

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 6
207 Genesee Street, Utica, NY 13501-2885
P: (315)793-2554 F: (315) 793-2748
www.dec.ny.gov

March 12, 2018

Mark E. Slade
Director, Licensing, New York Power Authority
123 Main Street
White Plains, New York 10601
Mark.Slade@nypa.gov

Re: Jarvis Project (P-3211-009)
Comments on Proposed Study Plan

Dear Mr. Slade:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the New York Power Authority's December 12, 2017 submittal of the *Proposed Study Plan (Study Plan)* for the Jarvis Dam hydroelectric power station on the West Canada Creek in the Towns of Remsen, Russia, Ohio, and Trenton, in the counties of Oneida and Herkimer, New York.

The Project generally consists of north and south embankment dams, a non-overflow concrete gravity section with integrated intake structure, a 15-foot diameter penstock which bifurcates into two 10.5-foot diameter penstocks, a powerhouse containing two 4.5 megawatt (MW) turbine/generator units, tailrace channel, step-up transformer and appurtenant facilities. The Project boundary encompasses a total of approximately 2,850 acres and have approximately 17 miles of shoreline.

Hinckley Reservoir serves a variety of purposes including: (1) supplying water to the New York State Canal System; (2) serving as the sole source of drinking water for approximately 130,000 people in the greater Utica area; (3) supplementing flows for the downstream hydropower generation owned and operated by Erie Boulevard Hydropower, LP and aquatic resources; and (4) recreation. As the New York State Canal Corporation (NYSCC) releases flows for these purposes, the Applicant captures the electric generation potential of these releases at the Project.

Comments on the Proposed Study Plan

The NYSDEC generally agrees with the studies proposed by the applicant specifically the Hinckley Reservoir Bathymetric Survey, the Tailwater Water Quality Study, the Assessment of Fish Entrainment and Turbine Passage Survival, and the Recreation & Public Access Study. However, the NYSDEC notes that contrary to the Applicant's assertions, we 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 this region have separate downstream passage facilities designed to keep and/or attract fish away from the intakes to the turbines.

The NYSDEC reiterates its original request, by letter dated October 19, 2017 and offers the following additional comments on the Applicant's Proposed Study Plan dated December 12, 2017:

Section 4.1.2 Effects of Jarvis Peaking Operations on Water Level Fluctuations

The Study Plan describes the effect of Jarvis peaking operations on water level fluctuations stating that if it was assumed the Jarvis peaking period duration would be four hours and that the Jarvis Project would operate at maximum generating capacity with a discharge of 1,800 cfs. then, for the remaining 20 hours of the day, outflows would be reduced so that the average daily discharge is equivalent to 24 hours of the flow release specified by the Operating Diagram. For example, if the scheduled daily flow release from the Operating Diagram is 600 cfs and the Power Authority operated Jarvis in peaking mode, the release is 1,800 cfs for four hours and 360 cfs the remaining 20 hours. 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.

Section 4.2.2 Water Level Fluctuation Impact

The Applicant's Study Plan states that the Applicant is not proposing to conduct the requested water level fluctuation study as there is no nexus between operation of the Jarvis Project and its effects on water resources and further, that the results of any such study would not inform the development of license requirements.

The Jarvis project is located in and uses the water of the West Canada Creek. Accordingly, there is a connection between the operation of the Jarvis Project and the water levels in the West Canada Creek. The requested water level fluctuation impact study is needed to adequately determine if there is a causal link between the Project operations and any impacts on resources, including shoreline erosion, water quality, fisheries, macroinvertebrate and freshwater mussel populations. Information obtained from this study is essential and will be utilized by the NYSDEC for the development of protection, mitigation and enhancement measures related to the NYSDEC's mandatory conditioning authority under §401 of the Clean Water Act (Water Quality Certification (WQC)).

The PAD states that for all months except for March and April, Project outflow exceeds inflow, and the inflow is supplemented with reservoir storage as is typical of a seasonal store and release reservoir.

Section 4.2.3 Base Flow

Pursuant to the current license, a continuous minimum flow of 160 cfs, as measured downstream of the NYSCC diversion weir at the Nine Mile Creek Feeder Dam, must be maintained in the West Canada Creek. The current license also requires that the Jarvis project release adequate water volume to the Prospect impoundment to allow the downstream controlling Projects to meet the current minimum flow requirement.

