STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 10-T-0139 - Application of Champlain Hudson Power Express, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the PSL for the Construction, Operation and Maintenance of a High Voltage Direct Current Circuit from the Canadian Border to New York City.

ORDER GRANTING CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

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At a session of the Public Service Commission held in the City of Albany on April 18, 2013

COMMISSIONERS PRESENT:

Garry A. Brown, Chairman
Patricia L. Acampora
Maureen F. Harris
James L. Larocca
Gregg C. Sayre

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(Issued and Effective April 18, 2013)

BY THE COMMISSION:

INTRODUCTION

By this Order, we grant to Champlain Hudson Power Express, Inc. (CHPEI) and CHPE Properties, Inc. (CHPE; collectively, Applicants), pursuant to Article VII of the Public Service Law (PSL), a Certificate of Environmental Compatibility and Public Need to construct and operate a transmission project known as the Champlain Hudson Power Express Project (Project or Facility). The certificate will adopt most of the terms and conditions presented to us in a Joint Proposal (JP) and in stipulations that have the full or partial support of a wide range of parties to this case.

The principal portion of the Project is a High Voltage, Direct Current (HVDC) transmission line extending

approximately 330 miles from the New York/Canada border to a converter station in Astoria, Queens. The HVDC transmission line will be underwater in Lake Champlain and the Hudson River, with underground upland segments. The line consists of two solid dielectric (i.e., no fluids) HVDC electric cables, each approximately six inches in diameter. The cables will be installed either underwater or underground along the entire length of the route, minimizing visual and other potential environmental impacts.

Applicants propose to install the converter station on properties currently owned by Consolidated Edison Company of New York, Inc. (Con Edison) in an industrial zone in Astoria. From there, one High Voltage, Alternating Current (HVAC) circuit will connect, via underground conduit, to the nearby substation of the New York Power Authority (NYPA). From the NYPA substation, another set of HVAC cables will be installed beneath the streets of New York City for approximately three miles to the Rainey Substation.

The Project will have the capacity to transmit 1,000 MWs of electricity into the New York City load pocket. It is anticipated that the electricity transmitted by the Project will be primarily hydroelectric power.

The parties have worked collaboratively for over a year to resolve the many complex technical details that have culminated in the Joint Proposal before us. As described in the Joint Proposal, the route has been constructed to minimize potential adverse environmental impacts. Although extensive portions of the route are located under the waters of Lake Champlain and the Hudson River, the line will transition to upland underground segments in order to avoid portions of the Hudson River designated by the US Environmental Protection Agency (USEPA) as contaminated with polychlorinated biphenyls

(PCBs) and to avoid environmentally sensitive River areas, including Haverstraw Bay, an important breeding and spawning habitat for various species. In addition, the Applicants have agreed to donate $117.15 million over time to establish and maintain a Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust, to be used to study and to mitigate possible impacts of the underwater cables on water quality or aquatic habitat in the Hudson, Harlem and East Rivers, Lake Champlain, and their tributaries. Other provisions of the JP would limit the times or locations of construction to further protect the Lake and River environments.

With the addition of the Astoria-Rainey Cable portion of the Project, the parties have solved problems of deliverability identified in this case. And, Applicants' commitment to assume the financial risk of this Project has been significantly strengthened in post-JP stipulations.

This proposal was filed over 3 years ago. Over 20 parties participated in lengthy, intensive, detailed settlement negotiations that spanned almost 16 months. These parties reached an accord on a proposal that they believe permits us to make the requisite PSL §126(1) findings and determinations. The fact that so many parties, representing myriad interests and advocating a broad spectrum of concerns, could reach agreement on so many detailed, technical and policy-based issues is a remarkable achievement and is consistent with our settlement rules.

Based on our review of the record, including the JP, we find that this proposal satisfies the requirements of Article VII of the PSL. Construction of the Project would offer significant benefits, among them: creating a new transmission entry into the New York City load pocket and enabling a

substantial increase in the State's utilization of renewable resources. Further, the adverse environmental impacts of construction and operation, relatively modest to begin with, have been further mitigated by route modifications and a commitment to follow best practices during construction. Finally, construction and operation of the line will impose minimal financial risk on ratepayers. As further discussed below, we find that the grant of the certificate here is in the public interest.

PROCEDURAL BACKGROUND

On March 30, 2010, CHPEI filed an application pursuant to Article VII of PSL for a Certificate of Environmental Compatibility and Public Need to construct and operate a transmission line it calls the Champlain Hudson Power Express Project. On April 30, 2010, the Secretary issued a deficiency letter identifying seven deficiencies and containing 83 requests for further information. Four supplements were provided on July 22 and 29, and August 6 and 11, 2010. The cover letter accompanying the July 22nd supplement noted that CHPE had been added as a co-applicant;[1] the proposal had been revised to eliminate the HVDC circuit from Rouses Point, to Bridgeport, Connecticut; and the proposed end point of the New York State HVDC circuit had been changed from a substation in Sherman Creek to a substation in Astoria, Queens.

On August 12, 2010, the Secretary issued a compliance letter informing Applicants that, as of August 11, 2010, their Article VII application, as supplemented, was in compliance with

[1] In order to ensure that one of the certificate holders will be a transportation corporation, CHPEI formed CHPE as a wholly-owned subsidiary pursuant to the Transportation Corporations Law (July 22nd cover letter at 1, note 1).

PSL §122. A prehearing conference was held before the Administrative Law Judges (ALJs or Judges) on Tuesday, September 21, 2010, in Albany,[2] to discuss, among other things, requests for intervenor funding.[3] In accordance with PSL §123(1), a public statement hearing was held on Monday, October 25, 2010, in Yonkers. Additional public statement hearings were held in Kingston on Thursday, October 28; Schenectady on Wednesday, November 3; Whitehall on Thursday, November 4; and Plattsburgh on Tuesday, November 9, 2010.

By letter dated November 2, 2010, Applicants filed a notice of intent to enter into settlement negotiations. They noted that the topics to be addressed as part of the discussions included need, environmental issues, alternatives, best management practices, construction techniques, and ordering clauses.[4] Settlement discussions ensued and continued for approximately 16 months, culminating in the February 2012 filing of a JP purporting to resolve all issues in this proceeding among the Signatory Parties. The JP has the following signatories: Applicants; Department of Public Service Staff (Staff); Department of Environmental Conservation (DEC); Department of State (DOS); Department of Transportation (DOT); Department of Agriculture and Markets; Office of Parks, Recreation, and Historic Preservation (OPRHP); the Adirondack Park Agency (APA); the Cities of New York (NYC) and Yonkers; the Palisades Interstate Park Commission; Riverkeeper, Inc. (Riverkeeper); Scenic Hudson, Inc. (Scenic Hudson); the N.Y.S.

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[2] A video conference link to the Commission's New York City offices was provided.

[3] Pursuant to PSL §122(5), an intervenor fund of $450,000 was established for this proceeding.

[4] In accordance with 16 NYCRR 3.9, the notice was reported to the Commission on November 4, 2010.

Council of Trout Unlimited; and Vermont Electric Power Company, Inc. (VELCO). VELCO and DOT support the JP only with respect to Certificate Conditions that address their specific concerns, which are, respectively, the requirements and restrictions governing work activities and infrastructure co-location, and the provisions addressing the use and protection of highways, roads, streets or avenues and other transportation facilities owned or operated by DOT or under DOT's jurisdiction. The Department of Agriculture and Markets in its supporting statement also indicates that it limits its endorsement of the JP to the terms and conditions designed to identify, protect, mitigate, and, if need be, remediate agricultural resources impacted by construction.

The JP addresses, *inter alia*, the findings we must make pursuant to PSL §126(1). It contains proposed Certificate Conditions, Environmental Management and Construction Plan (EM&CP) guidelines, and a proposed Water Quality Certification (WQC). It also contains a list of the testimony and the JP exhibits and JP appendices proffered by the signatories in support of the terms of the JP and Applicants' requested Article VII certificate.

After the JP was filed, there followed another procedural conference; public statement hearings in Washington, Schenectady, Albany, Greene, Rockland, and Queens Counties; and site visits in Rockland and Queens Counties.[5] Additional stipulations, two signed by Applicants, Staff and Con Edison and one signed by Applicants and Con Edison were filed in June and July 2012. The first two stipulations further addressed

[5] In total, the ALJs conducted four site visits, three on November 17 and 18 and December 1, 2010, and one on May 1, 2012.

merchant status and Certification Condition 15 (June 4th Stipulation, Hearing Exhibit 150) and deliverability and Certification Condition 133 (June 26th Stipulation, Hearing Exhibit 151). The third stipulation resolved issues surrounding the location of the converter station and use of the Luyster Creek property owned by Con Edison, and proposed changes to Certificate Conditions 21 and 22(f) (July 11th Stipulation, Hearing Exhibits 129 and 130). In addition, Applicants and Con Edison agreed to revise the proposed routing through the Astoria site in order to avoid an existing liquefied natural gas facility (Hearing Exhibit 152).

Evidentiary hearings were held on July 18, 19, and 20, 2012. At the evidentiary hearings, testimony and exhibits were proffered by witnesses for Applicants, Staff, and the Independent Power Producers of New York, Inc. (IPPNY). The evidentiary hearing record consists of 219 hearing exhibits[6] and over 700 transcript pages. In addition, parties submitted initial and reply statements on March 16 and 30, 2012, and initial and reply briefs on August 22 and September 7, 2012.

Except as noted above, the signatories recommend adoption of all of the terms of the JP, along with the proposed Certificate Conditions as modified by the stipulations filed on June 4 and 26, July 11, and October 19, 2012.[7] NYPA neither supports nor opposes the Project but it requests approval of several proposed Certificate Conditions that address its concerns. Con Edison originally opposed the Project; however, in July 2012, it reached a resolution of its objections to the

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[6] The hearing exhibits include, *inter alia*, the 125 exhibits that accompanied the JP.

[7] The October 19th stipulation, filed by Applicants, revised Certificate Condition 165 to extend the time for submission of the Trust Agreement.

Project, and now requests approval of the JP provisions that address its concerns.[8] Entergy Nuclear Marketing, LLC and Entergy Nuclear Fitzpatrick, LLC (collectively Entergy), IPPNY, Central Hudson Gas & Electric Corporation (Central Hudson), and International Brotherhood of Electrical Workers Local 97 (IBEW) oppose the Project and the JP.

By notice dated December 27, 2012, the Acting Secretary issued the Judges' Recommended Decision (RD) and established January 17 and February 1, 2013, respectively, as the due dates for the filing of briefs on and opposing exceptions. In their RD, the Judges recommended that we (1) adopt most of the terms and conditions of the JP as revised in this proceeding and in their RD; and (2) grant a Certificate of Environmental Compatibility and Public Need. They further recommended that the proposed WQC for the Project be issued by the Director of the Office of Energy Efficiency and the Environment (OEEE) in the Department of Public Service prior to the expiration of the U.S. Army Corps of Engineers (USACE) February 24, 2013 waiver deadline.

The WQC was issued on January 18, 2013. On that day, Applicants submitted a revised, final version of the Proposed Certificate Conditions designed to reflect all changes that were made to the proposed Certificate Conditions in one document (JP Appendix C). Briefs on exceptions were filed by IPPNY, Entergy, IBEW, Central Hudson, the Business Council of New York State (the Business Council), Applicants, Staff, Con Edison, and DEC. IPPNY's brief included a motion requesting official notice or incorporation into the record of a U.S. Dept. of Energy

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[8] As a result of the stipulations, Con Edison and NYPA did not introduce their pre-filed testimony and/or exhibits into the record at the evidentiary hearing.

document; the motion was opposed by Applicants and Staff and was denied by ruling issued on January 30, 2013. On January 18, 2013, Applicants moved to strike the briefs of Entergy and the Business Council on the grounds that they were filed after the 4:00 p.m. deadline; Entergy responded to the motion on January 28, 2013, and the motion was denied by ruling issued January 30, 2013.

Briefs opposing exceptions were filed by VELCO, Con Edison, Riverkeeper/Scenic Hudson, DEC, Applicants, NYC, and Staff.

JOINT PROPOSAL

The JP provides the bases upon which the signatories assert that the Commission may make its required PSL §126 findings regarding need, minimizing environmental impacts, undergrounding, conformance to state and local laws and regulations, and whether the project conforms to a long-range plan and is in the public interest. The JP includes a request that the Commission not apply local laws and regulations identified in Hearing Exhibit 115 because, as applied to the Facility, such local legal provisions are unreasonably restrictive in view of existing technology, cost, and the needs of consumers. Except for such identified local laws, Applicants will comply with, and the location of the Facility as proposed conforms to, all substantive State and local legal provisions applicable thereto.[9] The JP proposes that all of the proposed line be underwater or underground;[10] these requests are unopposed.

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[9] JP ¶¶128-133.

[10] JP ¶124.

The JP lists the Project's emission benefits, its ability to help mitigate the potential adverse impacts that may be associated with risk factors identified by the New York Independent System Operator (NYISO) in its planning processes and its ability to significantly increase supply capability into and fuel diversity in New York City as factors supporting the required need finding.[11]

Regarding the Facility's environmental impacts, the JP indicates that the environmental impacts associated with the Facility are expected to be avoided, minimized or mitigated, provided that the Best Management Practices (BMPs) and Guidelines for the preparation of the Environmental Management and Construction Plan agreed to by the signatories are adhered to in the preparation of the Environmental Management and Construction Plan (EM&CP) and are strictly complied with during construction, operation, and maintenance.[12] The JP adds that, as located and configured therein, the Facility represents the minimum adverse environmental impact considering the state of available technology and the nature and economics of the various alternatives and other pertinent considerations.[13] In addition, under the JP, Applicants have agreed to fund the Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust (Trust). This Trust will be used to study and mitigate any possible impacts of the Facility's underwater cables on habitat in the Hudson River Estuary, the Harlem and East Rivers, Lake Champlain, and their

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[11] JP ¶¶19-21.

[12] JP ¶¶24, 152; see also sections D and E, and JP appendices E and F.

[13] Id.

tributaries.[14] The JP also contains terms specifying Applicants' other obligations, including limitations on construction periods in both Lake Champlain and the Hudson River; establishment of "Exclusion Areas" within the Hudson River where construction may occur only as agreed to by DEC or as determined by the Commission.[15]

With respect to the Project's conformance with a long-range plan, the JP states that the Facility is consistent with the most recent State Energy Plan and with New York City's goal of providing its residents with increased access to renewable energy supplies, as described in the City's *PlaNYC*.[16]

The benefits identified in the JP as bases supporting the required finding that the Project would serve the public interest, convenience and necessity include its ability to increase the reliability of the Bulk Power System in New York City, reduce wholesale market prices and reduce air emissions in New York City, Long Island and the lower Hudson Valley.[17]

JP Appendices set forth detailed and comprehensive Certificate Conditions (Appendix C, dated January 18, 2013, revised and updated to reflect changes to conditions as set forth in the stipulations submitted subsequent to the filing of the JP), EM&CP guidelines (Appendix E) and BMPs (Appendix F) that were crafted and agreed to by the signatories.

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[14] JP ¶¶144-147.

[15] See, JP Appendix C, Certificate Condition 156(b).

[16] JP ¶¶125-127.

[17] JP ¶¶134-149.

PROPOSED ROUTE

The proposed route of the Facility (the Route) is shown on a series of maps, included as JP Appendix B,[18] depicting a nominal centerline (the Centerline) and an Allowed Deviation Zone. Those portions of the Allowed Deviation Zone ultimately determined to be actually affected by construction of the Facility (a process encompassed in the EM&CP phase of this case), as well as certain areas outside the Allowed Deviation Zone that are needed temporarily for site investigation, access, and construction, are referred to as the Construction Zone.

The HVDC portion of the proposed transmission system would originate underwater at the international border between the United States and Canada in the Town of Champlain, New York and continue south under Lake Champlain. Two cables would extend south through Lake Champlain for approximately 101 miles entirely within the jurisdictional waters of New York State. At the southern end of Lake Champlain, the cables would exit the water in the Town of Dresden, New York.

From Dresden, the cables would be buried along an overland, underground route for approximately 11 miles primarily within the right-of-way (ROW) of NYS Route 22, to the Village of Whitehall. In the Village of Whitehall, the cables would transition from the Route 22 ROW to enter the existing railroad ROW owned by Canadian Pacific Railway (CP) and remain buried for approximately 65 miles in and along the railroad ROW from Whitehall to Schenectady.

In Schenectady, the proposed cable route would enter Erie Boulevard just north of the railroad crossing at Nott Street and continue along Erie Boulevard to a point south of

[18] See also Hearing Exhibit 152.

State Street where it would again enter the railroad ROW.[19] The route would follow the railroad ROW for a short distance, and would then deviate west of the railroad property, pass under Interstate 890, then turn south along the eastern edge of the General Electric property, approximately parallel with the CSX railroad (CSX), re-entering the CP railroad ROW just north of Delaware Avenue. From this point in Schenectady, the line would follow the CP railroad ROW to the Town of Rotterdam. In Rotterdam, the route would transfer from the CP ROW to the CSX ROW and proceed southeast for approximately 24 miles before entering the Town of Selkirk. The cables would then travel south for approximately 29 miles generally in and along the CSX ROW through Ravena, New Baltimore, Coxsackie, the Town of Athens, and the Village and Town of Catskill, before entering the Hudson River in the Town of Catskill (Hamlet of Cementon).[20]

Upon entering the Hudson River via a tunnel excavated by means of horizontal directional drilling (HDD), the HVDC underwater cables would be located within the Hudson River for approximately 67 miles until reaching a point north of Haverstraw Bay. The cables would leave the water via HDD and enter the CSX ROW in the Town of Stony Point, Rockland County.

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[19] Along this portion of the route there are several alternative routings that include both the railroad ROW and various public ways for transitioning from the railroad to the city streets. The public ways include Nott Street, North Jay Street, Green Street, North Center Street, Pine Street, Union Street, Liberty Street and State Street as well as private property (Parking Lot) at or near 160 Erie Boulevard. (The precise route will be determined in the EM&CP phase.)

[20] The overland route from Dresden to Cementown is proposed primarily to avoid installing HVDC cables within the Hudson River polychlorinated biphenyl (PCB) site designated by the U.S. Environmental Protection Agency, which stretches from Hudson Falls, New York, to the Federal Dam at Troy, New York.

The cables would bypass Haverstraw Bay for approximately 7.66 miles, via a combination of trenching and three HDD excavations under the Stony Point State Historic Park Site and Rockland Lake State Park.[21]

The cables would then re-enter the Hudson River via HDD, and be buried in the river for approximately 20.7 miles to the Spuyten Duyvil, which leads to the Harlem River. The cables would extend south-easterly within the Harlem River for approximately 6.6 miles, exiting the water to a location along an existing railway ROW in the Bronx and continuing along that ROW for approximately 1.1 miles. At this point, the line would enter the East River via HDD, cross the East River and make landfall at Astoria.

At Astoria, the cables would terminate at a converter station to be located near Luyster Creek, north of 20th Avenue. From the converter station, a 345 kV underground circuit would connect to the existing 345 kV substation owned by NYPA. The circuits would interconnect with the NYPA substation near the site of the Charles Poletti Power Project in Queens. From NYPA's substation, another set of HVAC cables will be located within the City streets for approximately three miles to the Rainey Substation.

[21] The JP notes that the parties considered but rejected the alternative of diverting the line along the east side of the Hudson River. JP ¶ 103. They relied on Exhibit 86, which noted that the railroad ROW on the eastern bank is heavily travelled with passenger trains and that, due to its close proximity to the water and existing infrastructure, there would be numerous engineering constraints to the eastern alternative.

PROJECT OPERATION

Under the JP, Applicants would build and operate the HVDC portion of the Facility without relying on cost-of-service rates to recover their costs. Applicants state they will recover the majority of the Project's costs from users of the HVDC Facility.[22] The Facility has received authorization from FERC to charge negotiated rates and to enter into negotiated pre-subscription agreements with one or more "anchor" customers for up to 75% of the Facility's throughput, with the remaining 25% of the line's capacity to be available to all bidders in an open season.[23] Under the JP, there would be a Certificate Condition requiring Applicants to have 75% percent of their service under binding contract for a period of at least 25 years before commencing construction in New York State.[24]

As of the close of the record, Applicants did not have any contracts with shippers. However, Applicants and Hydro-Québec (HQ)[25] are exploring the possibility of HQ becoming an "anchor tenant" for the Project.[26] If HQ becomes the anchor tenant, it may commit to up to a 40-year purchase of 75% of the

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[22] Applicants have reserved the right to recover the costs associated with the use of the Astoria Rainey cable to deliver energy and capacity not transmitted over the HVDC transmission system pursuant to cost-based rates set by the Federal Energy Regulatory Commission (FERC). Tr. 65 and 76.

[23] Champlain Hudson Power Express, Inc., 132 FERC ¶61,006 (2010); see also Hearing Exhibits 197 (at 7) and 198 (at 11).

[24] Tr. 65, Hearing Exhibit 150.

[25] HQ is a Crown corporation wholly owned by the province of Québec. It has been developing and operating Québec's hydropower resources for over 50 years. HQ generates, transmits and distributes electricity. Hearing Exhibit 197 at 1.

[26] Hearing Exhibit 197 at 3.

transmission rights and would invest in new transmission in Québec needed to support the Project's 1,000 MW capacity.[27]

Applicants expect to ship mostly hydroelectric power through the proposed HVDC cables, with the most likely source being the four-station, 1500 MW Romaine hydro complex that is currently under construction by HQ in Canada, and expected to be put in service in 2015.[28]

POST-RD PUBLIC COMMENT AND PROCEEDINGS

After issuance of the RD on December 27, 2012, seven letters were received from elected officials and citizens of Rockland County who requested a 60-day extension of the exceptions schedule, to allow members of the public additional time to express their concerns.

In addition, by letter dated March 28, 2013, Honorable Congressman Brian Higgins expressed his opposition to the Project, making two points. Congressman Higgins contends that the Facility would cause higher electricity prices in Upstate New York and he also questions whether providing hydroelectric generating capacity from Quebec to New York City would result in greater reliance within Quebec on its nuclear and fossil fuel generating resources, thus having no net environmental benefit on an international level.

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[27] Id. Applicants have not finalized interconnection plans and details, but studies show that the project can be connected to the New York State Bulk Power System without adversely affecting reliability. JP ¶127. Exploration is underway to determine the feasibility of an interconnection on the Canadian side of the border. See Comments filed on March 30, 2012, by H.Q. Energy Services (U.S.), Inc. (HQUS). HQUS is the U.S. power marketing subsidiary of Hydro-Québec Production, the power generating division of HQ.

[28] Hearing Exhibit 197 at 1.

Also on April 9, 2013, Sierra Club, Atlantic Chapter, filed approximately 2,020 identical form letters, on behalf of its members, in opposition to the Project. The letters identify five points in opposition: that the Project contradicts the objectives of the Energy Highway, threatens in-state renewable energy and energy efficiency programs, violates Article XIV of the New York Constitution, adversely impacts Canadian indigenous peoples, and exaggerates claims of job creation. These issues have been identified by various other commenters in opposition to the Project, as described in the RD.

State Assemblyman James Skoufis (99th District) wrote twice in January 2013 to inform us that many constituents have contacted him about this application. He requested a 60-day extension of the exceptions schedule to allow constituents additional time to express their concerns. Assemblyman Skoufis noted that he has observed overwhelming opposition to this Project among Rockland County residents in his District, and he requested that a Commission representative hold a meeting in Stony Point to meet with concerned residents.

Two Rockland County legislators, Ilan S. Schoenberger and Douglas J. Jobson, jointly, sent a letter dated January 16, 2013, in which they requested a 60-day extension of the public comment period to allow the public to respond to the RD. This request was supported by other similar requests from Town of Stony Point Supervisor Geoffrey Finn, Town of Haverstraw Supervisor Howard T. Phillips, Jr., three Rockland citizens identified as the “Just Say No! to the Champlain Hudson Power Express” Committee (Just Say No!), and Susan Wright, a Stony Point resident. Enclosed with Supervisor Finn’s letter was a copy of the letter from Just Say No!

Those requesting an extension were advised that the requests to extend the schedule for filing exceptions were

denied, because the schedule for exceptions to the Judges' Recommended Decision applied only to parties in the proceeding, and those requesting the extension were not parties in this proceeding. The Secretary had issued a notice in May 2012 indicating that there was no firm deadline for public comments and that comments would be accepted throughout the pendency of this proceeding.

PARTIES' POSITIONS ON EXCEPTIONS[29]

IPPNY, Entergy, IBEW, and the Business Council oppose the ALJs' recommendation that we grant Applicants an Article VII certificate. Central Hudson also opposes the ALJs' recommendation, but in the event a certificate is granted, Central Hudson asks that several other recommendations by the ALJs be revised. The opponents generally argue that the Project is not needed; does not minimize adverse environmental impacts nor conform to a long-range plan that will serve the interests of electric system economy and reliability; and will not serve the public interest, convenience and necessity.

IPPNY and Entergy claim that the ALJs erroneously: relied on the 2012 Reliability Needs Assessment (RNA) performed by NYISO; concluded that the Project would not require out-of-

[29] Applicants, Staff, Con Edison, and DEC also filed briefs on exceptions, but for limited purposes. Applicants and Staff offered limited factual corrections to the RD. DEC "clarified" its jurisdictional role and urged us to accept the ALJs' conclusion that this proceeding is not the appropriate forum for determining the Office of General Services' authority to grant leases for or other property rights to land under Lake Champlain, but otherwise ignore their "dicta" on the topic; and Con Edison recounted the procedural developments that resolved its concerns and reiterated that it otherwise has no position on the project. In this section, we will limit the summary to briefs on exceptions filed by parties that oppose all or some of the ALJs' recommendations or findings.

market subsidies; credited Staff's "production cost" analysis; and failed to prohibit Project shippers from indirectly recovering "extra-market" subsidies. IPPNY also contends that the ALJs relied on "flawed and inconsistent conclusions" concerning the Project's alleged capacity market benefits, wholesale energy price savings and job-inducing benefits. Entergy argues that the ALJs ignored or marginalized arguments against finding that environmental impacts had been avoided or minimized and accepted standards that are at odds with USACE pronouncements.

IBEW contends, among other things, that "insufficient weight" was given to claims that this Project would reduce wholesale energy prices in upstate New York and harm generators in northern and western New York.

Central Hudson asserts that the ALJs did not correctly resolve its issues with proposed Certificate Conditions 5 and 27-29. Central Hudson also requests that, as a matter of policy, we require transmission corridor developers, including merchants, to propose a project that improves known grid constraints and problems, rather than a point-to-point delivery project.

Finally, the Business Council argues that: the Project does not expand transmission to carry excess power from upstate to downstate; its costs "warrant significant review"; Applicants should be required to accept the incremental costs to Central Hudson that result from placing CHPE facilities on top of Central Hudson's facilities; and the need determination cannot be made in this proceeding until after the Commission concludes several proceedings it instituted last year.

STATUTORY REQUIREMENTS

The PSL provides that we may not grant a certificate for the construction or operation of a major utility transmission facility unless we shall find and determine:

> (a) the basis of the need for the facility;
>
> (b) the nature of the probable environmental impact;
>
> (c) that the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, and other pertinent considerations including but not limited to, the effect on agricultural lands, wetlands, parklands, and river corridors traversed;
>
> (d) …(1) what part, if any, of the line shall be located underground; (2) that such facility conforms to a long-range plan for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability;
>
> (e) [not applicable][30]
>
> (f) that the location of the facility as proposed conforms to applicable state and local laws and regulations …, all of which shall be binding upon the commission, except that the commission may refuse to apply any local ordinance, law, resolution or other action or any regulations ... or any local standard or requirement which would be otherwise applicable if it finds that as applied to the proposed facility such is unreasonably restrictive in view of the existing technology, or of factors of cost or economics, or of the needs of consumers whether located inside or outside of such municipality;

[30] PSL §126(e) applies to gas transmission lines.

> (g) that the facility will serve the public interest, convenience, and necessity ….[31]

We generally have used the statute as our guide for the sequence in which we will discuss the contested issues. Therefore, we will start with need, followed by the extent to which adverse environmental impacts have been avoided or minimized, then undergrounding and the Project's conformance to applicable laws and to a long-range plan, and, lastly, public interest, convenience and necessity.

NEED

In recent major Article VII cases we have set forth grounds on which we base our statutory finding of need. Thus, when Bayonne Energy Center (Bayonne) proposed to build a submarine electric cable to provide a dedicated connection between a new natural gas-fired generator in Bayonne, New Jersey and the Con Edison substation in Brooklyn, we found that the facility would provide system reliability benefits and economic benefits for customers and New York State, and would achieve public policy goals.[32] With respect to reliability, we found that Bayonne would provide an additional source of supply in the event that other, expected generation and transmission projects were not completed as projected, generation retired or was unavailable as a result of relicensing disapproval, emissions control requirements, or for any other reason. We also found that Bayonne's direct interconnection with Con Edison's system allowed it to be considered in-city generation that would count

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[31] PSL §126(1).

[32] Case 08-T-1245, Bayonne Energy Center, LLC, Order Adopting the Terms of a Joint Proposal and Granting Certificate of Environmental Compatibility and Public Need, With Conditions, and Clean Water Act §401 Water Quality Certification (issued November 12, 2009) (Bayonne Order).

towards the City's Locational Capacity Requirement.[33] From an environmental perspective, we found that the addition of Bayonne would allow the City's electricity needs to be met with a cleaner generation mix and should reduce present annual NOx, SO_2, and CO_2 emissions in New York City.[34] We also found that Bayonne's economic benefit's included reducing prices and that all of its favorable impacts would benefit New York without imposing additional costs on electric ratepayers.[35] When Hudson Transmission Partners (HTP) proposed to build and operate a 345 kV electric transmission link between midtown Manhattan and the neighboring regional electric system located in Pennsylvania, New Jersey and Maryland (PJM), we grounded our statutory need determination on findings that the facility would provide a useful bulk transmission connection to another region; alleviate existing transmission constraints; be used as an additional in-city capacity reserve; offer network security attributes that would help protect the security of the transmission network; help enhance and maintain system reliability in the event of plant closings or in response to air quality or climate change initiatives; and provide economic benefits by importing lower cost power, providing production cost savings and by not imposing the economic project risks on public utility ratepayers.[36] Applying the same reasoning to this case, and, as discussed more fully below, we determine that there is more than ample basis to find that this Project is needed.

Initially, it is important to reiterate the aspects of need that are not contested. They are:

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[33] Bayonne Order at 13.

[34] Bayonne Order at 13-14.

[35] Id.

[36] HTP Order at 42-47.

- the Project will offer additional transmission capacity into the New York City load pocket;
- by providing a link to abundant hydropower resources, the Project will significantly reduce harmful emissions and will enhance fuel diversity; and,
- due to these and other characteristics, it will help achieve public policy objectives expressed in the 2009 State Energy Plan and New York City's *PlaNYC*, among other documents expressing State policy.

As did the Judges in the RD, we accept these uncontested propositions as supported by the record and demonstrative of need. These, standing alone, are ample bases for our finding and determination that this Project is needed. However, as noted above, IPPNY, Entergy, IBEW, and the Business Council contest other factors that also could support a finding of need for this Project. We discuss their objections, below.

Reliability

The question of whether this Facility is "needed" for reliability purposes was the subject of extensive litigation. In finding a basis of need for the Facility, the ALJs did not rely on a finding that this Facility was being proposed to remedy a forecast system deficiency as of a certain date. Instead, they noted that the RNA was "not automatically dispositive" of the need issue, and found that this case presented an opportunity to authorize an investment in a merchant electrical infrastructure project not tied tightly to any forecast reliability need.[37] The ALJs listed a series of bases for a need finding: (i) the addition of a transmission interface into the New York City Control Area; (ii) likely long-

[37] RD at 29-30.

term economic benefits; (iii) short-term reductions in the wholesale price of energy; (iv) enhanced fuel diversity, and (v) consistency with public policy goals of increased use of renewable energy and reduction in emissions of various pollutants.[38]

The 2012 RNA was issued after post-hearing briefs were submitted in the case. Prior to that time, the parties referred instead to the NYISO's 2010 RNA and its 2010 Comprehensive Reliability Plan (CRP), which found that no new supply resources were needed over the 10-year planning horizon through 2020. Nevertheless, the JP proponents had relied on certain "risk factors" articulated in the RNA that might trigger a supply need, such as higher than expected load growth, environmental initiatives, and the closing of the Indian Point nuclear power plants, to argue that the Project could mitigate adverse impacts that could result if any of those risk factors came to pass.

The 2012 RNA differed from the 2010 version. The 2012 RNA found a potential increased need for installed capacity in New York City beginning in 2020, due to factors such as higher load growth, the recent mothballing or proposed mothballing of generating plants, the possible retirement of the Indian Point nuclear plants, a reduction in the forecast of customers' willingness to positively respond to requests to curtail their electric power demands (Special Case Resources or SCRs), and the possibility of further retirements of plants in the face of stricter air quality requirements. Following the issuance of the 2012 RNA, the parties were afforded an opportunity to submit

[38] The RD considers "reliability need" and "fuel diversity" as two separate issues in separate sections. As we discuss below, we consider fuel diversity to be an important reliability benefit and therefore we have collapsed the two issues here.

supplemental briefs to address its implications. The ALJs relied on these supplemental materials as well as the record materials addressing the 2010 RNA in reaching the conclusions in the RD.

IPPNY and Entergy claim that the ALJs erroneously relied on the 2012 RNA. They assert that the need found in the 2012 RNA may not materialize because: mothballed generators may not actually retire; the 2012 RNA's Zones at Risk analysis found that one could eliminate up to 1,000 MW of capacity from various downstate zones before reliability violations would occur; and the prospect that the Indian Point units would retire is highly speculative. Entergy argues that it is irrational to conclude (as did the RD) that the 2010 and 2012 RNAs examined similar scenarios because the 2012 RNA is not the end of the NYISO's planning process.

IPPNY argues that the 2012 RNA's assumption that SCRs might decline over time is not supported. IPPNY also contends that the State's energy efficiency and renewable resources programs are likely to further reduce or eliminate any future reliability needs.

Applicants respond that the ALJs correctly concluded that the 2012 RNA shows that the additional capacity provided by the Facility may be needed by 2020, and perhaps sooner.[39] They say that IPPNY and Entergy are in effect, asserting that mothballed facilities should have a guaranteed right to reenter the market before new competitors are allowed to serve consumers in New York City, an assertion they say belies IPPNY's oft-repeated support for a fully competitive electric market in New York.

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[39] Applicants Brief Opposing Exceptions at 3-8.

They note our Order Instituting Proceeding and Soliciting Indian Point Contingency Plan in Case 12-E-0503, contending that we expressly rejected IPPNY's claim that due to the retirement of Indian Point (IP) nuclear facilities a reliability violation in 2016 is "highly speculative." They also highlight our statement that the potential retirement of such a significant electric generating facility "requires significant advanced planning" and the development of a contingency plan "now."[40] Applicants contend that the institution of the IP proceeding provides powerful evidence of the need for additional capacity to serve New York City and the lower Hudson Valley.

NYC argues that IPPNY's contention that the State's efficiency and renewables programs may eliminate any potential reliability need is "not persuasive," asserting there are "recognized implementation challenges and other circumstances" that render uncertain the achievement of those policy goals. Further, New York City observes that, as a general proposition, year–to-year need determinations are subject to a wide variety of changing circumstances[41]

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[40] Applicants Brief Opposing Exceptions at 6, quoting Order at 4.

[41] NYC Brief Opposing Exceptions at 13. NYC notes recent developments (i.e., the December 7, 2012, decision of the New York State Reliability Council's Executive Committee increasing the current 16% Installed Reserve Margin for the New York Control Area to 17%, effective May 1, 2013, and a January 17, 2013, NYISO's Operating Committee vote that increased the City's Locational Capacity Requirement (which establishes the percentage of capacity to meet the needs of customers within the New York City capacity market that must be purchased from supply resources located within the New York City market) from 83% to 86%) that it says demonstrate that the need determination is fluid and the ALJs properly accounted for that fluidity by analyzing all of the factors identified in the RD. NYC at 11-12.

Staff asserts that because Applicants are not requesting rate-based treatment to recover the cost of the Project, there is no need to address whether the Project satisfies a "reliability need" pursuant to the RNA.[42] Instead, says Staff, this proposal represents a merchant investment, which would help to avoid the need for potential regulated investments -- exactly as the RD concludes.[43]

The Business Council argues that we should await the outcome of a number of recently instituted cases[44] before deciding to advance this Project now. Applicants oppose the Business Council's suggestion, arguing that outcome "would cast a pall on all siting applications in the State."[45]

Discussion

We do not approach a need determination under Article VII as a narrowly-defined exercise, exclusively based on elective supply/demand forecasting –- forecasts that as New York City notes can change significantly from year-to-year based on a myriad of factors. In that regard, contrary to the arguments of Project opponents, the most recent RNA is not dispositive on the issue of need. In both the HTP and Bayonne cases, the then-current RNA found no reliability need during the next 10-year

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[42] Staff Brief Opposing Exceptions at 11-12.

[43] Staff Brief Opposing Exceptions at 12, citing RD at 30.

[44] Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades; Case 12-E-0503, Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans; Case 12-G-0297, Proceeding on Motion of the Commission To Examine Policies Regarding the Expansion of Natural Gas Service; and Case 12-E-0577, Proceeding on Motion of the Commission to Examine Repowering Alternatives to Utility Transmission Reinforcements.

[45] Applicants Brief Opposing Exceptions at 60.

planning period, yet we found those projects were needed for reliability. Specifically in the case of HTP, we found that the facility would provide a useful bulk transmission connection to another region; alleviate existing transmission constraints; be used as an additional in-city capacity reserve; offer network security attributes that would help protect the security of the transmission network; and help enhance and maintain system reliability in the event of plant closings or in response to air quality or climate change initiatives.[46] With Bayonne, we found that the facility would provide additional in-city generation; reduce transmission constraints for New York City; and contribute to ensuring system reliability in the event a range of possible regulatory and legal changes or events might transpire and reduce available generation.[47]

In this case, we find and determine need, in part, because, as an additional transmission interface into the City of New York, the Project will (1) alleviate existing transmission constraints, (2) protect the security of the transmission network, (3) enhance system reliability,[48] and (4) enhance fuel diversity. The Project opponents have failed on exceptions to undercut the ALJs' findings regarding the system reliability benefits that would flow therefrom.

The claims that too much reliance has been placed on the 2012 RNA and its underlying assumptions are misplaced, since other uncontested bases properly support a finding of need pursuant to PSL §126(1)(a). In any event, it is indisputable that if load increases, or Indian Point retires, or SCRs decrease, or, in short, if any adverse reliability events

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[46] HTP Order at 42-47.

[47] Bayonne Order at 12-16.

[48] Id.

materialize in the next 10 years, then a Project like this one would be beneficial as a means to help alleviate such adverse impacts.

Arguments about the various risk factors and events that have and may yet affect "need" and the information highlighted on exceptions by parties on both sides of the dispute merely serve to confirm that the State's generation and capacity markets are fluid, and often change in ways that are unexpected – the Danskammer retirement being a prime example.[49] In fact, the NYISO's 2012 CRP, approved and published subsequent to its 2012 RNA, advanced the year of need to 2019, based mainly on the Danskammer retirement announcement.[50] Finally, we reject the requests of the Business Council to consider transmission and generation proposals sequentially and to delay addressing this Project. By issuing this Article VII Certificate, we are merely allowing the Applicant to evaluate other generation and transmission projects in deciding whether to move ahead to construction. Delaying this decision will only add to market uncertainty, and that would be inconsistent with allowing market actors to do their own sorting of possible futures.

Installed Capacity

The RD states that the Project will provide installed capacity benefits. IPPNY excepts.[51]

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[49] On January 3, 2013, Dynegy Danskammer, L.L.C. (Danskammer) filed a written notice of intention to permanently retire (and then demolish) its 495 MW Danskammer Generating Station in Newburg, New York. See Case 13-E-0012, Petition of Dynegy Danskammer, LLC For Waiver of the Generation Facility Retirement Notice Period and Requesting Other Related Relief.

[50] See 2012 CRP at 8.

[51] IPPNY Brief on Exceptions at 18-19.

IPPNY cites Mr. Younger's testimony that the NYISO's buyer-side mitigation rules will prohibit the Project from selling its installed capacity into the markets for many years. IPPNY states that the ALJs seemingly acknowledged this prohibition but then appeared to confuse "additional transmission capacity on the one hand, and increased installed capacity on the other."[52] To the extent that the ALJs confused these two, IPPNY says we must reject any reliance on installed capacity benefits.

Applicants observe that IPPNY does not deny that the Facility will add an additional 1,000 MW of transmission capacity into the New York City load pocket, or that 1,000 MW of generating capacity in Québec will be able to serve load in the New York City load pocket over the proposed transmission line.[53] Applicants contend that, in the unlikely event that any of the installed capacity provided by the Facility is excluded from participating in the NYISO's capacity markets under the NYISO rules, that capacity would remain physically available to NYISO in its operation of the State Transmission System and would benefit consumers by enhancing the reliability of electricity supply.[54]

Discussion

Regardless of whether the ALJs relied on the Project's "installed capacity" benefits, we do not rely upon the Project's

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[52] IPPNY Brief on Exceptions at 19. IPPNY explains that transmission capacity refers to the ability of a transmission system to import and export energy, whereas installed capacity refers to a reliability product purchased by load serving entities to ensure they have sufficient supply, plus a reserve, to meet their load obligations. Id.

[53] Applicants Brief Opposing Exceptions at 27-28.

[54] Id.

potential ability to provide additional installed capacity as support for our decision. Our conclusion, however, does not mean that we find the potential for the Project to provide installed capacity benefits in the future to be non-existent. It simply means that our need finding is supported on other grounds.

Economics

The ALJs reviewed a number of economic analyses advanced by the parties in support of and opposition to the Project. They rejected two separate analyses proffered by Mr. Younger, one a cash-flow analysis and one a production cost savings analysis, in favor of Staff's long-term production cost savings analysis.[55] They determined that "the most meaningful economic analysis of this project is one that focuses on the long-term and gauges whether the proposal will provide net benefits to society as a whole." They then concluded that "Staff's long-term analysis is the one that is best suited to determining whether the proposed Facility will provide overall net societal benefits" because it "was performed in such a way that it reasonably balanced the competing assumptions and views advocated by the Project's opponents, on the one hand, and Applicants, on the other."[56]

In the analysis credited by the ALJs, Staff compared the cost of 1,000 MW of Canadian hydropower delivered to New York City via the Project to the cost of a combined cycle gas-fired turbine (CCGT) of similar capacity located in New York

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[55] Applicants' witness Frayer estimated annual average "production cost savings" of $606 million, or $6.1 billion in total over the 10-year period from 2018 to 2027. The RD did not credit her analysis and no party excepts, so we will not discuss it further.

[56] RD at 47.

City. Staff reasoned that because the Project would alleviate the need to construct the CCGT, the CCGT costs represented the savings attributable to the Project. Staff estimated the net present value of production cost savings over a 35-year period in a range from $0.4 billion to $2.6 billion (in 2015 dollars).[57] In other words, Staff found that the Project was economically beneficial and that the economic benefit constituted a basis for a need finding.

IPPNY's witness Younger testified that the Project would be uneconomic. Employing the same General Electric Multi-Area Production Simulation (GE MAPS) model J database that Staff used for its economic analysis of wholesale market benefits in the JP, Mr. Younger used Staff's representation of the physical and economic characteristics of the Project to model the first ten years of the Project's expected operation. Mr. Younger then made limited updates to Staff's MAPS database to account for the most recent available data on gas prices, generator retirements and full deliveries of 1,550 MW out of the Astoria Annex. Using the methodology the NYISO employs to conduct its Congestion Assessment and Resource Integration Study (CARIS) to determine whether a transmission project is economic, Mr. Younger compared the first ten years of the annualized cost of the Project to its production cost savings over the same period. He concluded that, over the first ten years of Project operation, it would cost a total of over $2 billion but create only $590 million in benefits, thus producing a benefit/cost ratio of only 0.29, substantially below the minimum threshold used by the NYISO to determine whether a proposed transmission project is economic.

[57] Tr. 198-199; see also Hearing Exhibit 202. Staff initially estimated these benefits as ranging between $1.2 billion and $3.2 billion dollars over a 35-year period (net present value in 2015 dollars). Tr. 165.

A second production cost analysis produced by Mr. Younger consisted of proposed corrections to the Staff analysis and also came to the conclusion that the Project was uneconomic.

In rejecting IPPNY's position, the ALJs found, *inter alia*, that IPPNY's overarching views on economic need were informed by the outdated 2010 RNA and by the incorrect assumption that the generation would not be needed for reliability purposes until 2026.

Production Cost Analyses

On exceptions, IPPNY asserts that Staff's analysis did not calculate the production cost savings that would result from the Project. According to IPPNY, by comparing the cost of the Project to the cost of a CCGT in New York City, Staff did not actually measure the long-term net benefits to society as a whole, but instead measured the amount of savings that, if realized, inure to the benefit of only the Project developer. Entergy argues that the RD claims Dr. Paynter's rebuttal savings estimate as a "societal" benefit even though such a finding is at odds with the JP's statement that such savings "should not be interpreted as ratepayer benefits" as they will be "captured by the Applicants, their financial backers and/or users of the Facility."[58]

In response, Staff argues that by comparing total economic costs, while ignoring transfer payments (due to price impacts), it has, in fact, measured economic benefits to society, rather than ratepayer benefits or profits to one party, as claimed by IPPNY.[59]

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[58] Entergy Brief on Exceptions at 19-20.

[59] Staff at 4.

Applicants argue that documented savings to a developer are indeed a benefit to "society." They cite an IPPNY statement in support of this view:

> [C]ompetitive market structures motivate power producers to undertake investments and improvements that lead to productivity gains, and many of the nation's generating facilities now are operated much more efficiently than in the past. Just as in any competitive market, market signals embedded in the competitive wholesale markets in New York have created incentives for producers to undertake needed investments and creative improvements in operating practices to achieve such cost savings.[60]

Applicants observe that the Commission has recognized in other contexts that, over time, competition will force producers to share cost reductions with consumers as other suppliers achieve similar cost reductions.

IPPNY reiterates its arguments that Staff significantly understated the combined costs of the Project and the HQ hydro facility while at the same time substantially overstating the CCGT costs that would otherwise be avoided. According to IPPNY, Staff understated Project costs by using the costs of a hydro facility with unique permitting and operating circumstances, failing to include all the costs of the new hydro facility in the calculation, understating the losses associated with delivering power from the hydro facility to the injection point for the Project and using an "abnormally long, 35-year amortization period" for the Project, which, according to the IPPNY witness, proved that any benefits are not likely to occur for decades, long after substantial, required expenditures.

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[60] Applicants at 9, citing Hearing Exhibit 165 (IPPNY White Paper "The Policies of Power: Energy Planning for New York's Future Recommendations from the IPPNY," November 2008, at 15).

IPPNY adds that Staff overstated the CCGT costs by calculating them as if they would be incurred in 2016, the year that Staff expected CHPE to bring the Project into service, instead of using 2026 (IPPNY's asserted need date). IPPNY reiterates its conclusion that the Project's costs are more than $5 billion more expensive than waiting to build CCGTs in New York City when they are needed.

Both Applicants and Staff urge us to affirm the ALJs' adoption of Dr. Paynter's analysis[61] because (1) Dr. Paynter properly dismissed Mr. Younger's concerns with respect to his use of Canadian hydro facilities and addressed Younger's concerns with respect to the facilities needed to transmit electricity from the Canadian hydro facilities to interconnect with the Facility;[62] (2) Dr. Paynter explained that transmission from hydroelectric facilities in Québec to the Facility will occur on lines with a documented history of line losses that vary from "4.5% to 8%, depending on operating conditions and temperatures";[63] and (3) IPPNY's reliance on 2026 as the date on which the proposed combined cycle plant would commence operations, instead of 2016, the date used by Dr. Paynter, relied on the outdated 2010 RNA and improperly introduces short-term market conditions into a long-term economic analysis.[64]

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[61] Applicants at 10; Staff at 5.

[62] Applicants at 10-12.

[63] Applicants at 12, citing Paynter rebuttal at 178; Staff at 5.

[64] Applicants at 13; Tr. 179-180. Applicants add that Dr. Paynter also explained that if he corrected his analysis to recognize short-term market conditions affecting the Facility in Canada, the total costs of the Facility would be reduced to less than one-third of the costs of Mr. Younger's CCGT facility. Applicants at 14, with recitation of testimony at Tr. 180-181 omitted.

Opponents argue that the RD misconstrues Mr. Younger's purpose in conducting a CARIS-type cost-benefit analysis, asserting that the CARIS model was appropriately applied because: (1) the Project failed the cash flow test by such a wide margin that it further supports the conclusion that a subsidy will be required; and (2) there is no other generally accepted benefit-cost methodology.[65]

With respect to IPPNY's CARIS analysis, Staff argues that the RD correctly dismissed it because it applies to regulated projects rather than merchant projects, and it fails to account for HQ's legitimate financial interests in the Project, including, *inter alia*, meeting the needs of HQ's financial backers; consideration of HQ's actual financing costs, which may be very different than CARIS' 16% rate; finding a market for HQ's new hydroelectric supplies; and considering the potential impacts of HQ's new hydro electric supplies on market prices and congestion. Staff notes that witness Paynter listed these "valid considerations," noting that they "are all outside the narrow scope of the CARIS analysis."[66]

Applicants argue that Mr. Younger's analysis also was properly rejected on the basis that it improperly assumed that the full output of the hydroelectric generating facilities now under development in Québec could simply be sold into New York State across existing, already constrained transmission lines.[67] Applicants argue that Ms. Frayer pointed out in rebuttal testimony that Mr. Younger's "production cost" analysis was flawed by this assumption, and that, in reality, differences in market design between control areas, sometimes referred to as

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[65] Entergy at 12-13.

[66] Staff at 7, citing Tr. 192-193 and referring to Tr. 190-193.

[67] Applicants at 20-21.

"seams," limit the extent to which energy can flow between control areas in response to differences in market prices, as FERC recognized in a recent Order.[68] Applicants state that Ms. Frayer explained that the effect of this erroneous assumption is that Mr. Younger's GE MAPS model substantially overstates actual trading opportunities[69] and his production cost analysis understates the Facility's true impacts on total production costs.

Revenue/Cash Flow Analysis

The ALJs also rejected a revenue/cash flow analysis proffered by IPPNY witness Younger. In that analysis, Mr. Younger calculated an annual cost, based on the Applicants' estimated construction costs and 90% capacity factor and the costs to connect with the transmission system in Québec. He then estimated annual revenues based on the historic price differential between the New York-Canada border and New York City. He concluded that it would cost a shipper, per MWh, over $50 to receive an $8 benefit and that therefore the Project was not economic pursuant to this analysis. On exceptions, IPPNY asserts that the Commission should credit this analysis.

IPPNY states that Applicants improperly refused to introduce affirmative evidence of their business plan or potential income stream. IPPNY reiterates its claim that no rational investor, including HQ, would risk its assets by participating in this Project absent some assurance of extra-market funding. It argues that this "undeniable need" for such funding means that subsidization by ratepayers in regulated

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[68] Applicants at 21, citing *Blumenthal v. ISO New England, Inc.*, 135 FERC ¶ 61,117 at P 44 (2011).

[69] Applicants at 21-22.

rates will be necessary to enable the Applicants to recoup their costs.

Applicants point to the rebuttal testimonies of Dr. Paynter and Ms. Frayer, saying both made clear that Mr. Younger "stacked the deck against the Facility in several important ways," including using today's historically low energy prices, and failing to demonstrate that existing interconnections between New York and Québec would be sufficient to accept the full output of the massive hydroelectric generating facilities now under development in Québec. Applicants and Staff note that the record shows that those existing interconnections are already constrained during periods of peak demand, leaving little opportunity for HQ to sell additional hydroelectric power into New York over those existing interties. For this reason, among others, Staff asserts that IPPNY's "Cash Flow" analysis is fundamentally flawed, and the RD was correct to dismiss it.

Discussion

First, it must be emphasized that no one can make any definitive statements about the future economics of the Facility. One can only talk about the future in terms of forecasts that are made at this point in time and the likelihood that the economics of the Facility may actually turn out to be better than forecasted or worse than forecasted. We must therefore recognize the role that uncertainty plays in the investment decisions of potential developers.

Staff, IPPNY, and Entergy agree that the primary economic analysis is the comparison of the overall societal benefits and costs of the Facility, which is sometimes called a production cost savings analysis. While undoubtedly important, the results of a production cost savings analysis are but one factor we consider.

Analyses of production cost savings were performed by IPPNY witness, Mr. Younger and Staff witness, Dr. Paynter. Mr. Younger's production cost savings analysis, using G.E.'s MAPS model, while subject to several weaknesses that were identified by the parties, must be given some weight. The analysis supports a conclusion that the Facility may not be economic on a forecast basis using low gas price forecasts, which lead, in turn, to forecasts of low wholesale electric prices for New York City. At low New York City electric prices, the Facility may not produce enough production cost savings to cover its costs.

We also give weight to Staff's long-run production cost savings analysis. Contrary to IPPNY's allegation, Staff's long-run production cost savings analysis is proper: it properly compares the cost of the added project to the cost savings that will result from it, in the form of an alternative project (a combined cycle gas facility located in New York City) that will be avoided. This analysis should be given the most weight. Its results are highly instructive because they show how sensitive the economics of the Facility are to gas price forecasts. Using its "low" and "high" gas price forecasts,

Staff estimated a net benefit of $0.4 billion and $2.6 billion, respectively.[70]

We acknowledge IPPNY's criticism that Staff's method overstated the net benefit of the Facility by assuming that its in-service date, originally forecasted to be 2016, exactly matched the date that a new CCGT would otherwise need to be built in New York City. According to IPPNY, excess supply in New York City means that a new CCGT would not be needed until substantially later than 2016. This criticism is valid. We recognize, however, that more recent analyses of supply and demand suggest that the need for new supply will likely occur much earlier than 2026. This recognition, combined with delays in the Facility's schedule that puts its in-service date out beyond 2016 by one or two years, brings the expected in-service dates of the Facility and the CCGT much closer into alignment with each other. Nevertheless, there would remain a slight

[70] In its Brief on Exceptions, IPPNY attempted to introduce into the record, the U.S. Energy Information Administration's Annual Energy Outlook (2013 AEO) Early Release Overview, for the purpose of bringing to our attention gas forecasts lower than those previously used by the parties in their production costs analyses. By Ruling Denying Motion to Incorporate or Take Official Notice (issued January 30, 2013) and Errata Notice (issued February 1, 2013), the Acting Secretary determined that the draft document would not be introduced into the record because the forecasts were preliminary in nature (subject to future revision). We agree that the ruling was proper at the time made. On April 15, the EIA issued the final 2013 AEO, which retains the gas price forecasts contained in the Early Release Overview. We recognize that incorporating these gas forecasts at issue into Staff's analysis (holding all other inputs constant), Staff's estimate of production cost savings would turn negative. Such a result, however, would only change one element in our overall analysis and would not change our conclusion that there is more than ample basis to conclude that the granting the Certificate is warranted.

mismatch in the two dates and therefore a slight overstatement by Staff of the Facility's production cost savings.

Based on the information available to us, we find the production cost savings estimates to be inconclusive, as the results of such an analysis depend very heavily on, among other things, the trajectory of actual gas prices. As was clear from the record and is well understood within this Commission's experience, gas price forecasts can change dramatically in a very short time. However, by granting the Facility a certificate, we are providing its investors with the option to move forward with construction of the Facility if circumstances such as a revised gas price forecast lead its investors to believe that it will be an economic project. As we explain below, the Project is in the public interest because its non-monetary benefits outweigh its environmental harm. This weighing of the Project's non-monetary aspects holds irrespective of any conclusion we make on the economics of the Project. If the economics are positive and the Project is built, then society will be better off for it, because of the important non-monetary benefits. If the economics become worse and the Project never gets underway, then no harm will come of our decision to grant the Facility a certificate.[71]

As an alternative to a production cost savings analysis, IPPNY's witness, Mr. Younger, performed a revenue/cash flow analysis. The analysis looked at the economics of the project from the perspective of the project owner: is the project likely to be reasonably profitable? We find that

[71] We note that, pursuant to Certificate Condition 13, the Applicants do not have unlimited time in which to go forward with the Project. Rather, Condition 13 allows us to vacate the Certificate if Applicants have not filed their EM&CP or commenced construction by certain specified deadlines.

IPPNY's revenue/cash flow analysis cannot be relied upon because it keyed on historical bus prices instead of forecasted bus prices. Historical bus prices fail to capture key future factors such as gas price forecasts, and, as Staff points out, the historical bus prices used by IPPNY were artificially depressed by the recent recession.

Wholesale Price Impacts

The ALJs observed that "[n]o party disagrees that this facility will (or is likely to) reduce wholesale electricity prices; parties disagree on whether these reductions should be viewed as a benefit, whether the estimates are accurate, and whether the metric should be relied on by the Commission in this proceeding."[72] The RD summarizes the various estimates put forward by the parties, noting Applicants' figure of $503 million for 2018 and $3.4 billion for the ten years starting with 2017, and Staff's estimate of $492 million in 2018.[73] According to the RD, IPPNY witness Younger argued that the 2018 numbers were overstated by $211 million.[74] The ALJs found that, "even after accounting for opponents' criticisms and proposed offsets, the proponents have successfully demonstrated that the Project will have sizable benefits in the form of reductions in the wholesale price of electricity" and that these particular benefits, though likely short-term, should be considered as evidence supporting both the required need and public interest findings.[75] IPPNY, Entergy, IBEW and the Business Council take exception to this recommendation, arguing that the wholesale price reductions should not be viewed as benefits nor be

[72] RD at 48.

[73] Id.

[74] RD at 49.

[75] RD at 54, 72-73.

considered as evidence supporting the need or public interest findings.

IPPNY and Entergy say any claimed benefits from wholesale energy price reductions produced by this Project must be disregarded entirely because they are temporary transfer payments between generators and consumers, rather than sustainable benefits to society as a whole. They also assert that any wholesale price reductions caused by this Project's "uneconomic entry" would be the result of anti-competitive price suppression and thus cannot be considered a benefit. IPPNY adds that the RD's conclusion that wholesale energy price savings will "nonetheless be realized" is erroneous and it is "pure speculation" whether such savings would have a perceptible impact on consumers. Entergy reiterates, and cites Dr. Paynter's testimony as support, that "[wholesale energy] price reductions benefit consumers at the expense of the suppliers; but the reduction in prices does not represent an economic (or societal) benefit, just a transfer payment from suppliers to consumers." Entergy argues that the RD's finding that such transfer payments somehow support both need and public interest is misplaced.

IBEW also disagrees with viewing wholesale price impacts as a benefit, especially in Upstate New York, while the Business Council states that if the projected wholesale energy market savings cannot be delivered, the Project simply cannot be in the public interest.

Applicants and Staff contest IPPNY's claim that wholesale price savings are "inherently unreliable because, *inter alia*, they do not account for market responses."[76] Applicants contend that it is unsupported by any citation to the

[76] Applicants at 25, citing Brief on Exceptions at 20.

record and cannot be reconciled with the testimony of DPS Staff witnesses Gjonaj and Wheat that "the Commission should be aware of these [wholesale price] benefits when considering whether this project is in the public interest."[77]

Applicants argue that the ALJs clearly considered and rejected IPPNY and Entergy's claim that the lower wholesale electricity prices resulting from the Facility should be ignored simply because they are likely to be transitory.[78] Applicants argue that IPPNY and Entergy have provided no explanation why this "obviously correct conclusion" should be rejected by the Commission.

Discussion

The Project will create significant benefits to consumers in the form of lowered wholesale prices. Even allowing for adjustments proposed by IPPNY, the wholesale price reductions for 2018 alone are forecast to be $281 million. We do not rely on these consumer benefits to find need. Instead, as discussed elsewhere in this Order, we find other bases for granting the certificate.

Price Impacts at U.S.-Canada Border

In response to claims that the Project could raise wholesale electricity prices at the U.S.-Canada border, the ALJs stated that:

> This potential scenario, however, is premised on the assumption that all other circumstances would remain constant. In fact, no basis for that assumption is substantiated on this record, where we have credible testimony that markets tend to

[77] Applicants at 25, citing Tr. 245.

[78] Applicants at 25-26, citing RD at 53.

> respond to such price differentials, eventually offsetting them over time.[79]

IPPNY and Entergy contest this conclusion, arguing that the RD's rationale for rejecting the border price information is inconsistent with the RD's rationale for crediting wholesale energy price savings. They argue that either all price impacts are relevant regardless of certainty and expected duration, or none of them are. Entergy argues that it demonstrated that we must take into account the higher energy prices that the Project will cause in the already struggling regions of Upstate New York, claiming this Project would increase Upstate power prices without providing any other tangible benefits. Entergy asserts that this scenario was suggested by Dr. Paynter.

Applicants assert that the ALJs correctly rejected IPPNY and Entergy's contention that the Facility will harm consumers in Upstate New York by increasing prices at the Canadian border because that contention was unsupported by record evidence.[80] Staff asserts that the contention is simply false.

Specifically, Applicants note that Entergy quotes from Dr. Paynter's testimony on cross-examination, but fails to include the very narrow question to which he was responding or the last fifteen words of Dr. Paynter's answer, both of which, Applicants state, make clear that Dr. Paynter is answering a purely hypothetical question posed by Entergy's counsel. Applicants argue that when the complete question and answer is viewed in context, the quotation presented by Entergy provides it no support.

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[79] RD at 65, citing as an example Tr. 172.

[80] Applicants at 34.

Staff says that Dr. Paynter, in fact, determined that the Project would reduce prices across New York State, including Upstate. Staff adds that IPPNY's claim is based, not on Staff's testimony, but on a hypothetical, presented on cross-examination, which assumes that HQ would invest in 1,000 MW of additional hydroelectric supply and sell this at the New York border, without any transmission upgrades in New York. Referring to its Reply Brief (p. 11), Staff states that the "increase" in border prices is only in comparison to the depressed prices in the hypothetical and that compared to current market prices, the impact of the additional hydroelectric resources delivered by the Facility is to reduce prices statewide, including at the Canadian border. Applicant makes a similar argument.

Applicants state that the only record evidence directly addressing the impact of the Facility on power prices in upstate New York is the testimony of Ms. Frayer, whose testimony included a chart clearly showing that the Facility will have no significant impacts on the price of electricity in upstate markets (Tr. 279, lines 1-7).

Discussion

Staff witness Paynter testified that when large supplies enter a market, they naturally tend to depress prices.[81] Based on this testimony, and on the arguments provided by Staff on exceptions, we reject claims that the Project will increase wholesale electric prices at the U.S.-Canada border.

Competitive Markets and Existing Generation

The ALJs rejected arguments that this Facility will harm competitive markets if it is granted a certificate, instead concluding that its addition should improve the competitiveness

[81] Tr. 171.

of the market in New York City and is consistent with State, Commission, and City policies encouraging competitive markets. Their reasons were: (1) short-term price decreases should not harm existing generators who are able to adapt to an evolving competitive market; (2) the entry of additional energy and capacity supply could help consumers, particularly in the City load pocket, since it could reduce the potential for market manipulation; (3) the "persuasive" record evidence rebutting the claims that the Project will be an uneconomic entrant; and (4) if some of the Project's costs prove uneconomic, Certificate Conditions should protect captive ratepayers from a significant portion of any such costs and the buyer-side mitigation rules should protect incumbent generators.[82]

The ALJs rejected claims that the Project would hasten the exodus of fossil or renewable generation because they found "far too many variables at play that could influence or explain a generator's decision to exit the competitive market, including changes in environmental regulations or tax laws" and "no credible basis for concluding that any generator's decision to exit the market can be definitively and exclusively linked to the entry of this Project."[83] IPPNY, Entergy and IBEW except to the ALJs' conclusion and renew arguments that certification of this Project will harm competitive markets and cause existing generators to exit the market.

IBEW contends that existing fossil or renewable generators' lack of usable transmission facilities denies them the opportunity to compete. IBEW also argues that, with 1,000 MW being delivered from Canada to downstate, (1) there would be no immediate need for renewable or fossil power generated in-

[82] RD at 66-67.

[83] RD at 66.

State to be transmitted downstate and (2) the upstate renewable and fossil generators' financing ability would be curtailed.[84]

IPPNY reiterates its claims that the "fact" that this Project is uneconomic and "likely to be financed by above-market, subsidized contracts," would turn the bases underlying the Commission's determination to implement competitive markets on their head and significantly harm the very competitive market the Commission sought to produce. These same arguments form the bases for IPPNY's claims this Project would hasten the exodus of existing generators.

IPPNY asserts that the policy implications of building uneconomic capacity are clear and were recognized long ago by FERC in its Order approving the NYISO's proposed measures to mitigate the impact of market power. IPPNY claims that our issuance of a certificate to the Applicants will allow the Project to satisfy a significant milestone and will encourage uneconomic entry and the suppression of energy prices, which will chill market-based entry and ultimately cause New York's consumers to pay higher electricity prices.

IPPNY concedes that it is not always possible to identify or isolate the one factor that led to a generator's retirement but contends that simple economics demonstrates that existing economic generators are dependent on market revenues and cannot survive long-term when those revenues are "artificially depressed in a significant manner by uneconomic entry." IPPNY claims that this Project's costs are higher than the costs of new entrants that legitimately lower costs, and those higher costs will be foisted on consumers through indirect subsidies for this "anticompetitive" Project.

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[84] IBEW Exceptions at 3.

Applicants respond that IPPNY and Entergy ignored the portion of the RD expressly rejecting their claims. They say that when addressing claims that the Facility will harm competitive wholesale power markets, the ALJs make clear that rejection was due, in part, to rejecting IPPNY and Entergy's views of the Facility's economics and, in part, on their finding that the buyer-side mitigation provisions of the NYISO Services Tariff will protect competitive wholesale power markets in the unlikely event that IPPNY and Entergy's economic arguments prove correct.

Applicants assert that FERC has made clear its intention and obligation to adopt measures designed to prevent any such competitive harm, reflected by its decision to protect New York's markets from competitive injury due to uneconomic entry by directing NYISO to impose "net buyer mitigation."[85] As a result, Applicants assert that FERC has taken the regulatory actions required to ensure that uneconomic entry will not pose a threat to New York's wholesale power markets.

Applicants urge rejection of IBEW's exceptions because (1) generators in upstate New York are already free to compete to serve customers in New York City using transmission capacity between upstate New York and downstate New York on existing facilities; (2) the record reveals that the Facility will actually reduce congestion on New York's constrained Total-East Interface, making more transmission capacity available to generators in New York State; and (3) IBEW has failed to identify any concrete transmission expansion projects that will not go forward if the Facility is approved.

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[85] Applicants at 30-31, citing FERC's March 7, 2008 Order in Docket No. EL07-39-000, New York Independent System Operator, Inc., 122 FERC ¶61,211 at P 105 (2008).

Staff argues that IPPNY's claim of harm to competitive markets is unsupported because it is based on IPPNY's "discredited" assertion that the Project is uneconomic and would be financed by contracts subsidized by New York consumers. Staff further asserts that IPPNY's "professed concern about 'chilling new investment' is not credible; indeed, it is difficult to imagine a more serious threat to competitive markets than to deny siting, thereby preventing a developer from even attempting to enter the market."[86]

Discussion

The single most important characteristic of a competitive market is ease of entry by new suppliers. One potential entry barrier is the siting process itself and the requirement that a potential new entrant, such as the Facility, obtain a certificate. One way to truly harm competitive markets is to deny potential suppliers the certificates they need without having a strong basis for doing so.

Opponents in this case ask us to deny the Facility a certificate because of the alleged possibility that the Facility will become part of a buyer market power scheme to artificially drive down New York City wholesale electric prices. Buyer market power problems tend to be rare and therefore do not need entry-blocking actions that cause more harm than good. Moreover, even if we were concerned about buyer market power in this case, we need not act now, at the siting stage of the process, to prevent hypothetical exercise of future buyer market power, since we can act later. Specifically, the single largest buyer of market-based electricity in New York City, Con Edison, would have to pass muster with us in the form of a prudence review, were it to later enter into a contract with a shipper

[86] Staff Brief Opposing Exceptions at 10.

such as HQ. Were Con Edison to pay above-market prices in such a contract, we have the authority to find the overpayments to be imprudent.[87] This regulatory power enables us to protect the market from buyer overpayments by Con Edison.

