



VIA Electronic Filing

April 11, 2018

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Gregory B. Jarvis Power Project (Hinckley Reservoir), FERC No. P-3211-009
Filing of Revised Study Plan and Request for Privileged Treatment of Confidential, Non-Public Information

Dear Secretary Bose:

The New York Power Authority (Power Authority) is pleased to file the enclosed Revised Study Plan (RSP) for the Federal Energy Regulatory Commission's (FERC or the Commission) relicensing of the Gregory B. Jarvis Power Project (Hinckley Reservoir), FERC Project No. 3211 (Jarvis Project). Pursuant to the ILP, the Power Authority filed its Notice of Intent and Pre-Application Document on June 30, 2017. Following an opportunity for resource agencies and stakeholders to submit comments and study requests, the Power Authority filed its Proposed Study Plan (PSP) on December 12, 2017. The Power Authority held a meeting on January 11, 2018 to provide a presentation on each study proposed, receive comments, and answer questions related to the proposed studies. Several agencies and stakeholders provided comments on the Power Authority's PSP. The Power Authority appreciates the contribution of resource agencies and stakeholders through their participation at the PSP meeting and submission of comments.

Pursuant to Section 5.13(a) of the Commission's regulations, 18 C.F.R. § 5.13(a), the Power Authority hereby submits the RSP for the Commission's review and approval. As discussed in the enclosed RSP, no new studies are being proposed by the Power Authority. The Power Authority believes that the four studies originally proposed in the PSP will enable FERC to meet its obligations under the National Environmental Policy Act to analyze environmental effects of its licensing action and to ensure that the Project continues to meet the public interest requirements during a new license term, as required under the Federal Power Act.

Additionally, the Power Authority notes that it has provided an updated response to the Commission's Additional Information Request No. 13, which contains sensitive locational information related to cultural resources. This information is protected from public dissemination and exempt from mandatory public disclosure requirements of the Freedom of Information Act.

Pursuant to sections 385.1112 and 388.112 of the Commission's regulations,¹ the Power Authority requests that this information be placed in the non-public file and not be released to the public. As required, the Power Authority is filing this response separately as confidential information.

In accordance with Section 5.13(b) of the Commission's regulations, 18 C.F.R. § 5.13(b), and the Commission's relicensing schedule for the Project, any comments on the RSP must be filed with the Commission by April 26, 2018 – within 15 days of this filing. The Director of the Commission's Office of Energy Projects will issue a Study Plan Determination by May 11, 2018.

The Power Authority is filing the RSP with the Commission electronically. Participants may access the RSP on the Commission's website (<http://www.ferc.gov>) by going to the "eLibrary" link and entering the docket number (P-3211). The Power Authority is also making the RSP available on the Project relicensing website (<http://www.jarvis.nypa.gov>). If there are any questions regarding the RSP or the relicensing process, please direct them to the undersigned at (914) 287-3153 or cindy.brady@nypa.gov.

Sincerely,

A handwritten signature in cursive script that reads "Cindy Brady".

Cindy Brady
Business Development Manager, Licensing

¹ 18 C.F.R. §§ 385.1112, 388.112 (2017).

REVISED STUDY PLAN



Prepared by:



April 2018

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**GREGORY B. JARVIS PROJECT
RELICENSING**

FERC NO. 3211



**NY Power
Authority**

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List of Abbreviations

A	Area
ADCP	Acoustic Doppler Current Profiler
APE	Area of Potential Effect
ADA	Americans with Disabilities Act
BCD	Barge Canal Datum
CAD	Computer aided-design
C.F.R.	Code of Federal Regulations
cfs	Cubic feet per second
DO	Dissolved oxygen
Erie Boulevard	Erie Boulevard Hydropower, L.P.
FERC	Federal Energy Regulatory Commission
ft/s	feet per second
GIS	Geographic Information System
HPMP	Historic Properties Management Plan
ILP	Integrated Licensing Process
ISR	Initial Study Report
mg/L	Milligram per liter
MVWA	Mohawk Valley Water Authority
NEPA	National Environmental Policy Act
NAD83	North American Datum of 1983
NHL	National Historic Landmark
NOI	Notice of Intent
NY	New York
NYSCC	New York State Canal Corporation
NYSDEC	New York State Department of Environmental Conservation
Operating Diagram	2012 Hinckley Reservoir Operating Diagram
OPRHP	New York State Office of Parks, Recreation and Historic Preservation
PAD	Pre-Application Document
PSP	Proposed Study Plan
Q	Discharge / Flow
QA/QC	Quality Assurance / Quality Control
RSP	Revised Study Plan
RTK GPS	Real-time Kinematic Global Positioning System
SCORP	Statewide Comprehensive Outdoor Recreation Plan

SD1	Scoping Document 1
SHPO	State Historic Preservation Officer
SPD	Study Plan Determination
SUNY	State University of New York
the Commission	Federal Energy Regulatory Commission
the Power Authority	the Power Authority of the State of New York
the Project	Gregory B. Jarvis Power Project (Hinckley Reservoir)
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V	Velocity
WSEL	Water Surface Elevation

1 Introduction

The Power Authority of the State of New York (d/b/a “New York Power Authority” and referred to as “the Power Authority”) is relicensing the Gregory B. Jarvis Power Project (Hinckley Reservoir) (FERC No. 3211-NY), referred to herein as “the Project.” The Project is located on West Canada Creek, a tributary to the Mohawk River, at the Hinckley Reservoir Dam. The Project is approximately 0.5 miles upstream of the Town of Hinckley in the counties of Oneida and Herkimer, New York (NY). The original license was issued on August 12, 1982 and expires on July 31, 2022. The Power Authority is using the Federal Energy Regulatory Commission’s (FERC or the Commission) Integrated Licensing Process (ILP) as outlined in 18 C.F.R. Part 5.

In accordance with 18 C.F.R. § 5.5 and 5.6, the Power Authority filed its Notice of Intent (NOI) and Pre-Application Document (PAD) on June 30, 2017, which included the Power Authority’s preliminary study plan for the Project. As discussed in the PAD, the Power Authority proposed to conduct a desktop study entitled *Assessment of Fish Entrainment and Turbine Passage Survival*. The Commission issued its Scoping Document 1 (SD1) on August 29, 2017, and held scoping meetings on September 26 and 27, 2017 at SUNY Polytechnic Institute in Utica, NY, where potential issues were identified by agencies, stakeholders, and the public. Subsequently, the Power Authority received comments on the PAD and the study plans as well as requests for additional studies. The Power Authority reviewed these comments and study requests and addressed them in the Proposed Study Plan (PSP) filed on December 12, 2017.

Subsequent to the PSP filing, the Power Authority held a PSP Meeting on January 11, 2018 at SUNY Polytechnic Institute in Utica, NY. The purpose of the meeting was to provide a presentation on each individual study plan in the PSP and to provide an opportunity for meeting attendees to ask questions related to the proposed studies. FERC and stakeholders attended this meeting.

In accordance with 18 C.F.R § 5.12, PSP comments were due on March 12, 2018. A list of submitted comments is provided in [Appendix A](#). Herein contains the Revised Study Plan (RSP), which serves to address the relevant concerns and requests of the PSP comments. The Power Authority believes that these revised studies will enable FERC to meet its obligations under the National Environmental Policy Act to analyze environmental effects of its relicensing action and to ensure that the Project continues to meet the public interest requirements during a new license term, as required under the Federal Power Act.

According to the Commission’s process plan and schedule in Appendix B of SD2, stakeholders may provide comments on the revised study plans by April 26, 2018 – within 15 days of this filing. Written comments need to be filed directly with FERC using the eFiling system at <https://www.ferc.gov/docs-filing/efiling.asp> or by regular mail at: Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C., 20426. According to the process plan and schedule, the Director, Office of Energy Projects, will issue the Study Plan Determination by May 11, 2018.

Following this section, the RSP is divided into the following sections:

- [Section 2](#) – Revised Studies
- [Section 3](#) – Response to Comments Received and Other Information
- Appendices:
 - [Appendix A](#) – List of PSP Comment Letters
 - [Appendix B](#) – SHPO Correspondence

2 Revised Studies

The Power Authority has reviewed the comments received on the PSP and, where appropriate, revised the applicable study plans. Overall, minimal comments were received on the studies proposed by the Power Authority in the PSP. For ease of review, changes from the PSP to the RSP include the following:

- **Hinckley Reservoir Bathymetric Survey** – the study plan has been updated to indicate the spacing between proposed transects, including discussion pertaining to why this spacing is appropriate. In addition, discussion has been added to indicate the elevations over which reservoir volumes will be estimated as part of Task 4.
- **Recreation and Public Access Study** – the methodology has been updated to include the total number of survey days as well as a description of how the survey days will be distributed throughout the study period. In addition, discussion has been added to describe how the survey routes will be rotated and how many times each day the different sites will be visited.

Comments received on the proposed study plans which were not adopted in the RSP are discussed further in [Section 3](#).

Finally, the Power Authority has included schedules for each study plan identifying when major tasks will be completed. These schedules can be found at the end of each study plan throughout the ensuing section. In addition to the milestones shown in the study-specific schedules, it should be noted that progress reports will be filed with the Commission in November 2018 for all studies. Furthermore, the dates denoted in the *Master Schedule of Proposed Studies* (PSP Table 2.15-1) have not changed.

2.1 Hinckley Reservoir Bathymetric Survey

2.1.1 General Description of the Study

FERC requested a bathymetric survey of Hinckley Reservoir for the purposes of providing updated information on reservoir area and volume. The survey includes standard bathymetric data collection methods, subsequent analyses to develop contours and new elevation-area-volume curves for Hinckley Reservoir, and a comparison to historic information.

2.1.2 Geographic Scope

The survey will be completed on Hinckley Reservoir, in all areas navigable by boat.

2.1.3 Study Goals and Objectives

The goals of this survey are to obtain the current bathymetric or bottom surface contours of the reservoir and update the elevation-area-volume curves. The objectives are to:

- Collect depth and water surface elevation measurements along pre-determined transects in Hinckley Reservoir for subsequent calculation of lake bottom (bed) elevations;

-
- Develop a bathymetric contour map;
 - Develop new elevation-area-volume curves;
 - Consult with the New York State Canal Corporation (NYSCC) and Mohawk Valley Water Authority (MVWA) to determine what, if any, historic bathymetric data exists; and
 - Compare the results of the bathymetric survey with historic data, to the extent historic data is available and of such quality that a comparison can be made.

2.1.4 Relevant Resource Management Goals and Public Interest Considerations

This is a study requested by FERC and stakeholder comments.

2.1.5 Existing Information and Need for Additional Information

Per the FERC study request, the New York State Engineer and Surveyor's office determined contours of the Hinckley Reservoir before the reservoir was constructed, beginning in 1912, and no additional bottom contour surveys are believed to have been completed since that time. In 1919 and 1921, the New York State Engineer used the bottom contour information to prepare area-volume curves to help estimate the volume of water stored in the reservoir for any given water elevation. While the elevation-volume relationship has been re-evaluated several times, including in 1934 by the U.S. Geological Survey (USGS) and in 1988 by the Power Authority, the bottom contours on which the elevation-volume relationships are based have not been surveyed since construction.

As noted in [Hinckley Reservoir Working Group, 2008](#), neither the accuracy of the original work nor the method used is known. Updated bottom contour information would support more accurate calculations of the volume of water in the reservoir.

2.1.6 Project Nexus

This study was requested by FERC staff and will fill a data gap identified by Staff and others involving the physical characteristics of the reservoir.

2.1.7 Methodology

The study includes bathymetric survey data collection, data processing, development of new elevation-storage relationships, and a comparison to historic data.

Task 1 Bathymetric Survey Data Collection

The survey will be performed during a period of high reservoir water levels to achieve the most spatial coverage, including over areas that may become exposed or too shallow to survey during periods of low water level. Field surveyors will collect depth and water surface elevation by boat along the survey tracks shown in [Figure 2.1.7-1](#). The proposed transects are spaced approximately 500 feet apart, and also include a survey of the lake perimeter. On lakes smaller than Hinckley Reservoir, this transect spacing, with the inclusion of lake perimeter measurements, has been demonstrated to provide similar volume estimates when compared to closer transect

spacing ([Cross and Moore, 2014](#)). Additionally, transect spacing of 500 – 1000 feet was shown to provide accurate volume estimates in a reservoir approximately twice the size of Hinckley Reservoir ([Dunbar and Estep, 2009](#)). Therefore, this survey design ensures adequate coverage of Hinckley Reservoir for the development of new bathymetric contours and calculation of reservoir volume.

An Acoustic Doppler Current Profiler (ADCP), or similar technology, linked to a Real-Time Kinematic Global Positioning System (RTK-GPS) will be used to collect the data.¹ The ADCP will be set to record depth every second, and each measurement will be georeferenced from the RTK-GPS data stream. The boat will be driven along the survey tracks at a determined speed depending on water conditions (depth, turbidity, etc.). Depth measurements will be collected every 10 feet or less. Independent depth verification will occur at various points during the survey to ensure the ADCP is accurately collecting depth measurements. Additionally, the RTK-GPS will record water surface elevations at regular intervals over the span of the survey.

Task 2. Data Processing and Bathymetric Calculations

All ADCP measurements will be offloaded and initially processed using the manufacturer-supplied software. The georeferenced depth and water surface elevation measurements will be uploaded to GIS and/or CAD for further quality assurance / quality control (QA/QC) and processing. All data will be referenced to the New York State Plane Coordinate System NAD83 horizontal datum and New York Barge Canal Datum (BCD) vertical datum. Outlier measurements, or those with known poor quality, will be flagged in the dataset and will not be used in subsequent analyses. Depth measurements will be converted to bed elevations by subtracting the measured depth from the measured water surface elevation. All suitable bed elevations will be used to develop a bathymetric contour map in GIS and CAD. New elevation-storage curves will be developed using the bathymetric contour data, based on volumes calculated at 2 foot increments between water surface elevations 1,175 to 1,225 feet. This range encompasses the water surface elevations observed on the 2012 Hinckley Reservoir Operating Diagram. Additionally, for direct comparison with historic information in Task 3, an additional bathymetric map and elevation-storage curve will be developed that is referenced to the same datum as the historic information.

Task 3. Comparison to Historic Information

The Power Authority will consult with the NYSCC and MVWA, as well as other relevant groups, to determine what historic Hinckley Reservoir bathymetric and/or storage information exists. Available historic bathymetric and elevation-storage information will be compiled. The updated elevation-storage information will be compared to the historic elevation-storage information such that the overall change in storage can be characterized, to the extent possible based on the limitations of the historic information. Additionally, the new bathymetric contour map will be compared with the most recent historic bathymetric information, to characterize the spatial extent

¹ The vertical accuracy of the RTK GPS unit is approximately +/- 0.10 ft., while the vertical accuracy of the ADCP is +/-1% of water depth.

and magnitude of infilling, if possible.

Task 4. Report

A report will be developed, which will include information on the methodologies utilized in the study; new bathymetric and elevation-storage results; Volumetric Storage Table based on various water level elevations up to the Max. Pool elevation; and a comparison to historic information, to the extent possible.

2.1.8 Deliverables and Schedule

This survey will be completed in a single study season, during open water and high reservoir water levels. The general schedule for each task is outlined in the table below.