This section further states that the applicant is not proposing to conduct the requested study as there is no nexus between operations of the project and effects on the resources and the study would not inform the development of license requirements.

The Jarvis project lies in West Canada Creek and the water of West Canada Creek is used to operate the project. The requested base flow study is needed to adequately determine if there is a causal link between the Jarvis project operations and the required minimum flows as per the current license agreement, and if the Jarvis project is providing adequate flows to the Prospect impoundment. The requested base flow study is also needed to determine if any effects on the resources such as potential streambank erosion, water quality, fisheries, macroinvertebrate and freshwater mussel populations and to determine if the currently licensed minimum base flows are adequate for the aquatic resources of West Canada Creek. This information is used by the NYSDEC for the issuance of a §401 WQC.

Section 4.2.4 Fish Survey

The Applicant states that it demonstrated in Section 4.1.2 that the Jarvis Project non-peaking operations have no impact on reservoir water level fluctuations or downstream flows and that the peaking operations have minimal to no impact. However, in the PAD under section 4.4.3 the Applicant noted that the middle mainstem section of West Canada Creek (from Prospect to Hinckley Reservoir) is categorized by the NYSDEC's Division of Water as an impaired segment with regards to aquatic life and habitat/hydrology with a known source of impairment identified as hydro modification or alteration to the natural flow regime and some suspected sources were identified from atmospheric deposition. Furthermore, fisheries resources were reported to be affected by factors such as the effect of multiple dams on the stream restricting fish migration.

Section 4.4.6 of the PAD mentioned the presence of black bass (Largemouth, *Micropterus salmoides*, and Smallmouth bass, *Micropterus dolomieu*), trout (Brook Trout, *Salvelinus fontinalis*, Brown Trout, *Salmo trutta*, and Rainbow Trout, *Oncorhynchus mykiss*), Yellow Perch (*Perca flavescens*) and sunfish (Family: *Centrarchidae*) in Hinckley Reservoir suggests a potential recreational fishery somewhat attributable to the Project area. The recreational fishery on the West Canada Creek 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.

In Section 5.1.2 the PAD stated that for all months except for March and April, Project outflow exceeds inflow, and the inflow is supplemented with reservoir storage as is typical of a seasonal store and release reservoir. Furthermore, Section 5.1.3 of the PAD stated that little or no applicable information was available to characterize certain aspects of fish and aquatic resources, including reproduction and early life history, seasonal occupancy; impingement, entrainment, and passage survival at the Project intakes; and macroinvertebrates, mussels, and zooplankton

resources. The PAD further stated that spawning success can be directly affected by water level and flow management of Hinckley Reservoir by the NYSCC, particularly the altering or dewatering of any potential spawning habitat. Secondary impacts on fish growth and survival may also be affected by water level fluctuations by influencing the productivity of the reservoir and the resulting food webs. Furthermore, the PAD states that the relatively wide spacing of the intake trashracks and entrainment of fish represents downstream passage but also mentions that turbine passage of fish at the Project has an unknown associated mortality.

The Applicant states in Section 4.2.4, Fish Survey, of the Study Plan that the Power Authority is not proposing to conduct the requested study as sufficient information exists to determine the potential Project impacts of continued operation on fishery resources.

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 requested fisheries survey/study is needed to adequately determine if there is a 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 stated in the PAD. Also, stated in the PAD it was noted that the 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. In addition, 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.

Section 4.2.5 Macroinvertebrate and Freshwater Mussel Surveys

In the PSP, the Applicant states that there is no nexus between Project operations and effects on macroinvertebrates or freshwater mussels nor would the study inform the development of license requirements as required by FERC's study plan criteria. In New York State, freshwater mussels are protected pursuant to Article 11 of the Environmental Conservation Law (ECL). New York State is home to approximately 40 species of freshwater mussels. There are five (5) Federally and NYS listed Endangered freshwater mussels; Dwarf Wedgemussel (*Alasmindonta heterodon*), Pink Mucket (*Lampsilis abrupta*), Clubshell (*Pleurobema clava*), Fat Pocketbook (*Potamilus capax*), and Rayed Bean (*Villosa fabalis*). There are three (3) listed NYS Threatened species; Brook Floater (*Alasmindonta varicose*), Green Floater (*Lasmigona subviridis*), and the Wavy-rayed Lampmussel (*Lampsilis fasciola*).