Furthermore, as the Applicants have noted, the NYISO has buyer market power mitigation measures in place, approved by FERC, and fully tested, whose sole purpose is to protect markets from buyer market power. Therefore, if the future entry of the Facility were to occur in the form of an alleged instance of buyer market power, the FERC-approved mitigation measures will be available to prevent damage to the market.[88]

An additional important factor that weighs in favor of a better functioning New York City competitive market is the benefit of the addition of a new supplier to New York City's existing mix. The reduced concentration of ownership of supply in New York City that occurs when a new supplier enters the market helps make for a more competitive market.

As for any impact of the Facility on incumbent generators, be they New York City generators or upstate generators, we acknowledge that the Facility will result in lower wholesale market prices, albeit for only a temporary

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[87] Of course, the payment of a reasonable premium above the regular market price for renewable power, or other desirable attributes, is common and could be prudent. We will carefully examine any future power purchase agreement entered into by a New York utility for power transmitted over this line, and we will not hesitate to disallow any amounts that are in any way imprudent.

[88] NYPA, for example, is a buying entity in New York City which we do not regulate, and therefore we cannot ourselves prevent it from exercising buyer market power. While we believe it is unlikely that the NYPA will overpay as part of a buyer market power scheme, the FERC-approved mitigation measures will be available to mitigate any such attempt to exercise buyer market power.

period. Therefore, as in any well functioning market, the entry of a new supplier will likely impact incumbent suppliers. This is an effect that is more than tolerable as a consequence of the proper workings of a competitive market.

In summary, the goal to have markets in New York that are more competitive rather than less competitive is well served by granting the Facility a certificate that is a prerequisite to entering the market. It would be folly to raise entry barriers by barring the entry of this new competitor, especially at the siting stage, out of a concern that doing so is needed to prevent the speculative potential for future buyer market power.

Public Policy

Emission Reductions

For the period 2017 to 2026, the Applicants' estimated reductions in total New York State emissions of SO_2, NO_x, and CO_2 are 1,329 tons, 5,612 tons and 35,434,166 tons, respectively.[89] The comparable estimates for 2018 are reductions in SO_2, NO_x and CO_2, of 243 tons, 1,026 tons and 3,801,502 tons, respectively. Staff estimates for annual (2018) New York City air emission reductions were 40 tons of SO_2, 320 tons of NO_x, and 1,037,062 tons of CO_2.[90] For the State as a whole, the Staff estimate of expected annual (2018) air pollutant emission reductions of SO_2, NO_x, and CO_2 were 751, 641, and about 1,500,000 tons per year, respectively.[91] By any of these measures, the Facility's expected emission reductions are a substantial environmental benefit, a benefit that is expected to be enduring.

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[89] Tr. 304.

[90] Tr. 248.

[91] Tr. 246-247; Hearing Exhibit 204. In the first full paragraph on page 31 of the RD, the word "million" should be inserted after the number "1.5" and before the word "tons."

Fuel Diversity

The Facility will increase fuel diversity, consistent with Commission and State policies encouraging diversification of the generation resource mix of energy sold in the State and increased reliance on renewable energy sources. The Project is also consistent with our policies of reducing dependence on natural gas as a fuel for electric generation.[92] These fuel diversity benefits are unique, having no recent precedent in terms of the source of supply –- mostly hydroelectric –- and the extent to which such supplies can enhance the diversity of generation sources and reduce dependence on natural gas as a fuel for electric generation.

Policies of the State, the PSC, and NYC

As noted above, the Judges found need for the Project based on its demonstrated ability to achieve public policy objectives expressed the 2009 State Energy Plan and New York City's *PlaNYC*, among other State policy documents,[93] and we adopt these uncontested findings. The 2009 State Energy Plan expresses support for the development of investments in energy infrastructure, especially infrastructure investments that support the State's transition to a clean energy economy, reduce greenhouse gas emissions, and "allow the State to fully exploit the potential benefits of ... additional Canadian imports."[94] Various Commission policies encourage diversifying the generation resource mix of energy sold in New York State as a means to improve energy security, while ensuring protection of system reliability and promoting and encouraging the development

[92] Tr. 307-308.

[93] RD at 30-34, 64-65, and 72-73.

[94] 2009 State Energy Plan, Executive Summary at xv.

of competitive markets. We find that this Project advances these goals, thus further demonstrating need for this Facility.

Conclusion

The Project satisfies a need by providing additional transmission capacity into the New York City load pocket and an additional source of supply – hydroelectric power -- that is both renewable and relatively stable in price, enhancing the fuel diversity in the City. Moreover, by allowing a new entrant into the New York City market, approval of the Project would advance our policy favoring competition. Finally, the Project advances State policies by enabling access to a source of clean energy supply.

THE NATURE OF THE PROBABLE ENVIRONMENTAL IMPACT AND MINIMIZATION OF ADVERSE ENVIRONMENTAL IMPACT

The RD found that the facility route is preferred because it would avoid or minimize the disturbance of natural habitat, and would use some existing and previously disturbed ROW (e.g., railroad ROW). The Judges recommend finding that the nature of probable environmental impacts have been identified, and that the facility, located and configured as conditioned by the JP's terms and conditions, and related stipulations, represents the minimum adverse environmental impact considering the state of available technology and the nature and economics of the various alternatives and other pertinent considerations.

In its Brief on Exceptions, Entergy reiterates the arguments made in its initial post-hearing brief, that Applicants have not adequately characterized and minimized potential environmental impacts, including potential impacts on shortnose and Atlantic sturgeon, species listed under the

federal Endangered Species Act (federal ESA)[95] and the New York Environmental Conservation Law (state ESA).[96] Entergy argues that the RD's conclusions regarding nature and minimization of impacts are in error. Entergy also objects to the RD's conclusions regarding the JP's Hudson River Navigation Channel Cable Burial Provisions.

The ALJs concluded that the USACE has not made a determination to grant, modify, or deny Applicants' federal application for a USACE permit, including a determination on minimization regarding this facility. Certificate Condition 11 requires that Applicants obtain the necessary USACE permit. The Judges recommended that the Commission should allow USACE to complete its permit review and render its determination. The Judges found that that the JP's Certificate conditions regarding cable placement and burial depth are consistent with Commission practice in previous cases, and will minimize potential adverse impacts related to cable burial depth and the location of cables in federal navigation channels.

Sturgeon Habitat

Entergy raises four issues regarding potential impacts on ESA sturgeon: potential loss of habitat due to proposed installation of concrete mats or rip-rap (concrete mats) in limited areas of the Hudson River subaquatic route, lack of characterization of impacts outside sensitive habitat areas, improper deferral of minimization of impacts to the EM&CP phase of the project, and nature and potential magnetic field impacts.

Use of Concrete Mats

In Hudson River areas where it is necessary to protect utility crossings or where the river bottom is solid rock,

[95] 16 U.S.C. §1531.

[96] Environmental Conservation Law (ECL) §11-0535.

preventing burial of the cable, Applicants propose to cover the cables with concrete mats. Entergy contends that concrete mats will be installed for approximately 6.41 miles of river bottom, and that the record does not address the potential loss of those areas as sturgeon habitat.

Applicants respond that Entergy has overstated the use and effect of concrete matting, relying upon information that was developed using the Applicants' original routing[97] and is no longer accurate. Applicants contend that the revised routing described in the JP proposes the use of concrete matting for only 4.45 miles, approximately 25% less than Entergy contends.

In addition, it is uncontroverted that approximately 17% of this concrete matting would be installed over existing hard substrate. Applicants assert that Entergy offers no explanation as to how use of concrete matting over hard substrate, or any other proposed use of the concrete mat surface, would function differently from the existing substrate in terms of habitat. To the contrary, Applicants cite evidence in the record that, "[i]n areas of hard bottom, the mats will create similar habitat, and in soft bottom areas the mats will, in essence, create small artificial patch reefs. The surface of the mats may develop an epibenthic community over time as well as provide structure that is important for some benthic species and fish."[98]

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[97] Hearing Exhibit 2 at 4 (Location of Facilities (Exhibit 2 to the Application)) (describing the original routing); Hearing Exhibit 92 at 3 (Letter to New York State Department of State dated February 18, 2011).

[98] See Hearing Exhibit 121 at 193 ("The mats will have an insignificant effect on near bottom hydrodynamics, which may be similar to the conditions found in rocky bottom areas.").

Further, Applicants state that the February 18, 2011, letter from Applicants' consultant to DOS states that the final design will "optimize the placement of protection to minimize the area of the bottom covered by concrete mattresses or other protective devices" so that "[t]he actual area of additional protection is likely to be substantially less than the total width of the cable/pipeline area as depicted on the NOAA charts."[99]

Lastly, Applicants contend that Entergy's arguments ignore the beneficial effects of the $117.15 million trust for the enhancement of water quality in the Hudson River and Lake Champlain. The Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust (the "Trust") resulted from collaborative discussions among the Signatory Parties and provides exclusively for in-water mitigation studies and projects that have a direct nexus to the construction and operation of the Facility. These studies and projects will minimize, mitigate, study or compensate for the short-term adverse aquatic impacts and potential long-term aquatic impacts and risks to these water bodies from construction and operation of the Facility.[100]

Applicants conclude that Entergy has failed to demonstrate any factual basis for its argument that the proposed limited use of concrete mats will have a negative effect upon state ESA sturgeon habitat.

Discussion

With respect to the Project's potential impacts to state ESA sturgeon, we observe that the relevant portions of the JP ensure benthic habitat is not lost and that environmental

[99] Hearing Exhibit 92 at 3.

[100] JP ¶144.

impacts are minimized. The record includes an extensive analysis of river bottom bathymetry, fisheries data, acoustic fish tracking, annual Hudson River surveys of fish distribution, adult and juvenile sturgeon monitoring, submerged aquatic vegetation maps, tidal wetland maps, and existing Significant Habitats.[101]

The record shows that Entergy has overstated the extent of concrete matting by at least 25%. Moreover, Entergy has failed to present any evidence or legal authority to support its claim that the Applicants' installation of concrete mats will result in the adverse modification of sturgeon habitat amounting to a state ESA "take."

A "take" under the state ESA includes the killing of an endangered species and lesser acts including "disturbing, harrying or worrying" of the species.[102] A "take" also includes an interference with or impairment of an "essential behavior" of an endangered species.[103] Essential behavior means any of the behaviors exhibited by a species listed under the state ESA as endangered or threatened that are a part of its normal or traditional life cycle and that are essential to its survival and perpetuation. Essential behavior includes behaviors associated with breeding, hibernation, reproduction, feeding, sheltering, migration and overwintering.[104]

The Facility has been routed to avoid, to the maximum extent practicable, environmentally sensitive DOS Significant

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[101] Hearing Exhibit 102 (Description of Protected Areas within Hudson River); JP, Appendix C, Final Revised Proposed Certificate Conditions (January 18, 2013), ¶156(b)(1).

[102] See, 6 NYCRR 182.2(x).

[103] 6 NYCRR 182.2(f).

[104] Id.

Habitats and DEC Exclusion Areas. The Significant Habitats and Exclusion Areas were designated specifically because they contain sensitive habitat, including sensitive state ESA sturgeon habitat, relative to other areas of the Hudson River. By avoiding areas recognized as sensitive aquatic habitat areas, including sensitive habitat areas for sturgeon, Applicants will avoid potential adverse impacts to sturgeon.

The Environmental Impact Assessment (EIA) provides Applicant's comprehensive assessment of the nature of potential environmental impacts of the proposed facility and proposals for minimization of potential impacts. The EIA addressed the habitat impacts of use of concrete mats specifically, concluding that:

> The mats will alter local hydraulic conditions such that some sediment deposition or scouring may occur around the irregularity in the bottom formed by the mats. However, the overall change in bottom topography will be insignificant because the mats will extend only a short height above the bottom and functional benthic habitat will develop. The volume of the cable is extremely small relative to the sediment layer and bottom hydrography of the water bodies involved, and the effect of the cable on bathymetry will be insignificant relative to natural levels of fluctuation due to currents, storms, navigational traffic, and other pre-existing factors.[105]

The EIA further states that "[a]fter the cable is energized, the benthic community is expected to be similar to that from adjacent benthic [areas]."[106] Therefore, for the small

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[105] Hearing Exhibit 121, p. 168. The benthic zone is the ecological region at the riverbed or lakebed; bathymetry describes the contours of a riverbed or lakebed.

[106] Id., p. 206.

sections of the riverbed where concrete mats will be installed, the benthic community is anticipated to redevelop on or around the concrete mats, so that the benthic zone will include the concrete matted areas. Entergy provided no evidence to the contrary.

In the RD, the Judges correctly identified the nature of the potential habitat impact and found that the Facility conforms with the substantive requirements of the state ESA. The Judges reasonably concluded, based upon the record, that the proposed limited installation of concrete mats would not degrade state ESA sturgeon habitat or harm sturgeon. The record supports the RD finding, that the Project satisfies the applicable standards of the PSL concerning nature and minimization of potential habitat impacts of the limited use of concrete mats. In considering the RD and EIA sections discussed above, we reject Entergy's contention that the RD does not consider potential habitat impacts attributable to the permanent installation of concrete mats that could displace sturgeon habitat after the construction phase is completed.

DEC Exclusion Areas and DOS Coastal Zone Program Significant Coastal Fish and Wildlife Habitats

The RD concludes that the JP provides seasonal construction windows to prohibit construction during times when the Exclusion Areas and Significant Habitats are likely to be occupied by sensitive species. Entergy takes exception to this conclusion as facially insufficient because it addresses only the period of construction.

In addition, Entergy asserts that any final Facility design that minimizes impacts only to particular defined areas -– Exclusion Areas and Significant Habitats -- cannot ensure that impacts to sturgeon habitat outside those defined areas will not adversely affect sturgeon.

Applicants respond that Entergy has not identified any specific potential adverse impact to state ESA sturgeon habitat. Instead, Applicants contend, Entergy argues that omissions exist in the record regarding the nature of potential impacts to state ESA sturgeon.

Applicants and Staff respond, as discussed above, that the JP reflects lengthy, detailed consultation with DEC and other environmental parties concerning nature and minimization of environmental impacts. They state that the record shows that Applicants are largely avoiding routing the Facility within sensitive habitat areas identified by the Signatory Parties, the DEC Exclusion Areas and DOS Significant Habitats. In addition, the JP provides for designated seasonal construction windows for construction within Exclusion Areas and Significant Habitats, to the limited extent that these areas cannot be avoided. Further, in the EM&CP phase, the JP provides that Applicants will develop a final Facility design that minimizes potential impacts.

Discussion

The record shows that the installation of the cable is designed to avoid or minimize environmental impacts. As explained in the previous discussion section, for the limited areas of the river bed where concrete mats will be installed, the benthic community is anticipated to redevelop. Therefore, we conclude that permanent habitat loss is not anticipated to occur and that any permanent habitat loss that may occur due to the limited use of concrete mats on the Hudson River segment of the facility has been minimized.

In its Conditional Concurrence with Consistency Certification, the DOS noted: “The most certain way to minimize the impact on benthic habitats is by siting the cable route to

avoid particularly sensitive habitats."[107] Applicants, in collaboration with the JP's Signatory Parties, including the DEC, DOS, DPS Staff, Riverkeeper, Scenic Hudson and Trout Unlimited, have developed a Facility route based upon existing habitat information, including state ESA habitat, that avoids to the maximum extent possible, areas recognized as sensitive habitat for aquatic species.[108]

The DOS Significant Habitats and DEC Exclusion Areas were designated specifically because they contain sensitive habitat relative to other areas of the river, including sensitive state ESA sturgeon habitat. The record shows that Applicants' negotiations with the Signatory Parties resulted in the designation of fifteen Exclusion Areas, to be avoided to the maximum extent possible. DEC Staff developed the Exclusion Areas based on an extensive analysis of river bottom bathymetry, fisheries data, acoustic fish tracking, annual Hudson River surveys of fish distribution, adult and juvenile sturgeon monitoring, submerged aquatic vegetation maps, tidal wetland maps, and existing Significant Habitats.[109]

The Exclusion Areas go above and beyond identifying legally protected habitats to include other areas considered to be high quality habitat, including state ESA sturgeon habitat. The record shows that DEC identified the state ESA as its authority for development of the Exclusion Areas and stated that

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[107] Letter from the New York State Department of State to Applicants regarding Conditional Concurrence with Consistency Certification (June 8, 2011) at 6, *available at* http://docs.dos.ny.gov/coastal/cd/F-2010-1162%20CondCCR_web.pdf.

[108] See, JP Paragraphs 51 and 54.

[109] Hearing Exhibit 102 (Description of Protected Areas within Hudson River); JP, Appendix C, Final Revised Proposed Certificate Conditions (January 18, 2013), ¶156(b)(1).

"[r]outing of the Project outside of the Exclusion Areas, to the maximum extent possible, will help avoid a taking of endangered or threatened species."[110]

The Facility will also avoid Significant Habitats to the maximum extent possible. The Significant Habitats are designated by the DOS under its Coastal Zone program because the designated habitat areas are essential to the survival of a large portion of a particular fish or wildlife population, support populations of rare and endangered species, are found in low frequency, support fish and wildlife that have significant commercial or recreational value, or would be difficult or impossible to replace.[111]

In addition, to the extent that the Facility is located within a Significant Habitat or Exclusion Area, construction windows will be used to avoid times when these areas are more likely to contain sensitive species, including state ESA sturgeon.[112] Furthermore, in the EM&CP project phase, Applicants will develop a final Facility design for five nearby Significant Habitats to minimize adverse environmental impacts to those areas.[113]

Next, Entergy argues that segments of state ESA sturgeon habitat outside Exclusion Areas and Significant Habitats have gone unstudied and unprotected. However, this argument ignores the substantial record in this proceeding

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[110] Id.

[111] Id.

[112] Revised, Final JP Appendix C, ¶156(b)(1); Hearing Exhibit 121 at 250-52 (Revised Environmental Impacts Assessment).

[113] Applicants state that all of these efforts were premised on the existing information from the other agencies primarily responsible for protecting these endangered species.

evaluating potential Hudson River impacts.[114] We conclude that the JP's provisions regarding the avoidance of Exclusion Areas and Significant Habitats were specifically designed to minimize potential adverse impacts and avoid the possibility of a state ESA sturgeon "take". Therefore, we reject Entergy's contention that additional assessment of potential impacts to state ESA sturgeon outside the Exclusion Areas and Significant Habitats is required.

In sum, by largely avoiding Significant Habitats and Exclusion Areas, including the river areas where state ESA sturgeon are believed more likely to occur, Applicants will avoid or minimize any potential impacts to sturgeon habitat, in accordance with the PSL §126(1) and the state ESA.

Minimizing Impacts in EM&CP Phase

As noted in the RD, during the EM&CP phase, the JP "provides that Applicants must develop a final Facility design that minimizes impacts to the five nearby DOS Significant Coastal Fish and Wildlife Habitats (SCFWH)."[115] Entergy argues that this provision improperly relegates the obligation to address impacts to state ESA sturgeon to a future time, and fails to establish that the state ESA is satisfied.

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[114] For example, Hearing Exhibit 121, EIA, at 149, §6, Physical and Chemical Characteristics of Major Aquatic Systems, assesses Hudson River water quality; water quality monitoring; bathymetry; sediment physical and chemical characteristics; marine disposal areas, dumping grounds, disposal sites, and spoil areas; use of concrete mat and rip-rap protection; and avoidance or minimization of adverse impacts. EIA §7, Fisheries, assesses Hudson River existing shellfish and benthic resources; existing finfish; existing essential fish habitat. EIA §9 addresses Hudson River existing conditions of threatened and endangered species; and avoidance or minimization of potential impact to these Hudson River resources.

[115] RD at 94.

Discussion

As noted above, we find that the Project has avoided or minimized potential environmental impacts in satisfaction of PSL §126, without reference to any further avoidance or minimization that may be achieved from the EM&CP Plan. In acknowledging that the Facility design would be finalized during the EM&CP project phase, when all final construction details are determined, the Judges merely recognized that there would be a further opportunity, after issuance of a Certificate, for Applicants to ensure that any potential risk to state ESA sturgeon habitat, or other potential adverse environmental impacts, are minimized to the greatest extent practicable. In sum, Entergy's argument regarding minimization during the EM&CP phase is inapposite.

Magnetic Field and Electromagnetic Field Impacts

The RD concludes that the magnetic field generated by the operation of the facility's HVDC cables will be localized and insignificant.[116] Entergy asserts that the HVDC cables may emit a magnetic field that may affect state ESA sturgeon.

In rejecting Entergy's arguments regarding potential magnetic field impacts on State ESA sturgeon, the Judges noted that modern DC cables are designed with sheathing to substantially reduce or eliminate direct electric field. It is

[116] In the RD, the Judges used the term electromagnetic field (EMF) generally, to apply to potential EMF and magnetic field impacts. On exceptions, Applicants clarify the distinction between EMF and magnetic field. We accept Applicants' clarification distinguishing the EMF and magnetic fields and agree that these terms were somewhat confused in the RD.

undisputed that magnetic field impacts diminish exponentially with distance from the cables.

Entergy asserts that the record demonstrates that the energized cables are expected to generate a magnetic field of 526.5 milligauss (mG). Entergy further asserts that Applicants, in the Environmental Impact Assessment (EIA), filed with their Application concede that the energized cables would create a deviation from the background magnetic field of up to 26.2 mG at 10 feet from the centerline at one foot above the riverbed. Consequently, Entergy concludes that the design and installation of the cables will not eliminate the magnetic field emanating from the Facility, nor does burial of the cables cancel out the magnetic field. Entergy contends that some fish species can detect and use the background magnetic field for navigation.

Entergy also contends that Applicants have not characterized the nature of magnetic field impacts for areas where concrete mats would be installed. For these areas, Entergy states that potential navigation impacts to ESA sturgeon may result in a "take" of ESA sturgeon. However, Entergy does not argue that the potential magnetic field will result in a violation of the state ESA, but only that potential magnetic field impacts could possibly adversely affect navigation of state ESA sturgeon, to an extent resulting in such a violation. Entergy asserts that, absent analysis comparing the magnitude and extent of the magnetic field generated by the cables to the sensory threshold and behavioral responses of state ESA sturgeon, it cannot be concluded that the magnetic field generated by the Facility will minimize impacts on state ESA sturgeon.

Applicants respond that the record includes uncontroverted expert testimony that "research studies on a variety of fish and other marine species have not reported

adverse effects of exposure to magnetic fields."[117] Regarding potential magnetic field impact on migratory behavior, the research shows that no single environmental stimulus such as current flow, light, smell, taste, magnetic field, temperature, or salinity dominates migratory behavior; instead, marine organisms have the means to coordinate and make use of multiple cues and resolve discrepancies.[118] In addition, Applicants note that the expert made these statements regarding the proposed Facility with the knowledge that certain limited portions of the cables would be installed under protective concrete mats.

Further, regarding the potential magnetic field impact on eggs and larvae, the data suggest "that much greater magnetic fields are required than the proposed cable will produce, in order to create deleterious effects on eggs and larvae" and that "as a percentage of the overall spawning numbers, the area of potential effect is small and extremely weak."[119]

Applicants also state that the Facility's cables will be buried in the ground or installed in a trench at the bottom of the waterways, and when installed in this manner, electric field levels are reduced to inconsequential levels because of the earth cover over the cables. Applicants state that the record shows that the Facility will not actually produce an EMF, but only a magnetic field.

Discussion

Entergy's principal argument, that state ESA sturgeon will respond to the magnetic field that the Facility is anticipated to induce, is contradicted and rebutted by expert record evidence.

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[117] Hearing Exhibit 64 at 57.

[118] Id. at 57.

[119] ID. at 59.

The magnetic field induced by operation of the Facility would be *de minimis* or non-existent throughout most of the Hudson River. The cables will be buried in a single trench, vertically on top of one another. This configuration also should result in the EMF and magnetic field from each cable essentially cancelling out the other, thereby further minimizing magnetic field impacts. Very little change in total geo-magnetic field would be expected, if the cables were to be buried at a depth of six feet.

Moreover, the record shows that cables will be buried to a depth of at least 15 feet, for portions of the cable located in the Hudson River's federal navigation channel, and at least six feet below the sediment floor, for portions of the cable located in the Hudson River outside the federal navigation channel. The zone of influence in which the magnetic field may be detectable above background levels will be focused directly above the facility centerline. Any magnetic field emanations will be reduced further, in proportion to the cable burial depth.

Indeed, migrating fish could potentially travel the full length of the Hudson without encountering the zone of influence. Moreover, because the magnetic field weakens rapidly with increasing distance from its source, the induced magnetic field would be strongest only within a small portion of the zone of influence. The record shows that burial of the cable as proposed would yield the least change in the background geomagnetic field.[120]

Furthermore, the analyses underlying the EIA considered the impact of the magnetic field on the migration, spawning, feeding, and development of aquatic species, including

[120] Hearing Exhibit 92, p. 8.

limited areas covering the cables with concrete mats.[121] The record supports the conclusion that no single environmental stimulus, such as magnetic field, dominates migratory behavior. To the extent that the magnetic field may affect navigation abilities of State ESA sturgeon, any such impact would be minimal, including avoidance of the waters nearest the cables. State ESA sturgeon and other marine organisms have the means to coordinate and make use of multiple cues and resolve discrepancies. In all instances, both expert testimony and the EIA conclude that the Facility's magnetic field would have no significant impact.[122] Nonetheless, as an additional protective measure, the JP provides that Applicants will be obligated to conduct a study of sturgeon movement patterns before and after the Facility is energized.[123]

We find no basis for Entergy's argument that low level magnetic field created by the Facility cables, including in areas where concrete mats will be installed, will adversely impact essential behaviors of ESA sturgeon. We find that the record supports a finding that the magnetic field induced by the Facility will have minimal impact, if any, on migratory species, including state ESA sturgeon, in the Hudson River. The Facility represents the minimum adverse environmental impact

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[121] Hearing Exhibit 24 at 10-16, 36-37 (Appendix B: Requests for Additional Information (Appendix B to the Supplement)), Hearing Exhibit 64 (NYSDEC-1 through NYSDEC-6), Hearing Exhibit 87 (Applicants' Letter to New York State Department of State regarding Updated Alternatives Analysis (January 18, 2011)), Hearing Exhibit 92, Hearing Exhibit 100 (Applicants' Letter to New York State Department of State, dated March 18, 2011).

[122] Hearing Exhibit 121 at 203 – 207.

[123] Revised, Final JP Appendix C, ¶163, and Attachment 4 (Atlantic Sturgeon Pre-Installation and Post-Energizing Hydrophone Scope of Study).

regarding magnetic field and EMF impacts, and further, the Facility conforms with the state ESA.

Hudson River Navigation Channel

The USACE has jurisdiction over dredge and fill activities in the waters of the United States and construction activities in federally-maintained navigation channels, including the federally-maintained navigation channel in the Hudson River.

Entergy cites a July 5, 2011 USACE letter to Applicants that states:

> The Corps of Engineers does not permit permanent structures within the length of the right of way, including side slopes, of a Federal navigation channel (perpendicular crossings are permitted) ... Laying the cables on lake/river bed in limited areas with protective coverings would not be acceptable ...
> As the Corps of Engineers does not permit permanent structures within the length of the right of way of a Federal navigation channel (crossings are permitted), the cables must be moved outside the NLC Federal navigation channel limits.[124]

Entergy interprets the USACE letter to be an absolute prohibition on locating permanent structures within the length of the right of way of a Federal navigation channel. Further, Entergy asserts that the letter precludes making a finding that the Facility represents the minimum adverse environmental impact.

However, as described in the RD, Applicants and Staff assert that USACE has not yet established parameters for this project or made a determination upon Applicants' USACE permit application. They contend that USACE establishes individual

[124] Hearing Exhibit 215.

permit conditions regarding the longitudinal installation or burial depth of submarine cables within federally maintained navigation channels on a case-by-case basis. Applicants and Staff cite the Bayonne Energy Center project as an example where the USACE issued a permit authorizing Bayonne to install its cables across and along several federal navigation channels.

Applicants, Staff, Scenic Hudson, and Riverkeeper emphasize that pursuant to revised Certificate Condition 95(a)(i), Applicants will bury the cable proposed in this proceeding at a depth of at least 15 feet below the authorized depth of the federally maintained navigation channel. Lastly, the Signatory Parties contend, and the Judges recommend, that we should not substitute our judgment for that of the USACE.

Discussion

The USACE's review of Applicant's project is ongoing, Entergy relies upon Hearing Exhibit 215 as if it were USACE's final determination on the USACE permit, and argues that we should not issue a Certificate which includes conditions conflicts with USACE policy, as set forth in Hearing Exhibit 215.

It is simply premature to guess the outcome of USACE's review. We decline to adopt Entergy's view that the USACE's July 5, 2011 letter is dispositive, particularly in light of the USACE permitting of Bayonne. Proposed Certificate Condition 9 provides Applicants cannot commence site preparation or construction until all the necessary permits and consents are received. In the event USACE imposes conditions conflicting with the Article VII Certificate, such conflicting conditions must be reconciled either with USACE or this Commission.[125]

[125] In the event USACE denies Applicants' federal application, the project could not go forward.

UNDERGROUNDING

The ALJs found ample support for the proposal that the transmission line should be underground (or underwater) given that:

> Undergrounding provides beneficial visual and land use impacts that would not be achieved if the transmission lines were above ground. In addition, undergrounding is the proposed method, supported by the signatories.[126]

The Judges' finding on this uncontested issue is well-supported on the record and reasonable, and we adopt it.

LONG-RANGE PLAN

The ALJs stated that the main challenges to our ability to find that the Facility "conforms to a long-range plan for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability" are claims by Entergy, IBEW and Central Hudson that the Facility would in effect be an "extension cord" with no NYS "on-ramps" providing access to existing in-State generation sources and would not address existing transmission constraints, especially in western and upstate portions of New York State.

The ALJs rejected such arguments for two reasons. First, they found that the challengers failed to point to any policy, rule, law or precedent that prohibits approval of a direct current transmission line. Second, they found that the 2009 State Energy Plan encourages facilities that, like this one, would provide infrastructure investments that support the State's transition to a clean energy economy, reduce greenhouse gas emissions, and allow the State to fully exploit the

[126] RD at 106.

potential benefits of additional Canadian imports. The ALJs further observed that the Facility would advance NYC's *PlaNYC* long-range goal of increasing NYC's clean energy supply by increasing the amount of clean energy that can be imported into the City.

The ALJs credited Staff's argument that the Facility would expand the State's electrical grid by providing an additional tie to Québec and to Québec's hydroelectric power, thus indirectly help relieve congestion on the existing HVAC electric transmission system.[127]

IPPNY claims that the Commission cannot find that the Project "conforms to a long-range plan for expansion of the electric power grid … which will serve the interests of the electric system economy and reliability" because the Project is uneconomic.[128] The ALJs rejected IPPNY's claim because the record did not demonstrate the Project was uneconomic.

Central Hudson, IBEW, the Business Council and IPPNY challenge the RD's conclusion that we have sufficient record bases to find that the Project conforms to a long-range plan for the State's electric grid. Central Hudson claims that the RD applied "policies developed in the context of short electric lines near New York City to the very different case of a long 'extension cord' electric line running virtually the length of the State from North to South." Central Hudson, IBEW and the Business Council assert that the need for grid improvements "to

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[127] RD at 106-108. The ALJs also noted that a System Reliability Impact Study for the interconnection of the HVDC Transmission System at NYPA's 345 kV bus located at Astoria has been completed by the NYISO, showing that the HVDC Transmission System can be connected to the New York State Bulk Power System without adversely affecting reliability.

[128] RD at 106-108. IPPNY renews this argument on exceptions.

the deliverability of bottled renewable and other upstate generation was simply not relevant to those earlier, near-NYC lines, but is very germane" in this proceeding. Opponents argue that the provision of some electric system benefits is insufficient and does no more than meet the "most narrow" of definitions of "expanding" the grid. Central Hudson asserts that we should establish, as a matter of policy in applying Article VII, that transmission corridor developers, including merchants, must propose a project that improves known grid constraints and problems, rather than a point to point delivery project.

IBEW also argues that approval of the Facility would provide foreign electric energy to a significant but relatively small congested area of the State with high demand and allow for the use of New York State land and waterways with no contribution to the economic well-being of the vast majority of communities and the power needs of constituents in Upstate and Western New York. IBEW asserts that, given the economic condition of northern and western New York, these vast areas with substantial populations should have been accorded greater consideration.[129]

Applicants argue that adoption of Central Hudson's argument would prevent the development of any future merchant transmission line. According to Applicants, merchant transmission lines can only be successful when the developer is able to exclude nonpaying customers, as is possible on HVDC lines and on radial generator leads, but not on the networked HVAC lines that would be required to meet Central Hudson's proposal. They add that Central Hudson and IBEW failed to identify any concrete transmission alternative to the Facility

[129] IBEW Brief on Exceptions at 2.

that would be frustrated if the Facility is approved. Applicants therefore conclude that, in the absence of any such competent evidence, Central Hudson's and IBEW's speculative concerns about the impacts the Facility might have on unidentified future projects at some unknown future date provide no basis for overturning the ALJs' finding that the Facility is consistent with long-range plans for the expansion of New York's electric power grid.

Staff argues that the Facility is consistent with long-range plans identified in the most recent State Energy Plan, which establishes as a policy objective, supporting the increased use of renewable energy and energy systems that enable the State to significantly reduce greenhouse gas emissions. Staff observes that the State Energy Plan recognizes that an increase in renewable energy will require additional transmission in-State.

Staff contends that the Facility provides the State with greater access to Québec's hydroelectric power without consuming capacity on New York's existing HVAC transmission system. Moreover, by increasing supply downstream of the congested interfaces, the Facility would reduce congestion on New York's HVAC transmission interfaces. Staff adds that the Facility is also consistent with long-range plans established in *PlaNYC*, which recognizes that providing New York City residents with increased access to renewable energy supplies will simultaneously reduce electricity prices, local air pollution, and greenhouse gas emissions in the City of New York.

Staff states that the ability of the Facility to advance these important public policy objectives of the State and New York City should be explicitly recognized by the

Commission in issuing a certificate, and provide the rationale for rejecting Central Hudson's arguments.[130]

Discussion

The exceptions on this issue merely repeat allegations that were raised and rejected by the ALJs below. As the RD states, the Project is consistent with express provisions of the 2009 State Energy Plan and New York City's *PlaNYC*, among other documents setting forth State planning goals. We therefore adopt the ALJs' recommendation, consistent with the arguments of Staff and Applicants in opposing exceptions, to find that this Facility "conforms to a long-range plan for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability." We rely, in particular, on the policy and planning objectives of the 2009 State Energy Plan that support projects, such as this Facility, which will enable increased State reliance on renewable energy and which will enhance transmission capacity into the New York City load pocket. In making this finding, however, we are not closing our eyes to the need to strengthen the State's AC transmission backbone. We have already initiated a major proceeding to do so.[131]

LOCAL LAWS AND REGULATIONS

The ALJs found *prima facie* justifications for the request made by Applicants and reflected in the JP that we waive the substantive requirements of the local laws and regulations listed in Hearing Exhibit 115. The Judges' finding on this uncontested issue is supported on the record and reasonable, and

[130] Staff at 16-17.

[131] Case 12-T-0502.

we adopt it. We further find that the Facility conforms to all applicable State and all other applicable local laws not set forth in Hearing Exhibit 115. We further find that the Project conforms to all applicable State laws and all other local laws not set forth on Hearing Exhibit 115.

PUBLIC INTEREST, CONVENIENCE AND NECESSITY

Emission Reductions and Fuel Diversity

The Facility's expected emission reduction and fuel diversity benefits and its ability to provide additional transmission capacity into New York City – features of the Facility that are uncontested – more than amply support our finding that the Facility will serve the public interest.[132]

Adequacy of Ratepayer Protection (Condition 15)

The ALJs noted that Applicants had proposed to build and operate the HVDC portion of the Facility without relying on cost-of-service rates[133] to recover the majority of the Project's costs.[134] The ALJs declined to focus on whether the Project would be merchant,[135] and instead focused on determining if there were sufficient bases to conclude that the majority of the Project's costs would not be funded by captive ratepayers. They found, *inter alia*, that proposed Certificate Condition 15

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[132] RD at 30-34, 64-65, and 72-73.

[133] RD at 69. The ALJs observed that, here, "cost-of-service rates" include any charges established by NYPA or a utility operating under cost-based regulation, including without limitation base rates, surcharges, adjustments, or any other recovery mechanism.

[134] RD at 10. Thus, they recognized that Applicants had reserved the right to recover the costs associated with the use of the Astoria Rainey cable to deliver energy and capacity not transmitted over the HVDC transmission system not as a merchant but rather pursuant to cost-based rates set by the FERC. RD at 10, footnote 15, citing Tr. 65, 76.

[135] RD at 67-72.

assigns the majority of the risk associated with the financing and recovery of Project costs to private investors and that a "demonstration that at least 75% of the [P]roject's output is under contract prior to commencing construction is consistent with Commission precedent in the HTP case (where the fact that approximately 76% of HTP's anticipated 660 MW output was already committed was sufficient for the Commission to find that it was merchant) and the Bayonne case (where the fact that 50% of its output was subject to identified and firm commitments was a sufficient basis for the Commission to find that is was a merchant project)."[136]

IPPNY and Entergy contend that the RD applies a far too narrow definition of a merchant project, asserting that such projects cannot rely on government or ratepayer dollars, directly (which they concede is not the issue here) or indirectly. They argue that indirect subsidization by the government will, of necessity, occur because the Project is uneconomic. Based on their shared view of the Project's economics, they renew claims that proposed Condition 15(b) must also prohibit any indirect subsidy, including, for example, prohibiting one or more of the Project's shippers from entering into an agreement with a New York State agency or authority to provide electricity to New York City at above-market prices. Indirect subsidies are the reason Entergy says it recommended additional conditions.[137]

Entergy and IPPNY also argue that we cannot rely on the 75% pre-subscription requirement because it does not prevent

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[136] RD at 71, citing HTP Order at 4 and Bayonne Order at 3.

[137] In the interest of brevity the proposed conditions are not recited here; see Entergy's Brief on Exceptions at 14-15 and/or the RD at 64 to review the additional conditions proposed by Entergy.

indirect subsidies and thus will not protect New York consumers against the adverse consequences that they opine are likely to be caused by indirect subsidies. IPPNY adds that, if existing resources are not able to meaningfully participate in the procurement process, perhaps due to its "discriminatory nature," the resulting contract will yield above-market prices. Entergy says that there will be significant adverse impacts if consumers are forced to fund the Project's costs, and therefore we cannot make the requisite public interest finding unless we expressly proscribe indirect subsidization. Entergy also asserts that the ALJs give "unreasonably short shrift" to whether a future change in business model by Applicants or future contractual arrangements by Applicants might result in costs of the Facility, in whole or in part, being recovered in cost-based rates.[138] Finally, Entergy asserts that the Project is "unquestionably non-merchant as to the Astoria-Rainey Cable" and, on that basis alone, is distinguishable from HTP and Bayonne and unworthy of review as a merchant.

IPPNY and Entergy concede that Condition 15(b) prohibits a direct subsidy."[139] For this reason, and because the commitments made by Applicants in Certificate Condition 15(b) go far beyond the commitments made by other merchant transmission

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[138] Entergy Brief on Exceptions at 8-9. Entergy also contends the RD applies the broader standard of need and benefit as established by the Commission in the Bayonne proceeding but did not consider (1) whether Applicants have carried their burden of proving that this project would actually be merchant or (2) whether the Facility's costs will be recovered exclusively through rates set by the competitive market. Because these contentions are belied by the RD's discussion at 67-72, we reject these claims.

[139] Briefs Opposing Exceptions by Applicants (at 32) and NYC (at 17), citing Briefs on Exceptions by IPPNY (at 28) and Entergy (at 14).

facilities approved by the Commission, Applicants argue that the ALJs correctly concluded that Condition 15(b) adequately protects captive ratepayers from being forced to bear the costs of the Facility in cost-based rates.

NYC asserts that IPPNY and Entergy presented no rationale to explain why a State agency or authority would elect to enter into a 25-year contract for 750 MW of transmission capacity at an above-market rate. Con Edison also argues that IPPNY and Entergy hypothesize a "speculative and highly unlikely scenario" and then fail to explain why someone would volunteer to pay above-market energy prices."[140]

NYC argues that the record supporting the ALJs' conclusions that "the risks associated with the financing and recovery of project costs will be borne, in large part, by private investors and that project revenues will be recovered from wholesale power transactions" is extensive and compelling.[141] NYC asserts that the ALJs properly evaluated whether the JP sufficiently ensures that the costs and risks of Facility development and operation would be borne by investors and also properly concluded that the "cost risk" associated with the Astoria-Rainey Cable is limited.

NYC contends that the record similarly supports the ALJs' decision to reject the argument that the pre-subscription requirement would compel, not prevent, indirect subsidies to the Facility. NYC notes that, under Condition 15(b), the Commission

[140] Con Edison at 2.

[141] NYC Brief Opposing Exceptions at 14-16.

retains the authority to review the subject contract before accepting Applicants' report if it so elects.[142]

Con Edison reiterates that one of its major concerns was the potential for the Project's risks and costs to be shifted from investors to utility ratepayers; and, to address this concern, it spent months negotiating with Applicants, ultimately obtaining changes that provide the strongest possible protections to customers from any subsidization of this Project.

Con Edison asserts that the 75% pre-subscription requirement will ensure that the Project does not go forward without a substantial portion of the capacity under contract. It adds that, if a willing buyer of that capacity establishes a price that is acceptable to the developer, that result is consistent with a competitive market.

Staff responds that those seeking conditions against indirect subsidization have not explained why consumers are at risk and how proposed Condition 15 fails to minimize that risk. Staff contends that allegations of "a phantom subsidy (the origin and form of which are never fully explained)" must be rejected as "baseless" and recognized as "fear of additional market competition."[143]

Discussion

The protections embodied in Condition 15 are adequate to protect consumers. The protections clearly prohibit the Facility from receiving cost-of-service rates, and that protection is sufficient to satisfy us that consumers are adequately protected from overpaying.

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[142] NYC states that it "assumes that the Commission may desire to review the contract underlying the report before it decides whether to 'accept' the report." NYC Brief Opposing Exceptions at 19.

[143] Staff Brief Opposing Exceptions at 20-21.

IPPNY and Entergy have focused much attention on the related question of whether the certificate should include a condition that prohibits the Facility from being financed indirectly via an agreement between a shipper, presumably HQ, and a utility we regulate, such as Con Edison, or a New York agency or authority. IPPNY and Entergy believe that such a condition is needed to protect consumers from a buyer that might in the future overpay for the electricity delivered by the Facility to New York City. As we noted above, through our regulation of the rates of Con Edison, we already have the authority to protect consumers from such an event, so we need not use the siting process to provide such protection. As for New York State authorities, we can presume that they can protect their own interests.

Moreover, we consider it important to maintain the possibility of a future power purchase agreement between a New York City buyer and a shipper. It is quite possible that the price offered by the shipper for Canadian hydroelectric power delivered to New York City could prove to be a good one, given the valuable characteristics of such power, and it may also be true that the whole enterprise could depend on a shipper obtaining a long-term power purchase agreement from a buyer. Therefore, the fact that the Certificate Conditions don't prohibit such an agreement is seen by us to be a positive element.

We presume that an important force behind IPPNY's and Entergy's views on this subject is their desire to prevent a possible future exercise of buyer market power. We have discussed above why it would be unwise to use the denial of a Certificate in a siting case for that purpose.

As for the issue of the definition of a merchant project, we reject IPPNY and Entergy's contention that the RD

applies a far too narrow definition of what it means to be a merchant project. The ALJs properly relied on our precedent to find that a project is non-merchant if its investors are seeking cost recovery through regulated cost-of-service rates and merchant when they are seeking to recover their costs through wholesale power transactions.

We furthermore reject Entergy's claims that any recovery of any portion of the costs associated with the HVAC cable should alter our conclusion that ratepayers are adequately protected from the majority of the Project's costs. The record establishes that the costs of the HVAC cable constitute about 10% of the overall Project cost, and not all of that small portion would be subject to recovery through cost-based FERC rates. Entergy makes no attempt to explain how provisions that prevent free ridership on the HVAC Astoria-Rainey Cable by virtue of cost-based FERC rates and that avoid constraining the existing capacity of Astoria Energy II can have any possible adverse consequences for the public interest; nor does it explain how ratepayer subsidy of the Astoria-Rainey cable is possible, given that the costs of the cable will be subject to regulatory scrutiny by us (via the filing provision of Condition 15) and also by FERC.

Job Creation

In the RD, the ALJs noted that "the evidence regarding the number of direct construction jobs that would be created if the Project is constructed is unopposed."[144] They therefore found that "Applicants' evidence regarding the number of direct construction jobs that would be created if the Project is

[144] RD at 120-121.

constructed provides support for the public interest finding that is required by PSL §126(1)(g)."[145]

The ALJs questioned the accuracy of Applicants' estimates of the indirect and induced jobs resulting from the construction and operation of the Facility. They noted opponents' assertion that jobs created by the Project must be offset by the loss of jobs it will cause but they found a lack of evidence substantiating this assertion. They ultimately recommended that the Project's potential for creating indirect and induced jobs, though imprecise and not a decisive decisional factor, should be viewed as additional support for the public interest finding required by PSL §126(1)(g).[146]

IPPNY asserts that the RD's conclusions about the Project's job-inducing effects rest on "flawed and internally-inconsistent conclusions concerning the Project's alleged capacity market benefits and wholesale energy savings."

Discussion

The Applicants' evidence on job creation was incomplete in a fundamental way. While evidence was proffered on the number of direct jobs created by the 1,000 MW Facility, the record is void on the critical question of whether those jobs would be offset, or more than offset, by the jobs displaced at the conventional generation facilities that would not be built as a consequence. IPPNY cited this important shortcoming and no party rectified it.

As was demonstrated in our discussion of the economics of the Facility, a reasonable way to analyze the Applicants' proposal to build the Facility is to compare the Facility to the resource that would otherwise have been built in the absence of

[145] Id.

[146] RD at 121-122.

the Facility. Staff's economic analysis followed this approach when it used a 1,000 MW combined cycle gas turbine located in New York City as the resource for which the Facility substitutes in New York's resource mix. Accordingly, for us to give any credit to an assertion of job creation, we need, at a minimum, a comparison of the Facility's job creation to the job creation of a combined cycle gas turbine. No such comparison was performed by any party.

IPPNY asserts that the Facility will be accompanied by a massive subsidy, and that the subsidy will cause lost jobs by taking money out of the hands of the source of the subsidy, presumably consumers. We find elsewhere that no such subsidy should be assumed to occur. Therefore, we reject IPPNY's assertion about subsidy-induced job losses.

Applicants cite wholesale price reductions caused by the Facility and estimates that substantial jobs will be created by the improved financial position of the retail buyers of electricity as a result of lowered electricity prices. As was found by the Judges, the number of jobs created by the wholesale price effect was heavily contested. We agree with the validity of this component of the overall accounting for job impacts.[147] Nevertheless, as just one component of an overall analysis, it cannot overcome the important failure of the Applicants to quantify the number of displaced jobs.

In conclusion, we will not give any weight, positive or negative, to the impact on jobs in our determination in this case.

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[147] A proper analysis would also account for the reduced profits of New York's existing generation owners and the resultant effect on New York jobs of reduced spending by the owners of New York generators.

NON-STATUTORY FINDINGS

CONTESTED

Co-Located Infrastructure

Proposed Certificate Conditions 27 through 29

Central Hudson objects to proposed Certificate Conditions 27 through 29, regarding co-located infrastructure.[148] Certificate Condition 27 sets a basic standard governing the Applicants' work in connection with co-located infrastructure: Applicants have committed to ensure that their project will be fully compatible with existing co-located infrastructure. Proposed Certificate Condition 28 imposes specific obligations on Applicants to consult with infrastructure owners or operators prior to finalizing designs and beginning construction. Proposed Certificate Condition 29 imposes upon Applicants certain cost reimbursement and indemnification obligations, and establishes a process by which any other infrastructure owners or operators (not limited to JP Signatory Parties) may secure cost reimbursement from the Applicants. Analyzing this issue below, the Judges found that there is no basis to conclude that Proposed Certificate Conditions 27 through 29 are designed to affect or displace laws governing existing rights and obligations of owners or operators of co-located infrastructure. The RD, at page 128, states:

> [i]n Article VII proceedings, the exact location of proposed facilities often is determined in the EM&CP process because that is when a certificate holder will have conducted the in-field inspections that will permit it and the staff of relevant agencies to ascertain whether there are any conditions that warrant a deviation that is

[148] JP, Appendix C, Final Revised Proposed Certificate Conditions (January 18, 2013), Proposed Certificate Conditions ¶¶27 through 29).

> still within the approved ROW but that may vary from the proposed centerline ... It is not yet clear where the proposed transmission line would be placed relative to existing infrastructure, but it is clear that the JP provisions at issue are designed to protect existing CI [Co-located Infrastructure] to the maximum extent practicable and to provide for reimbursement on reasonable terms. Finally, there is no basis for concluding that the provisions are designed to affect or displace laws governing parties' existing rights and obligations. Accordingly, we recommend that Central Hudson's opposition to the CI provisions be rejected [footnote omitted].

It is Central Hudson's view that in the event its co-located infrastructure is damaged by Applicants, Proposed Certificate Conditions 27 through 29 improperly would require Central Hudson to exhaust administrative remedies as a condition precedent to pursuing judicial remedies, by requiring Central Hudson to submit any disagreement to the Commission. Central Hudson contends that these Certificate Conditions may bind the JP Signatory Parties, but should not limit the rights of non-signatories, including Central Hudson, from pursuing judicial remedies.

Applicants respond that they accepted Conditions 27 through 29 in negotiations, in order to obtain an agreement by certain parties to the JP not to contest the grant of the Article VII Certificate. Applicants contend that although these Proposed Certificate Conditions address matters that are also governed by other laws -- both statutory and common law –- the conditions do not limit, restrict, replace, or modify such other laws. Applicants conclude that, to the extent that Proposed Certificate Conditions 27 through 29 create rights and impose liabilities, they can only be interpreted as creating rights and liabilities that are in addition to those created by such other laws.

VELCO states that Central Hudson asserts these arguments notwithstanding its acknowledgement that the Commission lacks the authority to restrict Central Hudson's access to the courts. VELCO further disputes Central Hudson's suggestion that the JP Signatory Parties have waived their rights to pursue other remedies and have agreed that the requirements of Condition 29 are prerequisites to pursuing other avenues available for seeking cost reimbursement. VELCO contends that none of Central Hudson's arguments regarding Proposed Certificate Conditions 27 through 29 have merit.

Staff emphasizes that the RD clearly states that "there is no basis for concluding that the provisions [Certificate Conditions 27 through 29] are designed to affect or displace laws governing parties' existing rights and obligations."[149] In addition, both Staff and Applicants have made affirmative statements that the proposed Certificate Conditions are not intended to, nor can they, impair Central Hudson's legal rights.

Discussion

A Certificate granted pursuant to PSL Article VII only places obligations and limitations upon the Certificate Holder. The provisions of the JP, including Proposed Certificate Conditions 27 through 29, do not purport to limit owners or operators of co-located infrastructure from seeking cost reimbursement through other available avenues, or to require such owners or operators seeking indemnification to employ the Condition 29 procedures.

To the extent that Central Hudson, or another owner or operator of co-located infrastructure, wishes to benefit from the cost reimbursement process created by Proposed Certificate

[149] RD at 128.

Condition 29, it must follow the procedures laid out in subparagraph (c). However, there is no basis for concluding that Proposed Certificate Conditions 27 through 29 are designed to affect or displace laws governing parties' existing rights and obligations regarding co-located infrastructure (except in the case of local municipal laws that the Commission explicitly overrides for being unreasonably restrictive).

We conclude that Central Hudson's exceptions regarding Proposed Certificate Conditions 27 through 29 are without merit.

Proposed Certificate Condition 5

Proposed Certificate Condition 5 provides:

> The portions of the Allowed Deviation Zone to be occupied by the Facility once construction is complete are referred to herein as the Facility ROW. The Certificate Holders shall also acquire and maintain the continuing right to enter onto and use certain additional lands immediately adjacent to the Facility ROW needed for repair and maintenance purposes, including preclusion of vegetative encroachment, on terms prohibiting the owners of such land from taking any action on that land that would interfere with such repair and maintenance activities.

Central Hudson objects to Proposed Certificate Condition 5. Central Hudson claims that Condition 5 is overbroad, mandating greater acquisitions of property rights by Applicants than actually may be required. Central Hudson also claims that Condition 5 provides Applicants with paramount authority over property rights of utility owners or operators of pre-existing co-located infrastructure. The RD rejected both arguments.

Central Hudson excepts, asserting that Proposed Certificate Condition 5 should be revised to authorize the Certificate Holders to acquire such lands and/or land rights to the extent consistent with all applicable requirements of law

and necessary for project construction, but should not mandate that the Certificate Holders make such acquisitions. Condition 5 should be further revised, Central Hudson contends, by striking the following phrase: “terms prohibiting the owners of such land from taking any action on that land that would interfere with such repair and maintenance activities.” Central Hudson argues that this phrase would improperly establish superior property rights in the Applicants over Central Hudson's pre-existing facilities (or property of other owners or operators of co-located infrastructure), and concludes that Article VII provides no authority for such a Certificate Condition.

Staff asserts that Proposed Certificate Condition 5, considered in its entirety, is appropriate and will not interfere with Central Hudson’s ability to maintain its existing infrastructure. Staff states that the requirement to obtain the right to enter and use certain lands is limited by Condition 5 to “certain additional lands immediately adjacent to the Facility ROW needed for repair and maintenance purposes.” These provisions of Conditions, Staff asserts, are not universal as Central Hudson posits; rather, these provisions are limited to the property rights that the Certificate Holders will need in order to maintain and repair their Facility in the future.

Staff explains that the requirement that the property rights be sufficient to avoid interference with the Certificate Holders’ ability to maintain and repair their Facility will ensure that Certificate Holders will not be prevented from performing necessary maintenance and repair of the Facility by adjacent or underlying landowners. Further, Staff contends that Condition 5 is limited by Conditions 27 through 29. Staff asserts that Condition 27 requires that the Facility must be fully compatible with co-located infrastructure. Therefore,

reading Conditions 27 and 5 together, Staff reasons that these Conditions preclude Certificate Holders from interfering with Central Hudson's existing co-located infrastructure (or the existing co-located infrastructure of any other owner or operator).

Discussion

Central Hudson's exceptions to Proposed Certificate Condition 5 are rejected. Condition 5 would not prevent Central Hudson (or any other owner or operator of co-located infrastructure) from repairing or maintaining its own infrastructure. We adopt Staff's view that Conditions 27 and 5, read together, preclude Certificate Holders from interfering with Central Hudson's co-located infrastructure (or the co-located infrastructure of any other owner or operator).

UNCONTESTED

Litigation of Rights to State-Owned Land

The ALJs stated that this proceeding is not the appropriate venue for litigating land rights given that, even with an Article VII certificate, Applicants will have to acquire any necessary land rights through other applicable means.[150] With the exception of DEC urging us to accept the conclusion that this proceeding is not the appropriate forum for determining the Office of General Services' authority to grant leases for or other property rights to land under Lake Champlain, but otherwise ignore the ALJs "dicta" on this issue, no party addressed this topic in their briefs on exceptions.

EM&CP Guidelines

The ALJs noted that the proposed BMPs and EM&CP Guidelines (JP ¶¶24, 152; Appendices E & F) were unopposed and are consistent with similar practices and guidelines adopted in

[150] RD at 113.

other Article VII proceedings.[151] No party takes exception to their resulting recommendation to adopt and apply the proposed practices and guidelines to the Facility.

Water Quality Certification

The ALJs recommended that the proposed WQC be issued by the Director of OEEE prior to the expiration of the USACE's February 24, 2013 waiver deadline.[152] As noted above, the WQC was issued by OEEE's Director on January 18, 2013. No party took exception.

Other Issues

JP ¶5 – deletion of "directly"

JP ¶5 begins by stating:

> Nothing in this Joint Proposal or any appendix thereto is intended: (a) to directly impose any obligations on or limit ay pre-existing rights of any party other than Applicants;

In response to concerns expressed by Central Hudson, the ALJs recommended that the word "directly" be deleted from JP ¶5(a).[153] No party excepted.

Certificate Condition 15(a)

Certificate Condition 15(a) states in relevant part that the Certificate is granted and the required determinations of need and public interest are explicitly contingent on Certificate Holders delivering a minimum of 1,550 MW of energy out of NYPA's Astoria substation. Central Hudson opposed Certificate Condition 15(a), claiming it is unknown whether the deliverability criterion can be met. The ALJs observed that Central Hudson's position in this regard had been refuted by (1)

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[151] RD at 136-137.

[152] RD at 139.

[153] RD at 129.

Hearing Exhibit 151, a stipulation between Applicants and Con Edison, in which Con Edison agreed that the deliverability target had been met, and (2) Applicants' Deliverability Panel testimony[154] that the Astoria Annex Phase Angle Regulator, together with NYPA's two existing lines and the Astoria-Rainey Cable, would be able to deliver more than 1,550 MW of electric energy out of the Astoria substation.[155] Central Hudson did not reiterate its position on exceptions.

Certificate Conditions, Section S, ¶¶138-144[156]

Central Hudson asserted that Certificate Conditions in Section S, entitled "Mapping, Land Acquisition, and as-built Drawings for the Facility," should be modified to assure that Central Hudson is provided with as-built drawings for any new facility or acquisition of any interest in land within 50 feet of existing Central Hudson property and for the full length of the route in the Hudson River within Central Hudson's service territory. Applicants responded that proposed certificate Condition 139 requires them to provide DPS Staff with as-built design drawings for each Facility segment following final completion of construction of that segment and that they would also provide copies of such drawings to Central Hudson for portions of the Facility in Central Hudson's service territory, so long as Central Hudson agrees to maintain the confidentiality of any Critical Infrastructure Information contained in those drawings. The ALJs found that there was no obvious dispute on this issue and opined that Applicants and Central Hudson should

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[154] Tr. 577-578.

[155] RD at 132.

[156] Provisions concerning mapping, land acquisition and "as-built" drawings for the facility. See JP Appendix C, dated January 18, 2013.

be able to agree to a process for sharing such information.[157] Neither party excepted.

Non-adoption of Specified JP Paragraphs

The ALJs recommended that the general terms governing the behavior and rights of the JP signatories, including paragraphs 1, 2, 3, 4, 6, 7, 8 and 9, not be adopted as terms of the Commission Order if a certificate is granted. They observed that if and to the extent the Commission adopts the terms of the JP, Central Hudson will have the same rights as any other party with respect to filing a petition with the Commission regarding the correct interpretation of one or more of the Order's terms or requesting dispute resolution assistance or services.[158] There were no exceptions.

[157] RD at 134.

[158] RD at 134-135.

Other Central Hudson Concerns

Non-specific Claims

Central Hudson expressed confusion about JP paragraphs 11, (and maybe 12), 107-119, 122, 132, 136-138 and 140 and opposed all or portions of JP ¶¶11, 20, 107-119, 122, 132, 136-138, and 140, and proposed Certificate Condition 5. The ALJs found there was insufficient explanation of the bases for confusion or opposition to these provisions to provide a response and therefore recommended that Central Hudson's opposition to these provisions be rejected.[159] Central Hudson did not pursue these issues on exceptions.

Discrimination Claims

Section §28-105.1 of the New York Administrative Code (N.Y. Adm. Code) makes it unlawful to construct a building in New York City without first obtaining a written permit. This permit, in turn, implicates N.Y. Adm. Code §28-105.12.7.1, a section that requires Applicants to procure insurance to, *inter alia*, insure adjacent property owners from loss, property damage and personal injury. Central Hudson claimed that the JP was discriminatory because "[t]he City Administrative Code requires essentially the indemnification protections to property affected by the proposed facilities in New York City that Central Hudson requested Applicants provide to Central Hudson's pre-existing property and operations that would be similarly affected by the proposed facility." The ALJs rejected Central Hudson's claim for being untimely (i.e., it was raised for the first time in reply brief).[160] They also rejected the claim because Central Hudson asserted that it was "similarly situated" to NYC when, in fact, it was not; the ALJs reasoned that the Administrative Code

[159] RD at 135.

[160] RD at 136.

section cited by Central Hudson applies because Applicants plan to build the converter station in New York City, not because they plan to lay cable there.[161] In addition, the ALJ noted that, with regard to plans to lay cable, Central Hudson has the same protections as any other owner or operator of co-located infrastructure.[162]

Central Hudson also claimed that discrimination was evidenced by the presence of the proposed environmental Trust because it will be pre-funded while the CI provisions do not provide for pre-funding. The ALJs recommended rejection of Central Hudson's assertion.[163] Central Hudson no longer pursues these issues on exceptions.

Conclusion Regarding Uncontested Matters

We find the Judges' conclusions on the foregoing, uncontested issues to be well-supported on the record and reasonable, and we adopt them.

CONCLUSION

PSL §126 requires that we find and determine need for a proposed facility; whether a facility will achieve the minimum imposition of adverse environmental impacts, considering the state of available technology and the nature and economics of various alternatives; what portion of the line should be underground; that the facility conforms to a long-range plan for expanding the State grid; and that the location of the facility conforms to applicable State and local laws and regulations, except for those local laws we refuse to apply because they are

[161] Id.

[162] Id.

[163] Id.

unreasonably restrictive in view of the existing technology, factors of cost or economics, or the needs of consumers; and that the facility will serve the public interest, convenience, and necessity. After considering all of the relevant factors, we find and determine that the record in this proceeding enables us to make the findings that are set forth in PSL §126(1)(a), (b), (c), (d)(1) and(2), (f) and (g).

This 1,000 MW Facility would allow imports of energy, nearly year round, into one of the most congested load pockets in the State. The energy imported could amount to over 10% of the energy consumption in New York City. This is a significant amount of additional capability that would enhance energy security to the City by providing another source of power into the City.

New York City relies significantly on gas- and oil-fired generation, thus raising fuel diversity concerns and electric reliability concerns. The addition of this Facility would allow renewable energy imports, thus increasing diversity of the City electricity supply sources and improving electric reliability. Providing this magnitude of renewable energy from local resources would be extremely difficult and would take a long time, even if possible.

Demand for natural gas use is increasing in New York City due to increased use of gas for electric generation and the gas conversion needs resulting from NYC rules to phase out use of #4 and #6 oils for home and business heating purposes. The increase in gas demand is putting a strain on the gas transportation system into and within the City. This Facility would help reduce the strain by allowing imports of electricity from outside the City.

The City is a load pocket with in which pivotal suppliers have the ability to exercise market power through

restrained by market rules enforced by FERC. Addition of a major new supplier into the pocket would help reduce the ability of various players to exercise market power.

We are recognizing the price stability benefits that flow from using energy generated by hydro resources and according weight to such a benefit as additional support for finding economic need for this Project.

Lastly, the need for this Project has been demonstrated by the Project's ability to advance important public policies set forth in the State Energy Plan and *PlaNYC,* among other documents expressing State policy.

Based on the foregoing, we conclude that there are sufficient bases in the record to find and determine need for this Project.

In addressing the nature and minimization of potential environmental impacts, it is significant that, because the Facility is subaquatic and underground, potential adverse visual impacts have been largely avoided. At the same time, the detailed provisions of the JP protect the State's valuable natural resources by ensuring that Lake Champlain and riverine benthic habitat is not lost and that environmental impacts are minimized. The subaquatic Facility segments have been routed to avoid, to the maximum extent practicable, areas deemed environmentally sensitive by DOS and DEC. Where the Facility would be located within a significant habitat or exclusion area, construction will be restricted to avoid times when these areas are more likely to contain sensitive species, thereby avoiding impacts during important life cycle periods. We find that any magnetic field induced by the Facility will have de minimus impact, if any, on migratory species, in the Hudson River.

The upland Facility segments primarily are located in existing railroad or State highway rights-of-way. Selective use

of horizontal directional drilling for upland segments and for land to water transitions, as proposed, will serve to avoid or minimize potential adverse environmental impacts.

We find that the nature of the probable environmental impacts have been identified, and further, that the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, and other pertinent considerations, including but not limited to, the effect on agricultural lands, wetlands, parklands, and river corridors.

We find that the Facility's transmission lines should be underground or underwater, as proposed.

We find that the Facility conforms to a long-range plan for expansion of the electric power grid serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability, in particular the planning objectives contained in the State's 2009 Energy Plan. The Champlain Hudson Power Express Facility can be constructed and operated consistent with the achievement of the State's long-range energy planning objectives. In allowing development of this New York interconnection with the regional transmission system of Quebec, Canada, we continue the State's efforts to increase use of renewable energy resources and to bring such resources to the State's major urban areas. As we have observed in other recent Article VII proceedings, there is a continuing need in the downstate area to establish better interconnections with our neighboring regional transmission systems, to provide citizens better access to diverse, renewable generation resources and stronger transmission ties than those currently existing.

We grant Applicants' request that we waive the substantive requirements of the local laws and regulations

listed in Hearing Exhibit 115 and find that the Project otherwise conforms to applicable State and local laws.

Finally, we conclude that the Project will serve the public interest, convenience and necessity. That this Project will serve New York City load while displacing more-polluting generation sources, advance major energy and policy goals as set forth in the City's *PlaNYC 2030: A Greener, Greater New York* and in Commission and State documents, and rely almost entirely on private investment are significant Project benefits, which can be realized without substantial negative environmental impacts. A decision not to permit the Project the opportunity to proceed will, in all likelihood, mean that these unique and substantial benefits will not be realized. Ratepayers are not assuming the risks associated with the investment in the project. The Certificate Conditions and stipulations effectively shield ratepayers from the project's construction and operation risks. This is precisely what the competitive markets envisioned: project developers taking calculated risks and investing in resources that ultimately provide benefits to consumers.

RD CORRECTIONS:

We adopt the following corrections to the RD:

1. On page 3, the second full sentence, reads, in relevant part as follows: "The JP, attached as Appendix 2, has the following signatories: …." The JP was not attached to the RD so the sentence should read "The JP has the following signatories: …."
2. On page 7, the second sentence of the second full paragraph lacks the words "converter station" after "HVDC." The sentence should read: "The HVDC converter station would be a "compact type" with a total footprint (i.e., building and

associated areas and equipment) of approximately 4.5 acres."

3. On page 31, in the last sentence of the first full paragraph the word "million" should be inserted between "1.5" and "tons" so that the sentence reads: "For the State as a whole, Staff witnesses Gjonaj and Wheat calculated expected annual air pollutant emissions reductions of SO_2, NO_x, and CO_2 to be 751, 641, and about 1.5 million tons per year, respectively, in 2018 (footnote omitted)."
4. On page 80, in discussing Certificate Condition 99, the second full paragraph states "The dredged material will be placed in scows and either replaced in the trench or pits (if determined by the appropriate permitting authority to be suitable for replacement), or removed for disposition at an authorized location…Placement of imported backfill when dredge spoil is not used would create some additional increases in suspended sediment." In fact, Certificate Condition 99 prohibits the use of dredge materials for backfill.
5. On page 105, the RD recites Staff's statement that the Facility's underground configuration "requires a 35-foot ROW to protect the cables." We note that Certificate Condition 140, however, states that "[e]ach edge of the permanent overland Facility ROW shall be no closer than (a) when located entirely within lands owned or controlled by a railroad company or a public highway, six (6) feet to the outer surface of the nearest installed cable and (b), in all other areas, eight (8) feet to the outer surface of the nearest installed cable."

The Commission orders:

1. Except as here modified, the Recommended Decision of Administrative Law Judges Michelle L. Phillips and Kevin J. Casutto is adopted as part of this Order. Except as here granted, all exceptions to the Recommended Decision are denied.

