dwarf wedgemussel populations that may be present downstream of the proposed project.

Further, as noted above in section 3.3.2.2, *Aquatic Resources*, construction of the project would require a 3-month cessation of flows from the low-level release outlet into the tailrace channel for penstock and powerhouse tie-in at the existing low-level release works. The City estimates that if 200 cfs is maintained in the spillway channel, backwatering effects would result in water depths in the tailrace channel during this period that would be 1 foot or less lower than at present for approximately 1,600 feet downstream of the low-level release works, but that water depths past 1,600 feet would be consistent with existing water levels.

The City proposes to: (1) minimize construction-related erosion and sedimentation through development and implementation of a detailed erosion and sediment control plan and stormwater pollution plan; and (2) during construction, provide conservation releases within the tailrace and spillway channels via two 200-cfs (total of 400 cfs) temporary siphons.

New York DEC's WQC conditions C1 through C9 require the City to develop a stormwater pollution prevention plan and follow several measures to prevent the introduction of sediment, debris, or other materials into project waters. New York DEC's WQC conditions CO1 through CO3 require the City to limit the use of siphons to October 1 to May 15 and establish a discharge temperature of 60 degrees or colder from the siphons. Interior provided a 10(j) recommendation (No. 1) that the licensee operate the Cannonsville Hydroelectric Project in strict compliance with the FFMP-OST, which would ensure continuance of downstream flows when siphons are used during project construction.

Staff analysis

Construction- related effects associated with the construction of the proposed powerhouse and tailrace excavation that could potentially affect dwarf wedgemussels, if present, include: (1) reduction in flows into the tailrace channel for a 3-month period when the low-level outlet works are unusable and downstream flows are passed through temporary siphons into the tailrace channel; and (2) the inadvertent release of sediments downstream of the project. A reduction in flow into the intake channel could reduce or eliminate wetted area within the tailrace channel, resulting in the loss of habitat and cause a deterioration of water quality, particularly temperature and DO concentration, downstream of the project. Inadvertent sediment releases could potentially harm dwarf wedgemussels and their habitat through sediment deposition.

We conclude that these potential effects of the proposed action would be largely limited to the tailrace channel from the base of the dam downstream to its confluence with the spillway channel, about 4,000 feet downstream for the following reasons:

- construction areas below the normal high water elevation in the tailrace channel would be isolated from the tailrace by cofferdams, minimizing the potential for the downstream release of sediments;
- any sediments that are released at the base of the dam as a result of construction activities would likely rapidly settle to the bottom in the tailrace channel, due to the lack of current to keep them in suspension; and
- as discussed in section 3.3.2.2, although significant increases in water temperature or decreases in DO concentration would not occur in the tailrace channel based on time-of-year restriction on the use of siphons,

any that did occur would not persist downstream after mixing with the flows from the spillway channel.

Although project effects would likely be limited to the tailrace channel, the possibility of an unanticipated release of sediments downstream of the project area cannot be ruled out. While the City's survey did not find dwarf wedgemussels, their shells, or suitable habitat within the tailrace channel, it is possible that some wedgemussels exist between the project area and the known downstream populations. Therefore, we conclude that the construction of the proposed project may affect, but would not be likely to adversely affect, the dwarf wedgemussel. In a letter filed November 21, 2013, Interior concurred with our finding.

3.3.5 Recreation and Land Use

3.3.5.1 Affected Environment

Recreation

Cannonsville Reservoir is approximately 150 miles from New York City and 120 miles from Albany, New York. As of August 25, 2011, the City owns approximately 30,705 acres within the Cannonsville Reservoir watershed and 834 acres adjacent to the watershed. Of these 31,539 total acres, 21,417 acres are available for public recreation.

The following recreational activities are permitted on the reservoir or in the area surrounding the Cannonsville Reservoir: hiking, fishing, canoeing, kayaking, hunting, sail boating, sculling, cross-country skiing, snowmobiling, picnicking, and bird watching. To protect reservoir water quality, mountain biking, swimming, horseback riding, and camping are not permitted on City-owned lands. Snowmobiling is only allowed by special permit and not in proximity to the reservoir.

There are several large tracts of City-owned land open for public recreation that border the impoundment (table 5); a City access permit is required on some of these lands. Recreational access areas near the reservoir are shown in figure 11.

Table 5. Cannonsville Recreation Areas - Uses and Acreages.

Recreation Unit	Use	Acres
Johnny Brook	Hunting	3,791
Speedwell Mountain	Public access area [19]	3,908
Beerston	Hunting	871
Barbour Brook	Public access area	417
Fletcher Hollow	Public access area	358
Sands Creek	Hunting	1,608
Roods Creek	Public access area	349
	Total	11,302

[19] Uses of public access areas (PAAs) include hunting, fishing, hiking, and trapping.

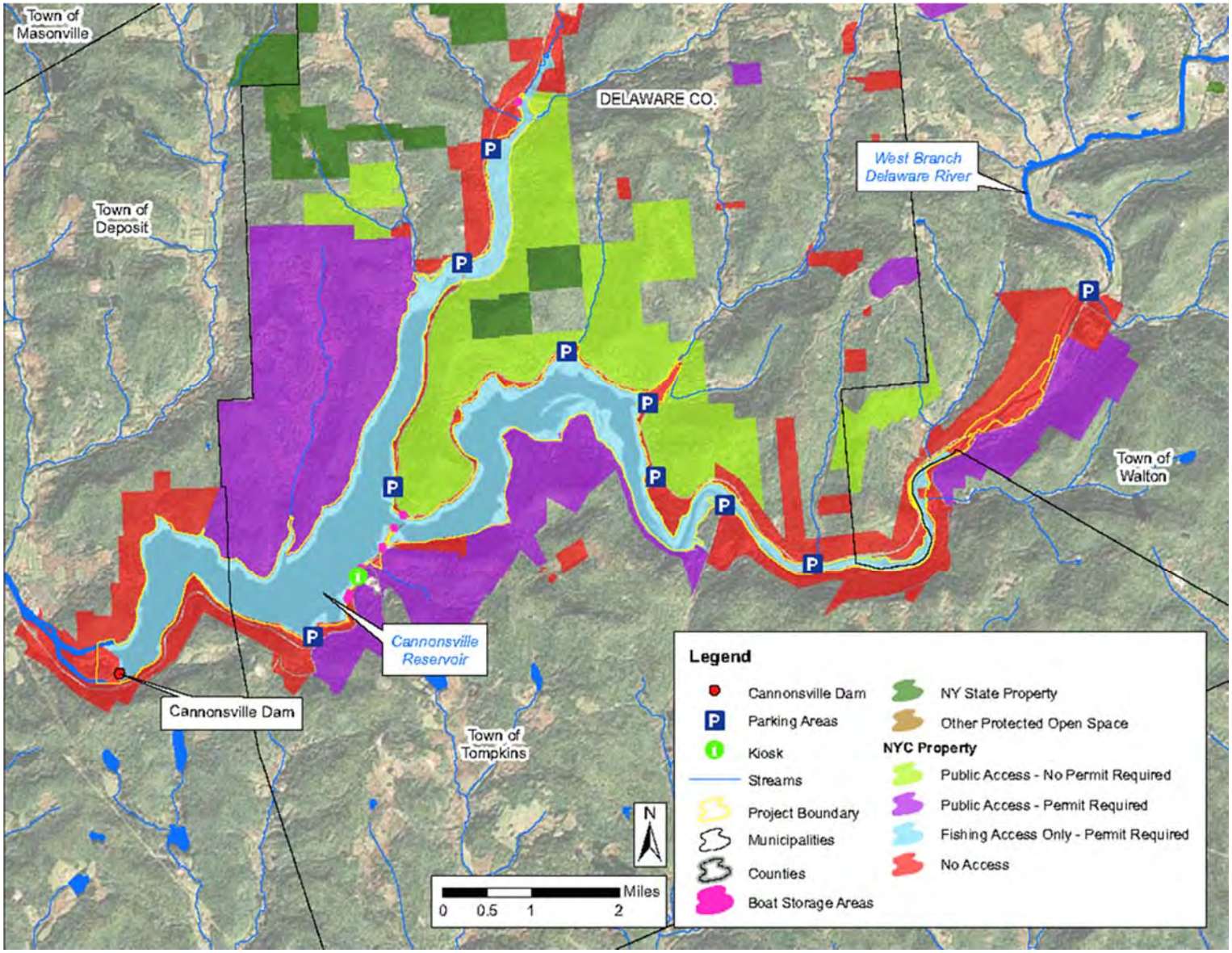

Figure 11. Recreation access near Cannonsville Reservoir (Source: license application).

Hunting for deer, turkey, and small game is permitted throughout most of the City-owned lands around the reservoir, but hunters must first obtain a DEP access permit. However, hunting, fishing, hiking, and trapping are permitted in PAAs without an access permit.

Hiking is permitted only in PAAs. The topography is rolling, to steep, and there are no designated trails. Therefore, hikers must bushwhack and/or follow previously established logging roads.

The reservoir provides fishing opportunities for trout, bass, common carp, perch, pickerel, panfish, and bullhead. The reservoir shorelines are open for fishing from shore. Brown trout are the primary sought-after species, but brook trout and rainbow trout are occasionally caught as well. At night, people fish along the Cannonsville shoreline, although it is more popular to fish from a boat. Night angling use appears evenly distributed during the spring, summer, and fall.

In order to protect the quality of its water supply, the City prohibits the use of boats with gasoline motors on the reservoir, but fishing or other recreation from unpowered boats or boats with electric motors is permitted and are important activities. Access permits and recreational boat tags are required and can be obtained after vessels and appurtenant devices (oars, paddles, sails) are steam-cleaned to prevent introduction of invasive organisms. As of the time of license application, there were 436 permitted boats at the reservoir. Beginning in 2013, the City began allowing boat rental companies to store and rent canoes and kayaks at the reservoir. Because these watercraft won't be used elsewhere, they do not need to be steam-cleaned. There are 10 boat launch areas (including one for sailboats) and associated parking areas, as well as a kiosk (see figures 11 and 12) at the reservoir.

The fisheries of the West Branch of the Delaware River and the reservoir are actively managed by the New York DEC. The West Branch of the Delaware River and tributaries above the reservoir are renowned for their trout fishery.

The area around the West Branch of the Delaware River offers four managed trail systems for year-round recreation off City-owned land. The Catskill Scenic Trail lies on the old Ulster-Delaware railroad bed and parallels the West Branch of the Delaware River for about 19 miles, crossing it at several points. Another trail system, including the Utsayantha Trail, has views of the West Branch of the Delaware River. Also, the West Branch Preserve, which was donated to The Nature Conservancy in 1973, features two short trails (Delaware Co. SWCD, 2004).