Task	Schedule
FERC Study Plan Determination (SPD)	May 11, 2018 (<i>anticipated</i>)
Task 1. Bathymetric Survey Data Collection	Spring 2018 (<i>weather dependent</i>)
Task 2. Data Processing and Bathymetric Calculations	Summer / Fall 2018
Task 3. Comparison to Historic Information	Fall 2018
Task 4. Report	Within one year of SPD (<i>likely May 11, 2019</i>)

2.1.9 Level of Effort and Cost

The estimated cost for the Hinckley Reservoir bathymetric survey and associated tasks is estimated to range from \$45,000 to \$65,000. The Power Authority believes that this level of effort is adequate to obtain and update the requested bathymetric and elevation-storage data.

2.1.10 References

Cross, B.K. and B.C. Moore. 2014. Lake and reservoir volume: Hydroacoustic survey resolution and accuracy. *Lake and Reservoir Management* 30(4): 405-411.

Dunbar, J.A. and H. Estep. 2009. Hydrographic survey program assessment. Waco, TX: Baylor University Department of Geology. Contract No. 704800734.

Hinckley Reservoir Working Group. 2008. Report to the Governor by the Hinckley Reservoir Working Group. Prepared by the Hinckley Reservoir Working Group Member Agencies. Albany, NY.

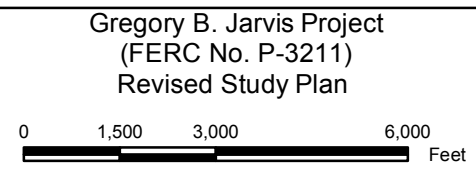
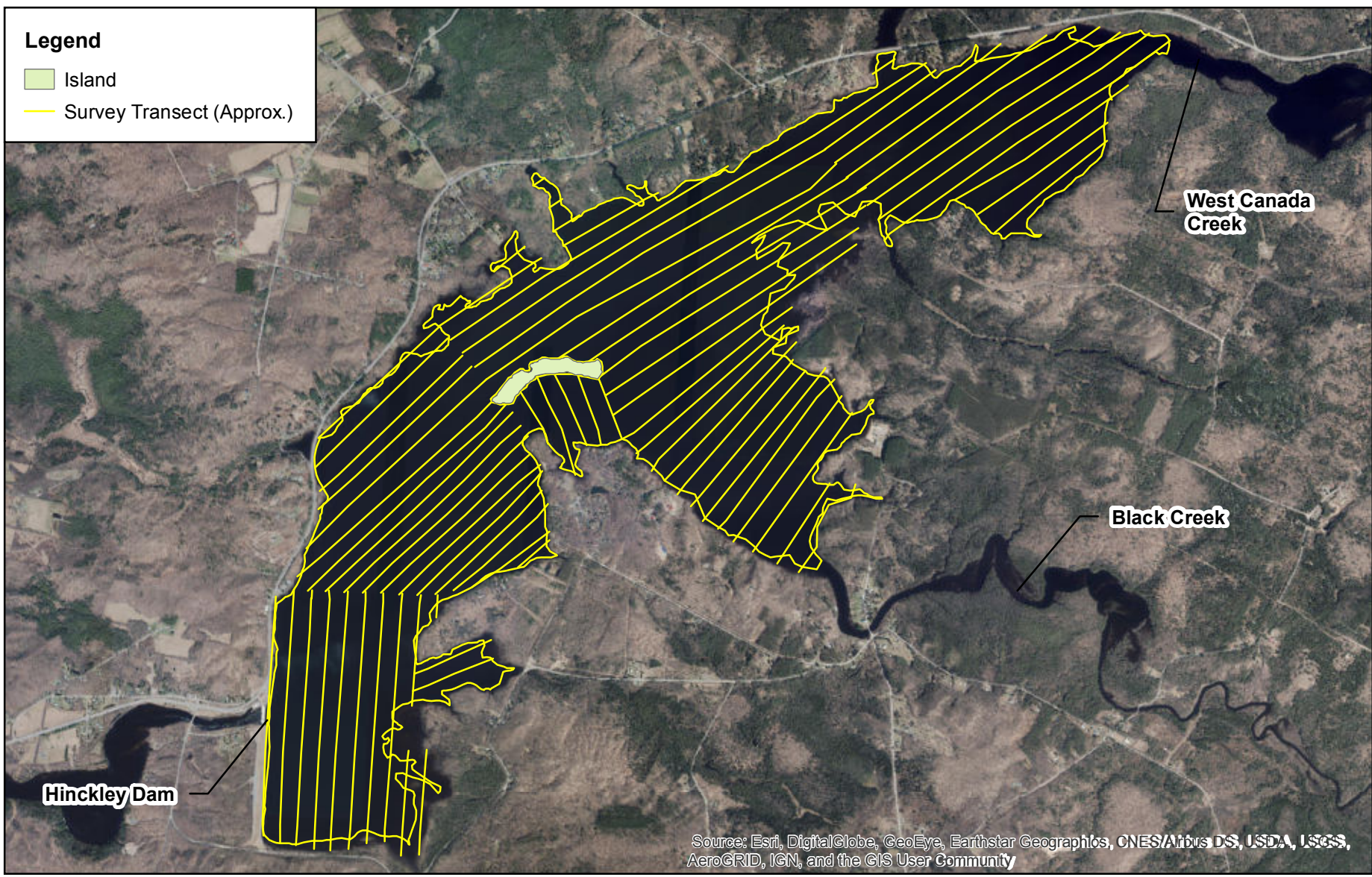


Figure 2.1.7-1
Hinckley Reservoir
Bathymetric Survey
Proposed Track Lines

2.2 Tailwater Water Quality Study

2.2.1 General Description of the Study

FERC and the New York State Department of Environmental Conservation (NYSDEC) requested a water quality study for the Project tailwater in order to gain a better understanding of water quality downstream of the Project. The study plan includes utilizing standard sampling methodologies, such as using in-situ water quality meters to continuously record dissolved oxygen (DO), temperature, and pH data.

2.2.2 Geographic Scope

The study will be performed in the tailwater of the Project.

2.2.3 Study Goals and Objectives

The goals of this study are to: (1) determine if the Project has an effect on downstream water quality parameters such as DO, temperature, or pH, and (2) determine compliance with NY water quality standards. The objective of this study is to collect continuous DO, temperature, and pH data in the Project tailwater downstream of the Project during the warm summer and early fall months (i.e., the period when reservoir stratification may be most pronounced and low DO waters could be released from the reservoir downstream).

2.2.4 Relevant Resource Management Goals and Public Interest Considerations

NYSDEC defines West Canada Creek downstream of the Project as Class B (trout waters). The best uses of these waters are defined as primary and secondary contact recreation and fishing. These waters are also suitable for fish, shellfish and wildlife propagation and survival ([State of New York, 2016a](#)). Class B (trout waters) shall have a pH no less than 6.5 and no more than 8.5. DO shall have a minimum daily average no less than 6.0 mg/L and at no time shall DO concentration be less than 5.0 mg/L ([State of New York, 2016b](#)).

NYSDEC states the middle mainstem of West Canada Creek (from Hinckley Dam downstream to the Prospect Development) is categorized as an “Impaired Segment” with regard to aquatic life and habitat/hydrology due to hydrologic modifications resulting from hydro generation ([NYSDEC, 2010](#)). The reassessment of these and related waters in the Mohawk River basin was stated to occur between 2015 and 2017. Data gathered as part of the reassessment is not currently available to the public, as such a determination as to whether the latest findings have changed is not possible at this time.

NYSDEC manages the West Canada Creek as a mixed cool/cold water fishery. Their relevant resource management goal is to assure relevant water quality standards are achieved and maintained to help promote the maintenance and promulgation of all fish, wildlife, and plant species.

Sections 4(e) and 10(a) of the Federal Power Act require FERC to give equal consideration to all uses of the waterway on which the Project is located. Ensuring that the effect of Project operation

pertaining to water quality is adequately informed will support FERC's public interest determination.

The results of the *Tailwater Water Quality Study* will provide information sufficient to enable agencies to understand water quality conditions at the Project.

2.2.5 Existing Information and Need for Additional Information

The Power Authority is not aware of any existing water quality data immediately downstream of the Project. Water quality data from the Project tailwater is needed for FERC to assess whether the continued Project operation would affect water quality downstream.

2.2.6 Project Nexus

Existing reservoir water quality data demonstrates that stratification sometimes occurs during the summer. The Project has deep intakes that withdraw water from the portion of the water column that may be below the thermocline during the stratification period. As a result, the Project may potentially release water that will affect downstream DO concentrations.

2.2.7 Methodology

Task 1. Water Quality Data Collection

The study will occur in 2018 during the warm summer and early fall months of June through September. This period was chosen as it represents the period when Hinckley Reservoir is likely to have the most pronounced stratification and when outflows are expected to be the lowest. The Power Authority will target the first week in June for the initiation of the water quality study. Based on review of existing reservoir water quality data, initiation of the study at this time should ensure data collection has commenced prior to the reservoir becoming stratified.

One water quality meter will be installed below Hinckley Dam as depicted in [Figure 2.2.7-1](#) (note that the monitoring location depicted in the figure is approximate pending field verification). It is anticipated that a multi-parameter sonde will be suspended to mid-depth in the channel from a surface buoy anchored to the river bottom. Any likely variations in water depth will be taken into account prior to installation in order to avoid the meter coming in contact with the river sediment. The sampling location will ultimately be confirmed in the field to ensure the field crew can safely access the meter and that the data collection location is representative of Project outflow conditions. Depending on the final monitoring location, the deployment method described above may be altered to accommodate river characteristics at the site. The coordinates of the monitoring location will be collected via GPS.

The sonde will be set to record DO, temperature, and pH every 15 minutes. The site will be visited approximately twice per month, at which time data will be downloaded, the instrument checked for calibration, and then re-deployed. Spot measurements of DO, temperature, and pH will be collected with an independent meter during deployment, periodic site visits (approximately every 2 weeks), and upon retrieval to verify meter accuracy. Weather, flow, and Project operations will

be noted. Project generation data for the monitoring period will be provided by the Power Authority for inclusion in the final report.

Task 2. Data Analysis

Upon completion of the field monitoring, the data will be reviewed for QA/QC. Any erroneous data will be removed and an explanation will be provided for why the data were rejected. Water quality data will be compared with generation data provided by the Power Authority as well as flow and meteorological data. If made available to the Power Authority, 2018 reservoir water quality data collected by MVWA will be reviewed as a means of providing context for the water year type. The data will then be summarized in graphical and tabular form for inclusion in the study report.

Task 3. Water Quality Report

A study report which will describe monitoring methods and study results will be prepared. Study results will include comparisons of data to Class B (trout) water quality standards, Project generation activity, flow, and meteorological data. Discussion pertaining to QA/QC procedures will also be included.

2.2.8 Deliverables and Schedule

Assuming the summer of 2018 is a typical year, the survey is anticipated to be completed in a single study season during low flow, warm summer/fall months.

Task	Schedule
FERC SPD	May 11, 2018 (<i>anticipated</i>)
Task 1. Water Quality Data Collection	June – September 2018
Task 2. Data Analysis	Summer – Winter 2018
Task 3. Water Quality Report	Within one year of SPD (<i>likely May 11, 2019</i>)

2.2.9 Level of Effort and Cost

The estimated cost for the *Tailwater Water Quality Study* and associated tasks is estimated to range from \$25,000 to \$40,000. The Power Authority believes that this level of effort is adequate to obtain the data needed to determine potential Project impacts on water quality, if any.

2.2.10 References

New York State Department of Environmental Conservation. 2010. Mohawk River Basin Waterbody Inventory and Priority Waterbodies List: Middle West Canada Creek Watershed. [Online]. URL: <http://www.dec.ny.gov/chemical/36739.html>. Date Accessed: November 10, 2016.

State of New York. 2016a. Official Compilations of Codes, Rules and Regulations of the State of New York – Title 6. Department of Environmental Conservation – Chapter X. Division of

Water Resources – Subchapter A. General – Article 2. Classifications and Standards of Quality and Purity Part 701 Classifications – Surface Waters and Groundwaters.

[Online]. URL:

[https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I0682f230b5a111dda0a4e17826ebc834&originationContext=documenttoc&transitionType=Default&contextData=\(sc.Default\)](https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I0682f230b5a111dda0a4e17826ebc834&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)). Date Accessed: November 10, 2016.

State of New York. 2016b. Official Compilations of Codes, Rules and Regulations of the State of New York – Tile 6. Department of Environmental Conservation – Chapter X. Division of Water Resources – Subchapter A. General – Article 2. Classifications and Standards of Quality and Purity – Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations. [Online]. URL:

[https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I070d30d0b5a111dda0a4e17826ebc834&originationContext=documenttoc&transitionType=Default&contextData=\(sc.Default\)](https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I070d30d0b5a111dda0a4e17826ebc834&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)). Date Accessed: November 10, 2016.



2.2 Assessment of Fish Entrainment and Turbine Passage Survival

2.3.1 General Description of the Study

A literature-based assessment will be conducted to evaluate the potential for fish entrainment and associated turbine passage mortality at the Project using existing scientific literature and data, and to assess the potential effects of entrainment on fish communities at the Project. Discussion pertaining to components of this study requested by the NYSDEC which are not adopted at this time is included in [Section 3.2.3](#).

2.3.2 Geographic Scope

Additional data collection describing facilities and operational conditions will be conducted at the Project in the vicinity of the intake. All other aspects will be literature / desktop based.

2.3.3 Study Goals and Objectives

The goals of this study are to assess the potential Project effects of turbine entrainment on fish residing in Hinckley Reservoir and to evaluate whether additional downstream passage or protective measures are necessary, and, if so, to determine which measures are appropriate and feasible.

The objectives are to:

- Provide a description of physical characteristics of the Project, including the intake location and dimensions, trashrack spacing, and depths and velocities near the intake structure;
- Conduct a literature review for species of interest relative to physiology, behavior, life history, and habitat preferences in the context of downstream passage and turbine entrainment and survival; and
- Assess the potential for entrainment and estimate turbine passage survival rates for target species, including, but not limited to, Brook Trout, Brown Trout, Rainbow Trout, Smallmouth Bass, and Yellow Perch.

The information compiled and analyzed in the study will be used as a basis of discussion with resource agencies regarding the need for, and feasibility of, any potential fish passage and protection structures that could be utilized at this site. An understanding of the probabilities of entrainment of species of interest based on life histories and project intake characteristics, along with estimates of turbine passage mortality, will allow for discussion of the merit of additional passage alternatives analysis in the context of risk of turbine entrainment/passage.

2.3.4 Relevant Resource Management Goals and Public Interest Considerations

West Canada Creek, in the vicinity of the Project, is managed by the NYSDEC as a mixed cool/cold water fishery. NYSDEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of West Canada Creek and Hinckley Reservoir, especially for trout (Brook Trout, Brown Trout, and Rainbow Trout), Smallmouth Bass, Yellow Perch and

sunfish. Additional goals include promoting the maintenance and propagation of all fish, wildlife and plant species in an ecological balance, and assuring designated water quality standards are achieved and maintained.

2.3.5 Existing Information and Need for Additional Information

The PAD contains discussion of a variety of fish community datasets spanning a 27-year period from 1988 through 2014 (see PAD Section 4.4). There is no reason to believe that the fish species composition has changed in the study area since the previous datasets were collected. Therefore, the Power Authority believes that the existing information provides the fisheries data required to successfully complete this study.