2. Except as modified in the RD and to the extent consistent with the discussion in this Order, the terms and provisions of the February 24, 2012 Joint Proposal submitted by Champlain Hudson Power Express, Inc., and CHPE Properties, Inc. on behalf of the Signatory Parties to the Joint Proposal, and stipulations dated July 11, 2012 (Luyster Creek), June 4, 2012 (Certificate Condition 15), June 26, 2012 (Deliverability), and October 19, 2012 (Trust), and attached to this Order, are adopted and made a part of this Order.

3. Subject to the conditions adopted in this Order, Champlain Hudson Power Express, Inc., and CHPE Properties, Inc. (Certificate Holders) are granted a Certificate of Environmental Compatibility and Public Need (Certificate) authorizing construction and operation of a 1,000 MW, High Voltage Direct Current (HVDC) sub-aquatic and underground electric transmission line, approximately 332 miles, from the Canadian border to a Converter Station to be located in the Astoria Annex of Con Edison, and a 345 kV AC transmission line, approximately 3 miles, from Con Edison’s Astoria Annex to Con Edison’s Rainey Substation in Astoria, within New York State along the project route depicted as Joint Proposal Appendix B, and Hearing Exhibit 152 attached hereto (Certified Route), and associated equipment comprising the Facility. The Facility is the New York State portion of a sub-aquatic high voltage direct current transmission line linking the Facility with the Province of Quebec, Canada, HVDC Interconnection.

4. The terms of the Certificate Conditions included as Joint Proposal, Appendix C, attached to this Order are hereby approved and incorporated into this Order, including the requirement that the Certificate Holder shall, within 30 days after the issuance of the Certificate, submit to the Public Service Commission either a petition for rehearing or a verified statement that it accepts and shall comply with the Certificate and the conditions placed upon the Certificate.

5. A Water Quality Certification pursuant to §401 of the Clean Water Act (33 U.S.C. §1341(a)(1)) and PSL Article VII having previously been issued, it is hereby certified that, if the Certificate Holders submit an acceptable Environmental Management and Construction Plan (EM&CP) and comply with all conditions contained in this Order, construction of the facility will comply with the applicable requirements of §§301, 302, 306 and 307 of the Clean Water Act, as amended, and will not violate New York State Water Quality standards and requirements.

6. The Certificate Holders shall file one or more Environmental Management and Construction Plans for the Project, either as a single filing or as a sequence of filings each pertaining to a segment of the Project, as provided in the Certificate Conditions. Certificate Holders shall not commence construction on any segment of the Project until the Commission has, by written Order, approved an EM&CP pertaining to that segment. Consistent with the Proposed Certificate Conditions, Certificate Holders shall provide notice to all landowners adjoining the Project or adjoining the Project segment, as may be appropriate, for each EM&CP filing.

7. Prior to the commencement of construction, the Certificate Holders shall comply with those requirements of Public Service Law §68 that do not relate to the construction

and operation of the facility by obtaining Commission permission and approval as an electric corporation.

8. This Certificate may be vacated if the Certificate Holders fail to file an EM&CP or to commence construction consistent with the milestones set forth in Certificate Condition 13.

9. This proceeding is continued.

By the Commission,

(SIGNED) JEFFREY C. COHEN
Acting Secretary

Case No.: 10-T-0139

CHAMPLAIN HUDSON POWER EXPRESS, INC.

JOINT PROPOSAL

February 24, 2012

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BEFORE THE
PUBLIC SERVICE COMMISSION
STATE OF NEW YORK

Application of Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law for the Construction, Operation and Maintenance of a High-Voltage Direct Current Circuit from the Canadian Border to New York City.	)	Case No. 10-T-0139

JOINT PROPOSAL

Champlain Hudson Power Express, Inc. ("CHPEI"), CHPE Properties, Inc. ("CHPE Properties," and, together with CHPEI, "the Applicants"), Staff of the New York State Department of Public Service designated to represent the public interest in this proceeding ("DPS Staff"), the New York State Department of Environmental Conservation ("NYSDEC"), the New York State Department of State ("NYSDOS"), the New York State Department of Transportation ("NYSDOT"), the Adirondack Park Agency ("APA"), the New York State Department of Agriculture and Markets ("Ag & Mkts"), Riverkeeper, Inc. ("Riverkeeper"), Scenic Hudson, Inc. ("Scenic Hudson"), the City of Yonkers, the New York State Council of Trout Unlimited ("Trout Unlimited"), the City of New York ("CNY"), the New York State Office of Parks, Recreation and Historic Preservation ("OPRHP") and the Palisades Interstate Park Commission, and any other parties executing this Joint Proposal (collectively, "the Signatory Parties") respectfully submit this Joint Proposal on the 24th day of February, 2012,

pursuant to Rule 3.9 of the New York State Public Service Commission's ("Commission") Procedural Rules, 16 N.Y.C.R.R. § 3.9 (2011).

INTRODUCTION AND BACKGROUND

On March 30, 2010, CHPEI submitted a compilation of studies, analyses and other documents (the "Original Application"), purporting to satisfy the requirements of Article VII of the New York State Public Service Law ("PSL"), to the Commission, seeking a Certificate of Environmental Compatibility and Public Need ("Certificate"), pursuant to PSL Article VII, to construct the Champlain Hudson High Voltage Direct Current ("HVDC") Transmission System (the "HVDC Transmission System") including a voltage converter station (the "Converter Station") at a site in Yonkers, New York from the Canadian border in the Town of Champlain, New York, to points of interconnection with the Consolidated Edison Company of New York, Inc. ("Con Edison") in Manhattan and with the facilities of United Illuminating Company in Bridgeport, Connecticut.

The Original Application was supplemented by Applicants on July 22, 2010, July 29, 2010, August 6, 2010, and August 11, 2010. By letter dated August 12, 2010, the Secretary of the Commission ("Secretary") determined that the submitted documents, as supplemented, were filed or otherwise in compliance with the filing requirements of PSL Article VII as of August 11, 2010. Applicants' July 22, 2010 supplement also informed the Commission and the active parties that the Applicants were revising the proposal to eliminate the HVDC circuit between the Canadian Border and Bridgeport, Connecticut, and were changing the end point of the line in New York City from Sherman Creek to a substation in Astoria, Queens, New York, owned by the New York Power Authority ("NYPA").

On October 27, 2010, DPS Staff submitted a letter to the Commission identifying three alternative route segments and an alternative location for the HVDC Transmission System's Converter Station. Specifically, DPS Staff proposed: (1) that the HVDC Transmission System should run for approximately one hundred (100) miles along right-of-way ("ROW") owned or operated by railroads on the west side of the Hudson River from the Town of Bethlehem, New York, to the Town of Clarkstown, New York (the "Hudson River Western Rail Line Route"); (2) that the HVDC Transmission System should run along the NYSDOT ROW on the northerly and easterly banks of the Harlem River for approximately six miles to the rail yards west of Willis Avenue ("the Harlem River Rail Route"); (3) that the HVDC Transmission System should follow the NYSDOT ROW from the Willis Avenue Bridge through NYSDOT's Harlem Rail Yard to the East River, thereby avoiding the need to run through Hell Gate ("the Hell Gate Bypass Route"): and (4) that the Converter Station should be located in NYSDOT's Harlem Rail Yard rather than in Yonkers.

Applicants have agreed to construct the facilities and implement such measures as are necessary to permit at least 1,550 MW of electric energy to be delivered from NYPA's 345 kV Astoria Substation into Con Edison's 345 kV system unless prevented by a transmission system outage, maintenance outage, or the 'New York State Power System' is in an 'Emergency' or an 'Emergency State', as such terms are defined in the New York Independent System Operator, Inc.'s ("NYISO") Open Access Transmission Tariff ("OATT"), that prevents the delivery of 1,550 MW of energy out of NYPA's Astoria substation. To achieve this result, Applicants propose to construct a 345 kV High Voltage Alternating Current ("HVAC") cable circuit from the NYPA gas insulated switchgear ("GIS") substation to Con Edison's Rainey Substation (the "Astoria-Rainey Cable"), and to pursue the implementation of a Special Protection System or other operational measure(s) through the NYISO, the Northeast Power Coordinating Council

("NPCC") or other applicable authorities.[1] Together, the HVDC Transmission System and the Astoria-Rainey Cable comprise the Project proposal and are collectively referred to herein as the "Facility." The Applicants will pursue other solutions to this deliverability requirement if an Operational Measure cannot be implemented**,** provided that the Facility remains economic with the incremental cost of such other solutions.

Procedural conferences were held in this proceeding before Administrative Law Judges ("ALJs") Michelle L. Phillips and Kevin J. Casutto on September 21, 2010, and January 19, 2011. Public statement hearings were held before ALJs Phillips and Casutto on the following dates and at the following locations: October 24, 2010, in Yonkers, New York; October 28, 2010, in Kingston, New York; November 3, 2010, in Schenectady, New York; November 4, 2010, in Whitehall, New York; and, November 9, 2010, in Plattsburgh, New York. Applicants also hosted informal informational sessions for the public on the following dates and at the following locations: March 9, 2010, in Albany, New York; April 13, 2010, in Plattsburgh, New York; April 20, 2010, in Kingston, New York; May 4, 2010, in Scotia, New York; and May 12, 2010, in Yonkers, New York.

After exploratory discussions among the parties, a Notice of Impending Settlement Negotiations was filed with the Secretary by the Applicants and served on all parties on November 2, 2010. Over fifty (50) Settlement conferences were held between the period of November of 2010 and February of 2012. In addition, a number of conference calls and technical meetings were also held. Electronic communications facilitated the settlement process, as well as numerous discovery requests.

[1] If Con Edison moves forward with the installation of a phase angle regulating transformer ("PAR") connected to NYPA's Astoria 345 kV substation as it recently proposed in the NYISO stakeholder process, the Converter Station will also include a four-breaker 345 kV GIS ring bus connected to NYPA's Astoria substation.

After thorough discussion of the issues, the Signatory Parties recognize that their various positions can be addressed through settlement and agree that settlement is now feasible. The Signatory Parties further believe that this Joint Proposal gives fair and reasonable consideration to the interests of all parties and that its approval by the Commission is in the public interest. The Signatory Parties have made good faith efforts to accommodate the positions of the non-Signatory Parties.

TERMS OF THE JOINT PROPOSAL

I. GENERAL PROVISIONS

1. The support of the Signatory Parties for this Joint Proposal is expressly conditioned upon acceptance or approval by the Commission of all provisions thereof, without material change or condition. In the event that the Commission does not accept or approve this Joint Proposal in its entirety and without material change or condition, the Signatory Parties shall be free to pursue their respective positions in this proceeding without prejudice.

2. The Signatory Parties have entered into the Joint Proposal on the express understanding that it constitutes a negotiated resolution of the issues in this proceeding and that no Signatory Party shall be deemed to have approved, accepted, agreed to or otherwise consented to any legal or regulatory principle or methodology underlying or supposed to underlie any of the provisions of this Joint Proposal. The terms and provisions of this Joint Proposal apply solely to, and are binding only in, the context of the present Article VII proceeding and do not necessarily reflect the position any Signatory Party would take in a future adjudicatory proceeding. Each Signatory Party reserves the right in future Article VII proceedings to propose or include such terms and conditions as it may deem appropriate.

3. The discussions that produced this Joint Proposal have been conducted on the explicit understanding, pursuant to Rule 3.9(d) of the Commission's Procedural Rules, 16 N.Y.C.R.R. § 3.9(d) (2011), that any discussions among the Signatory Parties with respect to this Joint Proposal prior to the execution and filing thereof shall not be subject to discovery or admissible as evidence.

4. The Signatory Parties recognize that certain provisions of this Joint Proposal contemplate actions to be taken in the future to effectuate fully this Joint Proposal, including the review under the National Environmental Policy Act ("NEPA"), which must be completed in order to allow Federal agencies to issue permits and approvals necessary in order to allow construction of the Facility to proceed. Accordingly, the Signatory Parties agree to cooperate with each other in good faith in taking such actions and to refrain from taking any action(s) or position(s) in these or any other federal proceedings relating to the siting or other environmental impacts of the Facility that would conflict with the construction and operation of the Facility as agreed to in this Joint Proposal, with the exception that the authority and responsibilities of NYSDOS pursuant to Article 42 of the Executive Law and 15 C.F.R. Part 930 subpart D are not affected by this provision.

5. Nothing in this Joint Proposal or any appendix thereto is intended:

   a. to directly impose any obligations on or limit any pre-existing rights of any party other than Applicants; or

   b. to require the payment of incidental, consequential, or punitive damages by the Applicants, except as expressly stated in the Proposed Certificate Conditions (Appendix C"), Condition 29(d); or

   c. to obligate the Applicants to pay for damage to any existing co-located infrastructure ("CI"), as defined in Condition 27 of Appendix C, attributable to

the defective condition of such existing CI, or to restore such existing CI to a better condition than that existing immediately prior to the commencement of construction in the immediate vicinity of such existing CI; or

d. to obligate the Applicants to pay for any damage to any existing CI which could have been avoided by the exercise of reasonable care by the owner(s) and/or operator(s) thereof; or

e. to limit in any way any rights the Applicants may have in law or in equity to receive compensation from any owner(s) and/or operator(s) of CI for any damage to the Facility or injury to workers caused in whole or in part by the construction, operation, maintenance, or repair of any CI by the owner(s) and/or operator(s) thereof.

6. The Signatory Parties agree that, if a new material issue is raised by the public at any public statement hearing held in this proceeding after the filing of this Joint Proposal or in public comments timely submitted in connection with the filed Joint Proposal, nothing in this Joint Proposal shall be regarded as restricting in any way the ability of DPS Staff or the NYSDOS to address that new material issue in its testimony or pleadings filed in this proceeding, provided DPS Staff or the NYSDOS notifies all parties of its determination that a new material issue has been presented within thirty (30) days following the conclusion of the last public statement hearing (if the new issue is raised for the first time in a public statement hearing) or the close of any public comment period (if the new issue is raised for the first time in public comments filed within the public comment period). Except as expressly provided in the preceding sentence or to the extent a Signatory Party has expressly reserved its position on one or more issues addressed in the Joint Proposal, all Signatory Parties agree to support Commission approval of the

Joint Proposal in any pleadings or testimony filed in this proceeding. In order to qualify as a material issue for purposes of this provision, an issue must have a material bearing on a finding that the Commission is required to make or a condition that the signatory parties have agreed should be imposed under PSL § 126 in this proceeding or that pertains to the obligations and responsibilities of the NYSDOS pursuant to Articles 6, 6B and 42 of the New York State Executive Law.

7. In the event of any disagreement over the interpretation of this Joint Proposal, or implementation of any of the provisions thereof, that cannot be resolved informally among the Signatory Parties, such disagreement shall be resolved in the following manner:

   a. the Signatory Parties shall promptly convene a conference and in good faith attempt to resolve any such disagreement; and,

   b. if any such disagreement cannot be resolved by the Signatory Parties, any Signatory Party may petition the Commission for resolution of the disputed matter.

   c. Notwithstanding paragraphs 7(a) and (b) above, any material changes to the project that would alter the Applicant's ability to fulfill the accepted conditions in the Applicants' coastal consistency certification, or should future consistency certifications be necessary if additional federal authorization activities require federal agency approval or funding beyond those NYSDOS considered in its June 8, 2011 conditional concurrence, those material changes or additional activities shall be resolved pursuant to 15 C.F.R. Part 930 subpart D.

8. This Joint Proposal shall not constitute a waiver by the Applicants of any rights they may otherwise have to apply for additional or modified permits, approvals, or certificates from the Commission or any other agency in accordance with relevant provisions of law.

9. This Joint Proposal is being executed in counterpart originals and shall be binding on each Signatory Party when the counterparts have been executed.

II. EVIDENTIARY RECORD

10. Appendix A attached to this Joint Proposal lists the discovery, testimony, affidavits and exhibits agreed upon by the Signatory Parties to be proposed for admission as record evidence in this proceeding. The documents listed in this Appendix are being filed contemporaneously with this Joint Proposal.

III. ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

A. Facility Description

11. The HVDC Transmission System proposed by the Signatory Parties in this Joint Proposal would be comprised of two solid dielectric (no fluids) HVDC electric cables, each approximately six (6) inches in diameter, extending from the international border to the Converter Station in Astoria, Queens, New York ("Astoria"). From the Converter Station, two HVAC circuits would connect to NYPA's 345 kV GIS Substation located at the complex of electric generating facilities located north of 20th Avenue and 29th Street in northernmost Astoria, and the Astoria-Rainey Cable would connect that substation to Con Edison's 345 kV Rainey Substation located on the northwest corner of 36th Avenue and Vernon Boulevard in Astoria. The HVDC transmission cables would be installed either underwater or underground along the overland portions of the HVDC Transmission System route. The Converter Station would be connected to the NYPA GIS substation

via an underground HVAC line. The HVAC cables of the Astoria-Rainey Cable would be installed underground in the streets of the CNY.

12. The route of the Facility (the "Route") is depicted on a series of maps included as Appendix B; the depiction is of a nominal centerline (the "Centerline") and an Allowed Deviation Zone. Those portions of the Allowed Deviation Zone that are ultimately determined to be actually affected by construction of the Facility, as well as certain areas outside the Allowed Deviation Zone that are needed temporarily for site investigation, access, and construction, are referred to as the Construction Zone. When the Facility is completed, those owning it (the "Certificate Holders") would have either exclusive control of, via fee, easement, or other appropriate interest, or rights granted by a governmental authority to use such authority's permanent ROW and certain adjacent areas as defined in Appendix C, Condition 5. The Astoria-Rainey Cable would be located in the streets of CNY in accordance with rights granted by CNY (collectively, the "Facility ROW").

13. The HVDC Transmission System would originate underwater at the international border between the United States and Canada in the Town of Champlain, New York and continue south into Lake Champlain. Two (2) cables would extend south through Lake Champlain for approximately one hundred-one (101) miles entirely within the jurisdictional waters of New York State ("NYS"). At the southern end of Lake Champlain, the cables would exit the water in the Town of Dresden, New York. From Dresden, the HVDC Transmission System would continue overland for approximately eleven (11) miles primarily within the ROW of NYS Route 22, to the Village of Whitehall.

14. To avoid installing HVDC cables within the Hudson River polychlorinated biphenyl ("PCB") site (U.S. Environmental Protection Agency ("EPA") Identification Number NYD980763841), which stretches from Hudson Falls, New York, to the Federal Dam at Troy, New York, as well as in certain sensitive areas within the lower Hudson River, the cables would be buried along an overland route. In the Village of Whitehall, the cables would transition from the Route 22 ROW to enter the existing railroad ROW owned by Canadian Pacific Railway ("CP") and remain buried for approximately sixty five (65) miles in and along the railroad ROW from Whitehall to Schenectady. The proposed cable route would enter Erie Boulevard just north of the railroad crossing at Nott Street and continue along Erie Boulevard to a point south of State Street where it would again enter the railroad ROW. Along this portion of the route there are several alternative routings that include both the railroad ROW and various public ways for transitioning from the railroad to the city streets. The public ways include Nott Street, North Jay Street, Green Street, North Center Street, Pine Street, Union Street, Liberty Street and State Street as well as private property (Parking Lot) at approximately 160 Erie Boulevard. The route would follow the railroad ROW for a short distance, and would then deviate west of the railroad property, pass under Interstate 890 then turn south along the eastern edge of the General Electric ("GE") property, approximately parallel with the CSX railroad ("CSX"), re-entering the CP railroad ROW just north of Delaware Avenue. From this point in Schenectady, the line would follow the CP railroad ROW to Rotterdam. In the Town of Rotterdam, New York, the route would transfer from the CP ROW to the CSX ROW and proceed southeast for approximately twenty four (24) miles before entering the Town of Selkirk. The cables would then travel south for approximately twenty nine (29) miles generally in and along the CSX ROW through

Ravena, New Baltimore, Coxsackie, the Town of Athens and Village and the Town of Catskill, before entering the Hudson River in the Town of Catskill (hamlet of Cementon).

15. Upon entering the Hudson River via Horizontal Directional Drill ("HDD"), the HVDC underwater cables would be located within the Hudson River for approximately 67.05 miles until reaching a point north of Haverstraw Bay. The cables would leave the water via HDD and enter the CSX ROW in the Town of Stony Point, Rockland County. The cables would bypass Haverstraw Bay for approximately 7.66 miles, including three HDD installations under the Stony Point State Historic Park Site and Rockland Lake State Park. After the HDD under the parks, the cables would enter the Hudson River via HDD, and be buried in the river for approximately 20.7 miles to the Spuyten Duyvil, which leads to the Harlem River. The cables would extend south-easterly within the Harlem River for approximately 6.6 miles, exiting the water to a location along an existing railway ROW in the Bronx and continuing along that ROW for approximately 1.1 miles. At this point, the line would enter the East River via HDD, cross the East River and make land-fall at Astoria, Queens.

16. At Astoria, the cables would terminate at a Converter Station to be located near Luyster Creek, north of 20th Avenue. From the Converter Station, a 345 kV underground circuit would connect to the existing 345 kV GIS substation owned by NYPA. The Converter Station would be installed on properties currently owned by Con Edison located in an industrial zone in Astoria. The HVDC Converter Station would be a "compact type" with a total footprint (i.e., building and associated areas and equipment) of approximately five (5) acres (approximately 550 feet by 400 feet). The main building would be approximately 165 feet by 325 feet, with a height of approximately 70 feet. These

circuits would interconnect with the NYPA substation near the site of the Charles Poletti Power Project in Queens, New York.[2]

17. The Applicants will initiate a System Impact Study at the NYISO concerning the Astoria-Rainey Cable within thirty (30) days after the filing of this Joint Proposal. The Astoria-Rainey Cable would be constructed, owned, and maintained by the Certificate Holders and would be under the operational control of the NYISO.

18. The Commission must consider the totality of all of the relevant factors in making its determination of environmental compatibility and public need. The relevant factors include, without limitation: the electric system, cost, environmental impact, the availability and impact of alternatives, overland considerations, conformance to long-range plans, state and local laws, identified benefits, and the public interest, convenience and necessity. The Signatory Parties support the issuance of an Article VII Certificate to the Applicants for the Facility, as described here, based on those factors.

B. The Need for the Facility

19. The Facility is needed to deliver an estimated 7640 gigawatt hours ("GWh") per year of energy, comprised of hydroelectric and wind energy generated in Canada to CNY. The benefits of these deliveries would include reductions in wholesale electric power prices and expected reductions in emissions of sulfur dioxide ("SO_2"), oxides of nitrogen ("NO_x") and carbon dioxide ("CO_2") as described in detail in paragraphs 141-143 below.

20. NYISO's 2010 Comprehensive Reliability Plan ("CRP") identified several risk factors that could affect the implementation of the reliability plan and future system reliability,

[2] If Con Edison proceeds with its recently announced plans to connect a PAR to NYPA's Astoria 345 kV substation, the Converter Station will also include a 345 kV GIS ring bus in a building adjacent to and on the same parcel as the rest of the Converter Station, unless a superior site is available closer to NYPA's 345 kV Astoria substation. Additional information on this GIS ring bus and the building in which it would be constructed to house it is provided in the Report attached hereto as Exhibit 125.

including Higher than Expected Load Growth (§ 3.1.1); Environmental Initiatives and Zones at Risk (§ 3.1.2); and Indian Point Plant Retirement Scenario (§ 3.1.3). In addition, the CRP at page 9 noted the increasing reliance on customers willing to curtail their electric power demands (Special Case Resources or "SCRs"); such customers are not obligated to continue to register at the rates projected by the 2010 CRP. The facility should help mitigate the potential adverse impacts that may be associated with these risk factors, although it is uncertain whether these factors will materialize, or the extent to which the Facility could mitigate such impacts, at this point.

21. The delivery of up to an additional 1,000 MW of electricity to CNY, through the Facility would provide a significant increase in energy supply capability and a resultant enhancement in system reliability. These deliveries would also enhance reliability through fuel diversity by reducing the proportion of CNY's electricity needs supplied by natural gas-fired generation.

C. Cost of the Certificated Facility

22. As originally proposed, the capital cost of the HVDC Transmission System was estimated to be $1.9 billion. In evaluating the capital cost of the HVDC Transmission System, as now proposed, estimated to be $2 billion, the Commission should recognize that, as a merchant project, all the risks associated with the HVDC Transmission System – as well as all risks associated with the use of the Astoria-Rainey Cable by shippers also using the HVDC Transmission System – would be borne by private investors rather than by utility rate payers. A certificate condition is proposed that would allow the Commission to reconsider its public interest finding and reopen the record should the Certificate Holders change their business model and seek approval of alternative or additional means of financing the these facilities, such as cost-of-service rates, from

either a federal or state regulatory body. Certificate Holders further agree that there shall be no cost-based charges for use of the Astoria-Rainey Cable for any energy or capacity produced by the capability of the Astoria Energy 2 Generating Station existing and in operation at Astoria, Queens, New York on February 1, 2012. Except as expressly provided in this Paragraph 22, nothing contained in this Joint Proposal shall be construed as affecting in any way the rights of Certificate Holders to unilaterally make application to the Federal Energy Regulatory Commission ("FERC") for a change in rates, terms and conditions, charges, classification of service, Service Agreement, rule or regulation under section 205 of the Federal Power Act ("FPA") and pursuant to FERC's rules and regulations promulgated thereunder.

23. DPS Staff has estimated the cost of the Astoria-Rainey Cable to be $194 million (2015 dollars), based on the NYISO Class Year 2010 Facilities Studies, Part 2 Studies: Deliverability Study and System Deliverability Upgrade Facilities ("SDU"), June 29, 2011, pp. 24-25, posted under meeting materials for the NYISO Operating Committee, July 14, 2011. This includes the cost of the Astoria-Rainey Cable, Existing Station Upgrades at Astoria and Rainey, and associated Sales and Service tax, adjusted for inflation.

D. Environmental Impact

24. The Application, testimony and exhibits designated for inclusion in the evidentiary record describe the nature of the probable environmental impacts of the Facility and are briefly summarized below. The environmental impacts associated with the Facility are expected to be avoided, minimized or mitigated, provided that the Best Management Practices ("BMPs") and Guidelines for the preparation of the Environmental Management and Construction Plan ("EM&CP Guidelines") agreed to by the Signatory Parties are adhered

to in the preparation of the Environmental Management and Construction Plan ("EM&CP") and provided that the EM&CP and the Proposed Certificate Conditions agreed to by the Signatory Parties are strictly complied with during facility construction, operation, and maintenance. The Signatory Parties agree that the Facility, located and configured as provided in this Joint Proposal, represents the minimum adverse environmental impact considering the state of available technology and the nature and economics of the various alternatives and other pertinent considerations. The route of the Facility is preferred because it would avoid and/or minimize the disturbance of natural habitat, and would use some existing and previously disturbed ROW.

25. The following sections address the potential for environmental impacts to result from the construction, installation and operation of the Facility with respect to various impact types.

a. Topography, Geology, Soils

26. No permanent or significant impacts related to geology or soils are anticipated. Along the overland route, initial clearing operations would include the removal of soils in the immediate trench area. Typically, the trench would be up to nine (9) feet wide at the top and at least three (3) feet deep to allow for the proper depth and separation required for the burial of the cables. Erosion controls such as straw bales and silt fencing would be used during construction to minimize storm-water run-off and the erosion of soils and surficial geologic materials, both at the trench and at the soil stockpiles. Upon completion of the installation of the overland cable, the surface of the Facility ROW disturbed by construction activities would be graded to match the original topographic contours and to be compatible with surrounding drainage patterns, except at those locations where permanent changes in drainage will be required to prevent erosion that

could lead to possible exposure of the cables or where restoration would be contrary to sound ROW management practices. An important geologic feature, the Hudson Palisades in Rockland County, will be crossed via HDD installations to avoid surface disturbances by drilling beneath the surface for long distances.

b. Aquatic Physical Characteristics

27. In the Hudson River and portions of Lake Champlain, jet plow installation technology would be used to bury the HVDC Transmission System's underwater cables. The jet plow would result in fluidization of the sediment, allowing both DC cables to be buried side-by-side in a single trench, with the option of including a fiber optic cable. Burial depth within the Hudson Harlem and East Rivers will be at the maximum depth achievable that would allow each pole of the bi-pole to be buried in a single trench using a jet-plow, which is expected to be at least six (6) feet below the sediment water interface. Where the cables traverse any federally maintained navigation channel, the cables will be buried at least fifteen (15) feet below the United States Army Corps of Engineers' ("USACE") authorized navigation channel depth in a single trench. Burial trenches would be installed in a linear path approximately two (2) feet wide, with an additional six (6) to eight (8) foot width disturbed along the sediment surface by the jet trenching device skids, wheels or support frame. Depressions in lake bottoms or river-beds are anticipated after installation but it is expected that the topography would return to pre-installation conditions through natural redeposition of the disturbed material into the trench within three (3) years.

28. The use of shear plow installation technology in the southern portion of Lake Champlain would result in the sediment being cut to a sufficient depth to bury the cables at a target depth of between three (3) and four (4) feet or the maximum reasonably attainable depth,

whichever is shallower, in a linear path of less than one foot in width. As would be the case with the jet plow, any depressions are expected to fill in naturally as a result of natural sediment redeposition.

29. The use of the jet plow or self-propelled remotely operated vehicles ("ROVs") in the northern part of Lake Champlain would result in the fluidization of the sediment sufficient to allow the cables to be buried at a target depth of between three (3) and four (4) feet or the maximum reasonably attainable depth, whichever is shallower. In those locations where the waters of Lake Champlain are one hundred fifty (150) feet deep or deeper, the cable may be buried at depths shallower than three (3) feet, or be laid on the lake bottom without burial, but only if a recognized authoritative technical consultant concludes that public health and safety can be appropriately protected without burial of the cable, and such conclusion is ratified by Commission approval of the EM&CP.

30. The use of HDD technology would avoid the need for shoreline trenching and disturbance to the shallow water interface between land and water. The cables would enter and exit the water through either a cofferdam, which would be approximately sixteen (16) feet by thirty (30) feet with a dredged entry/exit pit typically six (6) to eight (8) feet deep, or through a steel pipe. The installation and removal of cofferdams in accordance with the Proposed Certificate Conditions proposed along with this Joint Proposal are not expected to have any significant impacts on aquatic physical characteristics.

31. Conventional bucket dredging would be used to pre-dredge in order to achieve authorized cable burial depths in any federal navigation channel and for HDD entry and exit pits. The dredged material would be placed in scows and either replaced in the trench (if determined by the appropriate permitting authority to be suitable for replacement in the

trench) or pits or removed for placement at a permitted location. Dredging may result in sediment resuspension as the bucket is brought to the surface. The associated plume would travel varying distances depending upon sediment type and hydrodynamics. Impacts are expected to be similar to the deposited sediments suspended by water jetting. Placement of imported backfill when dredge spoil is not used would create some additional increases in suspended sediment, but these are expected to be short-term and localized. Any impacts from dredging discussed above are not expected to be significant.

32. In areas where the cables cannot be buried, primarily areas of rocky substrate or at utility crossings, the cables would be laid on the bottom and protected by laying articulated concrete mats or other appropriate materials over the cables for protection. The mats will alter local hydraulic conditions such that some sediment deposition or scouring may occur around the irregularity in the bottom formed by the mats. However, the overall change in bottom topography would be small because the mats will extend only a short height above the bottom. The mats are not expected to have a significant effect on near bottom hydrodynamics, which may be similar to the conditions found in rocky bottom areas.

33. During HVDC Transmission System operation, it is anticipated that the main source for potential impacts to aquatic physical characteristics would occur in the event of cable damage. In this instance, a jet plow may be used to unbury a length of the cable on either side of the repair location. The cable would then be cut and the ends brought to the surface. The damaged section of cable would be cut out and a new, slightly longer piece of cable would be spliced in and the cable lowered to the lake- or riverbed. The cable would then be reburied by diver operated hand jets ("hand jetting") or use of ROVs with water jets. The impacts are similar to those described for the original installation, but

much smaller in duration and extent. Because the HVDC cables do not contain a coolant fluid, there is no potential for fluid release in the event of a damaged cable.

34. Installation and operation of the HVDC Transmission System's underwater cables would not have any significant impacts on natural tidal flow or water depths, as the underwater cables will be buried in the Hudson, Harlem and East Rivers; and either in a buried configuration under the Lake Champlain lake- bed or laid upon the surface of the lake bed in water depths of one hundred fifty (150) feet or greater.

c. Aquatic Sediment and Water Quality

35. Hydrodynamic modeling of the northern Lake Champlain and the Hudson, Harlem and East Rivers performed by the Applicants and included in the Evidentiary Record (Exhibits 84, 85 and 90) indicates that installation of the HVDC Transmission System's underwater cables, in accordance with the Water Quality Certification ("WQC", Appendix D to this Joint Proposal), would likely result in sediment disturbance and resuspension of short duration and within agreed to limits. Dispersion of sediments during cable installation would be influenced by horizontal advection, dominated by local tidal currents and settling rates. Because the bottom sediments along the HVDC Transmission System route are primarily silt and sand, sediments resuspended during cable installation are expected to settle quickly.

36. Hydrodynamic modeling of southern Lake Champlain performed by the Applicants and included in the Evidentiary Record (See Exhibits 84 and 90) shows that water quality standards for the states of New York and Vermont are expected to be achieved with the use of shear plow from Crown Point south to Dresden, New York. The Applicants have also agreed not to utilize the jet plow or shear plow unless test trials have successfully

demonstrated their ability to achieve the total suspended solids ("TSS") standards established in the WQC.

37. Monitoring of suspended sediments, turbidity and water quality, would be performed prior to and during cable installation in accordance with the WQC (Appendix D) and the Suspended Sediment/Water Quality Sampling and Monitoring Plan (Attachment 1 of Appendix C to this Joint Proposal) for jet plow embedment operations and shear plow embedment operations. Mitigation strategies would be implemented prior to and during installation if conditions exceed the water quality thresholds established in the WQC (Appendix D) and the Proposed Certificate Conditions (Appendix C).

38. A Spill Prevention, Control and Countermeasures ("SPCC") Plan or its equivalent would be filed as part of the EM&CP and implemented during construction to avoid or minimize potential impacts to aquatic sediments and water quality that could result from spills of fuel, oils, or other substances associated with aquatic installation vessels and construction equipment.

39. No permanent or long-term impacts on water quality from cable installation are expected. In addition, no impacts are expected to occur during cable operation unless cable repair is required.

d. Benthic Resources

40. Construction of the HVDC Transmission System is expected to cause a temporary, localized disturbance to the benthos. However, the area disturbed represents a small fraction of the bottom, and it is expected that the temporary and localized loss of benthic prey or resources would not have any significant impacts on benthic resources. In addition, recruitment and re-colonization of the benthic communities are expected to

occur following construction because soft-bottom benthic species have adapted to naturally occurring bottom disturbances.

41. During jet plow, shear plow, conventional dredging and HDD activities, potential impacts to benthic communities would be limited to the areas of cable installation and cofferdam dredging. Temporary impacts, including increases in suspended sediment concentrations and redeposition of these sediments, may extend beyond the immediate area of active construction but are likely to be temporally and spatially limited.

42. HDD techniques and the installation of temporary cofferdams to contain sediment disturbed during dredging at landfall locations will also avoid or minimize suspended sediment and turbidity effects in the near shore benthic habitats. The use of jet plow and shear plow embedment and HDD construction methods is not expected to interfere with opportunistic re-colonization of benthos following construction activities.

43. It is expected that a long-term alteration of the lake or river bottom would occur with the placement of rip-rap or articulated concrete mats along the cable route, which would result in the mortality of benthic biota and other immobile or slow-moving benthic organisms located in the immediate area of placement. Given the anticipated short segments where rip-rap or concrete mats would be placed (primarily utility crossings and natural impediments), this alteration is not expected to cause any significant loss of soft bottom benthic habitat or associated benthic species. The rip-rap or concrete mats likely would provide structure for additional new hard benthic habitat for epibenthic organisms to colonize.

44. In areas where the cables cannot be buried and protective covering is therefore necessary, the existing benthos would be buried. However, in areas of hard bottom the exposed surface of the mats would create similar habitat. Epibenthic communities may develop

on the mats over time, which would provide structure that can be used by some demersal species.

45. Operation of the HVDC Transmission System's underwater cables is anticipated to have insignificant impacts to benthos, fish and shellfish resources. The Applicants will complete a Benthic and Sediment Monitoring Study and Bathymetry, Sediment Temperature and Magnetic Field Study based on pre-approved scopes of study that will characterize these communities and quantify temperature and magnetic field changes. The scopes for these studies are in Attachments 2 and 3 of Appendix C to this Joint Proposal. The underwater cables will be buried to a depth such that the magnetic field would be weak enough that, once the cables are energized, the benthic community is not expected to differ significantly from that found in the adjacent benthic area. Heat produced by the cables would be primarily dissipated in the sediments and would therefore have a negligible thermal effect on benthic populations. The underwater cables use a solid dielectric design that does not contain cooling fluids, thus eliminating the potential for such fluids to be released into the environment.

e. Finfish

46. Given the narrow construction route, bottom-feeding finfish are likely to temporarily relocate to adjacent areas unaffected by construction. Any pelagic piscivorous (fish feeding) species might leave the immediate construction area because of the noise and suspended sediment plume it produces, but they would resume feeding along the cable route and forage on fish that had re-occupied the construction area as soon as the cable installation vessel leaves.

47. In areas where conventional dredging would be employed, typically for deeper burial areas such as at crossings of a navigation channel, construction will involve sediment

removal, cable laying, and then backfilling. Sediment surface characteristics would be altered since it is unlikely that exactly the same grain size composition will be created as existed prior to cable installation. However, these areas are likely to become colonized over time with benthic organisms. Given the small amount of anticipated conventional dredging, any altered prey abundance or modified substrate characteristics are not likely to have any significant impacts on fish species.

48. Cable installation in sediment would likely result in a temporary and localized increase in suspended sediments, which could potentially lead to gill abrasion, hindering of predation efficiency of sight feeding fish in or adjacent to the cable route, and negative effects on respiration. However, the sediments suspended during construction activities are expected to affect localized areas and settle quickly out of the water column or be dispersed, any impacts on fish species in or adjacent to the cable route are likely to be temporary and not significant.

49. Underwater cable installation activities would be limited to certain times of the year to avoid life-cycle or migratory impacts to Atlantic sturgeon, American shad, winter flounder, striped bass, and other anadromous fish populations, as well as resident species such as shortnose sturgeon using the affected areas. These construction windows have been established in the Proposed Certificate Conditions (Appendix C) and the WQC (Appendix D).

50. Operation of the HVDC Transmission System's underwater cables is anticipated to have no adverse impacts to finfish resources. In the Hudson, Harlem, and East Rivers, the cables would be buried in a single trench to a target depth of six (6) feet below the sediment water interface, or the maximum depth achievable and would therefore not likely create a physical barrier that could interfere with fish migration or use of existing

habitats or nursery areas. Potential impacts to fish species, if any, from electromagnetic fields and thermal dissipation during the normal operation of the Facility are expected to be insignificant as a result of the proposed installation method of two cables being buried side-by-side in a single trench to an expected burial depth of at least six (6) feet below the sediment-water interface.

f. Lacustrine and Aquatic Protected Species

51. The Applicants will take all necessary measures consistent with this Joint Proposal, the Proposed Certificate Conditions, the BMPs and the EM&CP Guidelines, to avoid and/or minimize impacts to threatened or endangered wildlife species listed at 6 N.Y.C.R.R. Part 182 ("TE species") and their occupied habitats that are found to be located in the Construction Zone.

52. Aquatic TE species in Lake Champlain are the lake sturgeon, mooneye, and eastern sand darter. Aquatic TE species in the Hudson, Harlem and East Rivers are the shortnose sturgeon, fin whale, humpback whale, sei whale, and four species of sea turtle.

53. Within the Hudson River, both the shortnose sturgeon and the Atlantic sturgeon are listed as Federally-endangered species. In addition, a total of thirteen (13) finfish, two (2) shark, and three (3) skate species in the Hudson River are currently designated as Essential Fish Habitat ("EFH") species under the Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265) amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). These species include: Atlantic sea herring, bluefish, Atlantic butterfish, scup, black sea bass, red hake, cobia, Atlantic mackerel, Spanish mackerel, king mackerel, summer flounder, winter flounder, windowpane, sand tiger shark, sandbar shark, clearnose skate, little skate, and winter skate.

54. NYSDOS, Division of Coastal Resources, together with the NYSDEC, has designated seventeen (17) Significant Coastal Fish and Wildlife Habitats ("SCFWHs") within or in the vicinity of the HVDC Transmission System area. The routing as outlined in this Joint Proposal would avoid directly transiting twelve (12) of these areas. Within the remaining five (5) SCFWHs (Kingston Deepwater Habitat, Esopus Estuary, Poughkeepsie Deepwater Habitat, Hudson River Mile 44-56, and Lower Hudson Reach), the settlement parties have identified certain "Exclusion Zones" (Appendix B) that will be avoided to the maximum extent possible.[3] The overall installation plan and construction windows will be designed to accommodate location-specific and season-specific restrictions intended to avoid and/or minimize potential impacts on TE species.

55. The four species of Federal and State-listed sea turtles are the leatherback sea turtle, Kemp's Ridley sea turtle, loggerhead sea turtle, and green sea turtle. None of these sea turtles nest in the New York Harbor estuary, nor do they reside there year-round. In the event that transient sea turtles are present during installation of the underwater cables, it is expected that impacts, if any, to the species will not be significant in light of the species' mobility and the limited areas of construction.

56. Several species of Federally-endangered whales are known to occur seasonally near New York's coasts, but these marine mammals are seldom observed in the New York Harbor region. The vessels used for the installation of the cable would be operated at low speeds in this portion of the HVDC Transmission System area. Accordingly, the risk of potential collision with transient whales would not be significant.

57. The installation of the underwater cables is not expected to have any significant impacts on shortnose sturgeon. The cables have been routed to avoid or minimize impacts to

[3] As noted in the Certificate Conditions, the use of the term "Exclusion Zones" does not mean that all Project facilities are necessarily excluded from such area.

sensitive habitats. In addition, construction windows are established as a Certificate Condition to ensure that work will not impact these species during their most vulnerable life stages. In the unlikely event that transient shortnose sturgeon are present during installation, it is expected that any impacts from construction, installation and maintenance of the underwater cable will not be significant.

58. Operation of the HVDC Transmission System is not expected to have any significant impacts on protected aquatic species. In the Hudson, Harlem, and East Rivers, the underwater cable would be buried in a single trench to a target depth of six (6) feet below the sediment water interface or at the maximum depth achievable. Monitoring of the HVDC Transmission System's operation would be conducted in accordance with applicable Certificate Conditions (Appendix C).

g. Freshwater and Tidal Wetlands and Water Resources

59. Construction and operation of the HVDC Transmission System is expected to result in temporary impacts to wetlands and waterbodies along overland segments of the cable route, including within the CP and CSX railroad ROW. This may include both direct impacts, where the edge of the cleared construction corridor traverses a wetland or riparian area, and indirect impacts from vegetation clearing and ground disturbance in adjacent areas. During construction, short-term effects on water quality may be caused by localized increases in turbidity and downstream sedimentation resulting from trenching and disturbance within the water body. Water quality impacts would be minimized by limiting the duration of construction activities within the water body to the extent possible, and by immediately restoring and stabilizing the streambed and banks once construction is completed. At crossings with significant stream flows, the use of dry-ditch crossing methods instead of open cut methods would reduce potential impacts

from turbidity and sedimentation, because disturbed sediments within the construction area would not become resuspended.

60. The HVDC Transmission System would be located in the following water bodies and tributaries thereto: Lake Champlain and the Hudson, Harlem and East Rivers. The water quality classifications for the water bodies encountered range from AA to I.

61. Disruptions to streams and water bodies crossed would be minimized during HVDC Transmission System construction, operation and maintenance through measures detailed in the Proposed Certificate Conditions set forth in Appendix C below, as well as in the EM&CP (Appendix E).

62. Approximately 49.5 acres of wetland have been delineated in the field along the HVDC Transmission System route, and review of National Wetlands Inventory ("NWI") and NYSDEC freshwater wetlands mapping has shown an additional 6.5 acres for a total of fifty-six (56) acres of wetland area. No fill or permanent alteration to wetlands is expected to result from the HVDC Transmission System in general and it is anticipated that wetland hydrology, vegetation, and water quality will return to pre-construction conditions in most areas following restoration of the construction area. However, in limited areas, forested wetland cover may be converted to an emergent marsh or scrub-shrub community as part of the Certificate Holders' Vegetation Management Plan. Of the total of 56.0 wetland acres, approximately 10.7 acres have been identified as forested wetland.

h. Terrestrial Wildlife and Plants and Protected Species

63. Impacts to vegetation, including rare, threatened or endangered plant species under 6 N.Y.C.R.R. Part 193 ("RTE plants") and terrestrial wildlife habitats have been avoided or minimized by locating the HVDC Transmission System route underwater to the extent

possible. Where overland routes have been proposed, the HVDC Transmission System corridor has been located primarily along existing railroad or roadway ROW or other previously disturbed areas. Use of previously disturbed railroad ROW for the installation of the overland cables would generally avoid or minimize the potential impacts to wildlife and plants. In total, approximately two hundred thirty six (236) acres of existing forest cover may be cleared to accommodate proposed construction areas and easements. Upon completion of construction activities, initial restoration activities, including soil stabilization and temporary seeding of disturbed areas would be conducted. Natural revegetation within the disturbed areas, along with the continuation of any existing management practices, would result in vegetation cover similar to the preconstruction habitat, although vegetation will be managed within and adjacent to the ROW to preclude re-forestation. During operation of the Facility, all vegetation would be managed in a condition that ensures safe access to existing and proposed facilities and to prevent future electrical service interruptions caused by deep-rooted vegetation growing over the cables of the Facility. Permanent forest clearing on the Facility ROW will result in loss of approximately 60 (sixty) acres of forest land.

64. Because the Facility would predominately utilize existing transportation corridors and will be constructed, operated and maintained in accordance with the Proposed Certificate Conditions set forth in Appendix C below, wildlife habitat loss or conversion or impacts to vegetation would be minimized. Wildlife use within and adjacent to the Facility ROW is not anticipated to change measurably as a result of construction or operation of the Facility.

65. The Applicants will take all necessary measures consistent with this Joint Proposal, the Proposed Certificate Conditions, the BMP document and the EM&CP, as well as specific

measures described below, to avoid or minimize impacts to TE species and their occupied habitats and RTE plants.

66. The Indiana bat (*Myotis sodalis*) is a Federally- and New York State-endangered species that may be resident within the Hudson River Valley throughout the year. Indiana bats roost in trees and maternity colonies may be associated with a variety of forested community types identified along the overland cable route, including Appalachian oak-hickory, beech-maple mesic, floodplain and hemlock-northern hardwood forests. To the extent roosting trees are identified within the construction corridor, any impacts to these trees will be avoided or minimized.

67. The Karner blue butterfly (*Lycaeides melissa samuelis*) is a Federally and New York State-endangered species occurring in scattered populations in the vicinity of the HVDC Transmission System area in Saratoga and Albany Counties. The species is highly specialized on the larval host plant, wild blue lupine (*Lupinus perrenis*). Frosted elfin (*Callophrys irus*) is a State-listed threatened species of butterfly that occurs in the HVDC Transmission System area in Saratoga and Albany Counties. In the upper Hudson River area, it feeds on wild blue lupine associated with pine barrens, oak savannahs, dry oak forests, and disturbed grasslands, such as those that would be within Facility ROW and at airports. As the habitat requirements are similar to the Karner blue butterfly, the two species may co-occur. Areas of potential habitat for the Karner blue butterfly and frosted elfin were identified in the project area by field investigators. A *Karner Blue Butterfly Impact Avoidance and Minimization Report,* which is provided in the Evidentiary Record Exhibit 109, summarizes the routing and construction activities that would be employed to avoid and/or minimize impacts to occupied and potential habitat containing wild blue lupine and nectar patches.

68. Based on the recommended project location and installation and management techniques, as spelled out in settlement documents, installation and operation of the transmission cables is not expected to have any significant impacts on protected terrestrial species.

i. Land Use

69. The overland and underwater design of the Facility is consistent with state policies, Article 42 of the Executive Law entitled: *Waterfront Revitalization of Coastal Areas and Inland Waterways*, and Local Waterfront Revitalization Plans.

70. The Facility will be designed, operated and maintained to limit impacts to the current and planned land uses within the vicinity; Section 2 of the Environmental Assessment (attached here as Exhibit 121) and the Revised and Updated Exhibit 7 of the Application (attached here as Exhibit 115) discuss the planned land uses in further detail. Impacts associated with construction activities are anticipated to be localized and temporary in nature and are not expected to conflict with existing or planned land uses in the vicinity of the Facility.

71. The Facility has been sited and designed to avoid long-term or permanent impacts to all land uses within and adjacent to the construction corridor. The entirety of the Facility is located underwater or underground, except for the specific facility components including various cooling equipment at locations along the Facility ROW and the Converter Station at Astoria, with minimal potential impact to the general public or private property, open space, or any existing or planned land uses.[4] Underwater segments of the Facility are not expected to result in any significant permanent impacts to land or water uses, water-dependent uses, navigation, municipal water intakes, and other coastal uses are not

[4] If Con Edison proceeds with recently announced plans to connect a PAR to NYPA's Astoria 345 kV substation, the Converter Station will also include an above ground structure housing a new four-bay GIS ring bus as described in greater detail in the Report attached hereto as Exhibit 125.

expected to be affected. Along the overland segments of the Route, impacts to land use would be minimized by burying the line within and along existing disturbed railroad and roadway ROW to the extent possible.

72. The majority of the overland segments of the proposed route of the HVDC Transmission System would follow existing CP and CSX railroad ROW, and to a lesser extent NYS Route 22 and other road ROW. Close coordination with the railroad companies, the NYSDOT, and local municipal highway departments during the equipment delivery and construction stages of the Facility would assist in avoiding or minimizing conflict with ongoing operations and uses.

73. In order to bypass the Haverstraw Bay Significant Coastal Fish and Wildlife Habitat, the HVDC Transmission System would cross into Rockland Lake State Park and Stony Point State Historic Site. The cables would traverse these parklands via HDD, so there would be no permanent impacts to the current uses or visual character of these areas. Land use plans and policies, including the New York State Open Space Conservation Plan and local park and recreational area policies, were investigated for the counties, cities, towns, and villages crossed by the overland portion of the HVDC Transmission System. Construction and operation of the overland portion of the line is not expected to have any significant effects on local or regional land use patterns or land use planning because the line will be installed underground and is routed within and along existing disturbed railroad and roadway ROWs to the extent possible.

74. The Astoria-Rainey Cable will be installed for approximately three (3) miles within city streets of the borough of Queens in CNY. Land use adjacent to the Astoria-Rainey Cable is primarily residential, industrial, commercial, and open space. Two parks, one playground and three schools have been identified as being located adjacent to the

proposed route and the route is in the vicinity of other social features such as a library and a senior center. The Applicants' proposed EM&CP would propose measures to be taken to avoid and minimize any adverse land use and traffic impacts.

j. Agricultural

75. The Construction Zone would include approximately 138,040 linear feet of ROW within designated Agricultural Districts. Mapping obtained from the Cornell Institute for Resource Information Sciences indicates that the Construction Zone would cross Agricultural Districts for an estimated 46,690 linear feet in Washington County, 47,640 linear feet in Saratoga County, 660 linear feet in Schenectady County, 20,560 linear feet in Albany County and 22,490 linear feet in Greene County. The Facility would not cross Agricultural Districts in Rockland, Westchester, Queens or New York counties.

76. For the overland portion of the HVDC Transmission System, cables would be installed primarily within existing railroad or roadway ROW. If construction activities require that work occur on agricultural lands outside of the railroad ROW, Proposed Certificate Conditions 78 and 79 would require that appropriate mitigation measures be applied to maintain agricultural viability of agricultural soils, and that an "Agricultural Inspector" be available to provide site-specific agricultural information as necessary for development of the proposed EM&CP, and to serve as a contact with affected farmers and County Soil and Water Conservation Districts concerning farm resources and management matters pertinent to the agricultural operations. During construction, potential effects on adjacent agricultural land would be minimized by limiting impacts such as vegetation clearing and ground disturbance to the Construction Zone.

k. Visibility from Areas of Public View

77. The Facility has been sited and designed to minimize impacts on visual and aesthetic resources. The transmission cables would be installed underwater in existing waterways or buried along existing railroad, utility or roadway ROW, or installed via trenchless technology. This approach would minimize the visual and landscape impacts associated with traditional overhead transmission lines or conventional underground facilities sited on new ROW. Tree clearing for facility construction may result in changes to local views. Adverse impacts at locations due to clearing at areas with identified public interest (including parks, heritage resource sites, and residential areas) will be minimized by implementing tree protection measures and appropriate arboricultural standards, and use of landscape planting in select locations.

78. The only permanent above-ground components associated with the Facility would be line markers, warning signs at navigable waterways, cooling units and the Converter Station. Line markers will not be obtrusive as sited along existing corridors, and warning signs at the banks of navigable waterway crossings would be located in areas where visual contrasts are minimized due to existing shoreline development and visual sensitivity is low. Since the setting of the proposed Converter Station is dominated by existing utility infrastructure, and the immediate environment surrounding the proposed location of the Converter Station is predominantly industrial and commercial in nature, the Converter Station would not be out of character with existing land use and would not redefine the nature of the view. Views toward the Converter Station site from nearby residential areas are dominated by the expanse of existing utility infrastructure. Most of the Converter Station's elements would be enclosed within buildings which are within a scale similar to existing facilities adjoining the site at Astoria.

79. Although there would be no significant permanent visual impacts outside of the proposed Converter Station, there would be temporary visual impacts during construction. The majority of visual impacts would be caused by the large equipment necessary for construction both on-land and in-water, which would be seen along the Route for a limited amount of time, as well as any stormwater and erosion controls, such as silt fences, hay bales, and temporary mulching, etc. Once construction is completed, all equipment would be removed and the impacted areas will be re-seeded. Temporary erosion controls would be removed once revegetation is established.

80. The vegetative characteristics within the Construction Zone would change temporarily during the construction phase of the Facility. Existing vegetation that serves as a buffer in visually sensitive areas, such as the NYS Route 22 Lakes to Locks Scenic Byway, the Mohawk River – Erie Barge Canal, scenic areas, and viewpoints would be maintained where the vegetation does not interfere with the integrity of the cables or safe installation of the Facility. The Applicants' proposed EM&CP would include an analysis and rationale for construction affecting forest cover areas rather than utilizing existing cleared roadside areas within these areas. In situations where vegetation clearing is necessary for safe and proper installation of the Facility within visually sensitive areas, the vegetation clearing methods to minimize impacts would be detailed in the EM&CP and performed in accordance with the BMPs set forth in Appendix F below. Vegetative buffers in visually sensitive areas would be identified during restoration for landscape plantings as appropriate, except where replacement would inhibit or impair the safe operation of the cables.

l. Cultural and Historic Resources

81. A Pre-Phase 1A cultural resources screen report and a Phase 1A cultural resource investigation for the HVDC Transmission System route was submitted in April and September of 2010, respectively. The reports presented an assessment of the archeological sensitivity and potential for the prospective area of potential effects ("APE") for both the HVDC Transmission System and the Astoria Rainey Cable. Phase 1B field work was also completed for a portion of the overland route. A Phase 1B investigation for the remainder of the Route would be completed prior to construction. Route modifications or other mitigation would be made, as necessary, to avoid, minimize or mitigate impacts to any sensitive areas identified, as appropriate. No construction would occur in areas that have not been surveyed or where surveys have not been provided to the OPRHP and DPS Staff.

82. An aquatic route survey was conducted in the Spring of 2010, which included a geophysical survey employing a side-scan sonar and magnetometer data collection (Exhibit 31). The Lake Champlain Maritime Museum reviewed this geographical data for the Hudson River collected by the NYSDEC and its contractors, and the Phase 1A Cultural study, to create a list of potential submerged cultural resources in the transmission corridor. The Report discussing the sensitive submerged archeological resources is annexed to this Joint Proposal as Exhibit 19. The Applicants and DPS Staff have maintained contact and consultation with the OPRHP Historic Resources Bureau in accordance with Parks, Recreational and Historic Preservation Law §14.09 during the review of the Route. General provisions for resource evaluation, avoidance and impact minimization have been developed, and additional detailed analysis, planning and mitigation design will be detailed in a Cultural Resource Management Plan to be

developed in further consultation with the New York State Historic Preservation Office ("NYSHPO") and DPS Staff (and other consulting parties in the pending National Historic Preservation Act Section 106 project review for necessary federal licenses). Details of cultural and heritage resource site avoidance and protection measures will be addressed as appropriate in the EM&CP. Proposed Certificate Conditions address appropriate requirements to preclude construction in areas where cultural resource evaluations have not been concluded, to require implementation of appropriate resource protection measures, and to address unanticipated resource discoveries during Facility construction, including cultural artifacts and the handling of human remains.

m. Transportation

83. Because the electric cables comprising the Facility would be located entirely overland or under water, or attached to existing railroad bridges, no permanent impacts on transportation are expected. Where the proposed cable route intersects with planned or ongoing transportation infrastructure improvements, cable design, installation methods and installation schedule have been planned to accommodate those transportation facilities. The Converter Station would be designed to meet the substantive requirements of the local height ordinances to avoid impacts to air traffic.

84. Impacts to railroads associated with the installation of the HVDC Transmission System are anticipated to be minor, temporary, and localized. Equipment delivery and installation stages will be closely coordinated with the railroad companies to avoid or minimize conflicts with on-going railroad operations. Active rail lines will be crossed using trenchless methods, not by open cut trenching. Once installed, the HVDC Transmission System will be buried within the railroad ROW and have no effect on railroad operations. At locations of long HDD bores, it may be necessary to install small,

above-grade cooling units at the edge of the railroad ROW or within the railroad ROW but these will be sufficiently far from the railroad tracks so that they will not impact railroad operations.

85. Impacts to roadways associated with the installation of the Facility are anticipated to be minor, temporary, and localized. Use of roadways for the delivery of oversized loads would be minimized by the use of rail and water transportation where feasible. In the event that transportation of oversize loads by road is required, Applicants have agreed to comply with all NYSDOT requirements and, for construction within the CNY, all applicable CNY requirements as well. The routing, construction schedule and traffic control plans of the Facility will mitigate direct traffic impacts and indirect effects of construction on transportation facilities and adjacent land uses.

86. Where New York State highway ROW is to be occupied, all work will be performed in accordance with applicable regulations and standards, including 17 N.Y.C.R.R. Part 131 covering Accommodation of Utilities within State highway ROW, the applicable design standards of the *American Association of State Highway and Transportation Officials*, and NYSDOT's *Requirements for the Design and Construction of Underground Utility Installations within the State Highway Right-of-Way, Manual of Uniform Traffic Control Devices*, the *Highway Design Manual, and the Requirements for the Design and Construction of Underground Utility Installations* with the State highway ROW. Highway Work Permits will be obtained for any work in, on, under, or over State highway ROW, which includes areas and facilities such as shoulders, guiderails, clear zones, vegetated areas, slopes, and drainage facilities in addition to the paved roadway.

87. During construction of the Facility, minor and temporary impacts to existing infrastructure are possible where these features will be crossed by the cable route. Where

installation of the proposed Facility will occur within a road or highway ROW, the jurisdictional municipality or regulatory agency will be contacted to ensure appropriate protection and safety measures are employed. Where in-road work will be extensive enough to require detours or road closings, a *Maintenance and Protection of Traffic Plan* will be completed in consultation with all affected agencies prior to the start of construction.

88. Impacts to commercial and recreational use of navigable waterways during the construction phase are expected to be minor and temporary. During construction, the presence and operation of the cable installation vessels will create elevated noise levels and additional traffic on these waterways. All work activities will be closely coordinated with the USACE, the United States Coast Guard ("USCG"), federal, state, and local agencies and other local pilot associations, as determined to be necessary to minimize or avoid impacts. A Notice to Mariners or similar notification will be issued prior to any in-water work, as will notice to each affected municipality. Work activities in the vicinity of the Harlem River rail bridge will also be coordinated with the railroad to minimize disruption of rail traffic.

n. Noise

89. Construction noise associated with the installation of the overland transmission lines, Converter Station and transformer substation will be temporary in nature and impact will vary according to the construction equipment in use and existing background or ambient noise at given times and locations. Residents and businesses could be temporarily affected by noise from construction activities associated with the installation of the overland segments of the cables and the Converter Station. No residence will be exposed to significant noise levels for an extended period. Underwater noise from the operation

of vessels and installation of cables could impact certain aquatic organisms, although these impacts should be temporary and localized. The Applicants have requested that the Commission refuse to apply local noise ordinances during the construction phase of the Facility outside of CNY as provided in the Proposed Certificate Condition 32 (Appendix C). Appropriate noise control measures are included in the construction and mitigation control measures agreed to be applied during facility construction. Measures to apply at residential areas and other noise sensitive locations include: public outreach, appropriate work hour/work operation restrictions, temporary sound barriers, employment of equipment fitted with sound deadening materials, selection of low noise equipment and procedures, and other noise reduction work methods or devices as determined appropriate for the locale and tasks.

o. Communications

90. Both HVAC and HVDC power cables are designed with outer metal layers at ground potential and create no external electric field. The direct current magnetic field of the cables would not induce voltages or currents into communications equipment, including but not limited to marine radios, remote telephones, and cell phones. The cables, therefore, would not create any corona discharge and are not independent sources of radio, telephone, or television interference.

91. All electronic equipment associated with the construction and operation of the Converter Station located outside the valve halls, including communication cables and wires, would be in compliance with CISPR 11 (Comite International Special des Perturbations Radioelectriques, International Special Committee on Radio Interference, under IEC International Electro-technical Commission). This standard is considered to be equivalent

to the Federal Communications Commission ("FCC") part 15. The substation will also comply with IEC61000-6-1.

p. Electric and Magnetic Fields

92. The Signatory Parties believe that ensuring that the operation of the Facility complies with the interim electrostatic field standard (1.6 kV/m at the edge of the Facility ROW, measured at one meter above ground) established by the Commission in Opinion No. 78-13 (issued on June 19, 1978 in Cases 26529 and 26559) and the limit for magnetic fields (200 milliGauss ("mG") at the edge of the Facility ROW, measured one meter above ground) set in the Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities (issued on September 11, 1990 in Cases 26529 and 26559) calls for an appropriate Certificate Condition, which is contained in Appendix C hereof. The Signatory Parties believe, however, that the Commission standards and limit will be met: (1) in the case of the portions of the Facility that consist of HVAC facilities, because the values at the edge of the Facility ROW are below the 1.6 kV/m standard and the 200 mG limit, respectively; and, (2) in the case of the portion of the Facility that consists of HVDC facilities, because the electrostatic field associated with buried facilities is almost nonexistent and the difference between the magnetic field at the edge of the Facility ROW and at a distance of one hundred (100) feet from such edge (in order to differentiate between the earth's magnetic field and that of the DC facilities) is less than the 200 mG limit.

93. Since these transmission cables will be shielded, buried or covered with protective measures, the magnitudes of the electric field levels are expected to be inconsequential. In the water, the sheathing and insulation around the cables and the surrounding earth and

water will screen the electric field produced by the cables. On land, the soils covering the facility will screen the electric field to inconsequential levels.

94. The magnetic field levels were calculated using the C3CORONA, Version 3 software developed by the Bonneville Power Administration and the U.S. Department of Energy at three (3) locations: CP Railroad, over Lake Champlain, and over the Hudson River. For the CP Railroad calculation, the estimate assumed two cables would be buried to a depth of three and a quarter (3.25) feet. Calculated magnetic field levels at one meter above the ground were below two hundred (200) mG for the CP Railroad location at the centerline when the cables were touching (cable separation of 0.34 feet), at four (4) feet from the centerline when the cables are separated by one (1) foot, and at eleven (11) feet from the centerline when the cables were separated by three (3) feet.

95. The C3CORONA model also calculated that the expected magnetic field levels over Lake Champlain and the Hudson River were 0.4 mG and 44.6 mG, respectively, at the water's surface over the centerline under the assumption that the cables were separated by six (6) feet and buried to a depth of three (3) feet. This range is comparable to the expected magnetic field of a household appliance and considerably less than the earth's magnetic field (~470 to 590 mG). Therefore, there are no expected long term electromagnetic field ("EMF") exposure issues along Lake Champlain, the Hudson River, the Harlem River and the East River.

96. Magnetic field levels were also calculated at the riverbed of the Hudson River under the assumption that the cables would be installed vertically within the same trench to a planned depth of six (6) feet. Where the cables are laid vertically into a single trench, the maximum magnetic field deviation from background magnetic field if the cables are in a north/south orientation is calculated to be 26.2 mG at ten (10) feet from the centerline at

one (1) foot above the riverbed or lakebed. The magnetic field associated with the cables lessens as the distance horizontally and vertically from the centerline increases.

97. Modeling of compass deflection at an underwater cable burial depth of six (6) feet was also performed. At one (1) foot over the centerline, the maximum compass deflection is 21.3 degrees for the vertical installation. At ten (10) feet horizontally from the centerline, the maximum compass deflection is less than three (3) degrees at one (1) foot above the river bed where the cables are laid vertically on top of one another. Similar results were reported where the cables were laid horizontally (side-by-side) at a burial depth of six (6) feet so that, even if sediment conditions were such that the top cable "slid" off of the other, it would not significantly alter the information conveyed to aquatic organisms by the geomagnetic field. In terms of navigation, as the cables are outside of the designated navigation channel (where vessel traffic will be heaviest), the impact of the expected compass deflection is anticipated to be minimal.

98. Impacts to fish species from magnetic fields associated with the HVDC Transmission System's cables are not expected to be significant. Migratory species coordinate and make use of multiple cues to navigate and the magnetic field of the cables will accentuate or attenuate the magnetic field of the earth in a constant fashion along a narrow band of river bottom. Available literature indicates that there would be no adverse effects on egg or larval development, based on the expected magnetic fields associated with the HVDC Transmission System's cables. In addition, as a percentage of the overall spawning area, the area potentially affected by the weak magnetic field produced by the HVDC Transmission System is small and therefore would not have any significant effects on the total number of eggs and larvae present during spawning.

E. Availability and Impact of Alternatives

99. The Application and exhibits to be supplied for the record describe the availability and impact of alternatives to the Facility and are summarized below. Considering all the factors, the Signatory Parties agree that the Facility, as located and configured in this Joint Proposal is preferable, on balance, to any of the alternatives considered.

a. Alternative Technologies

100. The Applicants assessed several alternative cable technologies and determined that crossed-linked polyethylene ("XLPE") HVDC cables were the preferred technology for the following reasons. The use of solid dielectric cables means that no insulating or dielectric cooling fluids are required and there is no risk of a leak causing a fluid spill or sheen in the water. The XLPE cables that would be installed in the water are made up of several layers consisting of a conductor, polyethylene insulation, a copper sheath, outer covering and metallic armoring, which serve to reduce the electric field. A similar analysis was conducted for the Astoria Rainey Cable and the XLPE HVAC cables were the preferred technology. The advantages of the XLPE HVAC cables included off-the-shelf availability in diameters that would allow for a long-term emergency rating of approximately 1,000 MVA and elimination of any potential for dielectric fluid loss. For detailed information on XLPE cables see Exhibit 122 attached hereto.

b. Alternative Routes

101. The Signatory Parties considered and rejected various alternative routes for the Facility. The siting of the Route was developed through evaluations of various alternative landfall locations and overland routes, as well as through consultation with the Energy Subcommittee of the Harbor Safety, Operations, and Navigation Committee; the USACE and the USCG for underwater routes. Four (4) alternative routes for the Astoria Rainey

Cable were considered and rejected in favor of the route proposed for that line. Each of these routes was rejected in its entirety by the Signatory Parties due to presence of CNY infrastructure, engineering challenges, additional construction costs, and additional environmental impacts.