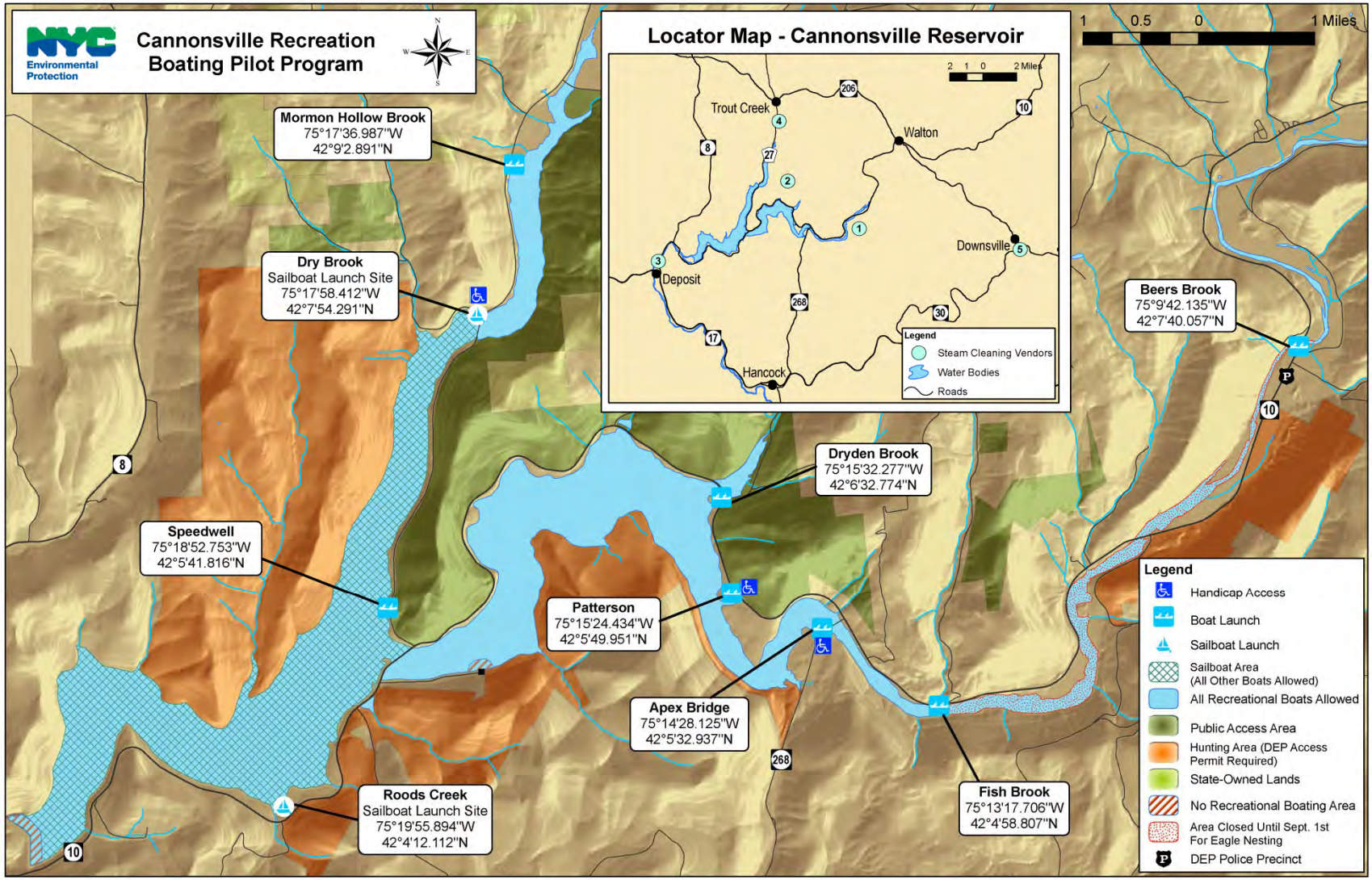

Figure 12. Boat launch areas on Cannonsville Reservoir (Source: license application).

Other recreation areas in the vicinity of the reservoir not owned by the City include:

- Oquaga Creek State Park
- Chenango Valley State Park
- Hunt's Pond State Park
- Salt Spring State Park
- Bear Spring Mountain Wildlife Management Area

Land Use

Lands surrounding the Cannonsville dam and reservoir are dominated by forest cover that is hilly and steep and used primarily for recreational purposes.

In the early settlement days, the entire area was covered by forests. As the forests were cleared, the rocks and stumps were pulled to make way for farmland. The shallow, infertile soil proved not to be conducive to sustained grain farming; however, the abundance of cold-hardy grasses and water supported dairy farming (Delaware Co. SWCD, 2007). Dairy farming and forestry remain the dominant land uses. Table 6 lists the land cover types within the West Branch of the Delaware River watershed.

Table 6. Land cover types; West Branch of the Delaware River.

Cover Type	Land Cover Type expressed in percentages
Forest	68.8
Shrubland	11.3
Urban (includes roads)	6.7
Water	1.8
Wetland	1.2
Agricultural Land (includes grasslands)	10.1

3.3.5.2 Environmental Effects

Recreation

The City does not propose any new recreational facilities as part of the proposed project, but the City would continue to maintain the current recreational opportunities and facilities provided at the reservoir.

Neither Interior, the New York DEC, nor any other stakeholders provided any recommendations or comments for creating, preserving, or enhancing recreational opportunities at the proposed project.

Staff Analysis

As discussed previously, project construction would take place on the downstream side of Cannonsville Dam. Consequently, access to and recreation on and around the reservoir would not be affected. Recreational activities such as hiking, fishing, canoeing, kayaking, hunting, cross-country skiing, snowmobiling, picnicking, and bird watching would continue to be available to the public and permit holders during the construction period.

Because the proposed construction areas on the downstream side of the dam are not open to the public, construction of the proposed project would not affect recreation in those areas.

Considering the water supply function of the reservoir, and given the lack of any comments regarding the need for additional recreational facilities at the reservoir, we conclude that the existing recreational facilities are adequate.

Land Use

As discussed previously, the City is proposing to construct and operate hydroelectric facilities on and adjacent to the downstream side of its Cannonsville water supply reservoir. The City is not proposing any measures related to land use in the areas surrounding the Cannonsville Reservoir.

Neither Interior, the New York DEC, nor any other stakeholders provided any recommendations or comments regarding land use in the context of the proposed project.

Staff Analysis

The construction of the City's proposed project would convert some small areas on the downstream side of the dam from open areas and forest to project structures, including a powerhouse, transmission line, and spoils pile. As discussed in section 3.3.3.2, excavation of the tailrace would convert about 0.57 acre of emergent wetlands to an open water area. Areas disturbed during construction would be revegetated following completion of construction.

Land uses surrounding the reservoir and upland areas from the reservoir would not be affected by the construction and operation of the proposed project. Some open

areas on the downstream side of the dam and the mowed fields adjacent to the dam would be permanently converted to project facilities.

3.3.6 Cultural Resources

3.3.6.1 Affected Environment

Section 106 of the NHPA of 1966, as amended, requires that the Commission evaluate the potential effects on properties listed or eligible for listing on the National Register of Historic Places (National Register). In this case, the Commission must take into account whether any historic property could be affected within the project's area of potential effects (APE). The APE for the proposed Cannonsville Project consists entirely of areas previously disturbed during construction of the Cannonsville Dam. Cannonsville Dam and its outlet works are less than 50 years old and thus not eligible for the National Register.

Archaeological and Historic Resources

Hartgen Archeological Associates, Inc. (Hartgen) conducted a Phase IA Archeological Literature Review and Sensitivity Assessment for the City's proposed project. A systematic search was conducted through the archeological site files maintained by the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) and the New York State Museum (NYSM) located at the OPRHP archives on Peebles Island, in Waterford, New York. Information concerning all reported precontact and historic period archeological sites within a 3-mile radius of the dam was collected. In addition, data relating to those sites located within and immediately adjacent to the reservoir, but outside of the 3-mile search radius was also collected. The OPRHP's electronic database was also searched for properties listed on or eligible for listing on both the State and National Registers of Historic Places (National Register) that are located within or immediately adjacent to the dam. The following summarizes the research findings.

The NYSM and OPRHP files contain 33 reported sites within 3 miles of Cannonsville Dam and 14 reported sites outside of the 3-mile search radius but within or immediately adjacent to the reservoir (table 7). These sites include 39 historic sites and 8 precontact sites. The nearest site, a mid 19th-century sawmill, was identified during a 1979 historic industrial resources survey and is located immediately adjacent to the east side of Cannonsville Dam. Thirty-four of the historic sites located within 3 miles of Cannonsville Dam or within and adjacent to the reservoir were identified over the course of the 1979 historic industrial resources survey by utilizing historic maps rather than subsurface archeological investigation. All of those sites identified during the 1979 survey represent 19th-century industrial complexes that were once located along the Delaware River or its contributing tributaries; many of which are now

submerged within Cannonsville Reservoir. The National Register status of each resource is determined by the OPRHP. Typically, resources are determined to be eligible or ineligible for listing on the National Register based on criteria developed by the National Park Service (1990, revised 2002). In some circumstances, resources have not been evaluated and are listed as unevaluated, in several other instances there were no records to indicate whether resources were evaluated or unevaluated, and for the purposes of this table are listed as unknown.

Table 7. OPRHP/NYSM archeological sites within 3 miles of the Cannonsville Dam and within or adjacent Cannonsville Reservoir.

OPRHP #	NYSM #	Identifier	Description	National Register Status	Location in Relation to Dam
02506.000001		Cider mill (WBD-139)	Mid 19th-century map documented industrial site	Unevaluated	1.5 miles northeast (now within reservoir boundary)
02506.000002		Sawmill (WBD-141)	Mid 19th-century map documented industrial site	Unevaluated	Immediately adjacent to the east side of dam
02506.000003		Sawmill (WBD-142)	Mid 19th-century map documented industrial site	Unevaluated	1.3 miles northwest
02506.000009		H. Hess Sawmill (WBD-156)	Remains of stone foundation and dam associated with mid 19th-century sawmill	Unevaluated	2.4 miles northeast
02506.000010		Sawmill, Wagon Shop (WBD-157)	Mid 19th-century map documented industrial site	Unevaluated	2.1 miles north
02506.000011		Blind Manufacture (WBD-158)	Mid 19th-century map documented industrial site	Unevaluated	2.2 miles northwest
02506.000012		Ira Snyder Carding Mill (WBD-159)	Mid 19th-century map documented industrial site	Unevaluated	1.4 miles northwest
02506.000013		Ira Snyder Axe Factory (WBD-160)	Mid to late 19th-century map documented industrial site	Unevaluated	1.4 miles northwest

OPRHP #	NYSM #	Identifier	Description	National Register Status	Location in Relation to Dam
02506.000014		Ira Snyder Sawmill (WBD 161)	Mid to late 19th-century map documented industrial site	Unevaluated	1.4 miles northwest
02506.000015		Southern NY Power Co. (WBD-160A)	Foundation remains as well as smokestack, sills, and exterior waterwheel associated with early 19th-century power plant	Unevaluated	1.4 miles northwest
02506.000016	5851	Briggs Site (SUBi-1124)	Late Archaic and Woodland period camp site	Unevaluated	1.3 miles northwest
02506.000017		Site 2	Late Archaic camp site	Not eligible	1.7 miles west
02506.000018		DEL-186	Historic quarry	Unevaluated	1.5 miles south
02506.000019		DEL-187	Historic quarry	Unevaluated	2.1 miles southeast
02506.000020		DEL-189	Historic quarry	Unevaluated	2.5 miles southeast
02506.000024		DEL-9932	Undated stone foundation; possibly a barn	Unevaluated	4,900 feet southwest
02506.000026		Deposit Airport I Site (SUBi-2048)	Late Archaic, Middle Woodland, and Late Woodland components: chert flakes, fire-cracked rock, points, biface, pottery fragments	Unevaluated	2.5 miles southwest
02506.000027		Deposit Airport II Site (SUBi-2049)	Archaic through Late Woodland: biface, points, pottery fragments, flakes, and an adze	Unevaluated	2.4 miles (3.8 km) southwest