The physical characteristics of the Project need to be compiled along with the physiology, behavior, life history, and habitat preferences of the species of interest to estimate entrainment and turbine passage survival and to determine the need for additional downstream passage measures, if any. The physical characteristics of the Project turbines are well documented; however, additional site-specific field data collection will occur to supplement the analysis.

2.3.6 Project Nexus

Potential effects of Project operations and facilities include obstruction of fish movements and entrainment through the generating units. Fish species resident to Hinckley Reservoir may come in proximity to the intakes. This may result in exposure of fish to entrainment, potentially causing some level of mortality.

2.3.7 Methodology

Task 1. Data Collection, Current Conditions

The Power Authority will collect and compile site-specific data from the Project area to document existing conditions regarding factors likely to influence the potential for entrainment including: (1) intake location relative to shore and littoral habitat; (2) depth of intakes; (3) hydraulic capacity; (4) intake velocities; and (5) generating unit specifications.

The Power Authority will collect depth and velocity data from the area in front of the powerhouse intakes and minimum flow release structures during the full range of generation (300 cfs to 1,800 cfs) and minimum flow releases (160 cfs).

Task 2. Literature Review for Species of Interest

A list of fish species residing in Hinckley Reservoir was included in the PAD (Section 4.4). A literature survey will be conducted to compile the life history and swim speed characteristics of species of interest (gamefish) and guilds representing non-gamefish, as necessary. Factors likely to influence the potential for entrainment that are of particular interest include the prevalence of littoral species and obligatory migrants.

Task 3. Estimate Entrainment and Turbine Passage Survival

The assessment of entrainment and turbine passage survival will be conducted as a desktop analysis. The potential for entrainment will be characterized based on the relationship of site-specific intake characteristics along with swim speed and life history characteristics of species of interest. This assessment will rely on intake velocities calculated using the velocity equation $Q = V \cdot A$ where Q = flow rate (cfs), V = velocity (feet per second) and A = area (square feet); the calculated intake velocity will be supplemented with field measurements as described in Task 1. The likelihood of entrainment for a particular species will be qualitatively assessed through the comparison of site-specific intake characteristics to literature-reported swim speeds, body dimensions, and other life history characteristics.

A review of entrainment studies conducted at other hydroelectric projects (i.e., [EPRI, 1997](#)) will be conducted to derive entrainment rates for target fish species. EPRI ([1997](#)) summarized entrainment rate data for hydroelectric projects, which relied on full-flow tailrace netting to sample the entire flow passing from one or more units at a project. Partial flow sampling was not included in that database due to the higher potential for sample contamination as a result of collection of resident tailrace fish or net avoidance. Each of the 43 projects contained in the EPRI ([1997](#)) data compilation will be reviewed for characteristics similar to the Project. Following determination of appropriate project(s) for use as surrogates, available entrainment rate data will be summarized for the species of interest at the Project.

Entrainment survival for target fish species will be estimated using data from survival studies conducted at other hydroelectric facilities with similar characteristics (e.g., [EPRI, 1997](#); [Winchell et al., 2000](#)), and the Franke blade strike probability equation ([Franke et al., 1997](#)).

Task 4. Report

Results of this study, including estimates of entrained fish survival through the Project turbines, will be summarized in a report. All supporting data used in the development of those estimates will be provided in an appendix to the study report. As described above, the results of this study will provide the basis of discussion with resource agencies regarding the need for and feasibility of any potential fish passage or protection structures that could be utilized at this site by characterizing risk resulting from turbine passage. Expansion of the study plan, if any, based on the results of the assessment and subsequent consultation will be presented in the Final Study Report, which will be filed with the Initial Study Report (ISR).

2.3.8 Deliverables and Schedule

The Power Authority anticipates that the desktop and field components of this study can be completed during one field season in accordance with the schedule outlined below.

Task	Schedule
FERC SPD	May 11, 2018 (<i>anticipated</i>)
Task 1. Data Collection - Current Conditions	June - September 2018
Task 2. Literature Review for Species of Interest	Summer - Fall 2018
Task 3. Estimate of Entrainment and Turbine Passage Survival	Summer - Fall 2018
Task 4. Report	Within one year of SPD (<i>likely May 11, 2019</i>)

2.3.9 Level of Effort and Cost

The estimated cost for the *Assessment of Fish Entrainment and Turbine Passage Survival Study* and associated tasks is estimated to range from \$60,000 to \$80,000. The Power Authority believes that this level of effort is adequate to complete the tasks outlined above and is consistent with the level of effort of similar studies at other projects.

2.3.10 References

EPRI (Electric Power Research Institute). 1997. Turbine Entrainment and Survival Database—Field Tests. Prepared by Alden Research Laboratory, Inc. EPRI Report No. TR-108630. 13 pp.

Franke, G.F., D.R. Webb, R.K. Fisher, D. Mathur, P.N. Hopping, P.A. March, M.R. Headrick, I.T. Laczko, Y. Ventikos, and F. Sotiropoulos. 1997. Development of Environmentally Advanced Hydropower Turbine System Design Concepts. Contract DE-AC07-94ID13223. Prepared for U.S. Department of Energy, Idaho Operations Office.

Winchell, F., S. Amaral, and D. Dixon. 2000. Hydroelectric Turbine Entrainment and Survival Database: An Alternative to Field Studies. In: *Hydrovision 2000: New Realities, New Responses*. HCI Publications, Kansas City, MO.

2.2 Recreation & Public Access

2.4.1 General Description of the Study

FERC has requested that the Power Authority conduct a Recreation Study to determine existing and future recreation use and capacity at the Project. NYSDEC has requested that a Public Access Study be conducted to evaluate the existing public access facilities in the Project vicinity, focusing on the current condition of the facilities and the potential need for improvements to ensure that the facilities are compliant with the Americans with Disabilities Act (ADA).

The Power Authority proposes to conduct a Recreation & Public Access study to evaluate the existing and future recreational use, capacity, condition, and accessibility of public recreation facilities in the Project vicinity. Public recreation facilities include well-used sites within the Project boundary accessed by the public without trespassing. Private recreation facilities, including commercial campgrounds, will not be included in this study as they are not Project recreation facilities and are not under the control of the Power Authority. The study will gather information using a combination of methods including: (1) literature review; (2) outreach to local municipalities, agencies and organizations for existing data; (3) recreation facilities inventory and assessments; and (4) spot counts at Project recreation facilities. Project recreation facilities include the Power Authority boat launch, the tailwater fishing area, and the scenic overlook north of the dam (see [Section 2.4.5](#)). The study will also include a visitor intercept survey at Project recreation facilities to supplement user counts and to provide user perceptions of recreation opportunities and facilities in the Project area. Although the NYSDEC Hinckley Reservoir Picnic Area is a public recreation facility, spot counts and visitor intercept surveys will not be conducted at that site as it is not a Project facility. Instead, the Power Authority will rely on existing information collected by NYSDEC to determine use and adequacy of that site.

In addition to evaluating existing access and facilities, NYSDEC has requested that the study evaluate the potential to create additional public access where feasible. The study will provide additional data on the current and future use and capacity of Project facilities. Analysis of this data will allow the Power Authority to ascertain whether there is a need for additional access at the Project. As a need for additional access has not yet been established, the Power Authority does not propose to study the potential to create additional public access at this time.

FERC requested that the results of the bathymetric survey be used to visually assess the effects of reservoir levels on reservoir surface area and identify specific areas that may become inaccessible at lower reservoir levels. The Power Authority is not proposing to conduct any analyses regarding the impact water level fluctuations have on recreation, as reservoir operations are independent of hydroelectric operations. However, it should be noted that the Power Authority currently has plans in place to conduct maintenance of the lower section of the boat launch which will rehabilitate the boat launch from elevation 1210 to elevation 1205 (a horizontal distance of approximately 45 feet) to enable it to be accessible over a greater range of water levels. Construction is scheduled to occur as soon as the right field conditions occur (i.e., water levels low enough to enable maintenance to occur in the dry). With the rehabilitation of the boat launch,

the Power Authority is implementing the only protection, mitigation, or enhancement measure within its control to alleviate the potential impacts of water level fluctuations on recreation in the reservoir. As such, examination of potential impacts of water level fluctuations on recreation would not inform the development of license requirements as the Power Authority could not mitigate those impacts beyond what is already proposed, nor should it as there is no nexus to Project operations.

Finally, the FERC study request also notes that the Power Authority should identify erosion at each recreation site that may be due to recreational use. For the reasons discussed above, as well as in Section 4.2.7 of the PSP, the Power Authority is not proposing to conduct erosion assessments at sites which are not owned or maintained by the Power Authority as there is no nexus to continued Project operations. However, the Power Authority will identify any recreation-induced erosion at the Power Authority boat launch, if such erosion exists.

2.4.2 Geographic Scope

The study area encompasses lands and waters available for public recreation within and abutting (i.e., touching) the Project boundary, including at the Project tailrace. [Figure 2.4.2-1](#) provides a map of known public recreation facilities in the study area.

NYSDEC requested that the study area extend one mile upstream and downstream of the Project's boundary. The Power Authority has not identified any public recreation facilities within one mile upstream of the Project boundary. Downstream of the Project is the West Canada Creek Hydroelectric Project (FERC No. 2701), which is comprised of the Prospect and Trenton Falls Developments. The Prospect impoundment backwaters to Hinckley Dam; as such, there is no free-flowing reach downstream of Hinckley Dam. While the Power Authority intends to include public recreation access areas within and abutting the Project boundary, it does not propose to extend the study area to include the Prospect impoundment, any Erie Boulevard recreation sites that may be within one mile of the Project boundary, or the area upstream of the Project boundary.

2.4.3 Study Goals and Objectives

The goal of this study is to evaluate the existing and future recreational use, capacity, condition, and accessibility of recreation facilities in the study area.

The objectives of the study are as follows:

1. Identify, describe, and photo document each formal and informal public recreation site and facility in the study area, as well as each site's location relative to the Project boundary;
2. Assess the condition of Project recreation facilities, including erosion that may exist due to recreational use at the Power Authority boat launch;
3. Assess whether upgrades would be necessary to ensure Project recreation facilities are ADA compliant;

4. Create GIS-based map layers denoting the recreation sites/facilities populated with information from 1-3 above; and
5. Conduct visitor surveys and spot counts during the recreation season to determine the use and adequacy of Project recreation facilities and if changes or upgrades to the sites would be needed to meet current or future recreation needs.

2.4.4 Relevant Resource Management Goals and Public Interest Considerations

The Federal Power Act requires that FERC give equal consideration to all uses of the waterway on which a project is located. When reviewing a proposed action, FERC must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the Project, as well as power and developmental values.

NYSDEC manages West Canada Creek in the Project vicinity as a mixed cool/cold water fishery. NYSDEC goals include sustaining and enhancing all viable fisheries resources of West Canada Creek and the Hinckley Reservoir.

2.4.5 Existing Information and Need for Additional Information

Section 4.8 of the PAD provided information regarding recreation resources within the Project boundary and surrounding area. Recreation opportunities at Hinckley Reservoir include fishing, boating, swimming, camping, and picnicking. Two formal public recreation sites offering public access to the reservoir are located either wholly or partially in the Project boundary: (1) the Power Authority boat launch, which also provides hunting and fishing access, and (2) the Hinckley Reservoir Picnic Area, also known as the NYSDEC Day Use Area. Formal public recreation sites in the Project vicinity but outside the Project boundary include Hinckley State Forest, a 1,590-acre tract offering 6.5 miles of multi-use trails, primitive camping, hunting and trapping. Portions of the Project lie within the boundaries of the Adirondack Park, a six-million-acre state park with 2.6 million acres of state-owned land open to the public for recreation. State-owned recreation facilities within the Adirondack Park and Project vicinity include the Black River Wild Forest and Hinckley Reservoir Picnic Area. A small portion of the Black River Wild Forest abuts the Project Boundary; however, a map of the Forest does not identify any formal recreation facilities proximate to the Project ([NYSDEC, 2015](#)).

In addition to these formal recreation sites, recreationists access the reservoir via informal sites, including an area at the Project tailrace primarily used for fishing and a scenic overlook area maintained by the Power Authority near the northern end of the dam. Within the reservoir, several beaches and at least one island are reportedly used informally for recreation.

The Power Authority's most recent estimate of use indicates that approximately 12,900 recreation days occurred at publicly operated areas at the Project in 2014 ([NYPA, 2015](#)). This includes activity at the boat launch, the scenic viewing area, and the picnic area. No overnight activity was reported for locations within the Project boundary. Review of the FERC Form 80s from 1996, 2002, 2008, and 2014 indicate that estimated recreational use within the Project boundary is

shown to be increasing over time (See PAD Figure 4.8.1.2-1).

New York State's Office of Parks, Recreation and Historic Preservation (OPRHP) reviews statewide recreational needs at five-year intervals. The most recent review is reported in the 2014-2019 Statewide Comprehensive Outdoor Recreation Plan (SCORP). Within the SCORP, OPRHP examines the supply and demand for outdoor recreational opportunities and provides a relative index of need by county. The index is a scale of 1 to 10, where 1 indicates the least level of need, 5 is considered the statewide average, and 10 indicates the highest level of need. Demand for pursuits typically identified with hydroelectric projects are generally shown to be near the statewide average in Herkimer and Oneida counties ([OPRHP, 2014](#)). This result is consistent with the findings of the most recent Form 80, which shows that no recreation-related facilities at the Project are being used at more than 50% of capacity ([NYPA, 2015](#)).

Additional information on current use, condition, and accessibility of Project recreation sites and facilities, along with recreational users' perceptions of Project recreation opportunities and facilities, will help inform a decision on whether existing Project recreation sites and facilities are meeting public recreation needs.

2.4.6 Project Nexus

FERC regulations require that the license application include a statement of the existing recreation measures or facilities to be continued or maintained, any new measures or facilities proposed by the applicant to create, preserve, or enhance recreational opportunities at the Project and in its vicinity, and to ensure the safety of the public in its use of Project lands and waters. In addition, recreation is a recognized project purpose at FERC-licensed projects under section 10(a) of the Federal Power Act.

2.4.7 Methodology

Task 1. Literature Review and Outreach

Prior to conducting the recreation field inventory, the Power Authority will conduct an internet literature review and contact readily known and identified local recreational organizations and county, state and federal agencies to identify any commonly used formal and informal public recreation access sites within the study area. If available, information on facility use and capacity and user survey results will be obtained from NYSDEC.

The Power Authority will also attempt to survey these entities to identify known seasonal usage of the investigation area, to determine whether existing public recreational facilities and access in the study area are meeting current user needs, and to determine what (if any) recreational improvements they feel are warranted at Project recreation facilities.

Task 2. Recreation Field Inventory of Access, Condition, and Use

A recreation field inventory will be conducted to confirm public access sites identified in Task 1, to document any additional sites that were overlooked, and to gather information on all readily

identified public access sites. The shoreline within the study area accessible by passenger vehicle will be visually surveyed to document formal and informal public access locations. The specific location of recreational access points will be captured via GPS. For each public recreation access point, the following information will be recorded:

- A physical description of the type of recreational feature;
- The type of recreation opportunity provided (boating access, angler access, picnicking, etc.);
- The type (if any) of vehicular access and parking; and
- Photographic documentation of the location and amenities.

For Project recreation facilities, the following additional information will be recorded:

- Whether the facilities are ADA compliant; and the condition of the facility and any amenities, including erosion that may exist due to recreational use at the Power Authority boat launch.

Information from this investigation will be used to develop a GIS map depicting all public access points within the study area. In addition, any recreational activity observed occurring at or in relation to a public access point during the site visit will be recorded.