102. Three alternative landfalls and overland route segments in proximity to lower Lake Champlain were considered and rejected in favor of the Route, including: (1) the Putnam Station Route, which would exit the waters of Lake Champlain in Putnam, New York and utilize residential roads and NYS Route 22 to reach Whitehall, New York; (2) the Ticonderoga Route, which proposed three potential exit points that would allow for use of NYS Route 22 to connect to Whitehall, New York; and (3) within the South Lake to Whitehall (as proposed in the Application). The alternatives analysis, provided as Exhibit 86, concluded that the environmental impacts associated with the first two (2) alternates did not appear to be significantly different from those identified with the landfall location in Dresden, New York, but that they would require a longer upland construction period, resulting in more disruption to the environment and the community. Whitehall was not selected as the favored landfall point due to concerns about water quality impacts between Dresden and Whitehall.

103. Four (4) alternative routes in proximity to the Hudson, Harlem and East Rivers were considered and rejected in favor of the Route: the route proposed in the March 2010 Original Application; the Hudson River Western Rail Line and Harlem River Rail routes presented by DPS Staff on October 27, 2010; and an overland segment from Poughkeepsie, New York on NYS Route 9 south to Peekskill Bay and into the Hudson River. Each of these routes was rejected in its entirety by the Signatory Parties due to engineering challenges, additional construction costs, and additional environmental

impacts. The alternatives analysis provided as Exhibit 86 demonstrated that there were no feasible alternatives to locating the HVDC Transmission System in the Hudson River between Cementon and Haverstraw Bay.

104. The Original Application also provided an evaluation of the potential to utilize existing utility ROW from Montreal, Canada to New York City, New York. These alternatives were determined to be infeasible due to cost, routing complexity, private property access, and acquisition and construction access.

105. The preferred route as presented in this Joint Proposal was determined to be the best suited for the Facility, since it provides an appropriate balance among the various state interests, and it represents the minimum adverse environmental impact, considering the state of available technology, the nature and economics of the studied alternatives and other pertinent considerations.

c. Alternative Locations for Converter Station

106. Multiple converter station locations were considered by the Signatory Parties. These alternatives included: three locations in Brooklyn in proximity to the Gowanus 345 kV substation; a property on Wells Avenue in Yonkers, New York; the Harlem River Rail Yard in the Bronx Borough of CNY; and a parcel owned by Consolidated Edison on the northern bank of Luyster Creek in the Astoria neighborhood of the Borough of Queens in New York City. The area near Con Edison's Rainey substation was reviewed and no location of sufficient size to site the converter station was identified. The Brooklyn sites were rejected as being too distant from the preferred Point of Interconnection at the Astoria 345 kV substation. The Bronx site is owned by NYSDOT, which has declined to make that site available to Applicants. The Astoria site is superior to the Yonkers site due to environmental and cost benefits. The Yonkers site would require installation of 11

miles of double circuit three-phase 345 kV circuits through the Hudson and Harlem Rivers in two trenches with a separation distance of 33 feet to deliver the Facility's energy to Astoria. The Astoria site would also require less disruption to existing land uses as it is on a parcel which has historically been utilized for utility-related purposes. The signatory parties agree that the overall environmental impacts would be reduced by the selection of the Astoria site and that the operation of a Converter Station would be consistent with the existing uses of the Astoria site and with the planned use of the site to the extent such plans are publicly available. A detailed review of these alternatives is contained in Exhibit 108.

d. Alternative Methods to Fulfill Energy Requirements

107. The Facility is expected to deliver electricity produced by wind and hydroelectric generation in Canada, displacing other, typically gas-fired, generation in and around CNY. Based on this expectation, DPS Staff performed an analysis comparing the cost of 1000 MW of Canadian hydroelectric power delivered to CNY via the Facility to the cost of building and operating 1,000 MW of combined cycle gas-fired turbine ("CCGT") generation of similar capacity located in CNY.

108. Because the Project is expected to be financed on a merchant basis, the difference between the estimated costs of these two supply options should not be interpreted as ratepayer benefits. To the extent that prices for electricity are determined by the long run cost of constructing and operating new CCGT capacity, these production cost savings will be captured by the Applicants, their financial backers and/or the users of the Facility.

109. Future developments may provide higher or lower-cost alternatives than those assumed by DPS Staff, causing the difference in cost between these two supply alternatives to differ from DPS Staff's estimates. DPS Staff provides this long-term production cost

comparison solely as a preliminary estimate of one important component of societal benefits – total production costs – to assist the Commission in deciding whether the facilities proposed in this case can be expected to yield net societal benefits.

110. For the capital cost of the HVDC Transmission System, DPS Staff assumed $2.0 billion, as in Exhibit 111. DPS Staff assumed annual operating costs for the HVDC Transmission System of $14.7 million per year, producing a 35 year Net Present Value ("NPV") of $0.2 billion. For the amount of energy to be delivered by the Facility, DPS Staff relied upon a report prepared by London Economics International ("LEI") for the Applicants, filed with the July 22, 2010 Article VII Application supplement. LEI assumed that the Facility would deliver 7640 GWh per year, representing an approximately 87% capacity factor. To be consistent with the LEI analysis, DPS Staff assumed that sufficient new hydroelectric resources would be developed to supply 7640 GWh per year of energy to CNY.

111. For the cost of the Facility's energy supply, DPS Staff used public information regarding the cost of new hydroelectric supply in Quebec. Specifically, HydroQuebec's 2009 Annual Report indicated that one project (Eastmain/La Sarcelle) could provide 8700 GWh of energy annually beginning in 2012 at a cost of $5 billion (Canadian), and another project (Romaine) could deliver 8000 GWh of energy annually beginning in 2014 at a cost of $6.5 billion (Canadian). Based on this, DPS Staff estimated that the cost of new dams to provide 7640 GWh of energy per year to CNY would be approximately $6.7 billion in 2015 (adjusting for exchange rate, inflation, and line losses).

112. For the cost of the alternative resource, DPS Staff relied on an estimate of the cost of a new 547 MW CCGT plant in CNY prepared by the NYISO and filed with the FERC on March 29, 2011 in Docket ER11-2224; see Attachment V (Affidavit of Christopher

Ungate), p. 12. DPS Staff scaled this up and adjusted for inflation, leading to an estimated cost of $2.0 billion for 1000 MW of CCGT capacity in 2015.

113. For the cost of energy from the CCGT, DPS Staff relied on recent forecasts of natural gas prices at Henry Hub, from the Department of Energy's Energy Information Administration ("EIA"). Gas prices were adjusted for gas transportation costs based on the historical difference between Henry Hub and CNY gas prices. The EIA's 2010 Annual Energy Outlook forecasted a Henry Hub gas price of $7.02 per MMBtu (million metric British thermal units) in 2015. However, EIA's 2011 Annual Energy Outlook forecasted a lower Henry Hub gas price of $5.17 per MMBtu in 2015, based on a greater anticipated supply of "shale gas" using hydro-fracturing. DPS Staff used these two EIA forecasts as "high" and "low" gas price scenarios. DPS Staff estimated energy costs based on the CNY price of natural gas multiplied by the "heat rate" of 7079 Btu per kWh, reflecting the average of summer and winter heat rates estimated by NYISO for a new CCGT plant. Energy costs escalate with the forecasted gas prices.

114. For variable operating and maintenance ("O&M") expenses, DPS Staff relied on an estimate of $6/MWh (in 2015) for CCGTs, from p. 79 of the LEI study prepared for Applicants. This value is comparable to the variable O&M expenses for gas-fired turbines prepared by National Economic Research Associates ("NERA") for the NYISO (see *Independent Study to Establish Parameters of the ICAP Demand Curve for the New York Independent System Operator,* September 3, 2010, p. 99, provided here as Exhibit 124). Based on this information, DPS Staff estimated annual variable O&M costs of approximately $46M per year for 7640 GWh of energy in 2015. DPS Staff assumed these costs would increase post-2015 at the average rate of inflation, forecast at 2.1%.

115. For fixed O&M expenses, DPS Staff relied on the NYISO March 29, 2011 filing referenced above. The NYISO estimated the fixed operating costs of a CCGT plant to be approximately $120 per kW-year in 2011, including labor, materials, overhead, site leasing, property taxes (without abatement), and insurance. At Applicants' request, property taxes were excluded from this analysis on the ground that such taxes would be transfer payments and would not represent economic costs. After removing property tax expenses, DPS Staff estimated annual fixed O&M costs of a 1000 MW CCGT to be approximately $34 million per year in 2015. DPS Staff assumed these annual costs would escalate with inflation.

116. DPS Staff combined these fuel and non-fuel operating costs, and then computed the NPV in 2015 of the stream of operating costs for 35 years of operation (consistent with the project's financing). The use of separate high and low gas price forecasts yielded a range of operating costs. For the NPV discount rate, DPS Staff employed the Commission-approved discount rate of 5.5% (real); combined with the forecasted inflation rate of 2.1%, this implies a nominal discount rate of 7.72% (i.e. 1.055x1.021 – 1 = .0772). This resulted in a range of NPV operating costs over a 35 year period of approximately $8.3 to $10.3 billion NPV. Thus the uncertainty in gas price forecasts leads to an uncertainty of almost $2 billion in NPV operating costs for the alternative energy source.

117. Finally, DPS Staff addressed the "deliverability" issues surrounding the Astoria Point of Interconnection. Astoria is the site of numerous generation plants and has limited transmission interconnections to CNY's bulk (345 kV) transmission system. The Astoria site includes 345kV transmission lines that formerly delivered power from the now-retired 890 MW Poletti plant, providing a potential outlet for Applicants' energy. However, the Astoria Energy II ("AE2") project currently uses approximately 550 MW

of that capacity. The Astoria-Rainey Cable will provide sufficient energy deliverability to permit both AE2 and the HVDC Transmission System to deliver all or substantially all of their electric output into Con Edison's 345 kV transmission system on a simultaneous basis, assuming the implementation of appropriate operational or other measures. Please see Siemens-PTI Inc.'s Study and Summary of Energy Deliverability Report provided here as Exhibit 123. However, these upgrades alone will not be sufficient to enable Applicants to qualify to supply a full 1,000 MW of Capacity Resource Interconnection Service ("CRIS") due to constraints elsewhere on Con Edison's 345 kV system. DPS Staff assumed that the alternative resource (1,000 MW of CCGT generation in CNY) could interconnect elsewhere on Con Edison's 345 kV system, and therefore avoid the cost of the Astoria-Rainey Cable. However, the alternative resource would face comparable limitations on CRIS rights, due to constraints elsewhere on Con Edison's 345 kV system, as explained by the Siemens Deliverability Analysis provided by the Applicants. As a result, DPS Staff agreed that the additional costs to achieve full capacity deliverability (beyond the cost of the Astoria-Rainey Cable) would be incurred by both the Facility and the alternative, and therefore cancel out in the net benefit analysis.

118. DPS Staff estimated the long-term production cost savings of the Facility as the cost of the Facility plus the cost of the hydropower (dams), less the cost of the combined cycle plant and the present value of the plant's fuel and other operating and maintenance costs. Over a 35-year period, the savings (NPV) ranged from approximately $1.2 billion to $3.2 billion in 2015.

119. Applicants have reviewed the DPS Staff's analysis described above and would note that it does not purport to be a complete analysis of all social costs associated with

construction of a new 1,000 MW CCGT in CNY. Applicants contend that a complete social cost analysis would also include the external costs imposed on society of the far greater physical footprint of a CCGT plant (including required oil storage tanks) compared to the CHPEI Converter Station in CNY's crowded urban environment, and by the release of the oxides of nitrogen, carbon dioxide and waste heat produced by such a facility. Other social costs that would need to be included to complete this analysis of social costs would include the costs imposed by the release of air pollution and greenhouse gasses by the natural gas pipelines and production fields that would supply such a plant, including not only the sulfur dioxide, oxides of nitrogen and carbon dioxide released by pipeline converter stations, but also the release of substantial quantities of methane, a potent greenhouse gas, in natural gas production and transmission.

120. Moreover, Applicants indicate that such a generating facility would consume substantial quantities of natural gas, which unlike the wind and water resources that will supply CHPEI is a finite resource that is an essential fuel for home heating in some parts of the country and may not be easy to replace. To the extent that the plant would be required to operate on oil to meet applicable in-city reliability requirements, Applicants note that the environmental impacts associated with fuel supply would be correspondingly greater.

121. Applicants acknowledge that quantifying all of these social costs would be extremely difficult, if not impossible. Thus, while DPS Staff's analysis of certain of the social benefits of the Facility is useful as a sensitivity analysis suggesting that the Facility can be expected to provide net social benefits even under a very stringent set of assumptions, Applicants do not believe that this analysis can be regarded as a measure of the actual benefits of the Facility, to society as a whole which may be considerably higher than the production cost savings calculated by DPS Staff.

122. The Signatory Parties agree that the "no build" alternative is not the preferred option in this proceeding, as it would result in a less desirable balance of economic and environmental benefits compared to adverse environmental impacts than would the construction and operation of the Facility. Moreover, because the HVDC Transmission System is being developed on a merchant basis rather than at ratepayer expense, the Facility should be viewed as a complement to the Commission's public policy objectives to promote renewable generation facilities, reduce environmental impacts, such as air pollution, and increase fuel diversity.[5]

123. The Signatory Parties have also concluded that conservation and distributed generation cannot be considered to be effective alternatives to the Facility. Unlike the HVDC Transmission System, which is being developed on a merchant basis without the need for ratepayer funding, both conservation and distributed generation are unlikely to significantly increase in CNY without Commission assistance. The Commission may pursue funding for projects in order to achieve whatever benefits they can provide in addition to the Facility.

F. Overland Considerations

124. The Facility as proposed would be located entirely underground or under water, except for the specific facility components including various cooling equipment at locations along the Facility ROW, and the Converter Station at Astoria. See Exhibit 117 for a list of cooling equipment at locations along the Facility ROW.

[5] *See* Executive Order 111 - Directing State Agencies To Be More Energy Efficient And Environmentally Aware "Green And Clean State Buildings And Vehicles" (issued by Governor George Pataki on June 30, 2001 and continued by Governor Eliot Spitzer on January 1, 2007 and by Governor David Paterson on March 20, 2008), and Executive Order 24 – Establishing a Goal to Reduce Greenhouse Gas Emissions Eighty Percent by the year 2050 and Preparing a Climate Action Plan (issued by Governor David Paterson August 6, 2009).

G. Conformance to Long-Range Plans for Expanding the Electric Grid

125. The Facility is consistent with the most recent State Energy Plan, which establishes as a policy objective that the state of New York will support energy systems that enable the state to significantly reduce greenhouse gas emissions.[6] In furtherance of this goal, the Renewable Portfolio Standard ("RPS") goal was increased from twenty five (25) percent to thirty (30) percent on January 8, 2010.[7] The New York State Energy Plan states that an increase in renewable energy will require additional transmission in New York.[8] Not all of the electricity delivered by the Facility will meet the exacting standards of New York's RPS program. However, because wind and hydro resources already represent ninety-four (94) percent of the electricity power generation in the Hydro-Québec control area, and because Hydro-Québec has no plans to interconnect any additional generation resources other than wind, hydro, and other renewable resources,[9] Applicants anticipate that at least ninety-four (94) percent of the power will come from hydroelectric and/or wind resources that will not contribute to greenhouse gas emissions.

126. The Facility is also consistent with CNY's own PlaNYC, in which the CNY recognized that providing CNY residents with increased access to renewable energy supplies will

[6] *See* Energy Infrastructure Issue Brief, New York State Energy Plan 2009 (December 2009), p. 9, *available at* http://www.nysenergyplan.com/2009stateenergyplan.html.

[7] *Id.* at 15, 25.

[8] *Id.* at 1.

[9] Wind and hydro resources already represent ninety-four (94) percent of the power generation in the Hydro-Québec control area. Hydro-Québec, Annual Report 2010, p. 3 (2011). *Available at* http://www.hydroquebec.com/publications/en/annual_report/pdf/rapport-annuel-2010.pdf. Applicants contacted Hydro-Québec which has informed the Applicants that the sources of remaining 6% are imports from the neighboring control areas and diesel generation connected to certain isolated distribution systems operated by Hydro-Quebec in remote portions of the Province of the Québec.

simultaneously reduce electricity prices, local air pollution, and greenhouse gas emissions in the CNY[10].

H. System Reliability Impact Studies

127. A System Reliability Impact Study ("SRIS") for the interconnection of the HVDC Transmission System at NYPA's 345 kV bus located at Astoria has been completed by the NYISO. The study shows that the HVDC Transmission System can be connected to the New York State Bulk Power System ("NYSBPS") without adversely affecting reliability. The Applicants have not yet executed a study agreement for a NYISO Class Year Study. That study will determine the additional system upgrades needed to allow the HVDC Transmission System to connect to the NYSBPS as an energy resource and may also determine the additional system upgrades required for the HVDC Transmission System to qualify as a capacity resource to the extent that Applicants request Capacity Resource Interconnection Service. The NYISO stated: "Subsequent to the 7/29/10 [Transmission Planning Advisory Subcommittee] review and recommendation for [Operating Committee] approval of the Astoria [Optional Interconnection Study ("OIS")] #2 study report for [Certificate Holders'] HVDC Transmission Project #305, the NYISO informed [Certificate Holders] that [Long Term Emergency ("LTE")] rather than [Short Term Emergency ("STE")] ratings should have been used in the study for the two Astoria-E13th Street Q35L & Q35M cable circuits owned by NYPA. If LTE ratings were used in the OIS #2 study for the two Astoria-E13th Street Q35L & Q35M cable circuits, loss of one of the two cables would have caused the remaining cable circuit to exceed its LTE rating of 621 MVA but there would have been no significant adverse impact on the reliability of the New York State Transmission System. To avoid the

[10] *See* PlaNYC (2007), pp. 112-117, *available at* http://www.nyc.gov/html/planyc2030/html/theplan/the-plan.shtml.

overload beyond LTE, some form of mitigation would be required, which could include automatically tripping the entire 1,000 MW output of the HVDC Transmission System upon the loss of either cable circuit, automatically running back (virtually instantaneously) the HVDC Transmission System to 621 MW upon the loss of either cable circuit, or requesting an exception to exceed the LTE rating up to the STE rating and reducing the HVDC Transmission System output to 621 MW within 15 minutes following the loss of either cable circuit. A determination will be made in the future as to which option to pursue to prevent an overload of either of these cable circuits (NYISO Review of the Optional Interconnection Study-2 for Transmission Developers, HVDC Astoria Project Interconnection Queue #305 Report dated March 3, 2011, Draft March 9, 2011)." However, the Signatory Parties note that each of these alternatives would require approval by NYISO or other applicable authorities other than the Commission before it is known whether they can be implemented.

I. State and Local Laws

128. Applicants will comply with the substantive provisions of each applicable state statute and regulation, including the NYS Coastal Management Program and Article 42 of the Executive Law entitled: *Waterfront Revitalization of Coastal Areas and Inland Waterways*. By way of example, Applicants will comply with the substantive requirements of the statutes and regulations cited in Paragraphs 16-20 of the Proposed Certificate Conditions.

129. Applicants agree to obtain required proprietary permits/consents/authorizations before the start of construction. In addition, Applicants will obtain Commission approval of all required Municipal consents under PSL § 68.

130. The Revised and Updated Exhibit 7 provided as Exhibit 115 identifies, for each required municipality in which the Facility will be located, all potentially applicable local laws and regulations issued thereunder, as well as every such local legal provision that Applicants requested in such exhibit that the Commission refuse to apply because, as applied to the Facility, such local legal provision is unreasonably restrictive in view of the existing technology, factors of cost or economics, or the needs of consumers.

131. Except for those provisions of local laws identified in the Revised and Updated Exhibit 7 provided as Exhibit 115, that Applicants specifically requested that the Commission refuse to apply, Applicants will comply with, and the location of the Facility as proposed conforms to, all substantive local legal provisions applicable thereto.

132. A Certificate Condition contained in Appendix C hereof provides that the Applicants will apply for specified CNY permits, subject to the Commission's ongoing jurisdiction.

133. To the degree that the subject matter of the *New York State Uniform Fire Prevention and Building Code and the Energy Conservation Construction Code* apply to the Facility, Applicants agree to undergo building plan review and obtain building permits, inspections, and certificates of occupancy, as appropriate, upon the inspection and completion of construction from the CNY Department of Building. The Signatory Parties agree that if Applicants follow such a course of action, the record in this proceeding supports a finding under PSL § 126(1)(f) that the Facility is designed to operate in compliance with applicable state laws, and regulations issued there under, concerning the *New York State Uniform Fire Prevention and Building Code and the Energy Conservation Construction* Code. A Certificate Condition in Appendix C hereof implements the Applicants' agreement.

J. Public Interest, Convenience and Necessity

134. The benefits of the Facility fall into three principal categories: (a) reduced wholesale market prices in CNY, Long Island and the lower Hudson Valley; (b) reduced air emissions in those areas; and (c) increased reliability of the Bulk Power System in CNY.

a. Wholesale Energy Price Savings

135. The Applicants and DPS Staff forecast the potential reduction in wholesale market prices, using different electricity production cost computer models and comparing the effects under a scenario with the Facility, to a scenario without the Facility, assuming no other changes to electricity supply or demand as a result of lower prices. These forecasts, therefore, do not address how long these savings could be expected to last, since they neglect potential supply and demand responses to lower prices resulting from the Facility.

136. The Facility is expected to benefit NYS by reducing wholesale electric energy prices in CNY, Long Island and the lower Hudson Valley. In a report filed with the July 22, 2010 Article VII Application supplement, LEI initially estimated that the wholesale energy market price benefits of the Facility would range from $684 million per year to $904 million per year on average over a ten year period, with an expected average savings of $813.5 million per year for the New York Control Area as a whole ("NYCA").

137. In January 2011, DPS Staff also prepared estimates of the wholesale energy market price savings resulting from the Facility, which showed a lower level of savings. Specifically, DPS Staff's analysis performed using the GE MAPS model and the input database from the 2009 State Energy Plan placed the cost savings for a single test year (2018) between $405 and $720 million.

138. Working collaboratively, Applicants and DPS Staff identified several reasons for the difference between the LEI and DPS Staff results. LEI updated its analysis incorporating

study changes as described in LEI's Report of the 2018 Test Year Modeling Analysis provided to the parties in settlement discussions on January 18, 2011 and provided as Exhibit 88.

139. The results of DPS Staff's GE MAPS study and LEI's updated analysis are similar, as shown in Figure 1 below:

Figure 1. Comparison of wholesale energy market benefits of the Facility for NYCA in 2018 ($ millions)

	Wholesale Energy Market Benefit ($ millions)
DPS Staff estimate	$405 - $720
LEI Updated wholesale energy market benefit with CHPEI @ 75%- 90%	$554 - $654

These studies also demonstrate that, in addition to the benefits to the NYCA noted above, the Facility could also reduce wholesale market prices in neighboring control areas.

140. Given the substantial difference between the computer models of the operation of the NYSBPS used by LEI and DPS Staff, and the differences in other assumptions underlying the forecasts, the similarity of results between these two studies clearly shows that the Facility will result in substantial reductions in wholesale energy prices.

b. Environmental Benefits

141. These studies also indicated that the Facility would result in environmental benefits by reducing the emissions of SO_2, NO_X, and CO_2 due to the displacement of electric power that would have otherwise been generated by burning fuel in power plants. A comparison of the estimates of annual environmental benefits as predicted by LEI and by DPS Staff using the GE MAPS program for calendar year 2018 is presented in Figure 2 below:

Figure 2. Comparison of emissions reductions of the Facility for NYCA in 2018

Emissions Reductions	SO_2 (tons)	NO_X (tons)	CO_2 (tons)
DPS Staff estimate	499 - 828	748 - 1,432	1.5-2.2 million
LEI Updated emissions reduction benefit with CHPEI @ 75%- 90%	454 – 571	952-1,114	2.5-2.9 million

Here, too, the similarity between the results produced by the very different modeling approaches used by LEI and DPS Staff suggest that these are reasonable estimates of the reductions in emissions of these pollutants resulting from the Facility.

142. DPS Staff revisited its analysis in July 2011 to address concerns that benefits might be significantly reduced from earlier estimates as a result of energy deliverability concerns. To address these, Applicants undertook additional analyses that resulted in the proposal to construct and operate the Astoria-Rainey Cable. In addition, Applicants are also pursuing implementation of the Operational Measures. As described in paragraph 117 above, these measures could allow Applicants and the new gas-fired AE2 combined cycle unit to simultaneously deliver their respective energy to Con Edison's 345 kV system. Although the benefits of this increased capability have not been quantified, the expectation is that both the economic and air emissions benefits should be greater than the estimates provided by LEI and DPS Staff for the Applicant's original proposal. Further, it should be noted, however, that as it was completing its July 2011 analysis addressing energy deliverability concerns, DPS Staff became aware of recent significant changes in environmental regulations that are expected to impose much more stringent emissions limits for SO_2 and NO_x in the near future. First, revisions to the NYSDEC NO_x

Reasonably Available Control Technology ("RACT") regulations include lower NO_x emission rate standards. Second, on July 6, 2011, the USEPA finalized its proposed Clean Air Transport Rule as the Cross State Air Pollution Rule ("CSAPR"), requiring more aggressive reductions in SO_2 and NO_x emissions on an accelerated basis. While these requirements may reduce air pollutant emissions from older existing generators and thereby reduce the air quality benefits of the Facility to some extent, the Signatory Parties agree that the air quality benefits of the Facility are expected to remain substantial.

143. The Signatory Parties agree that the "no build" alternative could potentially result in the loss in annual wholesale market price savings in the range of $405-$720 million and associated reductions in emissions of SO_2, NO_x, and CO_2 due to displacement of electricity that would otherwise be generated by burning fossil fuels.

144. The Signatory Parties have agreed upon the establishment of the Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust (the "Trust"), as detailed at Proposed Certificate Condition 165 in Appendix C, to be used exclusively for in-water mitigation studies and projects that have a direct nexus to the construction and operation of the Facility. The Signatory Parties have participated in extensive discussions to develop a variety of studies and projects that will minimize, mitigate, study and/or compensate for the short-term adverse aquatic impacts and potential long-term aquatic impacts and risks to these water bodies from construction and operation of the Facility.

145. NYSDOS and the following parties signing this Joint Proposal, without reservation, have agreed to serve on the Governance Committee of the Trust:

(1) Champlain Hudson Power Express, Inc. and CHPE Properties, Inc;

(2) DPS;

(3) DEC;

(4) CNY;

(5) APA;

(6) Trout Unlimited;

(7) Scenic Hudson; and

(8) Riverkeeper.

146. Within sixty (60) days after the execution of the Joint Proposal, DPS staff will convene a meeting of the Governance Committee. The Governance Committee shall have final decision-making authority over the Trust and will develop internal rules and procedures which shall establish:

(a) the organization and administration of the Trust;

(b) the operations of the Committee including assistance with the implementation of the Priority Projects as defined in Proposed Certificate Condition 165 in Appendix C and making final determinations regarding other projects proposed to be funded through the remainder of the Trust; and

(c) all other necessary and appropriate tasks including the development of a schedule for future committee meetings.

Provided however that the Governance Committee shall have no authority to authorize the expenditure of any money or the making of any legally enforceable commitment(s) by the Trust prior to the date of Applicants initial endowment of the Trust as provided in Proposed Certificate Condition 165 in Appendix C.

147. Technical sub-committees consisting of interested signatories to the Joint Proposal and interested state and federal resource agencies with permitting authority or other jurisdiction over the Facility will be convened by the Governance Committee after the

Governance Committee's first meeting to provide scientific and technical advice, support and recommendations. The technical sub-committees will evaluate and assist with the implementation of the projects approved for funding.

c. Reliability Benefits

148. Due to the highly controllable nature of the HVDC Transmission System, the Facility will provide the NYSBPS with a number of benefits that can be expected to increase overall system reliability. These benefits include fast voltage control, and the ability to energize at a lower voltage level when required. In addition, the output of the HVDC Transmission System is controllable so that system operators can match load and generation, at morning pick up, during system emergencies, normal operation, etc. This HVDC Transmission System provides another source into the Con Edison control area. The HVDC Transmission System is isolated and prevents system disturbances from the Hydro-Quebec system propagating into New York, likewise, disturbances in New York cannot propagate into the Hydro-Quebec system.

d. Other Considerations

149. The Facility is not expected to have any adverse impacts on public safety or on public lands, as it would be located almost entirely underground or under water, and the Proposed Certificate Conditions dealing with construction would minimize both the impacts on the public and the safety issues associated with the construction and maintenance of the Facility. In addition, the portions of the Facility's overland route would be subject to taxation by the municipalities in which they would be located.

IV. PROPOSED FINDINGS

150. The Signatory Parties agree that the record in this proceeding enables the Commission to make the findings required in connection with the construction and operation of an

electric transmission line that are set forth in PSL §126(1)(a), (b), (c), (d)(1) and(2), (f) and (g).

V. PROPOSED CERTIFICATE CONDITIONS

151. The Signatory Parties agree that the proposed Certificate Conditions set forth in Appendix C hereto are acceptable and appropriate for inclusion in a Certificate of Environmental Compatibility and Public Need authorizing construction and operation of the Facility as proposed herein.

VI. ENVIRONMENTAL MANAGEMENT AND CONSTRUCTION PLAN GUIDELINES

152. The Signatory Parties agree that the BMPs and the EM&CP Guidelines set forth in Appendices G and F hereto are acceptable and appropriate for application to the Facility as proposed herein.

VII. WATER QUALITY CERTIFICATION

153. The Signatory Parties agree that the record in this proceeding supports the proposed WQC set forth in Appendix D hereto. On the date that the executed Joint Proposal was filed, the Applicants also filed a request that the Commission issue a WQC, pursuant to § 401 of the Federal Clean Water Act ("CWA"), for activities associated with construction of the Facility. The CWA requires a federal permit to discharge dredged or fill material into "navigable waters" (33 U.S.C. §§ 1311(a) and 1342(a)) and requires an applicant for a federal permit to provide a certification from the State that the discharge will comply with State water quality standards. Given the ministerial nature of the Commission's decisions to grant a WQC (in that, whether issued before or after an Article VII Certificate, such WQC must be consistent with any such certificate), as well as the normal sixty (60) day period for granting the certifications established in federal rules [33

C.F.R. §325.2(b)(1)(ii)] (which period may be extended for up to one year) after which a waiver will be deemed to occur, the Commission delegated responsibility for granting a WQC in connection with Article VII certificates to the Director of the Office of Energy Efficiency and the Environment. As requested by the Applicants, the Director should issue the WQC on or before the 60th day after the filing of this request to avoid waiver of such certification, unless DPS Staff has provided information to the USACE indicating that circumstances require a period of time longer than sixty (60) days (up to one year).

[SIGNATURE PAGES FOLLOW AT THE END OF THE DOCUMENT]

APPENDIX A - LIST OF TESTIMONY AND EXHIBITS TO BE ADMITTED

Testimony:

Direct testimony of Samantha Hard, Julia Frayer, Joshua Brown, Sean Murphy, Laurence E. Perkins, Carl Erik Opsahl, Alan Prior, Laura Lefebvre, Ronald A. Alveras, Robert Quiggle, Jack Wu, Kenneth Cormier, Judith Bartos, and Anthony Agresti sponsoring Exhibits 1 through 9 (Exhibits 1 through 9 to the application in this proceeding (the "Application") and Exhibits 10-15 (Exhibits E1 through E-6 to the Application).

In addition to the Original Application that was submitted on March 30, 2010, the Applicants filed the "Supplement to the Article VII Application by CHPEI" document on July 22, 2010 ("Supplement"). Julia Frayer, Joshua Brown, Samantha Hard, Judy Bartos, Anthony Agresti, Sarah Zappala, Laurence Perkins, and Alan Prior sponsored Attachments A through M of the Supplement.

Applicants also listed several reports that were shared with the parties during the settlement negotiations.

JOINT PROPOSAL Exhibit List

Exhibit 1: General Information Regarding Application (Exhibit 1 to the Application)

Exhibit 2: Location of Facilities (Exhibit 2 to the Application)

Exhibit 3: Alternatives Analysis (Exhibit 3 to the Application)

Exhibit 4: Environmental Impacts (Exhibit 4 to the Application)

Exhibit 5: Design Drawings (Exhibit 5 to the Application)

Exhibit 6: Local Economic Effects (Exhibit 6 to the Application)

Exhibit 7: Local Ordinance Review (Exhibit 7 to the Application)

Exhibit 8: Other Pending Filings (Exhibit 8 to the Application)

Exhibit 9: Cost of Proposed Facilities (Exhibit 9 to the Application)

Exhibit 10: Description of Proposed Transmission Lines (Exhibit E-1 to the Application)

Exhibit 11: Other Facilities (Exhibit E-2 to the Application)

Exhibit 12: Underground Construction (Exhibit E-3 to the Application)

Exhibit 13: Engineering Justification (Exhibit E-4 to the Application)

Exhibit 14: Effects on Communication (Exhibit E-5 to the Application)

Exhibit 15: Effect on Transportation (Exhibit E-6 to the Application)

Exhibit 16: Agency Consultation (Appendix B to the Application)

Exhibit 17: Wetland Delineation Report (Appendix C to the Application)

Exhibit 18: Historic Sediment Sampling Location (Appendix D to the Application)

Exhibit 19**: Historic and Archeological Resource Mapping and Tables (Appendix E to the Application)

Exhibit 20: LEI Projected Energy Market and Emissions Impact Analysis Report (Appendix F to the Application)

Exhibit 21: Nexans Cable System Study Report (Appendix G to the Application)

Exhibit 22: Electric and Magnetic Fields Report (Appendix H to the Application)

Exhibit 23: Appendix A: Data Gaps and Deficiencies (Appendix A to the Supplement filed on July 29, 2010)

Exhibit 24: Appendix B: Requests for Additional Information (Appendix B to the Supplement)

Exhibit 25: Appendix C: Response to NYSDEC Comments (Appendix C to the Supplement)

Exhibit 26: Appendix D: Revised Project Description / Updated Facility Description and Resources (Appendix D to the Supplement)

Exhibit 27: Projected Energy Market, Capacity Market and Emissions Impact Analysis of the Champlain-Hudson Power Express Transmission Project for New York (Attachment A to the Supplement)

Exhibit 28: Revised Wetland Delineation Report (Attachment B to the Supplement)

Exhibit 29: Visual Assessment Report (Attachment C to the Supplement)

Exhibit 30: Noise Assessment Report (Attachment D to the Supplement)

Exhibit 31: Marine Survey Report (Attachment E to the Supplement)

Exhibit 32: Updated Ecological Mapping (Attachment F of the Supplement)

Exhibit 33: Threatened and Endangered Species Consultations (Attachment G of the Supplement)

Exhibit 34: Updated Design Drawings (Attachment H of the Supplement)

Exhibit 35: Revision of Exhibit 7 Local Ordinance Review (Attachment I of the Supplement)

Exhibit 36: Exhibit 9: Cost of Proposed Facility Supplemental (Attachment J of the Supplement)

Exhibit 37: Revision of Exhibit E-2 Other Facilities (Attachment K of the Supplement)

Exhibit 38**: Draft SRIS Report (Attachment L of the Supplement)

Exhibit 39: Revised Electric and Magnetic Fields Report (Attachment M of the Supplement)

Exhibit 40: Certificates of Service (Attachment N of the Supplement)

Exhibit 41: HVDC Classic Reference List (Attachment O of the Supplement)

Exhibit 42: Aquatic Sampling and Analysis Plan (Attachment P of the Supplement)

Exhibit 43: Supplemental Alternatives Analysis (Attachment Q of the Supplement)

Exhibit 44: List of Recreational Trails and Public Recreational Areas along Underwater Transmission Cable Route (Attachment R of the Supplement)

Exhibit 45: FOIL Letters sent to Public Drinking Water Systems (Attachment S of the Supplement)

Exhibit 46: Estimate Tax Impacts (Rough Estimates Only) (Attachment T of the Supplement)

Exhibit 47: Flood Insurance Maps (Attachment U of the Supplement)

Exhibit 48: State, County, and Municipal Land Use Plans, Comprehensive Plans and Master Plans; Local Laws, Codes, and Zoning Ordinances (Attachment V of the Supplement)

Exhibit 49: Replacement Maps (Attachment W of the Supplement)

Exhibit 50**: Feasibility Study Report (NYISO Queue #305) (Attachment X of the Supplement)

Exhibit 51: Consultations with Transportation Agencies (Attachment Y of the Supplement)

Exhibit 52: Public Notices (Attachment Z of the Supplement)

Exhibit 53: Public Information Plan (Attachment AA of the Supplement)

Exhibit 54: Filing with Federal Energy Regulatory Commission (Attachment AB of the Supplement)

Exhibit 55: National and State Heritage Areas, State Heritage Trails (Attachment AC of the Supplement)

Exhibit 56: Letter to Commission, dated August 6, 2010

Exhibit 57: Design Drawings (Attachment A to August 6, 2010 letter)

Exhibit 58: Updated Exhibit 7 (Attachment B to August 6, 2010 letter)

Exhibit 59: Letter to Commission, dated August 11, 2010

Exhibit 60: Design Drawings (Attachment to August 11, 2010 letter)

Exhibit 61: Response to Visual Assessment Information Needs Request (Attachment to August 11, 2010 letter)

Exhibit 62: Certificates of Service (Attachment to August 11, 2010 letter)

Exhibit 63: DPS-1 through DPS-190[11]

Exhibit 64: NYSDEC-1 through NYSDEC-6

Exhibit 65: APA-1 through APA-9

Exhibit 66: CHG-1 through CHG-17

Exhibit 67: COW-1 through COW-6

Exhibit 68: Entergy-1 through Entergy-2

Exhibit 69: IBEW-1 through IBEW-11

Exhibit 70: IPPNY-1 through IPPNY-39[12]

Exhibit 71: NYPA-1 through NYPA-12

Exhibit 72: NYSTA/CC-1 through NYSTA/CC-9

Exhibit 73: OPRHP-1 through OPRHP-3

[11] DPS-130 does not exist.

[12] IPPNY 36-39 do not include responses.

Exhibit 74: RVK-1 through RVK-12

Exhibit 75: ADKC-1 and ADKC-2

Exhibit 76: APA Informal-1 through APA Informal-2

Exhibit 77: NYSDEC Informal-1

Exhibit 78: DOS Informal

Exhibit 79: NYSDOT Informal-1 through NYSDOT Informal-5

Exhibit 80: RVK Informal-1

Exhibit 81: Informal IRs received verbally during the Settlement Conferences (Informal -1 through Informal-5)[13]

Exhibit 82: DPS Informal-1 through DPS Informal-23[14]

Exhibit 83: COY-1 through COY-14

Exhibit 84: Lake Champlain Water Quality Modeling (October, 2010)

Exhibit 85: Hudson, Harlem and East River Water Quality Modeling (October, 2010)

Exhibit 86: Champlain Hudson Power Express Project – Updated Alternatives Analysis (submitted on November 5, 2010)

Exhibit 87: Applicants' Letter to New York State Department of State regarding Updated Alternatives Analysis (January 18, 2011)

Exhibit 88 LEI Memo on the Results of the 2018 Test Year Modeling Analysis (distributed January 24, 2011)

Exhibit 89: Technical Review Report by ESS, submitted by Riverkeeper, Inc. and Scenic Hudson (January 21, 2011)

Exhibit 90: Revised Lake Champlain Water Quality Report with Shear Plow (January, 2011)

Exhibit 91: Letter to New York State Department of State (dated February 4, 2011)

Exhibit 92: Letter to New York State Department of State (dated February 18, 2011)

Exhibit 93: Harlem Rail Yard Layout Map (submitted on February 23, 2011)

[13] Informal-4 does not exist.

[14] DPS Informal-16 does not exist.

Exhibit 94: Cultural Resources Analysis of Underwater Remote Sensing Data for Champlain Hudson Power Express dated February 22, 2011 and Revised Cultural Analysis Report dated August 09, 2011

Exhibit 95: Typical Construction Spreads along Route 22 (submitted on February 23, 2011)

Exhibit 96: Ballston Spa Alternative (submitted on February 23, 2011)

Exhibit 97: Routing Map for Erie Boulevard, City of Schenectady (submitted on February 24, 2011)

Exhibit 98: Route Reconfiguration in Lake Champlain: Environmental Impacts (submitted on (February 28, 2011)

Exhibit 99: Certificate of Service on Additional Municipalities (submitted on March 4, 2011)

Exhibit 100: Applicants' Letter to New York State Department of State, dated March 18, 2011

Exhibit 101: Applicants' Response to New York State Department of Public Service review of ESS Report (submitted on 4/15/2011).

Exhibit 102: Description of Protected Areas within Hudson River (submitted April 29, 2011)

Exhibit 103 Memorandum from Exponent Inc on Effect of Bolt-on Split Pipe on DC Magnetic Field Levels, dated March 15, 2011

Exhibit 104: Meeting notes for meeting with Energy Subcommittee of the Harbor Operations Safety and Navigation Committee held on March 16, 2011 (submitted on March 28, 2011)

Exhibit 105: Upland Deviation Zone Report (submitted on May 20, 2011)

Exhibit 106: Fidelity Title Review (submitted on May 3, 2011)

Exhibit 107: Revised Noise Assessment Report (June 2011)

Exhibit 108: Comparative Analysis of Converter Station Sites (Yonkers, Astoria and Harlem River Yard Sites) (submitted on April 20, 2011, revised on February 6, 2012)

Exhibit 109: Karner Blue Butterfly (*Lycaeides Melissa samuelis*) Impact Avoidance and Minimization Report (submitted on June 17, 2011) and *confidential maps.* **

Exhibit 110: Amendment to Visual Assessment Report: Projected Converter Station in Astoria, NY. (June 16, 2011)

Exhibit 111: Revised Construction Cost of the Project (submitted on April 29, 2011)

Exhibit 112: CHPEI- 1 through CHPEI-14

Exhibit 113: IBEW Informal-1

Exhibit 114: CECONY-1 through CECONY-22, CECONY Informal-1 and 2, and CECONY to NYPA-1[15]

Exhibit 115: Revised and Updated Exhibit 7 to the Application (submitted on July 14, 2011), along with all local laws cited therein

Exhibit 116: Revised Electric and Magnetic Fields Report (July 2011)

Exhibit 117: List of cooling equipment at locations along the ROW

Exhibit 118: Lake Champlain Burial Depth Update (submitted October 26, 2011)

Exhibit 119: Revised Electric and Magnetic Fields Report for HVAC Cable

Exhibit 120: Revised Alternatives Analysis for Astoria-Rainey Cable (Revised February 7, 2012)

Exhibit 121: Revised Environmental Impacts assessment (February 7, 2012)

Exhibit 122: Report to the Parties regarding cable types (February 9, 2012)

Exhibit 123: Siemens PTI – TDI's Merchant CHPEI Transmission Project with POI at Astoria (NYISO Queue # 305 Deliverability Analysis)

Exhibit 124: Independent Study to Establish Parameters of the ICAP Demand Curve for the New York Independent System Operator, September 3, 2010, Revised September 7, 2010 and November 15, 2010

Exhibit 125: Applicants' Report to Parties regarding Con Edison's Proposed Local Transmission Plan (February 14, 2012)

Appendix B: Description of the Facilities and Maps***
Appendix C: Proposed Certificate Conditions and Monitoring Reports***
Appendix D: Water Quality Certification***
Appendix E: EM&CP Guidelines***
Appendix F: Best Management Practices***

**Confidential Document – Document was only filed with the ALJs.
*** Included in the DVD, "Joint Proposal of Settlement Exhibits," dated February 24, 2012.

[15] CECONY 20-22, and CECONY Informal 1 and 2 do not include responses.

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

Champlain Hudson Power Express, Inc.
By:
Donald Jessome
President and CEO

DATE: 2/14, 2012

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

CHPE Properties, Inc.
By:
Donald Jessome
President and CEO

DATE: 2/14, 2012

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

Staff of the New York State Department
of Public Service
By:
Steven Blow
Assistant Counsel

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

New York State Department of
Environmental Conservation
By:
Patricia Desnoyers
Office of General Counsel

DATE: February 24, 2012

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

Cesar A. Perales
Secretary of State
New York State Department of State

Dated: February 23, 2012

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

Robert L. Sack

New York State Department of
Transportation*
By:
Robert L. Sack, P.E.
Director
Operations Division

DATE: February 17, 2012

* The New York State Department of Transportation is signing this Joint Proposal in support of only those provisions thereof that address issues related to the use and protection of the highways, roads, streets, or avenues and other transportation facilities that are owned by, operated by or under the jurisdiction of the New York State Department of Transportation.

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

Terry deFranco Martino

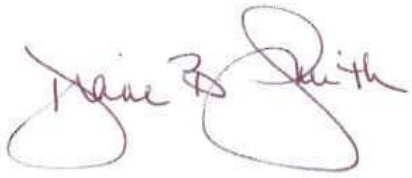
New York State Adirondack Park Agency
By:
Terry deFranco Martino
Executive Director

DATE: 2-23-2012

CASE 10-T-0139 – Joint Proposal

The Department of Agriculture and Markets' endorsement of this Joint Proposal and the supporting documents is limited to those terms and conditions that impact agricultural resources.

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.



_____

New York State Department of Agriculture and Markets
By:
Diane Smith
Associate Attorney

DATE: February 23, 2012

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

Riverkeeper
By:
Paul Gallay
President and Hudson Riverkeeper

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

Scenic Hudson
By:
Ned Sullivan
President

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

City of Yonkers
By:
Bryan D. Duroy
Assistant Corporation Counsel

DATE: February 23, 2012
Yonkers, New York

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

William A Wellman

New York State Council of Trout Unlimited
By:
William Wellman
Region 5 Vice President

DATED: 2/13/12

CASE 10-T-0139 – Joint Proposal

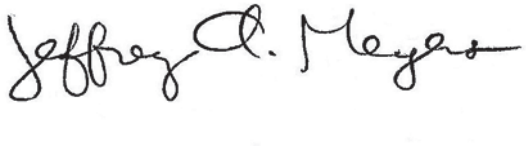
IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.

City of New York
By:
Sergej Mahnovski
Director of Energy Policy
Office of the Mayor

DATE: 2-23-2012

CASE 10-T-0139 – Joint Proposal

IN WITNESS WHEREOF, the Parties hereto this day signed and executed this Joint Proposal.



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New York State Office of Parks, Recreation
& Historic Preservation and the
Palisades Interstate Park Commission
By:
Meyers Jeffrey
Associate Attorney

DATE: February 24, 2012

REVISED

APPENDIX C

Case No.: 10-T-0139

CHAMPLAIN HUDSON POWER EXPRESS, INC.

PROPOSED CERTIFICATE CONDITIONS

January 18, 2013

TABLE OF CONTENTS

TABLES:

ATTACHMENTS

A. General Conditions of the Order

The Commission orders:

1. Subject to the Conditions set forth in this Opinion and Order, Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. ("Certificate Holders"), are granted a Certificate of Environmental Compatibility and Public Need ("Certificate"), pursuant to Article VII of the New York Public Service Law ("PSL"), authorizing the construction and operation of an electric transmission facility comprised of the following components: (i) two high-voltage direct current ("HVDC") cables capable of transmitting 1,000 megawatts ("MW") extending from the United States/Canada border east of the Town of Champlain, New York under the waters of Lake Champlain to the Town of Dresden, New York, extending from that point along rights-of-way ("ROW") of existing highways and railroads to the hamlet of Cementon in the Town of Catskill, New York, where the cables will enter the Hudson River and travel to the Town of Stony Point, New York where the cables will exit the water to proceed along existing highways and railroad ROW, as well as under state park land through Horizontal Directional Drill ("HDD") borings, to bypass Haverstraw Bay, reentering the Hudson River at Hook Mountain State Park in Clarkstown, New York and continuing in the waters of the Hudson and Harlem Rivers to a point south of the Willis Avenue Bridge and north of the Bronx Kill, following the railroad ROW in the Bronx and then across the East River to terminate at Astoria, Queens ("the HVDC Line"); (ii) a voltage source converter station to convert HVDC to high voltage alternating current ("HVAC") be constructed at Astoria, Queens, that will be connected to the New York Power Authority ("the Authority" or "NYPA") 345 kV HVAC gas insulated switchgear ("GIS") Substation (the "Converter Station" and, collectively with the HVDC Line, the "HVDC Transmission System"); and (iii) a HVAC

cable circuit extending from NYPA's 345 kV GIS Substation at Astoria, Queens to Con Edison's 345 kV Rainey Substation located on the corner of 36th Avenue and Vernon Boulevard in Queens, New York (the "Astoria-Rainey Cable" and, collectively with the HVDC Transmission Line System, the "Facility").

2. The Facility route is authorized as depicted on a series of maps included in Appendix B to the Joint Proposal.

3. The Facility is defined geographically by a deviation zone ("Allowed Deviation Zone") around a nominal centerline (the "Centerline"), as depicted in Appendix B to the Joint Proposal. For the portion of the Facility located on land, the Allowed Deviation Zone is depicted in Appendix B to the Joint Proposal. For the portions of the HVDC Transmission System located in Lake Champlain and the Hudson, Harlem, and East Rivers, the Allowed Deviation Zone is as specified in Certificate Condition 155.

4. Those portions of the Allowed Deviation Zone that may be affected by construction of the Facility are included in the construction zone ("Construction Zone"), which may also include areas outside the Allowed Deviation Zone that are needed temporarily for site investigation, access, and construction.

5. The portions of the Allowed Deviation Zone to be occupied by the Facility once construction is complete are referred to herein as the Facility ROW. The Certificate Holders shall also acquire and maintain the continuing right to enter onto and use certain additional lands immediately adjacent to the Facility ROW needed for repair and maintenance purposes, including preclusion of vegetative encroachment, on terms prohibiting the owners of such land from taking any action on that land that would interfere with such repair and maintenance activities.

6. The Facility may be developed in segments (each, a "Segment") to facilitate construction sequencing and scheduling, including the commencement of construction of overland components thereof, provided that, with the Environmental Management and Construction Plan ("EM&CP") filing regarding the first Segment, the Certificate Holders shall identify the anticipated Segments and include a schedule for their construction and, provided further that the EM&CP filings regarding subsequent Segments shall include updates to the Segment identification and construction schedule.

7. In the event of any conflict between the express provisions of this Certificate and any of the provisions of the Joint Proposal, including the Best Management Practices document ("BMPs") and the Environmental Management and Construction Plan Guidelines document ("EM&CP Guidelines"), both of which are attached as appendices to the Joint Proposal, the express provisions of this Certificate shall govern.

8. The Certificate Holders shall, within thirty (30) days after Commission approval of this Certificate, file with the Secretary to the Public Service Commission ("Commission") either a petition for rehearing or a verified statement that they accept and will comply with this Certificate. Failure to comply with this condition shall invalidate this Certificate.

9. The Certificate Holders shall not commence site preparation or construction of a particular Segment unless and until all the necessary permits and consents referred to in Certificate Condition 16 that pertain to that Segment are received and unless and until the EM&CP for that Segment (each such EM&CP filing for a particular Segment being referred to as a "Segment EM&CP") is approved by the Commission.

Copies of all permits/consents required for or obtained in connection with site preparation and construction shall be provided to the Secretary to the Commission ("Secretary") before commencement of any such activity. For the purposes of this Certificate, "construction" shall include site preparation, installation, delivery of equipment and supplies, maintenance of construction equipment during construction, clearing, and grading, but shall not include component manufacture, including cable manufacture.

10. The Certificate Holders shall not commence work on any Segment until they shall have obtained all required interests in real estate, including interests in real estate to be used for access roads (whether obtained through a conveyance, consent, permit, or other approval) as are necessary and applicable for such Segment. Evidence of the obtaining of such interests shall be provided to the Secretary prior to commencement of the work.

11. The Certificate Holders shall not commence construction of the Facility prior to the issuance (i) by appropriate Canadian federal and/or provincial authorities of those approvals and permits necessary in order to allow for the construction of transmission facilities interconnecting with the bulk power system operated by TransÉnergie (or a successor to such organization) and extending to the New York border, (ii) by the United States Department of Energy of an approval pursuant to Executive Orders 10485 and 12038, and (iii) by the United States Army Corps of Engineers ("USACE") of permits pursuant to section 404 of the Federal Clean Water Act and section 10 of the Federal Rivers and Harbors Act. The Certificate Holders shall provide copies of said permits to the Secretary within fifteen (15) days of receipt.

12. The Certificate Holders shall promptly notify the Secretary in writing should they decide not to complete construction of all or any portion of the Facility and shall serve a

copy of such notice upon all parties to this proceeding.

13. This Certificate may be vacated on notice to the Certificate Holders if (a) the Certificate Holders have not submitted the EM&CP or the initial Segment EM&CP to the Commission for its review within twelve (12) months of the date upon which Certificate Holders have received all permits and approvals required for the commencement of construction of the Facility from any and all governmental agencies and authorities having jurisdiction with respect thereto, and any finding made or action taken by any such agency or authority that is subjected to administrative and/or judicial review has been conclusively upheld as a result of such review, or the time period for the initiation of any such review has definitively expired, or (b), unless reasonable cause as defined in this Condition is shown, the Certificate Holders have not commenced construction of the Facility on or before the date that is six (6) months following the approval by the Commission of the EM&CP for the initial Segment EM&CP submitted to the Commission, or the date that is eighteen (18) months following the date of the grant of this Certificate, whichever is later. Reasonable cause may include delays in the issuance of permits and approvals required for the Facility by federal agencies and other circumstances beyond the reasonable control of the Certificate Holders.

14. The Certificate Holders shall integrate and coordinate maintenance of the Facility with that of adjacent facilities, structures, and property in accordance with the EM&CP.

15. a. The Certificate is granted and the required determinations of the need for the Facility and that the Facility will serve the public interest, convenience and necessity are explicitly made contingent on Certificate Holders delivering a minimum of 1,550 MW of

energy (including 550 MW of energy not flowing through the HVDC Transmission System) out of NYPA's Astoria substation. The Certificate Holders shall file a report documenting how they will achieve this level of deliverability prior to, or at the time they file their EM&CP for the first segment of the Facility. If the Certificate Holders cannot demonstrate compliance with this deliverability requirement, the Certificate Holders shall file with the Secretary a Request for Reconsideration of the need and public interest, convenience and necessity determinations made with respect to the Facility. The request shall be served on all parties to this proceeding and shall clearly state that all parties may submit comments on the filing within thirty (30) days of service. Such request shall explain why Certificate Holders believe that a lesser amount of energy deliverability is consistent with the Commission's findings that the Facility is needed and will serve the public interest, convenience and necessity. Such request shall include a discussion of each option the Certificate Holders considered as a means of achieving the minimum threshold level of deliverability. The Certificate Holders may not commence construction of the Facility unless and until the Commission has accepted the report or approved the request filed pursuant to this subpart.

b. The Certificate is granted and the required determination that the Facility will serve the public interest, convenience and necessity is explicitly made contingent on the HVDC Transmission System being developed, financed, constructed, and operated on a merchant basis with no reliance on cost-of-service rates set by either a federal or state regulatory entity, and will not be included in utility rate base, either directly or through a contractual arrangement between Certificate Holders and any agency, authority or other entity of the State of New York, any municipal subdivision of the State of New York, any utility subject to cost-based regulation, or any

instrumentality of any of the foregoing, and on the further condition that all costs associated with the use of the Astoria-Rainey Cable to deliver electric energy and capacity transmitted over the HVDC Transmission System will also be recovered exclusively on a merchant basis with no reliance on cost-of-service rates set by either a federal or state regulatory entity, and will not be included in utility rate base, either directly or through a contractual arrangement between Certificate Holders and any agency, authority or other entity of the State of New York, any municipal subdivision of the State of New York, any utility subject to cost-based regulation, or any instrumentality of any of the foregoing. Prior to, or at the same time they file their EM&CP for the first segment of the Facility, the Certificate Holders shall file a report documenting that they have received binding contractual commitments from one or more financially-responsible entities for a combined total of no less than 750 MW of Firm Transmission Service over the Facility for a period of no less than twenty-five (25) years. The Certificate Holders may not commence construction of the Facility unless and until the Commission has accepted this report. In the event that Certificate Holders seek to recover any of the costs of the HVDC Transmission System, or any of the costs associated with the use of the Astoria-Rainey Cable to deliver electric energy and capacity transmitted over the HVDC Transmission System, in cost-based rates set by a Federal or State regulatory authority, the Certificate shall be deemed invalid. In the event that the Certificate Holders recover all or any part of the costs of the HVDC Transmission System, or any of the costs associated with the use of the Astoria-Rainey Cable to deliver electric energy and capacity transmitted over the HVDC Transmission System, under a contract between Certificate Holders and any agency, authority or other entity of the State of New

York, any municipal subdivision of the State of New York, any utility subject to cost-based regulation, or any instrumentality of any of the foregoing, the Certificate shall also be deemed invalid. For purposes of this provision, the term "rates" shall include any charges established by NYPA or a utility operating under cost-based regulation, including without limitation base rates, surcharges, adjustments, or any other recovery mechanism.

c. The Certificate is granted and the required determination that the Facility will serve the public interest, convenience and necessity is explicitly made based on the cost estimate for the Astoria-Rainey Cable set out in Paragraph 23 of the Joint Proposal in this proceeding. Certificate Holders shall include as part of their EM&CP for the Astoria-Rainey Cable a report providing an updated construction cost estimate for the Astoria-Rainey cable, including supporting documentation. If the updated cost estimate exceeds the cost estimate in the evidentiary record of this proceeding by ten (10) percent or more, the Certificate Holders shall file with the Secretary a Request for Reconsideration of the determination of public interest, convenience and necessity made with respect to the Facility. The request shall be served on all parties to this proceeding and shall clearly state that all parties may submit comments on the filing within thirty (30) days of service. Such request shall explain how such increased cost would be consistent with the Commission's public interest, convenience and necessity determination made in this proceeding.

d. Upon commencement of construction, the Certificate Holders shall file with the Secretary monthly reports showing the costs for the Astoria-Rainey Cable as they occur, broken out as follows: excavation costs, traffic control costs, cable installation costs, splicing costs, thermal back fill, manhole and vault costs, costs relating to

damage to other facilities (gas, electric, telephone, fiber optic cables, sewer, water, etc.), engineering costs, inspector costs, fines, cable costs, and all other costs by category. The reports shall include the names of the individuals responsible for providing the information, along with their contact information, and shall contain all supporting documentation.

e. Subject to the limitations of Condition 15(b), nothing contained in this Certificate shall be construed as affecting in any way the rights of Certificate Holders to unilaterally make application to the Federal Energy Regulatory Commission ("FERC") for a change in rates, terms and conditions, charges, classification of service, Service Agreement, rule or regulation under section 205 of the Federal Power Act ("FPA") and pursuant to FERC's rules and regulations promulgated thereunder.

B. Laws and Regulations

16. Each substantive federal, state, and local law, regulation, code, and ordinance applicable to the Facility authorized by this Certificate shall apply except as set forth in Condition 17 below and except and to the extent that the Commission has refused to apply any substantive local ordinances, laws, resolutions, or other actions issued thereunder or local standards or requirements, as being unreasonably restrictive as listed in the Revised and Updated Exhibit 7 to the Application (see Exhibit 115 to the Joint Proposal).

17. No state or municipal legal provision purporting to require any approval, consent, permit, certificate, or other condition for the construction or operation of the Facility authorized by this Certificate shall apply, except (i) those of the PSL and regulations and orders adopted thereunder, (ii) those provided by otherwise applicable state law for the protection of employees engaged in the construction and operation of the Facility, (iii)

those regarding permits issued pursuant to federally approved authority, (iv) those regarding the right to use or occupy state or municipal property (including ROW), and (v) those discussed in Condition 18 below.

18. Subject to the Commission's ongoing jurisdiction, the Certificate Holders shall apply for certain local regulatory permits and approvals, to wit:

a. The following City of New York ("CNY") regulatory permits and approvals that would be applicable to construction and operation of those portions of the Facility located within the boundaries of CNY in the absence of PSL § 130: building permits, street excavation permits, street closure permits, permits for structural welding, permits under the CNY Fire Code, permits under the CNY Construction Codes and Electrical Code, permits for the discharge of wastewater or stormwater to CNY's sewer system, permits for the use and supply of water, and forestry permits.

b. If the Certificate Holders believe that any action taken, or determination made, in connection with the permits and approvals referenced in subpart (a) of this Certificate Condition is unreasonable or unreasonably delayed, they may petition the Commission, upon reasonable notice to the permitting authority, to seek a resolution of any such unreasonable requirement or unreasonable delay. The permitting authority may respond to the petition, within ten (10) business days, to address the reasonableness of any requirement or delay.

19. The Certificate Holders shall construct the Facility in a manner that conforms to Good Utility Practice, as herein defined, and all applicable standards of the American National Standards Institute ("ANSI") including, without limitation, the National Electrical Safety Code ("NESC"), Institute of Electrical and Electronics Engineers ("IEEE"), Standard

IEEE C2-2002, and any stricter standards adopted by the Certificate Holders. Upon completion thereof, the Certificate Holders shall certify to the Commission that the Facility was constructed in full conformance with the standards specified herein.

20. For the purposes of this Certificate, "Good Utility Practice" shall include any of the practices, methods or acts engaged in or approved by a significant portion of the electric, gas, steam, water, sewer or telecommunications industries, as applicable, during the relevant time period, including without limitation, the electric, gas, steam, water, sewer or telecommunications utility or utilities in whose service territories the work in question is being performed and/or whose facilities are physically impacted by the work in question and, for the electric power industry only, the New York Independent System Operator ("NYISO"), the New York State Reliability Council ("NYSRC"), the Northeast Power Coordinating Council ("NPCC"), the North American Reliability Corporation ("NERC") and the North American Electric Reliability Organization ("NAERO"), or any successor organizations. Good Utility Practice shall include any of the practices, methods, or acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to delineate acceptable practices, methods, or acts generally accepted in the region, such as, in the case of the electric power industry only, those practices required by FPA Section 215(a)(4).

C. HVDC-AC Converter Station Design, Interconnection and Construction

21. The Converter Station shall be located entirely on and within Subdivision Parcel A as shown on Hearing Exhibit 130 along Luyster Creek in the Astoria neighborhood of the borough of Queens ("Subdivision Parcel A"), a copy of which is annexed to these Certificate Conditions. The Certificate Holders shall be responsible for the cost of protecting or relocating any utility infrastructure during or as a result of construction activity by them in Subdivision Parcel A. The Certificate Holders may not use, occupy or take (by condemnation or otherwise) any other real property owned or occupied by Con Edison at Astoria for the Converter Station, a ring bus and related facilities that are required to complete the Facility without Con Edison's prior written consent.

22. (a) The tallest building serving as part of the Converter Station shall not exceed seventy (70) feet in height above finished grade, as defined below, and the tallest support tower shall not exceed seventy (70) feet above finished grade. The finished grade shall be the grade at the elevation of the 100-year floodplain, and such additional minimal fills as necessary to provide drainage of the site. The height and arrangement of all station facilities shall be indicated in the EM&CP site plan discussed in Section A (1) of the EM&CP Guidelines.

(b) The Converter Station shall be designed to minimize visibility and visual impacts.

(c) The Converter Station design shall use materials that minimize glare and that are neutral in color. The design shall also include appropriate landscaping at the site.

(d) Maintenance and enhancement of the shoreline area vegetative cover between the Converter Station site and the Luyster Creek waterway shall be addressed in the final site plan and station maintenance plans.

(e) Exterior night lighting of the Converter Station shall be designed to provide

illumination necessary for worker safety and site security purposes, giving full consideration to energy conservation, glare, and the minimization of light trespass. All such lighting shall be selected and installed to shield the lamp filaments from direct view to the greatest extent possible, which may include the use of full-cutoff fixtures without drop-down optics, use of task lighting for maintenance purposes where feasible, and minimizing upward lighting. Lighting design shall comply with worker safety requirements.

(f) If Con Edison moves forward with its recently announced plan to interconnect a PAR to NYPA's 345 kV Astoria GIS Substation, the Converter Station may also include a fourbreaker 345 kV GIS ring bus, which ring bus, if owned and operated by Applicants, shall be located entirely on Subdivision Parcel A and shall be interconnected at 345 kV to the Astoria-Rainey Cable, NYPA's Astoria GIS Substation and the Converter Station as described in Hearing Exhibit 125 to the Joint Proposal.

23. The EM&CP Site Plan for the Converter Station site shall include the following:

a. a site plan of sufficient detail to demonstrate conformance with the requirements of this Certificate, the Noise Mitigation Procedures of the CNY, and the EM&CP guidelines.

b. construction drawings including architectural, structural, HVAC, mechanical, electrical, plumbing and fire protection plans for all structures, which drawings shall have been prepared by an architect or engineer licensed by the State of New York and in conformance with the code requirements of the CNY.

c. a review of the sound emissions characteristics of the high-voltage transformers selected for final project design, including typical and maximum noise levels

generated at associated operating levels; and a tonal analysis based on one-third octave bands to determine the potential for tonal sound generation, including pure tones.

d. an exterior lighting plan based on illumination requirements for worker safety, which limits off-site glare.

24. In developing the site plan for the Converter Station, Certificate Holders shall consult with New York State Department of Public Service ("DPS") Staff and the CNY, and share preliminary drawings of foundations, elevations, renderings, stormwater control, and noise control measures, as they become available. Not later than thirty (30) days prior to the date by which Certificate Holders expect to file the EM&CP segment for the Converter Station, they shall file with the same parties a preliminary site plan of sufficient detail to address relevant requirements of this Certificate and the EM&CP guidelines, for their review and comment.

25. Prior to commercial operation of the Converter Station, the Certificate Holders shall obtain from CNY a certificate of occupancy covering the Converter Station. A copy shall be provided to the Secretary.

26. The Converter Station shall have a 345 kV underground Gas Insulated Line connection to the Astoria Annex GIS Substation installed in duct banks.

D. Special Conditions Regarding Co-located Infrastructure and Related Matters

27. The Certificate Holders shall engineer, construct, and install the Facility so as to make it fully compatible with the continued operation and maintenance of Co-located Infrastructure ("CI"), as herein defined, and affected railroads, railways, highways, roads, streets, or avenues. CI shall consist of electric, gas, telecommunication, water, wastewater, sewer, and steam infrastructure and appurtenant facilities and associated

equipment, whether above ground, below ground, or submerged that:

a. are located within the Construction Zone approved in the EM&CP for the Facility or a proposed Construction Zone as provided for in Certificate Condition 28(d); and

b. are either owned by a State agency or municipality or a subdivision thereof or owned or operated for public utility purposes by a regulated electric, gas, telecommunication, water, wastewater, sewer, or steam service provider;

c. but do not include railroads, railways, highways, roads, streets, or avenues.