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. In Section 4.4.8 of the PAD the Applicant mentioned that based on the unionid mussel records in adjacent basins and the presence of an appropriate fish species hosts within the West Canada Creek drainage, it is possible that unionids are present within the West Canada Creek including Hinckley Reservoir, but have not been documented to date. The requested macroinvertebrate and freshwater mussel surveys are needed to adequately determine if there is a causal link between the Jarvis project operations and the macroinvertebrate and freshwater mussel populations within the reservoir and West Canada Creek.

Section 4.2.6 Wetland Delineation and Aquatic Habitat Survey

In the PSP, the Applicant states that there is no nexus between Jarvis Project operations and effects on wetlands or aquatic habitat nor would the study inform the development of license requirements as required by FERC's study plan criteria.

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. Section 4.1.2 of the Study Plan describes the effect of Jarvis peaking operations on water level fluctuations stating that if it was assumed the Jarvis peaking period duration would be four hours and that the Jarvis Project would operate at maximum generating capacity with a discharge of 1,800 cfs. 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 wetland delineations and aquatic habitat surveys are needed to adequately determine if there is a causal link between the Jarvis project operations and the characterization of certain aspects of the wetlands, aquatic habitat, and associated aquatic resources.

Section 4.2.7 Shoreline Erosion Survey

In the PSP, the Applicant states there is no nexus between Project operations and effects on shoreline erosion nor would the study inform the development of license requirements as required by FERC's study plan criteria.

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. Section 4.1.2 of the Study Plan describes the effect of Jarvis peaking operations on water level fluctuations stating that if it was assumed the Jarvis peaking period duration would be four hours and that the Jarvis Project would operate at maximum generating capacity with a discharge of 1,800 cfs. 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 shoreline erosion survey is needed to adequately determine if there is a causal link between the Jarvis project operations and the potential shoreline erosion in Hinckley Reservoir and West Canada Creek.

Section 4.2.8 Reservoir Water Quality

In the PSP, the Applicant states that there is no nexus between Project operations and effects on water quality as required by FERC's study plan criteria. Previously in the PAD the Applicant stated that Hinckley Reservoir is listed in the Waterbody Inventory/Priority Waterbodies List as "Waters with Minor Impacts" and that these segments correspond to waters listed as having impacted and stressed uses. Impacted uses include water supply, recreation, and habitat/hydrology with the stressed uses indicated as being due to seasonal water level fluctuations and other impacts resulting from multiple uses of the reservoir, which affect its natural resources habitat and hydrology. While existing water quality data does exist for the Hinkley Reservoir, because of its use as a public drinking water supply, it does not appear that water quality data exists in relation to the

aquatic resources such as fisheries, macroinvertebrates, freshwater mussels, wetlands, and associated aquatic habitats. The Existing water quality data should be used as a baseline with which a comparison could be made with the requested water quality study.

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. As mentioned in the PAD under section 4.4.3 the Applicant noted that the middle mainstem section of West Canada Creek (from Prospect to Hinckley Reservoir) is categorized by the NYSDEC's Division of Water as an impaired segment with regards to aquatic life and habitat/hydrology with a known source of impairment identified as hydro modification or alteration to the natural flow regime and some suspected sources were identified from atmospheric deposition. The requested water quality study for both the reservoir and downstream of the Jarvis project is needed to adequately determine if there is a causal link between the Jarvis project operations and the potential shoreline erosion in Hinckley Reservoir and West Canada Creek. This information is used by the NYSDEC for the issuance of a §401 Water Quality Certification (WQC).

Study Requests

The NYSDEC reiterates its previous request that the Applicant conduct the following studies:

I. Fish Surveys

The Applicant should conduct comprehensive fisheries surveys within the vicinity of the Project. Comprehensive sampling for fisheries data collection should include, but not be limited to, the use of electrofishing, gill netting, trap netting, minnow traps, seining, and angling. The survey work should be done for at least 1 full year; with an option for a second year of study should the data collected be deemed inadequate upon review by the NYSDEC and the USFWS. The survey should cover at least three seasons (spring, summer, and fall), and all four seasons, if possible. The information collected should include species identification, size, age, sex, and condition, as well as movement patterns and habitat utilization. Standard water quality data (e.g. water temperature, dissolved oxygen, pH, conductivity, and turbidity) should also be collected in conjunction with these surveys. These studies should focus on the general fishery resources.

1. Goals and Objectives

The goals and objectives of this study are to provide information on the existing fishery and resources in the vicinity of the Project, including areas upstream and downstream of the dams, to aid in the determination of what the impacts of this Project may be. The information to be collected should include both the temporal and spatial aspects of species distribution; age, size, sex, and condition data; habitat utilization; and fish movement patterns.