Task 3. Recreation Field Survey of Existing Use

The Power Authority will conduct field surveys at Project recreation sites to estimate current recreational use. A total of 17 days will be sampled between May 12, 2018 and October 8, 2018 (Columbus Day), which encompasses the height of the water-based recreation season. The Power Authority does not propose to conduct field surveys in the winter given that the Power Authority boat launch is closed during the winter. Survey days will be stratified by weekdays, weekends, and holidays during the investigation timeframe, with the majority of the surveys conducted during the peak recreation season (Memorial Day through Labor Day). Survey days will be randomly selected and distributed throughout the study period as follows: one weekday per month, one weekend per month, and a third day each month except October. In months with a holiday weekend, this third day will fall on a holiday weekend. For the month of October, two survey days will be conducted: one weekday and one weekend day; the weekend survey day will occur on one day during Columbus Day weekend.

Each survey site will be visited once per survey day. Routes between sites will be the same; however, the starting location will change each survey day to cover each site at different times of day throughout the study. A survey day will span approximately 6 hours and will begin either at 7 am or at 1 pm.

Surveys will consist of spot counts and visitor intercept surveys. Spot counts are short duration counts which will be utilized as a snapshot of use at each survey location. Individuals conducting the count will collect data immediately upon arriving at the survey location. The number of vehicles parked at each site and any observed recreation use will be recorded on data forms to determine the time-of-day use patterns at the sites. See [Figure 2.4.7-1](#) for spot count data forms.

Visitor intercept surveys will be conducted on the same days as spot counts. A visitor intercept survey has been developed (see [Figure 2.4.7-2](#)) to determine users' perceptions of Project recreation sites and facilities. Among other things, the survey will ask respondents what recreational activities they are participating in at the Project that day, the frequency with which they visit the Project area, and what other seasonal recreation activities they participate in at the Project. The survey will also be used to determine length of stay, number of people in a party, and user distribution.

Spot counts and visitor intercept surveys will be conducted at Project recreation sites, including the Power Authority boat launch, the tailwater fishing area, and the scenic overlook north of the dam. Survey administrators will spend two hours at each location.

Task 4. Study Report

Data collected from previous tasks will be entered into spreadsheets for statistical analysis. A report will be developed to summarize the methods and the results of the study. The report will include a summary of each access site identified within the study area, including location in relation to the Project boundary; types and number of amenities provided; the condition of the facility and amenities; site accessibility and ADA compliance; the entity responsible for operation and maintenance; and the hours/seasons of operation. Photographs and, if available, use figures and projected use figures will be provided for each site. Average weekday, weekend and holiday recreation days will be estimated for Project recreation facilities using spot count and visitor intercept survey data. Future recreation demand over the term of a new license will be projected. The report will describe the general recreational usage of Project facilities, including activities participated in, seasonal usage, and visitor distribution. Visitor perceptions of the condition and adequacy of existing facilities will be discussed. Using the information gathered, the Power Authority will assess the overall adequacy of Project recreation facilities and whether changes or upgrades to the sites would be needed to meet current or future recreation needs.

2.4.8 Deliverables and Schedule

The Power Authority anticipates that the Recreation and Public Access Study can be completed during one field season in accordance with the schedule outline below.

Task	Schedule
FERC SPD	May 11, 2018 (<i>anticipated</i>)
Task 1. Literature Review and Outreach	Spring – Summer 2018
Task 2. Recreation Field Inventory of Access, Condition, and Use	Summer 2018
Task 3. Recreation Field Survey of Existing Use	May 2018 – October 2018
Task 4. Study Report	Within one year of SPD (<i>likely May 11, 2019</i>)

2.4.9 Level of Effort and Cost

The Power Authority believes that the level of effort is sufficient to determine the adequacy of existing recreation facilities in meeting existing and future recreation needs at the Project. The cost of the study as outlined in this plan is estimated to range from \$90,000 to \$110,000.

2.4.10 References

New York Power Authority. 1997. FERC Form 80 for Gregory B. Jarvis Project 1996/97. March 1997.

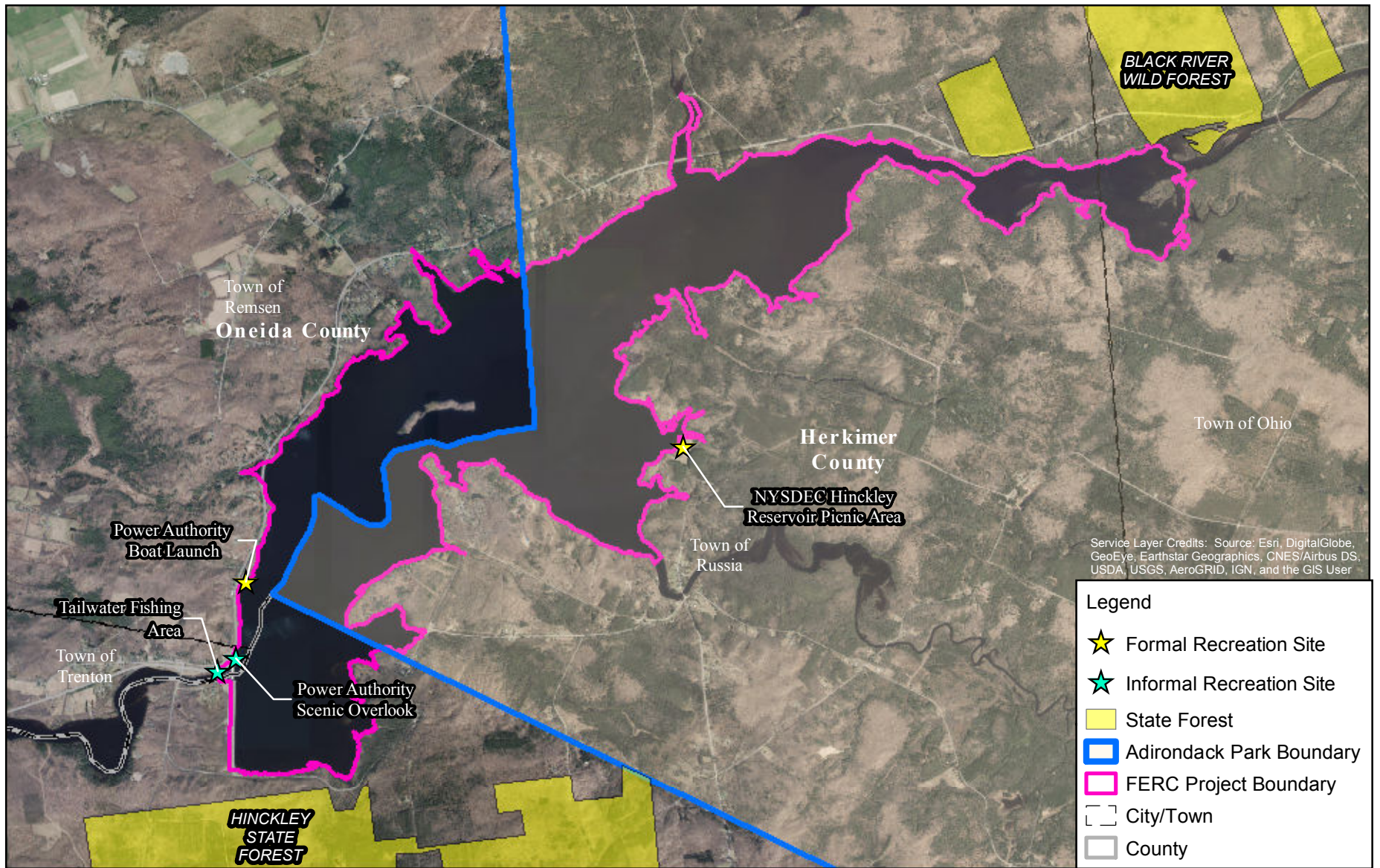
New York Power Authority. 2003. FERC Form 80 for Gregory B. Jarvis Project 2002. March 2003.

New York Power Authority. 2009. FERC Form 80 for Gregory B. Jarvis Project 2008. March 2009.

New York Power Authority. 2015. FERC Form 80 for Gregory B. Jarvis Project 2014. May 2015.

New York State Department of Environmental Conservation. 2015. New York's Forest Preserve Black River Wild Forest. Map. <http://www.dec.ny.gov/outdoor/56067.html>. Accessed November 21, 2016.

New York State Office of Parks, Recreation and Historic Preservation. 2014. Statewide Comprehensive Outdoor Recreation Plan 2014-2019. March 26, 2014.



Gregory B. Jarvis Project
(FERC No. P-3211)
Revised Study Plan

Figure 2.4.2-1:
Known Public Recreation Facilities
in Study Area



0 2,000 4,000 8,000
Feet

Figure 2.4.7-1 Draft Spot Count Data Collection Form**General info:**

Name of Observer	
Date	
Time	
Location	
Temperature	
Weather	
# of adults present (age 18+)	
# of children present (under age 18)	

Number of people observed engaged in each of the following activities:

Backpacking		Horseback Riding		Power Boating	
Camping		Hunting		Road Bicycling	
Canoeing		Jet Skiing		Rowing	
Cross Country Skiing		Kayaking		Running	
Fishing from a Boat		Mountain Biking		Sailing	
Fishing from Shore		Paddle Boarding		Swimming	
Hiking		Picnicking		Waterskiing	
OTHER:					

Parking Area:

Vehicles w/out car top rack	
Vehicles w/ car top rack	
Vehicles w/ trailer	
Vehicles w/out trailer	
Buses	
Total vehicles	

Number of vehicles observed with license plate from the following state:

Massachusetts	
New Hampshire	
New York	
Pennsylvania	
Vermont	
OTHER:	

Notes:

Figure 2.4.7-2 Draft Visitor Intercept Survey

Interviewer: _____ Date/Time: _____ Location: _____
 Weather: _____ Air Temp: _____ Declined Survey: _____

Good afternoon. My name is _____ and I am conducting a recreation use survey of visitors to the Gregory B. Jarvis Hydroelectric Project area for the New York Power Authority. We are surveying public access areas at Hinckley Reservoir and the surrounding area. Collected information will assist the Power Authority in understanding more about land and water based recreation in this area. Responses from the survey will remain anonymous. Would you mind answering a few questions?

1. Have you participated in this survey effort before?

Yes _____ Thank you for your time. We are only interviewing each person once with this survey.

No _____ Continue with survey

2. How many people are in your group, including yourself? _____

3. Which of the following best describes your group? (check one)

- | | | |
|----------------------------------|--|---|
| ☐ Alone | ☐ Multiple Families | ☐ Organized Outing Group |
| ☐ Family | ☐ Family & Friends | ☐ Educational Group |
| ☐ Friends | | ☐ Other _____ |

4. How many vehicles did your group use to come here? _____

5. Have you ever visited the Hinckley Reservoir area before? Yes _____ No _____

If yes, how many times a year do you typically visit for recreation? (please use a number) _____

6. What is your zip code? _____

7. When did you arrive, and when do you plan to depart?

Arrived: Date: _____ Time: _____ AM _____ PM _____

Departing: Date: _____ Time: _____ AM _____ PM _____

8. Please indicate which of the following activities you participate in at Hinckley Reservoir by season. (Mark all that apply)

Activity	This Trip	Spring (Mar. 1-May 31)	Summer (June 1-Aug. 31)	Fall (Sept. 1-Nov. 30)	Winter (Dec. 1-Feb. 28)
Backpacking					
Birding					
Boating					
Canoeing					
Kayaking					
Power Boating					
Rowing					
Sailing					
Camping					
Cross Country Skiing					
Dog Walking					
Driving for Pleasure					
Educational Programs					
Fishing from a Boat					
Fishing from Shore					
Hiking					
Horseback Riding					
Hunting					
Ice Fishing					
Ice Skating					
Jet Skiing					
Mountain Biking					
Multi-day Boat Trip					
Nature Observation					
Orienteering					
Paddle Boarding					
Photography					
Picnicking					
Road Bicycling					
Running					
Sightseeing					
Snowshoeing					
Swimming					
Walking					
Waterskiing					
Other:					

9. Of the activities listed above, which is your PRIMARY activity on this trip? _____

10. During your visit today what is your perception of the amount of use occurring at this site? (circle a number)

1	2	3	4	5
Not Crowded		Somewhat Crowded		Extremely Crowded

11. During your visit today, did you experience any conflicts with other users? Yes____ No____

If yes, please explain: _____

12. Please rate the following for this location

	Poor		Fair		Excellent
Availability of parking	1	2	3	4	5
Site condition	1	2	3	4	5
Adequacy of facilities	1	2	3	4	5
Adequacy of access to reservoir	1	2	3	4	5
Adequacy of signage	1	2	3	4	5
Placement of signage	1	2	3	4	5

Please explain any ratings below Fair (3): _____

13. Does this recreation facility serve your interests? Yes____ No____

If no, please explain: _____

Thank you for your time and input.

3 Response to Comments Received and Other Information

Comments related to the Jarvis PSP typically fell into one of two categories: (1) general comments, which were typically in reference to Hinckley Reservoir operations; or (2) study-specific comments, which included both adopted studies and studies not adopted. In addition, the Citizens of Hinckley provided several comments pertaining to the Power Authority's response to FERC's Additional Information Requests (AIR). A summary of comment letters filed with FERC can be found in [Appendix A](#). Where appropriate, or if the comment(s) warranted a response, the Power Authority has provided responses in the sections below. Furthermore, the Power Authority has engaged in informal outreach with stakeholders, particularly NYSDEC and USFWS, throughout the study plan process, including a meeting in Utica on November 28, 2017, to discuss differences over study requests. Any revisions to studies resulting from those discussions have been incorporated herein.

In addition, at the time of filing the PSP the Power Authority had engaged the State Historic Preservation Officer (SHPO) to determine the Project's Area of Potential Effect (APE). [Section 3.5](#) provides an update on this process as well as additional information pertaining to cultural resources.

2.1 Response to General Comments

In addition to the study specific comments received from various stakeholders (discussed in the ensuing sections), several general comments were also received. The Power Authority has prepared responses to these comments below.

3.1.1 Existing Uses of Hinckley Dam and Reservoir

USFWS, Citizens of Hinckley, and the New York State Council of Trout Unlimited submitted general comments on the PSP suggesting that the existing uses at NYSCC's Hinckley Dam and Reservoir – which long pre-date the Project – should be subject to the Commission's jurisdiction. These commenters reference the Great Sacandaga Lake Project and related cases in which the Commission determined that certain dam and reservoir facilities should be included in the "unit of development" to be licensed because they were components of the hydropower project.

Unlike the Great Sacandaga Lake and other projects cited by these commenters, where critical facilities comprising the unit of hydropower development (i.e., a dam or reservoir) were not included in the license as required by the Federal Power Act, in this proceeding, that issue is not subject to debate: the NYSCC's Hinckley Dam and Reservoir facilities *are* included in the unit of development. But that by no means supports the commenters' suggestion that the existing uses and operations of those facilities – that are entirely unrelated to the Project – should be subject to Commission oversight.

At similar projects, where there are well-established water resources uses of facilities that are included within a unit of development, the Commission has recognized and protected those existing uses. For example, the Commission has declined to impose a run-of-river mode of

operation where it would have interfered with the reservoir's primary municipal water supply purpose.² As the Power Authority described in pages 2-3 of the transmittal letter for the PSP and in Section 4.1.1 of the PSP, there are numerous other examples of FERC's recognition of similar existing uses at licensed projects across the country. Moreover, as noted in the transmittal letter for the PSP at pages 3-4, it is imperative to recognize these uses to promote and facilitate hydropower development at existing non-powered dams.