OPRHP #	NYSM #	Identifier	Description	National Register Status	Location in Relation to Dam
02506.000028		Wheeler Historic Site (SUBi-2070)	Architectural and domestic deposits dating to the mid 19th century	Unevaluated	2.4 miles southwest
02518.000002		Sawmill (WBD-97)	Mid 19th-century map documented industrial site	Unevaluated	9.5 miles northeast
02518.000004		Sawmill (WBD-99)	Mid 19th-century map documented industrial site	Unevaluated	7 miles northeast (now within reservoir boundary)
02518.000009		N. Boyd Sawmill (WBD-103)	Mid 19th-century map documented industrial site	Unevaluated	6.9 miles northeast (now within Dryden Brook inlet of reservoir boundary)
02518.000010		Sawmill (WBD-104)	Mid 19th-century map documented industrial site	Unevaluated	6.4 miles northeast (now within reservoir boundary)
02518.000011		Gregory Sawmill (WBD-105)	Early through mid 19th-century map documented industrial site	Unevaluated	6.1 miles northeast (now within reservoir boundary)
02518.000012		Sawmill (WBD-106)	Early 19th-century map documented industrial site	Unevaluated	5.5 miles northeast (now within reservoir boundary)
02518.000013		W.H. Sprague Lumber Manufactory (WBD-107)	Mid 19th-century map documented industrial site	Unevaluated	3.6 miles northeast (now within reservoir boundary)

OPRHP #	NYSM #	Identifier	Description	National Register Status	Location in Relation to Dam
02518.000014		E.B. & M.W. Owens Wagon Shop, Blacksmith Shop (WBD-109)	Mid 19th-century map documented industrial site	Unevaluated	3.5 miles northeast (now within reservoir boundary)
02518.000025		J. Tillotson Sawmill (WBD-128)	Mid 19th-century map documented industrial site	Unevaluated	7.9 miles northeast (now within reservoir boundary)
02518.000026		W. Huggins/W.B. McGibbon Sawmill (WBD-130)	Early through mid 19th-century map documented industrial site	Unevaluated	5.5 miles northeast (now within reservoir boundary)
02518.000028		Sprague/Ogden & Leal/Jester/Deposit Milling Co./McLaughlin Gristmill (WBD-132)	Early through late 19th-century map documented industrial site	Unevaluated	3 miles northeast (now within reservoir boundary)
02518.000029		J.A. Kenyon Tannery (WBD-133)	Mid through late 19th-century map documented industrial site	Unevaluated	3 miles northeast (now within reservoir boundary)
02518.000030		Sawmill (WBD-134)	Early through mid 19th-century map documented industrial site	Unevaluated	3 miles northeast (now within reservoir boundary)
02518.000031		Huntington Sawmill (WBD-135)	Early through late 19th-century map documented industrial site	Unevaluated	2.1 miles east (now within reservoir boundary)

OPRHP #	NYSM #	Identifier	Description	National Register Status	Location in Relation to Dam
02518.000033		E. Boyd Sawmill (WBD-137)	Mid 19th-century map documented industrial site	Unevaluated	2.9 miles northeast
02518.000034		Burr Map Sawmill (WBD-138)	Early 19th-century map documented industrial site	Unevaluated	1.5 miles northeast (now within reservoir boundary)
02519.000032		E. Beers/W. Beers/O. Hanford Sawmill (WBD-96)	Mid 19th-century map documented industrial site	Unevaluated	9.4 miles northeast
02544.000003		Tannery (WBD-162)	Mid 19th-century map documented industrial site	Unevaluated	2 miles west
02544.000004		Deposit Steam Mill (WBD-163)	Mid 19th-century map documented industrial site	Unevaluated	2 miles west
02544.000005		R. H. Evans Cottage D Sawmill (WBD-164)	Mid 19th-century map documented industrial site	Unevaluated	1.9 miles west
02544.000006		W. Evans/B.E. Hadley Sawmill (WBD-165)	Mid 19th-century map documented industrial site	Unevaluated	1.9 miles west
02544.000007		Hadley Steam Mill (WBD-167)	Late 19th-century map documented industrial site	Unevaluated	2.1 miles west
02544.000008		N.K.W. Sash Factory (WBD-168)	Mid 19th-century map documented industrial site	Unevaluated	2.2 miles west
02544.000009		Organ Factory and Wagon Shop (WBD-169)	Mid 19th-century map documented industrial site	Unevaluated	2.3 miles west

OPRHP #	NYSM #	Identifier	Description	National Register Status	Location in Relation to Dam
02544.000013		Deposit Airport III Site	Chert flakes, cortical chunk, chert shatter fragments	Unevaluated	2.4 miles west
	761	No information	One fluted projectile point identified as a stray find	Unknown	3 miles northeast (now within reservoir boundary)
	3131	No information	Reported location of a precontact village burial site	Unknown	1.4 miles west
	8407	No information	Reported traces of precontact occupation	Unknown	2 miles west

A review of the OPRHP computer inventory identified no properties listed on the State or National Register of Historic Places or eligible for such a listing immediately adjacent to the Cannonsville Dam and Reservoir.

3.3.6.2 Environmental Effects

The City states that although the proposed project area has moderate sensitivity for both precontact and historical archaeological sites, the potential for locating intact unidentified archaeological sites that may be eligible for the National Register has been greatly diminished by the prior construction related to Cannonsville Dam and reservoir. Land-disturbing activities associated with prior construction have thoroughly disturbed the proposed project area. Accordingly, the City concludes that there is no likelihood of locating archaeological sites at the proposed locations for the powerhouse, substation, transmission line, or other structures. Consequently, the City is not proposing to conduct additional archaeological studies or measures with respect to cultural resources.

The OPRHP reviewed Hartgen's study, which included a Phase IA Archeological Literature Review and Sensitivity Assessment for the City's proposed Cannonsville Project. The OPRHP concurred with Hartgen's findings that the direct impact areas associated with the proposed project have all been previously disturbed, and therefore there is no need for Phase 1B testing. However, the OPRHP recommended that the City develop a Historic Properties Management Plan (HPMP) to address the 16 sites identified by Hartgen that are now submerged, as well as the potential for more sites and continued erosion of them along the edges of the reservoir.

Staff Analysis

There are currently no known historic or archaeological sites within the APE that have not been surveyed or recorded. Construction would only occur on a previously-disturbed area, and therefore the likelihood of discovery of any intact unidentified archeological resources during construction would be minimal. However, if such resources are found during land-disturbing activities associated with construction or maintenance of the proposed project, it would be important to have procedures in place to ensure the proper treatment of any such resource. These procedures would include provisions for notifying the Commission and the New York SHPO if previously unknown archaeological resources are discovered during the term of the license, and discontinuing construction-related activities until the proper treatment of any potential archaeological or cultural resources is established.

The OPRHP expressed concern regarding known and unknown sites submerged in the reservoir and the potential for their continued erosion along the edges of the reservoir. However, construction and operation of the project would not influence reservoir operation, including fluctuations in reservoir elevation. Since its construction in 1964, the reservoir's surface level has fluctuated significantly both within and among years as part of its water supply function. Reservoir operations are currently stipulated by the decree parties (currently through the FFMP-OST) and would continue to be following construction of the project. As a result, project operation would not have the potential to affect cultural resources that are or may be present in the Cannonsville Reservoir.

3.3.7 Aesthetic Resources

3.3.7.1 Affected Environment

Construction of the Cannonsville Dam and reservoir was completed in 1964. The grass-covered dam is 175 feet tall and is situated in a bowl-like setting surrounded by heavy forest. The project is visible from a few locations along State Route 10. There are parking and stopping areas along State Route 10 that offer obstructed views of the proposed project area. However, in general, the proposed project construction area would not be visible from the reservoir and surrounding area.

3.3.7.2 Environmental Effects

The City conducted an aesthetic study of the proposed project area. The study focused on public viewsheds at the location of the low-level release works and powerhouse, the work/staging areas, the substation, and the route for interconnection facilities associated with the proposed project. The City determined from the study that the proposed project area would not be readily visible along any of the sightlines from the public viewsheds east of Cannonsville Dam. Also, the height of the earthen dam

exceeds the height of the proposed project facilities and screens the areas from the eastern viewsheds. The dense vegetation around the area also screens the proposed project-related facilities from the northern, western, and southern public viewsheds. Even these viewsheds from State Route 10 were found to be limited due to the dense vegetation.

Neither Interior, the New York DEC, nor any other stakeholders provided any recommendations or comments regarding aesthetics in the context of the proposed project.

Staff Analysis

The height of the dam and the dense vegetation surrounding the reservoir screen much of the proposed project facilities from the public view. The proposed project would be constructed near existing features and would be constructed with material and using techniques that would blend in with the existing structures and environment.

Although, construction vehicles entering and leaving the proposed project area would be visible to drivers on State Route 10, the compact nature of the construction activities, the plan to dispose of spoils on-site, and the limited number of vehicle trips would thus result in only a minor, temporary effect to aesthetic resources.

3.3.8 Socioeconomic Resources

3.3.8.1 Affected Environment

Cannonsville Reservoir is located within Delaware County. The population of the county was 48,057 in 2000 and 47,980 in 2010, remaining relatively unchanged over this period (U.S. Census Bureau).

In 2010, the annual average unemployment rate in Delaware County was 8.7 percent - nearly equivalent to the statewide annual average unemployment rate of 8.6 percent, and less than the national average unemployment rate of 9.6 percent in 2010 (New York State Department of Labor and U.S. Bureau of Labor Statistics). Table 8 lists the employment breakdown of Delaware County.

Table 8. 2010 Percent employment breakdown in Delaware County, NY.

Industry	2010 Employment	Percent
Government (Federal, State and Local)	4,633	30.0
Manufacturing	3,445	22.3
Health Care and Social Assistance	1,956	12.7
Retail Trade	1,634	10.6
Accommodation and Food Services	978	6.3
Other Services	501	3.2
Construction	446	2.9
Finance and Insurance	422	2.7
Wholesale Trade	279	1.8
Information	238	1.5
Transportation and Warehousing	217	1.4
Professional and Technical Services	164	1.1
Agriculture, Forestry, Fishing Hunting	119	0.8
Mining	109	0.7
Arts, Entertainment, and Recreation	109	0.7
Real Estate and Rental and Leasing	78	0.5
Administrative and Waste Services	68	0.4
Management of Companies and Enterprises	24	0.2
Unclassified	13	0.1
Delaware County Total	15,433	100.0

Source: New York State Department of Labor, 2011.

3.3.8.2 Environmental Effects

The City conducted a socioeconomic study of the proposed Cannonsville Project to identify and quantify the impacts of the construction and operation of the project on employment, population, housing, personal income, local government services, and local tax revenues in the project area.

The study found that the project would have a modestly positive impact on employment, earnings, and economic output in Delaware County and would increase Delaware County tax revenue. The study further found that, because of the relatively small number of jobs that would be created, adverse socioeconomic impacts, including demands on local government services, are likely to be minimal or non-existent.

No agency or other stakeholders provided comments or recommendations concerning the socioeconomic effects of constructing or operating the proposed project.

Staff Analysis

The construction of hydroelectric facilities at the City's Cannonsville Reservoir would create some temporary construction-related jobs at the project site. Operation and maintenance of the project would involve a smaller number of people, some of whom may already be employed by the City at its water supply facility there, including grounds maintenance personnel. Overall, the proposed project would have a minor, beneficial effect on the socioeconomics of the project area.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the proposed Cannonsville Project's use of the flow of the West Branch of the Delaware River for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp*.,[20] the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead Corp*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the cost of individual measures considered in the final EA for the protection, mitigation and enhancement of environmental resources affected by the project; (2) the cost of alternative power; (3) the total project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

Table 9 summarizes the assumptions and economic information we use in our analysis. This information was provided by the City in the license application. We find that the values provided by the City are reasonable for the purposes of our analysis. Cost items common to all action alternatives include taxes and insurance costs; net investment (the total investment in power plant facilities remaining to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; normal operation and maintenance cost; and Commission fees.