2. *Resource Management Goals*

West Canada Creek, in the vicinity of the Project, is managed by the NYSDEC as a mixed cool/cold water fishery. The NYSDEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of West Canada Creek and the Hinckley Reservoir, especially for trout (Brook Trout, *Salvelinus fontinalis*, Brown Trout, *Salmo trutta*, and Rainbow Trout, *Oncorhynchus mykiss*), Smallmouth bass, (*Micropterus dolomieu*), Yellow Perch (*Perca flavescens*) and sunfish (Family: *Centrarchidae*). 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.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The information in the PAD is based on irregular surveys between 1988 and 2014 provide by the NYSDEC. The Applicant was provided data by the NYSDEC for the sampling efforts between 1989 and 2014 regarding fish species found in Hinckley Reservoir and sampling efforts between 1988 and 2010 for West Canada Creek upstream and downstream of the Project. Updated information on the fishery resources is needed to determine potential impacts of the Project.

5. *Nexus to Projects Operations and Effects*

The Project dam serves as a barrier to upstream and downstream migration for both fish and immature aquatic invertebrates. Fish moving downstream are subjected to potential mortality from impingement and entrainment. The Project modifies water levels in the impoundment; modifies flows downstream from the Project, and impact habitats in the impoundments through fluctuations.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard scientific collecting techniques used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve one field crew sampling on a seasonal basis. The study would last for 1-2 years. The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to combine multiple studies (e.g., fisheries, macroinvertebrates, and water quality) into one task, etc. The existing literature is inadequate to fully address projects impacts, and there are no alternatives to conducting standard fishery surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.

II. Macroinvertebrate & Freshwater Mussel Surveys

Information is needed regarding macroinvertebrate populations (including freshwater mussels) in the impoundment and downstream of the Project. A critical evaluation (both qualitative and quantitative) of macroinvertebrate communities in all instream habitats affected by the operation of the project is needed. Very little information is known regarding the macroinvertebrate populations, especially freshwater mussels, in the vicinity of the Project. Information regarding the aquatic insects and freshwater mussels in this section of West Canada Creek and the Hinckley Reservoir is of great importance to the NYSDEC.

Sampling should be conducted seasonally and include the use of both shallow water and deep-water sampling gear. Collections should be stratified by microhabitat (sediment size). Macroinvertebrates will be identified to species. Since any one sampling year may experience atypical environmental conditions (dry year verses wet year; low water verses high water; colder verse warmer temperature years) the NYSDEC recommends more than 1 year of data collection to try to capture typical environmental conditions and to establish current baseline conditions in West Canada Creek and the Hinckley Reservoir affected by the Project.

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on the existing macroinvertebrate populations in the impoundment and downstream of the Project dam that are impacted by Project operations. This information will be used to assess impacts the Project has on the West Canada Creek aquatic ecosystem, assess if current water quality standards are impaired and determine mitigation for these impacts. This information is necessary to the §401 WQC application for the Project and their compliance with State water quality standards.

2. *Resource Management Goals*

West Canada Creek, in the vicinity of the Project, is managed by the NYSDEC as a mixed cool/cold water fishery. The NYSDEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of West Canada Creek and the Hinckley Reservoir, especially for trout (Brook Trout, *Salvelinus fontinalis*, Brown Trout, *Salmo trutta*, and Rainbow Trout, *Oncorhynchus mykiss*), Smallmouth bass, (*Micropterus dolomieu*), Yellow Perch (*Perca flavescens*) and sunfish (Family: *Centrarchidae*). 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.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

In the Preapplication document, the Applicant states that there are no known studies of benthic macroinvertebrate communities in the Project area. Macroinvertebrate information presented in

the PAD is limited to areas upstream and downstream of the Project. Freshwater mussel information is non-existent for West Canada Creek and the Hinckley Reservoir while the PAD acknowledges that freshwater mussels may be present. The PAD does mention that the Hinckley Reservoir Working Group noted that on September 26, 2007, NYSDEC biologists found thousands of stranded and dehydrated snails that had died in Hinckley Reservoir as the result of low water levels. There are unionid mussel records in adjacent basins and the presence of an appropriate fish species hosts within the West Canada Creek drainage, it is possible that unionids are present within the West Canada Creek including Hinckley Reservoir, but have not been documented to date. More thorough sampling is needed in the area immediately below the dam and the impoundment in order to help determine appropriate minimum flow needs and the macroinvertebrate data will be considered by the NYSDEC in connection with its review of the §401 WQC application for the Project.