28. In order to protect CI, Certificate Holders shall:

a. within sixty (60) days of Commission issuance of a Certificate, consult with the owners and/or operators of all known electric, gas, telecommunication, water, wastewater, sewer, and steam infrastructure and appurtenant facilities and associated equipment, whether above ground, below ground or submerged, other than railroads, railways, highways, roads, streets and avenues, located either: (i) within the Allowed Deviation Zone, (ii) within three hundred (300) feet of any location outside the Allowed Deviation Zone where Certificate Holders intend to undertake any pre-construction activities; or (iii) sufficiently close to areas of anticipated pre-construction activities such that Good Utility Practice, as defined in Condition 20 of this Certificate, requires discussion of the impacts of such pre-construction activities between Certificate Holders and the owners and/or operators of such facilities ("Potential CI"). Such consultations shall include discussion of the likely routing of the Facility and the measures that will be employed by Certificate Holders to protect CI, including the studies required by the exercise of Good Utility Practice regarding the manner in which the Facility

will be designed and installed wherever they are expected to cross CI or are expected to come in such proximity to CI that Good Utility Practice would require a specific design to be developed. All agreements and requirements resulting from this consultation shall be reflected in the proposal prescribed in subsection (d) of this Condition and the notice prescribed in subsection (e) of this Condition; and

b. within sixty days (60) of Commission issuance of a Certificate, begin the process of consulting with the owners and/or operators of Potential CI to develop a construction schedule for the Facility that, among other things, coordinates system outage requirements, if any, and avoids conflicts with the internal construction programs of each affected owner and/or operator. This consultation shall continue throughout each phase and portion of the construction of the Facility that affects any CI or Potential CI, as applicable. As a part of this consultation, the Certificate Holders will identify to a reasonable degree of certainty the appropriate representative of the party, whether owner or operator, having primary care, custody, and control of a particular segment of Potential CI or CI (each such representative being a "Designated Representative"). All agreements and requirements resulting from this consultation shall be reflected in the proposal prescribed in subsection (d) of this Condition and the notice prescribed in subsection (e) of this Condition and in the Certificate Holders' EM&CP; and

c. comply with all procedures identified by the Designated Representative(s) of the owners and/or operators of such CI or Potential CI, including, without limitation, application procedures and compliance with requirements for obtaining relevant rights, permission, permits, or authorization, whenever the Certificate Holders

seek to undertake any studies, surveys, testing, sampling, preliminary engineering, pre-construction, construction, operation, maintenance, or repair activities that involve CI or Potential CI, except in cases where such actions must be taken on an expedited basis to protect the public or to ensure reliable operation of the Facility, whereupon Certificate Holders shall provide such Designated Representatives with such notice and obtain such approvals as is reasonable under the circumstances, and except where such procedures are subject to the Commission's jurisdiction and the Commission or its designee finds such procedures to be unreasonable or unduly restrictive. Notwithstanding the foregoing, the Certificate Holders shall not be required to comply with the requirements of subsection (c) of this Condition for the transport or travel over or under CI or Potential CI by the Certificate Holders and their agents, employees, and contractors where such CI or Potential CI is located in, over, or under public waterways, roads, streets, highways, or railroad ROW, unless such transportation would be subject to special approval by state and/or local authorities due to the size or weight of load(s) transported; and

d. provide to the owner(s) and operator(s) of Potential CI or CI, at least one-hundred-and-eighty (180) days prior to the filing of the relevant Segment EM&CP, a proposal for the location and design of the Facility (including a proposed Construction Zone) and the methods of construction to be employed with respect to all locations involving CI ("Proposal"). The Certificate Holders' Proposal must include all studies, calculations, tests, results, explanations, protocols, drawings, proposed construction schedules, and documents developed through the consultations described in subsections (a) and (b) of this Condition,

other documentation identified in Condition 162, and any other information that supports the proposal. To the extent that any such Proposal addresses CI that was not previously identified as Potential CI, the Certificate Holders shall conduct the consultations described in subsections (a) and (b) of this Condition 28 with the Designated Representative(s) of the owner(s) or operator(s) of such CI and shall perform all other activities required by such paragraphs with respect to such CI in as reasonably expeditious a manner as possible and shall provide any resulting studies, calculations, tests, results, explanations, protocols, drawings, proposed construction schedules, and documents to the appropriate Designated Representative in a timely fashion; and

e. advise owner(s) and operator(s) of CI at least thirty (30) days prior to commencing any planned repair, construction, operation, or maintenance activity relating to the Facility affecting or occurring in the vicinity of such owner's or operator's CI, unless such actions must be taken in less than thirty (30) days to protect the public or to ensure reliable operation of the Facility, whereupon Certificate Holders shall provide such notice as is reasonable under the circumstances; provided that, in any event, "vicinity" with respect to CI used to transmit or distribute natural gas shall mean all areas within two hundred (200) feet thereof and with respect to all other CI shall mean all areas within one hundred (100) feet thereof; and

f. immediately upon knowledge or discovery of any damage to or adverse effect on any CI or Potential CI resulting from any studies, surveys, testing, sampling, preliminary engineering, pre-construction activities, construction, operation, maintenance, or repair of the Facility, report to the owners and operators of the

affected CI or Potential CI the nature and existence of such damage or effect and other known facts relating to the cause thereof; and

g. notify the owners or operators of CI or Potential CI as soon as possible in the event of any situation involving imminent risk to health, safety, property, or the environment requiring the Certificate Holders to cross such CI or Potential CI or to use any associated property to address the emergency. Such notice shall not be required for the transport or travel over or under CI or Potential CI by the Certificate Holders or their agents, employees, or contractors where such CI or Potential CI is located in, over, or under public waterways, roads, streets, highways, or railroad ROW unless such transportation would be subject to special approval by state and/or local authorities due to the size or weight of load(s) transported; and

h. include within any Project Segment EM&CP filing relating to the Astoria-Rainey Cable a study demonstrating that the proposed installation of the Astoria-Rainey cable will have not have a negative impact on the continued operation of any Parallel CI. A draft of that study will be included in the materials that Certificate Holders are required to provide to the owner or operator of such CI pursuant to Certificate Condition 28(d) and will be subject to review and comment as provided therein. For purposes of this subsection, Parallel CI means electric transmission facilities that are located in the same public ROW and are generally parallel to the Astoria-Rainey Cable.

29. Reimbursement of Owners or Operators of CI and/or Potential CI for Certain Expenses:

a. Subject to the provisions of subsections (b) and (c) of this Condition, the Certificate Holders shall reimburse owners and/or operators of Potential CI or CI

for the reasonable costs they incur in the following activities:

1. consulting with Certificate Holders as described in Certificate Conditions 28 (a) and (b).
2. reviewing pre-construction activities, designs, construction methods, maintenance and repair protocols, and means of gaining access to Potential CI or CI proposed by Certificate Holders.
3. reviewing studies and design proposals described by Condition 28(d) and the EM&CP filings described in Certificate Condition 162.
4. conducting or preparing such additional studies and designs as may be agreed to by Certificate Holders or approved by the Commission pursuant to Condition 29(a)(3).
5. coordinating with, and monitoring the activities of, the Certificate Holders during pre-construction activities, construction, maintenance and repair of the Facility.
6. conducting maintenance and repair work on CI property or facilities, but only to the extent of increases in such costs that result from the presence of the Facility.
7. repairing damage to Potential CI or CI or associated property caused by Certificate Holders or their representatives in connection with any studies, surveys, testing, sampling, preliminary engineering, pre-construction activities, construction, operation, maintenance or repair of the Facility.
8. scheduling and implementing electric system outages required by any studies, surveys, testing, sampling, preliminary engineering, pre-construction activities, construction, operation, maintenance, or repair of

the Facility.

b. For the purposes of this Certificate Condition 29, cost shall be deemed to be reasonable if in the case of each separate review of a study or design proposal described in subsection (a)(3) of this Certificate Condition, the total cost to be borne by the Certificate Holders is five thousand dollars ($5,000) or less.

c. Certificate Holders' cost responsibility is limited as follows: a Potential CI or CI owner or operator who intends to incur costs as described in subsection (a) of this Certificate Condition 29 for which reimbursement will be sought for activities other than reviewing a study or design proposal described in subsection (a)(3) of this Certificate Condition 29, or for reviewing such a study or design proposal but in an amount greater than five thousand dollars ($5,000), must provide Certificate Holders with a written description of the scope of the planned studies or activities and a good faith estimate of the expected costs, except where such studies or activities are undertaken in a situation involving unscheduled electric outages or an imminent risk to health, safety, property, or the environment, in which case Certificate Holders' reimbursement obligations shall be limited to reasonably incurred costs. Within sixty (60) days of the expenditure by the owners and/or operators of affected Potential CI or CI of any funds which are eligible for reimbursement by the Certificate Holders under this Certificate, the Potential CI or CI owner or operator shall present Certificate Holders with a final invoice for the actual costs incurred, but not to exceed twenty-five percent (25%) over the good faith estimate unless approved by Certificate Holders in advance in writing or, in the case of a dispute between the Certificate Holders and the Potential CI or CI owners or operators, by the Commission. Certificate Holders shall pay the

authorized invoice amount within thirty (30) days of receipt.

d. Disputes concerning the Certificate Holders' cost reimbursement responsibility shall be brought to the Commission for resolution. The time required to resolve any dispute arising under this Certificate Condition 29 shall not be counted for the purpose of any limitation on the time available for commencement or completion of construction of the Facility.

E. Public Health and Safety

30. The Certificate Holders shall design, engineer, and construct the Facility such that, to the extent applicable, their operation shall comply with the interim electrostatic field standard established by the Commission in Opinion No. 78-13 (issued on June 19, 1978 in Cases 26529 and 26559) and the limit for magnetic fields set in the Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities (issued on September 11, 1990 in Cases 26529 and 26559) or with any standard that has superseded these standards at the time of consideration by the Commission of the EM&CP or a particular Segment EM&CP.

31. Construction work occurring inside the boundaries of the CNY and outside the walls of buildings whose exterior walls and roof are substantially complete shall take place between 7:00 a.m. and 6:00 p.m. as required by Section 24-222 of the CNY City Administrative Code. For certain construction phases and activities, additional work hours may be necessary. Nothing herein shall preclude the Certificate Holders from making necessary arrangements for the extension of additional work hours with appropriate authorities of the CNY. Noise mitigation procedures shall follow those set forth in the approved EM&CP and shall not be less stringent than the citywide Construction Noise Mitigation Procedures provided by the CNY. DPS Staff shall be

notified at least twenty four (24) hours in advance if planned weekend, evening, or holiday construction becomes necessary. This condition is not intended to prohibit nighttime construction reasonably necessary to comply with restrictions on daytime construction on or along roadways or public access areas or to require the cessation of construction activities that require a continuous work effort once started. Furthermore, construction vehicles used in CNY will be outfitted with smart back up alarms.

32. Deliveries occurring inside the boundaries of the CNY and related to construction activities shall take place between 7:00 a.m. and 6:00 p.m., except that, to the extent required to accommodate oversized delivery pursuant to a New York City Department of Transportation ("NYCDOT") permit, the Certificate Holders shall be exempt from restrictions limiting delivery to 7:00 a.m. to 6:00 p.m. This condition is not intended to prohibit nighttime deliveries reasonably necessary to facilitate compliance with restrictions on daytime construction in or along roadways or public access areas or to require the cessation of construction activities that require a continuous work effort once started.

33. The Certificate Holders shall provide timely information to adjacent property owners and/or their tenants regarding planned construction activities and schedules. The Certificate Holders shall notify these persons of construction work within one hundred (100) feet of their property at least two (2) weeks prior to the commencement of construction in these areas and provide copies of all correspondence to the DPS Staff.

34. The Certificate Holders shall keep local fire department and emergency management teams apprised of on-site chemicals and waste and shall also advise owners and operators of CI as to on-site chemicals and waste stored within one hundred (100) feet of their CI. In the case of CI located within the CNY, the Certificate Holders shall advise CI owners

and operators of on-site chemicals and waste stored within three hundred (300) feet of such facilities. All chemicals shall be secured in a locked and controlled area(s).

35. The Certificate Holders shall notify DPS Staff and the New York State Department of Environmental Conservation ("NYSDEC") immediately of any petroleum product spills. The Certificate Holders shall also notify owners and operators of CI of any petroleum product spills within one hundred (100) feet of their CI, provided however that in the case of CI located within CNY, the Certificate Holders shall advise CI owners and operators of petroleum product spills within three hundred (300) feet of such facilities.

36. The Certificate Holders shall comply with the requirements for the protection of underground facilities set forth in 16 N.Y.C.R.R. Part 753, entitled "Protection of Underground Facilities."

37. Parking for construction workers shall be in designated areas that do not interfere with normal traffic, cause a safety hazard, or interfere with existing land uses, including CI.

38. Direct disturbance to properties shall be avoided by accessing the overland Construction Zone from existing roadways or approved access roads where feasible. The Certificate Holders, in undertaking the Facility, shall not violate the property rights of individual landowners and shall not commit trespass upon their lands. Before the Certificate Holders attempt to enter private property that they do not have the legal right to enter, they shall first obtain the permission of the landowner and shall abide by all conditions on such permission that the landowner may impose. If the Certificate Holders rely on a document as evidence of their easement or other right to access land owned in fee by an individual landowner, they shall provide a copy of such document to the landowner upon his or her request.

39. For each location where the Facility involves construction across or within the ROW

limits of a road, street, highway or public thoroughfare, the Certificate Holders shall implement a Maintenance and Protection of Traffic ("MPT") plan that identifies procedures to be used to maintain traffic and provide a safe construction zone for those activities within the roadway ROW. The Certificate Holders shall also prepare MPT plans for each location where construction vehicles will access the Construction Zone from a local roadway. The MPT plans shall address temporary signage, lane closures, placement of temporary barriers, and traffic diversion.

a. All signage utilized shall comply with the New York State Department of Transportation ("NYSDOT") Manual of Uniform Traffic Control Devices (Manual No. 7155) and, within State highway ROW, a Highway Work Permit issued by NYSDOT. Placement of signs shall be determined in consultation with the jurisdictional agency. At a minimum, signs shall be placed at the following distances:

   (1) Signs announcing construction at five hundred (500) feet and one thousand (1,000) feet;

   (2) Signs depicting workers at three hundred (300) feet; and

   (3) Where blasting is to take place within fifty (50) feet of a road, a blast-warning sign at one thousand (1,000) feet.

b. Flagmen shall be present at all times when equipment is crossing or entering any road, when equipment is being loaded or unloaded, and when two-lane traffic has been reduced to one lane. All flagging operations shall comply with 17 N.Y.C.R.R. Part 131.

40. To the extent required in connection with the delivery of oversized components, the

Certificate Holders or their suppliers shall obtain any necessary permits from applicable state agencies and provide copies of such permits to the Secretary.

F. Notices and Public Complaints

41. The Certificate Holders shall make available to the public a toll-free or local phone number of an agent or employee who will receive complaints, if any, during the construction of the Facility. In addition, the phone number of the Secretary and the phone number of the Commission's Environmental Compliance Section shall be provided. A log shall be maintained that lists at least the date of any complaint, identity and contact information for the complaining party, the date of the Certificate Holders' response, and a description of the outcome. Phone logs shall be made available to DPS Staff upon request. The Certificate Holders shall report to DPS Staff every complaint that cannot be resolved after reasonable attempts to do so. Any such report shall be made within three (3) business days after receipt of the complaint.

42. No less than two (2) weeks before commencing site preparation, the Certificate Holders shall:

(1) provide notice to local officials and emergency personnel in the area where they will be working on the Facility; and

(2) provide notice to the owners of property identified in Condition 33 herein; and

(3) provide such notice for dissemination to local media and display in public places (such as general stores, post offices, community centers, and conspicuous community bulletin boards); and

(4) in the event that the site preparation is delayed after notice is given, additional notice as set forth above shall be provided before site

preparation is resumed.

The notice shall be written in language reasonably understandable to the average person and shall contain:

(1) a map and a description of the Construction Zone in the local area; and

(2) the anticipated date for start of construction in the local area; and

(3) the name, address, and local or toll-free telephone number of an employee or agent of the Certificate Holders who will receive complaints, if any, during the construction of the Facility; and

(4) a statement that the Facility, as applicable, is under the jurisdiction of the Commission, which is responsible for enforcing compliance with environmental and construction conditions and which may be contacted at an address and telephone number to be provided in the notice.

Upon distribution, a copy of such notice shall be filed with the Secretary.

43. The Certificate Holders shall provide the Engineering, Procurement, and Construction Contractor retained to undertake construction of the Facility and their other construction Contractors ("Contractors" or "EPC Contractors") with complete copies of this Certificate and any and all permits, certificates, and approvals required to initiate and/or complete construction of the Facility, including, without limitation, approved Segment EM&CPs and governmental approvals issued pursuant to § 401 and § 404 of the Federal Clean Water Act, and § 10 of the Federal Rivers and Harbors Act. To the extent that the listed documents are available before contracts for construction services are executed, such copies shall be provided to the Contractors prior to the execution of such contracts.

44. The Certificate Holders shall notify all Contractors that the Commission may seek to

recover penalties for violation this Certificate and other Orders issued in this proceeding, not only from the Certificate Holders, but also from their Contractors, and that Contractors also may be liable for other fines, penalties, and environmental damage.

45. No later than three (3) days after completion of the transaction(s) pursuant to which the costs of construction of the Facility are funded ("Closing"), the Certificate Holders shall notify the Secretary of the date of such Closing.

46. The Certificate Holders shall inform the Secretary and NYSDEC at least five (5) days before commencing site preparation for the Facility.

47. The Certificate Holders shall provide DPS Staff, NYSDOT, and NYSDEC with bi-weekly status reports summarizing construction and indicating construction activities and locations scheduled for the next month.

48. Within ten (10) days of the completion of final restoration activities, the Certificate Holders shall notify the Secretary that all restoration has been completed in compliance with this Certificate and the Order(s) approving the EM&CP.

49. Within sixty (60) days of completing construction of the HVDC Transmission System, the Certificate Holders shall consult with the New York State Office of General Services ("OGS") Bureau of Land Management regarding specifications for providing as-built information and mapping of the submerged portions of the HVDC Transmission System in conformance with the requirements of the OGS Bureau and 9 N.Y.C.R.R. Part 271. Within sixty (60) days of that consultation, the Certificate Holders shall provide to the OGS as-built information and mapping complying with its specifications (including shapefile information compatible with ArcView® GIS software), and shall file with the Secretary copies of the as-built information and mapping and proof of filing with the OGS.

50. No later than three (3) days after the date on which the Facility commences commercial operation ("COD") of the Facility, the Certificate Holders shall notify NYSDOT, NYSDEC, and the Secretary of the date of such commencement.

51. The Certificate Holders shall promptly notify DPS Staff and NYSDEC if a New York State listed species of special concern is observed to be present in the Facility area.

52. The Certificate Holders shall promptly notify DPS Staff, NYSDEC and the United States Fish and Wildlife Service ("USFWS") or National Marine Fisheries Service ("NMFS") (if applicable) if any threatened or endangered wildlife species under 6 N.Y.C.R.R. Part 182 ("TE species") or any rare, threatened or endangered plant species under 6 N.Y.C.R.R. Part 193 ("RTE plants") are observed to be present in the Facility area so as to determine the appropriate measures to be taken to avoid or minimize impacts to such species. If necessary to avoid or minimize impacts to such species or as directed by DPS Staff, the Certificate Holders shall stabilize the area and cease construction or ground-disturbing activities in the Facility area until DPS Staff have determined that appropriate protective measures have been implemented.

G. Environmental Supervision

53. a. The Certificate Holders shall employ at least six (6) inspectors on the HVDC Transmission System (or at least five (5) inspectors if the Certificate Holders elect to use the same individual as both environmental inspector ("Environmental Inspector") and agricultural inspector ("Agricultural Inspector")) as follows: (i) an Environmental Inspector employed full-time on the HVDC Transmission System; (ii) a construction inspector employed full-time on the HVDC Transmission System during construction of overland portions of the HVDC Transmission System, including construction of the Converter Station ("Construction

Inspector"); (iii) an aquatic inspector employed full-time on the HVDC Transmission System ("Aquatic Inspector"); (iv) an Agricultural Inspector; (v) a safety inspector employed full-time on the HVDC Transmission System ("Safety Inspector"); and (vi) a part-time quality assurance inspector who will inspect the work site from time to time ("Quality Control and Quality Assurance Inspector").

b. The Certificate Holders shall employ the following inspectors in connection with the Astoria-Rainey Cable: (i) an Environmental Inspector; (ii) a Construction Inspector; (iii) a Safety Inspector; and (iv) a Quality Control and Quality Assurance Inspector.

c. During periods of relative inactivity on the Facility, the number of inspectors and the extent of their presence at the Facility construction site may be temporarily decreased commensurate with the decline in activity levels; likewise, during periods of relatively high activity on the Facility, the number of inspectors and the extent of their presence at the Project site may be temporarily increased commensurate with the increase in activity levels.

d. The Certificate Holders shall provide to DPS Staff a weekly schedule of the Environmental Inspector and the Construction Inspector and their cell phone numbers.

e. The Environmental Inspector and Construction Inspector shall be equipped with sufficient documentation, transportation, and communication equipment to effectively monitor each Contractors' compliance with the provisions of every Order issued in this proceeding and applicable sections of the PSL, New York State Environmental Conservation Law ("ECL"), the Water Quality Certification ("WQC") issued in connection with the Facility pursuant to section 401 of the

Federal Clean Water Act and the approved EM&CP.

f. The Agricultural Inspector shall be available to provide site-specific agricultural information as necessary for development of the proposed EM&CP through field review, as well as to have direct contact with affected farm operators, County Soil and Water Conservation Districts, and the New York State Department of Agriculture and Markets ("Ag & Mkts"). The Agricultural Inspector shall maintain regular contact with the Environmental Inspector and the Construction Inspector throughout the construction phase. The Agricultural Inspector shall also maintain regular contact with the affected farmers and County Soil and Water Conservation Districts concerning farm resources and management matters pertinent to the agricultural operations and the site-specific implementation of the approved EM&CP.

g. The names and qualifications of the Environmental Inspector and the Construction Inspector shall be submitted to DPS Staff and NYSDEC at least two (2) weeks prior to the start of construction.

h. The Environmental Inspector's qualifications shall satisfy those of a "Qualified Inspector" pursuant to the NYSDEC State Pollutant Discharge Elimination System ("SPDES") General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-10-001) ("SPDES General Permit").

i. The Certificate Holders' employees, Contractors, and subcontractors shall be properly trained in the construction, operation, and maintenance of the Facility.

54. The authority granted to the Certificate Holders in this Certificate and any subsequent Order(s) in this proceeding is subject to the following conditions necessary to ensure compliance with such Order(s):

a. The Certificate Holders shall regard DPS Staff representatives (authorized pursuant to PSL § 8) as the Commission's designated representatives in the field. In the event of any emergency resulting from the specific construction or maintenance activities that violate or may violate the terms of this Condition, the WQC, or any other Order in this proceeding, either the Certificate Holders' Environmental Inspector or DPS Staff may issue a stop work order for that location or activity.

b. A stop work order issued by DPS Staff shall expire twenty four (24) hours after issuance unless confirmed by a single Commissioner. If a stop work order is confirmed, the Certificate Holders may seek reconsideration from the confirming Commissioner or the whole Commission. If the emergency prompting the issuance of a stop work order is resolved to the satisfaction of the Commissioner or the Commission, the stop work order will be lifted. If the emergency has not been satisfactorily resolved, the stop work order will remain in effect.

c. Stop Work Authority will be exercised sparingly and with due regard to potential environmental impact, economic costs involved, possible impact on construction activities, and whether an applicable statute or regulation is or is claimed to be violated. Before exercising such authority, DPS Staff will consult (wherever practicable) with the Environmental Inspector. Within reasonable time constraints, all attempts will be made to address any issue and resolve any dispute in the field. In the event the dispute cannot be resolved, the matter will be brought immediately to the attention of the Certificate Holders' construction manager and the Director of the DPS Office of Energy Efficiency and the Environment. In the event that DPS Staff issues a stop work order, neither the

Certificate Holders nor the Contractor will be prevented from undertaking any safety-related activities that they deem necessary and appropriate under the circumstances. The issuance of a stop work order or the implementation of measures as described below may be directed at the sole discretion of the DPS Staff during these discussions.

d. Exercise of Stop Work Authority: If DPS Staff or the Environmental Inspector discovers a specific activity that represents a significant environmental threat that is or immediately may become a violation of this Condition, the WQC, or any other Order in this proceeding, and on-site construction personnel refuse to take appropriate action after being advised of the threat, DPS Staff and/or the Environmental Inspector may direct the field crews to stop the specific potentially harmful activity immediately. If the direction to stop work is issued by DPS Staff and Certificate Holders' responsible personnel are not on site, the DPS Staff will immediately thereafter inform the Construction Inspector and/or the Environmental Inspector of the action taken. The stop work order will be lifted by the DPS Staff when the situation prompting its issuance has been resolved.

e. DPS Staff's Implementation of Specific Measures to Protect the Public and the Environment: If DPS Staff determines that a significant threat exists such that protection of the public or the environment at a particular location requires the immediate implementation of specific measures, the DPS Staff may, in the absence of the Environmental Inspector and the Construction Inspector, or in the presence of such personnel who, after consultation with the DPS Staff, refuse to take appropriate action, direct the Certificate Holders or their Contractors to implement the corrective measures identified in the approved EM&CP. The field

crews shall comply with the DPS Staff's directive immediately. DPS Staff will immediately thereafter inform the Certificate Holders' Construction Inspector and/or Environmental Inspector of the action taken.

f. DPS Staff or the Environmental Inspector will promptly notify the appropriate NYSDEC representative of any activity that is a significant environmental threat to a State-regulated wetland or its adjacent area, a protected stream or other waterbody, a TE species, or a State- or Federally- identified hazardous waste site or that may become a violation of this Condition, WQC, or any other Order issued in this proceeding pursuant to subsection (d) of this Certificate Condition 54.

55. The Certificate Holders shall organize and conduct site-compliance audit inspections for DPS Staff as needed, but not less frequently than once per month during the site preparation, construction, and restoration phases of the Facility and at least annually for two (2) years after the COD.

a. The monthly inspections shall include a review of the status of compliance with all conditions contained in this Certificate, the WQC, and any other Order issued in this proceeding, and with other legal requirements and commitments, as well as a field review of the construction site, if necessary. The inspections may also include:

(1) review of all complaints received, and their proposed or actual resolutions; and

(2) review of any significant comments, concerns, or suggestions made by the public, local governments, or other agencies; and

(3) review of the status of the Facility in relation to the overall schedule established prior to the commencement of construction; and

(4) other items the Certificate Holders or DPS Staff consider appropriate.

b. The Certificate Holders shall provide a written record of the results of the inspection, including resolution of issues and additional measures to be taken, to agencies involved in the inspection audit.

56. Nothing herein shall be deemed to limit the right of any jurisdictional agency to enter and inspect the Facility to assess compliance with any permit issued by such agency or any applicable substantive statute or regulation under such agency's jurisdiction; provided, however, that such inspection shall, to the extent possible, be coordinated with the DPS Staff (authorized pursuant to PSL § 8).

57. Nothing in this Certificate shall restrict NYSDOT's authority over Certificate Holders' use of state highways, including without limitation NYSDOT's authority to place inspectors on site to monitor and observe the Certificate Holders' activities on state highways and/or to request the presence of state or local police to assure the safety of freeway travelers at such times and for such periods as NYSDOT deems appropriate.

H. Overland Installation[1]

58. At least two (2) weeks prior to the start of overland construction, the Certificate Holders shall hold a preconstruction meeting to which they shall invite DPS Staff, NYSDOT, and NYSDEC. The agenda, location, and attendee list for this meeting shall be agreed upon between DPS Staff and the Certificate Holders. The Certificate Holders shall supply draft minutes from this meeting to all attendees. The attendees may offer corrections or comments, and thereafter the Certificate Holders shall issue the finalized meeting minutes to all attendees. If, for any reason, the Contractors retained by the Certificate Holders to

[1] The term "overland" is used to describe the portions of the Project constructed on land because this is the term used by the United States Army Corps of Engineers to describe such areas.

construct the Facility cannot finish the construction of such facilities, and one or more new construction contractors are needed, there shall be another preconstruction meeting with the same format as outlined above.

59. The Certificate Holders shall confine construction to the Construction Zone and approved additional work areas as detailed in the approved EM&CP. A detailed construction schedule and location timeline shall be provided to DPS Staff prior to construction.

60. The Certificate Holders shall identify encroachments within the Construction Zone and contact individual property owners or occupants to address and seek to rectify such potential encroachments on a case-by-case basis. The Certificate Holders shall report to DPS Staff the result of efforts to address and rectify encroachments in the Construction Zone periodically, but in no event less than quarterly.

61. The Facility may not be located beneath existing buildings, footings, or foundations, except as authorized in the EM&CP, and all excavations shall be in accordance with all applicable standards and specifications, including:

    a. the Building Code of New York State, including Section 1803 and other relevant sections; and

    b. the Occupational Safety and Health Administration ("OSHA") Technical Manual ("OTM"), including Section V: Chapter 2 and other relevant sections; and

    c. OSHA Regulations, including Part Number 1926, Standard Number 1926.651, and other applicable provisions.

62. Except as authorized in any Segment EM&CP, the Certificate Holders shall not construct or allow their Contractors to construct any new, or improve any existing access roads for the construction, operation, or maintenance of the Facility.

63. Before construction begins on any Segment, the boundaries of the Construction Zone

shall be delineated in the field. Also, the Certificate Holders shall stake and flag all access roads and extra workroom areas to be used in constructing that Segment.

64. The Certificate Holders shall adopt appropriate measures to minimize fugitive dust and airborne debris from construction activity and details of measures to be implemented shall be described in the proposed Segment EM&CP. If contamination in the ground is detected during overland construction and such contamination is of the kind that will lead to volatilization or off-gassing of such contamination or chemical constituents thereof, the Certificate Holders shall contact the New York State Department of Health ("NYSDOH"), NYSDEC, and DPS Staff prior to further disturbance. Additionally, the Certificate Holders shall conform to practices and procedures described in the DER-10/Technical Guidance for Site Investigation and Remediation and the NYSDOH Generic Community Air Monitoring Plan ("CAMP"), to the extent applicable. Nothing in this Certificate shall have the effect of diminishing, enlarging, or altering in any way the obligations of any party that may be triggered in the event a spill of petroleum or a release of hazardous substances to the environment ("Reportable Event") is detected within the Construction Zone by the Certificate Holders and/or their contractors and other representatives during overland construction of the Facility, including, without limitation, any obligation the Certificate Holders may have to report such Reportable Event to the NYSDEC Oil and Hazardous Materials Spills Hotline (800/518-457-7362).

65. Disposal of trees and woody material:

a. The Certificate Holders shall negotiate in good faith with each landowner the purchase of rights to all logs over six (6) inches in diameter at the small end and eight (8) feet or longer ("merchantable logs") to be cleared from the Construction Zone. Certificate Holders shall not leave any permanent slash piles or log piles

along passenger railroad routes or public highways. The Certificate Holders' removal of the merchantable logs resulting from clearing the Construction Zone shall be based on factors such as the attributes of the site, outcome of landowner negotiations, and attributes of the logs, and the Certificate Holders shall explain these factors in detail in the proposed EM&CP.

b. The Certificate Holders shall comply with the provisions of 6 N.Y.C.R.R. Part 192, Forest Insect and Disease Control.

c. The Certificate Holders shall prepare a plan for removal, reuse, recycling, and disposal of all woody material. Logs and woody material that cannot be reused or sold shall be either chipped on site, stacked along the edge of the Final Layout Area (as defined below at Condition 139), hauled to a NYSDEC approved landfill or other suitable off-site location, or buried on the Final Layout Area with landowner agreement. The Certificate Holders shall not leave any logs or other woody material in any designated floodway or other flood hazard area.

66. All trees over two (2) inches in Diameter at Breast Height or shrubs over four (4) feet in height damaged or destroyed by activities during construction, operation, or maintenance, regardless of where located, shall be replaced within the following year by the Certificate Holders with the equivalent type of trees or shrubs except if:

a. other arrangements are specified in the approved EM&CP; or

b. equivalent type replacement trees or shrubs would interfere with the proper clearing, construction, operation, or maintenance of the Facility or would be inconsistent with State-invasive species policy; or

c. replacement would be contrary to sound ROW management practices, or to any approved long-range ROW management plan applicable to the Facility or

adjoining ROW; or

d. the owner of land where the damaged or destroyed trees or shrubs were located (or other recorded easement or license holders with the right to control replacement) declines replacement.

67. The Certificate Holders shall provide detailed soil erosion and sediment control plans in a Stormwater Pollution Prevention Plan ("SWPPP"), which shall be included with the first Segment EM&CP associated with the overland route of the Facility. Soil and sediment control measures shall be implemented early in the construction process and be installed prior to, and maintained in acceptable condition for the duration from any clearing or earthmoving operations through to the permanent stabilization of the soil. Erosion and sediment control devices shall be installed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control ("SSESC"), the approved EM&CP Plan and Profile drawings, permit conditions, regulatory approvals, and as otherwise necessary or directed by the Environmental Inspector to prevent adverse impacts to environmentally sensitive areas. The SWPPP shall include a schedule for necessary inspections at all control measure locations. The SWPPP shall be available at the construction site and available to the public upon five (5) days written notice.

68. The Certificate Holders shall coordinate with DPS Staff and NYSDOT regarding all plans and work to be performed in State-owned ROW under NYSDOT's supervision and management. Prior to filing any Segment EM&CP involving any such state-owned ROW, the Certificate Holders shall provide DPS Staff and NYSDOT Staff with a preliminary design marked to avoid conflict with potential transportation projects that NYSDOT Staff may seek to undertake in the future and shall offer to consult with NYSDOT Staff concerning any comments it may offer and shall use reasonable efforts

to accommodate any NYSDOT concerns.

69. a. In preparing the proposed EM&CP, the Certificate Holders shall consult with each transportation department or agency having jurisdiction over any roads, related structures, and components that will be crossed by the Facility or used for direct access to the Construction Zone. If the access road takes direct access from, or lies within the limits of, such roads, the Certificate Holders shall notify each relevant transportation department or agency of the approximate date when work will begin.

b. Infrastructure subject to the requirements of Condition 69(a) include: movable bridges over the Harlem River and their associated apparatus, including any cables, chains or other apparatus allowing for their operation; and a planned pedestrian and bicycle pathway and associated infrastructure, including landscaping, lighting, rail crossings, fences, railroad gates, and stormwater retention facilities, and associated subsurface components, to be constructed under and in the vicinity of the Hells Gate Bridge in the Bronx, whether constructed or designed at the time of the EM&CP development. The procedures and protections outlined in Conditions 27 through 29 shall apply to the movable bridges and other apparatus, and, if they are in place at the time of construction of the Facility, the aforementioned infrastructure associated with the pedestrian and bicycle pathway.

70. Construction access to the Construction Zone at controlled-access highways shall be provided from off-highway locations.

71. The Certificate Holders shall minimize the impact of construction of the Facility on traffic circulation. Traffic control personnel and safety signage shall be employed to

facilitate safe and adequate traffic flow when secondary roadways are affected by construction.

72. The Certificate Holders shall consult periodically with state and municipal highway transportation agencies about traffic conditions near the site of the Facility and shall notify each such transportation agency of the approximate date work will begin in its jurisdiction and Construction Zone access points that connect with the highways in that jurisdiction.

73. The Certificate Holders shall be responsible for checking all culverts and assuring that they are not crushed or blocked during construction and restoration of the Facility and, if a culvert is blocked or crushed, taking immediate steps to replace or repair the culvert in accordance with applicable state or local standards.

74. Disturbed areas, ruts, and rills shall be restored to original grades and conditions with permanent revegetation and erosion controls appropriate for those locations. Disturbed pavement, curbs, and sidewalks shall be restored to their original preconstruction condition or improved.

I. Agricultural Lands

75. The Certificate Holders shall design the Facility to the extent possible to avoid crop fields or other active agricultural land.

76. During the acquisition of rights to use lands comprising the Construction Zone, the Certificate Holders shall ask the owners of such lands that appear to be either undeveloped or used as active agricultural land whether such lands are presently being used for agricultural purposes and, if so, whether such lands are being operated, in whole or in part, by third parties. During the preparation of the EM&CP, the Certificate Holders shall use this information, along with any additional information received during

consultation with Ag & Mkts, to identify land within the Construction Zone reasonably believed to be active agricultural land. The Certificate Holders shall provide the owners and identified operators of such land with a telephone number to facilitate direct contact with the Certificate Holders and the Agricultural Inspector(s).

77. Where construction entrances are required from public roadways to the Construction Zone across agricultural fields, temporary access shall use matting or road installation. The use of topsoil stripping for construction access, as opposed to matting, shall only be allowed with approval from DPS Staff in consultation with Ag & Mkts. For matting, the mats shall be layered where necessary to provide a level access surface. For road installation and topsoil stripping, an underlayment of durable, geotextile fabric shall be placed over the exposed subsoil surface prior to the use of temporary gravel access fill material. Complete removal of the construction entrance upon completion of the Facility and restoration of the affected site is required prior to topsoil replacement. Segments of farm roads utilized for access shall be improved as necessary following consultation with the farm operator and Ag & Mkts prior to use, subject to the Commission's ongoing jurisdiction.

78. The Certificate Holders shall provide a monitoring and remediation period of two (2) years following completion of Construction Zone restoration in active agricultural areas. The Certificate Holders shall retain the services of the Agricultural Inspector through this period. The monitoring and remediation phase shall be used to identify any remaining agricultural impacts associated with construction of the Facility that are in need of mitigation and to implement the follow-up restoration. During the monitoring and remediation period, on site monitoring shall be conducted at least three times during each growing season and shall include a comparison of growth and yield for crops within and

outside the Construction Zone. When subsequent crop productivity within the Construction Zone is less than that of the adjacent unaffected agricultural land, the Agricultural Inspector, in conjunction with the Certificate Holders and in consultation with other appropriate organizations including Ag & Mkts, shall help to determine the appropriate rehabilitation measures for the Certificate Holders to implement (soil de-compaction, topsoil replacement, etc.). During the various stages of construction of the Facility, all affected farm operators shall be periodically apprised of the duration of remediation by the Agricultural Inspector. Because conditions that require remediation may not be noticeable at or shortly after the completion of construction, the signing of a release form prior to the end of the remediation period shall not obviate the Certificate Holders' responsibility to fully redress all impacts caused by construction of the Facility. After completion of the specific remediation period, the Certificate Holders shall continue to respond to the requests of the farmland owner/operators to correct adverse impacts to agricultural resources caused by construction of the Facility.

79. The Agricultural Inspector shall work with farm operators during the planning phase to develop a plan to delay pasturing of livestock in the Construction Zone, work areas, access roads, or staging areas following construction until pasture areas are adequately revegetated. The Certificate Holders shall be responsible for maintaining temporary fencing on the Construction Zone, work areas, access roads, or staging areas until the Agricultural Inspector determines that the vegetation in the Construction Zone is established and able to accommodate grazing. At such time, the Certificate Holders shall be responsible for removal of the fences.

80. On affected farmland, restoration practices shall be postponed until favorable (workable, relatively dry) topsoil/subsoil conditions exist. Restoration shall not be conducted while

soils are in a wet or plastic state. Stockpiled topsoil shall not be re-graded until plasticity, as determined by the Atterberg field test, is significantly reduced. No Facility restoration activities shall occur in agricultural fields in the months of October through May unless DPS Staff has determined after consultation with Ag & Mkts that favorable soil moisture conditions exist. The Certificate Holders shall monitor and advise Ag & Mkts and DPS Staff regarding tentative restoration planning.

J. Herbicide Use

81. The application of herbicides shall be made under the direct supervision of a NYSDEC Certified Applicator ("Applicator") who shall own or be employed by a NYSDEC-registered business. The supervising certified Applicator shall be familiar with and understand the Conditions of this Certificate, the approved EM&CP, and any other pertinent Orders issued in this proceeding and shall be present in the field to ensure compliance with provisions in such documents for targeting species and for proper application of authorized herbicides.

82. All herbicides used shall have valid registrations under applicable state and federal laws and regulations.

83. Application of herbicides shall conform to all label instructions and all applicable federal and state laws and regulations. Herbicides shall not be applied within one hundred (100) feet of any public water supply (reservoirs and wellheads) or any private well-head of which Certificate Holders have actual knowledge. Applicators shall reference maps that indicate treatment areas, and wetland and adjacent area boundaries, prior to treating. Applications required in seasonally flooded freshwater wetlands shall be undertaken during a dry season.

84. The Certificate Holders shall notify DPS Staff and the appropriate NYSDEC Regional

Natural Resource Supervisor(s) and Pesticide Control Specialist fourteen (14) days prior to the commencement of any herbicide application on the Facility.

K. Building Code and Inspections – Converter Station and Related Buildings

85. Prior to the commencement of construction of the Converter Station and related buildings, the Certificate Holders shall first obtain review and written certification by the CNY Department of Buildings that the construction plans for the Converter Station are in compliance with the New York City Electrical Code ("NYCEC"), the New York City Fire Code ("NYCFC"), and Title 28 of the New York City Administrative Code, including the New York City Construction Codes ("NYCCC"). Within ten (10) days of receiving any written certification, the Certificate Holders shall file a copy of such certification with the Secretary and shall serve a copy on the Director of the Office of Energy Efficiency and the Environment.

86. During construction of the Converter Station and related buildings, the Certificate Holders shall obtain periodic inspections of the construction work by the CNY Department of Buildings for compliance with the NYCFC, NYCEC and NYCCC.

87. Prior to the use or occupancy of the Converter Station and related buildings, the Certificate Holders shall first obtain written certification by the CNY Department of Building that the construction was completed in compliance with the NYCFC, NYCEC, and the NYCCC. Within ten (10) days of receiving any written certification, the Certificate Holders shall file a copy of such certification with the Secretary and shall serve a copy on the Director of the Office of Energy Efficiency and the Environment.

L. Overland Restoration

88. At the conclusion of all Facility construction, Construction Zone areas, work areas, access roads, and/or staging areas shall be thoroughly cleared of debris such as wood,

nuts, bolts, spikes, wire, pieces of steel, and other assorted items.

89. The Certificate Holders shall, on completion of construction of the Facility:

a. provide an assessment of the need for landscape improvements, including vegetation planting, earthwork, or installed features to screen or landscape with respect to road crossings, residential areas, parks, highways, converter stations, and substations; and

b. prepare plans for any visual mitigation found necessary, considering removal, rearrangement, and supplementation of existing landscape improvements or plantings; and

c. consult with DPS Staff on the content and execution of their landscape improvement assessment, resultant landscaping plan specifications, and materials list; details shall include measures for controlling maintenance and third party or wildlife damage to any landscape or vegetation plantings; and

d. assure the reduction or elimination of net storm water runoff within or immediately adjacent to the Construction Zone and any contribution to sources of non-point pollution resulting from the finished condition; and

e. present assessments and plans for DPS Staff review within one (1) year of the date the Facility is placed in service.

M. Overland Habitat Areas

90. The Certificate Holders shall incorporate the measures described in the *Karner blue butterfly (Lycaeides melissa samuelis) Impact Avoidance and Minimization Report* (Exhibit 109 to the Joint Proposal) into the EM&CP. Prior to the commencement of construction, the Certificate Holder shall arrange a "walk through" of the Construction Zone where lupine habitat has been identified for representatives of the DPS Staff,

NYSDEC, the EPC Contractor, and others as deemed appropriate to discuss and review these measures including the location of the flagging of lupine and nectar patches of potential and occupied butterfly habitat. The flagging shall be maintained until construction has been completed and all disturbed areas have been restored to their final grade.

91. Within six (6) months after the commencement of commercial operations of the Facility, the Certificate Holders shall provide a ROW maintenance plan for the Facility ROW from Route Mile 145**,** south of Scout Road in the Town of Wilton, New York to Route Mile 180, north of County Line Road in the Town of Rotterdam, New York. This plan shall include but not be limited to methods of maintenance, access routes to the ROW, seasonal construction windows, and the education of all company employees and contractors regarding all measures to avoid occupied habitat associated with Karner blue butterfly and frosted elfin butterfly. The plan shall also provide requirements for notification of the DPS Staff and NYSDEC of any planned maintenance or repair work within, or in the vicinity of occupied habitat that requires excavation or ground disturbance.

N. Underwater Cable Installation

92. All of the terms and conditions of the WQC are incorporated by reference into this Certificate as though fully set out herein. Any changes to the WQC shall be governed by the provisions of Condition 158 of this Certificate.

93. Construction within navigable waters and pre-installation route clearing activities (pre-lay grapnel run and associated obstruction and debris removal) shall occur within the construction time frames set forth in Table 1 below. After consultation with DPS Staff, the New York State Department of State ("NYSDOS"), and NYSDEC, the Certificate

Holders may seek an appropriate modification of the time frames, either in the proposed EM&CP or subject to the provisions of Condition 158 of this Certificate.

Table 1: Underwater Construction Windows in Lake Champlain, The Hudson, Harlem, and East Rivers

River Mile	Route Mile	Location	Construction Windows
	Lake Champlain		
	0 to 73	US/Canada Border to Crown Point	May 1 to August 31
	73 to 101	Crown Point to Dresden	September 1 to December 31
	Hudson River, Harlem River, East River		
107-68	229 to 269	Cementon – New Hamburg	Aug 1 - Oct 15
68-41	269 to 296	New Hamburg – Stony Point	Sep 15 - Nov 30
41-33	296 to 303	Stony Point - Rockland Lake State Park	OVERLAND
33-14	303 to 324	Rockland Lake State Park – Harlem River	Jul 1 - Oct 31
all	324 to 330	Harlem River – East River	May 15 - Nov 30

94. Commencement of in-river work within one (1) mile south of the designated Significant Coastal Fish and Wildlife Habitats ("SCFWHs") at Haverstraw Bay shall occur during the high, or flood, tide condition in order to avoid and/or minimize impacts from resuspended sediments to the SCFWH habitat of Haverstraw Bay.

95. The Certificate Holders shall use installation techniques for underwater cable installation activities that are appropriate for the prevailing substrate conditions.

a. Cable installation in the Hudson, Harlem, and East Rivers shall be designed and installed to meet the following criteria:

(i) Where the cables shall be located within the limits of the maintained

Federal Navigation Channels in the Harlem, Hudson, and East Rivers, the Certificate Holders shall install the cables to a depth of at least fifteen (15) feet below the federally-authorized depth of the Federal Navigation Channel;

(ii) and where the cables shall be located outside the limits of the maintained Federal Navigation Channels in such rivers, the Certificate Holders shall install the cables to the maximum depth achievable that would allow each pole of the bi-pole to be buried in a single trench using a jet-plow, which is expected to be at least six (6) feet below the sediment water interface or, if sand waves are present, the trough of said waves, or as authorized by DPS Staff, NYSDEC, and NYSDOS as discussed in condition 95(a) (iii), below the existing riverbed outside maintained Federal Navigation Channels, except where utility lines or other infrastructure are crossed or where geologic or topographic features prevent burial at such depth.

(iii) No changes in the installation technology or burial depth shall be allowed without a written statement from NYSDOS stating that the deviation would not result in coastal effects that differ significantly from the coastal effects reviewed by NYSDOS in Certificate Holders' original federal coastal consistency certification ("Coastal Consistency Certification"). In the event that NYSDOS determines that such deviation would result in coastal effects that differ significantly from those reviewed in the Coastal Consistency Certification, the Certificate Holders shall seek a written concurrence from NYSDOS for any such project changes that would require an amendment to the Certificate Holders' Coastal Consistency

Certification. Nothing in this Certificate shall be construed to limit or expand any rights Certificate Holders may have to seek administrative or judicial review of any action or inaction by NYSDOS relating to any such deviation.

b. Cable installation in Lake Champlain shall be designed and installed to meet the following criteria:

(i) in locations where the water depth is less than one hundred fifty (150) feet, the target burial depth is three (3) to four (4) feet below the sediment surface, except where the cables cross other utility lines or other infrastructure or where geologic or bathymetric features prevent burial at such depth, and adequate measures for cable and infrastructure protection are provided;

(ii) in locations where water depth is one hundred fifty feet (150) or greater, the target burial depth is three (3) to four (4) feet below the sediment surface, however the cables may be buried at shallower depths or laid on the lake bed where Certificate Holders provide a report prepared by a recognized authoritative technical consultant demonstrating and concluding that public health and safety can be appropriately protected without such burial, and the proposed installation method is approved by the Commission in the Segment EM&CP.

(iii) Where the cables shall be located in the portion of Lake Champlain south of Crown Point (Route Mile 73), the Certificate Holders will rely on the shear plow installation method or, when reliance on such method is

infeasible, an alternative method that avoids environmental impacts to a substantially equivalent degree. Where cables shall be located in the portion of Lake Champlain north of Crown Point, the Certificate Holders shall rely on a jet-plow or shear plow or, in deeper waters, either a self-propelled remotely operated vehicle ("ROV") that shall bury the cables using water jetting after the initial surface lay of the cables from the lay vessel.

c. Utility and other infrastructure crossings shall be executed consistent with site-specific design measures for each such crossing as specified in the approved EM&CP.

96. In the event that the target depth of cover (consistent with the requirements of Condition 95) has not been substantially achieved in an area due to geologic or topographic features and not due to limitations associated with a utility crossing, following the post-installation inspection provided for in Condition 161, the Certificate Holders shall report the actual depth of cover, and propose a plan, with a reasonable schedule, consistent with Good Utility Practice whose definition is provided in Condition 20, for achieving an adequate burial depth or protection level given the location to NYSDEC, NYSDOS and DPS Staff for review and comment.

97. As long as the Certificate Holders comply with the requirements of Condition 96, failure to achieve the depth of cover consistent with the requirements of Condition 95 shall not be a basis for an order to cease installation of the remaining cable sections, an order not to energize, or an order to cease operation. An order not to energize or to cease operation will be issued only after affording the Certificate Holders an opportunity to show cause why such order should not be issued.

98. The Certificate Holders shall employ HDD and dredging to install the proposed underwater cables from the proposed cable landfall locations to avoid disturbance to near shore sediments. The exit pit of each HDD borehole shall be installed within temporary dredged cofferdams or into a steel casing rise pipe. The walls of each temporary cofferdam shall extend above mean high water during dredging to contain suspended sediments associated with dredging activities and hence limit the dispersion of the suspended sediments to the interior footprint of the temporary cofferdam.

99. As part of the planning process for dredging, consultations with NYSDEC and USACE shall occur, at which time the specific practices to be employed shall be discussed. All cofferdams and any other dredged area shall be backfilled with clean material. The dredging practices and procedures to be utilized by the Certificate Holders shall be specified in the EM&CP and shall include:

a. A closed (i.e., sealed) environmental (clamshell) bucket with sealing gaskets or an overlapping sealed design at the jaws and seals or flaps positioned at locations of vent openings, approved by the Commission, shall be used to minimize sediment suspension at the dredging site for fine grained unconsolidated (silty) sediments and for dredging across or within Federal Navigation Channels. Seals or flaps designed or installed at the jaws and locations of vent openings must tightly cover these openings while the bucket is lifted through the water column and into the barge, and the closed environmental (clamshell) bucket dredge shall be equipped with sensors to ensure complete closure of the bucket before lifting through the water.

b. Dredging Practices: The following practices shall be applied to all activities to ensure that large amounts of sediment are not released into the water column:

(1) Hoist speed shall be limited so that the bucket is raised through the water column at a rate of two (2) feet per second or less. The bucket shall be lifted in a continuous motion through the water column and into the barge;

(2) The dredge shall be operated to control the rate of the descent and to maximize the depth of penetration without overfilling the bucket;

(3) Washing of the gunwales of the dredge scow shall be avoided except to the extent necessary to ensure the safety of workers; and

(4) The bucket shall be lowered to the level of the barge gunwales prior to release of the load and the dredged material shall be placed deliberately and in a controlled manner;

(5) Operations shall be suspended until all necessary repairs or replacements are made when a significant loss of water and visible sediments from the bucket are observed; and

(6) Dredged material shall not be side cast or returned to the water.

c. Barge overflow is prohibited.

d. Barge/Scow Type: Barges or scows shall be of solid hull construction or be sealed.

e. Dredging Monitoring: An on-board Aquatic Inspector(s) shall be present at all times during dredging operations.

f. Dredging Windows: Dredging shall occur within the underwater construction windows identified in Table 1 of Condition 93.

g. Decanting Operations: Decanting of barges shall be approved by DPS Staff in consultation with NYSDEC prior to implementation. Barges may not be decanted before twenty-four (24) hours of settlement within the scow.

h. Only barges in good operating condition shall be used. Deck barges shall not be used, unless modified to allow no barge overflow and as approved by the Aquatic Inspector and DPS Staff in consultation with NYSDEC.

i. The Aquatic Inspector shall inspect all dredging equipment prior to use and shall perform periodic inspections of all such equipment no less than once per week. The contractor shall demonstrate to the Aquatic Inspector that the bucket dredge operator has sufficient control over the bucket depth in the water and bucket closure.

j. All sediments excavated during cofferdam construction and transition activities at the landfall location must be disposed of at a State-approved upland disposal site. All contaminated sediments excavated during placement in the navigation channel shall be disposed of in a State-approved upland disposal site.

k. During dredging operations, the Certificate Holders shall provide weekly reports on progress to date, document compliance with Certificate requirements, and such other information as determined necessary based on consultation with DPS Staff, NYSDEC, and NYSDOS.

l. All cofferdams and any other dredged area shall be backfilled using imported clean material, as needed, to restore the stream, lake, or riverbed to preconstruction contours. This work shall be completed in accordance with the relevant approved Segment EM&CP.

m. In no instance shall excavated contaminated sediment be placed back into a waterbody.

100. Underwater activities shall be undertaken in a manner that minimizes the potential for interference with navigation.

101. The Certificate Holders shall coordinate with NYSDOT on cable construction and maintenance activities within Lake Champlain that may affect construction, operation, maintenance, and inspection of the Crown Point Bridge in Lake Champlain.

O. Water Supply Intakes

102. The Certificate Holders shall review the pre-installation marine sediment survey to determine if the location of any public water supply ("PWS") structure along the HVDC Transmission System route can be identified.

103. The Certificate Holders shall provide notice that the EM&CP is available for review to operators of PWS facilities located within one (1) mile of the in-water facility. The notice shall include, in plain language: (i) details about the planned work; (ii) hours and duration of activities; (iii) provisions for protection of facilities, if applicable; (iv) identification of locations where additional information and copies of the EM&CP are available; (v) contact information for Certificate Holders' personnel, including a toll-free number; and (vi) instructions on how comments regarding construction plans and mitigation measures may be filed with the Secretary, indicating appropriate deadlines for commenting and contact information. Proof of notice shall be provided to the Secretary.

104. The Certificate Holders shall notify operators of PWS facilities of construction work within one (1) mile of their intake structure(s) at least thirty (30) days prior to the commencement of any underwater work (including but not limited to grapnel, pre-construction, and construction activities) in these areas or within the time period requested by the systems operators during the consultation process detailed in Condition 150. Such notice shall be in the form of a written letter as well as any other method identified during the consultation process detailed in Condition 150. The Certificate Holders shall provide copies of all written correspondence to DPS Staff.

105. Operational Control: The schedule of grapnel/debris removal and all phases of construction shall be coordinated in consultation with each PWS facility. Construction and pre-construction operations within one (1) mile of an intake shall be performed at night or another scheduled time when systems are not operating to the extent reasonably possible.

106. PWS Sampling during Grapnel/Debris Removal and Construction Operations: The Certificate Holder shall establish a fund that provides for each of the PWS facilities identified by the NYSDOH as being within one (1) mile of the underwater cable facility to enable completion of the following testing, with payment for this work being based on the mechanism established during the consultation provided for by Certificate Condition 150:

a. One (1) pre-construction raw water sample collected no more than twelve (12) hours prior to in-water operations occurring in proximity to the intake structure. Samples collected shall be analyzed for total metal concentrations with United States Environmental Protection Agency ("EPA") Method 200.8. Raw water samples collected from PWS facilities located along the Hudson River shall also be analyzed for polychlorinated biphenyls ("PCBs") with EPA Method 508A. All pre-construction raw water samples collected from the PWS facilities should be reported using a twenty-four (24) hour turnaround.

b. Two (2) sets of post-construction raw water and finished water (post-treatment) samples from the PWS facility. The first set shall be collected immediately following operations occurring in proximity to the intake structure and the second set shall be collected approximately twelve (12) hours after conclusion of operations.

c. Post-construction raw water samples from all PWS facilities shall be analyzed for total metal concentrations with EPA Method 200.8. Raw water samples collected from PWS facilities located along the Hudson River shall also be analyzed for PCBs with EPA Method 508A. All post-construction raw water samples collected from the PWS facilities shall be reported using a twenty-four (24) hour turnaround. Finished water samples shall be held at the laboratory.

d. If raw water sample results suggest any significant water quality impacts associated with any pre-construction or construction operations, the finished water samples shall be analyzed: (a) for total metal concentrations with EPA Method 200.8 and, (b) if collected from PWS facilities located along the Hudson River, for PCBs with EPA Method 508A. All finished water samples submitted for analysis shall be reported using a twenty-four (24) hour turnaround. The decision to analyze the finished water samples shall be made by DPS Staff in consultation with the NYSDOH.

e. If analysis of finished water sample results indicates that there has been a maximum contaminant level ("MCL") violation caused by the installation activities, the Certificate Holders shall employ the mitigation measures prescribed in accordance with Condition 14(c) of the WQC in all locations where cable installation operations are within one (1) mile of a water intake structure. If the Certificate Holders propose to employ mitigation measures not otherwise provided for in accordance with Condition 14(c) of the WQC, they must first consult with the DPS Staff, NYSDEC, and the Aquatic Inspector. In the event that DPS Staff determines that the mitigation techniques are unable to mitigate the MCL violation(s), underwater cable installation shall be suspended, and the

Certificate Holders shall consult with DPS Staff, NYSDOH, and NYSDEC regarding alternative cable installation techniques and propose such changes to the approved EM&CP in accordance with Condition 158 as may be necessary.

f. The Certificate Holders shall provide copies of all laboratory data reports for samples collected from each PWS facility located along the Hudson River to NYSDOH and DPS Staff.

P. Cultural Resources

107. The Certificate Holders shall:

a. avoid creating adverse impacts on heritage resource sites, archeological sites, historic structures, and underwater cultural resources in the vicinity of the Facility by implementing location, design, vegetation management, resource protection, and construction scheduling measures as shall be specified in the approved EM&CP; and

b. provide cultural and heritage resource impact mitigation measures as specified in the approved EM&CP or facility management and restoration plan(s).

108. The Certificate Holders shall refrain from undertaking construction in areas where archeological surveys have not been completed and until such time as the appropriate authorities, including New York State Office of Parks Recreation & Historic Preservation ("OPRHP") and DPS Staff, have reviewed the results of any additional historic properties and archeological surveys that are required. These archeological surveys may be segmented in conjunction with the preparation of the EM&CP to permit the review, approval, and commencement of any circuit or converter station improvements prior to review and approval for the remaining portions of the Facility.

109. The Certificate Holders shall develop a Cultural Resources Management Plan ("CRMP")

as described below. The CRMP shall be developed in consultation with the OPRHP Field Services Bureau, Indian tribes, the Advisory Council on Historic Preservation ("Council"), the U.S. National Park Service, DPS Agency Preservation Officer, and other stakeholders (as appropriate). The CRMP shall provide for the identification, evaluation, and management of historic properties within the Area of Potential Effects ("APE") of the Facility. The CRMP shall also outline the processes for resolving adverse effects on historic properties within the APE and determining the appropriate treatment, avoidance, or mitigation of any effects of the Facility on these resources.

110. Should archeological materials be encountered during construction, the Certificate Holders shall stabilize the area and cease all construction activities in the immediate vicinity of the find, and protect the site from further damage. Within twenty-four (24) hours of such discovery, the Certificate Holders shall notify and seek to consult with DPS Staff and OPRHP Field Services Bureau to determine the best course of action. No ground-disturbing activities shall be permitted in the vicinity of the archeological materials until such time as the significance of the resource has been evaluated and the need for and scope of impact mitigation have been determined.

111. Should human remains or evidence of human burials be encountered during the conduct of archeological data recovery fieldwork or during construction, all work in the vicinity of the find shall be halted immediately and the site shall be protected from further disturbance. Within twenty-four (24) hours of any such discovery, the Certificate Holders shall notify the DPS Staff and OPRHP Field Services Bureau. Treatment and disposition of any human remains that may be discovered shall be managed in a manner consistent with the Native American Graves Protection and Repatriation Act ("NAGPRA"); the Council's Policy Statement Regarding Treatment of Burial Sites,

Human Remains, and Funerary Objects (February 2007); and OPRHP's Human Remains Discovery Protocol. All archaeological or remains-related encounters and their handling shall be further reported in the status reports summarizing construction activities and reviewed in the site-compliance audit inspections.

112. The Certificate Holders shall have a continuing obligation during the life of the Facility to respond promptly to complaints of negative archeological impacts and to consult with OPRHP, the Council, Indian tribes, and other appropriate parties identified in the CRMP to resolve adverse effects on historic properties and determine the appropriate avoidance, treatment, or mitigation measures.

Q. Waterbodies and Regulated Wetlands

113. The Certificate Holders shall minimize disruption to regulated wetlands during the construction, operation, and maintenance activities of the Facility.

a. Regulated wetland locations shall be delineated in the field and indicated on the proposed EM&CP drawings for the Construction Zone and any access roads. Such delineations shall be delivered for review to DPS Staff, NYSDOS, and NYSDEC and, for wetlands within the Adirondack Park, to the Adirondack Park Agency ("APA"), at least thirty (30) days prior to the filing of the proposed EM&CP.

b. Any activities that may affect regulated wetlands shall be designed and controlled to minimize adverse impacts, giving due consideration to the environmental features and functions of the regulated wetlands and the one hundred (100) foot adjacent area associated with any State-regulated wetlands ("adjacent area").

c. The Certificate Holders shall, to the maximum extent practicable, avoid direct impacts to regulated wetlands and construct access roads outside regulated

wetlands and adjacent areas. Any direct impacts that are not avoided shall be minimized and appropriately mitigated.

d. Construction through regulated wetlands or adjacent areas shall be done with tracked equipment or on temporary mats or geotextile/gravel access roads and shall be restricted to access roads and work areas set forth on the approved EM&CP drawings, provided that the Certificate Holders' use of geotextile and gravel for access roads shall not contravene the requirements set forth in Condition 77 of this Certificate.

e. Clearing of existing vegetation in wetlands or in or near waterbodies shall be limited to that material necessary to allow completion of construction activities and to allow for reasonable access for long-term maintenance so as to reduce the amount of activity and disturbance to the wetland and adjacent area.

f. Equipment or machinery shall not be washed in any regulated wetland or adjacent area, and runoff resulting from washing operations shall not be permitted to directly enter any regulated wetland or protected stream or waterbody.

g. Excavated material shall be stockpiled outside regulated wetland areas and all excess material shall be disposed of in approved overland locations.

114. The Certificate Holders shall minimize disruption to streams and waterbodies during construction, operation, and maintenance of the Facility. Measures to protect such streams and waterbodies from runoff and sedimentation during construction (other than installation of underwater cables in navigable waters) shall include:

a. The development of an inventory that includes for each Segment: (i) a listing of waterbodies within the Construction Zone, including associated stream width, NYSDEC classification, proposed crossing method, and any potential

construction schedule window developed during the preparation of the proposed EM&CP; (ii) a spreadsheet that contains the GPS coordinates (latitude and longitude) of each waterbody; (iii) a digital photograph of each waterbody, cross-referenced to its GPS coordinates; and (iv) a wetland delineation shape-file. This inventory shall be delivered for review to DPS Staff, NYSDOS, and NYSDEC and, for waterbodies within the Adirondack Park, to APA, at least thirty (30) days prior to the filing of the proposed EM&CP;

b. Limitation of construction vehicle access across streams and waterbodies to existing bridges and culverts and to temporary crossings installed in accordance with the provisions set forth in the approved EM&CP;

c. Construction of equipment crossings to allow for unrestricted flow and to prevent soil from entering streams and waterbodies. Temporary crossings shall be designed and constructed to withstand the two (2) year flood event at a minimum;

d. Except where an access path is necessary, a fifteen (15) foot wide buffer zone shall be maintained at all waterbody crossings along any railroad ROW;

e. Prohibition of vehicular access where alternative access can be provided;

f. Restriction of equipment and materials (including fill, construction materials, or debris) from being deposited, placed, or stored in any waterbody;

g. Prohibition during overland construction refueling of equipment, storage mixing, or handling of open containers of pesticides, chemicals labeled “toxic,” or petroleum products, within one hundred (100) feet of a stream or waterbody or wetland. Field personnel and Contractors shall be trained in spill response procedures, including the deployment and maintenance of spill response materials;

h. Employment of precautions, when not feasible to move the affected vehicle or equipment from an environmentally sensitive area to a suitable access area (i.e., pumping equipment), to prevent petroleum products or hazardous materials from being released into the environment. These precautions include (but are not limited to) deployment of portable basins or similar secondary containment devices, use of ground covers (such as plastic tarpaulins), and precautionary placement of floating booms on nearby surface waterbodies;

i. Implementation of EM&CP procedures for erosion and sediment control (in accordance with the SWPPP to be included with the proposed EM&CP) early in the construction process and prior to the start of grading and excavation activities; such procedures shall be maintained throughout the construction period and in accordance with SSESC;

j. Pumping of water from dewatering operations into a temporary straw bale or silt fence barrier or filter bag to settle suspended silt material prior to discharge. Direct discharge of sediment laden water to state- and/or federally- regulated wetlands and to streams and stormwater systems shall be avoided;

k. Runoff resulting from equipment or machinery washing operations shall be prevented from directly entering any State-regulated wetland or protected stream or waterbody;

l. Development and implementation of spill response and cleanup procedures to minimize and respond to any accidental spills of petroleum producing chemicals or hazardous liquids that occur during construction;

m. A requirement that, during the performance of any HDD waterbody crossing, contractors monitor the use of inert biodegradable drilling solution and, in the

event of a detected release of fluid, implement the procedures specified in the approved EM&CP. For any release occurring in a waterbody, the Certificate Holders shall immediately notify DPS Staff and NYSDEC of details of the release and the course of action they recommend taking;

n. Monitoring of the status of each HDD waterbody crossing while construction activities are underway until the crossing has been completed and the stream and stream banks have been restored. In the event of any potential or actual failure of the crossing, the Certificate Holders shall have adequate staff and equipment available to take necessary steps to prevent or avoid adverse environmental impacts;

o. Completion of backfilling operations and of cleanup and restoration of the stream crossing, banks, and bank approaches (at least fifty (50) feet adjacent to each bank) within twenty-four (24) hours. If needed, stream banks shall be re-established to original grade immediately after stream bank work is completed. The banks shall then be permanently stabilized by seeding with native grasses, mulching, and, if needed, planting native shrub seedlings.

115. The Certificate Holders shall notify DPS Staff and NYSDEC at least five (5) days prior to construction involving protected stream crossings.

116. NYSDEC field representatives will notify the DPS Staff representative and the Certificate Holders' appropriate representative and, for wetlands within the Adirondack Park, APA of any activities that violate or may violate either the terms of this Certificate or the ECL. DPS Staff, NYSDEC field representatives, and, for wetlands within the Adirondack Park, the APA will consult in assessing site conditions and determining whether a recommendation should be made to DPS Staff to exercise its stop work

authority or, alternatively, whether the Certificate Holders should be directed to take action to minimize further impacts to streams and regulated wetlands as appropriate.

117. The Certificate Holders shall establish and implement a program to monitor the success of wetland and stream restoration upon completion of construction and restoration activities. The success of wetland revegetation shall be monitored and recorded annually for the first two (2) years (or as required by any applicable permit) after construction, or longer, until wetland re-vegetation is successful. Wetland re-vegetation will be considered successful when the vegetative cover is at least eighty (80) percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If re-vegetation is not successful at the end of two (2) years, the Certificate Holders shall develop and implement (in consultation with a professional wetland ecologist) a plan to actively revegetate the wetland with native wetland herbaceous plant species.

118. If DPS Staff, in consultation with NYSDEC, determines that restoration of damage to wetlands caused by use of temporary road mats has not been adequate, the Certificate Holders shall prepare a mitigation plan for impacts arising from the use of temporary road mats. Such plan shall provide for compensatory mitigation in the form of a proposed project to address the loss of wetland functions, such as vegetation plantings or a project to address invasive species in wetlands.

R. Transmission System Reliability

119. This section of this Certificate deals with the interconnection of the Facility to the New York State Bulk Power System ("NYSBPS") and with certain aspects of the operation of the Facility while interconnected with the NYSBPS. Some of these matters may also be subject to regulation by the FERC under the FPA. Nothing contained in this section shall

be construed as limiting or waiving Certificate Holders rights under the FPA in any way. In the event that Certificate Holders petition a tribunal of competent jurisdiction to determine whether any of the conditions and/or requirements established within this Transmission System Reliability section are regulated within the scope of FERC's exclusive jurisdiction under the FPA, Certificate Holders will provide a copy of such petition to DPS Staff within three days of filing. If determined by such tribunal to be within FERC's exclusive jurisdiction, Certificate Holders' compliance with FERC's requirements applicable to such matters (including without limitation any requirements established in any tariff or service agreement accepted for filing by FERC) shall be regarded as full and complete compliance with any such conditions and/or requirements established in this section.