In New York, the Commission has specifically recognized that the facilities that comprise the NYSCC system, while they may be included in a licensed unit of development, serve many uses other than hydropower generation. Importantly, the Commission has stated that the "rights encompassing those uses need not be transferred to the licensee or otherwise be subject to the terms of the license."³ The Commission has further noted that it has "no desire to obstruct the State of New York in carrying out the useful public service provided by its barge canal system."⁴ There is no reason to do so here, as USFWS and others suggest.

3.1.2 Effects of Jarvis Peaking Operations on Water Level Fluctuations

The Citizens of Hinckley note in their comment letter that "Jarvis operations do impact the water level and the entire Hinckley Lake." The comment letter goes on to note that "one major issue that is created by their peaking process is when they release the maximum of 1,800 cfs over a four-hour period. It has been observed often during this peaking time that boats become stranded on shore due to the excessive releases." The comment letter further notes that "this would not happen if the water were released on a slower steadier manner instead of in a peaking type release." The Citizens of Hinckley noted that this is particularly an issue in the evening time and when lake levels are below elevation 1220.

As demonstrated in the PSP and discussed further in [Section 3.3.1](#), Jarvis peaking operations have minimal to no impact on reservoir water level fluctuations. Maximum water level fluctuations associated with peaking are less than 3 inches (when both units are operational) but often are significantly less. To put this into context, the impact of Jarvis peaking operations on reservoir water level fluctuations are so insignificant that they are within, or near, the accuracy limitation of a standard water level logger. The Operating Diagram or the natural variation of inflow are the sole causes of significant water level fluctuations within Hinckley Reservoir and are responsible for any associated resource impacts.

Furthermore, in response to the comments received from the Citizens of Hinckley, the Power Authority examined Project operations data for the period May 25th – October 7th for the years 2006-2017 to determine the impacts of peaking operations during the boating season. This analysis focused on periods during the boating season when: (1) the reservoir water surface

² *Fairfax County Water Authority*, 54 FERC ¶ 62,142 at p. 63,226 (1991).

³ *New York State Electric & Gas Corp.*, 16 FERC ¶ 61,176 at p. 61,393 (1981).

⁴ *Id.*

elevation was below elevation 1220; (2) both Jarvis units were operational⁵; and (3) Jarvis peaked. The results of this analysis found that during the twelve year period examined, Jarvis peaked less than ten times total during periods that met the criteria when the Citizens of Hinckley claim Jarvis peaking operations caused boat stranding. Upon further review of the boating season data it was observed that the majority of the instances when peaking occurred were between May 31 and June 6, 2008 ([Figure 3.1.2-1](#)). As shown in the figure, the gradual decrease in reservoir elevation over the course of the week is attributed to either (a) decreasing reservoir inflow, and/or (b) the releases mandated by the Operating Diagram. Incremental water level fluctuations resulting from peaking are insignificant or nonexistent. This is demonstrated further in [Figure 3.1.2-2](#), which provides a zoomed in view of the peaking cycle which occurred on June 3, 2008. As observed in the figure, the change in water level which occurred during the day was less than 1.5 inches, while the reservoir elevation was constant during the five hour peaking period which occurred from 2:00 to 7:00 PM. No instances of Jarvis releasing the maximum 1,800 cfs during peaking could be found in the dataset for the period examined.

Given that Jarvis rarely peaked during the boating seasons of the twelve year period examined and when peaking did occur changes in reservoir water surface elevation were insignificant or nonexistent, it is apparent that Jarvis peaking operations could not have caused the boat stranding noted by the Citizens of Hinckley. This analysis further illustrates the point that variations in natural inflow and/or the releases mandated by the Operating Diagram are the causes of reservoir water level fluctuations and any associated resource impacts – not Jarvis peaking operations.

⁵ Unit No. 2 was out of service from June 2012 to November 2015. Unit 1 has been out of service since November 2017.

Figure 3.1.2-1. Boating Season – Jarvis Peaking Analysis (2008)

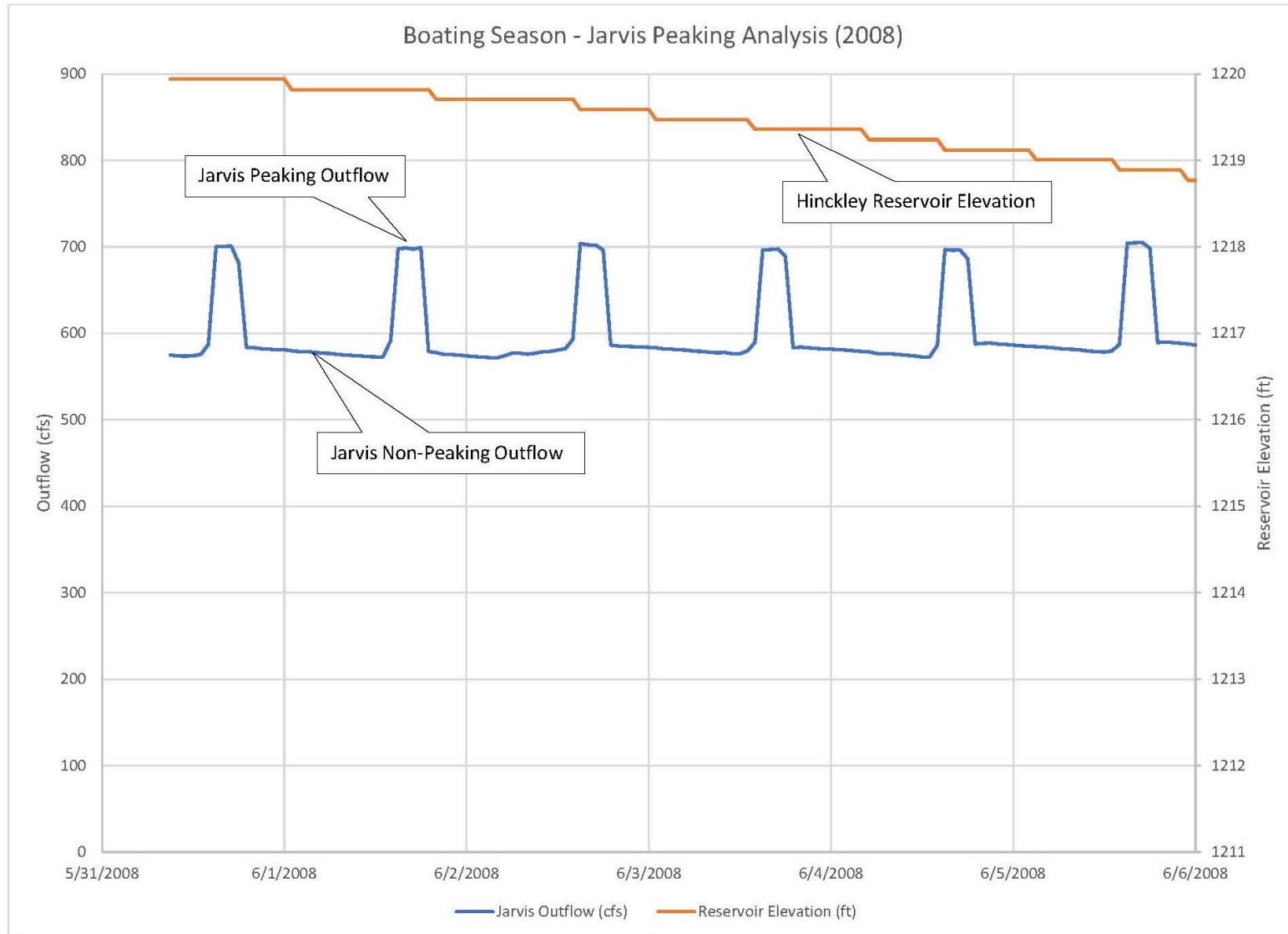
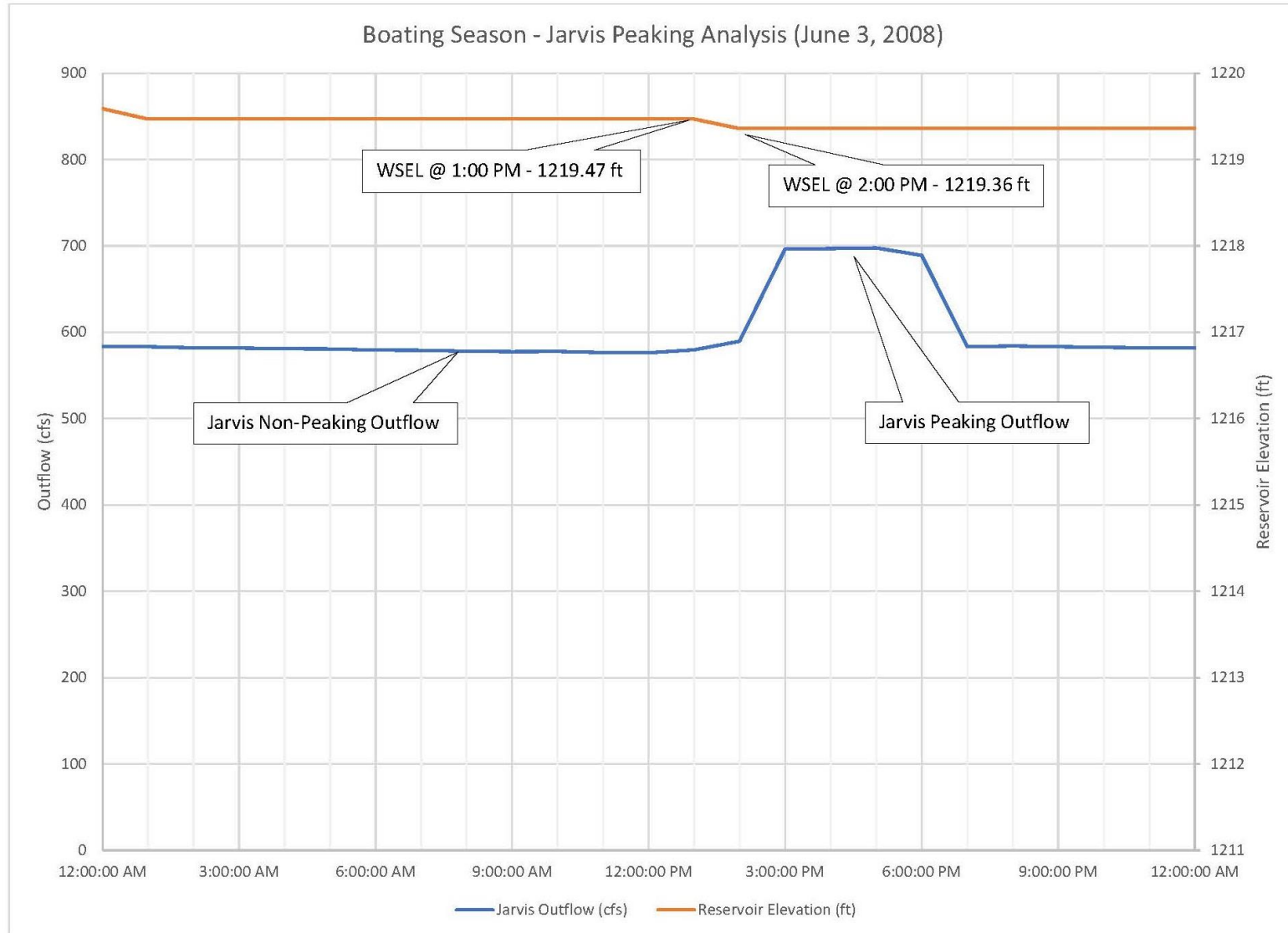


Figure 3.1.2-2. Boating Season – Jarvis Peaking Analysis (June 3, 2008)



3.2 Response to Comments Pertaining to Adopted Studies

In addition to study specific comments adopted in [Section 2](#), several comments were also received pertaining to the proposed study plans which were not adopted. Responses to study specific comments not already discussed in [Section 2](#) are included below.

3.2.1 Hinckley Reservoir Bathymetric Survey

Proposed revisions/clarifications to the study methodology were recommended by FERC in their letter dated March 8, 2018. As discussed in [Section 2](#), the study plan has been revised to include the recommended clarifications. No other comments which warrant a response were received regarding this study.

3.2.2 Tailwater Water Quality Study

By letter dated March 6, 2018, the USFWS submitted comments pertaining to the Tailwater Water Quality Study. Specifically, the USFWS noted that the proposed location of the water quality sonde is located in an area where spillage would mix with the tailrace release. Furthermore, it was noted that the sonde should be located directly in the tailrace or there should be two sondes to compare tailwater releases with overall Jarvis releases (which would include spillage).

Due to the configuration and relatively short length of the tailrace, the proposed monitoring location was identified to ensure accurate data could be collected during periods of Project generation. The Power Authority is concerned that by placing the sonde further into the tailrace channel, erroneous data will be collected during periods of generation due to the associated turbulence. In addition, the proposed water quality monitoring period coincides with the typical low flow period when spillage infrequently occurs. For the June to September period from 2001 to 2016 it was observed that spillage only occurred 5% of the time, or an average of approximately 6 days per year during the proposed monitoring period. As such, the Power Authority believes that the proposed location is appropriate to collect water quality data representative of what is released during generation and that a second sonde is not necessary.

The USFWS also notes that instead of relying upon historic reservoir water quality information, it would be more useful to have a data sonde in the reservoir collecting data at the same time as the tailrace data are being collected to allow a direct one-to-one comparison. It is unclear what relevance this request has to Project operations. As discussed in Section 4 of the PSP, normal Jarvis Project operations have no impact on reservoir water level fluctuations while peaking operations have minimal to no impact; therefore, the only potential Project impact pertaining to water quality would be due to what is being released during generation through the turbines. The methodology currently proposed (i.e., tailwater water quality monitoring) will adequately determine potential Project impacts, if any. As such, water quality monitoring in the reservoir is not necessary, would not inform potential Project impacts, and is not being proposed by the Power Authority. Regardless, if made available to the Power Authority, 2018 reservoir water quality data collected by MVWA will be reviewed as a means of providing context for the water year type.

3.2.3 Assessment of Fish Entrainment and Turbine Passage Survival

In their comment letter dated March 12, 2018, NYSDEC noted that they “do not agree that Turbine Passage Survival should be considered an effective and safe method of downstream fish passage as most of the recently relicensed projects with[in] this region have separate downstream passage facilities designed to keep and/or attract fish away from the intakes of the turbines. The NYSDEC reiterates its original request...” In their original comment letter, the NYSDEC requested that the Power Authority explore alternatives to keep all fish species out of the turbines and to develop alternatives to effectively pass fish downstream around the dam, including conducting a literature search of available passage designs and the effectiveness of each design.

The Power Authority has not adopted this request as it is premature to conduct such an analysis until the problem, if any even exists, is fully understood. The Power Authority has laid out a phased approach such that the first step will be to identify and determine if a problem exists and, if it does, to what extent. Once this is fully understood, the Power Authority will consult with the appropriate agencies to explore potential solutions, as necessary, using the information gathered as part of the study to inform those discussions. This is ultimately a question of sequencing as opposed to a rejection of NYSDEC’s recommendation.