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[20] See *Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

Table 9. Parameters for the economic analysis of the Cannonsville Project (Source: the City and staff).

Parameter	Value
Period of analysis (years)[a]	30
Federal income tax rate (%)[b]	0
State and local tax rate (%)[b]	0
Estimated first year of operation [c]	2017
Project cost ($) [d]	43,518,000
Cost of developing FERC license application ($) [d]	708,000
Operation and maintenance ($/year)[e]	845,620
Alternative energy value ($/MWh)[f]	56.23
Interest rate (%)[b]	6.75
Discount rate (%)[b,g]	6.75
Installed Capacity (MW) [b]	14.08
Average Annual Generation (MWh) [b]	42,281
Dependable Capacity (MW)[b]	1.586 – November 5.088 – August

Notes:

[a] Regardless of the potential license term (30, 40, or 50 years), consistent with Mead, we perform a 30-year economic analysis.

[b] Provided by New York City.

[c] Consistent with Mead, for an unconstructed project, the first year of the analysis is the year the project is expected to become operational.

[d] Cost was provided by the City.

[e] The future operation and maintenance cost provided by the City.

[f] Consistent with Mead, the value of energy is based on the current energy values. Alternative energy value is based on an average of the average monthly value for the past year (July 2012 to June 2013) obtained from the New York Independent System Operator Monthly Report dated June 2012. See: http://www.nyiso.com/public/webdocs/markets_operations/documents/Studies_and_Reports/Reports/Monthly_Reports/2013/Board%20Monthly%20Report%20June%202013.pdf.

[g] Assumed by staff to be the same as the interest rate.

4.2 COMPARISON OF ALTERNATIVES

Table 10 compares the installed capacity, annual generation, cost of alternative power, estimated total project cost, and difference between the cost of alternative power and total project cost for the two action alternatives considered in this final EA: the City's proposal and the staff alternative.

Table 10. Summary of the annual power values and annual production costs for the action alternatives for the Cannonsville Hydroelectric Project (Source: Staff).

	The City's Proposal [a]	**Staff Alternative**
Installed capacity (MW)	14.08	14.08
Annual generation (MWh)	42,281	42,281
Annual cost of alternative power ($/MWh)	$2,627,870 62.15	$2,627,870 62.15
Annual project cost ($/MWh)	$4,923,630 116.45	$4,935,000 116.72
Difference between cost of alternative power and project power ($/MWh)	($2,295,760) (54.30)	($2,307,130) (54.57)

[a] A number in parentheses denotes that the difference between the power value and production cost is negative.

4.2.1 The City's Proposal

The City proposes to build a project that has an installed capacity of 14.08 MW, and generate an average of 42,281 MWh of electricity annually. The average annual power value of the project would be $2,627,870, or about $62.15/MWh. In total, the average annual cost of producing power would be $4,923,630, or about $116.45/MWh.

Overall, the project would produce power at a cost which is $2,295,760, or $54.30/MWh, more than the cost of alternative power.

4.2.2 Staff Alternative

The staff alternative includes the same development proposal as the City and, therefore, would have the same capacity and energy attributes. Table 11 shows the staff-recommended additions, deletions, and modifications to the City's proposed environmental protection and enhancement measures, and the estimated cost of each.

Based on a total installed capacity of 14.08 MW, and an average annual generation of 42,281 MWh, the project would have an average annual power value of $2,627,870, or about $62.15/MWh. The average annual cost of producing power would be $4,935,000, or about $116.72/MWh. Overall, the project would produce power at a cost which is $2,307,130, or $54.57/MWh, more than the cost of alternative power.

4.3 COST OF ENVIRONMENTAL MEASURES

Table 11 gives the cost of each of the environmental enhancement measures considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 11. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of the Cannonsville Project (Source: City and staff).

Enhancement/Mitigation Measures	Entities	Capital Cost ($)	Annual Cost ($)	Levelized Annual Cost ($)
Geology and Soils				
1. Update the soil erosion and sedimentation control plan to reflect final project design.	City, Staff, New York DEC	5,000	0	455
Aquatic Resources				
2. Update the Flow Management Plan to incorporate the conditions of the Water Quality Certificate (WQC) pertaining to siphon use;	Staff	5,000	0	455
3. Continue to release flows in accordance with the FFMP-OST	City, Staff, New York DEC, Interior	0[1]	0	0

Enhancement/Mitigation Measures	Entities	Capital Cost ($)	Annual Cost ($)	Levelized Annual Cost ($)
Terrestrial Resources				
4. Avoid invasive plant species and take precautions to not further the spread of invasive plants during site restoration.	City, New York DEC, Staff	0[1]	0	0
5. Avoid vernal pools located within construction and buffer area (i.e., vernal pool 3) and mark the areas to avoid disturbance during construction	City	0[1]	0	0
6. Wetland mitigation to account for the removal of approximately 0.57 acre of emergent marsh within the tailrace, if required by the U.S. Army Corps of Engineers	City	75,000	0	6,850
7. Develop wetland avoidance and mitigation plan, to include measures #5 and #6 above.	Staff	80,000	0	7,310

Enhancement/Mitigation Measures	Entities	Capital Cost ($)	Annual Cost ($)	Levelized Annual Cost ($)
8. Prior to construction, identify bald eagle nests within 1 mile of project-related construction activities, provide data to the relevant agencies	City, New York DEC, Interior, Staff	0[1]	0	0
9. Follow FWS Bald Eagle Management Guidelines to avoid construction-related impacts to bald eagles.	City, New York DEC, Interior, Staff	0[1]	0	0
10. Follow the New York DEC's bald eagle take permit conditions, including: submission of final electrical facility plans with avian protection measures; seasonal limits on construction near bald eagle nests; handling of dead, injured, or damaged individuals of threatened or endangered species; and development of an Eagle Conservation and Implementation Plan (New York DEC's Water Quality Certification conditions T/E1 through T/E7).	New York DEC, Staff	10,000	0	910
11. Protect and enhance migratory birds by taking all practical measures to avoid take and minimize disturbance during project construction and operation.	Interior	-[2]	0	0

Enhancement/Mitigation Measures	Entities	Capital Cost ($)	Annual Cost ($)	Levelized Annual Cost ($)
12. Incorporate raptor protection measures in the design of the new overhead transmission lines to reduce the collision and electrocution risk.	City, New York DEC, Interior, Staff	50,000	0	4,570
13. Bury powerlines wherever feasible; for any overhead lines, follow Avian Power Line Interaction Committee (APLIC) guidance for powerline design (Interior 10(j) recommendation No. 3)	Interior, Staff	14,500[3]	0	1,320
14. Develop an Avian Protection Plan for protection of bald eagles and other raptors per Interior 10(j) recommendation No. 4.	Interior, Staff	10,000	0	910
15. Develop an Eagle Conservation Plan, in consultation with the FWS and New York DEC per Interior 10(j) recommendation No. 5.	Interior, Staff	10,000	0	910

Cultural

16. Notify the Commission and the New York SHPO if any previously unknown archaeological resources are discovered. Discontinue construction-related activities until the proper treatment of any potential cultural resources is established.	Staff	0	0	0

Notes:
[1] The City currently implements this measure pursuant to the operation of its water supply operations. There would be no additional costs attributable to the hydropower project.
[2] Due to lack of specificity, we are unable to determine a cost for this measure.
[3] The cost for this measure is based on burying 150 feet of transmission line. The cost of burying the transmission line was determined using information from the U.S Energy Information Administration. See: http://www.eia.gov/todayinenergy/detail.cfm?id=7250.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPARISON OF ALTERNATIVES

In this section, we compare the developmental and non-developmental effects of the City's proposal, the City's proposal as modified by staff, and the no-action alternative.

We estimate the annual generation of the project under the three alternatives identified above. Our analysis shows that the annual generation would be 42,281 MWh for the proposed action and the staff alternative; and 0 MWh for the no-action alternative.

We summarize the environmental effects of the different alternatives in table 12.

Table 12. Comparison of alternatives for the proposed Cannonsville Project (Source: staff).

Resource	No-Action Alternative	Proposed Action	Staff Alternative
Generation	0 MWh	42,281 MWh	Same as proposed action.
Geology and Soils	N/A – project would not be constructed.	Short-term increases in erosion during construction of the project. The City's proposed erosion and sediment control plan would minimize the potential for erosion and sedimentation at the project.	Same as proposed action.

Resource	No-Action Alternative	Proposed Action	Staff Alternative
Aquatic Resources – Water Quantity during construction	N/A – project would not be constructed.	The use of siphons to maintain downstream flow quantities in accordance with the FFMP-OST and WQC would minimize effects.	Same as Proposed Action.
Water quantity during operation	No effect: reservoir releases would continue to be made in accordance with the FFMP-OST.	Same as No-Action.	Same as No-Action.
Water quality during project construction	N/A – project would not be constructed.	The City's erosion and sediment control plan would minimize suspended sediments in the tailrace. Time-of-year restrictions on siphon use would maintain appropriate water temperatures.	Same as Proposed Action.
Water quality during project operation	No effect: the City would continue to monitor water quality in Cannonsville Reservoir as part of its water supply operations.	Same as No-Action.	Same as No-Action.

Resource	No-Action Alternative	Proposed Action	Staff Alternative
Terrestrial Resources – Upland Resources	No effect. Existing resource protection measures would continue.	Vegetation clearing would occur to accommodate the transmission line. The City's proposed measures to minimize the spread of invasive species would protect upland resources.	Same as proposed action.
Terrestrial Resources – Wetlands	No effect. Existing resource protection measures would continue.	The City's proposed measure to identify and avoid sensitive wetland resources, such as vernal pool habitat, would minimize impacts to these habitats.	In addition to proposed action, development and implementation of a wetland avoidance and mitigation plan would further minimize construction effects to small wetlands and mitigate for the loss of a 0.57-acre emergent marsh within the tailrace.
Wildlife, including migratory birds	No effect. Existing resource protection measures would continue.	The City's proposed raptor protection measures for the project transmission line following APLIC guidelines would minimize impacts to some species of migratory birds, particularly raptors and other large-bodied birds.	Same as proposed action.

Resource	No-Action Alternative	Proposed Action	Staff Alternative
Bald eagles	No effect. The City would continue existing conservation measures.	The City's inclusion of raptor protection in the transmission line would minimize impacts to bald eagles. Developing a bald eagle conservation plan and continuing conservation measures would protect eagles.	Same as proposed action, but including Interior's recommendations for following APLIC guidelines for transmission line design and developing an avian protection plan, in addition to New York DEC's water quality certification conditions regarding bald eagles, would provide greater protection for bald eagles.
Threatened and Endangered Species	No effect.	The City's proposed erosion and sediment control measures and conservation releases via siphon into the spillway channel would minimize impacts to any downstream populations of dwarf wedgemussels that may exist in the West Branch of the Delaware River below the project.	Same as proposed action.

Resource	No-Action Alternative	Proposed Action	Staff Alternative
Recreation	No effect.	The City proposes no new measures regarding recreation. Existing recreational opportunities would continue.	Same as proposed action
Land Use	No effect.	The City proposes no measures regarding land use. Existing land uses would continue.	Same as proposed action
Aesthetics	No effect.	No effect. Existing aesthetics would be preserved.	Same as proposed action.
Cultural Resources	No effect.	The City proposes no measures relating to cultural resources. All areas to be disturbed were disturbed during construction of the dam in 1964.	Halting construction and notifying the Commission and the New York SHPO if previously unknown archaeological resources are discovered would ensure that proper treatment of such resources would occur.