120. The Certificate Holders are authorized to construct and agree to design, engineer, and construct the HVDC Transmission Facility's Attachment Facilities (as defined in the Open Access Transmission Tariff ("OATT") of the NYISO, as provided in the Optional Interconnection Study ("OIS") and System Reliability Impact Study ("SRIS") approved by NYISO, NYISO's Transmission Planning and Advisory Subcommittee ("TPAS"), and NYISO's Operating Committee ("OC"), the applicable NYISO Class Year Annual Transmission Reliability Assessment Study ("ATRAS"), and the Facility's Interconnection Agreement with the applicable parties, which may include the NYPA, the Consolidated Edison Company of New York, Inc. ("Con Edison") and NYISO (the "IA"). The Certificate Holders shall utilize Good Utility Practice as described in Condition 20, in the design, engineering, and construction of the HVDC Transmission System's Attachment Facilities.

121. The Certificate Holders shall connect the HVDC Transmission System to the 345 kV

Astoria bus owned by NYPA at 345 kV, as shown in Appendix B. Certificate Holders shall connect the Astoria-Rainey Cable to the 345 kV Astoria bus owned by NYPA and to the 345 kV Rainey bus owned by Con Edison as shown in Appendix B.

122. The Certificate Holders shall work with NYPA and Con Edison, and any successor Transmission Owner(s) ("TOs") (as defined in the NYISO Agreement) to ensure that the Facility has a power system relay protection and appropriate communication capabilities to ensure that operation of the electric transmission system is adequate under NPCC Bulk Power Protection Criteria, and meets the protection requirements at all times of the NERC, NPCC, NYSRC, NYISO, Con Edison, and NYPA and any successor organizations. The Certificate Holders shall ensure that their power system relay protection and communication capabilities comply with applicable NPCC criteria and shall be responsible for the costs to verify that their relay protection system is in compliance with applicable NERC, NPCC, NYISO, NYSRC, Con Edison and NYPA criteria.

123. The following requirements apply:

a. The Certificate Holders shall be responsible for the Facility's share of the cost of System Upgrade Facilities (as that term is defined in the OATT) as determined by NYISO in accordance with its FERC approved tariffs, rules, and procedures.

b. The Certificate Holders shall be responsible for the cost of interconnection facilities as they are defined in Attachment S of the OATT, and to the extent set forth in the IA.

c. Payments from the Certificate Holders to NYPA and/or Con Edison of the amounts contemplated in this Certificate Condition shall be made in accordance with the terms of the IA.

d. The Certificate Holders shall maintain the Facility in accordance with the approved tariffs and applicable rules and protocols of NYPA, Con Edison, NYISO, NYSRC, NPCC, NERC, and NAERO, and successor organizations.

e. The Certificate Holders shall obey operational orders and dispatch instructions issued by NYISO or its agent or successor pursuant to applicable tariffs, manuals, rules, protocols, and other relevant documents applicable to the Facility. In the event that the NYISO System Operator encounters communication difficulties, the Certificate Holders shall obey dispatch instructions issued by the Con Edison Energy Control Center, or its successor(s), pursuant to applicable tariffs, manuals, rules, protocols, and other relevant documents applicable to the Facility in order to maintain reliability of the transmission system.

124. The Certificate Holders shall fully comply with the applicable reliability criteria of NYPA, the Commission, Con Edison, NYISO, NPCC, NYSRC, NERC, NAERO and their successors. If the Facility fails to meet such reliability criteria at any time, the Certificate Holders shall notify NYISO immediately, in accordance with NYISO requirements, and shall simultaneously provide the Commission, NYPA and Con Edison with a copy of the NYISO notice.

125. The Certificate Holders shall file a copy of the following documents with the Secretary and provide any updates to the documents throughout the life of the Facility:

a. all facilities agreements with Con Edison, NYPA, and successor Transmission Owners (as defined in the NYISO agreement);

b. any documents submitted to the NYSRC, including but not limited to, any updates issued by the NYSRC;

c. the SRIS or any OIS or the Systems Impact Study ("SIS") approved by the

NYISO Operating Committee, and the Final Class Year Facilities Study. Should the Certificate Holders apply in the future to NYISO for additional Capacity Resource Interconnection Service ("CRIS") rights for the Facility, they shall file with the Commission copies of all documents submitted to NYISO, provided however that in the case of documents containing confidential information of the NYISO, Certificate Holders shall not be obligated to file any materials that NYISO refuses to authorize Certificate Holders to file. Certificate Holders shall file such documents with the Commission, even if they choose not to fund construction of the System Deliverability Upgrades (as that term is defined in the OATT) required to obtain such additional CRIS rights;

d. the Relay Coordination Study (which shall be filed not later than six (6) months prior to the projected date for circuit energization or testing and commissioning activities of the Facility, and shall be performed in concert with Con Edison and NYPA, and the results of which shall be provided to Con Edison and NYPA);

e. a copy of the IA(s) and all updates thereto throughout the life of the Facility;

f. a copy of the facilities design studies, including all associated drawings and support documentation and a copy of the manufacturer's "terminal facilities design characteristics" of the equipment installed (including test and design data); updates thereto throughout the life of the Facility; and

g. if any equipment or control system with different characteristics is to be installed, the Certificate Holders shall provide that information to the Commission, NYPA and Con Edison before any such change is made at least three (3) months in advance so that it can be reviewed prior to installation (throughout the life of the Facility).

126. Within five (5) business days of any failure of equipment causing a reduction of more than ten (10) percent in the capability of the Facility to transmit electric power, the Certificate Holders shall promptly provide to DPS Staff, NYPA, and Con Edison copies of all notices, filings, and other substantive written communications with NYISO as to such reduction, any plans for making repairs to remedy the reduction, and a proposed schedule for any such repairs. The Certificate Holders shall provide monthly reports to DPS Staff, Con Edison, and NYPA on the progress of any repairs until completed. The report shall contain, when available, copies of applicable drawings, descriptions of the equipment involved, a description of the incident, and a discussion of how future occurrences will be avoided. The Certificate Holders shall work cooperatively with NYPA, Con Edison, and NYISO to avoid any future occurrences. If such equipment failure is not completely repaired within nine (9) months of its occurrence, the Certificate Holders shall provide a detailed report to the Secretary within nine (9) months and two (2) weeks after the equipment failure, setting forth the progress on the repairs and indicating whether the repairs will be completed within three (3) months. If the repairs will not be completed within three (3) months, the Certificate Holders shall explain the circumstances contributing to the delay and demonstrate why the repairs should continue to proceed.

127. The Certificate Holders shall include in the Facilities Study for the HVDC Transmission System prepared by NYISO, and request that NYISO identify, the additional facilities required for the Certificate Holders to provide Black Start service, as well as the cost of those facilities. If the Certificate Holders subsequently decide to participate in the NYISO's Black Start program, they shall demonstrate annually that the Facility can be black started. The Certificate Holders shall schedule with the NYISO, Con Edison, and

NYPA the black start test and demonstrate black start procedures. If the Black Start Test fails, the Certificate Holders shall produce a report describing the test, detailing the cause (including copies of diagrams, photos, details of the test, and illustrations of the fail test) and what actions or changes are being made to the black start procedures. A copy of the report shall be submitted to Con Edison, NYPA, the Commission, and the NYISO. The Certificate Holders will provide the opportunity for DPS Staff to observe the black start testing and to attend all meetings related to Black Start. The Certificate Holders shall effectuate a successful black start annually to qualify for the Black Start program.

128. The Certificate Holders shall coordinate with NYPA and Con Edison system planning and system protection engineers to evaluate the characteristics of the transmission system before purchasing any system protection and control equipment related to the electrical interconnection of the Facility to NYPA's and Con Edison's transmission facilities. This discussion is designed to ensure that the equipment purchased will be able to withstand most system abnormalities.

129. The technical considerations of interconnecting the Facility to NYPA's and Con Edison's transmission facilities shall be documented by the Certificate Holders and provided to Staff of the Bulk Power Systems Section of DPS, Con Edison, and NYPA prior to the installation of transmission equipment. Updates to the technical information shall be furnished as available throughout the life of the Facility.

130. The Certificate Holders shall work with NYPA and Con Edison engineers and safety personnel on testing and energizing equipment and develop a start-up testing protocol providing a detailed description of the steps that they will take to limit system impacts prior to and during testing of the Facility. Such protocol shall be provided to NYISO, Con Edison, and NYPA for review and comment and, following the review and comment

phase, a copy of such protocol shall be provided to Staff of the Bulk Electric System Section of the DPS. The Certificate Holders shall comply with this protocol once established, unless NYISO provides written authorization to Certificate Holders to deviate from that protocol. The Certificate Holders shall make a good faith effort to notify DPS Staff of meetings related to the electrical interconnection of the Facility to NYPA's or Con Edison's transmission system, as applicable, and provide the opportunity for Staff to attend those meetings. The Certificate Holders shall provide a copy of the testing protocol to Staff of the Bulk Electric Systems Section of DPS.

131. The Certificate Holders shall make modifications to the Facility if it is found by the NYISO or the Commission to cause reliability problems to the New York State Transmission System. If NYPA, Con Edison, or the NYISO bring concerns to the Commission, the Certificate Holders shall be obligated to respond to those concerns. The Certificate Holders shall prepare a report within forty-five (45) days of notification by DPS Staff that DPS Staff has determined that a reliability problem exists.

132. No less than sixty (60) days prior to the Facility's anticipated COD, the Certificate Holders shall file with the Secretary, Operation and Maintenance Plan(s) for the Facility's Interconnection Facilities. The plan(s) shall be updated yearly and a copy of the updated plan(s) shall be filed with the Secretary; the plan(s) and updates shall be provided to Con Edison and NYPA.

133. The Certificate Holders shall file with the Secretary, no less than sixty (60) days prior to delivery of test energy from the Facility to the Astoria Annex Substation and the Rainey Substation, a report regarding the measures taken to achieve the 1,550 MW deliverability commitment established in Condition 15(a) hereof, as well as copies of all studies, drawings, and backup documentation that support all such measures. The Certificate

Holders shall provide a draft of such report to Con Edison for its review and comment at least thirty days prior to the filing of such report. The measures for achieving the 1,550 MW deliverability commitment specified by the Certificate Holders in that report shall not include a Special Protection System ("SPS") or other operational measures subject to individual approval by NYISO, the New York State Reliability Council or other applicable reliability authorities, unless Con Edison informs the Certificate Holders, no more than twenty five days after receiving Certificate Holders' draft report, that as a result of changed circumstances since the execution of the Stipulation in Commission Case 10-T-0139 on June 26, 2012, it disputes Certificate Holders' conclusion that they can achieve 1,550 MW of energy deliverability out of the Astoria Annex Substation and into Con Edison's transmission system. In the event that Con Edison takes the position that Certificate Holders cannot meet the 1,550 MW energy deliverability commitment using such facilities, nothing in this Certificate shall limit Certificate Holders' right to propose to meet this deliverability commitment by using an SPS, other operational measures or any other measures, or the right of any party, including Con Edison, to object to the use of such measures. In such circumstances, the Certificate Holders shall include with their report all documentation for the design of any such SPS, other operational measures or other measures, with a complete description of all components and logic diagrams. Prior to delivery of test energy to the Astoria Annex Substation, the Certificate Holders shall provide documentation to DPS Staff that any such measures to be used by the Facility have received all required approvals from all applicable authorities, including without limitation NYISO and NPCC.

134. In the event the HVDC Transmission System trips offline (other than as a result of any Operational Measures), the Certificate Holders shall notify DPS Staff, within one (1)

hour of the incident. Following the incident, the Certificate Holders shall notify DPS Staff, NYPA, and Con Edison of the cause of the trip, and what actions, if any, the Certificate Holders are taking to rectify the cause. The Certificate Holders shall call and report to the Staff of the Bulk Electric Systems Section of the DPS within six (6) hours of any transmission related incident that affects the operation of the Facility. The Certificate Holders shall submit a report on any such incident within seven (7) days to the Bulk Electric System Staff, Con Edison, and NYPA. The report shall contain, when available, copies of applicable drawings, descriptions of the equipment involved, a description of the incident and a discussion of how future occurrences will be prevented. The Certificate Holders shall work cooperatively with Con Edison, NYPA, NYISO, NPCC, NYSRC, NERC, and DPS Staff to prevent any future occurrences.

135. If there is a failure of one of the Facility's cables, the Certificate Holders shall report, within one (1) day of determining the location of the fault, to Bulk Electric System Section of DPS Staff, Con Edison, and NYPA as well as the likely location of and schedule for repairs. Any changes in the schedule shall be reported to DPS Staff, Con Edison, and NYPA.

136. The Certificate Holders shall provide the Bulk Electric System Section of DPS with a copy of their emergency procedures and contacts, and an updated copy shall be provided with documentation of any modifications.

137. The Certificate Holders shall report any theft of materials related to the Facility with a value in excess of ten thousand dollars ($10,000) to the DPS Representative within one (1) business day of the time when the theft comes to the attention of the Certificate Holders. The Certificate Holders shall provide the DPS Representative with a list of the stolen items to the extent known and a copy of any police report.

S. Mapping, Land Acquisition, and As-built Drawings for the Facility

138. Each Segment EM&CP shall include a detailed map or maps showing (a) the boundaries of the Construction Zone associated with the work to be performed in connection with such Segment, including access routes, laydown and storage areas, sampling locations, and other relevant places, and (b) the anticipated ultimate location and the anticipated boundary of the Facility ROW and, (c) in the case of overland ROW, areas associated therewith, as follows:

(i) areas within which periodic vegetative management may be necessary in order to prevent significant intrusion of tree roots into the Facility ROW,

(ii) areas within which future ground alteration, structural construction, or other permanent installations by others generally should be precluded in order to protect the Facility and ensure appropriate access thereto for the purposes of repair and maintenance, and,

(iii) areas offering (a) continuous longitudinal access along and (b) intermittent linking access from public roads and highways or established railroad access routes to the Facility ROW.

139. Following final completion of construction of a particular Segment, the Certificate Holders shall prepare and provide to the DPS the as-built design drawings, which shall include a detailed map or maps showing:

(a) the boundary of the permanent Facility ROW and areas that will be subject to periodic vegetation management ("Final Layout Area"),

(b) the location of the Facility as installed ("As-built Design Drawings"). All As-built Design Drawings provided to DPS pursuant to this condition shall include

shapefile information compatible with ArcView® GIS Software, and

(c) With respect to As-built Design Drawings that relate to installation of the Project on lands owned or controlled by the Canadian Pacific Railway, such As-built Design Drawings shall be provided to DPS staff within ninety (90) days of the completion of construction and shall conform with Section 5.5.5 of the American Railway Engineering and Maintenance-of-Way Association ("AREMA") Manual for Railway Engineering, taking into account the fact that such standard is specifically addressed to fiber optic infrastructure. With respect to As-built Design Drawings that relate to installation of the HVDC Transmission System on lands owned or controlled by the CSX Transportation, such As-built Design Drawings shall be provided to DPS staff within ninety (90) days of the completion of construction and shall conform to an appropriate standard that is substantially equivalent in terms of detail to the AREMA standard referenced, and

(d) With respect to As-built Design Drawings that relate to submerged portions of the HVDC Transmission System, such As-build Design Drawings shall indicate areas in which the cables are laid in deep waters without cover and areas in which the cables are laid on the bottom but covered, in which case(s) the type of cover (i.e., natural bed material, rip-rap or concrete mattress cover) shall also be described.

140. Each edge of the permanent overland Facility ROW shall be no closer than (a) when located entirely within lands owned or controlled by a railroad company or a public highway, six (6) feet to the outer surface of the nearest installed cable and (b), in all other areas, eight (8) feet to the outer surface of the nearest installed cable.

141. The Certificate Holders shall acquire control of all lands within the overland Final Layout Area by fee, easement, or other appropriate interest and shall perfect, in accordance with

New York State law relating to the official recordation of instruments related to land and other possessory interests, their rights to use and occupy such lands for the life of the Facility, as appropriate.

142. For each Segment EM&CP that involves municipal lands with respect to which the Certificate Holders cannot acquire control by fee or easement, the Certificate Holders shall provide to the Commission an instrument or instruments confirming that the affected municipality has consented to the use of such lands and shall in any and all events comply with PSL § 68 with respect to exercise of rights conferred pursuant to such consents.

143. For all rights concerning property comprising the Facility ROW, the Construction Zone, off-rights-of-way access, storage or staging areas, or the like, to be acquired, the Certificate Holders shall cause an examination of title (title search) to be conducted in the same manner as would be conducted by a reputable title insurance company to identify all of-record owners, mortgagees, lienholders, leaseholders, or others with an interest in such property rights to be acquired. The Certificate Holders shall serve written notice(s) of the EM&CP filing on each such person identified, and on any person owning the land underlying an affected easement or leasehold interest of record. Such notice would include, at a minimum, the procedures and deadlines for submitting comments.

144. The Certificate Holders shall not commence any proceedings under the New York State Eminent Domain Procedure Law ("EDPL") to acquire any part of the Facility ROW areas temporarily-needed areas within the Construction Zone, or off-ROW access until the Commission has approved the relevant Segment EM&CP. To calculate the three-year period for acquisition of property pursuant to the EDPL, the date of Commission approval of a Segment EM&CP covering the affected parcel shall be regarded as the date

on which this Article VII proceeding was completed. The Certificate Holders retain all rights afforded them by the New York Transportation Corporations Law and the EDPL.

T. Environmental Management and Construction Plan

145. Except where the provisions of this Certificate require otherwise, the environmental protection measures contained in the Joint Proposal and the Certificate Holders' Article VII Application, the WQC, the approved EM&CP Guidelines, and the approved BMPs shall be incorporated into the proposed EM&CP and applied during construction, operation, and maintenance of the Facility. Applicable Conditions of this Certificate, approved EM&CP, and orders approving the EM&CP and any Segment EM&CP shall be included in any design, construction, ownership, or maintenance contracts associated with the Facility.

146. The Certificate Holders shall provide, as a part of the proposed EM&CP, a final design plan that conforms with the design of the Facility set forth in this Certificate, applicable federal, state, and local requirements (including, but not limited to, applicable regulations administered by or in connection with the OSHA, NYSDEC, OPRHP, Ag & Mkts, the APA, the Commission, NYSDOT, the Bureau of Alcohol, Tobacco and Firearms, the New York State Department of Labor, and hazardous materials, chemical and waste-storage use and handling regulations).

147. The proposed EM&CP shall identify details of nearby electric, gas, telecommunication, water, wastewater, steam, sewer, and related facilities (whether underground, aboveground or underwater) and Measures to protect the integrity, operation, and maintenance of those facilities shall be presented in the EM&CP for each Segment, which shall explain the safety procedures that will be implemented during construction of the Facility.

148. With respect to each Segment EM&CP filed with the Commission and prior to the filing of the same, the Certificate Holders shall:

a. conduct a pre-installation survey that will document the location and condition of CI within the Construction Zone that is the subject of the Segment EM&CP and identify the parties owning and operating such CI and the agencies exercising regulatory jurisdiction over the same;

b. include the results of such survey as a part of such filing;

c. provide a detailed plan setting forth the measures that will be taken by the Certificate Holders to avoid damage to CI documented in connection with the filing and explaining how any reasonably foreseeable contingency will be met.

149. The Certificate Holders shall identify black cherry trees located in the Construction Zone near active livestock use areas during the development of each proposed Segment EM&CP. During the clearing phase, such vegetation shall be disposed of in a manner that prevents access by livestock.

150. In preparing the proposed EM&CP, the Certificate Holders shall consult with the NYSDOH to identify all PWS systems within one mile of the HVDC Transmission System facilities. The Certificate Holders shall consult with the operators or other representatives of each system to obtain information on the location of intake structures(s), plant operations, raw water quality parameters of concern including turbidity, and appropriate notification procedures. The results of that consultation shall be reported in the proposed EM&CP. The Certificate Holders shall include in their proposed EM&CP justification for any cable installation proposed to occur within five hundred (500) feet of a PWS intake and a description of alternative cable installation methods or modified methods (i.e., reduced speed and pressure) of trenching for cable

installation in such areas as determined necessary based on information obtained from the PWS.

151. The Certificate Holders shall file copies of the proposed EM&CP as directed by the Secretary, and serve five (5) hard copies and two (2) copies on CD-ROMS on DPS Staff, two (2) copies on the Staff of the NYSDEC in the Central Office in Albany, one (1) copy on each Regional Office of NYSDEC where the Facility is located, one (1) copy on the Commissioner of OPRHP, one (1) copy on staff of the Palisades Interstate Park Commission (if the Segment EM&CP relates to construction that may take place in Rockland County), one (1) copy on the Staff of Ag & Mkts., one (1) copy on NYSDOT in the Central Office in Albany and one (1) copy on each municipality and Regional Office of NYSDOT where the relevant portion of the Facility is located (if requested by such municipality or NYSDOT), one (1) copy on NYSDOS, one (1) copy on any other New York State agency (and its relevant regional offices) that requests the document, and one (1) copy on active parties on the service list who request the document (in the case of a municipality, such service shall be directed to the Chief Executive Officer thereof). Service upon state agencies shall be in the same manner and at the same time as filing with the Secretary. The Certificate Holders also shall place electronic or hard copies for inspection by the public on an internet website and in at least one (1) public library or other convenient location in each municipality in which the construction authorized in that portion of the EM&CP will take place. Contemporaneously with the filing and service of the proposed EM&CP, the Certificate Holders shall provide notice, in the manner specified below, that the proposed EM&CP has been filed.

152. The Certificate Holders shall serve written notice(s) of the filing of the proposed EM&CP or Segment EM&CP on all parties to this proceeding, as well as the relevant railroads and

CI owners whose facilities, properties, and/or structures within the geographic scope of that portion of the EM&CP that may be impacted,, including but not limited to tracks and devices, and shall attach a copy of the notice so served to each copy of the proposed EM&CP or Segment EM&CP. Further, the Certificate Holders shall publish the notice(s) in a newspaper or newspapers of general circulation in the vicinity of the Segment(s) to which the EM&CP relates.

153. The Certificate Holders shall provide notice that the EM&CP is available for review to the chief executive officer of each affected municipality and to residents, businesses, and building, structure, and facility owners and, to the extent known, operators of the same when such land uses are located within one hundred (100) feet of the HDD staging areas, off-ROW construction access roads, and the overland components of the Facility. The notice shall include, in plain language: (i) details about the planned work locations; (ii) hours and duration of activities; (iii) provisions for protection of properties, if applicable; (iv) provisions for maintenance and protection of pedestrian and vehicle access to buildings and properties; (v) identification of locations where additional information and copies of the EM&CP are available; (vi) contact information for Certificate Holders personnel, including a toll-free number; and (vii) instructions on how comments regarding construction plans and mitigation measures may be filed with the Secretary, indicating appropriate deadlines for commenting and contact information. The Certificate Holders shall also provide a hard copy synopsis of any approved Segment EM&CP for residents owning property located within one hundred (100) feet of the Construction Zone as delineated therein. Such synopsis shall include a hard copy page(s) from the approved Segment EM&CP that may have relevance to the resident's property. Proof of notice to residents, businesses, and building and structure owners shall be

provided to the Secretary.

154. (a) The Certificate Holders shall provide notice to residents, businesses, and building, structure, and facility (including underground, aboveground and underwater facilities) owners and operators within one hundred (100) feet of any HDD staging area or trenching activity with an offer to inspect foundations before, during, and after construction. The notice provided shall include the following provisions: (i) an offer to inspect building, facility, and structure foundations before, during, and after construction; (ii) an explanation of the benefits of such inspections and what documentation will be provided to building or facility or structure owners and operators; and (iii) proof of notice to residents, businesses, and building, facility, and structure owners and operators shall be provided to the Secretary. Proof of notice shall accompany filing of the proposed EM&CP.

(b) Inspections of building foundations conducted for residents, businesses, and building, facility, or structure owners or operators, or for which Certificate Holders reimburse such costs expended by any such individuals for this purpose, shall (i) provide each building, facility, or structure owner or, to the extent known, operator with documented conditions at each significant stage of construction; (ii) include photographs of any existing and post-construction damage and document measurements of foundation crack lengths during each inspection phase; (iii) provide each building, facility, and structure owner/operator a report detailing foundation condition findings; and (iv) provide a copy of each prepared report to DPS Staff within thirty (30) days of completion.

(c) HDD site preparation or trench excavation work shall not commence until all building, facility, and structure owners and operators provided with notice under

sub-part (b) above have accepted or declined inspection offers, or a response has not been received within two (2) weeks from service.

155. (a) The written notice(s) and the newspaper notice(s) of filing the proposed EM&CP or Segment EM&CP shall contain, at a minimum, the following:

(1) a statement that the proposed EM&CP has been filed;

(2) a general description of the Facility and the proposed EM&CP;

(3) with respect to the written notice(s) for identified persons with a record interest in property to be acquired or significantly disturbed by construction, a specific description of the ROW of the Facility, as applicable, temporarily needed areas within the Construction Zone, or off-ROW access to be acquired;

(4) a listing of the locations where the proposed EM&CP is available for public inspection;

(5) a statement that any person desiring additional information about a specific geographical location or specific subject may request it from the Certificate Holders;

(6) the name, address, and telephone numbers of an appropriate Certificate Holders representative;

(7) the address of the Secretary; and

(8) a statement that any person may be heard by the Commission on any matter or objection regarding the proposed EM&CP by filing written comments with the Secretary and the Certificate Holders within thirty (30) days of the date the proposed EM&CP was filed with the Commission (or within thirty (30) days of the date of the newspaper notice, whichever is

later).

(b) A certificate of service indicating upon whom all EM&CP notices and documents were served and a copy of the written notice shall be filed with the Secretary at the time the proposed EM&CP is filed, and shall be a condition precedent to approval of the EM&CP.

156. (a) For the overland portions of the Facility, construction outside the Allowed Deviation Zone, to the minimum extent necessary, as detailed and justified in an EM&CP submittal, shall be allowed for appropriate environmental or engineering reasons, except where a conflict with a specific provision of this Certificate would be created.

(b) For the HVDC Transmission System installed in Lake Champlain and the Hudson and Harlem Rivers, the Allowed Deviation Zone shall be anywhere within those bodies of water where the water depth exceeds twenty (20) feet at mean low water, and where installed in the East River the Allowed Deviation Zone for the HVDC Transmission System shall be anywhere where the water depth exceeds ten (10) feet at mean low water, provided however that:

(1) Where the HVDC Transmission System Centerline enters any of the Exclusion Zones identified on the maps contained in Appendix B to the Joint Proposal, the Allowed Deviation Zone shall be limited to one hundred and fifty (150) feet on either side of the Facility Centerline. The Certificate Holders' rights to enter into such Exclusion Zones are as follows: Prior to installation in these areas, the Certificate Holders shall provide in the EM&CP an analysis as to whether there are any reasonable and feasible underwater alternatives outside of the Exclusion Zones that

would allow for burial at the target depth of six (6) feet. No deviation in the Centerline may cause the HVDC Transmission System to enter into any of the Exclusion Zones identified in that Appendix B without (a) the Certificate Holders providing in the EM&CP an analysis that there are no other reasonable and feasible alternatives that would allow for achieving the target burial depth of six (6) feet and (b) the written consent of NYSDEC. In the event the Certificate Holders are unable to agree on a change to the Centerline governed by this subpart, the Certificate Holders shall be free to file an application for an amendment to this Certificate setting out their proposed new Centerline and the environmental and engineering considerations underlying that proposal;

(2) No deviation of over one hundred fifty (150) feet in the Centerline may cause the HVDC Transmission System to come within one hundred sixty (160) feet of any instance of "Lake Champlain Maritime Museum ("LCMM")/CHPE Marine Route Survey Cultural Resources" identified in Appendix B to the Joint Proposal without (a) the Certificate Holders providing in the EM&CP an analysis that there are no other reasonable and feasible alternatives; and (b) the written consent of the New York State Historic Preservation Office ("NYSHPO"). In the event that the Certificate Holders and NYSHPO are unable to agree on a change to the Centerline governed by this subpart, the Certificate Holders shall be free to file an application for an amendment to this Certificate setting out their proposed new Centerline and the environmental and engineering considerations underlying that proposal; and

(3) No deviation of more than one hundred and fifty (150) feet in the Centerline may cause the Facility to be located or re-located within any Significant Coastal Fish & Wildlife Habitat identified in the NYS Coastal Management Program without:

a. the Certificate Holders providing in the EM&CP an analysis that there are no other reasonable and feasible alternatives that would allow for achieving the target depth of cover of six (6) feet;

b. the written consent of NYSDEC. In the event that the Certificate Holders and NYSDEC are unable to agree to a change in the Centerline governed by this subpart, the Certificate Holders shall be free to file an application for an amendment to this Certificate setting out their proposed new Centerline and the environmental and engineering considerations underlying that proposal;

c. a written statement from NYSDOS stating that the deviation would not result in coastal effects that differ significantly from the coastal effects reviewed by NYSDOS in Certificate Holders' original federal Coastal Consistency Certification. In the event that NYSDOS determines that such deviation would result in coastal effects that differ significantly from those reviewed in the Coastal Consistency Certification, the Certificate Holders shall seek a written concurrence from NYSDOS for any such project changes that would require an amendment to the Certificate Holders' Coastal Consistency Certification. Nothing in this Certificate shall be construed to limit or expand any rights Certificate Holders may

have to seek administrative or judicial review of any action or inaction by NYSDOS relating to any such deviation; and

(4) No significant increase in adverse effects to CI or other infrastructure results from proposed facility re-location.

157. All deviations from the design depth, height, and location of facilities or structures shall be presented in the proposed EM&CP for approval. An explanation for the proposed deviations shall be provided, with supporting documentation. Deviations shall be allowed for appropriate environmental or engineering reasons without modification to this Certificate, except where a conflict with a specific provision of this Certificate would be created. If a deviation is proposed after approval of the EM&CP, the procedures contained in Condition 158 of this Certificate shall apply.

158. The EM&CP approved by the Commission may incorporate modifications from the EM&CP proposed by the Certificate Holders. No change to the approved EM&CP may thereafter be made except in accordance with the following procedures:

a. For a proposed change that:

(i) would involve a site listed or eligible for listing on the New York State or National Register of Historic Places, the Certificate Holders shall give at least two (2) weeks prior notice to the Field Service Bureau of OPRHP.

(ii) would involve any State-regulated wetland or protected stream or water body, the Certificate Holders shall give at least two weeks prior notice to NYSDEC, and, if within the Adirondack Park, to APA.

(iii) would affect the occupied habitat of a TE species, the Certificate Holders shall give at least two weeks prior notice to NYSDEC and to the USFWS or NMFS (where applicable) prior to providing notice to DPS staff of the

proposed change.

(iv) would affect the individual or habitat supporting RTE plants, the Certificate Holders shall give at least two (2) weeks prior notice to NYSDEC and DPS.

(v) would involve agricultural land, the Certificate Holders shall give at least two (2) weeks prior notice to Ag & Mkts.

(vi) would involve the herbicides planned for use (including mixed proportions, additives or method of application), the Certificate Holders shall give at least thirty (30) days prior notice to NYSDEC.

(vii) would affect land or water owned or controlled by CNY, the Certificate Holders shall give at least two (2) weeks prior notice to CNY.

b. The Certificate Holders shall report any proposed changes to the EM&CP to DPS Staff. DPS Staff will refer to the Commission for approval any proposed changes that cause a substantial increase in environmental impact, after consultation with NYSDEC, any proposed changes that relate to contested issues decided during the proceeding, and any proposed changes affecting State highways (but need not do so if the report indicates NYSDOT's agreement to such proposed changes). DPS Staff is authorized to approve all other proposed changes, in accordance with the procedure outlined herein, and will submit reports of such changes to the Secretary or the Secretary's designee, which reports will be posted on the Commission's website under this case number.

c. Upon being advised that DPS Staff will refer a proposed change to the Commission, the Certificate Holders shall notify all active parties that have requested to be so notified, as well as property owners or lessees whose property

is affected by the proposed change. The notice shall:

(i) describe the original conditions and the requested change;

(ii) provide documents supporting the request; and

(iii) state that persons may comment by writing to the Commission within twenty one (21) days of the notification date.

d. The Certificate Holders shall not execute any proposed change until they receive written approval from the Commission (if Commission approval is required pursuant to subparagraph (a) of this paragraph) or oral or written approval from DPS Staff (in the case of a change that Staff has authority to approve) except in emergency situations threatening personal injury, property damage, or severe adverse environmental impact, or as specified in the EM&CP. When the Certificate Holders have obtained oral approval from DPS Staff for a change, DPS Staff will confirm such approval in writing within ten (10) business days.

159. The EM&CP and, as and when appropriate, a Segment EM&CP and any proposal to modify the EM&CP or a Segment EM&CP shall address, but not be limited to, the following information:

a. details of work site dimensions; construction ROW and off-ROW access needs and locations; locations and descriptions of work scheduled or planned by others in the vicinity of the construction identified after consulting relevant federal, state, and city agencies; and measures to protect adjacent facilities, structures and vegetation;

b. documentation of methods to meet the requirements of this Certificate and incorporation of appropriate engineering standards, regarding existing road, bridge, and culvert conditions;

c. location of the utility, water, steam, sewer, and wastewater crossings and other nearby utility facilities, including CI facilities, and methods for protecting the cable and other facilities, including CI facilities, at those crossings and nearby locations; the plan shall include detailed construction techniques, methods, and equipment descriptions for the protection of existing utilities including, but not limited to, how damage to existing utilities will be avoided and how any contingency will be met in case damage does occur, and for coordination with utilities and public service providers;

d. detailed construction schedule and coordination plans, including those in connection with other utility owners and operators with respect to any work on the Facility for which coordination is required by this Certificate or other related agreement(s), including construction calendar;

e. each construction activity as discussed in Condition 58;

f. a comprehensive plan to identify encroachments within the Construction Zone as discussed in Condition 60;

g. an HDD work packet providing planning, installation controls, and site measures that will be taken in accordance with good engineering practices; including relevant information and deliverables described in Section 8.1 of the BMPs;

h. jet plow and shear plow techniques and adjustments, including details related to crossing existing underwater facilities and infrastructure;

i. a work plan for dredging activities including specific practices to be used during dredging, dredged materials management plans, and proof of the ability to provide proper disposal;

j. drawings and specifications of any closed environmental bucket or other dredging

equipment, including specifications demonstrating that appropriate design considerations are incorporated in equipment selected for deployment;

k. a pre-installation and post-energizing sediment sampling and monitoring plan, which plan will be subject to review and comment by NYSDEC and NYSDOS and will adhere to the following specifications: the plan will correspond to Attachment 2 of this Certificate, Benthic and Sediment Monitoring Scope of Study. The plan submitted to DPS Staff for approval shall include the results of the consultation with NYSDEC and NYSDOS;

l. details of cable pulling and splicing plans that include locations of any spare conduits that will be installed;

m. night time construction provisions, including lighting and noise control, and mitigation measures, including conditions when night time construction will be undertaken;

n. public road traffic control and public safety and the MPT plans as discussed in Condition 39;

o. details regarding street work, including provisions for minimizing the duration and extent of open excavation, traffic disruptions, and work within and adjoining public streets and public street ROW;

p. public safety control provisions including practices for work near residential and publicly accessible sites; fencing around open work areas, and provisions for through traffic, and alternative access;

q. designated parking areas and equipment storage and staging locations;

r. details for drainage line repair procedure and drawings in the event of a crushed or severed drain lines;

s. provision for submission of a certification by a professional engineer licensed by the State of New York stating that, if constructed in accordance with the final design plans, the Facility shall, to the extent applicable, comply with the interim electrostatic field standard established by the Commission in Opinion No. 78-13 (issued on June 19, 1978 in Cases 26529 and 26559) and the limit for magnetic fields set in the Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities (issued on September 11, 1990 in Cases 26529 and 26559) or with any standard test that has superseded these standards at the time of consideration by the Commission of the EM&CP or a particular Segment EM&CP;

t. a work plan for reducing magnetic fields, which will include documentation of the calculation of anticipated average magnetic field levels, overland and underwater with the Facility in operation;

u. impact avoidance and/or minimization measures for regulated wetlands, streams, and other environmental resources including any maps and plan drawings of streams, regulated wetlands, and sensitive habitat crossing locations, site-specific stream-crossing techniques for the construction of the Facility and for the construction of any access roads to be used for such construction, and selective vegetation-clearing techniques in areas near streams or regulated wetlands;

v. measures consistent with this Certificate, the Joint Proposal, the BMPs, and the EM&CP Guidelines to avoid and/or minimize impacts to TE species and RTE plants and their occupied habitat;

w. work plan for measures to be taken for protection of vegetation and visual resources of the Lakes to Locks Passage Scenic Byway (State Highway 22);

x. a notice of intent to exercise authority under the SPDES General Permit for construction activities;

y. details of erosion control plans, including grading and filling at the overland Construction Zone, Converter Station, and substation, so as to provide for the control of discharges incidental to the construction of the Facility, including to stormwater, groundwater, and surface waters, and meet applicable water quality standards;

z. methods to avoid the effects of sediment on nearby facilities and infrastructure, including avoidance techniques with respect to the clogging of outfalls and diffusers;

aa. spoil control plans for excavations, including for any materials proposed for use as backfill in the underwater or overland route, identification of its source and the evaluation of its suitability;

bb. a blasting plan that includes the information described in the BMPs;

cc. work plan for storage of all petroleum products and hazardous chemicals which may be used during, or in connection with, the construction, operation, or maintenance of the Facility, fuel and fluids spill prevention and control plans;

dd. work plans for responding to and remediating the effects of any spill of petroleum products or hazardous substances that occurs during construction of the Facility on land or in the water in accordance with applicable federal and state laws, regulations, and guidance, which shall include proposed methods of handling spills of petroleum products and any chemicals that may be stored or utilized during the construction, operation, or maintenance of the Facility;

ee. plans for pre- and post-installation bathymetry, sediment, benthic invertebrate,

fish, temperature, and magnetic field surveys as described in Condition 163, and mitigation;

ff. a plan for suspended sediment and water quality monitoring consistent with Attachment 1 of this Certificate, Suspended Sediment and Water Quality Plan Scope of Study, for jet and shear plow activities, as well as removal of large debris with an area greater than nine hundred (900) square feet or longer than thirty (30) feet in any direction;

gg. invasive species control measures during construction;

hh. appropriate measures as proposed in *Karner blue butterfly (Lycaeides melissa samuelis) Impact Avoidance and Minimization Report* attached to the Joint Proposal as Exhibit 109;

ii. United States Coast Guard Notice(s) to Mariners during the occupation of any surface waters of the State of New York which may present a hazard or obstacle to safe navigation;

jj. other mitigation measures as appropriate to demonstrate compliance with other permits and approvals;

kk. plans and specifications for site and pavement restoration, including pre-existing drainage systems;

ll. noise mitigation plan for noise sensitive sites showing the locations of residential areas and other noise-sensitive areas along the proposed ROW of the Facility and the specific procedures to be followed to minimize noise impacts related to ROW clearing, facility construction, and operation for the Facility;

mm. mitigation measures that will be employed should significant concentrations of waterfowl be encountered during fall migration when construction is proposed

near the following SCFWH: Germantown-Clermont Flats, The Flats, Roundout Creek, Esopus Meadows, Vanderburgh Cove and Shallows, Constitution March, and Iona Island Marsh;

nn. plans for use of roadways for the delivery of oversized loads in the event that transportation of oversize loads by road is required. The Certificate Holders shall obtain any necessary governmental permits associated with transport of such oversized loads and provide copies of such permits to the Secretary;

oo. a plan for responding to and remediating the effects of any spill of petroleum or any hazardous substances that occurs during the construction of the Facility, in accordance with applicable state and federal law and regulations. Such plan shall be developed in accordance with such applicable laws and regulations and relevant official guidance and shall include proposed methods of handling spills of petroleum products and any hazardous substances which may be stored or utilized during construction, operation, or maintenance of the Facility;

pp. For excavations in close proximity to buildings, walls, or other structures:

i. a description of the support system method for each such location where support is determined to be necessary;

ii. the rationale for each such location where it is determined that support systems are unnecessary; and

iii. support system designs for each location where it is determined that support is necessary; designs shall demonstrate approval by a registered professional engineer licensed in New York State.

qq. For excavations that will be below the level of the base or footing of any foundation or retaining wall:

i. a list of all locations where excavation below the base or footing of any structure is considered necessary;

ii. a description of the support system method for each such location where support is determined to be necessary;

iii. the rationale for each such location where it is determined that support systems are unnecessary per OSHA Requirements 1926.651(i)(2)(ii), 1926.651(i)(2)(iii), and 1926.651(i)(2)(iv); and

iv. support system designs for each location where it is determined that support is necessary; designs shall demonstrate approval by a registered professional engineer licensed in New York State.

160. The Certificate Holders shall also include in the proposed EM&CP a compliance assurance plan that includes but is not limited to:

a. The name(s) of the inspector(s) selected under Condition 53 and a statement of qualifications for each inspector demonstrating sufficient knowledge and experience in environmental and construction matters to complete the inspections and audits;

b. Provision for deployment of more than one of a particular type of inspector (or types of inspectors, when appropriate) in the event that two or more major construction operations are undertaken simultaneously in areas separated by ordinary highway driving of more than three (3) hours, such that at least one inspector of a particular type shall be assigned to each such separated construction area;

c. A proposed checklist of matters to inspect for compliance, including the specific items or locations to be inspected, the inspection to be employed such as visual,

auditory, testing by instrument, and acceptability criteria to be applied by the inspector(s);

d. A procedure setting forth how the Certificate Holders shall respond to and correct problems found by the inspector(s);

e. A procedure setting forth how the Certificate Holders shall respond to and correct problems identified by any utility owners or operators whose property has been damaged in any material way as a result of the construction, operation, or maintenance of the Facility;

f. A schedule for monthly environmental audits during construction and submission of audit checklists, together with a written explanation of problem(s), signed by the independent inspectors and an authorized representative of the Certificate Holders, to DPS Staff and NYSDEC; and

g. A schedule for submission of annual environmental audits during the first two (2) years of operation of the Facility to DPS Staff, NYSDEC, and specified state and municipal agencies.

161. The Certificate Holders shall also include in the EM&CP:

a. An immediate post-installation inspection plan that shall include at a minimum: (i) the method for determining the actual cable location and actual burial depth of the cable upon completion of installation; (ii) standards to be used to determine what remedial actions are warranted consistent with Good Utility Practices (e.g., additional burial and/or protection efforts) in all locations where the cable burial depth is less than the applicable target burial depth; (iii) standards to be used to determine if any damage has been or will be caused to any pre-existing facility and/or infrastructure as a result of cable installation, operation, or maintenance,

and remedial measures therefore; and (iv) the method and timing for undertaking such efforts; and

b. A maintenance and emergency action plan that shall include, at a minimum, (i) a schedule for periodic verifications, not to exceed three (3) years for overland locations and five (5) years for underwater locations, of the depth of burial of the cable and the standard to be used to determine, based upon inspection results, whether, and if so, what relocation, reburial, and/or added protection measures for the cable or pre-existing facilities or infrastructure are required; (ii) ROW vegetation maintenance plan; (iii) provisions for stabilizing erosion and resolving drainage problems; and (iv) control of access to the ROW and facility components.

162. In order to protect CI described in Condition 27, the Certificate Holders shall include in the EM&CP:

a. an interference study, conforming to industry standards and performed by an individual or individuals with suitable qualifications to conduct such study, with respect to each location at which the Facility crosses CI or comes into such proximity to CI that an interference study is warranted by Good Utility Practices, and specifying any proposed mitigation measures;

b. a study to determine whether the Facility may have corrosive effects on any CI, conforming to industry standards and performed by individual(s) with suitable qualifications to conduct such study, and specifying any proposed mitigation measures;

c. detailed cable ampacity and thermal calculations and documentation demonstrating that CI will not be adversely affected by the construction,

operation, or maintenance of the Facility; such documentation shall include study results, calculations, and underlying assumptions used in the analysis and also to include, but not be limited to, cable specification, installation cross sections, thermal resistivity (tested or assumed) and, in the case of alternating current ("AC") lines only, magnetic field studies;

d. detailed calculations and documentation demonstrating that CI will not be adversely affected by the weight and installation methodology of the Facility's cables; such calculations and documentation shall respond to and address study results and shall set forth the underlying assumptions used in the analysis and shall also include, but not be limited to, cable specification, installation cross sections, geotechnical data (tested or assumed), and proposed mechanical protection;

e. in the event that a Segment EM&CP proposes that the HVDC Transmission System is to cross CI located on or below the beds of the Hudson, Harlem, or East Rivers or Lake Champlain ("Submerged CI"), any such Segment EM&CP shall include:

i. a technical and economic analysis and documentation (including supporting information) comparing the installation of the Facility both over and beneath such Submerged CI;

ii. a detailed explanation of Certificate Holders' plans for maintaining the existing mechanical protection of any Submerged CI during and after installation of the HVDC Transmission System's cables, including a discussion of the type and replacement of thermal sands;

iii. a demonstration based on the final design of the HVDC Transmission

System of the manner in which the owners or operators of such Submerged CI would have access to repair and/or maintain its Submerged CI;

iv. where requested by the Designated Representative of the owner(s) or operator(s) of such Submerged CI, Certificate Holders shall make reasonable efforts to ensure that the route of the HVDC Transmission System is designed to cross such Submerged CI at an angle which is as close to a right angle on the horizontal as is practicable having due regard to other route requirements; and

f. documentation showing that there will be no material interference with the ability of the owners and/or operators of any CI crossed by, or in proximity to, the Facility, to repair, operate, or maintain such CI as a result of the construction, operation, or maintenance of the Facility;

g. a full description of all measures that will be employed by Certificate Holders to protect all CI that may be affected by the construction, operation, or maintenance of the Facility, including, but not limited to, detailed construction techniques and methods, equipment descriptions, an explanation of how any contingency will be met in case damage does occur, and procedures for coordination with utilities and public service providers;

h. protocols for performing repair and maintenance work on the Facility in proximity to CI;

i. documentation showing agreement by the owners and/or operators of affected CI with both Certificate Holders' construction schedule for operations in the vicinity of such CI and the measures described in the EM&CP documents relating to such

CI or a description of those aspects of the proposal that are disputed, and a discussion of the positions taken by the Certificate Holders and the owners and/or operators of the CI;

j. documentation showing agreement by CNY that CI owned or operated by CNY, whether located within the boundaries of CNY or elsewhere, has been adequately identified and protected or a description of those aspects of Certificate Holders' proposal that are disputed and a discussion of the positions taken by the Certificate Holders and CNY; and

k. A decommissioning plan setting forth steps to be taken in the event that the Facility is permanently de-energized.

163. Within six (6) months after issuance of this Certificate, the Certificate Holders shall submit to the DPS Staff for review, comment, and approval in consultation with NYSDEC and the NYSDOS, detailed Standard Operating Procedures ("SOP") for compliance monitoring studies to be conducted in the Hudson River. The SOPs shall be consistent with the Scopes of Study attached to this Certificate:

- Benthic and Sediment Monitoring Scope of Study (Attachment 2 to this Certificate)
- Bathymetry, Sediment Temperature and Magnetic Field Scope of Study (Attachment 3 this Certificate)
- Atlantic Sturgeon Pre-Installation and Post-Energizing Hydrophone Scope of Study (Attachment 4 to this Certificate)

164. The approved SOPs required by Condition 163 shall be incorporated into the EM&CP or first Segment EM&CP that proposes to perform cable installation in the Hudson River and completion of the studies as defined by the approved SOPs shall be a requirement of

this Certificate.

U. Environmental Trust

165. The Certificate Holders shall establish the Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust ("the Trust") solely for the purposes of protecting, restoring, and improving aquatic habitats and fisheries resources in the Hudson River Estuary, the Harlem and East Rivers, Lake Champlain, and their tributaries, in order to minimize, mitigate, study, and/or compensate for the short-term adverse aquatic impacts and potential long-term aquatic impacts and risks to these water bodies from Facility construction and operation and for the administration of the Trust to the extent expressly authorized in these Certificate Condition.

(a) Certificate Holders shall file an agreement providing for the establishment of the Trust (the "Trust Agreement") within one hundred twenty (120) days after issuance of this Certificate. The trustee selected by Certificate Holders to oversee the Trust (the "Trustee") shall be, or shall be associated with, a bank accredited by and doing business in the State of New York. Both the Trust Agreement and the selection of the Trustee shall be subject to review and approval by the Commission (in consultation with NYSDEC) and, if required, the New York State Comptroller, and Attorney General.

(b) Within thirty (30) days of the Closing, the Certificate Holders shall endow the Trust with an interest-bearing account established at the Trustee bank, with a first payment of $2.5 million. Within one (1) month of the COD, the Certificate Holders shall make a second payment of $7.21 million (the "Second Payment") into the Trust. Certificate Holders shall thereafter make annual payments to the

Trust, adjusted as described below in Table 2 attached hereto, of $2.15 million on or before each anniversary of the date of the Second Payment for a period of thirty five (35) years. On the fifth (5^{th}) anniversary of the Second Payment, Certificate Holders shall make a payment to the Trust of $5 million in addition to the annual payment. On each of the seventh (7^{th}), ninth (9^{th}), eleventh (11^{th}), thirteenth (13^{th}) and fifteenth (15^{th}) anniversaries of the Second Payment, Certificate Holders shall make a payment to the Trust of $1 million in addition to the annual payment described above.

(c) Within thirty (30) days of the Closing, Certificate Holders shall prepare and file with the Commission for its approval a written agreement to govern the administration and operation of the Trust (the "Governance Agreement"). The Governance Agreement shall:

(i) provide that the funding commitments of the Certificate Holders will be fixed in accordance with Table 2 attached hereto and the terms stated in this condition, and that they will not be increased for any reason or decreased except as provided for in subsections (d)(vii) and (d)(ix) of this Certificate Condition;

(ii) establish a Governance Committee consisting of: Certificate Holders; DPS Staff; NYSDEC; NYSDOS; CNY; APA; the New York State Council of Trout Unlimited; Riverkeeper, Inc.; and Scenic Hudson, Inc.;

(iii) authorize the Governance Committee to meet prior to COD to perform the preliminary work required to implement the Trust, including consideration of whether to use a third-party administrator (the "Administrator") to assist in the conduct of its business and for the administration of the Trust

for tasks including but not limited to developing: (A) cash flow schedules for the Trust expenditures; (B) measures to track administrative costs; and (C) associated auditing and reporting tasks;

(iv) permit the Governance Committee to retain an Administrator, if desired by the Governance Committee, and to compensate the Administrator (if any) from monies available in the Trust;

(v) provide that members of the Governance Committee other than Certificate Holders will not be obligated to pay into the Trust and that no member of the Governance Committee, including Certificate Holders, shall be obligated to directly fund or perform any of the responsibilities of the Trustee, including compensation of the Trustee or the Administrator;

(vi) obligate the Trust to indemnify and hold harmless all members of the Governance Committee, including Certificate Holders, from liability for any and all actions and/or inactions of the Trustee, the Administrator (if any), or any representative(s) of any of them;

(vii) provide that the studies, projects and activities listed in Attachment 5 hereto totaling approximately $ 32.4 Million (the "Priority Projects") satisfy the requirements of this Certificate Condition and shall be implemented by the Administrator (or by the Trustee if no Administrator has been selected) pursuant to a schedule to be developed by the Governance Committee in order to meet the primary objectives of the Trust during its initial implementation phase. The Governance Committee, by a three quarters vote, may determine, on the basis of

changed circumstances, that a Priority Project should not be implemented; and

(viii) provide that the Governance Committee shall be empowered to approve all expenditures of the monies of the Trust, provided however that no more than 75% of the monies to be provided by Certificate Holders to the Trust in any year may be designated for such Priority Projects during the first fifteen (15) years of the Trust's existence or until the Priority Projects have been completed; and

(ix) require the Administrator (or the Trustee if no Administrator has been selected) to maintain a clear written record identifying any criteria and justification for the decisions of the Governance Committee and for all expenditures by the Trust itself.

(d) The Governance Agreement shall further require that:

(i) the Governance Committee shall manage the Trust so that, over the life of the Facility, the monies of the Trust will be able to support additional studies, projects, or activities that may result from (A) the Priority Projects, (B) studies to be agreed to at a later time by the Governance Committee, or (C) information produced by the Governance Committee, consistent with the criteria set forth in this Condition 165 below;

(ii) the Governance Committee shall manage the Trust so that money remains available for future projects that were not identified in this Certificate and, from time to time, project ideas shall be solicited from the Governance Committee's members, other Federal and State Agencies or municipalities, individuals, and organizations located along the route of

the Facility, provided these ideas are consistent with the purposes of the Trust and approved by the Governance Committee;

(iii) projects and activities approved by the Governance Committee for funding shall not replace natural resource management programs funded by the General Fund of the State of New York or NYSDEC Environmental Programs, meet an obligation of the State of New York or any other party to this proceeding, or replace funding for the operation and maintenance of any project not previously funded by the Trust. The Governance Committee may, however, authorize the Administrator (or the Trustee if no Administrator has been selected) to use the monies of the Trust to carry out additional or new activities that are part of or are consistent with applicable State and Federal resource management and land use plans;

(iv) studies, projects or activities to be financed by the Trust shall have a nexus to the Facility and shall include, but not be limited to: (A) habitat restoration, enhancement, or protection; (B) habitat research; (C) fish and wildlife species restoration, enhancement, or protection; (D) stewardship activities including additional or new activities, formally adopted by the Governance Committee, that are part of or are consistent with applicable State and Federal resource management and land use plans; (E) water quality improvement (excluding projects eligible for funding under the Clean Water State Revolving Fund); and (F) scientific or administrative support to ensure coordination of Trust projects with each other and externally funded research, restoration, and stewardship projects; delivery of final products; review of reports, data sets, and metadata; and

placement of project results and data to insure public access in appropriate digital and hard copy media;

(v) prior to funding any studies, projects or activities, the Governance Committee must find that such studies, projects or activities have been proven: (A) to make a contribution to the long-term protection and enhancement of fish and wildlife species and habitats in the Hudson River Estuary, the Harlem and East Rivers, and/or Lake Champlain and their tributaries; (B) to have a strong scientific foundation; (C) to achieve identified environmental goals; (D) to be consistent with applicable State and Federal natural resource management plans; (E) to address impacts associated with the construction, operation, maintenance or security of the Facility; and, (F) to be feasible from an engineering perspective;

(vi) the Governance Committee shall give preference to projects that: (A) achieve multiple environmental goals; (B) involve multi-stakeholder collaboration; (C) feature matching funds; and/or, (D) are cost effective;

(vii) the Administrator (or the Trustee if no Administrator has been selected) shall pay any administrative costs associated with the establishment and maintenance of the Trust from any accrued interest on monies of the Trust or, if adequate interest is not accrued, such administrative costs shall be borne by the Trust, provided however that the monies of the Trust shall not be used to compensate any party, including Certificate Holders, for participation in the Governance Committee or to reimburse any such party for any expenses incurred in such participation;

(viii) Certificate Holders' obligation to make the payments into the Trust set out above and in Table 2 attached hereto shall terminate upon receipt by the Administrator (or the Trustee if no Administrator has been selected) of documentation from the NYISO or DPS stating that the Facility has ceased commercial operation. Should the Facility resume operations, the Certificate Holders shall resume the payments to the Trust on January 1st of the following year;

(ix) if the Facility ceases permanent operation for any reason, payments owed to the Trust as of the date of the final termination and the balance of unused monies in the Trust, plus any accrued interest and minus any administrative cost, shall be retained in the Trust and administered by the Governance Committee until completely expended;

(x) the Trustee, Administrator (if any) and the Governance Committee shall all be prohibited from directly or indirectly bonding or pledging any funds to be provided by the Certificate Holders at any future date; and

(xi) in the event that any department, agency, authority, office or other instrumentality or subdivision of the State of New York shall claim ownership or control of the Trust or any of the funds paid into the Trust by Certificate Holders or any interest thereon, the Trustee shall immediately return all monies held in the name of the Trust to Certificate Holders.

Table 2: Summary of the Payment Stream for the Champlain Hudson Environmental Research and Development Trust ($ millions)

Nominal $ 2% Escalator **Financial Close**	$117.15 $2.5
COD	$7.21
2	$2.15
3	$2.19
4	$2.24
5	$7.81
6	$2.14
7	$3.33
8	$2.23
9	$3.47
10	$2.32
11	$3.61
12	$2.41
13	$3.75
14	$2.51
15	$3.90
16	$2.61
17	$2.66
18	$2.71
19	$2.77
20	$2.82
21	$2.88
22	$2.94
23	$3.00
24	$3.06
25	$3.12
26	$3.18
27	$3.24
28	$3.31
29	$3.37
30	$3.44
31	$3.51
32	$3.58
33	$3.65
34	$3.73
35	$3.80

Attachment 1

CHAMPLAIN HUDSON POWER EXPRESS

SUSPENDED SEDIMENT / WATER QUALITY MONITORING PLAN SCOPE OF STUDY

1.0 Introduction

Suspended sediment and water quality sampling and monitoring (hereinafter referred to as "water quality monitoring") will be conducted during jet plow and shear plow pre-installation trials, and during cable installation. Water quality sampling and monitoring will consist of collecting water samples for analysis of turbidity, total suspended solids (TSS) and chemical constituents at specified transects and real-time monitoring for turbidity. Jet plow trials will be conducted in the Hudson River and Lake Champlain and shear plow trials will occur in the south lake area of Lake Champlain. Trial runs shall evaluate operational modifications including speed and pressure reduction and their influence on resuspension, to the extent possible given that operational changes will have different effects depending on sediment types and hydrodynamics. Water quality monitoring for physical and chemical constituents will take place over the entire in-water cable route in Lake Champlain, the Hudson River, Harlem River and East River.

Within 6 months of the effective date of the 401 Water Quality Certificate, CHPE shall submit a draft "Suspended Sediment / Water Quality Monitoring Plan" for review, comment, and approval to the New York State Department of Public Service ("DPS") Staff in consultation with the New York State Department of Environmental Conservation ("NYSDEC"). The work plan will provide specifications for the following program elements.

2.0 General Sampling and Monitoring Procedures

The physical and chemical characteristics of the ambient background water conditions and the sediment re-suspended by the installation equipment will be determined through water sampling at selected transects and subsequent laboratory analysis. Sampling will be conducted downcurrent of the installation equipment and at upcurrent control (i.e., background) stations.

TSS and turbidity monitoring will use a similar upcurrent and downcurrent transect approach. Samples will be collected along transects approximately 500 feet upcurrent and 500 feet downcurrent of the installation equipment. A combination of calibrated acoustic (ADCP) and optical backscatter (OBS) instruments will be used to measure water column TSS and turbidity on selected transects. Companion water samples will be collected and analyzed for TSS and turbidity. The OBS will be mounted on a datasonde measuring conductivity (salinity) and temperature. The laboratory derived TSS data will be used to calibrate the ADCP and OBS instrumentation during jet plow trials of selected operating conditions and to provide a calibration check during cable installation.

3.0 Water Quality Sampling – Pre-Installation

Water Column Sampling

Water column sampling stations will be distributed at one mile intervals along the proposed Project route within all SB and I waters. Sampling will occur during the season where it is expected that cable installation will occur in these water bodies. All monitoring and sampling methods will be performed in accordance with an approved Quality Assurance Project Plan (QAPP) or referenced standard operating procedures (SOPs).

Water quality samples will be collected and analyzed for the chemical parameters identified in Condition 14 of the 401 Water Quality Certification. Samples will be collected at near-surface, mid-depth, and near-bottom. An elevated level of care will be exercised during the collection of mercury samples to preclude contamination of either the samples or the field blanks. Mercury samples will be collected in accordance with EPA method 1669 or another method agreed upon by CHPE, NYSDEC, and NYSDPS. Water samples for the required parameters will be sent to a New York State Certified Laboratory for analysis in accordance with the methods prescribed in Condition 14 of the 401 Water Quality Certification.

Pre-Installation Trials

As detailed in Section 5 below, Pre-installation trials of the jet plow and shear plow equipment will be conducted to simulate cable installation and refine operating configurations. During these trials within all SB and I waters, water quality samples will be collected and analyzed for the chemical parameters identified in Condition 14 of the 401 Water Quality Certification. The collection procedures followed will be the same as those for the cable installation water quality sampling, which is described in Section 4.0 below.

Water samples for the required parameters will be sent to a New York State Certified Laboratory for analysis in accordance with the methods prescribed in Condition 14 of the 401 Water Quality Certification. Water samples will be delivered to the laboratory within 24 hours or in accordance with allowable holding times of the applicable method, whichever is shorter.

4.0 Water Quality Sampling – Cable Installation

Water quality samples will be collected and analyzed for the chemical parameters identified in Condition 14 of the 401 Water Quality Certification.

Water samples will be collected along transects approximately 500 feet upcurrent and 500 feet downcurrent of the installation equipment in the Hudson River where tidal currents dominate water movement. In Lake Champlain, the distribution of transects will reflect water movement patterns detected by the ADCP, which provides current direction and velocity. The backscatter data from the ADCP will be used to identify the likely area for re-suspended sediment for water quality sampling. Samples will be collected at near-surface, mid-depth, and near-bottom at 500 feet upcurrent and downcurrent from the installation equipment at each sampling location. Water samples will be collected at the same location where the TSS water samples are taken (where the highest acoustic backscatter intensity was observed to the extent practicable in the

field). An elevated level of care will be exercised during the collection of mercury samples to preclude contamination of either the samples or the field blanks. Mercury samples will be collected in accordance with EPA method 1669 or another method agreed upon by the Certificate Holder, New York State Department of Conservation (NYSDEC) and New York State Department of Public Service (NYSDPS).

Water samples for the required parameters will be sent to a New York State Certified Laboratory for analysis in accordance with the methods prescribed in Condition 14 of the 401 Water Quality Certification. Water samples will be delivered to the laboratory within 24 hours or in accordance with allowable holding times of the applicable method, whichever is shorter. Laboratory processing will be completed in 72 hours from laboratory receipt. The analytical results will be reviewed by the Certificate Holders and the results submitted to NYSDEC, New York State Department of State (NYSDOS), New York State Department of Health (NYSDOH), and NYSDPS within one day of receipt from the laboratory via email. The Certificate Holders will provide quality control analysis to the NYSDEC, NYSDOS, NYSDOH, and NYSDPS via email within fourteen days of laboratory receipt.

5.0 TSS Sampling and Monitoring – Pre-Installation Trials

Pre-installation trials of the jet plow and shear plow equipment will be conducted to simulate cable installation and refine operating configurations. These trials will be conducted in actual field conditions within representative sections or areas proximate to the proposed underwater cable route in Lake Champlain and the Hudson River. The trial will include approximately 1,000 feet of jet plow operations and 1,000 feet of shear plow operations within the dominant sediment types (e.g. sand, silt) to simulate actual cable installation to design burial depth. Re-suspended sediment (i.e., the sediment plume) associated with the trials will be monitored using the ADCP, OBS vertical profiles and water samples as described above. Trials will allow the testing of equipment operation settings in order to minimize resuspension of sediments while achieving target burial depth. In addition, the trials will provide an opportunity to refine suspended sediment monitoring procedures including the calibration of acoustic, optical backscatter and water sampling equipment, as well as communication and safety protocols between the monitoring and installation crews. Procedures for TSS monitoring may be modified based on the findings of the pre-installation trial. Modifications may include adjustment of transect locations, number of water samples collected, methods for deploying equipment, and the procedures for correlating water samples with instrument monitoring. Any modification to this monitoring plan would be coordinated with NYSDEC and NYSDPS and then be submitted to NYSDPS for approval.

Water samples will be collected at multiple points in the tidal cycle in the Hudson River to generate data required to develop curves for calibration of the ADCP and OBS sensors. The calibration will consist of a regression type analysis. Once calibration procedures have been completed, a calibration curve will be generated and provided to NYSDEC Staff and NYSDPS Staff prior to the commencement of cable installation. The calibration curves will be updated based on data collected during the cable installation.

If the jet plow or shear plow trials demonstrate that the preferred operating conditions result in

real-time TSS concentrations, measured 500 feet down-current of the jet plow in the Hudson River and northern portion of Lake Champlain, exceeding the TSS concentrations at an up-current background station by more than 200 mg/L, the Certificate Holder shall report such conditions to the Aquatic Inspector and work with the Staffs of NYSDPS and NYSDEC to evaluate and implement modifications to the plow operating conditions to further reduce *in-situ* sediment suspension associated with the single pass installation procedure. If the shear plow trials demonstrate that the preferred operating conditions result in real-time TSS concentrations, measured 500 feet down-current of the southern portion of Lake Champlain (south of Crown Point), exceeding the TSS concentrations at an up-current background station by more than 100 mg/L, the Certificate Holder shall report such conditions to the Aquatic Inspector and work with the Staffs of NYSDPS and NYSDEC to evaluate and implement modifications to the plow operating conditions to further reduce in-situ sediment suspension associated with the single pass installation procedure. The Certificate Holders shall not utilize the jet plow or shear plow until they have successfully demonstrated their ability to achieve the TSS standards established in the 401 Water Quality Certification. Review of this information by NYSDPS and NYSDEC staffs shall not unreasonably delay the commencement of installation of the underwater cable system.

6.0 TSS Monitoring – Cable Installation

TSS monitoring will be conducted in accordance with procedures established during jet plow and shear plow trials and will be modified as needed during installation operations. Water samples collected for TSS analysis will be sent to the laboratory within 24 hours of collection. TSS samples will not be batched since the results will be used during installation to update calibration curves. Laboratory TSS results will be available 24 hours after receipt by the laboratory. The calibration curves will be updated based on laboratory results on a daily basis.

Sediment resuspension during embedment will be monitored along transects oriented perpendicular to the direction of current flow. The characteristics of the suspended sediment plume created by jet plow/shear plow embedment will be monitored in real-time using an ADCP and a CTD-OBS vertical profiler. Water samples for laboratory analysis of TSS will also be collected from a designated location at each transect. The ADCP and CTD-OBS instruments will be calibrated to measure suspended sediment concentrations during embedment through quantitative relationships between the ADCP, CTD-OBS, and TSS established during Pre-Installation Trials and updated and refined throughout the embedment monitoring. Monitoring of the suspended sediment plume will be conducted twice daily. In the tidal portion of the Hudson River, monitoring will be conducted once during ebb tide and once during flood tide.

Real-time monitoring will consist of ADCP measurements and CTD-OBS profile measurements taken along two route-perpendicular transects. The first transect will be conducted approximately 500 feet up-current of the operating jet plow/shear plow (or at reasonable safe survey distance up-current of the plow) to measure ambient or background TSS conditions. The down-current transect will be conducted 500 feet down-current of the installation device.

Along each transect, the ADCP will provide horizontal and vertical profiles of current velocities and acoustic backscatter intensity at the point of measurement. At the conclusion of each transect a CTD-OBS vertical profiler system will be deployed and collected at the location where

the highest acoustic backscatter intensity was observed by the ADCP. Water samples will also be collected at this location for laboratory measurement of TSS from three depths (near-surface, mid-depth, and near bottom). Water samples will be shipped to a New York State Department of Health certified laboratory for analyses.

If, during underwater cable installation, (1) TSS concentrations monitored or measured at 500 feet down-current of the jet plow in the Hudson River and Lake Champlain north of Crown Point exceed TSS concentrations at an up-current background station by more than 200 mg/L at the corresponding depth; or (2) TSS concentrations monitored or measured at 500 feet down-current of the shear plow in Lake Champlain south of Crown Point) exceed TSS concentrations at an up-current background station by more than 100 mg/L at the corresponding depth, then the Aquatic Inspector shall be immediately notified. The Certificate Holders also must attempt to notify the NYSDEC and NYSDPS within 24 hours of any such TSS exceedance. The Certificate Holders shall employ the mitigation measures prescribed in accordance with Condition 14(c) of the WQC. If the Certificate Holders propose to employ mitigation measures not otherwise provided for in accordance with Condition 14(c) of the WQC, they must first consult with the NYSDPS, NYSDEC, and the Aquatic Inspector. In the event that NYSDPS determines that the mitigation techniques are unable to reduce TSS concentrations below the maximum allowable threshold, underwater cable installation will be suspended and the Certificate Holders shall consult with NYSDPS and NYSDEC regarding alternative cable installation techniques. Nothing in this subsection is intended to require that cable installation methods be modified in a manner that would inhibit the cable installer from burying the cable to the depths specified herein through a single installation pass.