NYSDEC’s assertion that most of the recently relicensed projects within the region have a separate means of downstream passage does not justify requiring downstream passage at the Project and is premature without knowledge of the potential impact of turbine passage. Every hydroelectric project is different and the extent of entrainment and mortality will vary depending on a number of factors (project configuration, fish species, habitat, operating regime, etc.). Until the extent of entrainment and mortality is understood at this project, it is premature to assume that alternatives, including turbine exclusion and downstream bypasses, will result in substantial improvements to protection of the fisheries resource.

3.2.4 Recreation & Public Access

Comments pertaining to the Recreation & Public Access study were received from the Citizens of Hinckley. In addition, DEC noted in its comment letter that it generally agreed with the studies proposed but provided no specific comments pertaining to the proposed study plan (other than in regard to the Entrainment Study); instead NYSDEC resubmitted their original study request in full as part of their comment letter. The study methodology incorporates the vast majority of NYSDEC’s recommendations. Specific recommendations not adopted are discussed in the study plan. Given this, the response below focuses on comments received from the Citizens of Hinckley.

In their comment letter the Citizens of Hinckley note that “NYPA’s peaking process with the Jarvis Project combined with the 2012 Operating Diagram does impact all areas of the lake, including recreation.” The Citizens of Hinckley go on to specifically note the boat launch at Trails End Campground, the island, “Boaters Beach”, the NYSDEC Park, as well as “other areas that the public enjoy when water levels allow.” The Citizens of Hinckley request that an “extensive and

comprehensive study be done on recreation and public access and the impacts the power production has on this”.

As discussed in Section 4 of the PSP, normal Jarvis operations have no impact on reservoir water levels while peaking operations have minimal to no impact. The 2012 Operating Diagram, which the Power Authority has no control over, is the primary cause of water level fluctuations in the reservoir. Any resource impacts associated with water level fluctuations in the reservoir, including recreation, are the result of the Operating Diagram, not Jarvis operations. The methodology that the Power Authority has laid out is adequate to examine Project impacts on recreation as required by FERC’s regulations. Regarding the specific locations noted in the Citizens of Hinckley letter, information pertaining to recreation at those sites will be gathered as part of the literature review; however, since those areas are not Project recreation facilities they will not be included in the field inventory or use assessment portion of the study.

The Citizens of Hinckley also questioned the source and accuracy of the estimated capacity of the Power Authority Boat Launch noted in the PSP (i.e., used less than 50% of the time) and also commented on the condition of the boat launch. The usage capacity was determined based on the most recent Form 80 recreation survey conducted for the Project (2015). As part of this study both the usage capacity and condition of the boat launch will be examined and discussed in the final report.

Finally, the Citizens of Hinckley noted that the proposed study plan excludes the winter recreation season even though people still utilize the reservoir and surrounding area for recreation opportunities (e.g., ice fishing, cross-country skiing, etc.). Although people may still utilize these areas for recreation during the winter, the Power Authority does not encourage winter recreation at the Project. The Project boat launch is closed in late fall, not reopened until late spring, and not maintained during the winter. As such, any access to the reservoir or surrounding areas is not from Project facilities. Nonetheless, as part of the Visitor Intercept Surveys that will be conducted during the study, the Power Authority will collect information pertaining to winter usage from visitors (see [Figure 2.4.7-2](#) – Page 2). In addition, information on seasonal usage will be solicited during the Literature Review and Outreach portion of the study (Task 1). Data collected during these tasks will provide a rough estimate of winter usage at Hinckley Reservoir.

2.2 Response to Comments Pertaining to Studies Not Adopted

The USFWS, NYSDEC, Trout Unlimited, and the Citizens of Hinckley submitted comments pertaining to studies requested by stakeholders that were not adopted by the Power Authority (a summary of these studies can be found in Section 4 of the PSP). Responses to general comments received from USFWS, Trout Unlimited, and the Citizens of Hinckley can be found in [Section 3.1](#). Regarding the NYSDEC comment letter, NYSDEC reiterated their original request, submitted responses to the Power Authority’s rationale for not adopting various studies, and resubmitted the same study requests as were received prior to development of the PSP (letter dated October 27, 2017). Studies requested by NYSDEC and resubmitted via their March 12,

2018 letter include:

1. Fish Surveys
2. Macroinvertebrate and Freshwater Mussel Surveys
3. Fish Protection and Downstream Passage Studies
4. Base Flow Studies
5. Water Quality
6. Wetland Delineation
7. Public Access

The Fish Protection and Downstream Passage, Water Quality, and Public Access studies were adopted with modifications, as discussed in [Section 2.3](#) and [Section 3.2.3](#) (Fish Protection and Passage), [Section 2.2](#) and [Section 3.2.2](#) (Water Quality), and [Section 2.4](#) and [Section 3.2.4](#) (Public Access). The Power Authority has concluded that the remaining studies (i.e., fish surveys, macroinvertebrate and freshwater mussel surveys, base flow studies, and wetland delineation) are still unnecessary because: (1) there is sufficient existing information concerning the subject of the study proposal; (2) there is no nexus between Project operations and effects on the resources requested to be studied; and/or (3) these requested studies would not inform the development of license requirements. For the sake of brevity, the Power Authority will not reiterate its detailed response to each of these requests here but instead refers to and incorporates by reference Section 4 of the PSP; however, the Power Authority has provided responses to several comments included in the NYSDEC letter as discussed below.

3.3.1 Nexus to Project Operations

In Section 4 of the PSP, the Power Authority asserted that one of the primary reasons why these studies were not adopted is because there is no nexus to Project operations (among other reasons). In response to this, NYSDEC noted in their comment letter the following for each study (or some variation of the following) as the rationale for why there is a nexus to Project operations and why each study should be adopted:

“The indisputable fact that the Jarvis project lies in West Canada Creek and uses the water of West Canada Creek is; by definition, a nexus or connection....The daily fluctuation of water levels as depicted in Figure 4.1.2-1 of the Study Plan demonstrates a response to peak demand for generation and does not emulate a response to the natural environmental fluctuations a waterbody, wetlands, and associated aquatic habitats would receive through naturally occurring weather related events. The requested [study name] is needed to adequately determine if there is a causal link between the Jarvis project operations and the potential [impact to various resource] in Hinckley Reservoir and West Canada Creek.”

NYSDEC notes that PSP Figure 4.1.2-1 demonstrates a response to peak demand for generation. Upon close review of the figure, and the accompanying hydrologic analysis presented in Section 4 of the PSP, it is observed that the “demonstrated response to peak demand” versus a constant discharge corresponds to a maximum reservoir water level fluctuation of 3 inches over a 24 hour

period. Furthermore, this represents a worst case scenario and not how the Project is typically operated when peaking. The typical fluctuation associated with peaking is often less than that shown in PSP Figure 4.1.2-1. To put this into context, water level fluctuations in the reservoir associated with peaking are so insignificant that they are typically within, or near, the accuracy limitations of most water level loggers. A water level fluctuation of this magnitude would have no impact on the resources NYSDEC is requesting the Power Authority to study.

NYSDEC goes on to note that the three inch fluctuation shown in PSP Figure 4.1.2-1 does not emulate a response to the natural environmental fluctuations that a waterbody, wetlands, and associated aquatic habitats would receive through naturally occurring weather related events. On the contrary, the three inch fluctuation over a 24 hour period for which peaking is responsible (worst case) results in significantly less of a water level fluctuation than those associated with naturally occurring weather events such as moderate to high flows from rain or snowmelt, low flows associated with droughts, or even wind/boat waves. In addition, as demonstrated in Table 4.3.1.2-3 of the PAD, the median daily outflow for Hinckley Reservoir exceeds the median daily inflow for all months except April and October. As a result, the minimum flow requirement is supplemented by storage from the reservoir for large portions of the year. In other words, outflow exceeds inflow; which does not emulate a response to natural environmental hydrology.

Hinckley Reservoir is a regulated reservoir that has been in existence for over 100 years (approximately 70 years before the Jarvis Project was built) and is operated in accordance with the Operating Diagram (over which the Power Authority has no control). Water level fluctuations which occur within the reservoir: (a) are the result of the Operating Diagram; (b) are not caused by Jarvis operations; and (c) would still occur even if the Jarvis Project were to cease generation all together. The hydrologic analysis discussed in Section 4 of the PSP clearly demonstrates that there is no nexus between Project operations and the associated reservoir resource studies requested by NYSDEC.

3.3.2 Base Flow

Both USFWS and NYSDEC provided comments pertaining to their requests that the Power Authority conduct a base flow study below the West Canada Creek Project. As noted in the NYSDEC letter, the current license requires that the Jarvis Project release adequate water volume to the Prospect impoundment to allow the downstream hydroelectric projects to meet the current minimum flow requirement. As noted above, the Jarvis Project meets this requirement by pulling water out of storage to supplement inflow for large portions of the year (the annual inflow and outflow curve is shown in [Figure 3.3.2-1](#), monthly duration curves are provided in the PAD). It is not the responsibility of the Power Authority to conduct relicensing studies downstream of two other hydroelectric developments, which are owned by another licensee. Impacts associated with instream flows downstream of the Prospect or Trenton Falls developments would be analyzed in the relicensing of the West Canada Creek Project and do not have any nexus to Jarvis Project operations.

In FERC relicensing proceedings, adjacent projects that are licensed contemporaneously conduct their own studies of their own project impacts. An upstream project is not required to extend the geographic scope of its studies to include areas downstream of another FERC-licensed project, particularly when the downstream project also is undergoing relicensing.⁶ The Commission indicates in Scoping Document 2 that after Erie Boulevard files its license application, FERC will determine whether to consolidate its environmental review of the Jarvis and West Canada Creek Projects into a single National Environmental Policy Act (NEPA) document.

If, during the West Canada Creek relicensing proceeding, the resource agencies determine that instream flow studies are required to examine minimum flows downstream of the West Canada Creek Project, the Power Authority is willing to release the water necessary to support the downstream licensee's completion of such studies with approval from NYSCC. However, it is not the Power Authority's responsibility to conduct such studies nor does such a request meet FERC's study criteria for the Jarvis proceeding. If it is determined based on the results of such studies that changes to the current flow regime are necessary, the Power Authority is willing to meet with the resource agencies and applicable stakeholders to discuss potential changes at the appropriate point in the relicensing proceeding.

Finally, the USFWS notes that "...the Jarvis Project is essentially responsible for any downstream flow fluctuations" and also notes that "...the downriver flows [below the West Canada Creek Project] directly mimic the Jarvis Project peaking operations, thus making the Jarvis Project directly responsible for any downstream impacts." This is an incorrect assertion and is not an accurate characterization of how the Jarvis and West Canada Creek Hydroelectric developments are operated. While it is true that when the Jarvis Project peaks, the West Canada Creek Project typically uses the releases from Jarvis to peak at the Prospect and Trenton Falls Developments; it is also true that the West Canada Creek Project has the capacity to peak regardless of whether Jarvis is peaking and typically peaks far more frequently than the Jarvis Project. As such, the Jarvis Project is not directly responsible for downstream impacts as the USFWS notes in their comment letter. This is demonstrated in [Figures 3.3.2-2](#) and [3.3.2-3](#).

To analyze representative hydrologic characteristics of West Canada Creek, Jarvis outflow was plotted against the flow recorded at the USGS Gage at Kast Bridge (Gage No. 01346000) for the representative period January 14 – 31, 2018 ([Figure 3.3.2-2](#))⁷ and February 1 – 28, 2018 ([Figure 3.3.2-3](#)). The Kast Bridge USGS gage is located approximately 26 miles downstream of the

⁶ Examples of such relicensing proceedings include Great River Hydro, LLC's Vernon, Bellows Falls, and Wilder Projects (Project Nos. 1904, 1855, and 1892) and FirstLight Hydro Generating Company's Northfield Mountain Pumped Storage and Turners Falls Projects (Project Nos. 2485 and 1889) on the Connecticut River; Exelon Generating Company's Muddy Run Pumped Storage and Conowingo Projects (Project Nos. 2355 and 405) and York Haven Power Company's York Haven Project (Project No. 1888) on the Susquehanna River; Cellu Tissue Corporation's Natural Dam Hydroelectric Project (Project No. 2851) and Erie Boulevard's Oswegatchie River Project (Project No. 2713) on the Oswegatchie River.

⁷ For the purpose of this analysis, the representative period started in mid-January as flow information was not available at the Kast Bridge USGS gage for early January due to ice conditions in the river.

Trenton Falls Development. Although this gage is located a considerable distance downstream of the Jarvis and West Canada Creek Projects, any dams between the Projects and the gage are operated as run-of-river. As such, there is no re-regulation of releases from the West Canada Creek Project between the Trenton Falls Development and the USGS gage. As observed in [Figure 3.3.2-2](#), the Jarvis Project peaked on four occasions between January 14th and 18th. A hydrologic pattern consistent with peaking is also observed at the Kast Bridge USGS gage during that period. Based on how the West Canada Creek Project is typically operated, the Prospect and Trenton Falls Developments likely also peaked during this time.

It is also observed on [Figure 3.3.2-2](#) that starting on January 18th and continuing through for the end of the month, the Jarvis Project did not peak. Although Jarvis did not peak during this time, a hydrologic pattern consistent with peaking is still observed at the Kast Bridge USGS gage for the remainder of the month with the exception of January 22nd through the 26th when a natural high flow event occurred. The hydrologic pattern observed during the end of January clearly demonstrates that the Jarvis Project is not responsible for downstream impacts as the USFWS states nor are the Jarvis and West Canada Creek Projects operated in tandem. This is further demonstrated in [Figure 3.3.2-3](#) where it is observed that the Jarvis Project did not peak during the month of February yet a hydrologic pattern consistent with peaking is observed at the USGS gage throughout the month except during the first week of the month and during a period of naturally occurring high flows starting on February 20th.