5.2 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for licensing the Cannonsville Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

5.2.1 Recommended Alternative

Based on our independent review and evaluation of the environmental and economic effects of no action, the proposed action, and the proposed action with staff modified measures (staff alternative), we recommend the staff alternative.

We recommend this alternative because: (1) the project would provide a dependable source of electrical energy for the region (an estimated 42,281 MWh annually); and (2) the environmental measures proposed by the City, as modified by staff, would adequately protect and enhance environmental resources affected by the project.

In the following section, we make recommendations as to which environmental measures proposed by the City or recommended by agencies and other entities should be included in any license issued for the project. In addition to the City's proposed environmental measures, we offer additional environmental measures recommended by staff to be included in any license issued for the project.

5.2.1.1 Measures Proposed by the City

Based on our environmental analysis of the City's proposal, as discussed in section 3, *Environmental Analysis* and the costs discussed in section 4, *Developmental Analysis*, we recommend including the following environmental measures proposed by the City in any license issued for the Cannonsville Project:

- update its conceptual erosion and sediment control plan for project construction, contained in its license application, that includes using best management practices (BMPs), revegetating of disturbed areas with weed-free

seed mixes, and minimizing the spread of invasive plant species, to reflect final project design;

- use signage to identify vernal pool areas to be avoided during construction and implement any wetlands mitigation that may be required by the U.S. Army Corps of Engineers (Corps);

- in accordance with its Flow Management Plan, deploy and operate flow management structures (i.e., siphons) to maintain flows of appropriate quantity (i.e., in accordance with the FFMP-OST) and quality (i.e., temperature) to the West Branch of the Delaware River during a 3-month period when construction renders the existing outlet works unusable; and

- include raptor protection measures in the design and construction of the proposed transmission lines to reduce the collision and electrocution risk for raptors, including bald eagles; and

- continue to make reservoir releases in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties.

5.2.1.2 Additional Measures Recommended by Staff

Under the staff alternative, the project would include the City's proposed measures, as noted above, and the following additions or modifications:

- update the Flow Management Plan to incorporate the conditions of New York DEC's Water Quality Certification (WQC) pertaining to siphon use;

- develop and implement a wetland avoidance and mitigation plan to formalize the City's proposal for identifying and avoiding vernal pool habitat and mitigating for the removal of 0.57 acre of emergent wetland within the tailrace;

- develop and implement an avian protection plan, to include the City's proposed and Interior's recommended avian protection measures following Avian Power Line Interaction Committee guidelines;

- develop and implement a bald eagle conservation plan for the monitoring and protection of bald eagles during project construction, operation, and maintenance; and

- notify the Commission and the New York SHPO if previously unknown archaeological resources are discovered during the term of the license. If such discovery occurs during construction, discontinue construction-related

activities until the proper treatment of any potential archaeological or cultural resources is determined.

We discuss the rationale for the measures we are recommending or not recommending below.

Erosion and Sediment Control Plan

Construction of the proposed project would result in temporary ground and riverbed disturbance, and could potentially result in sediment reaching the West Branch of the Delaware River. The City's development of an erosion and sediment control plan incorporating New York State Standards and Specifications for Erosion and Sediment control and the provisions of a SPDES and updating it to reflect final project design would minimize erosion and sedimentation associated with construction-related activities. Minimizing sediment transport from construction areas to the West Branch of the Delaware River would help preserve water quality in the river and protect fish and other aquatic life therein.

We estimate that the levelized annual cost to develop the Erosion and Sediment Control Plan would be $455, and conclude that the benefits of the measure would outweigh the costs.

Flow Management during Construction

During construction, there would be an approximately 3-month period during which no water is conveyed to the tailrace channel, when the pipe leading to the low-level release works is bifurcated to accommodate the powerhouse. During this period, conservation releases to the West Branch of the Delaware River would be maintained in the spillway channel via two temporary siphons installed over the spillway crest. The City prepared a Flow Management Plan that would be implemented during the estimated 3-month period of siphon operation that addresses maintenance of flow quantity and quality.

New York DEC's WQC includes several conditions (CO1, CO2, CO3) that address the use of siphons for flow management during construction. These conditions address water temperature issues that could arise if the siphons transported warm reservoir surface waters into the West Branch of the Delaware River.

The City's Flow Management Plan describes its proposed measures to ensure the continuation of the required downstream flow releases during the construction period. However, the City's Flow Management Plan was prepared prior to the issuance of the WQC. Staff recommends updating the plan to incorporate the WQC's conditions pertaining to siphon use. Doing so would help ensure that flows of the appropriate quantity (i.e., in accordance with the FFMP-OST, or subsequent operating protocol

agreed to by the Decree Parties) and quality (i.e., temperature) are passed downstream during construction when the outlet works are unusable. We estimate that the levelized annual cost of this measure would be $455, and conclude that the benefits of the measure would outweigh the costs.

Project Operation – Flow Releases

The City proposes to continue to operate the reservoir in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties, during both project construction and project operation. Electricity would be generated using the flow releases currently being passed to the West Branch of the Delaware River. Interior's 10(j) recommendation No. 1 states that the project be operated in strict compliance with the FFMP-OST. WQC conditions AP1B and FO1 specify that the project be operated in accordance with the FFMP-OST. Condition FO1 acknowledges that the Decree Parties may change the operating protocol and that the WQC would incorporate the new protocol.

Because flow releases during project construction and subsequent operation would continue to be made in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties, there would be no changes to flow releases from Cannonsville Reservoir as a result of construction and operation of the project. Operation of the project in accordance with the FFMP-OST, or any subsequent operational protocol agreed to by the Decree Parties, would ensure that the municipal water supply system and downstream releases are maintained, and that the reservoir would continue to provide flood control benefits. Consequently, staff recommends this measure. Because the reservoir is already operated in this manner, there is no cost associated with this measure.

Wetland Avoidance and Mitigation Plan

Construction of the project would occur adjacent to wetlands in several locations, and would result in the removal of a 0.57-acre freshwater emergent marsh. Wetlands serve as important habitat for wildlife, including pool-breeding amphibians that use vernal pool habitat, improve water quality, and other functions. Therefore, staff recommends that the City develop and implement a wetland avoidance and mitigation plan, in consultation with the Corps, FWS, and New York DEC.

The wetland avoidance and mitigation plan should include details on the wetland areas to be protected from construction, the types of visual signage and other barriers to be used, and on-site mitigation opportunities to compensate for the loss of the 0.57-acre emergent wetland in the tailrace, such as restoration or enhancement of existing emergent wetlands adjacent to the tailrace channel. With such a plan in place, impacts to wetlands, including vernal pool habitat, due to project construction would be minimized. We

estimate that the levelized annual cost of the measure would be $7,310, and conclude that the benefits of the measure would outweigh the costs.

Avian Protection Plan

Construction of the project would involve clearing of open land and forested land that would be highly likely to contain nesting migratory birds during the breeding season, and the placement of new above-ground transmission lines between the proposed powerhouse and interconnection with the existing NYSEG transmission system that pose a risk to migratory birds through electrocution or collision with powerline structures. Therefore, for the protection of migratory birds, staff and Interior (10(j) recommendation no. 4) recommend that the City develop and implement a site-specific avian protection plan, in consultation with the FWS and New York DEC.

The avian protection plan should be developed in accordance with APLIC guidance regarding avian collision (2012) and electrocution (2006), and APLIC and FWS' guidelines on developing avian protection plans (2005). With such a plan in place, impacts to migratory birds, including raptors and other birds that may interact with powerlines, would be minimized. We estimate that the levelized annual cost of the measure would be $910, and conclude that the benefits of the measure would outweigh the costs.

Bald Eagle Conservation Plan

Construction of the project has the potential to affect bald eagles by disturbing nesting, roosting, or foraging activity. Presently, there are eight bald eagle nests at Cannonsville Reservoir, including at least two within or adjacent to the proposed construction area. New York DEC's WQC condition T/E4 and Interior's 10(j) recommendation no. 5 both would have the City develop an eagle conservation plan to address construction impacts on bald eagles. Such a plan would minimize impacts to bald eagles within the project boundary, provided that specific measures to monitor bald eagles and avoid bald eagle habitat during project construction, operation, and maintenance are included. Therefore, staff recommends that the City develop and implement a bald eagle conservation plan, in consultation with the FWS and New York DEC. We estimate that the levelized annual cost of the measure would be $910, and conclude that the benefits of the measure would outweigh the costs.

Cultural Resources Discovery and Notification

There are no known historical or archaeological properties that would be affected by construction, operation, or maintenance of the project. All areas where construction activities would occur were disturbed during construction of the dam and reservoir in 1964. Nonetheless, it is possible that archaeological or historic sites could be discovered

over the course of the license. Therefore, staff recommends that the City notify the Commission and the New York SHPO if previously unidentified archaeological or historic properties are discovered during the course of constructing, operating, or maintaining the project. In the event of any such discovery, the City should discontinue construction-related activities until the proper treatment of any potential archaeological or cultural resources is established. We estimate that the levelized annual cost of the measure, if such resources were to be discovered, would be minimal, and conclude that the benefits of the measure would outweigh the cost.

5.3 UNAVOIDABLE ADVERSE EFFECTS

None.

5.4 FISH AND WILDLIFE AGENCY RECOMMENDATIONS

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by the federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission finds that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

In response to the Commission's Ready for Environmental Analysis notice, Interior, in a letter filed December 18, 2012, recommended five fish and wildlife measures under section 10(j). On November 21, 2013, in response to the draft EA, Interior revised its recommendation no.2. Table 13 presents Interior's 10(j) recommendations and indicates whether the recommendations are included in the staff alternative. Environmental recommendations that we consider outside the scope of section 10(j) have been considered under section 10(a) of the FPA and are addressed in the specific resource sections of this document and the previous section.

Interior's original 10(j) recommendation no. 2 stated: "*For the protection and enhancement of migratory birds, the licensee shall take all practical measures to avoid take and minimize disturbance during the construction and operation of the hydropower project. Vegetation clearing should be conducted outside the breeding season to reduce the likelihood of taking nesting birds.*"

In the draft EA, Commission staff made a preliminary determination that 10(j) recommendation no. 2 would be within the scope of section 10(j), but may be

inconsistent with the purposes and requirements of the FPA or other applicable law. The draft EA stated that Interior's recommendation to limit vegetation clearing to the period outside of the migratory bird breeding season was overly broad and impractical, as it could be interpreted to restrict the City's routine maintenance of lands adjacent to project facilities and within proposed transmission line corridors to a small window of time outside of the migratory bird breeding season (i.e., September through December).

By letter dated November 1, 2013, we provided Interior our preliminary determination concerning Interior 10(j) recommendation no. 2. In its response, filed November 21, 2013, Interior revised its recommendation to remove the time-of-year restriction for vegetation clearing (i.e., the second sentence of the original recommendation). It stated that *"provided the licensee complies with all of the provisions of the license pertaining to bald eagles and undertakes all reasonable and practical measures to protect other migratory birds, the Department concurs that the license, as proposed in the DEA, will adequately protect migratory birds."* It further stated that it did not believe that a meeting or teleconference to discuss the preliminary determination was needed.

Interior's revision to recommendation no. 2 resolves our concerns regarding the impact of the measure's restriction on the timing of vegetation removal on proper, efficient maintenance of the project, and that sufficient protection for migratory birds exists within other recommended measures. However, the revised recommendation to "take all practical measures to avoid take and minimize disturbance" is not a specific measure for the protection, mitigation, or enhancement of fish and wildlife resources that may be affected by the project, and therefore not a valid 10(j) recommendation. We have considered this measure under section 10(a)(1) of the FPA and agree with Interior that the other recommended and mandatory measures, such as the restriction on the City's construction and maintenance activity in proximity to bald eagle nests between January 1 and the preparation of an avian protection plan, would adequately protect migratory birds at the project.

of fish and wildlife agency recommendations for the Cannonsville Project (Source: staff).