7.0 Sampling and Monitoring Schedule

Water quality and TSS field monitoring will be conducted continuously during cable installation in Lake Champlain, the Hudson River, and Harlem River (and East River, as appropriate) during hours of operation. Monitoring will be conducted for the duration of the cable installation. Based on a review of the methodology and results of the installation monitoring program, a monitoring program for potential cable repair in the future will be developed.

8.0 Reporting

A report of the results of the pre-installation water quality sampling will be provided with the applicable Project segment of the proposed EM&CP. The report will include any recommendations for modifying the action levels contained in Condition 14 of the 401 Water Quality Certification.

Results of the pre-installation trials will be summarized along with any findings or recommendations for procedures to be followed during cable installation. These results will be summarized in a brief letter report and provided to the NYSDEC, NYSDOS, NYSDOH, and NYSDPS prior to in-water installation of the cables. The final report will include the correlations between optical and acoustical backscatter data and corresponding TSS results from water samples.

Once cable installation activities begin, available monitoring data results will be reported daily.

After completion of cable installation activities, a final report will be prepared that will include a description of procedures followed during the monitoring program, field data results, analytical testing data results, and accompanying QA/QC data. The final report will include the correlations between optical and acoustical backscatter data and corresponding TSS results from water samples. The report will also include a comparison of TSS results to permit-required thresholds and a comparison of water quality results to relevant water quality standards. The final report summarizing the results of the suspended sediment/water quality monitoring program will be submitted to the Secretary of the New York State Public Service Commission (PSC), NYSDEC, NYSDOS, NYSDOH, and NYSDPS within one year of the completion of installation.

Within one year of project completion, an analysis comparing the actual TSS results obtained during installation to the previous model TSS concentration predictions will be submitted to the Secretary of the PSC, NYSDEC, NYSDOS, NYSDOH, and NYSDPS. This analysis will include a table and a quantitative analysis (statistical analysis if possible) comparing the actual and predicted results. This comparison should be conducted in a section of the Lake and the River for jet plow operations and in the southern portion of the Lake for shear plow operations.

Attachment 2

CHAMPLAIN HUDSON POWER EXPRESS

BENTHIC AND SEDIMENT MONITORING SCOPE OF STUDY

1.0 Introduction

Pre- and Post-Energizing Benthic Monitoring and Sediment Sampling programs will be developed based on final Certificate Condition 163. For each program, pre-installation surveys will be conducted. Benthic post-energizing surveys will be conducted: (1) three (3) years after installation, assuming cable energizing; and (2) when the transmission system is operating at 500 to 1,000 MW if it is not doing so three years after installation. Sediment post-energizing sampling will be conducted three (3) years after installation at the same time as the first benthic sampling event. The benthic macroinvertebrate and sediment sampling locations will be selected so as to represent the primary sediment environments and characteristic sediment types traversed by the cable.

The Pre- and Post-Energizing Benthic Monitoring Program and the Sediment Sampling Program activities will include:

- Development of monitoring Work Plans,
- Sample Collection and Laboratory Analysis, and
- Development of Draft and Final Reports.

2.0 Development of Pre- Installation and Post-Energizing Monitoring Work Plans

The work plans for both benthic macroinvertebrate sampling and sediment chemistry will be developed based on the Article VII Certificate Conditions. Once the work plans are developed, they will be submitted to the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of State (NYSDOS) for review and comment. The plans will then be submitted to the New York State Department of Public Service (NYSDPS) for approval and the submission will include the results of the consultation with the NYSDEC and NYSDOS.

3.0 Benthic Sample Collection and Laboratory Analysis

Benthic sampling will occur in Lake Champlain and the Hudson River. The methodology of Maher and Cerrato (2006) will be used to refine the sampling effort for each biotope selected for benthic macroinvertebrate monitoring, where previously collected geophysical data is used to direct subsequent environmental and faunal sampling.

In Lake Champlain, geophysical surveys and sediment cores were collected in the Spring 2010 marine route study (as described in Attachment E of the Supplement to the Champlain Hudson Power Express Article VII Application). Geophysical surveys described surficial sediments as relatively fine grained, with some areas containing coarse grain surficial sediments. A review of existing literature may allow for additional stratification of potential sample locations but it is anticipated up to 30 samples will be collected within Lake Champlain.

In the Hudson River (from Cementon to Yonkers, excluding Haverstraw Bay), sediment characteristics will be based on the sediment provinces identified by the NYSDEC Benthic Mapping Project (Bell et al. 2006). Because this reach of the estuary spans the lower freshwater segment and a gradient of salinity from the transition between fresh and low salinity water to relatively high salinity, for study design purposes the study reach will be divided into three (3) salinity zones: freshwater, low salinity and high salinity, to reflect the expected benthic faunal differences associated with the salinity gradient.

The sampling locations will be selected so that the primary sediment environments encompassing a range of substrate types (i.e. grain size) traversed by the cable will be sampled in the three salinity zones, if they occur there. The sediment environments of the Hudson Estuary have been grouped into three (3) principal types: erosion, deposition and dynamic, and further categorized into sub-types within each principle type. The distribution of these sediment environments are such that many are not traversed by the cable. For example, erosional environments, which cover relatively infrequently, were avoided to the extent possible, during siting of the cable route so that the cable would not traverse exposed rock. In addition, some sediment environment subtypes are associated with inshore areas while the cable was sited in relatively deep water.

Based on this approach, benthic samples will be collected at each of the following sediment environments and substrate types based on the current Project route. This listing will be updated once the final routing has been selected based on the construction marine route survey. The sampling locations will be situated such that the samples are representative of a specific biotope, i.e., an area with homogenous environmental and biotic characteristics. The sampling locations will avoid transitional areas between sediment environments.

Salinity Zone	Sediment Environment	Substrate Types
Freshwater	Dynamic-Waves	sand
	Deposition-Unrestricted Thickness	muddy sand
	Dynamic-Scour	sand
	Deposition-Thin	muddy sand
	Dynamic Lineation	muddy sand
Low Salinity	Dynamic-Waves	sandy mud
	Deposition-Thin	mud
	Dynamic-Drift	sandy mud
	Dynamic-Scour	sandy mud
High Salinity	Dynamic-Scour	gravelly mud
	Dynamic-Waves	sand
	Dynamic-Drift	sandy mud
	Deposition-Unrestricted Thickness	mud

Approximately ten (10) samples will be collected at each location during the pre- and post-energizing programs. Maher and Cerrato (2006) found in a study to estimate benthic sampling

effort needed to define species richness that coarser bottom types with low biodiversity may require less sampling effort than finer-grained more diverse biotopes. Samples will be allocated among disturbed (i.e., within 100 feet of the proposed cable route) and undisturbed (i.e., outside of the proposed cable route) locations for suitable comparison. Benthic grabs will be obtained with a $0.1m^2$ Smith-McIntyre Grab. Sampling will take place during late spring and early summer for the pre-installation survey and as close as possible to this time for the post-energizing survey to allow for comparison.

Benthic grab samples will be split in two and analyzed for species composition and abundance and sediment grain size. One half will be used for sediment grain size and the other half will be brought back to the laboratory where organisms will be sorted, identified and enumerated. If the number of organisms in a sample is large (>500), the samples will be sub-sampled. Replicate samples will be collected and archived. Archived samples will be analyzed if needed based on power analysis and Maher and Cerrato (2006) method.

The sediment samples will be sorted into standard phi sizes (Wenthworth, C. K., 1922) and the mean and standard deviation will be determined. The final report will include a table showing the percentage value of each phi class present in each sample (percentages total 100%). Along with biological and grain size analysis for each station, water quality parameters (i.e., salinity, dissolved oxygen, conductivity, temperature and total suspended solids) will be measured at each sampling location.

Upon collection of the benthic macroinvertabrates, a stringent Quality Control (QC) program will be followed during sample sorting, enumeration, identification, and water quality parameters to ensure accuracy.

4.0 Sediment Sample Collection and Laboratory Analysis

Sediment surveys will be conducted to characterize existing and post-energizing sediment conditions proximate to the cable in Lake Champlain, Hudson River, Harlem River, and East River. Sediment collections in Lake Champlain and the Hudson River will be made at or near the benthic macroinvertebrate sampling stations as described above. In the Harlem River and East River, it is anticipated up to three samples will be collected during each sample event. Sediment sampling locations will be recorded using a Global Positioning System (GPS) unit and brought into a Geographic Information System spatial database. The post-energizing survey will occur following cable installation and sampling locations will be made at or near pre-installation survey locations.

Surficial sediment grabs will take, as nearly as possible, the upper two (2) centimeters of the substrate, and three (3) samples will be obtained at each location; one (1) sample will be collected along the Project route and one (1) sample will be collected approximately one-hundred (100) feet from each side of the Project route for a total of three (3) samples per location.

Laboratory analysis of sediments in Lake Champlain will include the following parameters: arsenic and copper. Laboratory analysis of the sediments in the Hudson River, Harlem River and East River will include the following parameters; arsenic, cadmium, copper, lead, mercury, zinc, total PCBs (22 congeners), and total PAHs. The sampling protocols will reference the

USACE/Environmental Protection Agency Regional Testing Manual for Dredged Materials,

Upon collection of the sediment samples, a stringent Quality Control (QC) program will be followed during laboratory analyses, where one (1) QC sample will be analyzed for every ten (10) samples collected.

5.0 Development of Draft and Final Reports

A report will be prepared for each the pre- and post-energizing sampling programs. These final reports will include a description of procedures followed during the monitoring program, field sampling results, analytical testing data results, and accompanying QA/QC data and interpretation. The post-energizing final report will also include a comparison of existing and post-energizing benthic communities and sediment characteristics.

Benthic community biodiversity will be measured via taxa richness, the Shannon-Wiener Diversity Index, and evenness (or equitability). Benthic community comparisons will be made using Analysis of Variance (ANOVA) to test for significant differences among groups of sample means. A Before-After-Control-Impact design will be used to test for a significant interaction effect between Period (i.e., Before and After) and Location (i.e., Control and Impacted) (Thomas et al. 1978, Green 1979, Smith et al. 1993, Smith 2002).

As benthic community composition, abundance and diversity are highly dependent on water quality and sediment properties, a multivariate discriminant analysis (MDA) will also be used as appropriate to analyze the physical and chemical data collected regarding water quality and sediment temperature. Sediment characteristics will also be compared to applicable standards or criteria.

The final reports summarizing the results of the Pre- and Post-Energizing Benthic Monitoring and Sediment Sampling programs will be submitted to the NYSDEC, NYSDOS, NYSDPS Staff, and the Secretary of the New York State Public Service Commission within one (1) year of completing the sample collection.

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Attachment 3

CHAMPLAIN HUDSON POWER EXPRESS

BATHYMETRY, SEDIMENT TEMPERATURE, AND MAGNETIC FIELD SCOPE OF STUDY

1.0 Introduction

Cable installation and burial in Lake Champlain, Hudson River, Harlem River and East River would temporarily disturb and/or alter the sediment and bottom substrates. The bulk of the sediment disturbed will resettle in the trench created by the jet plow or shear plow, with some sediment potentially accumulating along the trench edge. Natural processes that control scour and deposition are expected to re-establish the original bottom contours along the cable route. The rate of recovery of the bottom contours will vary by sediment type and the hydrodynamic factors in different parts of the lake and river bottom. Post-installation bathymetric surveys will be used to monitor recovery of the bottom substrate.

The energized transmission cables have the potential to impact magnetic fields in the near vicinity of the cable and dissipate heat to the surrounding substrate. Modeling of magnetic fields and sediment temperature has predicted small changes to these physical conditions. Monitoring will provide measurement of magnetic field and sediment temperature for comparison with modeling predictions and conditions prior to cable operation.

2.0 Bathymetric Monitoring

High resolution multibeam sonar and side scan sonar will be used to survey a 30-foot wide swath centered on the cable route prior to installation. The bathymetry survey will be repeated one year after the cable installation and then three years after cable installation. Initially (year one), the entire cable route will be surveyed to compare with the bottom elevations of the pre-installation survey. Where the substrate has returned to the pre-installation configuration, these segments will not be resurveyed during any subsequent survey. If a cable segment has not returned to pre-installation condition after three years it will be resurveyed after five years (eight years after cable installation). This survey will provide a check on the long-term stability of the substrate on the cable route. The surveyed route will be recorded so that the past installation surveys for physical conditions can follow the cable route and can return to any selected survey locations.

Bathymetric surveys will result in a horizontal grid of water bottom elevations with a grid spacing of one meter. Elevations of the water bottom should be reported relative to NAVD88 and Mean Lower Low Water (MLLW) National Tidal Datum Epoch (1983-2001). Surveys will be conducted so as to achieve 100% coverage in the survey area with at least one depth reading for every square meter. Navigation shall be conducted so as to achieve or exceed the resultant elevation/depth accuracy, the horizontal positioning system accuracy, and reported feature horizontal

location accuracy described for general surveys and studies in Army Corps of Engineers Manual 1110-2-1003 (ACOE manual) (http://140.194.76.129/publications/eng-manuals/em1110-2-1003/toc.htm). This is substantially the same horizontal position accuracy as described in NOAA NOS Hydrographic Surveys Specifications and Deliverables (2008) (NOS manual) (http://www.nauticalcharts.noaa.gov/hsd/specs/specs.htm). If these two manuals indicate conflicting specifications, the New York State Department of Public Service (NYSDPS) in consultation with the New York State Department of Environmental Conservation (NYSDEC) and the Certificate Holders shall determine which specification applies. Since models for the tidal variations in the estuary are not adequate to predict tidal variations for survey purposes, real-time kinematic (RTK) differential global positioning system (DGPS) techniques are necessary to meet the required standard.

3.0 Magnetic Field Survey

At selected locations along the cable route a pre-installation and post-energizing magnetometer survey will be conducted. These locations will include sensitive habitats where the cable route encroaches into small portions of Significant Coastal Fish and Wildlife Habitats (SCFWH) and designated exclusion zones indentified during the settlement discussions for the cable route corridor. The cable avoids all shallow water SCFWH's with an upland route in the upper estuary and is confined to relatively deep water in the middle and lower estuary. In Lake Champlain, the monitoring sites will include deep water areas of the central lake and shallow water in the south lake area. The post-energizing survey will occur three (3) years after installation, assuming cable energizing, or when the transmission system is operating at 500 to 1,000 MW if it is not doing so three years after installation. The post-installation survey will be conducted within the same season as the pre-installation survey.

The Certificate Holders will develop a study plan on the magnetic field survey. The study plan will provide a discussion of the width of the survey corridor as well as the grid size necessary to allow for adequate comparison of natural conditions (including natural anomalies and noise) against magnetic field effects due to cable installation. The study plan will also include a recommendation on appropriate survey equipment, which may include but is not limited to surface-towed magnetometer, bottom-towed magnetometer, or magnetic gradiometer. Once the study plan is developed, they will be submitted to the NYSDEC and New York State Department of State (NYSDOS) for review and comment. The plans will then be submitted to the NYSDPS for approval and the submission will include the results of the consultation with the NYSDEC and NYSDOS.

4.0 Sediment Temperature Survey

The Certificate Holders will survey sediment temperature and thermal resistivity along the cable route both pre-installation and post-energizing at select locations. Sediment temperature will be measured directly with a temperature probe inserted into the bottom. Temperature measurements will be made one foot above the cable, at the mid-point between the cable and sediment/water interface and at the sediment/water interface. Measurements will be taken at the same depth at horizontal distances of 3 ft. and 6 ft. from the centerline of the cable. The post-energizing survey will occur three (3) years after completion of cable installation, assuming cable energizing, or when the transmission system is operating at 500 to 1,000 MW if it is not

doing so three years after installation. The post-energizing survey will be conducted during the same season as the pre-installation survey.

At shallow water stations, a diver will be used to operate the temperature probe. At deep water sites, a small platform containing the temperature probe will be lowered to the bottom over the cable and at the selected distances from the cable. The depth of the probe will be controlled from the survey vessel. At each measurement point the probe will be allowed to equilibrate before recording the reading.

The sediment temperature and thermal resistivity sampling survey locations will include the locations where prior magnetometer readings have been collected, though the temperature survey may not be completely duplicative of such area. Because temperature is a point reading, the measurement site will avoid areas that may correspond to a transition point in substrate types. The sediment temperature readings at any site will be in uniform substrate conditions. In selecting survey locations, a variety of substrate types will be included.

The Certificate Holders will develop a study plan on the sediment temperature and thermal resistivity survey. The study plan will provide the locations of where surveys will be completed and provide recommendation on appropriate survey equipment. Once the study plan is developed, they will be submitted to the NYSDEC and NYSDOS for review and comment. The plans will then be submitted to the NYSDPS for approval and the submission will include the results of the consultation with the NYSDEC and NYSDOS.

5.0 Development of Draft and Final Reports

Separate reports will be prepared for each bathymetric, magnetic field and sediment temperature sample event. These final reports will include a description of procedures followed during the monitoring program, field data results, and accompanying QA/QC data. The post-installation final reports will also include a comparison of bathymetric, magnetic field and sediment temperature characteristics pre- and post-installation. Each report will be submitted to the Secretary of the PSC, NYSDEC, NYSDOS, and NYSDPS within one years of completing the field work.

Attachment 4

CHAMPLAIN HUDSON POWER EXPRESS

ATLANTIC STURGEON
PRE- AND POST-ENERGIZING SCOPE OF STUDY

1.0 INTRODUCTION

A Pre- and Post-energizing hydrophone study ("Study") to determine the movements of adult Atlantic sturgeon in the Hudson Estuary will be developed based on Certificate Condition 163. The Study will compare Atlantic sturgeon movement patterns in the following programs: 1) a pre-energizing monitoring event, and 2) a post-energizing monitoring event with the same type of equipment in the same area as the pre-energizing monitoring event. The pre-energizing monitoring event may occur prior to cable installation to accommodate the overall project schedule; however, it should occur no sooner than three (3) years before the anticipated post-energizing monitoring. The Study will be conducted as part of the Certificate Holders' compliance monitoring requirements to document Atlantic sturgeon movements in relation to cable operation. The Study will be designed so as to allow for integration with similar research in the area.

Study activities will include:

- Development of a work plans for all three program elements;
- Equipment deployment and maintenance;
- Analysis of data; and
- Report preparation.

2.0 DEVELOPMENT OF WORK PLAN

The study program work plan will be coordinated with New York State Department of Environmental Conservation (NYSDEC) and will be revised following comments and consultation with NYSDEC. The draft plan will then be submitted to New York State Department of Public Service (NYSDPS) for approval with a summary of the consultation with NYSDEC. The work plan will provide specifications for the following program elements.

<u>Equipment</u>

The work plan will provide a recommendation for the acoustic transmitters which will be surgically implanted into the fish based on factors including but not limited to signal strength, design life, ability to provide 3-D positioning, compatibility with similar ongoing research and longevity in the field. Acoustic transmitters must be compatible with acoustic equipment currently in use by the NYSDEC Hudson River Fisheries Unit. The acoustic tags will broadcast

a unique MAP (CDMA) acoustic signal at a pre-selected frequency and period. It is anticipated that up to 50 adult sturgeon would be collected at a location in the lower estuary (e.g., Haverstraw Bay) or in the spawning area (near Hyde Park) and implanted with the acoustic tags. The final numbers of fish to be tagged will be developed as part of the work plan. Twenty-two Atlantic Sturgeon are presently carrying long term (5 year) transmitters, in addition to 20 fish with short term transmitters. Fish were tagged by NYSDEC during 2006-2008 tagging and active tracking efforts. The long-term tags are expected to continue transmitting until 2013.

The work plan will also provide recommendations for the fixed receivers based on factors including but not limited to anticipated deployment depth, battery life, field longevity, and potential for remote data downloading. Each fixed receiver consists of a hydrophone (underwater microphone element) and a co-located signal processor and data storage and batteries, which together are referred to as a submersible data logger (SDL). The SDLs will be moored off the bottom in a stable, upright position. The details of the mooring equipment and the calibration of the units will be included in the plan.

Placement of SDLs

To determine movement patterns of Atlantic sturgeon within the designated study area, SDLs will be deployed to five (5) known Atlantic sturgeon congregation areas in the Hudson River estuary; the general study area is bounded by Crum Elbow to the south and Rondout Creek to the North (see Figure 1). One area would be located at Crum Elbow; one will be located north of Crum Elbow; one will be located at Esopus Meadows, one would be located near Dinsmore Point and the remaining area will each be south of Indian Kill. This will divide the estuary width at each transect into several north-south segments as determined by shoreline/channel width along the study area reach (and therefore, the final number of SDLs deployed along each transect) and will divide the longitudinal reach into five segments. The pre-installation study of sturgeon distribution across these areas will be compared to sturgeon distribution after the cable is energized. By comparing the distribution of sturgeon in areas containing the cable with areas without the cable, one could determine if sturgeon demonstrate preference, avoidance or no response to the presence of the cable.

Based on expectations of effective detection range from studies in comparable estuarine conditions, it is anticipated that up to approximately 10 to 12 (twelve) SDLs will be deployed in each area or array (Figure 1) to allow for effective trilateration, as a means of documenting movement patterns within and across each area. SDLs would be positioned so as to maximize the potential for any tagged sturgeon passing through the instrumented area to be detected by at least three (3) SDLs (at least 50 SDLs deployed in total).

While previous studies using comparable equipment in large rivers or estuaries have indicated a potential operational distance of up to 300+ meters between trilaterating SDLs, a number of environmental and operational constraints (e.g., weather, passing vessels, conductivity, temperature, depth) may determine the optimal spacing and orientation of SDLs within the designated study area. The final number of SDLs to be deployed within each area may be less or more than twelve (12), depending on channel width, depth profiles of the channel along each transect, and the results of initial range testing. SDLs will be placed within close proximity to each

other such that 100% overlap in detection range is exceeded, to account for worst case conditions. The actual orientation and position of SDL arrays would also be optimized through review of available information from NYSDEC on potential sturgeon aggregation zones within the designated study area, as determined by active-tracking studies conducted during 2006-2008.

3.0 EQUIPMENT DEPLOYMENT AND MAINTENANCE

SDL arrays will be installed in April and removed in October by the Applicants to prevent ice damage to the equipment and allow for safe installation. The timing of the deployment of SDLs will be coordinated with NYSDEC and NYSDOS in each year. Range testing will need to be conducted in advance of actual SDL deployments, either during April of the anticipated study year(s) or during the preceding summer/fall, to allow for optimization of SDL placement and proper equipment calibration.

Adult Atlantic sturgeon will be tagged in coordination with NYSDEC to provide target fish for the study. The timing and location of sturgeon tagging will be coordinated with NYSDEC. Atlantic sturgeon is a candidate species for listing as threatened or endangered under Section 7 of the Endangered Species Act, thereby requiring consultation with National Oceanic and Atmospheric Administration, National Marine Fisheries Service, and United States Fish and Wildlife Service.

Deployment of the SDL arrays will be integrated with the data management and analysis team. The SDLs will be configured for local conditions (echo filter settings, symbol definition files assigned, duty cycles set, and tested for reception in real time). The SDL receivers are initially clock-synchronized upon deployment (using the SDL host software). Retrieved data is processed to track differential clock drift between the receivers as a post-processing operation. Fixed underwater beacons (e.g. a fixed transmitter) will be used to synchronize time settings and clock accuracy for post-processing tracking data within sub-meter accuracy. Fixed transmitter locations will be determined during study program work plan development.

Each hydrophone position will be logged with a differential GPS (surveyed). As part of study mobilization, an initial subset of SDLs will be range tested prior to deployment of a full array of SDLs along designated areas.

Data recovery and equipment maintenance will be based on manufacturer specifications on the lifespan of the batteries and the storage capacity of the data storage unit. However, data will be downloaded from the initial array within three weeks of deployment to check on data recovery. NYSDEC will assume ownership and maintenance of acoustic equipment following the post-energizing study.

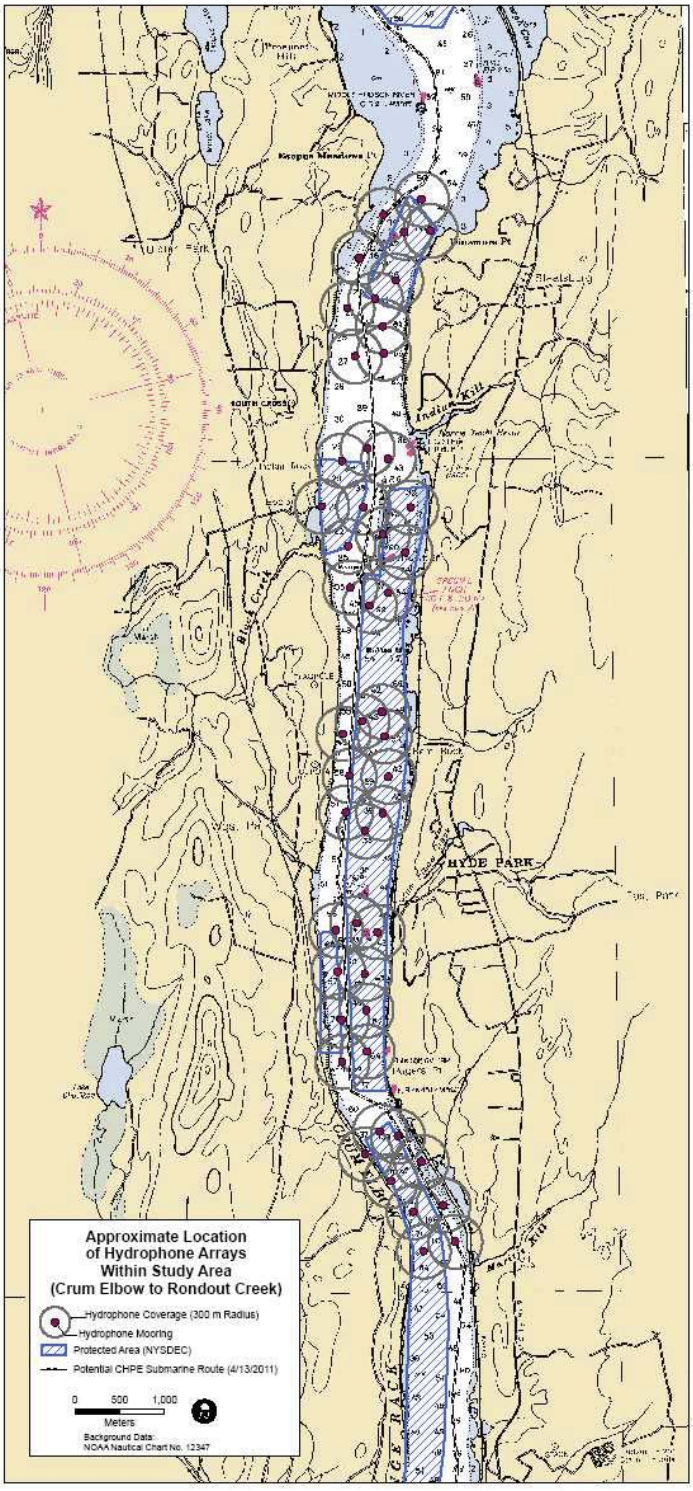
4.0 DATA ANALYSIS

The primary output from each element of the program will be plots of sturgeon movements to determine if there is a discernable response to the presence of the cable.

5.0 REPORTING

A report of the pre- and post-energizing monitoring events will be submitted within three months of the completion of each field season after consultation with the NYSDEC, New York State Department of State (NYSDOS), and NYSDPS. These reports will include a description of procedures followed during the program and field data results. The reports will also provide recommendations as appropriate for improving the design and implementation of the study. Each report will be submitted to the New York State Public Service Commission Secretary, NYSDEC, NYSDOS, and NYSDPS.

Figure 1. Proposed location of hydrophone transects within the designated study area (Crum Elbow Creek to Esopus Meadows).



Attachment 5

List of Approved Projects for the Champlain Hudson Environmental Research and Development Trust

First Priority Hudson River Projects

1. Field sampling and analysis of adult and juvenile resident and migratory fish habitat distributions

Description: This project will identify important habitat areas for resident and migratory adult and juvenile fish within the upper Hudson River Estuary. A variety of habitat types over a large region in the river will be sampled including shallow vegetated and unvegetated areas, shoals, open channel and backwaters. Juvenile and adult fish community composition and abundance will be compared across all habitat types to determine relative importance of each habitat to each fish species and community. This work will lead to identifying specific locations that will serve as reference sites for developing design parameters and target conditions for restoration sites throughout the region.

2. Analysis of preferred habitat characteristics for migratory and resident larval and juvenile fish

Description: This project is an in-depth study of the biotic and abiotic characteristics of important habitats identified in project #1 and similar ongoing research on larval fish. Plant communities, water chemistry, benthic fauna, sediment characteristics, flow regimes, along with a variety of other measures will increase our understanding of the preferred habitat types and how they function. This information will be used to guide the design of future projects that restore similar types of habitats. There will be fewer, but more intensively studied sites than in project #1.

3. Analysis and summary of existing tracking and mapping data

Description: This project involves combining data gathered by three separate and existing projects: high resolution, deepwater benthic mapping and Atlantic sturgeon and American

shad tracking information collected by the NYSDEC. Position data on individual fish collected as part of on-going fish telemetry work will be spatially referenced to benthic mapping data. Statistical analysis of how spatial distributions of classes of benthic environment are related to spatial distributions of tagged fish will be done. Project will seek to identify deep water habitat (as defined by sediment environment and sediment type) preferences throughout the river for sturgeon and shad.

4. Modeling transport of upper estuary fine grain sediment and contaminants

Description: Model transport of upper estuary fine grain sediment and contaminants to predict how habitat restoration designs will affect sediment management and contaminant distribution in the upper estuary. This information is needed to guide design of restoration projects that will benefit migratory fish species while minimizing impact to sediment management plans and contaminant distribution in the estuary. Modeling work will address three challenges: 1) to effectively predict local conditions at the scale of ~10 meters while at the same time including significant factors throughout the estuary watershed that might affect local conditions; 2) to model ice scour, and 3) to properly model fine-grained sediment transport and deposition which include some physical properties not found in coarser-grained sediment transport. This last is important in that contaminants are generally associated with fine-grained mud.

5. & 5a. Hudson River Habitat Restoration plan- Implementation of a migratory fish spawning and juvenile refuge habitat restoration project.

Description: A secondary channel refuge habitat restoration project will be implemented in the upper estuary consistent with the goals of the Draft Hudson River Habitat Restoration Plan. The restoration project will be implemented consistent with the Society of Ecological Restoration International's (SER) "Guidelines for developing and managing ecological restoration projects, 2nd Edition", (2005). Total project costs may include baseline and post construction monitoring of restoration and reference sites, design, implementation and land acquisition costs. Mitigation funding may be used for any part of the project cost, or used as matching funds for state or federal habitat restoration grants.

Second Priority Hudson River Projects

6. Atlantic and shortnose sturgeon tracking

Description: This project entails tagging juvenile and adult life stages of Atlantic and shortnose sturgeon with acoustic tags, and tracking fish movements using mobile hydrophones mounted on boats. Deploy and use arrays of fixed receivers to monitor habitat utilization at high resolution within the array study area. Tag 30 to 40 fish for each life stage for each species each year. The purpose of this work is to expand knowledge of how individual fish species use different parts of the Hudson River Estuary's varied habitat (in terms of water depth, salinity, and bottom type) at different times of the year and at different life stages.

7. Adult American shad tagging and tracking

Description: Tag adult American shad with acoustic tags and track fish movements in the estuary using mobile hydrophones mounted on boats. Deploy and use arrays of fixed receivers to determine habitat utilization by the tagged fish at high resolution within the array study area. Tag and monitor 30 to 40 fish each year. The purpose of this work is to expand knowledge of how individual fish species use different parts of the Hudson River Estuary's varied habitat (in terms of water depth, salinity, and bottom type) at different times of the year and at different life stages.

Third Priority Hudson River Projects

8. Shallow water mapping

Description: Complete shallow water benthic mapping to map the bathymetry and sediment environment of the waters less than 4 meters deep in the Hudson River Estuary from the harbor at New York City to Troy. The purpose of this project is to develop a detailed description of the physical environment in which fish live, and to support management activities related to fish and wildlife management and contaminant transport. Project will

include development of databases and products consistent with techniques used in prior Hudson River shallow water mapping, building on the Hudson River benthic mapping project, including use of several different types of sonar to measure water depth and sediment character at 1-meter horizontal resolution, supplemental sediment cores and grabs, and sediment profile imagery, to create detailed bathymetric maps and interpretive maps of sediment type and sediment environment.

9. Hudson River Estuarium

Description: Provide funding for the construction and operation of the Hudson River Estuarium, a field research station currently being developed at Pier 26 in Manhattan. The facility will house and support scientists performing field studies within the estuary, and will serve as a hub for the collection and transmission of remote sensing data.

10. Hudson River habitat restoration plan- Implement a second migratory fish spawning and juvenile refuge habitat restoration project

Description: Implement a secondary channel refuge habitat restoration project in the upper estuary consistent with the goals of the Draft Hudson River Habitat Restoration Plan. Restoration project will be implemented consistent with the Society of Ecological Restoration International's (SER) "Guidelines for developing and managing ecological restoration projects, 2nd Edition", (2005). Total project costs may include baseline and post construction monitoring of restoration and reference sites, design, implementation and land acquisition costs. Available mitigation funding may be used as matching funds for state or federal restoration grant applications.

Fourth Priority Hudson River Projects

11. Sturgeon habitat and forage

Description: Project will include field studies to determine dietary habits of sturgeon and the relationship between benthic biota and benthic characteristics. Sturgeon will be captured and stomach contents sampled, on location prior to release. Location information will be

spatially referenced to Benthic Mapping data identifying benthic characteristics (sediment composition and dynamics). Evaluation of benthic fauna using shallow cores collected in the field will correlate benthic community compositions with sediment environment and observed dietary preferences of the target species. Project will help identify priority areas and habitat type for feeding sturgeon.

12. Recreation fishery survey

Description: Project will include field survey of anglers utilizing the Hudson River Estuary to identify catch composition, total catch, total effort, and catch rates during ice free season. Fish populations and fisheries are likely to respond to any construction or operational impacts. A fishery survey is an economical way to assess change to a wide range of fished species. Earlier surveys will be used as a baseline for change analysis, post- installation.

13. Hudson River habitat restoration plan- Implement a third migratory fish spawning and juvenile refuge habitat restoration project.

Description: Implement a secondary channel refuge habitat restoration project in the upper estuary consistent with the goals of the Draft Hudson River Habitat Restoration Plan. Restoration project will be implemented consistent with the Society of Ecological Restoration International's (SER) "Guidelines for developing and managing ecological restoration projects, 2nd Edition", (2005). Total project costs may include baseline and post construction monitoring of restoration and reference sites, design, implementation and land acquisition costs. Available mitigation funding may be used as matching funds for state or federal restoration grant applications.

First Priority Bronx, Harlem and East River Projects

1. Bronx Kill Habitat Restoration

Description: Restore habitats in and along the Bronx Kill by softening the shoreline, creating wetlands, and removing flow impediments in order to benefit migratory and resident species affected by cable construction and operation.

2. Bronx River Fish Passage

Description: Implement dam removal or bypass projects along the Bronx River to improve fish migration, in order to benefit migratory and resident species affected by cable construction and operation.

3. Harlem River Designing the Edge Project

Description: Reconfigure existing vertical shoreline structures along the Harlem River to create habitat complexity, and provide refugia for migratory and resident fish species in order to compensate for habitat disturbance associated with cable construction and operation.

4. Oyster Bed Development and Restoration

Description: Oysters are "ecosystem engineers," creating a complex environment that supports a diversity of aquatic organisms. Oysters help to moderate the concentration of phytoplankton in the water, thereby benefitting other marine life by reducing the competition for dissolved oxygen. Once ubiquitous in the Hudson-Raritan Estuary and New York Harbor, decades of overfishing, disease and pollution almost eliminated the oysters that once blanketed those areas. Recent water quality improvements have enabled efforts to restore this vital element of the Estuary.

Restoration of oyster beds in New York waters, including areas of the Hudson River, is one of the key targets in the Army Corps of Engineers' Comprehensive Restoration Plan for the Hudson-Raritan Estuary. Pilot oyster reefs were constructed as part of the Oyster Restoration Research Project ("ORRP"), a partnership of more than 30 entities. Ongoing two-year studies of the pilot reefs conducted by the ORRP have shown positive results that warrant further investigation consistent with the Corps of Engineers' Comprehensive Restoration Plan. The initial two-year studies of pilot oyster reefs are expected to be completed in the spring of 2012. An infusion of funds from the Trust would allow the City to conduct additional studies of existing pilot oyster reefs consistent with the Corps of Engineers' Comprehensive Restoration Plan, including (i) a comprehensive evaluation of the ecosystem services and water quality benefits that the oyster reefs provide, and (ii) an examination of oyster larval development, disease resistance, and obstacles to oyster reproduction. Also, ongoing studies of the pilot oyster reefs have demonstrated that larval oysters "planted" at the reefs may be lost to hydraulic

transport. With the Trust funding, new methods to reduce such losses would be studied within the existing footprint of the Soundview Park pilot reef in the Upper East River in the Bronx. If approved as presently proposed, the HVDC Transmission Facility will be installed in the bed of the East River as the cables are laid between the Hudson River and the East River.

Timing: Data collected from the two-year pilot oyster reef study to be completed in the spring of 2012 will be used to evaluate the feasibility of oyster reef expansion, particularly at the Soundview Park in the Bronx. This evaluation of the pilot project studies, together with any additional data or other relevant information obtained during the period between completion of the initial pilot oyster reef studies and CHPE Project construction financial closing, will be reviewed again at Project construction financial closing. If warranted by that review, and approved by the Trust Governance Committee, the process necessary to enable pilot oyster reef expansion may be initiated.

5. New York Harbor Contaminated Sediment Assessment

Description: Sediments in the Hudson River and New York Harbor are contaminated with many harmful chemicals, including polychlorinated biphenols (PCB)s. The disturbance (*i.e.* dredging) and disposal of contaminated material is problematic, as it is harmful to the environment, and expensive. Since sediment contamination may impact benthic communities and other aquatic species, it should be considered and evaluated as part of certain restoration and remediation projects. An understanding of how sediment contaminant levels change over time is important for a variety of purposes, including the conduct and evaluation of sediment remediation efforts and informing policies on where and how to dispose of contaminated dredged material. The contaminated sediment assessment project will develop, update and refine our understanding of how the quality of dredged sediments level of sediment contamination changes over time by efforts including, for example: (a) collecting sediments and quantifying contaminant levels, including the levels of substances of concern for dredged material management; (b) determining which sediment areas are currently toxic and the identity and level of their contaminants; and (c) how the quality of dredged sediments may change over time, including, for example, by burial by cleaner sediments entering the system or transport to other parts of the system. The project initially will focus on contaminant load in, and transport through, the Hudson, Harlem and East Rivers. These areas include part of the present configuration for

the route of the CHPE cables. This project will be conducted over a period of approximately two (2) years. The information produced from this project will be presented in a final report that will inform the Design Guidelines for Shoreline Enhancements project, for example, by factoring information regarding the nature and extent of contamination into shoreline restoration projects, as well as future efforts to restore or enhance aquatic habitat in the study areas.

6. Develop design guidelines for shoreline enhancements

Description: The shoreline and shallow areas of the waters surrounding New York City have been heavily altered over the centuries to meet human demands. These alterations were driven almost exclusively by engineering and economic considerations with little regard to the ecological needs of those waters, aquatic species and the aquatic habitat. As a result, the City's shoreline has a significantly reduced capacity to provide important habitat for aquatic species, to reduce wave energy, and limit nutrient and sediment delivery from the watershed to the Harbor Estuary. This proposal is based on the observation that new designs for engineered structures in the shore zone that meet engineering and economic requirements, and that enhance and rehabilitate ecologically-degraded shore-zone ecosystems are necessary to guide shoreline restoration projects.

To increase our understanding of the ecological functions of shore zone ecosystems, to facilitate future shoreline restoration projects, including those upriver shoreline projects that are currently in progress, and to enhance and protect aquatic habitat and aquatic species in City waters, this project will develop: (a) a classification scheme specific to the urban shoreline habitats of New York City; (b) a comprehensive shoreline and shallow waters characterization and habitat map; and (c) design guidelines and recommendations for managing the City's shoreline and shallow waters to enhance the ecological function of City waters. This work will be conducted over a period of approximately three (3) years and will create a final report that will be used to guide the design and location of shoreline enhancement projects.

The design guidelines presented in the report may be evaluated and/or otherwise implemented at locations along the shorelines of the Hudson, East and Harlem Rivers. Shoreline areas near the Project may also be the subject of potential future funding requests, if determined to be feasible, to enhance habitat or water quality in the Project area. Such activities along those

rivers may include, for example: (a) selection of one or more locations that would be suitable for a pilot or larger-scale project that would demonstrate and study the effectiveness of ecological enhancement measures identified in the guidelines (such potential sites may include, for example, open space located at the mouth of the Harlem River and Roberto Clemente State Park); (b) monitoring and evaluating the effectiveness of existing shoreline enhancement measures (*e.g.*, Harlem River Park); and (c) incorporating shoreline enhancements into certain CNY permitting processes for shoreline construction projects. This project will build off, and complement, the Sustainable Shorelines effort underway north of New York City. The two projects share similar goals and, where practical, can exchange information and coordinate efforts.

First Priority Lake Champlain Projects

1. Development and Implementation of Fish Population and Recreational Fisheries Surveys

Description: The shallow, eutrophic South Lake section of Lake Champlain favors warmwater species and is the primary area of concern for potential impacts from cable installation. An increase in turbidity due to construction activities is the main concern for the South Lake fish community. Eggs and larval and juvenile fish are the most susceptible life stages to increases in turbidity, therefore impacts to adult populations and sportfisheries resulting from construction activities may not be evident for several years. In order to gauge the potential impacts of cable installation on the Lake's warmwater fish community, a comprehensive monitoring program for the lake, with an emphasis in South Lake, should be developed and implemented. The monitoring program should be comprised of studies focused on: 1) obtaining up to date angler creel and opinion information; 2) assessing the characteristics and potential impacts of black bass tournaments; 3) the status of important sport- and panfish populations such as walleye, yellow perch, black bass, northern pike, and muskellunge; 4) the status and ecology of Species of Greatest Conservation Need such as sauger and mooneye; and 5) assessing the fish community dynamics for the lake, including assessments of forage and invasive fish populations. These studies will aid in the development and implementation of management recommendations for the aforementioned species. The monitoring program will be consistent with the guiding principles, nearshore fish community sub-goals, and information priorities in the Strategic Plan for Lake

Champlain Fisheries (Fisheries Technical Committee 2009).

2. Fish Habitat Assessments

Description: Protecting and restoring fish habitats is critical to the proper management of fish populations in Lake Champlain and is a guiding principle in the Strategic Plan for Lake Champlain Fisheries (Fisheries Technical Committee 2009). In addition, habitat quality and connectivity are important criteria in determining the potential impacts of certain stressors, such as expansion of invasive species or increases in turbidity. In Lake Champlain, there is a need to identify locations and characteristics of important habitats for critical life stages of a number of migratory and resident fish species. Habitat assessments should focus on percids, esocids, black bass, rainbow smelt, lake trout, landlocked salmon, steelhead, lake sturgeon, and mooneye. In addition, there should be an assessment of the links between deep water benthic habitats and the pelagic fish community. This will involve an assessment of mysid shrimp abundance and the impacts that invasive fish such as alewife may be having on these organisms. Information will be used to document current habitat suitability and connectivity, and identify habitat restoration goals for restoring and managing resident and migratory fish.

3. Critical Habitat Restoration

Description: Restoration and maintenance of critical fish habitats is essential to improve and sustain productive fisheries and is a key component of fish community conservation. Management actions to increase fish production and expand distribution should incorporate identification, protection and restoration of spawning, nursery, or other critical habitats (Fisheries Technical Committee 2009). Lake Champlain has experienced substantial habitat degradation due to the damming of rivers, nuisance invasive species, loss of shoreline wetlands, and sedimentation and contamination from adjacent land use practices. Habitat restoration goals and target restoration areas will be identified in the Fish Habitat Assessment project (Project 2). This project will involve the implementation of priority critical habitat restoration projects identified in Project 2. The selected restoration projects will be consistent with the guiding principles and healthy fish community sub goals of the Strategic Plan for Lake Champlain Fisheries. Projects will need to include intensive pre and post condition monitoring to identify project outcomes and

adaptive management opportunities. Projects may include, but are not limited to, installation of reefs, improving connectivity between habitats (including fish passage) and submerged aquatic vegetation restoration and will provide benefits to both the resident and migratory fish communities. Priority will be given to projects benefiting lake sturgeon, sauger, whitefish, landlocked salmon and other rare or game fish species.

4. Aquatic Invasive Species Management

Description: Aquatic invasive species can have tremendous ecological impacts (e.g., dense water chestnut growth limits littoral habitat in the South Lake and expanding alewife populations may prevent successful natural reproduction of walleye). Also, combining invasives with other stressors that impair habitat quality can have profound detrimental effects on fish populations and has resulted in the declines of several species native to Lake Champlain that are now listed as endangered, threatened, or of special concern (Fisheries Technical Committee 2009). Controlling aquatic invasive species is a means to improve habitat quality, manage existing habitats, and reduce risks to important fish populations. Management activities may include removal of aquatic invasive plants, developing a program to minimize the risk for introduction of invasives via the Champlain Canal and other connecting waters, recreational boats, and fishing practices, and developing and implementing research, monitoring, and control programs for invasive species such as spiny water flea, zebra and quagga mussels, sea lamprey, and alewife. Removal of aquatic invasive plants will result in changes to the plant communities of managed areas. Aquatic plant community responses should be assessed in these areas.

APPENDIX E

CHAMPLAIN HUDSON POWER EXPRESS, INC.

Case 10-T-0139

GUIDELINES FOR ENVIRONMENTAL MANAGEMENT AND CONSTRUCTION PLAN(S)

The Environmental Management and Construction Plans (EM&CP), consisting of appropriate maps, charts, illustrations, and text associated with overland and underwater cable pre-installation and installation, shall include, but need not be limited to, the following information.

A. Plan and Profile Details. A Line Profile (at an appropriate scale) and Plan drawings (scale minimum 1 inch = 200 feet)[1] identifying:

1. Authorized Facility Location

   a. The boundaries of any new, existing, or expanded right-of-way[2] (or boundaries of railroad or public highway right-of-way if cables are to be constructed underground in railroad or street right-of-way); plus areas contiguous to the right-of-way, railroad or street rights-of-way within which the Applicant will obtain additional rights; and an explanation of the need for those additional rights (including additional work space, access lanes, etc.). Indicate the initial survey work that will be needed and discuss landowner rights and access to parcels not currently under easement or fee.

   b. The location of any facility structures (showing its size, material and type), structural foundation, fence, or gate that may be required for the proposed facility.

   c. Existing utility or non-utility structures on the right-of-way, and indicate those to be removed or relocated (include circuit arrangements where new structures will accommodate existing circuits, indicate methods of

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[1] Contour lines (preferably at 2-foot intervals) are desirable on the photostrip map if they can be added without obscuring the required information.

[2] The term "right-of-way" in these *Guidelines* includes property to be used for substations, disposal sites, underground terminals, storage yards, and other associated facilities. Where such properties cannot reasonably be shown on the same plan or photo-strip, maps or plan drawings used for the transmission line, additional maps or drawings at convenient scales should be used.

removal of existing facilities, and show the new locations, types and configurations of relocated facilities).

d. Locations of additional cable protection methods (e.g., sleeves or grout filled mattresses) to protect integrity, operation and maintenance of existing utilities and in areas where underwater cable is not buried due to bottom substrate type as required by Good Engineering Practice.

e. Details of Horizontal Directional Drill ("HDD") pit locations, stabilization, design drawings of bore holes, procedures for drilling fluid management and cable pulling plan

f. Any relocated or underground facility not associated with the Authorized facility but encountered within the approved right-of-way.

g. The relationship of the Authorized facility to nearby fence lines, roads, railways, airfields, property lines, hedgerows, waterbodies, associated facilities, flowing water springs, nearby buildings or structures, major antennas, oil or gas wells, and pipelines or blowdown valves. State any objections raised by federal, state or local transportation (highways, waterways, or aviation) officials to the final location or manner of installation of, or access to, the authorized facilities.

h. The location of any proposed new or expanded converter station, switching station, substation, or other terminal or associated facility (attach plan[3] - plot, grading, drainage, and electrical - and elevation views with architectural details at appropriate scales). Indicate the type and expected impact of outdoor lighting, including design features to avoid off-site illumination and minimize glare; the color and finish of all structures; the locations of temporary or permanent access roads, parking areas, construction contract limit lines, property lines, designated floodways and flood-hazard area limits, buildings, sheds, relocated structures, and any plans for water service and sewage and waste disposal.

i. The location and boundaries of any areas, whether located on- or off-right-of-way, proposed to be used for fabrication, designated equipment parking, staging, lay-down and cable pulling. Also identify all planned fencing or screening of storage or staging areas.

j. The proposed location of all on- or off-right-of-way access, temporary construction and permanent maintenance roads, identifying locations for access from other roadways.

[3] Preferably 1inch = 50 foot scale with 2-foot contour lines.

k. Topographic conditions within the right-of-way and any features which affect conditions on the right-of-way such as adjoining steep slopes.

2. Right-of-Way Clearing

a. The locations of sites, if any, requiring trimming or clearing of vegetation and the geographic limits of such trimming or clearing. Identify in text and on the drawings the specific methods for the type and manner of cutting, and disposition or disposal method for cut vegetation (i.e., chip; cut and pile; salvage merchantable timber, etc.). Designate methods for management of vegetation to be cut or removed at each site, indicating the rationale for the method designated. Vegetation disposal methods to prevent distribution of invasive species will be adhered to. Trimming or clearing site locations should be based on an initial right-of-way vegetation inventory conducted prior to clearing and access road construction, and should be distinguished by criteria such as:

(1) any geographical area bounded by distinctly different cover types requiring different cut-vegetation management methods.

(2) any geographical area bounded at each end by areas requiring distinctly different cut-vegetation methods due to site conditions such as land use differences, population density, habitat or site protection, soil or terrain conditions, fire hazards or other factors.

(3) different property-owners requesting specific vegetation treatment or disposal methods.

(4) delineation and protection of desirable vegetation species.

(5) indication of areas requiring danger tree removal.

(6) management of invasive species.

b. The location of any areas where specific tree protection measures will be employed to avoid and/or minimize damage to specimen trees, stands of desirable species, important screening trees or hedgerows. Details of specific measures should be specified in text and site plans.

3. Buildings and Structures and Removals

Indicate the locations of any buildings or structures within or adjoining the facility and right-of-way, including any to be acquired, demolished, moved or removed. In text, provide details of measures to protect specific structures, including existing transportation and utility structures; and provide the rationale for the acquisition and removal of buildings or structures.

4. Waterbodies

a. Indicate the name, water quality classification and location of all rivers and streams (whether perennial or intermittent) within one hundred (100) feet of, or crossed by, the proposed right-of-way or any off-right-of-way access road constructed, improved or maintained for this facility. Indicate the procedures that were followed to inventory such resources and provide copies of any resulting data sheets and summary reports. Describe the measures to be taken in each location to protect stream bank stability, stream habitat, and water quality including, but not limited to: crossing technique (including HDD); crossing structure type; timing restriction; site restoration; restoration monitoring; threatened or endangered wildlife species under 6 NYCRR Part 182 ("TE species") or rare, threatened or endangered plant species under 6 NYCRR Part 193 ("RTE plants"); and other site-specific measures appropriate to the location for impact avoidance and/or minimization, resource protection, and facility construction management. For each waterbody, indicate the water index number and Global Positioning System ("GPS") coordinates for all existing and proposed crossings. On the Plan maps, indicate:

(1) stream crossing method and delineate any designated streamside "protective or buffer zone" in which construction activities will be restricted to the extent necessary to minimize impacts on rivers and streams;

(2) the activities to be restricted in such zones;

(3) delineate any designated floodways or flood hazard areas to be traversed by the proposed facility or access roads, or otherwise used for facility construction or the site of associated facilities.

b. Show the location of all potable water sources including:

(1) springs and wells on the right-of-way or within one hundred (100) feet of the right-of-way or access roads;

(2) surface water intakes within five hundred (500) feet of the right-of-way;

(3) for each such source, indicate on a site-by-site basis, precautionary measures to be taken to protect each water source.

5. Wetlands

a. All wetlands and those with one hundred (100) foot adjacent areas located within the right-of-way or crossed by the right-of-way or any off-right-of-way access road constructed, improved or maintained for the Facility must be identified, delineated in the field, and depicted on Plan drawings, to the extent practicable in consideration of Certificate Condition 131, and such delineations shall be delivered for review to NYS Department of Public Service ("DPS") Staff and the staff of the NYS Department of Environmental Conservation ("NYSDEC"). Indicate the location and type of any wetland (e.g., marsh, meadow, bog, scrub-shrub or forested swamp) within or adjoining the right-of-way or any access road, as determined by site investigation and delineation. For each State-regulated wetland, indicate the following:

(1) town,

(2) approximate Route Mile location,

(3) wetland field designation,

(4) NYSDEC Classification Code,

(5) wetland type,

(6) National Wetland Inventory ("NWI") Classification,

(7) total area of temporary disturbance/impact,

(8) total area of permanent disturbance in NYSDEC-regulated wetland (square feet),

(9) area crossed by the Facility, and

(10) conversion of forested wetland.

Provide a wetland delineation report with a narrative description of the wetland, including the vegetation, hydrology and wetland functions and values and the wetland delineation determination form. The wetland delineation report should also include photographs of the wetlands. Indicate in text, and on plans as appropriate, on a site-by-site basis the precautions or measures to be taken to protect such wetlands, associated drainage patterns, and wetland functions.

b. Describe all activities that will occur within regulated wetlands or adjacent areas (e.g., construction, filling, grading, dewatering, vegetation clearing and excavation) and assure that the activity is consistent with the weighing standards set forth in 6 NYCRR §663.5(e) and (f). Describe how impacts

to wetlands and one hundred (100) foot adjacent areas will be avoided; how impacts will be minimized; and how unavoidable impacts will be mitigated. Describe the procedures for erosion and sediment control in accordance with the Storm Water Pollution Prevention Plan ("SWPPP") specific to wetland crossings. Provide detailed plans for mitigating all unavoidable impacts. Mitigation plans must separately address impacts to each of the wetlands benefits described in Article 24 of the ECL (24-0105(7)). Plans must provide for wetland mitigation in the same watershed as the entire Facility is located.

c. Facility plans must delineate the wetland "protective or buffer zone" in which construction activities will be restricted to the extent necessary to minimize impacts on wetlands. Describe the activities to be restricted in such zones.

6. Landscaping

Show locations of existing or proposed vegetative plantings, earthwork, or installed features to screen or landscape substations or other facility components. Describe in text and on detailed drawings, any screening or landscaping plans proposed.

7. Noise Sensitive Sites

Show the locations of noise sensitive areas along the proposed right-of-way and the specific procedures to be followed to avoid and/or minimize noise impacts related to right-of-way clearing, facility construction, and operation. Indicate the types of major equipment to be used in construction or facility operation; sound levels at which that equipment operates; days of the week and hours of the day during which that equipment will normally be operated; any exceptions to these schedules; and any measures to be taken to reduce audible noise levels caused by either construction equipment or facility operation, including substation and converter station sites.

8. Other Environmentally Sensitive Areas

a. Indicate the general locations of any known ecologically and environmentally sensitive sites (including TE species or occupied habitats, RTE plants, Significant Coastal Fish and Wildlife Habitats ("SCFWHs"), documented submerged aquatic vegetation ("SAV") beds, shallows and migratory fish habitat sensitive areas ("Exclusion Zones"), significant natural communities, deer winter yards, and archaeological sites), within or near the proposed overland and underwater right-of-way or along the general alignment of any access roads to be constructed, improved or maintained for this facility. Indicate the procedures that were followed to identify such resources and specify the measures that will be taken to

avoid and/or minimize impacts to these resources. Reports prepared to identify and analyze such sites shall be made available to DPS Staff and the staff of the NYSDEC upon request. All known occupied habitats of TE species and locations of observed RTE plants will be clearly marked on the EM&CP Plan and Profile drawings and will be provided to the NYSDEC, NYS Natural Heritage Program, and Public Service Commission ("PSC") for review. If new occupied habitat of TE species or locations of observed RTE plants are identified and verified, EM&CP Plans will be updated to show the new occupied habitat(s).

b. Indicate the location and identification of sensitive land uses and resources that may be affected by construction of the facilities or by construction-related traffic (i.e., hospitals, emergency services, sites on the National or State Register of Historic Places, sanctuaries, schools, residential areas, highway ingress and egress etc.). Specify measures to minimize impacts on these resources, including considerations for scheduled events at historical or cultural sites.

9. Recreational Areas

Indicate the locations where existing or planned recreational uses, if known to the Applicant at the time of the submission of the EM&CP, would affect or be affected by facility location, construction or other right-of-way preparation. Explain in text how these recreational uses or plans were (or can be) accommodated in facility construction operation and maintenance.

10. Agricultural Areas

Indicate the locations of prime, unique and significant agricultural lands, vulnerable soils, and underground drainage systems and the locations of sites under cultivation or in active agricultural use, where structures, access roads, lay-down areas or cable pulling operations will be located. Designate the site-specific techniques to be implemented to minimize or avoid construction-related impacts to agricultural resources.

B. Description and statement of objectives, techniques, procedures and requirements.

1. Erosion Control

a. Describe the temporary and permanent measures to be taken during all construction phases to stabilize and restore soils, control erosion, and preserve natural drainage patterns in areas where significant soil disturbances (including removal of vegetative cover, grading or excavation) are proposed. Include standards, practices, erosion control measures and techniques to address construction management,

communications, planning, monitoring and reporting requirements as appropriate for conformance with plans in a SWPPP.

b. Provide detailed soil erosion and sediment control plans in SWPPP details.

c. In areas of coastal erosion hazard, include plans to demonstrate compliance with the standards for coastal erosion hazard protection as required by 6 NYCRR Part 505.

2. Fuel and Chemical Handling Procedures

The EM&CP shall include a Spill Prevention, Control, and Countermeasure Plan ("SPCC Plan") or its equivalent for overland and underwater construction and installation.

a. The SPCC Plan or its equivalent shall describe precautions and measures to be followed during clearing, construction and site restoration:

(1) to control the storage, handling, transporting and disposal of fuels, oil, chemicals, and hazardous and other potentially harmful substances; and

(2) to avoid spills and improper storage or application in the vicinity of any wetland, river, creek, stream, lake, reservoir, spring, well or other ecologically sensitive site, or existing recreational area along the facility right-of-way and access roads.

b. The SPCC Plan or its equivalent shall include a plan for responding to and remediating the effects of any spill of petroleum or other hazardous substances which occur during the construction of the Facility, in accordance with applicable laws and regulations. Such Plan shall be developed in accordance with applicable federal and state laws, regulations and guidance, and shall include proposed methods of handling spills of petroleum products and any hazardous substances which may be stored or utilized during the construction and site restoration, operation and maintenance of the Facility.

c. The SPCC Plan or its equivalent shall include a Shipboard Oil Spill Contingency Plan developed by Engineering, Procurement and Construction Contractors ("EPC Contractors").

3. Environmental Supervision

a. Describe protocols for supervising demolition, vegetation clearing (including any use of herbicides), construction and site restoration activities to ensure avoidance and/or minimization of environmental

impacts and compliance with the environmental protection provisions specified by the Certificate.

b. Specify the titles and qualifications of personnel proposed to be responsible for ensuring avoidance and/or minimization of environmental impact throughout the demolition, clearing, construction and restoration phases, and for enforcing compliance with environmental protection provisions of the Certificate and the EM&CP. Indicate the amount of time each supervisor is expected to devote to the Facility.

c. Explain how all environmental protection provisions will be incorporated into contractual specifications, and communicated to those employees or contractors engaged in demolition, clearing, construction, and restoration.

d. Describe the procedures to stop-work in the event of a Certificate violation. Identify the Certificate Holders' designated contact including phone number, for assuring overall compliance with Certificate Conditions.

4. Safety Procedures

a. Describe the specific Construction and Safety Policies and Procedures that will be followed by the entities and individuals working on the construction, operation and maintenance of the Facility. The procedures should address work near public utility facilities, work near railroad and transportation facilities, public safety, and boater safety.

The procedures for all electrical work practices must comply with applicable sections of the Occupational Safety and Health Administration ("OSHA"), National Fire Protection Association ("NFPA"), National Electrical Code, National Electrical Safety Code, and State-adopted electrical codes.

b. The Aquatic Safety Plan will also be included in the EM&CP.

5. Cleanup and Restoration

Describe the Applicant's program for right-of-way cleanup and restoration, including:

a. The removal of any temporary roads, restoration of lay-down or staging areas, the finish grading of any scarified or rutted areas, the removal of waste, scrap metals, surplus or extraneous materials or equipment used;

b. Plans, standards and a schedule for the restoration of vegetative cover; include specifications to address:

(1) design standards for ground cover:
   (a) species mixes and application rates by site;
   (b) site preparation requirements (soil amendments, stone removal, subsoil treatment or drainage measures);
   (c) acceptable final percent cover by cover type;

(2) planting installation specifications and follow-up responsibilities;

(3) a schedule or projected dates of any seeding and/or planting.

c. Plans to prevent unauthorized access to and along the right-of-way.

6. Herbicides

a. Specify the locations where herbicides are to be applied. Provide a general discussion of the site conditions (e.g., land use, target and non-target vegetation species composition, height and density) and the choice of herbicide, formulation, application method and timing.

b. Provide a general comparative analysis of any proposed herbicide applications using the following selection criteria: selectivity, efficacy, toxicity, persistence, and cost-effectiveness.

c. Describe the procedures that will be followed during application to protect non-target vegetation, streams, wetlands, potable waters and other waterbodies, and residential areas and recreational users on or near the right-of-way.

d. The right-of-way and adjoining properties shall be posted and notified by using the NYSDEC-approved format (Environmental Conservation Law ("ECL") Part 33 and 6 NYCRR Part 325); or as may be implemented subject to interim utility guidance, if issued.

e. As part of the EM&CP, Certificate Holder must include a comprehensive list of herbicides and method of application proposed for use in the right-of-way.

7. Agricultural Areas

a. Describe the program, policies and procedures to mitigate agricultural impacts, and explain how construction plans avoid or minimize soil compaction, crop production losses, and potentially wet agricultural soils. Also, list locations where such procedures have been and will be followed in facility construction and restoration.

b. Indicate specific techniques and references to appropriate Agricultural Protection Measures recommended by the NYS Department of Agriculture and Markets ("Ag & Mkts"), as available.

8. Adirondack Park

Describe the program, policies and procedures to minimize and mitigate the impacts associated with the construction and long-term maintenance for work performed in the Adirondack Park and within the Lakes to Locks Scenic Byway, including a long-term vegetation management plan for the Route 22 Travel Corridor in the Adirondack Park intended to blend the proposed transmission line ROW restoration and maintenance with the scenic landscape of the Adirondack Park.

Provide the procedures that will be followed to monitor invasive species within and immediately adjacent to the proposed construction ROW along the Route 22 Travel Corridor. These protocols should include a) recording the presence/absence and abundance of invasive species prior to construction; b) annual surveys for a period of up to four years after construction activities have been completed; and c) potential control measures could be employed in the event that there has been a significant change in the composition of invasive species within the construction area relative adjacent undisturbed areas.

9. Access Roads

a. Discuss the necessity for access to the right-of-way, including the areas where temporary or permanent access is required; and the nature of access improvements based on natural features, equipment constraints and vehicles to be used for construction and maintenance, and the duration of access needs through restoration and the maintenance of the facility.

b. The location of proposed permanent access roads, temporary access roads and existing access roads shall be delineated on maps and be provided in an electronic format to NYSDEC and DPS Staff.

c. Identify the types of access which will be used and the rationale for employing that type of access including consideration of:

(1) temporary installations (i.e., over-land provisions, corduroy, mat and fill, earthen road, geotextile underlayment, gravel surface, etc.);

(2) permanent installations (i.e., cut and fill earthen road, geotextile under-layment, gravel surface, paved surface, etc.);

(3) use of roads, driveways, farm lanes, rail beds, etc.;

(4) other access, such as helicopter, ship or barge placement.

For each temporary and permanent access type provide a figure or diagram showing a typical installation (include top view, cross section and side view with appropriate distances and dimension). Where existing access ways will be used, indicate provisions for upgrading to meet appropriate standards.

d. Indicate the associated drainage and erosion control features to be used for access road construction and maintenance. Provide diagrams and specifications (include plan and side views with appropriate typical dimensions) for each erosion control feature to be used, such as:

(1) staked straw bale or check dam (for ditches or stabilization of topsoil);

(2) broad-based dip or berm (for water diversion across the access road);

(3) roadside ditch with turnout and sediment trap;

(4) French drain;

(5) diversion ditch (water bar);

(6) culvert (including headwalls, aprons, etc.);

(7) sediment retention basin (for diverting outfall of culvert or side ditch);

(8) silt fencing.

e. Indicate the type of stream crossing method to be used in conjunction with access road construction. Provide diagrams and specifications (include plan and side view with appropriate dimensions) for each crossing device and rationale for their use. Stream crossing devices may include but not be limited to:

(1) ford (with or without gravel);

(2) ford with sill;

(3) timber mat;

(4) culverts including headwalls;

(5) bridges (either temporary or permanent).

All diagrams and specifications should include type and size of material to be placed in stream and on stream approaches.

10. Construction Requirements

a. Describe in detail the following construction requirements for overland cable installation:

(1) Highway, utility, municipal road crossing methods;

(2) Utility clearances for each type of construction (open cut, HDD, J&B etc);

(3) Backfill requirements at utilities and roads (soil types and compaction);

(4) Thermal fill requirements for trenches;

(5) Maximum open trench area;

(6) Shoring requirements adjacent to structures/roads; and

(7) Borehole backfill requirements

b. Describe in detail the following construction requirements for underwater cable installation:

(1) Pre-installation route clearing activities;

(2) Installation methods (including but not limited to jet-plowing, shear plowing, dredging, and hand jetting) and locations at which each method is expected to be employed;

(3) Dredging and dredged material management plan including suspended sediment control measures, backfill requirements, and locations (mapped) where dredging is anticipated;

(4) Dredged material disposal plan;

(5) Cofferdam installation and dewatering plan;

(6) Avoidance and/or minimization measures for any suspended sediments associated with in-water removal of large debris and protocol for monitoring turbidity;

(7) Locations (mapped) and methods for all in-water HDD operations;

(8) Procedures for the handling and use of drilling fluid and procedures to be implemented in the event of a detected release of fluid;

(9) Transition methods for HDD to underwater cable;

(10) Cable-laying methods including barge positioning and use of spuds or anchors;

(11) Underwater construction and vessel spill containment and control plans;

(12) Utility crossings methods specified for each such crossing, location (mapped) of utility crossings, and method of protecting the cable at those crossings;

(13) A post-installation inspection plan that is consistent with the requirements of the Certificate Conditions.

(14) A maintenance plan that is consistent with the requirements of the Certificate Conditions.

(15) A discussion of alternatives for decommissioning the cable in the event that the cable is permanently de-energized; and

(16) Pre- and post-installation monitoring plans consistent with the requirements of the Certificate Conditions.

c. Describe in detail the following construction requirements for converter station and substation construction:

(1) Detailed oversized load delivery route to the site;

(2) Excavation and grading;

(3) Construction of foundations for the converter building, transformers, and switchgear;

(4) Installation of appropriate drainage systems, and station service including electrical and water;

(5) Control and protection system for operation and monitoring of the station, and;

(6) Other auxiliary systems, including AC auxiliary power, DC distribution, valve cooling system, ventilation system, and fire protection system.