Figure 3.3.2-1. Annual Inflow and Outflow Duration Curves

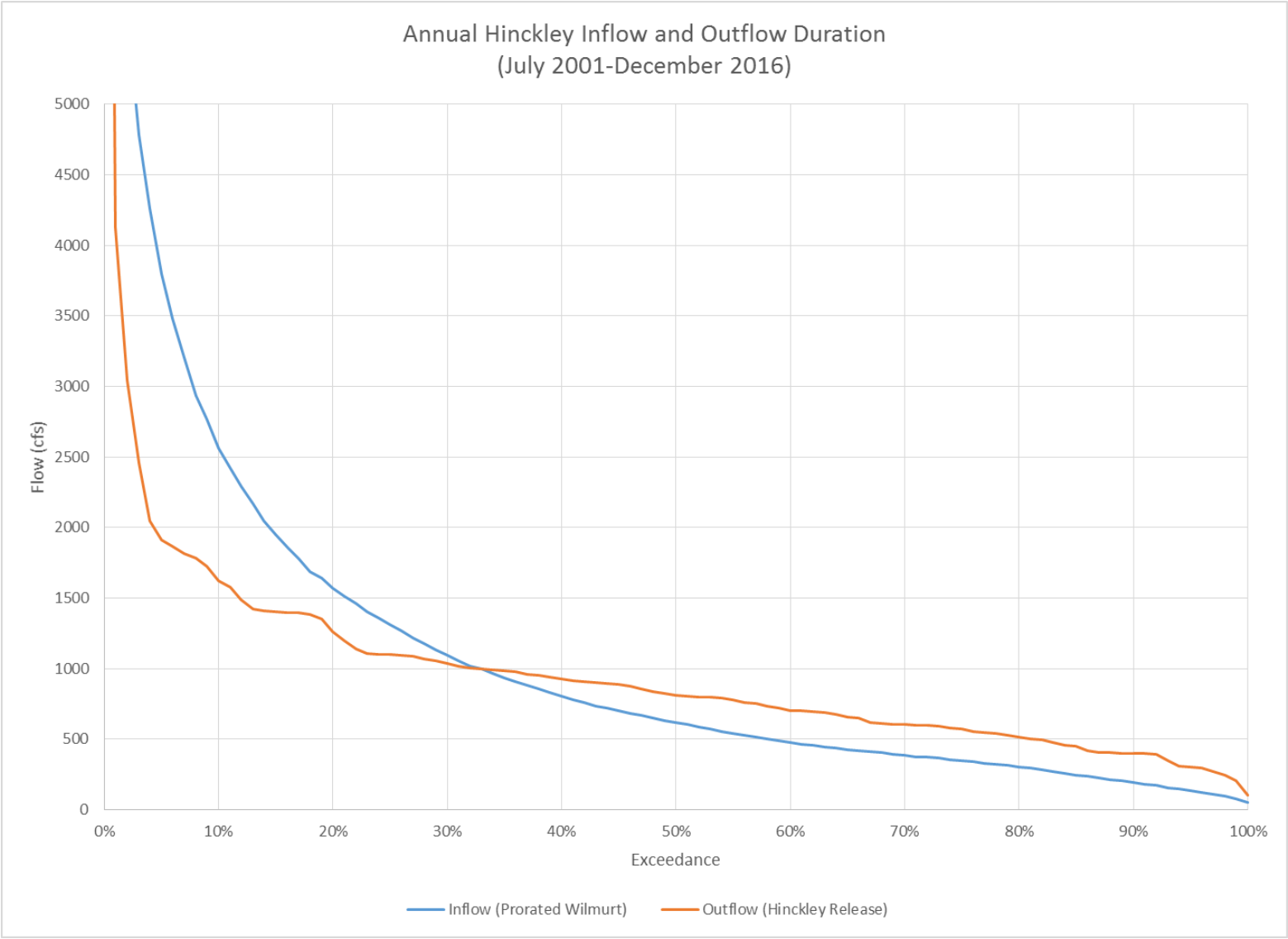


Figure 3.3.2-2. Jarvis Outflow and West Canada Creek Flow at Kast Bridge USGS Gage (No. 01346000) January 14-31, 2018

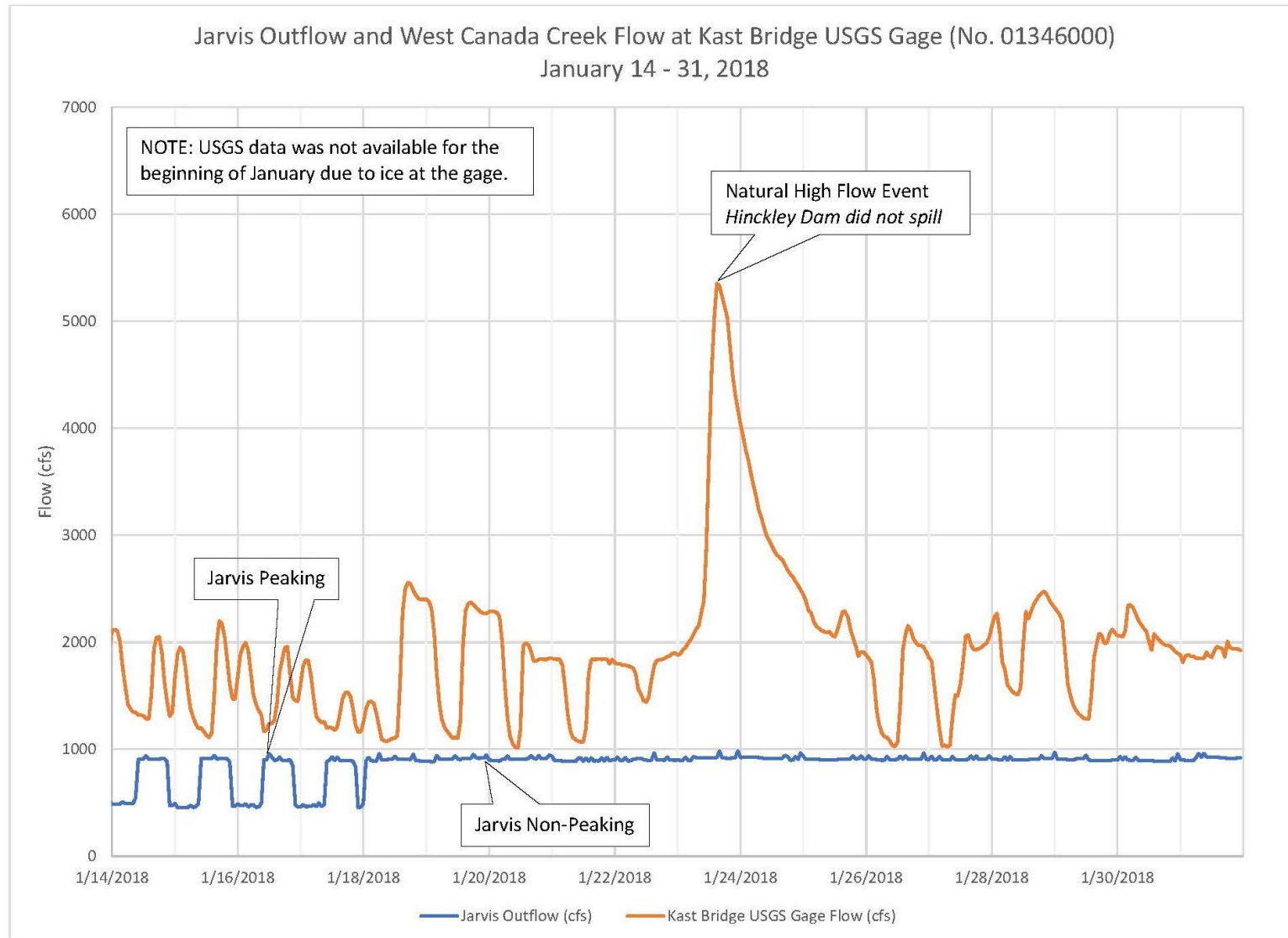
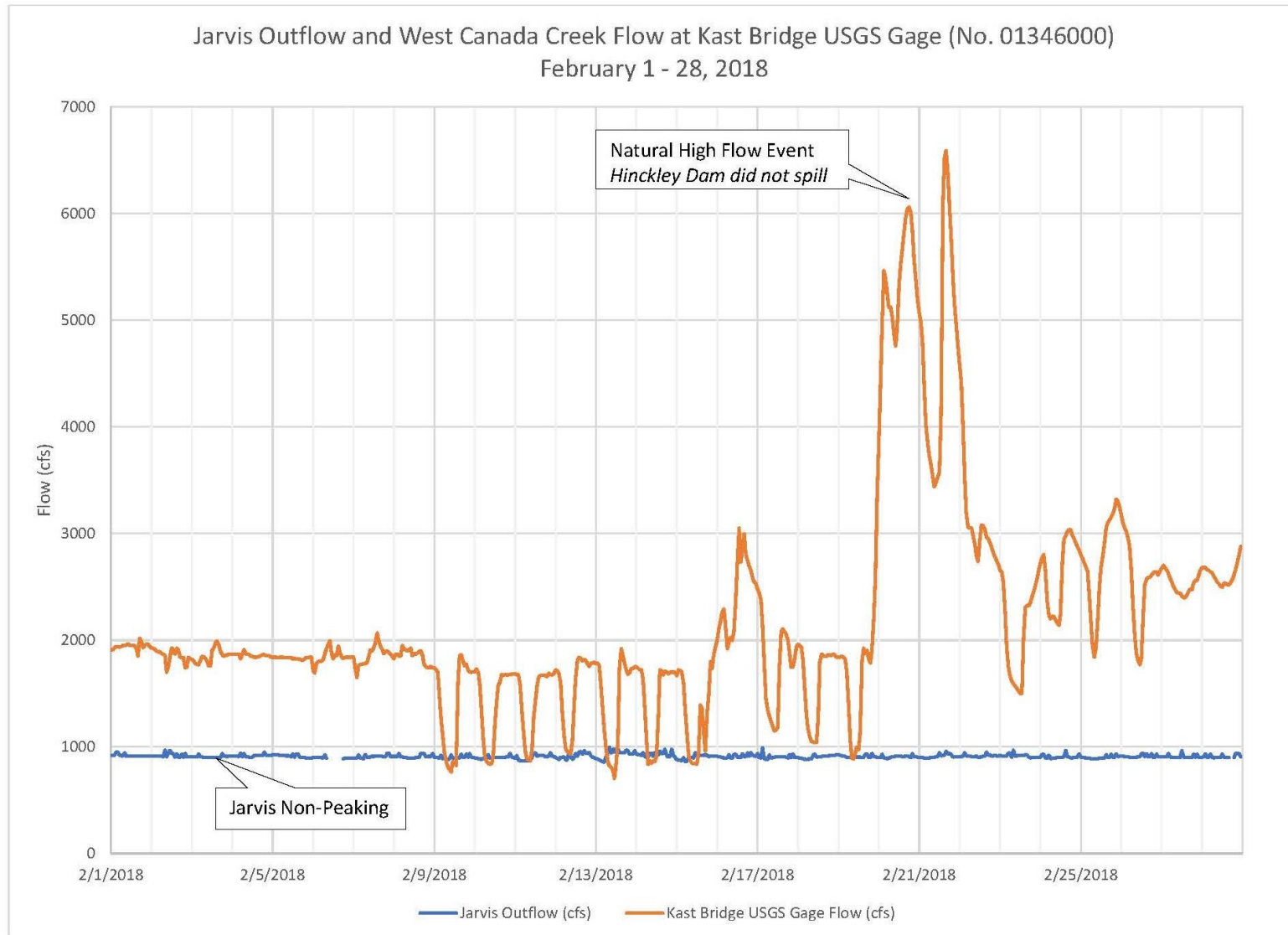


Figure 3.3.2-3. Jarvis Outflow and West Canada Creek Flow at Kast Bridge USGS Gage (No. 01346000) February 1-28, 2018



3.3.3 Fish Survey

NYSDEC notes that this study is necessary to “adequately determine the causal link between the Jarvis Project operations and the characterization of certain aspects of fish and aquatic resources, including reproduction and early life history, seasonal occupancy; impingement, entrainment, and passage survival at the Project intakes; along with macroinvertebrates, freshwater mussels, and zooplankton resources...” As discussed in Section 4 of the PSP and [Section 3.3.1](#), there is no nexus between Project operations and potential impacts on fish species in the reservoir aside from potential impingement, entrainment, and passage survival at the Project intakes. This will be examined as part of the *Assessment of Fish Entrainment and Turbine Passage Survival* study ([Section 2.3](#) and [Section 3.2.3](#)). Based on the available existing information, the Fish Survey is not required to conduct the *Assessment of Fish Entrainment and Turbine Passage Survival* study as the existing information is sufficient to determine target species for the study.

Additionally, NYSDEC notes that “West Canada Creek is a heavily used recreational fishery as the area between Trenton Falls and Herkimer was reported to have the greatest angling pressure due to an angler effort of 14,942 hours, which translates to 20 angler-hours/acre.” While interesting, this has no relevance to the Jarvis Project and no bearing on why this study should or shouldn’t be conducted. The reach of West Canada Creek noted by NYSDEC is well outside the Jarvis Project boundary, below two other hydroelectric projects, and as much as 32 miles downstream of the Hinckley Dam. The fishery in that area, and popularity with anglers, was established under the current operating regime of the downstream hydroelectric projects.

Finally, NYSDEC states “the PAD noted that spawning success, growth and survival and productivity of the aquatic food webs may also be directly and/or indirectly affected by the Jarvis Project operations.” This is factually incorrect. On the contrary, the PAD states, “spawning success can be directly affected by water level and flow management of Hinckley Reservoir by NYSCC, particularly the altering or dewatering or any potential spawning habitat. Water level fluctuations may also have secondary impacts on fish growth and survival by influencing the productivity of the reservoir and the resulting food webs” (PAD, Page 147, Section 5.1.3). The water level fluctuations referenced in this quote refer to those associated with the Operating Diagram, not Jarvis Project operations. The Power Authority has no control over water level fluctuations associated with the Operating Diagram. Jarvis Project operations do not directly or indirectly impact spawning success, growth and survival, and productivity of the aquatic food webs.

3.2 Response to Comments Pertaining to Additional Information Requests

By letter dated March 9, 2018, the Citizens of Hinckley provided several comments pertaining to the Power Authority’s responses to FERC AIRs, which were included in the PSP. Where appropriate, the Power Authority has responded to comments received from the Citizens of Hinckley.

3.4.1 FERC AIR No. 5: Geology and Soils

In the PSP, the Power Authority responded to FERC's AIR regarding the extent of erosion within the Project boundary by noting that minimal to no shoreline erosion occurs throughout the reservoir. In response to this, the Citizens of Hinckley included pictures in their comment letter which depicted property lines in two locations extending into the reservoir. The Citizens of Hinckley noted in their letter that these pictures were indicative of the loss of shoreline due to erosion. Upon review of the photos provided by the Citizens of Hinckley it appears that the source of the information is www.zillow.com, a real estate website whose mapping applications rely on high level GIS layers of varying accuracy. In this case, the parcel information shown on the figure is likely based on town or county level parcel information georeferenced based on aerial imagery to show the approximate location of parcel boundaries, not based on survey data. Such layers are approximate at best and are not appropriate to be used to determine changes in shoreline location over time. The property lines observed extending into the water are the result of accuracy limitations of the underlying data as opposed to evidence of shoreline erosion. The appearance of property lines not aligning with underlying aerial imagery is a common occurrence with such datasets.

3.4.2 FERC AIR No. 9: Terrestrial Resources

In their AIR FERC requested that the Power Authority "provide a list of all common loon sightings since 2001 within Hinckley Reservoir as part of the New York Annual Loon Census or similar survey effort." In response to this request, the Power Authority contacted the Adirondack Communities and Conservation Program (the entity responsible for the loon census) to gather relevant information. The Adirondack Communities and Conservation Program noted that zero loons were observed during the 2016 and 2017 census. This is not to say that loons may not occasionally frequent Hinckley Reservoir, but rather that no loons were observed during census monitoring activities. In their comment letter the Citizens of Hinckley noted that "it is currently estimated that there are 4-6 loons that return to Hinckley each year on a consistent basis" (source unknown). While this may be true, the Adirondack Communities and Conservation Program noted in correspondence with the Power Authority that chicks or immature loons have never been reported for the period 2002 – 2017, indicating that breeding on Hinckley Reservoir is unlikely.

3.4.3 FERC AIR No. 10: Land Use

In the Citizens of Hinckley comment letter it is noted that there are many private properties that are adjacent to the reservoir and Project lands. This is consistent with the discussion presented by the Power Authority in the PAD, which notes that there are a number of private residences adjacent to the reservoir that use project lands for fishing, boating, swimming, and other recreation. The Citizens of Hinckley go on to note in their comment letter that "it is not quite understood why NYPA is ignoring FERC's request for the number and type of properties that border Hinckley Lake..." As is clearly stated in the PAD, the Power Authority recognizes the private residences adjacent to the reservoir; however, all of these residences are outside of the Project boundary. FERC's AIR specifically requests that the Power Authority "specify the number

of private residences within the Project boundary...” There are no private residences within the Project boundary because the reservoir up to El. 1225 is owned by New York State.