Recommendation	Agency	Within the scope of section 10(j)?	Levelized Annual cost $	Recommend adopting?
n and enhancement of fish and wildlife Cannonsville Project in compliance with	Interior	Yes	0[1]	Yes
n and enhancement of migratory birds, take s to avoid take and minimize disturbance on and operation of the project.	Interior	No[2]	-[3]	No
n and enhancement bald eagles and other lines wherever feasible. If not feasible, Avian Power Lines Interaction Committee.	Interior	Yes	1,320	Yes
n and enhancement of migratory birds, s and other raptors, develop an avian nsultation with the New York DEC and the	Interior	Yes	910	Yes
n and enhancement of bald eagles, develop n plan in consultation with the FWS and	Interior	Yes	910	Yes

nplements this measure pursuant to the operation of its water supply operations. There would be no additional e hydropower project.

re for the protection mitigation, or enhancement of fish and wildlife resources that may be affected by the

icity, we are unable to determine a cost for this measure.

5.5 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C. section 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by a project. We reviewed 15 comprehensive plans that are applicable to the project.[21] We found no inconsistencies.

6.0 FINDING OF NO SIGNIFICANT IMPACT

If the City's Cannonsville Project is issued an original license as proposed, with the additional staff-recommended measures, the project would allow the City to generate 42,281 MWh of electrical energy from a renewable resource which does not contribute to atmospheric pollution, while maintaining the reservoir as an important component of its water supply system, and maintaining the environmental, recreational, and flood control benefits currently provided at the site.

Based on our independent analysis, the issuance of a license for the Cannonsville Project with our recommended environmental measures would not constitute a major federal action significantly affecting the quality of the human environment.

7.0 LITERATURE CITED

Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. http://www.aplic.org/uploads/files/11218/Reducing_Avian_Collisions_2012watermarkLR.pdf. Accessed July 1, 2013.

Avian Powerline Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. http://www.aplic.org/uploads/files/2643/SuggestedPractices2006(LR-2).pdf. Accessed July 1, 2013.

Avian Powerline Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (FWS). 2005. Avian Protection Plan Guidelines. http://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Aprl2005.pdf. Accessed July 1, 2013.

Bryce, S.A., Griffith, G.E., Omernik, J.M., Edinger, G., Indrick, S., Vargas, O., and Carlson, D., 2010, Ecoregions of New York (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey,

[21] A listing of these comprehensive plans is contained in appendix B of this EA.

map scale 1:1,250,000. ftp://ftp.epa.gov/wed/ecoregions/ny/NY_front.pdf. Accessed August 8, 2013.

Castelli, E., P. Parasiewicz, and J. Rogers. 2012. Use of frequency and duration analysis for the determination of thermal habitat thresholds: Application for the conservation of *Alasmidonta heterodon* in the Delaware River. Journal of Environmental Engineering. 138: 886-892.

Cole, J. C., P. A. Townsend, and K. N. Eshleman. 2008. Predicting Flow and Temperature Regimes at Three Alasmidonta heterodon Locations in the Delaware River. Technical Report NPS/NER/NRTR—2008/109. National Park Service. Philadelphia, PA. http://www.nps.gov/nero/science/FINAL/UPDE_Flow&Temp/UPDE_Flow&Temp.htm. Accessed August 8, 2013.

Ford, D. and G. Johnson. Undated. Salamanders of New York. State University of New York – College of Environmental Science and Forestry. http://www.esf.edu/pubprog/brochure/salamanders/salamand.htm. Accessed August 26, 2013.

Galbraith, H. 2012. Phase 1 freshwater mussel survey and comparison to historical surveys at the Pond Eddy bridge, Delaware River, New York and Pennsylvania: U.S. Geological Survey Open-File Report 2012–1224. Accessed August 6, 2013 from http://pubs.usgs.gov/of/2012/1224/support/of2012-1224.pdf

Maloney, K., W. Lellis, R. Bennett, and T. Waddle. 2012. Habitat persistence for sedentary organisms in managed rivers: The case for the federally endangered dwarf wedgemussel (Alasmidonta heterodon) in the Delaware River. Freshwater Biology. 57: 1315-1327. Accessed August 1, 2013 from http://www.lsc.usgs.gov/files/Maloney_et_al_2012_FWB_57_6_p1315_1327.pdf

Nedeau, E.J. 2008. Freshwater Mussels and the Connecticut River Watershed. Connecticut River Watershed Council. Greenfield, Massachusetts. Accessed April 10, 2013 at http://www.biodrawversity.com/pubs/Chapter5.pdf . Accessed April 10, 2013.

New York State Department of Environmental Conservation (New York DEC). 2013. New York State Breeding Bird Atlas Data for Block 4665A. http://www.dec.ny.gov/animals/51030.html. Accessed July 24, 2013.

New York State Department of Environmental Conservation (New York DEC). 2010. New York State Bald Eagle Report. http://www.dec.ny.gov/docs/wildlife_pdf/baea2010.pdf. Accessed August 1, 2013.

New York State Department of Environmental Conservation (New York DEC). Undated. Bald eagle fact sheet. http://www.dec.ny.gov/animals/74052.html. Accessed August 1, 2013.

New York State Natural Heritage Program (New York NHP). 2013a. New York NHP Conservation Guide: Longtail salamander. http://www.acris.nynhp.org/report.php?id=6695. Accessed August 26, 2013.

New York State Natural Heritage Program (New York NHP). 2013b. New York NHP Conservation Guide: Bald eagle. http://www.acris.nynhp.org/report.php?id=6811. Accessed August 1, 2013.

New York Natural Heritage Program (New York NHP). 2013c. NYNHP Conservation Guide - Northern Monkshood (*Aconitum noveboracense*). http://www.acris.nynhp.org/report.php?id=9263 . Accessed February 13, 2013.

New York Natural Heritage Program (New York NHP). 2013d. NYNHP Conservation Guide - Dwarf Wedgemussel (*Alasmidonta heterodon*). http://www.acris.nynhp.org/report.php?id=8375. Accessed August 1, 2013.

The Nature Conservancy. 2000. High Allegheny Plateau Ecoregion - Elevation. http://gis.tnc.org/data/MapbookWebsite/map_page.php?map_id=225&sType=TITLE&sKind=high. Accessed August 14, 2013.

North American Electric Reliability Corporation (NERC). 2012. 2012 Long-Term Reliability Assessment. Atlanta, GA. November 2012.

U.S. Geological Survey (USGS). 2012. Northeastern Highlands Ecoregion. http://landcovertrends.usgs.gov/east/eco58Report.html. Accessed August 8, 2013.

U.S. Fish and Wildlife Service (FWS). 2013. Federally Listed Endangered And Threatened Species And Candidate Species In Delaware County, New York. http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=36025. Accessed August 1, 2013

U.S. Fish and Wildlife Service (FWS). 2011. Bald Eagle profile. http://www.fws.gov/arcata/es/birds/baldEagle/b_eagle.html. Accessed August 1, 2013.

8.0 LIST OF PREPARERS

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APPENDIX A: RESPONSES TO COMMENTS ON DRAFT EA

STAFF RESPONSES TO COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT

The Commission staff issued its draft environmental assessment (EA) for the proposed relicensing of the Cannonsville Project on October 31, 2013. Staff requested comments on the draft EA be filed within 30 days from the issuance date, or by December 2, 2013. The following entities filed comments on the draft EA.

Commenting Entity	**Date Filed**
Interior	November 21, 2013
City	December 2, 2013

Below, we summarize the substantive comments, provide responses to those comments, and explain how we modified the text of the draft EA, as appropriate, to address the comments. The comments are grouped by topic for convenience. Changes addressing editorial comments were made to the final EA, but are not described below. Comments regarding desired license conditions that are administrative in nature (e.g., license term) are not discussed here, but would be addressed, as appropriate, in the license order.

General

Comment: The City commented that although the draft EA recommended adopting the City's proposal to generate electricity using the water being released from the Cannonsville Reservoir in accordance with the applicable operating protocol agreed to by the Decree Parties, currently the FFMP-OST, there are several instances in the document where the analysis appears to be tied specifically to the FFMP-OST. The City requests clarification that where the EA discusses construction or operation of the project in accordance with the FFMP-OST, the Commission recognizes and accepts that the project would be constructed and operated in accordance with the FFMP-OST, and any subsequent operating protocol duly adopted by the decree parties.

Response: The draft EA recognized that the City's proposal was to release water in accordance with the applicable operating protocol agreed to by the Decree Parties (currently the FFMP-OST) and that the protocol is subject to change over time by unanimous consent of the Decree Parties. The City is correct that the draft EA did not consistently make this clear. The EA has been revised, where needed, to provide the requested clarification.

Aquatic Resources

Comment: The City states that, since 2009, limnological surveys of Cannonsville Reservoir have been conducted once monthly during the months of April through November, rather than twice monthly, as was performed historically.

Response: We have updated the text in section 3.3.2.1 to reflect this information.

Comment: The City requests clarification that the draft EA's recommendation that the City update its Flow Management Plan to incorporate the conditions of New York DEC's water quality certification pertaining to siphon use refers to the Flow Management Plan included as Volume 11 to the license application, and not the like-named component of the FFMP-OST.

Response: The City is correct that the referenced Flow Management Plan is the plan contained in appendix 11 to the license application. We have revised the EA to provide the requested clarity.

Comment: The City provided an update on its ongoing fish impingement and entrainment study. It stated that although the study is still ongoing, the preliminary results have found very few entrained fish.

Response: We have revised the text in section 3.3.2.2. to incorporate this information.

Terrestrial Resources

Comment: Interior provided comments regarding staff's non-adoption of its 10(j) recommendation no. 2, and provided a revised 10(j) recommendation no. 2, intended to clarify its original recommendation and address staff's stated concerns regarding the original recommendation's restriction on routine vegetation maintenance for a large part of the year.

Response: We address Interior's revised 10(j) recommendation no. 2 in sections 3.3.3.2 and 5.4 of this final EA.

Comment: The City requested clarification concerning staff's recommendation that the City develop and implement a wetland avoidance and mitigation plan in consultation with the Corps, FWS, and New York DEC that would include details on the areas to be protected, the types of signage and barriers to be used, and the on-site mitigation opportunities available to compensate for loss of the 0.57-acre emergent wetland. The City states that as part of its section 404 permit application to the Corps, it is preparing a Compensatory Mitigation Plan to compensate for the removal of wetlands as part of project construction. The City states that to avoid duplication of effort, it will ensure that its Compensatory Mitigation Plan includes the wetlands avoidance and mitigation

measures recommended in the draft EA and that the staff recommended agency consultation occurs during development of the plan.

Response: Staff agrees that our recommended wetland avoidance and mitigation plan could be a part of the compensatory mitigation plan that the City is preparing for the Corps. When completed, the plan should be filed with the Commission. We have added text to section 3.3.3.2 of this final EA.

Comment: The City states that based on a recent wetland delineation study, it estimates that only 0.57 acre of wetlands would be directly impacted by construction of the project, not the 1.05 acres previously estimated and analyzed in the EA. The City further states that it is preparing a Wetland Delineation Report as part of the section 404 permitting process and will file a copy with the Commission when the report is complete.

Response: We have revised the EA to incorporate this new information.