5. Nexus to Projects Operations and Effects

The Project alters the natural flows upstream and downstream of the project. These areas are important for macroinvertebrate propagation and survival. Fish and wildlife species rely on the macroinvertebrate community as a food source and can be impacted by reductions in macroinvertebrate production. The parasitic larvae of unionid freshwater mussels require a fish host to complete their life cycle. Fluctuating water levels in the impoundment also affects macroinvertebrate communities in the littoral zone of the impoundment. Fish and mussel communities in the impoundment are impacted as a result of impoundment fluctuations.

6. Methodology Consistent with Accepted Practice

The recommended study uses standard scientific collecting techniques used in most hydro licensing activities.

7. Level of Effort, Cost, and Why Alternative Studies Will Not Suffice

The level of effort would involve one field crew sampling on a seasonal basis. The study would last for 1-2 years. The actual cost is unknown and would depend upon the gear types used, number of sampling locations, local labor costs, the ability to combine multiple studies (e.g., fisheries, macroinvertebrates, and water quality) into one task, etc. The existing literature is inadequate to fully address projects impacts, and there are no alternatives to conducting standard macroinvertebrate and freshwater mussel surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.

III. Fish Protection and Downstream Passage Studies

The Project Dam serves as a barrier to upstream and downstream fish migration. This Project represents a barrier to upstream resident fish migration in this section of West Canada Creek; however, multiple artificial barriers on the West Canada Creek and the Mohawk River downstream prevent diadromous fish migration from reaching the Project. Therefore, there are currently no upstream fish passage issues identified at this Project. Fish moving downstream are subjected to potential mortality from impingement and entrainment. New licenses issued for projects on the

Beaver River, as well as similar rivers throughout New York State, have incorporated 1" –clear trashracks to physically exclude most adult fish from the turbines, alternate downstream passage routes, and other features (e.g., reduced approach velocities, adequate plunge pools, ... etc.) to encourage safe downstream fish passage.

The Applicant should explore alternatives to keep all fish species out of the turbines, with special emphasis on Brook Trout, Brown Trout, Rainbow Trout, Smallmouth Bass, Yellow Perch, and any other species found in abundance during fishery surveys. They also need to develop alternatives to effectively pass fish downstream around the dam. These alternatives may include modifying any existing trash sluices located close to the intakes.

This study should include a literature search of available passage designs for the species of concern, as well as information on the relative effectiveness of each design. Existing facilities at other dams should be investigated. Careful attention should be paid to attraction flows, guidance mechanisms, and velocities. The fish moving downriver must be diverted away from the turbines and guided to the downstream passage facility. Adequate attraction and conveyance flows must be provided. The passage facility should not create a bottleneck that would delay downstream movement or expose the fish to excessive predation. All passage facilities should be designed to prevent blockage from ice and debris and should be as maintenance-free as is feasible. They must be able to operate under all flow conditions experienced in West Canada Creek and the Hinckley Reservoir.

In addition to literature review and on-site investigations of existing facilities, the Applicant should collect site-specific data from the Project to aid in the design of protection and passage facilities. This information should include flows, velocities, water depths, and substrates.

The Applicant should also collect information on the passage requirements of the fish species found in West Canada Creek and the Hinckley Reservoir. This information should include swimming speeds (including burst speeds), where in the water column these fish are likely to be moving, different forms of attractants or repellents (e.g., sound, light, ...etc.) that may help guide each species ... etc.

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on potential fish passage and protection structures that could be utilized at these sites. The information obtained will allow the NYSDEC aquatic biologists and the USFWS's fishway engineers to evaluate the potential effectiveness of various options.

2. *Resource Management Goals*

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

(*Perca flavescens*) and sunfish (Family: *Centrarchidae*). 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.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The information in the PAD is based on irregular surveys between 1988 and 2014 provide by the NYSDEC. The Applicant was provided data by the NYSDEC for the sampling efforts between 1989 and 2014 regarding fish species found in Hinckley Reservoir and sampling efforts between 1988 and 2010 for West Canada Creek upstream and downstream of the Project. Updated information on the fishery resources is needed to determine potential impacts of the Project.