2.2 Cultural Resources

In the PSP, the Power Authority responded to several FERC AIRs related to Cultural Resources, including FERC’s request for the Power Authority to develop a Historic Properties Management Plan (HPMP) (AIR No. 11), to provide additional information pertaining to archaeological sites within two miles of the Project (AIR No. 13), and a record of any consultation which has occurred with the SHPO since the filing of the PAD (AIR No. 14). The Power Authority submits additional information pertaining to these requests below.

3.5.1 FERC AIR No. 11 & No. 14

FERC AIR No. 11 (transmitted via letter dated October 27, 2017) noted, among other things, that “a historic properties management plan will most likely be required to protect the historic property from any adverse effects that may result from continued project operation. Please prepare a historic properties management plan and file it with your study report.” In response, the Power Authority noted that engagement with the SHPO had recently occurred to determine the APE, that it would be premature to commit to the development of an HPMP until the APE had been determined, and that the Power Authority would provide an update on the status of the APE determination in the RSP. In addition, FERC AIR No. 14 requested that the Power Authority provide FERC with a record of any consultation which has occurred with the SHPO since the filing of the PAD.

On January 23, 2018, the Power Authority submitted an APE justification letter, map, and shapefiles to the SHPO for their review. By letter dated March 14, 2018, the SHPO noted that they concurred with the proposed APE. Copies of this correspondence are included in [Appendix B](#), while the SHPO approved APE is shown in [Figure 3.5.1-1](#).

The Power Authority is not proposing to conduct cultural resource studies or develop an HPMP. As noted in the PAD, the New York State Barge Canal Historic District was recently designated as a National Historic Landmark (NHL). The Hinckley Dam and Reservoir are discontinuous contributing properties of said historic district with the majority of the Project boundary and APE located within the NHL.⁸ In addition, the Jarvis facility itself is less than 50 years old and is currently not eligible for the National Register. Finally, the properties noted above will not be affected by the continued operation of the Jarvis Project. For these reasons, the Power Authority believes that additional cultural resource studies or development of an HPMP are unwarranted and would not inform license conditions. In the event that future Project maintenance is required

⁸ It should be noted that the NHL boundary was drawn based on aerial photography and is not based on survey data, a given elevation, or other specific data sources. It is possible that the NHL includes lands not under NYSCC control (e.g., the Jarvis tailrace). As such, the potential exists that the NHL boundary may be redrawn at a future date to more accurately reflect the actual boundary of Hinckley Dam and Reservoir.

which could potentially have an adverse effect on cultural resources, the Power Authority will consult with the SHPO and the NYS CC as appropriate.

3.5.2 FERC AIR No. 13

FERC AIR No. 13 noted, “page 136, table 4.10.2-1 [of the PAD] lists the archaeological sites within two miles of the project. So that staff has a clear understanding of the locations of these sites in relation to the project, please add a column that explains the proximity of each site to the Project boundary.” The Power Authority provided the requested information as a non-public filing on December 12, 2017.

Upon further review of the information provided to FERC, several inconsistencies were discovered. As such, the Power Authority is submitting updated information as summarized in Table 3.5.2-1, which replaces and supplants the information contained in the document entitled “*Proposed Study Plan – Non-Public Gregory B. Jarvis Project Relicensing*” dated December 12, 2017. Due to its sensitive nature, the updated information is filed as privileged under separate cover.



Gregory B. Jarvis Project
(FERC No. P-3211)
Revised Study Plan

Figure 3.5.1-1:
Jarvis Project
Area of Potential Effect (APE)

0 750 1,500 3,000
Feet

Appendix A – List of PSP Comment Letters

List of PSP Comment Letters

Date	Entity	Description
3/6/2018	USFWS	Review of Proposed Study Plan
3/8/2018	FERC	Staff Comments on the Proposed Study Plan
3/9/2018	NYS Council of Trout Unlimited	Comments on Proposed Study Plan
3/9/2018	The Citizens of Hinckley	Comments to the New York Power Authority's Proposed Study Plan
3/12/2018	NYSDEC	Comments on Proposed Study Plan
3/12/2018	Mohawk Valley Chapter of Trout Unlimited	Comments on Proposed Study Plan

Appendix B – SHPO Correspondence



ANDREW M. CUOMO
Governor

JOHN R. KOELMEL
Chairman

GIL C. QUINIONES
President and Chief Executive Officer

9 January 2018

Daniel Mackay, Deputy Commissioner
New York State Office of Parks, Recreation
and Historic Preservation
Peebles Island Resource Center
Delaware Avenue
Cohoes, NY 12047

SUBJECT: Gregory B. Jarvis Power Project Relicensing (17PR03658)
Proposed Area of Potential Effect
Towns of Rensen and Trenton, Oneida County and
Town of Russia, Herkimer County

Dear Mr. Mackay:

On May 25, 2017, the New York Power Authority (NYPA or the Power Authority) informed the New York State Division for Historic Preservation of its intent to commence the relicensing process for the Gregory B. Jarvis Power Project (Jarvis Project or the Project; FERC No.3211). On June 30, 2017, the Power Authority commenced the relicensing process by filing its Notification of Intent (NOI) to file an Application for New License and Request for Designation as Non-Federal Representative along with the accompanying Pre-Application Document (PAD) with the Federal Energy Regulatory Commission (FERC). Since the Jarvis Project's new license will be issued by FERC, the relicensing is subject to Section 106 review under the National Historic Preservation Act (36 CFR Part 800). As part of the Section 106 process, the Power Authority proposes the following Area of Potential Effect.

Project Description

The Power Authority's Jarvis Project is located on West Canada Creek approximately 0.5 miles upstream of the Hamlet of Hinckley in the towns of Remsen, Russia, Ohio, and Trenton, in the counties of Oneida and Herkimer, NY. In this area, West Canada Creek flows south out of the Adirondack Mountains, through the reservoir, and then approximately 35 miles to its confluence with the Mohawk River. The Hinckley Dam, Reservoir, and associated lands are owned by the State of New York, under the jurisdiction of the New York State Canal Corporation (NYSCC).¹ Hinckley Reservoir was constructed by the State of New York in the valley formed by West Canada Creek for the purpose of supplying water to the New York State Barge Canal. The reservoir was commissioned in 1915. When full, the reservoir has a surface area of approximately 4.46 square miles (mi²). When full (El. 1225²), the volume of the reservoir is approximately 25.8 billion gallons. Much of the northern and eastern portions of the reservoir are within the Adirondack Park

¹ The New York State Legislature transferred control of the NYS Canal System from NYSDOT to NYSTA in 1992 and then from NYSTA to the Power Authority in 2016. Effective April 1, 2016, the Power Authority is financially responsible for the NYSCC. As of January 1, 2017, the NYSCC became a subsidiary of the Power Authority.

²All elevations are referenced to Hinckley Datum. Elevations referenced to the Hinckley datum are 1.04 feet higher than elevations referenced to the National Geodetic Vertical Datum (MSL of 1929), thus, 1225.00 Hinckley Datum = 1223.96 NGVD29. (The Hinckley Datum is the same as the Barge Canal Datum).

Gregory B. Jarvis Power Project Relicensing (17PR03658)

Proposed Area of Potential Effect

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The 9-megawatt (MW) Jarvis Project was issued a 40-year license by the Federal Energy Regulatory Commission (FERC or the Commission) on August 12, 1982. In 1984, the New York State Department of Transportation (NYSDOT) conveyed a permanent easement to NYPA for hydroelectric generating facility or facilities. This easement includes the area surrounding the generating facilities, the dam itself, a substation site on the north side of NYS Route 365, a recreational boat launching site, and the reservoir upstream of the dam up to elevation 1225.00 feet. NYPA owns the generating station and ancillary equipment. The power plant was commissioned on June 22, 1986. The current license is set to expire on July 31, 2022.

The Hinckley Reservoir Dam is a contributing element of the New York State Barge Canal National Historic Landmark. The dam consists of a 570-foot long north earthen embankment dam, a 65-foot long concrete non-overflow intake structure, a 400-foot long concrete ogee spillway, and a 2,600-foot long south earthen embankment. Water is conveyed to the powerhouse through a 15-foot diameter penstock, which bifurcates into two 90-foot long, 10.5-foot diameter penstocks, which lead to the two horizontal Kaplan turbine units. The powerhouse discharges into a short tailrace that meets West Canada Creek approximately 150 feet downstream of the powerhouse. This tailrace is cut into bedrock and has nearly vertical side slopes. A 60-inch diameter pipe acts as a low level outlet for the Project in addition to a penstock bypass.

The upstream section of the spillway south (left) wingwall contains a gatehouse from which the Mohawk Valley Water Authority (MVWA) on average draws up to 30-35 cubic feet per second (cfs) for water supply under existing agreements. Flow into each of the two 42-inch diameter water supply conduits is controlled by two 3- by 4-foot gate valves located on an outer gate shaft. These valves lead to a 42-inch diameter sluice gate at invert El. 1161.5, located in an inner gate shaft. The water supply conduits pass under the south embankment dam in a trench excavated into rock and backfilled with concrete.

The Project's concrete powerhouse is a semi-underground structure located 200 feet downstream of the non-overflow intake. The powerhouse is 120 feet long, 55 feet wide, and 43 feet deep below grade. The powerhouse contains two 4.5-megawatt horizontal Kaplan turbines operating under a maximum head of 67.5 feet, plus surcharge, at normal pool (El. 1225) with tailwater level at El. 1157.5. It should be noted that the powerhouse is not located within the boundary of the New York State Barge Canal National Historic Landmark.

Project Operation

The Project is operated in accordance with the 2012 Hinckley Reservoir Operating Diagram (Operating Diagram, Figure 1).³ In accordance with a February 1, 2013 Settlement Agreement, NYSCC agreed to maintain the reservoir within a normal operating range of El. 1195 and above, except during certain adverse conditions. Under some conditions, NYSCC deviates from the Operating Diagram as necessary to maintain reservoir releases. Releases through the powerhouse are determined by the time of year and Hinckley Reservoir elevation, as plotted in the Operating Diagram. Project operations are adjusted on a twice weekly basis in accordance with the Operating Diagram. The Jarvis Project has the ability to peak on a limited basis, so long as Project operations meet the criteria of the Operating Diagram.

Based upon these operating criteria, the reservoir levels are usually maintained between El. 1195 and El. 1225 (the elevation of the spillway crest); however reservoir water levels can fall below El. 1195 when

³ The 2012 Hinckley Reservoir Operating Diagram was established as part of a settlement between NYS and MVWA, effective February 1, 2013.

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prolonged dry conditions occur. The Jarvis Project does not operate when reservoir levels are below El. 1195. Consistent with the Operating Diagram, during the winter months, the reservoir is generally drawn down and then allowed to refill during spring melt. Deviations from the Operating Diagram may occur in the following situations:

Decreased release

- at low reservoir levels to maintain MWWA water supply
- at low reservoir levels so that 160 cfs minimum flow downstream of the diversion weir for the NYS Barge Canal (Morgan Dam, also known as the Nine Mile Creek Feeder Dam) will always be available if it is anticipated that low reservoir inflow will occur in the immediate future
- for public safety (to allow bridge reconstruction, alleviate downstream flooding, etc.)

Increased release

- at high reservoir levels to possibly provide some flood storage

Area of Potential Effect

NYPA has given careful consideration to the APE for the Jarvis Project's relicensing. In crafting the APE, NYPA referred to both NHPA regulations, 36 C.F.R. § 800.16(d), as well as FERC's guidelines. 36 C.F.R. § 800.16(d) defines the APE as:

the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

As indicated above, the NYS Department of Public Works constructed the Hinckley Dam and Reservoir in 1915, for the purpose of supplying water to the NYS canal system. Hinckley Reservoir is owned by the NYSCC and outflows from the reservoir are governed by legally binding operating agreements between the NYSCC, MWWA and Erie Boulevard. In 1986, the Power Authority constructed the Jarvis Project at the Hinckley Dam to capture hydropower generation from NYSCC's reservoir releases. Construction of the Jarvis Project entailed reconfiguring discharge outlets at the dam to install turbine generators capable of producing hydropower from the existing releases. The Power Authority does not have the authority or the rights to deviate from these releases and if the Jarvis Project were not to exist, the same reservoir water levels and discharges would still occur in accordance with the Operating Diagram. In other words, the Jarvis Project simply redirects reservoir outflow (determined by the Operating Diagram) through the Project's power generating equipment, which is released by the NYSCC for purposes other than generation at the Jarvis Project and which would be made even in the absence of the Project. NYSCC does not manage Hinckley Reservoir water levels or releases to promote generation at the Jarvis Project.

Gregory B. Jarvis Power Project Relicensing (17PR03658)

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NYPA does not have any discretion in how the Hinckley Reservoir is utilized. The Hinckley Reservoir is currently operated by the NYSCC in accordance with the 2012 Hinckley Reservoir Operating Diagram for which the Jarvis Hydroelectric Project utilizes the reservoir releases to generate power.

Taking both the NHPA definition of the APE, the way in which water is released from Hinckley Reservoir, and the manner in which the Jarvis Project is operated into account, NYPA has drawn the APE to include:

- the north earthen embankment
- the non-overflow intake structure,
- the Project's intakes, penstocks, powerhouse, discharges, and low level outlets,
- the areas within the Project's fenceline at the entrance, extending to the north wingwall and the top of the north non-overflow intake structure,
- the concrete ogee spillway,
- the south earthen embankment, and
- the two parcels of land that comprise the Power Authority's boat launch north of the Project.

The total area of the APE equals approximately 19.7 acres of which approximately 14.43 acres are within the New York State Barge Canal National Historic Landmark.

Within the APE, but not subject to control by the Power Authority or this relicensing are those facilities associated with and/or owned by the Mohawk Valley Water Authority (MVWA), including an upstream section of the spillway south wingwall containing a gatehouse; two 42-inch diameter water supply conduits controlled by two 3- by 4-foot gate valves located on an outer gate shaft; a 42-inch diameter sluice gate at invert El. 1161.5, located in an inner gate shaft; the water supply conduits passing under the south embankment of the dam in a trench excavated into rock and backfilled with concrete; and appurtenances. The MVWA draws, on average, up to 30-35 cubic feet per second (cfs) for water supply under existing agreements.

As always, the Authority welcomes the opportunity to discuss this matter with any of the consulted parties. Should there be any questions, please contact the Power Authority's Cultural Resources Specialist, Robert F. Panepinto, at 914.681.6404.

Very truly yours,



Cindy Brady

Business Development Manager, Project and Business Development

cc: M. Slade (NYPA)
R. Panepinto (NYPA)



Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

March 14, 2018

Mr. Robert Panepinto
Cultural Resource Specialist
New York Power Authority
123 Main Street-5E
White Plains, NY 10601

Re: FERC
Gregory B. Jarvis Power Project (Hinckley Reservoir) FERC Relicensing
17PR03658

Dear Mr. Panepinto:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

We have reviewed the project submission received on 1/23/2018, including the Area of Potential Effect (APE) justification letter, map, and shape files. Based upon this review, the SHPO has no concerns with the proposed APE.

If you have any questions, I can be reached at (518) 268-2217.

Sincerely,

Christina Vagvolgyi
Historic Preservation Technical Specialist
e-mail: christina.vagvolgyi@parks.ny.gov

via e-mail only

Document Content(s)

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