Comment: The City states that since the application has been filed, there have been some developments bearing on staff's recommended Avian Protection Plan that warrant clarification in the EA. The City states that on November 26, 2013, the City conferenced with Interior and New York DEC to discuss the anticipated impacts of project construction and operation on migratory birds, and those entities agreed that the City should focus its avian protection efforts on bald eagles. The City seeks clarification that the recommendation included in the draft EA be read broadly and not require duplicate efforts; that the Commission allow the City to address appropriate protection measures from the APLIC guidelines within the context of the existing avian protection plan and associated federal and state permits.

Response: Staff's recommendation for an Avian Protection Plan was based on its analysis contained in section 3.3.3.2 and also Interior's 10(j) recommendation no. 4. Staff is unclear as to which "existing avian protection plan" the City is referring to. If the existing plan addresses staff's and Interior's concerns, or can be modified to do so, the City would not need to prepare another plan. In either case, the Avian Protection Plan should be filed with the Commission.

Comment: The City states that it is still assessing whether to construct the new power line above- or below-ground. It states that it considers this a design detail to be addressed in a pre-construction compliance filing, but that any above-ground facilities would have avian protection devices, as appropriate.

Response: In the draft EA, staff evaluated the environmental effects of the above-ground transmission line proposed in the license application. Inasmuch as the above-ground line is still the City's proposal, no changes were made to the body of the EA. Whether or not this is a "design detail to be addressed in a pre-construction compliance filing" would need to be determined at such time as a decision was made to place the line underground.

Comment: The City states that it has no authority to install avian protection devices on NYSEG's existing 46-kV transmission line that traverses the project area. The City seeks confirmation that the EA's recommendations apply only to City-owned facilities.

Response: Staff's recommendations regarding avian protection measures apply only to City-owned facilities. No changes to the text of the EA are needed.

Comment: Regarding the draft EA's recommended Bald Eagle Conservation Plan, the City states that it currently has federal and state bald eagle incidental take permits for its routine operation and maintenance activities in the vicinity of bald eagle nests at the reservoir, and that the state permit requires it to develop a site-specific Bald Eagle Conservation Plan to monitor and protect bald eagles in the vicinity of Cannonsville Reservoir. The City states that in addition to this site-specific plan, it has developed and is implementing a reservoir-wide Bald Eagle Conservation Plan that requires it to protect, monitor, and enhance bald eagle populations at City-owned reservoirs. The City states that during its November 26, 2013 teleconference with Interior and New York DEC, it stated its intent to incorporate bald eagle protection measures arising from project construction and operation into its existing permits and that Interior and the New York DEC agreed that permit modification is the preferred method for incorporating such measures.

Response: Staff agrees that the bald eagle conservation plans identified in Interior's 10(j) recommendation no. 5 and New York DEC's Part 182 incidental take permit would satisfy the EA's recommended Bald Eagle Conservation Plan. The plan should be filed with the Commission.

Threatened and Endangered Species

Comment: Interior stated that it concurred with the DEA's conclusion that the project is "not likely to adversely affect" the dwarf wedgemussel.

Response: We have updated the EA to document Interior's concurrence.

Recreation and Land Use

Comment: The City requests clarification of the draft EA's discussion of the type of recreational activities available at the reservoir. The City states that the following recreational activities are permitted in the area surrounding the Cannonsville Reservoir: hiking, fishing, canoeing, kayaking, hunting, sail boating, sculling, cross-country skiing, snowmobiling, picnicking, and bird watching. Mountain biking, swimming, horseback riding, and camping opportunities are not permitted on City-owned lands. Snowmobiling is only allowed by special permit and not in proximity to the reservoir.

Response: We have revised the text and provided the requested clarification in section 3.3.5 of this EA.

Cultural Resources

Comment: The City states that it accepts the Commission's recommendation concerning procedures to be followed if previously unidentified archaeological or historic properties are discovered during construction or during the term of the license, and that to address this potential, it is developing a Historic Properties Management Plan (HPMP) for the project.

Response: The Commission requires the preparation of an HPMP in those cases where a Commission undertaking (e.g., license issuance) has the potential to result in adverse effects to cultural resources. In this proceeding, staff has determined that the proposed project would not affect cultural resources, because construction of the project would impact only areas that were previously disturbed when the dam was constructed in 1964. Therefore, staff did not recommend preparation of an HPMP. Staff did recommend, however, the procedures to be followed in the unlikely event that previously unidentified cultural resources are discovered.

Aesthetic Resources

Comment: The City states that although the draft EA "agrees" with the City's assessment of aesthetic impacts, the draft EA does not specifically "adopt" the City's position that no aesthetic mitigation measures are needed.

Response: Although staff did not "adopt" the City's "position" on the need for aesthetic mitigation measures, because staff did not recommend any aesthetic mitigation measures, it can be assumed that staff determined that no such measures were needed.

APPENDIX B: WATER QUALITY CERTIFICATE

New York State Department of Environmental Conservation

Water Quality Certification Conditions

DEC Permit Number: 4-1230-0089/00010

Effective Date: June 11, 2013

Modified: June 18, 2013

DESCRIPTION OF AUTHORIZED ACTIVITY:

The permittee is authorized to modify existing facilities and construct additional facilities for operation which will generate electricity from current flow releases from the Cannonsville Dam to the West Branch of the Delaware River. The facility will have four turbines (two 5.850 MW, two 1.170 MW) for a total hydropower generation capacity of 14.04 megawatts. The current reservoir release operation through the Delaware River Decree Party process Flexible Flow Management Plan-Operational Support (FFMPOST) tool will be maintained. No changes to the flow releases are proposed following facility construction or during project operation. A powerhouse is proposed to be constructed adjacent to the existing low-level release works building to contain four turbine-generator units. The electrical interconnection between the project and the New York State Electric and Gas Corporation transmission system will be via a new aerial line. The existing Part 182 Threatened and Endangered Species Incidental Take permit is modified and incorporated into this approval for protective measures for Bald Eagles. Additional protective measures and plans will incorporated into this permit as the final facility plans are completed.

Modification #1 to original permits issued 6/10/13 : Changes to Special Condition FMS 1 and FMS 3 to reflect references to Special Conditions AP 1. AP1An, and AP1B.

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification

The permittee expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees, and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the permittee’s undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits,

actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

Item B: Permittee's Contractors to Comply with Permit

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

Item C: Permittee Responsible for Obtaining Other Required Permits

The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

Item D: No Right to Trespass or Interfere with Riparian Rights

This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.

GENERAL CONDITIONS

1. Facility Inspection by the Department

The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71-0301 and SAPA 401(3).

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project

site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

2. Relationship of this Permit to Other Department Orders and Determinations

Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

3. Applications for Permit Renewals or Modifications

The permittee must submit a separate written application to the Department for renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing.

The permittee must submit a renewal application at least:

a) 180 days before expiration of permits for State Pollutant Discharge Elimination System (SPDES), Hazardous Waste Management Facilities (HWMF), major Air Pollution Control (APC) and Solid Waste Management Facilities (SWMF); and

b) 30 days before expiration of all other permit types.

Submission of applications for permit renewal or modification are to be submitted to:

NYSDEC Deputy Regional Permit Administrator, Region 4, Rte. 10, Stamford, NY 12167

4. Permit Modifications, Suspensions and Revocations by the Department

The Department reserves the right to modify, suspend or revoke this permit in accordance with 6 NYCRR Part 621. The grounds for modification, suspension or revocation include:

a) materially false or inaccurate statements in the permit application or supporting papers;

b) failure by the permittee to comply with any terms or conditions of the permit;

c) exceeding the scope of the project as described in the permit application;

d) newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit;

e) noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

Additional General Conditions

FOR ARTICLES 15 (Title 5), 24, 25, 34, 36 and 6 NYCRR Part 608

1. If future operations by the State of New York require an alteration in the position of the structure or work herein authorized, or if, in the opinion of the Department of Environmental Conservation it shall cause unreasonable obstruction to the free navigation of said waters or flood flows or endanger the health, safety or welfare of the people of the State, or cause loss or destruction of the natural resources of the State, the owner may be ordered by the Department to remove or alter the structural work, obstructions, or hazards caused thereby without expense to the State, and if, upon the expiration or revocation of this permit, the structure, fill, excavation, or other modification of the watercourse hereby authorized shall not be completed, the owners, shall, without expense to the State, and to such extent and in such time and manner as the Department of Environmental Conservation may require, remove all or any portion of the uncompleted structure or fill and restore to its former condition the navigable and flood capacity of the watercourse. No claim shall be made against the State of New York on account of any such removal or alteration.

2. The State of New York shall in no case be liable for any damage or injury to the structure or work herein authorized which may be caused by or result from future operations undertaken by the State for the conservation or improvement of navigation, or for other purposes, and no claim or right to compensation shall accrue from any such damage.

3. Granting of this permit does not relieve the applicant of the responsibility of obtaining any other permission, consent or approval from the U.S. Army Corps of Engineers, U.S. Coast Guard, New York State Office of General Services or local government which may be required.

4. All necessary precautions shall be taken to preclude contamination of any wetland or waterway by suspended solids, sediments, fuels, solvents, lubricants, epoxy coatings, paints, wet or fresh concrete, leachate or any other environmentally deleterious materials associated with the project.

5. Any material dredged in the conduct of the work herein permitted shall be removed evenly, without leaving large refuse piles, ridges across the bed of a waterway or floodplain or deep holes that may have a tendency to cause damage to navigable channels or to the banks of a waterway.

6. There shall be no unreasonable interference with navigation by the work herein authorized.

7. If upon the expiration or revocation of this permit, the project hereby authorized has not been completed, the applicant shall, without expense to the State, and to such extent and in such time and manner as the Department of Environmental Conservation may require, remove all or any portion of the uncompleted structure or fill and restore the site to its former condition. No claim shall be made against the State of New York on account of any such removal or alteration.

8. If granted under 6NYCRR Part 608, the NYS Department of Environmental Conservation hereby certifies that the subject project will not contravene effluent limitations or other limitations or standards under Sections 301, 302, 303, 306 and 307 of the Clean Water Act of 1977 (PL 95-217) provided that all of the conditions listed herein are met.

Special Conditions

6NYCRR 608:

WATER QUALITY CERTIFICATION

APPROVED PLANS

AP1. **Conformance With Plans.** All work shall be done in strict conformance with the approved documents and plans listed below in AP1.A and B and referenced in the Special Permit Conditions. In the event of inconsistencies: 1) more recently dated documents supersede earlier documents, 2) conditions in this permit supersede referenced documents.

A. Application documents:

a. Cannonsville Hydroelectric Development Application for Section 401 Water Quality Certification received 6/11/2012 and all attachments.

b. VOLUME 6 Appendix E-4: Impact of Hydropower Development Construction Related Activities on Wildlife and Botanical Resources, including Wetlands, Riparian, and Littoral Habitat, and Rare, Threatened and Endangered Species.

c. Joint Application Form 6/4/2013 and cover letter dated 6/8/2012, stamped received 6/11/2012, Attachment 1: Location Map of Cannonsville Development and Attachment 2: Tax Map Information.”.

d. VOLUME 2 Exhibits F-G PUBLIC VERSION.

e. VOLUME 1 Verification Statement Initial Statement Exhibits A – E.

f. VOLUME 5 Appendix E-3: Fish Entrainment Report, Literature Based Characterization of Resident Fish Entrainment and Mortality.

g. VOLUME 4 Appendix E-2: Impact of Construction-Related Activities on Erosion.

h. VOLUME 7 Appendix E-5: Phase IA Archeological Literature Review and Sensitivity Assessment.

i. Supplemental FERC Filing Letter May 1, 2012.

j. VOLUME 8 Appendix E-6: Impact of Construction-Related Activities and New Construction on Aesthetics.

k. VOLUME 9 Appendix E-7: Socioeconomic Study Report.

l. VOLUME 10 Appendix E-8: USGS Report: A Decision Support Framework for Water Management in the Upper Delaware River.

m. VOLUME 11 Appendix E-9: Flow Management Plan during Construction.

n. "Study Plan, Field Sampling to Evaluate Potential Fish Entrainment at Cannonsville Reservoir" "Revision 1", dated "May 2013".

o. VOLUME 2 Appendix F: Cannonsville Final License Application List of Project Drawings

B. "Agreement of the Parties to the 1954 U.S. Supreme Court Decree effective June 1, 2013 (Flexible Flow Management Program-Operational Support Tool)

AP2. Final plans including but not limited to the Stormwater Pollution Prevention Plan shall be submitted to the Department for prior review and approval no less than 90 days prior to the scheduled start of work. Such review and approval may result in modification of this permit and/or plans.