5. *Nexus to Projects Operations and Effects*

The Project dam blocks fish movements both upstream and downstream. The turbine intakes may impinge or entrain fish, resulting in mortality. The existing minimum flow release structures may not be adequate for fish passage.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard literature reviews and site-specific data collection techniques common to most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would involve moderate literature review, discussions with fishway engineers, and site-specific data collection. The study could be completed in less than 1 year, but may require more time to design effective facilities. The actual cost is unknown and would depend upon the number of alternatives examined. The existing information in the PAD is inadequate to allow a thorough examination of alternatives. However, most of the information needed should be available in the existing literature.

IV. Base Flow Studies

The Project operations serve a variety of purposes including: (1) supplying water to the New York State Canal System; (2) serving as the sole source of drinking water for approximately 130,000 people in the greater Utica area; (3) supplementing flows for the downstream hydropower generation owned and operated by Erie Boulevard Hydropower, LP, aquatic resources; and (4) recreation. As the NYSCC releases flows for these purposes, the Applicant captures the electric generation potential of these releases at the Project. Flow studies should be conducted to determine whether these are the appropriate minimum base flows below Trenton Falls. We

recommend a Delphi approach, which is simpler and less expensive than more complex studies such as using the Instream Flow Incremental Methodology (IFIM).

The Delphi approach requires the creation of a "team" representing the resource agencies and other interested parties. The team should identify target species and life stages, with appropriate priorities for each, a range of flows to be viewed, and the areal extent downriver of the Project to be viewed, along with specific viewing locations. During the study, the Licensee will provide a variety of flows to the downstream reach, starting with a flow to be determined and working up to the highest flow to be studied. During each flow, the team will examine the habitat and "score" it for each species/life stage. The final data will then be used in conjunction with fisheries, macroinvertebrate, and habitat mapping data to negotiate base flow regimes.

The Applicant should also conduct habitat mapping for the downstream study reach. This mapping should identify the type of habitat in each section (e.g., run, riffle, pool) along with depths, velocities, and substrates.

1. *Goals and Objectives*

The goals and objectives of this study are to determine whether the existing base flow requirements provide appropriate protection for aquatic resources, or whether a different flow regime is necessary.

2. *Resource Management Goals*

West Canada Creek, in the vicinity of the Project, is managed by the NYSDEC as a mixed cool/cold water fishery. The NYSDEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of West Canada Creek and the Hinckley Reservoir, especially for trout (Brook Trout, *Salvelinus fontinalis*, Brown Trout, *Salmo trutta*, and Rainbow Trout, *Oncorhynchus mykiss*), Smallmouth bass, (*Micropterus dolomieu*), Yellow Perch (*Perca flavescens*) and sunfish (Family: *Centrarchidae*). The recreational fishery on the West Canada Creek 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. 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.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

The PAD states that for all months except for March and April, Project outflow exceeds inflow, and the inflow is supplemented with reservoir storage as is typical of a seasonal store and release reservoir. The current FERC license (FERC No. 3211) requires that a continuous minimum flow of 160 cfs must be maintained in West Canada Creek, as measured downstream of the NYSCC

diversion weir at the Nine Mile Creek Feeder Dam. No information regarding how the base flows, deviations from the required base flows, or operating the Project in peaking generation mode, effect aquatic life downstream to the confluence with the Mohawk River.

5. Nexus to Projects Operations and Effects

Operation of the hydroelectric project results in a variable flow regime downstream from the Project. The existing base flows may or may not provide adequate mitigation for this periodic dewatering. This study is necessary to determine the appropriate mitigation for these impacts.

6. Methodology Consistent with Accepted Practice

The recommended study uses a standard Delphi study design that has been used in many hydro licensing activities.

7. Level of Effort, Cost, and Why Alternative Studies Will Not Suffice

The level of effort would involve at least one meeting to establish the Delphi study team and identify the flow ranges to be studied. The actual study would likely take 1 or 2 days in the field, depending on the number of flows to be viewed and the difficulties encountered in providing and stabilizing these flows. At least one follow-up meeting would be necessary to review the data and negotiate the final flows. The habitat mapping would be done separately and would likely take a crew of two people 2 days.

The cost will be moderate and will depend on the number of flows to be viewed, the difficulty in providing these flows, and the number of meetings necessary to complete the Delphi study and negotiations. Alternatives studies such as IFIM studies could be utilized, but the NYSDEC and the USFWS believe that the Delphi approach is appropriate for this Project and less costly than other types of studies.

V. Water Quality

Baseline water quality studies are needed to allow a proper determination of potential project impacts. These studies should include water temperature and dissolved oxygen (DO) on a continuous basis for at least 1 full year, along with monthly sampling of other parameters such a pH, turbidity, and conductivity. An additional year of monitoring may be needed based on a review of the first year's study results. This information will be used to document baseline water quality conditions and to determine potential impacts from the Projects operations. Data should be collected from the impoundment and the areas upstream and downstream from the Project.

1. Goals and Objectives

The goals and objectives of this study are to provide baseline water quality information.

2. *Resource Management Goals*

West Canada Creek, in the vicinity of the Project, is managed by the NYSDEC as a mixed cool/cold water fishery. The NYSDEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of West Canada Creek and the Hinckley Reservoir, especially for trout (Brook Trout, *Salvelinus fontinalis*, Brown Trout, *Salmo trutta*, and Rainbow Trout, *Oncorhynchus mykiss*), Smallmouth bass, (*Micropterus dolomieu*), Yellow Perch (*Perca flavescens*) and sunfish (Family: *Centrarchidae*). The recreational fishery on the West Canada Creek 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. 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.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

Section 4.3.2 in the PAD describes water quality data collected in the vicinity of the Project. Continuous monitoring of temperature and dissolved oxygen in the impoundment and at the discharge for at least 1 full year is not provided.

5. *Nexus to Projects Operations and Effects*

The existing Project impounds West Canada Creek. This could impact such water quality factors as temperature and DO, which are critical to the quality of the aquatic habitat.

6. *Methodology Consistent with Accepted Practice*

The recommended study uses standard water quality sampling techniques common used in most hydro licensing activities.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort would be low and would involve one crew collecting monthly samples while undertaking other work such as fisheries or macroinvertebrate and freshwater mussel surveys. In addition, temperature and DO loggers would be installed, with data being periodically downloaded. The actual cost is unknown but would be relatively low. The existing data for the immediate vicinity of the Project is limited.

VI. Wetland Delineation

The applicant should document all wetlands within the Project's vicinity. The NYSDEC and the USFWS's wetland maps were consulted, but the delineations need to be field verified. The Applicant should also identify any aquatic vegetation found in the Project's vicinity. This information is necessary to characterize the aquatic habitats in the Project's vicinity.

1. *Goals and Objectives*

The goals and objectives of this study are to identify key aquatic habitat areas in the Project's vicinity. The study will provide information on the extent and quality of wetlands and aquatic vegetation.

2. *Resource Management Goals*

West Canada Creek, in the vicinity of the Project, is managed by the NYSDEC as a mixed cool/cold water fishery. The NYSDEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of West Canada Creek and the Hinckley Reservoir, especially for trout (Brook Trout, *Salvelinus fontinalis*, Brown Trout, *Salmo trutta*, and Rainbow Trout, *Oncorhynchus mykiss*), (Smallmouth bass, *Micropterus dolomieu*), Yellow Perch (*Perca flavescens*) and sunfish (Family: *Centrarchidae*). The recreational fishery on the West Canada Creek 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. 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.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

In Section 4.6.2 of the PAD it states that no formal surveys of wetland or riparian vegetation has been performed for the Jarvis Project. Generally, NWI and NYSDEC delineations are not precise enough to capture all regulated wetlands, thus there is a need for wetland vegetation and aquatic plant surveys for this Project.

5. *Nexus to Projects Operations and Effects*

Operation of this Project affects water levels and velocities, as well as the timing and location of releases. These factors can impact aquatic vegetation and wetlands, which can be important habitats for fish and wildlife. The information will be used to determine what, if any, impacts the Project may have on these resources and what the appropriate protection and mitigation measures might be.

6. *Methodology Consistent with Accepted Practice*

The NYSDEC and NWI maps are frequently used as the starting point in delineating wetlands. We expect the Applicant to use techniques commonly accepted by the scientific community.

7. *Level of Effort, Cost, and Why Alternative Studies Will Not Suffice*

The level of effort and associated costs should be relatively low. Much of the readily available information is already presented in the PAD, and the remaining information can probably be collected during field work related to other studies. No alternative studies have been proposed.