AP3. Any modification to these plans that will affect the indicated waterbody must be approved by the Department prior to being undertaken. Work and ground or waterway disturbance is strictly limited to the areas approved by this permit and shown on the approved plans.

CONSTRUCTION REQUIREMENTS

C1. As described in Special Condition 1 above no less than 90 days prior to the start of construction, the permittee must provide to the Department the plans and specifications for the facilities, including a Stormwater Pollution Prevention Plan and Best

Management Practices for maintaining water quality during construction. All site work including but not limited to constructing and maintaining all settling ponds/retention basins, drainage ways, drainage and water control and erosion control shall be carried out in strict accordance with the approved NYCDEP Stormwater Pollution Prevention Plan

C2. The work area shall be isolated from the flowing stream by use of sandbags, cofferdam, or piping or pumping around the work area. Waters accumulated in the isolated work area shall be discharged to an upland settling basin, field or wooded area to provide for settling and filtering of solids and sediments before water is returned to the stream. Return waters must be as clear as the flowing water upstream from the work area.

C3. No discharge of sediment or turbid waters to wetlands or water bodies is permitted. In the case of stream work, the water below the work area shall remain as clear as the flowing water above the work site.

C4. No wet or fresh concrete or leachate shall be allowed to escape into the waters of New York State, nor shall washings from Redi-Mix trucks, mixers or other devices be allowed to enter any wetland or waters.

C5. Equipment operation, other than for the construction of the cofferdam, in the water is prohibited.

C6. Disturbance to the bed and banks of the stream shall be kept to the minimum necessary to complete the project.

C7. Filter fabric barriers, silt fencing, or other methods to control erosion are to be used on the downslope edge of any disturbed areas. These erosion/sediment controls are to be put in place before any disturbance of the ground occurs and are to be maintained in good working order until all disturbed land is heavily vegetated. Said structures must remain "in place" in good working order throughout construction and shall remain until final grading has been completed and final seeding has been established.

C8. Any excavated soil shall be suitably retained and covered so that there is no turbid runoff discharged either directly or indirectly into any waterway or wetland.

C9. All unused, excavated materials and/or construction debris, shall be immediately removed, upon completion of construction, a minimum of 100 feet from the waterbody or wetland or flood plain.

C10. All areas of soil disturbance resulting from this project shall be shaped/graded, and seeded with an appropriate perennial grass seed (free of other invasive species such as purple loosestrife) and mulched within one week of final grading. Mulch shall be maintained until a suitable vegetative cover is established.

C11. If seeding is impracticable due to the time of year, a temporary mulch (free of other invasive species such as purple loosestrife) shall be applied and final seeding shall be performed at the earliest opportunity when weather conditions favor germination and growth after project completion.

C12. Notice of Intent to Commence Work. The Permittee shall notify the Department 3 to 5 days prior to the commencement of work on the project, either by e-mail to the Regional Permit Administrator at r4stamforddep@gw.dec.state.ny.us , or by letter to the: NYSDEC, Deputy Regional Permit Administrator, 65561 State Highway 10, Stamford, NY 12167. The notification shall contain the following information: 1) Permittee Name; 2) DEC Permit #; 3) Town and County; 4) Permit Effective Date; 5) Permit Expiration Date and 6) Work Commencement Date.

OPERATIONAL REQUIREMENTS-SIPHONS

CO1. Use of siphons will be limited to October 1 to May 15 of any year this permit is in effect and a water discharge temperature of 60 degrees or colder shall be maintained during use. If use of siphons is required after May 15 or prior to October 1, the permittee shall notify NYSDEC no less than 30 days prior to use. Notification shall contain a detailed description of the methods that will be used to insure a discharge temperature of 60 degrees is maintained. Warmer temperature is allowed but only up to the ambient temperature at the intake for the Cannonsville Reservoir outlet and only if NYSDEC after review of the proposed methods notifies NYCDEP of their acceptance prior to use.

CO2. The discharge temperature of the siphons shall be 60 degrees Fahrenheit or colder. If conditions cause the permittee to operate the siphons when the water column temperature is above 60 degrees Fahrenheit, the permittee shall provide written notification to NYSDEC at least 30 days prior to siphon operation. Notification shall include a detailed description of methods proposed to be employed to insure the discharge water from the siphons is as close to 60 degrees as the reservoir allows. Warmer temperature is allowed but only up to the ambient temperature at the intake for the Cannonsville Reservoir outlet and only if NYSDEC, after review of the proposed methods, notifies the permittee of their acceptance prior to use.

CO3. The permittee must meet all flow and water quality requirements set forth in this permit, the approved plans, applicable orders and regulations. The permittee shall develop and submit a stream flow and temperature monitoring plan for Department review and approval no less than 90 days prior to operation of the siphons.

FACILITY OPERATION REQUIREMENTS

FO1. Releases from the reservoir shall be governed by the document entitled "Agreement of the Parties to the 1954 U.S. Supreme Court Decree effective June 1, 2013 (Flexible Flow Management Program-Operational Support Tool). Each successor agreement as modified and approved by the Decree Parties shall be submitted to the Department by the Permittee for modification of this permit to incorporate by reference said successor agreement.

FISH STUDIES AND MITIGATION:

FSM1. Any changes proposed to the WQC application as listed in Special Condition AP1 in operating parameters and or the FFMP-OST in Special Condition AP1.B shall be submitted to the Department and as applicable to the other Decree Party members, no less than 90 days prior to proposed implementation. At minimum the permittee will need to provide documentation to address any potential impacts such as fish mortality unanticipated by the studies in Special Condition AP1An and the need for mitigation to reduce or compensate for such unanticipated fish mortality.

FSM2.If the results of the City of New York Cannonsville Hydroelectric Project study entitled "Study Plan, Field Sampling to Evaluate Potential Fish Entrainment at Cannonsville Reservoir" "Revision 1", dated "May 2013", reveals fish congregation at the intake and concurrent observation of fish mortality downstream of the dam during the sampling period not anticipated in the study, then NYCDEP will consult with NYSDEC on the design of a study to determine incremental turbine entrainment over and above existing non-turbine conditions. The Department reserves the right to require mitigation measures to reduce and/or compensate for such fish mortality incrementally due to the turbine operation, if necessary.

FSM3. Once construction is complete and under operating conditions of the hydro facility, if fish mortality which is unanticipated based upon the studies in Special Condition AP1.A.n, is observed downstream of the outlet, the Department reserves the right to require additional studies and if necessary mitigation measures to reduce such fish mortality.

THREATENED/ENDANGERED SPECIES REQUIREMENTS

T/E1. The permittee shall follow the conditions contained in the NYCDEP Cannonsville Part 182 Threatened and Endangered Species taking permit 4-1230-00089/00011.

T/E2. Prior to construction, the permittee is required to submit for Department review and approval, the final plans for electrical facilities incorporating any necessary avian protection measures as part of a Part 182 permit modification.

T/E3. No construction activity is permitted within 330 feet of a Bald Eagle Nest site between January 1 and July 31st unless the Department determines in writing that breeding activity for the year has ceased.

T/E4. The project shall be carried out in strict accordance with the plans and documents prepared by the permittee as fully described above in the Species Conservation and Implementation Plans prepared by the permittee.

T/E5. Work within 660 feet of a nest tree shall be limited as follows unless the Department determines in writing that breeding activity for the year has ceased:

a. No work prior to June 1 of any calendar year or at least 3 weeks after hatching whichever is later.

b. All other work within 660 feet of the nest is limited to August 1st to December 31st.

T/E6. During the term of this permit, if any dead, injured or damaged NYS listed threatened or endangered species are discovered by the permittee, or their designated agents, the permittee shall immediately contact the regional NYSDEC Wildlife Manager to arrange for recovery and transfer of the specimen(s). The permittee shall record: species, the date the animal was discovered, the location of discovery, the name(s) of any person(s) involved with the mortality/injury, and, if known, an explanation of how the mortality/injury occurred. This record shall be kept with the container holding the specimen and given to the Department at the time of transfer.

T/E7. This permit is required as the Department has determined that the project proposed by NYCDEP may result in an incidental "take" or "taking" of the Bald Eagle, which is listed as a threatened species pursuant to Environmental Conservation Law Section 11-0535 and 6 NYCRR Part 182. The Department has determined that operations authorized under this permit may result in the loss of productivity of pair of nesting bald eagles through temporary disturbance and nearby habitat modification if the breeding activity at

the nest is successful. This loss will be offset through compliance with all minimization and avoidance measures identified in the conditions of this permit and the mitigation provided through the implementation of the eagle habitat protection, research and monitoring outlined in the Eagle Conservation and Implementation Plans identified in conditions resulting in a net conservation benefit to the threatened species. These conditions can be waived on an annual basis if the Department determines each year that breeding activity at the nests have ceased.

APPENDIX C: LIST OF COMPREHENSIVE PLANS

APPENDIX C: LIST OF COMPREHENSIVE PLANS

The following is a list of comprehensive plans currently on file with the Commission that are relevant to the proposed Cannonsville Project.

Atlantic States Marine Fisheries Commission. 1995. Interstate fishery management plan for Atlantic striped bass. (Report No. 24). March 1995.

Atlantic States Marine Fisheries Commission. 1998. Interstate fishery management plan for Atlantic striped bass. (Report No. 34). January 1998.

Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.

Atlantic States Marine Fisheries Commission. 2000. Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring. February 9, 2000.

Atlantic States Marine Fisheries Commission. 2009. Amendment 2 to the Interstate Fishery Management Plan for shad and river herring, Arlington, Virginia. May 2009.

Atlantic States Marine Fisheries Commission. 2010. Amendment 3 to the Interstate Fishery Management Plan for shad and river herring, Arlington, Virginia. February 2010.

Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel (Anguilla rostrata). (Report No. 36). April 2000.

Delaware River Basin Commission. 1967. Delaware River Basin Compact. Trenton, New Jersey. January 1967. 51 pp.

National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.

New York Department of Environmental Conservation. 1985. New York State Wild, Scenic, and Recreational River System Act. Albany, New York. March 1985.

New York Department of Environmental Conservation. 1986. Regulation for administration and management of the wild, scenic, and recreational rivers system

in New York State excepting the Adirondack Park. Albany, New York. March 26, 1986. 27 pp.

New York State Office of Parks, Recreation, and Historic Preservation. New York Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2003-2007. Albany, New York. January 2003.

Soil Conservation Service. 1977. Watershed plan and environmental impact statement - Deposit watershed in Broome, Chenango, and Delaware Counties, New York. Department of Agriculture, Syracuse, New York. September 1977. 110 pp.

U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.

U.S. Fish and Wildlife Service. Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.