VII. Public Access

1. *Goals and Objectives*

The goals and objectives of this study are to provide information on the existing public access facilities in the vicinity of the Project (within 1 mile upstream and downstream of the Project's boundary), including the potential to create additional public access where feasible. The current condition of the existing public access facilities and the need for improvements, especially upgrades that would be necessary to ensure the facilities are Universally Accessible and are ADA compliant, should be the focus of this study.

2. *Resource Management Goals*

West Canada Creek, in the vicinity of the Project, is managed by the NYSDEC as a mixed cool/cold water fishery. The NYSDEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of West Canada Creek and the Hinckley Reservoir, especially for trout (Brook Trout, *Salvelinus fontinalis*, Brown Trout, *Salmo trutta*, and Rainbow Trout, *Oncorhynchus mykiss*), Smallmouth bass, (*Micropterus dolomieu*), Yellow Perch (*Perca flavescens*) and sunfish (Family: *Centrarchidae*). The recreational fishery on the West Canada Creek 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. 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.

3. *Public Interest*

The requestor is a resource agency.

4. *Existing Information*

Section 4.8.1.1 mentions three formal recreation sites exist in the vicinity of the Project which offer public access to the shoreline and/or project waters: (1) the Power Authority Boat Launch; (2) the Hinckley Reservoir Picnic Area [also known as the NYSDEC Day Use Area], and (3) Trails End Campground [a commercially operated venture]. The PAD also mentioned how low water levels

can affect the function of recreational facilities like the boat launches and beaches, as well as, general boating when areas become dewatered. The low water levels experienced during the drought of 2007 resulted in the dewatering of the Power Authority boat launch and the closure of the swimming beach at Hinckley Reservoir Picnic Area.

Section 4.8.1.2 of the PAD demonstrated that a review of the FERC Form 80s from 1996, 2002, 2008, and 2014 estimated that recreational use within the Project Boundary has been increasing over time and this was graphically displayed in Figure 4.8.1.2-1. The 2014 FERC Form 80 indicated that the daytime use at the Project was approximately 12,900 recreation days at publicly operated areas at the Project in 2014. This includes activity at the Power Authority boat launch, the informal scenic area at the northern end of the dam, and the Department of Environmental Conservation Hinckley Day Use Area.

5. Nexus to Projects Operations and Effects

The 2014-2019 NYS State Comprehensive Outdoor Recreation Plan (SCORP) was written by the New York State Office of Parks and Recreation and Historic Preservation (NYSOPRHP) identified Herkimer County and Oneida County, New York as having a moderate need for additional fishing, boating, and swimming access as referenced in Table 4.8.1.3-1 of the PAD.

6. Methodology Consistent with Accepted Practice

The recommended study uses standard techniques used in most hydro licensing activities.

7. Level of Effort, Cost, and Why Alternative Studies Will Not Suffice

The level of effort would involve field site visits to the existing facilities with the parties of interest and recreational surveys of use as well as investigating the potential to add new access sites. The actual cost is unknown and would depend upon the number of observational and interview surveys to be conducted. The ability to combine multiple studies (e.g., fisheries, recreation observational surveys, macroinvertebrate surveys, and water quality) into one task may help to reduce the overall cost. The existing literature is inadequate to fully address project impacts, and there are no alternatives to conducting standard recreation surveys. However, the Applicant has flexibility to design the most cost-effective way to acquire the necessary data.

Thank you for the opportunity to comment on the Proposed Study Plan. Under the Integrated Licensing Process (ILP) being used for this relicensing, the Licensee is required to file and have approved by the FERC a formal Study Plan. The Study Plan developed by the Applicant should incorporate all the above-listed studies. If you have any questions or desire additional information, please contact me at (315) 793-2740.

Sincerely,



Todd J. Phillips
NYSDEC - Environmental Analyst
Division of Environmental Permit, Region 6 - Utica
todd.phillips@dec.ny.gov

cc: Secretary Kimberly D. Bose, FERC
Cindy Brady, NYPA
Susan L. Watson, Principal Attorney, NYPA
Charles R. Sensiba, Van Ness Feldman, LLP
Michelle Stottler, Gomez and Sullivan Engineers, DPC

ec: Emily Carter, FERC
Stephen Patch, USFWS
John Wiley, USFWS
Michele Stefanucci, NYSDEC
Judy Drabicki, NYSDEC
Thomas Voss, NYSDEC
Terry Tyoe, NYSDEC
Fred Munk, NYSDEC
Russ McCullough, NYSDEC
Dick McDonald, NYSDEC
David Erway, NYSDEC
Christopher Balk, NYSDEC