11. Maintenance and Protection of Traffic Plan

A Maintenance and Protection of Traffic ("MPT") Plan shall be developed that identifies procedures to be used to maintain traffic and provide a safe construction zone for those activities within the roadway right-of-way in conformance with the MUTCD. MPT plans shall also be prepared for each location where construction vehicles will access the transmission line right-of-way from the local roadway. The MPT plans shall address temporary signage, lane closures, placement of temporary barriers and traffic diversion. MPT plans shall be provided in conjunction with the Plan and Profile drawings in the EM&CP.

12. Dust Control

Specify appropriate measures to minimize fugitive dust and airborne debris from construction activity.

13. Right-of-Way Management Plans

a. Describe the interim right-of-way vegetation management plan to be used for the proposed facility from the beginning of vegetative clearing until the comprehensive site-specific long-range right-of-way management plan is submitted. Include a description of the initial and follow-up vegetation treatment techniques; and the proposed contents of any post-construction and long-range right-of-way management plans. Such plans, when submitted, shall describe the goals and objectives and include supporting inventories and analyses, proposed and alternative techniques (including consideration of vegetative screening and buffer areas at locations such as stream crossings, public roadways, and residential areas), schedules, and other important environmental information deemed necessary.

b. Describe interim right-of-way management plans and standards for securing, stabilizing, monitoring and addressing right-of-way access roads, facility maintenance, and analysis of compliance with any post-restoration requirements.

c. Invasive Plant Species Management Plan: The Certificate Holder must include an Invasive Species Management Plan for construction and post construction activities in the EM&CP.

d. Emergency Access Management Plan: The Certificate Holder must include a plan for emergency access to the facility that demonstrates compliance with the Certificate Conditions, including avoidance and/or minimization of impacts to sensitive habitats.

14. Soil Management

A comprehensive Soil Management Plan that includes at a minimum a description of:

a. Procedures for identifying, sampling, and handling contaminated soils. Include the procedures for field screening of excavations for evidence of contamination, volatile organic compounds (VOCs) monitoring of excavated soils within five hundred (500) feet of known contamination sites, and air particulate monitoring within five hundred (500) feet of areas of known environmental contamination.

b. Procedures that will be followed to characterize and sample excavated soils for potential reuse as backfill or disposal.

c. Procedures for sampling and handling contaminated trench water. Include the procedures that will be followed to verify and ensure that trench dewatering activities do not contain pollutants that may cause water quality standards violations.

15. Cultural Resources Management Plan

A Cultural Resource Management Plan ("CRMP") will be developed in consultation with the NYS Office of Parks, Recreation and Historic Preservation ("OPRHP") Field Services Bureau, Indian tribes, the Advisory Council on Historic Preservation, the United States National Park Service, and other stakeholders (as appropriate). The CRMP will include:

a. Identification, evaluation, and management of historic properties within the Facility's area of potential effects ("APE").

b. An outline of the processes for resolving potential impact on historic properties within the APE and determining the appropriate treatment, avoidance, or mitigation.

c. Identification of any special events that may take place during construction and a description of appropriate mitigation, such as restrictions on work space, access to sites, scheduling considerations or work hour restrictions, etc.

16. Infrastructure Consultation

Describe consultation which occurred during EM&CP development with entities that do infrastructure planning and construction which may affect CHPEI facility location and design. These entities may include but not be limited to: railroads, the New York State Department of Transportation, the New York State Canal Corporation, Industrial Development Agencies, and municipalities.

17. Organization of EM&CP Document

The EM&CP document should include appropriate cross-references, indicating where the Plan addresses specific requirements including:

a. These *Environmental Management and Construction Plan Guidelines*;

b. The Commission's Article VII Certificate Conditions and the procedures followed or to be followed to comply with those requirements.

c. If any particular requirements of these documents are not applicable, the EM&CP document should so indicate.

Champlain Hudson Power Express Inc.

Best Management Practices

General Information
Regarding Application

February 10, 2012

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ACRONYMS

AASHTO	American Association of State Highway Transportation Officials
AC	Alternating Current
Ag & Mkts	New York State Department of Agricultural and Markets
APA	Adirondack Park Agency
APE	Facility's prospective area of potential effects
BMPs	Best Management Practices
Consulted Parties	NYSHPO, the Council, the USACE, federal and state agencies, and the public as appropriate collectively
Council	Advisory Council on Historic Preservation's
CPESC	Professional in Erosion and Sediment Control
CPSWQ	Professional in Storm Water Quality
CRMP	Cultural Resources Management Plan
CTD	conductivity temperature and depth
dBA	decibels
DOE	U.S. Department of Energy
DOS	Department of State
DPS	New York State Department of Public Service
EM&CP	Environmental Management and Construction Plan
EPC Contractor	Engineering, Procurement, & Construction
Facility	Champlain Hudson Power Express HVDC Transmission System and the Astoria-Rainey Cable
FERC	U.S. Federal Energy Regulatory Commission
FIRM	FEMA Flood Insurance Rate Mapping
FO	Fiber Optic
GPS	Global Positioning System
HA	Mechanical Clearing Machine
HAA, Inc.	Hartgen Archaeological Associates, Inc.
HABS/HAER	Historic American Building Survey/Historic American Engineering Record
HAZCOM	Construction Hazardous Communication Standard
HC	Hand Cutting
HDD	Horizontal Directional Drill, Drills, or Drilling (as the context requires)
HDPE	high-density polyethylene
HVDC	high-voltage direct current

IEA	Illuminating Engineers Association
IMO	International Maritime Organization
J&B	Jack and Bore
kV	kilovolt
MPT	Maintenance and Protection of Traffic
MSDS	Material Safety Data Sheets
MUTCD	Manual of Uniform Traffic Control Devices
MW	megawatt
NAGPRA	Native American Graves Protection and Repatriation Act
NANPCA	National Aquatic Nuisance Prevention and Control Act of 1990
National Register	National Register of Historic Places
NESC	National Electrical Safety Code
NHL	National Historic Landmarks
NMFS	National Marine Fisheries Service
NOT	Notice of Termination
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NYS Natural Heritage Program	New York State Natural Heritage Program
NYSCC	New York State Canal Corporation
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSGIS	New York State Geographic Information Systems
NYSHPO	State Historic Preservation Office
OPRHP	New York State Office of Parks, Recreation, and Historic Preservation
OSCP	Oil Spill Contingency Plan
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PPE	Personal Protection Equipment
PSC	New York State Public Service Commission
psi	Pounds per square inch
RA	Regional Administrator
RTE plants	Rare, Threatened or Endangered Plant Species under 6 NYCRR Part 182
SAV	submerged aquatic vegetation
SCADA	Supervisory Control & Data Acquisition
SCFWHs	Significant Coastal Fish and Wildlife Habitats

SPCC Plan	Spill Prevention, Control, and Countermeasure
SPDES	State Pollutant Discharge Elimination System
SSESC	New York State Standards and Specifications for Erosion and Sediment Control
State Register	New York State Register of Historic Places
SWPPP	Stormwater Pollution and Prevention Plan
TE species	Threatened or Endangered Wildlife Species under 6 NYCRR Part 193
TOC	total organic carbon
TSDR	Treat, Store, Dispose, Recycle
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

1.1 BEST MANAGEMENT PRACTICES OBJECTIVES

The objectives of the Best Management Practices ("BMPs") are to establish basic procedures to be used in developing the Environmental Management and Construction Plan ("EM&CP") to protect environmental, agricultural, historic, cultural and other resources that may be encountered in the process of constructing, operating and maintaining the Champlain Hudson Power Express HVDC Transmission System and the Astoria-Rainey Cable (collectively, "the Facility").

The BMPs will include general methods and procedures to be followed in preparation of the EM&CP and implemented during construction, operation and maintenance. Topics covered in these BMPs include methods and procedures for: basic stormwater pollution prevention; clearing of right-of-ways for installation and maintenance; access to work sites; disposal of debris; protection for streams and wetlands; soils and groundwater management; protection of agricultural lands; cleanup and restoration of disturbed areas; control of invasive species; avoidance and minimization of impacts on threatened and endangered wildlife species under 6 NYCRR Part 193 ("TE species") and rare, threatened and endangered plant species under 6 NYCRR Part 182 ("RTE plants"); and qualifications for various inspectors that will be utilized on the Facility. The BMPs are generalized and will be prescribed on a site specific basis during the EM&CP development and shown on the EM&CP Plan and Profile drawings.

It is important to note that the EM&CP will incorporate the Stormwater Pollution Prevention Plan ("SWPPP") required by the Stormwater SPDES General Permit for Construction Activities. As such, the EM&CP incorporates by reference the SWPPP.

In the event of any conflict between the terms of the Certificate (including the Water Quality Certificate incorporated therein) and the provisions of the Joint Proposal (to the extent adopted by the Commission), the BMPs or the EM&CP Guidelines, the provisions of the Certificate shall govern.

1.2 GENERAL PLANNING OBJECTIVES

Facility planning will develop an overall construction schedule that will optimize efficiency while avoiding and/or minimizing impacts to environmental and natural resources. Objectives will include avoiding significant spawning and breeding seasons for fish and wildlife to the greatest extent possible, given other seasonally dependent construction variables. Resources traversed by the Facility that have a seasonal specific sensitivity will be identified along with the preferred construction season to avoid and/or minimize impacts and will be reflected in Facility scheduling.

1.3 FACILITY SEQUENCING AND CONSTRUCTION SEQUENCING

Facility sequencing and construction sequencing will proceed in a logical progression based on the availability of construction materials and right-of-way access and will focus initially on construction areas requiring a long lead time. The construction sequencing for the Facility will

be established early in the Facility planning process and incorporate seasonal restrictions and construction windows, material fabrication schedule, and overall timeline requirements to complete each segment of the Facility. More information on construction windows is included in Section 26.0.

2.0 CONSTRUCTION SUPERVISION AND INSPECTION

During the construction, multiple Inspectors will be employed to ensure appropriate adherence to all Certificate Conditions, EM&CP requirements, plans, and specifications. The qualifications and duties of each type of inspector are provided below.

In addition to the inspector specific qualifications listed in the following sections, the following attributes are highly recommended for all inspectors:

a) Possess good communication skills, both oral and written;

b) Be honest, fair, straightforward, sincere, and not easily intimidated;

c) Be able to communicate effectively with all parties: Certificate Holders' staff and fellow Facility inspectors; construction/restoration contractors, foremen, equipment operators and laborers; agency inspectors, etc.; and

d) Be experienced with underground utilities.

2.1 ENVIRONMENTAL INSPECTOR

At least one Environmental Inspector will be employed full-time during construction and restoration. Additional Environmental Inspectors may be utilized as required to meet environmental inspection requirements set out in the EM&CP and any relevant permit conditions. The lead Environmental Inspector will be responsible for determining when additional inspectors are needed to meet inspection requirements.

2.1.1 Responsibilities

The Environmental Inspector will assume responsibility for the following duties:

a) Monitoring all construction activities including: clearing, trenching, cable installation, installation and maintenance of temporary erosion controls, work involving wetlands, streams, agricultural lands, avoidance and minimization of impacts to TE species and their occupied habitat and RTE plants, restoration work, etc.;

b) Providing New York State Department of Public Service ("DPS"), New York State Department of Environmental Conservation staff ("NYSDEC"), and for construction within the Adirondack Park, the Adirondack Park Agency staff, and Facility team members with weekly status reports summarizing construction activities from the week prior to the report and identifying construction activities and locations scheduled for the next two weeks;

c) Coordinating inspections of the Facility by NYSDEC, New York State Department of Agricultural and Markets ("Ag & Mkts"), U.S. Army Corps of Engineers ("USACE"), and other involved agencies;

d) Monitoring and managing all environmental protection requirements of the EM&CP and closely coordinating these requirements with the Construction Inspector and the Engineering, Procurement, & Construction ("EPC") Contractor;

e) Monitoring Contractor compliance with the provisions of the Certificate and permits, applicable sections of the Public Service Law, and the EM&CP;

f) Verifying that the right-of-way and any access roads are marked prior to construction;

g) Identifying, documenting, and overseeing corrective actions as necessary to bring an activity back into compliance;

h) Installing and maintaining signs and flagging/marking the boundaries of sensitive resource areas (e.g., waterbodies and wetlands) or other areas where special requirements will be in effect;

i) Locating slope breakers, drivable berms, and waterbars to ensure that they will not direct water into sensitive resources such as wetlands or waterbodies;

j) Directing the Construction Inspector when site conditions make it advisable to restrict construction activities in areas of sensitive environmental resources;

k) Ensuring restoration of preconstruction contours, topsoil and vegetation;

l) Determining the need for additional erosion and sediment controls other than those already required by the Certificate and the EM&CP and ensuring that these controls are properly installed to prevent sediment flow into wetlands, waterbodies, streams, or other sensitive environmental resources;

m) Inspecting and ensuring the maintenance of all temporary soil erosion and sedimentation controls in fulfillment of the requirements for a qualified inspector as defined in the SPDES Construction General Permit (GP-0-10-001).

n) Ensuring the repair of all ineffective erosion and sediment control devices within twenty four (24) hours of identification;

o) Keeping records of compliance with the environmental conditions of the Certificate, the EM&CP, and other federal, state, or local agency requirements. The Environmental Inspector shall have stop work authority over all aspects of the Facility;

p) Identifying areas that will be given special attention to ensure stabilizations and restoration after the construction phase;

q) Being the point of contact for all emergency response procedures such as oil spills, encountering hazardous wastes, etc.;

r) Monitoring all construction activities on, above, below or in the vicinity of State highways to assure that any work in the right-of-way of a State highway is performed in accordance with a Highway Work Permit issued by NYSDOT and, as applicable, any use and occupancy permits, leases or other permits or agreements issued by, with or involving NYSDOT; and

s) Monitoring all construction activities in the vicinity of railroad tracks, equipment or facilities to assure that any alteration of railroad-related improvements paid for by NYSDOT is made in accordance with requirements of NYSDOT and the railroad operating the tracks, equipment or facility.

2.1.2 Qualifications

The Environmental Inspector must meet the following qualifications:

a) Sufficient knowledge and experience to manage the environmental compliance procedures described in the EM&CP;

b) A bachelor's degree in geology, soil science, natural resource science or management, forestry, or a related environmental discipline or a demonstrated equivalent knowledge, including courses in ecological sciences and experience in environmental construction inspection; and

c) Necessary qualifications consistent with a "Qualified Inspector" pursuant to the NYSDEC State Pollutant Discharge Elimination System ("SPDES") General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-10-001).

2.2 AGRICULTURAL INSPECTOR

A qualified Agricultural Inspector will be engaged during each phase: EM&CP development, construction, initial restoration, post-construction monitoring, and follow-up restoration. If qualified, the Environmental Inspector may perform the duties of the Agricultural Inspector.

2.2.1 Responsibilities

The fundamental duty of the Agricultural Inspector is ensuring all aspects of the Facility that affect farmland, either fully meet (comply with) or exceed: a) the basic standards of Ag & Mkts including the recommendations in the Pipeline Right-of-Way Construction Project guidance document (Ag & Mkts 1997), and b) Facility-specific conditions or orders of certification, relevant to agricultural resources, which are incorporated by the lead or certifying agency (e.g.: Public Service Commission ("PSC"); U.S. Federal Energy Regulatory Commission ("FERC"); etc.).

The Agricultural Inspector will assume responsibility for the following duties:

a) Informal and formal training of other company/sponsor staff (e.g.: land men, craft inspectors, assistant agricultural compliance inspectors, environmental inspectors, etc.) and construction personnel in the proper use and application of the agricultural right-of-way standards and case-specific orders of certification;

b) Directing all aspects of the Facility that affect agricultural resources through every stage of on-site work: right-of-way clearing, construction, cleanup, and initial restoration stages;

c) Directing the on-site monitoring of, and the follow-up restoration in, agricultural lands;

d) Communicating with affected farmland owners and operators over the Facility's duration: preliminary planning through construction/initial restoration to completion of monitoring and follow-up restoration; and

e) Communicating with the County Soil and Water Conservation Districts and Ag & Mkts.

2.2.2 Qualifications

The Agricultural Inspector must meet the following qualifications:

a) A bachelor's or associate's degree in applied science: agronomy or environmental sciences, with concentration in: agriculture, soils, horticulture, forestry, or closely allied science, and employment in the respective field, regionally, for not less than five (5) years; or

b) Steady advancement in a career through on-the-job training and performance, regionally, for a minimum of ten years as a soil and water conservation field technician with a practical working knowledge of soil conservation, farming, surveying, land excavation and drainage, or similar types of work: from the land review, field planning and design/layout phase, through construction inspection and site completion; or

c) Combination of a and b above; or

d) Steady advancement in a career through on-the-job training and field performance for a minimum of five (5) years in construction/restoration right-of-way work, with at least two (2) full years serving as an assistant to either a qualified agricultural or environmental compliance inspector, and a certification as, either:

   i. Professional in Erosion and Sediment Control (CPESC); or
   ii. Professional in Storm Water Quality (CPSWQ); or
   iii. Certified Crop Advisor.

2.3 AQUATIC INSPECTOR

At least one Aquatic Inspector will be employed full time per spread for all underwater installation procedures for the Facility. They will be on site at the start-up of each field operation and during environmentally sensitive phases of installation. If in-water installation operations are to occur continuously (24 hours a day) a minimum of two (2) Aquatic inspectors will be employed. At least one inspector must be on duty during underwater installation operations.
Additional Aquatic Inspectors will be employed if necessary to adequately cover all areas of active construction.

2.3.1 Responsibilities

The responsibilities of the Aquatic Inspector are to ensure compliance with regulatory and permit requirements for the underwater portions of the cable installation.

The Aquatic Inspector will assume responsibility for the following duties:

a) Conducting field inspections of installation activities to confirm that the site remains in compliance with all applicable statutes, regulations and permit conditions, and the EM&CP;

b) Working closely with other Environmental Inspectors and Health and Safety officers;

c) Requiring construction to cease immediately if it is determined that continuation of installation activities would result in a violation of the Certificate of Environmental Compatibility and Public Need. The Aquatic Inspector will attempt to direct preventative or remedial action, prior to exercising stop-work authority;

d) Monitor all construction activities on, above, below or in the vicinity of waters of the State; and

e) Collecting water quality samples and performing real-time water quality and suspended sediment monitoring during jet plow operations and dredging/trenching.

2.3.2 *Qualifications*

The Aquatic Inspector must meet the following qualifications:

a) Sufficient knowledge and experience to manage the environmental compliance procedures described in the EM&CP;

b) Four (4) year degree in environmental science or engineering, or equivalent experience; and

c) A minimum of one (1) to three (3) years of applicable marine construction experience.

2.4 CONSTRUCTION INSPECTOR

One or more Construction Inspectors will be employed full-time on the Facility as needed.

2.4.1 Responsibilities

The Construction Inspector will assume responsibility for the following duties:

a) Ensuring that high standards of contract compliance are consistently maintained;

b) Working with the appropriate individuals to fully understand contract program needs and ensure that promised commitments are delivered on time and within budget;

c) Participating in construction conference calls and meetings to provide weekly updates and reports;

d) Assuring that site personnel are properly directed, trained, licensed, and evaluated;

e) Monitoring all construction activities on, above, below or in the vicinity of State highways to assure that any work in the right of way of a State highway is performed in accordance with a Highway Work Permit issued by NYSDOT and, as applicable, any use and occupancy permits, leases or other permits or agreements issued by, with or involving NYSDOT; and

f) Monitoring all construction activities in the vicinity of railroad tracks, equipment or facilities to assure that any alteration of railroad-related improvements paid for by NYSDOT is made in accordance with requirements of NYSDOT and the railroad operating the tracks, equipment or facility.

2.4.2 Qualifications

The Construction Inspector must meet the following qualifications:

a) An associate degree or higher in a construction related discipline;

b) Five (5) years of experience in construction of transmission facilities with an understanding of the applicable construction standards and work methods, construction field issues, prints specification sheets, schematics, one-line diagrams, instructional information to construct, maintain, troubleshoot cable installation and general aspects of converter station and substation construction;

c) Knowledge of federal, state, Occupational Safety and Health Administration ("OSHA"), local, and applicable environmental rules and regulations;

d) A thorough understanding of electrical principles and the hazards associated with electrical transmission work; and

e) The ability to travel throughout the Facility area and work extended hours and weekends in emergency situations, as needed.

2.5 SAFETY INSPECTOR

One Safety Inspector will work full time on the Facility and will be present for any higher risk procedures.

2.5.1 Responsibilities

The Safety Inspector will assume responsibility for the following duties:

a) Assisting in the establishment and implementation of regulatory compliance and incident-prevention activities regarding the safety and health of employees, contractor and subcontractor personnel, and the public;

b) Assisting management and directing safety specialists in analyzing any serious incidents;

c) Advising management on problem solving or decision making to eliminate safety hazards and to develop incident-prevention and regulatory compliance programs to reduce incidents that may lead to personal injury or property damage;

d) Monitoring all construction activities on, above, below or in the vicinity of State highways to assure that any work in the right-of-way of a State highway is performed in accordance with a Highway Work Permit issued by NYSDOT and, as applicable, any use and occupancy permits, leases or other permits or agreements issued by, with or involving NYSDOT; and

e) Monitoring all construction activities in the vicinity of railroad tracks, equipment or facilities to assure that any alteration of railroad-related improvements paid for by NYSDOT is made in accordance with requirements of NYSDOT and the railroad operating the tracks, equipment or facility.

2.5.2 Qualifications

The Safety Inspector must meet the following qualifications:

a) A bachelor's degree – preferably in Safety Management, a related science or engineering discipline;

b) Five (5) to seven (7) years of professional safety experience;

c) Five (5) to seven (7) years of experience in electric or gas operations or in a related industry, preferably in a supervisory or leadership role;

d) Certified as a Safety Professional or Occupational Health Professional or other equivalent recognized credential;

e) Knowledge of federal, state, and local safety and health laws and regulations;

f) Knowledge of electric operations, experience with underground utilities is a plus;

g) Knowledge of industrial hygiene principles;

h) Proven interpersonal skills coupled with the ability to lead in connection with various broad occupational safety and health principles in a constantly changing work environment;

i) Demonstrated ability to manage multiple high-priority tasks and engage in complex problem-solving;

j) Demonstrated high level of ethical behavior; and

k) Excellent judgment and decision-making skills.

2.6 QUALITY CONTROL AND QUALITY ASSURANCE INSPECTOR

One Quality Control and Quality Assurance Inspector may be employed on a part-time basis as needed for the overland segments, and one Quality Control and Quality Assurance Inspector shall be employed at all times during any activity for the submarine segments in the vicinity of utility cables and other infrastructure.

2.6.1 Responsibilities

The Quality Control and Quality Assurance Inspector will assume responsibility for the following duties:

a) Performing quality audits on transmission lines, converter stations and substations;

b) Verifying that installation of the cable complies with construction specifications;

c) Writing and publishing reports detailing results of field construction audits;

d) Tracking non-conformances for work not meeting the required specifications;

e) Requiring submission of corrective and preventive action from the Certificate Holders for any non-conformance with the construction plans;

f) Maintaining documentation in a systematic and orderly manner;

g) Indentifying areas where the quality of work can be improved;

h) Participating in conference calls and meetings;

i) Developing in-process quality statistical reporting forms and charts to support the quality program; and

j) Conducting audits of compliance with the Certificate, Orders, and legal requirements as required by the Certificate Conditions.

2.6.2 Qualifications

The Quality Control and Quality Assurance Inspector must meet the following qualifications:

a) A bachelor's degree and a minimum of three (3) years experience in a quality assurance role; or an equivalent combination of technical education and training and a minimum of eight (8) years experience in a quality assurance role;

b) Ability to undertake tasks with limited supervision and be highly motivated;

c) Demonstrated analytical skills with the ability to evaluate and produce routine reports;

d) Ability to collect, enter, analyze, track, and produce data;

e) Demonstrated organization and planning skills, with the ability to schedule and perform quality audits across internal and external functions;

f) The ability to solve complex issues; and

g) Familiarity with construction job sites that may be in harsh climates and terrain, and in controlled conditions that require the use of Personal Protection Equipment ("PPE").

References - Section 2.0

[NYSDAM] New York State Department of Agriculture and Markets. November 1997. Pipeline Right-of-Way Construction Projects: Agricultural Mitigation Through the Stages of Project Planning, Construction/Restoration and Follow-up Monitoring.

[NYSPSC] New York State Public Service Commission. February 18, 2003, Environmental Management and Construction Standards and Practices for Underground Transmission and Distribution Facilities in New York State.

3.0 SITE PREPARATION

3.1 OBJECTIVES

This section identifies the site preparation activities associated with the Facility and measures to minimize adverse environmental impacts associated with these activities. Site preparation activities are intended to ensure compliance with plans developed and included in the EM&CP that take into account associated permits and restrictions including safety plans, Highway Work Permits, RR operation procedures, environmental protection measures and any other conditions and restrictions.

All right-of-way boundary locations will be determined during EM&CP development by a duly licensed NYS Land Surveyor or under his direction by his agents or employees. Any access to adjoining parcels will be performed under the Right of Entry provisions of Section 105, Article 9 of the NYS General Obligations Law.

3.2 STAKING AND RIGHT-OF-WAY DELINEATION (SURVEY)

As part of site preparation, the right-of-way will be surveyed and staked clearly identifying work area limits to avoid and/or minimize potential environmental impacts. When staking out or delineating the work areas for construction the following steps will be taken:

a) The transmission cable centerline, right-of-way edges, access roads, extra workspace boundaries and marshaling yards will be surveyed and marked with stakes and colored flagging in accordance with the approved EM&CP Plan and Profile drawings;

b) Stakes and flags along the right-of-way will be spaced at appropriate intervals (i.e., fifty (50) feet or more depending on site-specific right-of-way conditions) to ensure that unauthorized clearing and grading does not occur outside of the approved right-of-way boundaries. Flags may be placed on trees or wooden stakes that may be installed as needed along the outside edge of the work area;

c) Flags and staking will be checked by the Environmental Inspector or Facility Construction Inspector before construction to ensure proper alignment;

d) Wetland and stream adjacent areas will be clearly marked in the field to avoid inadvertent disturbance of wetlands and streams by construction equipment;

e) Areas of occupied habitat of TE species will be identified on the EM&CP Plan and Profile drawings and marked in the field with signs or high visibility flags prior to construction;

f) Areas where RTE plants are observed to be present will be identified on the EM&CP Plan and Profile drawings and marked in the field with signs or high visibility flags prior to construction;

g) Areas designated as “no vehicular access” will be clearly marked in the field with a silt fence or construction fence to avoid inadvertent intrusion by construction equipment;

h) In wooded areas, any clearing needed to facilitate surveying will be minimized to the extent possible;

i) In residential areas where landscaping is maintained by adjacent property owners, trees or shrubs that are selected for protection by the Environmental Inspector will be marked;

j) In populated areas along the right-of-way, temporary construction fencing may be used to delineate the work area. Fencing left in place during construction may also help restrict unauthorized access to the right-of-way; and

k) Areas to be used for work areas at the converter station and substation sites will be marked with stakes and colored flags. In addition, the area will be fenced, in accordance with the approved EM&CP Plan and Profile drawings.

4.0 EROSION AND SEDIMENT CONTROL

Construction activities associated with the Facility, including cable installation, and construction of the new converter station and substation will involve soil disturbances of one (1) acre or more, and therefore will obtain coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity prior to the commencement of the construction activity. Construction Activity, for purposes of the SPDES General Permit for Stormwater Discharges, is defined as "any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

The EM&CP will serve as the Stormwater Pollution Prevention Plan in compliance with the SPDES General Permit for Stormwater Discharges (GP-0-10-001). Detailed construction maps including contours, slopes, drainage patterns and locations of erosion control structures will be included in the EM&CP Plan and Profile drawings. This plan will accompany a Notice of Intent that will be submitted to NYSDEC prior to any construction activities. All contractors and subcontractors will be required to sign the contractor certification statements and have a trained individual on site daily, as required by GP-0-10-001.

4.1 OBJECTIVES

The purpose of erosion and sedimentation control is to prevent erosion both on the construction site itself and on adjacent undisturbed areas, as well as to prevent environmental degradation resulting from the transport of sediment and pollutants into undisturbed areas including wetlands and waterbodies. This is accomplished through stabilization, structural controls, and good housekeeping practices on the construction site.

4.2 MEASURES AND DEVICES

New York State Standards and Specifications for Erosion and Sediment Control ("SSESC") (NYSDEC 2005) specify BMPs for addressing erosion and sediment control. These measures will be installed prior to, and maintained in acceptable condition for the duration of, any clearing or earthmoving operations. Erosion and sediment control devices will be installed in accordance with the SSESC standards (Attachment A), the EM&CP Plan and Profile drawings, permit conditions, regulatory approvals, and as otherwise necessary or directed by the Environmental Inspector to prevent adverse impacts to environmentally sensitive areas. Additional erosion and sediment control devices to be used are described below. During each work day, all erosion control devices will be inspected in each work area and repaired (if necessary) to ensure proper functioning. The temporary measures will be continually monitored and maintained until final stabilization within the effected corridor is established. At that point, temporary measures will be removed from the site.

Additional measures and devices appropriate for control of erosion and stormwater drainage in the linear co-occupation of railroad ROW will be developed for inclusion in the EM&CP. These measures will address linear drainage ditches aligned parallel to the proposed facility location, which are common on many areas of the railroad alignment. Culvert sizing, installation, and maintenance details will be developed for inclusion in the EM&CP.

4.2.1 French Drains

A French drain is a stone-filled trench, with or without drain tile, used to intercept both surface runoff and subsurface flow, and to firm unstable soils. French drains will be installed where needed for equipment crossings or during restoration under the supervision of the Environmental Inspector and, if applicable, the affected landowner. Construction of a French drain involves lining a trench with geotextile fabric followed by filling the trench with cobble or stone (six (6) inches or larger) (Figure 4-1). During construction, if it is necessary for equipment to cross the French drain, the crossing will be covered with filter fabric and clean fill to prevent clogging the void spaces of the French drain with dirt from tires and treads.

4.2.2 Inlet Protection

Inlet protection will be provided to prevent sediment-laden runoff from entering adjacent drainage systems. Within State highway right-of-way, inlet protection will be provided in accordance with the Highway Design Manual (Figures 4-2A, B and C) and the highway work permit issued by NYSDOT. Alternatively, with approval of DPS and NYSDEC, silt sacks (Figure 4-3) may be used. Inlet protection will be inspected after every major rain event.

4.2.3 Dewatering

During construction it may be necessary to remove surface or subsurface water from work areas. Where dewatering of the trench is necessary, the discharges of water from the excavated trench will be pumped into a portable sediment tank. The intakes of the hoses used to withdraw the water from the trench will be elevated and screened to minimize pumping of deposited sediments. Soil excavated from the hole shall be stockpiled separately within a straw bale/silt fence barrier to prevent siltation into surrounding areas.

Where there is not sufficient room in the right-of-way to utilize a portable sediment tank as described above, commercial sediment filter bags (Figure 7-4) may be used to remove sediments from dewatering effluent. The dewatering hose will be connected to a filter bag placed on the ground surface within a stabilized area (e.g., vegetated or permeable surface such as aggregate). Once passing through the filter bag, the dewatering effluent will be discharge onto a vegetated area. Additional erosion and sedimentation controls may be installed as determined by the Environmental Inspector. Sediment filter bags will be inspected regularly. The filter bag and accumulated sediment shall be disposed of in an upland location at least one hundred (100) feet from a wetland or waterbody, or disposed of offsite in a state approved solid waste disposal facility.

Trapped sediment collected during dewatering activities shall be graded on the right-of-way in areas where it cannot be washed into the adjacent stream, wetland, or other sensitive resource. Dewatering structures will be removed as soon as possible following the completion of dewatering activities.

Any contaminated waters removed from a work site may not be discharged without a SPDES permit or must be discharged at a waste water treatment plant following chemical analysis.

4.2.4 Concrete Wash Out

After placement of concrete, wash water used to clean the concrete truck will be directed to a concrete washout structure at designated areas only. These concrete washout area(s) will be located a minimum of one hundred (100) feet from all wetlands, waterbodies, and drainage structures. Self-installed or pre-fabricated containers may be used and are intended to capture the wash water to allow for evaporation or off-site disposal. Washout structures or containers will be inspected after each use to determine if they are filled to seventy five (75) percent of capacity and to make sure that the plastic linings are intact and not leaking. Material in washout structures or containers will be removed when they reach seventy five (75) percent capacity. (Figure 4-4).

4.2.5 Clearing, Excavation, and Grading

In general, the right-of-way will be cleared to provide safe operation of construction equipment. Typical clearing methods are described in Section 5.0.

Excavated material will be stockpiled temporarily within the right-of-way, away from stormwater conveyance areas in a manner that prevents erosion and the transport of sediments (*e.g.*, by installing silt fences). Where sufficient space for stockpiling within the ROW is not available, excavated material will be transported to staging areas and stabilized in accordance with the SSESC. The locations of proposed staging areas will be identified on the EM&CP Plan and Profile drawings. A Soil Management Plan will be developed as part of the EM&CP. Following restoration, excess or unsuitable material will be removed from the right-of-way to an approved upland disposal location on or off the right-of-way, spread evenly, seeded, and mulched in accordance with seed mixes and application rates prescribed in the Facility-specific EM&CP.

Any contaminated soils removed from a work site may not be used as backfill and shall be analyzed and disposed of in accordance with the applicable regulations.

The EPC Contractor will exercise all necessary and reasonable precautions to minimize sedimentation, soil erosion, and permanent impacts to wetlands and watercourses in the work areas and along the right-of-way. Special conditions and erosion and sedimentation controls will be prescribed on the EM&CP Plan and Profile drawings by work location in these special areas. Excavated material will be stockpiled with proper stabilization, erosion controls, and drainage outside the wetland or watercourse, and thereafter disposed of at approved upland locations.

Landgrading will be conducted in accordance with the standard specifications in pp. 5B.49-54 of the SSESC (Attachment A). Railway drainages which are impacted by the Facility will be restored as if they were a grass waterway and will follow restoration and stabilization procedures as described in the SSESC. All graded or disturbed areas will be protected with erosion and sediment controls as described in the EM&CP and SWPPP until they are adequately stabilized.

4.2.6 Site Stabilization

In addition to the structural controls described above, stabilization measures that will or may be used during Facility construction also include non-structural controls. Surface-stabilization techniques will be used during construction to reduce the potential of sediment loading in stormwater runoff from disturbed areas. All disturbed areas that will be left exposed more than seven (7) days, and not subject to construction traffic, will receive temporary seeding or stabilization in accordance with the SSESC (Attachment A).

Site clearing, excavation, grading and stabilization will be closely sequenced to minimize impacts to exposed areas.

4.2.7 Responsibilities

The EPC contractor will be responsible for the installation of stormwater control structures. The installation of stormwater control structures may be sub-contracted. Responsibilities will be defined in the EM&CP that will also serve as the SWPPP.

4.2.8 Inspection and Record-keeping

For construction activities along the right-of-way, the Environmental Inspector(s) will perform inspections of all erosion and sediment control in accordance with the SPDES General Permit. The Environmental Inspector will also establish a protocol with the contractor for the identification and repair of all erosion and sediment control measures deemed to be in need of repair or reinstallation. The Environmental Inspector is also responsible for record-keeping required by the EM&CP and the Stormwater General Permit.

References - Section 4.0

[NYSDEC] New York State Department of Environmental Conservation. August 2005. New York State Standards and Specifications for Erosion and Sediment Control.

[NYSDOT] New York State Department of Transportation. Highway Design Manual. Accessed online December 1, 2010 at: https://www.nysdot.gov/divisions/engineering/design/dqab/hdm

[USEPA] United States Environmental Protection Agency. January 2008. National Menu of Best Management Practices. January 9, 2008. Site accessed on August 30, 2010. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

5.0 VEGETATION CLEARING IN UPLAND AREAS ALONG THE OVERLAND ROUTE

5.1 OBJECTIVES

The objective of vegetation clearing is to remove the vegetation from the work area that is necessary for safe and proper installation of the Facility and selection of the appropriate vegetation clearing methods to avoid and/or minimize impact to RTE plants and sensitive areas (e.g., streams and wetlands or areas of high visual sensitivity, such as the Lakes to Locks scenic byway). This is accomplished through site specific prescriptions for clearing and disposal of woody vegetation and selective retention of vegetative buffer zones. Limits of clearing and site specific clearing and disposal prescriptions will be provided on the EM&CP Plan and Profile drawings.

5.2 DEFINITIONS

Clearing – the cutting and physical removal, either by hand or mechanical means, of all vegetation from the work area.

Grubbing – the mechanical removal of the stump and root mass of felled woody vegetation.

Slash – shrubs, saplings, and tops of trees four (4) inches in diameter or less at the large end for hardwood and six (6) inches in diameter or less at the large end for softwoods.

Stumps – the woody stem and fibrous root mass left in the soil after removing the trunk at the butt.

Timber/Logs – trunks and limbs greater than six (6) inches in diameter at the small end, with a minimum eight (8) foot length.

5.3 EQUIPMENT

Vegetation clearing operations will be carried out with the following equipment:

a) Bulldozers or crawlers equipped with forestry brush rakes or hydraulic clams;

b) Bladed mowers (hydro axe or brush hog), and chain thrashers;

c) Hydraulic shears or mechanized felling saws;

d) Chain saws;

e) Skidders or forwarders; and

f) Excavators equipped with grapple arms.

5.4 CLEARING METHODS AND PROCEDURES

The cleared width within the right-of-way and temporary construction workspace will be kept to the minimum that will allow for spoil storage, staging, assembly of materials, construction vehicle passage, and all other activities required to safely install the Facility. The Certificate Holders will also limit the removal of stumps and roots that are not in the footprint of the excavated trench to allow re-sprouting and assist in the recovery of woody species, except where removal is required for safe construction.

During clearing operations, crews, in coordination with the Environmental Inspector, will scout the terrain ahead for unexpected conditions, check right-of-way boundaries and review property-specific conditions or restrictions noted on the EM&CP Plan and Profile drawings. Trees will be felled into the right-of-way to avoid off-right-of-way damage, using the following methods:

a) Hand Cutting (HC) – This method employs a hand-held chain saw. It is selective, but is slower and more expensive than motorized mechanical devices. Residential areas, buffer zones, wetlands, and highway screens are areas where hand cutting is typically prescribed.

b) Mechanical Clearing Machine (HA) – This term usually refers to a machine known as the Hydro-ax or Kershaw mower. This machine can cut trees up to ten (10) inches in diameter at the rate of several acres a day, depending on stem density and terrain. It is essentially nonselective and a good device for clearing rights-of-way that are composed of young undesirable species in a relatively uniform stand.

c) Mowing – This technique is primarily used in areas of herbaceous vegetation. Terrain must be relatively flat with no gullies or rocks.

d) Mechanical whole-tree felling equipment – This method allows controlled felling and loading of whole trees while minimizing damage to adjacent trees.

Where vegetation is cleared, erosion and sediment control measures will be installed and monitored until the topsoil is stabilized and can support grassy vegetation.

5.4.1 Upland Areas

Initial clearing operations will include the removal of vegetation within the cable trench area and within any temporary additional construction workspace (e.g., Horizontal Directional Drilling ("HDD") workspace) either by mechanical or hand cutting. Vegetation will be cut at ground level, leaving existing root systems intact except for the immediate trench area, and the aboveground vegetation removed for chipping or disposal. Tree stumps and rootstock will be left undisturbed in the temporary workspace wherever possible to encourage natural revegetation. Brush and tree limbs will be chipped and spread in approved locations or hauled off-site for disposal. Timber will be removed from the right-of-way for salvage or to approved locations. Any vegetation removal within the right-of-way of a State highway will be conducted pursuant to a highway work permit issued by NYSDOT and as shown on the EM&CP Plan and

Profile drawings. Within the Adirondack Park, any vegetation removal in a State highway right-of-way shall be in accord with the Adirondack State Land Master Plan, in order to achieve and maintain a park-like atmosphere that compliments the total Adirondack environment and with the NYSDOT Guidelines for the Adirondack Park ("Green Book").

5.4.2 Wetlands and Other Sensitive Resources

BMPs for clearing in wetlands are included in Section 19.2. BMPs for RTE plants are included in Section 16.

To avoid and/or minimize impacts to occupied habitat of TE species, the Certificate Holders will minimize the cutting of mature trees. Unless required for safety, the Certificate Holders will limit the removal of stumps and roots that are not in the footprint of the excavated trench. In addition, the following species-specific measures will be taken: (Please see Section 16.0 for further discussion of sub-sections a-c below).

a) Indiana bat –The Certificate Holders will identify and avoid and/or minimize impacts to large specimen trees of shagbark hickory (*Carya ovata*), which could potentially serve as maternity or roost trees.

b) Karner blue butterfly and frosted elfin – Areas of potential and occupied habitat for Karner blue butterfly (*Lycaeides melissa samuelis*) and frosted elfin (*Callophrys irus*) were identified by field investigators. These areas will be identified on the EM&CP Plan and Profile drawings and marked in the field with signs or high visibility flags prior to construction. To avoid and/or minimize impacts on areas of potential or occupied habitat of the Karner blue butterfly and frosted elfin, clearing and disposal activities within these areas will be performed in accordance with the Karner Blue Butterfly Impact Avoidance and Minimization Report.

c) TE species and RTE plants – If any new or previously undiscovered TE species or RTE plants are observed to be present in the Facility areas during construction, the Certificate Holders will consult with the NYSDEC and U.S. Fish and Wildlife Service ("USFWS") to determine measures to avoid and/or minimize any impacts to the observed TE species or RTE plants. If it is determined impacts cannot be avoided and it is determined a "take" will occur the Certificate Holder will seek to modify the certificate.

5.5 LOG DISPOSAL

In general, the log disposal method along the right-of-way will be selected after assessing each designated clearing area, and with consideration of:

a) Tree species and potential volumes of marketable timber;

b) Soil and terrain conditions that would allow mechanized collection and skidding without creating severe rutting or significantly increasing erosion potential;

c) Sufficient marketable volumes of wood to make economic utilization practical;

d) Whether adequate log-hauling access exists between the nearest public road and the yarding area on the right-of-way or yarding directly to a highway is desirable and economically feasible; and

e) Abutter/landowner cooperation, as well as clearing and trimming rights.

The following log disposal methods have been selected for the Facility.

5.5.1 Construction Use

Logs may be utilized as needed during construction for wetland access, cribbing, retaining walls, or other uses. Following use, any logs unsuitable for firewood, saw logs, or chipping will be transported off the right-of-way to an approved disposal site.

5.5.2 Log Piles

Logs not needed for construction will be removed from the right-of-way to an approved disposal area, as shown on the EM&CP Plan and Profile drawings.

5.5.3 Sale

Where sufficient merchantable volume exists on the site, logs may be sold to a third party. Where appropriate and practical, and with the agreement of landowners, unsold logs will be hauled to accessible locations for salvage by the general public in accordance with the substantive requirements of 6 NYCRR Part 192.5, firewood restrictions to protect forests from invasive species.

5.5.4 Chipping

When logs cannot be reused or sold, they will be chipped on site. The resulting wood chips will be piled in upland areas within the right-of-way or transported off right-of-way to an approved disposal site. Wood chips will be spread three (3) to five (5) inches thick with fertilizer spread over the chips to minimize soil nitrogen depletion due to cellulose decomposition.

5.6 SLASH AND STUMP DISPOSAL

Slash and stumps will be disposed of using the following methods.

5.6.1 Chipping

Slash may be chipped to reduce debris volume. See Section 5.5.4 above for the handling of chips.

5.6.2 Hauling

Slash and stumps may be hauled to a NYSDEC approved landfill or other suitable off-site location with the approval of the landowner and all applicable permitting agencies.

5.6.3 Burial

Stumps may be buried on the right-of-way with landowner agreement. The burial areas will be sufficiently compacted and monitored after construction to assure that settling does not occur. Where significant settling after construction has been identified by the Construction Inspector et. al., finished grade will be re-established using locally obtained run-of-bank material and/or topsoil and re-seeded as appropriate as specified in the approved EM&CP. Areas where significant amounts of stump burial occurs will be noted on as-built drawings, and monitored for settling during ROW condition surveys and maintenance activities.

5.7 VEGETATION BUFFER AREAS

Vegetative buffers adjacent to sensitive areas such as wetlands and streams will be maintained to the maximum extent practicable. Tree cutting in buffer areas will be limited to hand cutting methods. Buffer areas will be clearly marked on the EM&CP Plan and Profile drawings and marked in the field to avoid unintentional clearing. Additionally, the Environmental Inspector or construction supervisor will notify clearing and other crews of buffer areas that will be encountered that day.

To prevent soil erosion along streams, vegetation (ground cover, shrubs, and tree stumps) will be left in place along a minimum twenty five (25) foot wide zone on each bank until the time of crossing. Existing vegetation buffers will be maintained at selected road and stream crossings and other visually sensitive locations, where possible, especially at HDD drilling or boring sites, residential areas, and the peripheries of historic sites.

To the greatest extent possible, trees that provide a buffer to visually sensitive areas will be avoided. Where buffer areas cannot be avoided, a qualified arborist will be consulted before construction in these areas and Tree Protections Zones ("TPZ") will be established. The TPZs and all tree work in these buffer areas will be done using the American National Standards Institute ("ANSI") A300 Standards for Tree Care Operations. Visually sensitive areas will be restored as described in Section 11.2.2.

5.8 WALLS AND FENCES

In limited locations existing stone walls and fences may be crossed by the proposed right-of-way. Unless otherwise requested by the landowner, walls or fences will be restored or replaced during restoration.

5.8.1 Stone Walls

Where stone walls are encountered, the following standards will apply:

a) Improved stone walls will be photographed during construction and the landowner will be consulted regarding the level of restoration;

b) Wall stone will be carefully removed, stockpiled, and re-used, or comparable replacement stone will be used;

c) Walls will be restored to a comparable standard of material and design unless otherwise agreed to by the landowner;

d) Walls of historical or archaeological significance will be restored using original stone in accordance with landowner and permit conditions; and

e) At landowner direction, walls of lesser quality (e.g., loose piles for field separation or all-terrain vehicle control) or fencing may be substituted for the original stone wall.

5.8.2 Fences

Where fences (wood, wire, mesh, etc.) and gates are encountered during construction, the following guidelines apply:

a) Landowner will be consulted prior to removing fencing during construction;

b) Segments of fences and gates affected by construction will be restored to a comparable standard of material and design upon completion of construction unless otherwise agreed to by the landowner;

c) The base of all new posts will be secured to a reasonable depth below the surface to prevent frost heave;

d) If existing livestock fencing is removed, temporary fencing or gates will be installed to control livestock (Figure 5-1A and B);

e) Existing fencing will be dismantled and stored for re-use where practical; and

f) Any damaged fencing material will be replaced with new material.

References - Section 5.0

[APA] Adirondack Park Agency. 2001. State of New York Adirondack Park State Land Master Plan. Accessed online April 26, 2011 at: http://www.apa.state.ny.us/Documents/Laws_Regs/SlmpPDF2001.pdf

[NYSDOT] New York State Department of Transportation. Guidelines for the Adirondack Park. Accessed online April 26, 2011 at: https://www.nysdot.gov/divisions/engineering/environmental-analysis/manuals-and-guidance/greenbook

6.0 GRADING AND ROAD CONSTRUCTION

6.1 OBJECTIVES

The objective of grading and access road construction is to establish a safe and accessible work area. Grading will be required for access for cable installation, additional work space areas such as HDD locations and jointing as well as access roads to marshaling yards. All temporary roads and workspaces will be graded to direct runoff away from streams, wetlands, and adjacent areas. Any road improvements, including relocation of gas pipelines or utility poles needed for the transportation of heavy equipment/machinery, will be assessed and will be included as part of the EM&CP.

6.2 TECHNIQUES AND EQUIPMENT

The majority of the overland route has existing railroad access roads. These roads will be used wherever possible. Where the existing access road does not provide adequate construction access, new access will be established. Backhoes and bulldozers will be used for grading and road construction. Typical road construction will consist of a stabilized construction entrance (Figure 6-2) to limit material being tracked off site and onto public roads the remainder of the access roads will be installed based on site specific conditions. Where appropriate, topsoil will be stripped for road installation or work space preparation. Site specific access and work area construction methods will be identified on the EM&CP Plan and Profile drawings. Topsoil will be stockpiled and reused in-site whenever practicable following construction.

6.3 ACCESS ROADS AND CONSTRUCTION PATHS

The objective of access road and construction path construction is to provide safe access for personnel and equipment to the work site while minimizing impact to sensitive resources.

6.3.1 Construction Access Roads or Paths

Construction access roads will be built to facilitate safe access to the construction site for personnel, equipment, and supplies where no access currently exists. Any access roads that require a temporary or permanent access point to a State highway, or work within the right-of-way of a State highway, will be undertaken pursuant to a highway work permit issued by NYSDOT. The travel way width will be limited to a single lane to minimize impacts to soil and drainage with passing lanes provided as needed in non-sensitive areas. Standard construction methods in compliance with the SWPPP and General Permit GP-0-10-001 will be used. All erosion control and sedimentation control devices will be installed prior to the initiation of road construction activities.

In areas where the slope of the terrain is favorable and the soils are deep, stable, and well-drained, little or no earth grading is needed to prepare the access roads (Figure 6-1). Where slopes are steep or where unstable soil conditions are encountered, it will be necessary to modify the construction path to make it stable for safe use. The following modifications will be considered and applied, as appropriate:

a) Rough grading to smooth the working surface to improve drainage;

b) Stripping and storing topsoil;

c) Placing crushed stone on the construction access road;

d) Placing geotextile fabric covered by clean fill;

e) Using prefabricated wooden or metal construction mats; or

f) Employing pontoon bridges in areas of standing water.

Location of stripped soil storage will vary based on construction installation methods selected and construction right-of-way available. See Section 7.0 for description of various overland trenching procedures. In all cases soil stockpiling will be outside of environmentally sensitive locations and properly protected as described in Section 4.0.

6.3.2 Off Right-of-Way Access Roads

To facilitate delivery of materials and equipment along the right-of-way, where site conditions interrupt a continuous travel way, off right-of-way access roads will be utilized, pursuant to appropriate review and approval procedures. Off right-of-way access roads that include temporary or permanent access points to State highways, or work within the right-of-way of State highways, will be undertaken pursuant to a highway work permit issued by NYSDOT. Off right-of-way access roads will be similar to the construction access roads. Where practical, existing private roads, driveways, farm lanes, etc. will be used, with landowner and DPS approval. The location of proposed access roads will be shown on the EM&CP Plan and Profile drawings. If the access road must cross agricultural land, agriculture protection procedures identified in Section 20.0 will be used. Standard construction methods in compliance with the SWPPP and General Permit GP-0-10-001 will be used. These access roads will be restored to preconstruction conditions or better.

7.0 OVERLAND CABLE INSTALLATION

The objective of the overland trenching operations for the Facility is to safely and efficiently install the HVDC cable within the railroad right-of-way, minimize the use of land outside of the railroad right-of-way and avoid and/or minimize environmental impacts. Over the length of the overland portion of the Facility the railroad right-of-way varies in width, grade, and number of rails, which will require variation of the installation methods. The three primary installation methods will be traditional trench and spoil method, series trenching method and trenchless installation method. Variation among these three installation methods will be prescribed based on site specific evaluations with the EPC Contractor selected by the Certificate Holders and then identified on the EM&CP Plan and Profile drawings. General descriptions of traditional trench and spoil installation and series installation are provided in the following sections and trenchless installation is described in Section 8.0. The installation construction method for each segment of the Facility will be identified on the EM&CP Plan and Profile drawings.

7.1 PRECONSTRUCTION STUDIES

Preconstruction studies will include identifying available right-of-way construction areas, identifying structural crossings and verification of landforms along the cable route, including geotechnical investigations where needed, to determine the geology in the area to be trenched. These preconstruction studies will be used to identify the areas where various installation methods will be effective. In addition to preconstruction studies, agreements with the railroads will be completed to determine protection measures to be utilized to assure the Facility does not interfere with operations or safety of railroads and highways and the Facility will comply with New York State's Dig Safely Program ("One-Call") notification system, 16 NYCRR Part 753. The construction work area, specific installation method and site specific details for installation of the Facility will be identified on the EM&CP Plan and Profile drawings.

7.2 CORRIDOR PREPARATION

A linear work corridor ranging from twenty (20) feet to in excess of fifty (50) feet where right-of-way permits, will first be cleared, grubbed and graded to establish an access path for subsequent steps. The width of the work corridor prepared will vary based on the selected installation method for a given section of the overland cable route. Multiple installation methods and variations of each method will be developed to facilitate installation of the Facility in areas with limited right-of-way widths. Further description of clearing and grubbing to prepare the work area is provided in Sections 5.0 and 6.0, respectively.

7.3 TRADITIONAL TRENCH AND SPOIL METHOD

Traditional trench and spoil procedures are typically the most efficient for underground cable installation. The trench and spoil method involves excavation of the trench by traditional back hoe or bulldozer from an access road established adjacent to the trench area, segregating and stockpiling the excavated trench material next to the trench (Figure 7-1). Although typically the most efficient, this method requires the widest construction corridor.

Trenching will be conducted in accordance with OSHA's Technical Manual for open trenching (i.e., Section V, Chapter 2) and Section 10.1.2.1. The excavated trench will be four (4) feet wide and four (4) or five (5) feet deep (depending upon individual railroad requirements). Figure 7-2 provides a typical trench cross section. In all agricultural areas a minimum depth of forty-eight inches of cover over the Facility is required. In areas where the depth of soil over bedrock ranges from zero to forty-eight inches, the cable shall be buried entirely below the top of the bedrock. Material removed from the trench will be stockpiled next to the trench and segregated as ballast, cinders, topsoil, and subsoil, as appropriate. Geotextile fabric or similar material may be used where space constraints require layering of various materials. In locations where the right-of-way limits stockpiling next to the trench, trench material may be removed from the immediate construction area and stockpiled in an approved location until backfilling and restoration. Excavated materials stockpiled away from the immediate excavation will be set back at least one hundred (100) feet from streambanks and wetlands and will be protected with appropriate erosion and sedimentation controls.

7.3.1 Cable Pulling

Cables of the size and voltage design used on the Facility are supplied spooled on a steel reel. A suitable trailer or rail car will be used for transporting the cable reel to the pulling sites. The cable is pulled into the trench off the trailer. If the cable is not to be laid directly off the trailer, it will be unloaded as close as possible to where it is to be pulled out along the right-of-way and lowered into the trench at a later time.

When cables are pulled out, the cable corridor is prepared with cable rollers along the ground surface. The cable reels will be placed on stable ground, firmed up by rock fill and steel plates if necessary. The cables are pulled by pulling machines placed evenly along the cable route. Alternatively, a nose pull by a winch or continuous bond pull may be applied. The cable will not be pulled over hard and pointed obstacles, as these could damage the corrosion protection and/or insulation, nor will the cable be bent more than the minimum bending radius. An appropriate communication system will be established and tested for all operators.

During wet weather, operations will be suspended in areas with unstable soil conditions to prevent potential rutting, erosion, and other site hazards. Any erosion control devices that are moved or damaged by construction equipment will be replaced or repaired by the end of the work day or sooner during wet weather.

7.3.2 Length of Open Trench

The length of the open trench for traditional installation will be determined by the maximum length of cable that can be transported in a single piece or by the maximum length of cable that can be pulled, whichever is the least. For land installation, typical segment lengths range from three tenths (0.3) to six tenths (0.6) miles.

Where local physical or environmental conditions preclude leaving long sections of trench open for cable pulling, it may become necessary to install conduit and backfill in those portions of trench. The cable would then be pulled into these sections of conduit at a later date. This,

however, typically causes more friction during cable pulling and potential casing damage. This method requires installation in shorter cable sections than the maximum transportable length.

7.3.3 Splicing/Jointing

The number of splices required will be determined either by the maximum length of cable that can be transported in a single piece or by the maximum length of cable that can be pulled; whichever is the least. Joints may also be required where trenching methods change and where there are transitions from underwater to overland cable. Although electrically identical to the underground cable, underwater cable is armored, has an overall larger diameter, is heavier and has a larger minimum bend radius. These properties make it more difficult and expensive to install than underground cable.

Jointing and termination will be performed by skilled jointers according to detailed installation instructions. The work is performed in a jointing enclosure ("house") supported on a stable work base of crushed stone, concrete or suitable native soil. The jointing house controls the ambient conditions during the splicing operation, including controlled levels of humidity, temperature, and airborne dust. The jointing house is assembled from pre-constructed modular units that can be modified in terms of length and width. The units include heating, air conditioners, dehumidifiers, and lifting equipment such as traverse carriers. Where necessary, the jointing house and splicing location ("bay") may include a concrete base and side walls for mechanical protection and separation from parallel utilities.

7.3.4 Padding and Thermal Cover

To protect the cables, imported or screened on-site material may be used to pad the cables. Subsequent to cable laying, the trenches will be backfilled with low thermal resistivity uniformly graded sand or excavatable, low density concrete. In some locations where the risk of dig-in or damage is higher, a protective concrete layer or steel plate may be installed over the thermal sand or flowable fill cover above the low thermal resistive backfill material. Excavated material with boulders and large cobbles removed will then be placed in the trench. Stockpiled trench material will be replaced in the trench in reverse order and stabilized in accordance with SSESC as described in Section 4.0. Unsuitable native material (wet clay, silt, organic matter or material having large cobbles) will be replaced with appropriate backfill. The whole assembly will have a marker tape placed one (1) to two (2) feet above the cables.

7.3.5 Backfilling

Following cable installation, and placement of thermal cover and top protection, the trench will be backfilled with screened native material or material imported to the site. These materials will be tested to ensure they possess the proper thermal characteristics to meet engineering specifications. The upper portion of the trench will use the native spoil as backfill free of boulders, large cobbles, foreign matter, or other deleterious materials. Where it is permissible to open cut roadways, the upper portions of the trench will be backfilled with roadway base material meeting NYSDOT standard specifications. Any excess natural material, except shot rock will be spread over the cable trench area or in upland areas within the right-of-way, in a

manner that does not detrimentally affect pre-existing surface drainage. Excess unnatural road base material must be disposed of in compliance with all applicable environmental regulations. Backfilling in agricultural lands in conformance with the agricultural mitigation standards in the guidance developed by Ag & Mkts (1997) (Section 20.0).

All granular backfill material will be placed when conditions are dry and compacted to the density required by the cable design. Backfill or fill material will not be placed on surfaces that are muddy, frozen, or contain frost or ice. Excavated areas will be dewatered pursuant to Section 4.2.3 as required to perform the work and in such a manner as to preserve the undisturbed state of the approved subgrade material. Flowable fill may be placed by tremie where dewatering is unsuccessful to create a dry situation. Backfill, fill and site topsoil will either be compacted to match the surrounding grade or a crown will be left over the trench to accommodate settling.

Railroad ballast and cinder materials will be replaced and spread where it had been removed.

Any contaminated soils removed from a work site may not be used as backfill and shall be analyzed and disposed of in accordance with the applicable regulations.

After rough grading, the topsoil will be York-raked and seeded, or similarly prepared for an acceptable vegetative cover. Crowned trenches will be periodically inspected following restoration, and necessary measures will be taken to restore grade and stabilize the right-of-way. Backfill will be completed within two (2) days of lowering-in the cable.

7.4 SERIES INSTALLATION METHOD

Series installation involves specialized equipment that excavates and lays the cable in one step. The series installation method utilizes the trench area as the access for installation equipment, minimizing the construction work space needed. Following preparation of the work corridor, the cable would be unreeled and laid along the surface of the corridor by equipment moving along the corridor, or pulled over blocks along the ground surface. A specialized excavator straddles the cable and lifts and passes it overhead while excavating the trench; placing the excavated material on one or both sides of the trench. The cable is then lowered into the trench in one pass. Series operations can also backfill the trench as the work progresses, but this is most readily accomplished in areas where the native soil does not have to be replaced with thermal fill.

7.4.1 Cable Pulling

With the series installation method the cable pulling is very similar to the traditional method described in Section 7.3.1 except that the cable is laid on the surface and not in a trench.

7.4.2 Length of Open Trench

When utilizing the series installation method, the linear length of the open trench will be very short because backfilling occurs quickly after the cable laying. It is expected that by the end of each day the trench will be backfilled to a point very close to the excavator. Any excavations

left open overnight will be marked as a safety precaution. Open excavations at locations such as roadsides, access roads, or in villages shall be marked with lighting and barricades.

Another alternative installation method includes a process of directly laying the cable and immediately backfilling it. Use of this method will be limited to locations where thermal backfill will not be necessary, the soil is stable enough not to require shoring, and the right-of-way width will allow installation at the required depth without violation of established railroad construction criteria (theoretical embankment boundaries).

7.4.3 Splicing/Jointing

Jointing and splicing may be performed using two different approaches. The first and most likely method would use a procedure similar to that of the traditional installation method. The second approach would leave a short section of trench open, with the ends of the cable exposed within the open excavation. After the installation operation has moved forward, the splice area will be prepared to receive the splice house. The splice operation itself is identical to that previously described. When complete, the splice house and related equipment will be removed and the pit backfilled.

7.4.4 Padding and Thermal Cover

Padding and thermal cover will be installed in the same manner as in the traditional method discussed in Section 7.3.4, unless native material is suitable for this use. If native material is used the trench would be backfilled in the same process as the trench excavation and cable laying.

7.4.5 Backfilling

Backfilling will occur immediately following placement of low thermal resistive fill and follow the same procedures as used in the traditional method.

7.5 MECHANICAL ROCK REMOVAL AND BLASTING

During preconstruction studies, areas where rock or ledge may be encountered during construction will be identified. Rock and ledge encountered above the minimum cable installation depth will be removed by mechanical equipment if possible. Often the rock surface has been weathered enough that mechanical removal is possible. Where it is not, three options exist: evaluation of a more shallow cable installation with enhanced concrete or steel cover protection, an increase in the amount of cover (if the changed topography is not problematic), or blasting to achieve the standard depth.

Mechanical removal would be the preferred method of achieving the required burial depth; however if any blasting is required it will be performed by licensed professionals pursuant to New York State Department of Labor's regulations 12 NYCRR Part 39, Possession, Handling, Storage and Transportation of Explosives, and in strict accordance with guidelines designed to

control energy release. DPS will be provided with a copy of the blaster's license prior to any blasting that might be necessary.

In areas where blasting is anticipated, pre-blast surveys of foundations, underground wells, and other susceptible in ground and above ground structures will be performed to determine pre-blasting condition of the structures.

Proper safeguards will be taken to protect personnel and property in the area. Charges will be kept to the minimum required to break up the rock. Where appropriate, mats made of heavy steel mesh or other comparable material will be utilized to prevent the scattering of rock and debris. Blasting will strictly adhere to all industry standards applying to controlled blasting and blast vibration limits with regard to structures and underground utilities. No fly rock will be allowed to leave the right-of-way. Blasting in the vicinity of nearby utilities will be coordinated with the owner, as necessary. Blasted rock will be hauled off-site and disposed of in an appropriate manner. Details of blasting controls and safety procedures will be specified in the site-specific EM&CP documents.

In agricultural areas of till over bedrock where blasting is required, the Certificate Holders will use matting or controlled blasting to limit the dispersion of rock fragments. All blasted rock not used as backfill will be removed from croplands, haylands, and improved pastures. The till and topsoil shall be returned in natural sequence to restore the soil profile. Farm owners/operators will be given timely notice prior to blasting on farm property.

7.5.1 Monitoring and Inspection

A Safety Inspector and Construction Inspector will be present for areas that require blasting. In addition, an independent consultant will be hired to monitor blasting and the effects of the blasting on structures, wells and other infrastructure and to investigate claims of damage.

7.5.2 Time Constraints and Notification

Explosives use will be limited to the hours of 9:00 am to one hour before sunset on non-holiday weekdays, unless otherwise approved by DPS. Fly rock or other airborne debris will be controlled by heavy steel mesh or other comparable material. DPS staff, NYSDOT, and local and state public safety officials will be notified at least forty eight (48) hours prior to the initiation of blasting, and each morning with planned blasting locations. Inhabitants of occupied structures and farm operators within one- quarter (0.25) mile of the blasting area will be notified at least forty eight (48) hours before blasting in that area.

7.5.3 Remediation

Any claims of damage from blasting that are documented and verified as having been caused by such blasting by an independent consultant will be assessed for remediation by the Certificate Holders.

7.6 TRENCH PLUGS

After cable installation, permanent sand bag trench plugs will be installed before backfilling (Figure 7-3). Trench plugs will be installed at the locations shown on the EM&CP Plan and Profile drawings or as determined by the Environmental Inspector. If not specified, the following spacing will be used:

Table 7.1
Trench Plug Slope and Spacing Specifications

Slope (%)	Spacing (feet)
<5	No Structure
5-15	300
>15 – 30	200
>30	100

Trench plugs will be installed at the base of slopes adjacent to waterbodies and wetlands and where needed to avoid draining of a resource area.

7.7 TRENCH DEWATERING

Dewatering of the trench may be required in areas with a high water table or after a heavy rain. All trench water will be discharged into well-vegetated upland areas or properly constructed dewatering structures to allow the water to infiltrate back into the ground, thereby minimizing any long-term impacts on the water table. If trench dewatering is necessary in or near a waterbody or wetland, the trench water will be discharged into a portable sediment tank or sediment filter bags (see Section 4.2.4.3 and Figure 7-4) located away from the waterbody to prevent silt-laden water from flowing into the waterbody (Section 4.2.4.1).

Any contaminated waters removed from a work site may not be discharged without a SPDES permit or must be discharged at a waste water treatment plant following chemical analysis.

References - Section 7.0

[OSHA] Occupational Safety and Health Administration. January 20, 1999. OHSA Technical Manual.

8.0 TRENCHLESS CABLE INSTALLATION

Trenchless cable installation is a construction technique used to install cables without disruption to surface structures. There are two types of trenchless installation that will be used in construction of the Facility: HDD and Jack and Bore ("J&B").

8.1 HORIZONTAL DIRECTIONAL DRILLING

HDD is a trenchless installation process used to install cables beneath obstacles or sensitive areas utilizing equipment and techniques derived from oil well drilling technology.

HDD is used for transmission cable installation to avoid and/or minimize environmental impacts. It is a preferred technology because surface disruption is minimized. HDD technology is used in many situations including the following: lake crossings, wetland crossings, canal and watercourse crossings, valley crossings, sensitive wildlife habitat, and road and railway crossings. HDD is a multi-stage process composed of the steps listed below and further depicted by Figure 8-1.

a) Drilling a pilot hole;
b) Expanding the pilot hole by reaming;
c) Pull back of drill string with simultaneous installation of conduit; and
d) Cable pulled through conduit.

8.1.1 Pre-site Planning

The HDD rig and associated equipment is set up on one side of the obstacle to be crossed. For each proposed HDD location, two separate drills will be required, one for each cable. Each cable will be installed within an eight (8) to ten (10) inch-diameter high-density polyethylene ("HDPE") casing. Each HDD location will be evaluated during the EM&CP process. Planning and execution of each HDD shall include applicable requirements of ASTM F 1962, Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings.

8.1.2 Site Planning

Site planning will involve the production of a Preliminary Site Investigation and Planning Report, a Geotechnical Analysis Report, and Engineering Plans and Profiles as applicable.

The Preliminary Site Investigation and Planning Report will verify the embankment stability, roads or other major features to be traversed and explain entry and exit staging areas, accessibility to HDD operations and staging areas, and availability and accessibility to a water source.

The Geotechnical Analysis Report will include a geological model describing the stratigraphic profile of the drill zone. Detailed data logs, results and analysis of all subsurface investigation methods used to develop the geologic model and stratigraphic profile will be provided and may

include: test pits, test bores, core samples, and groundwater elevation surveys. This report will provide soil and bedrock characterizations of the proposed HDD locations. Should additional subsurface investigations be required, methods may include: dynamic cone testing, seismic studies, sonar studies, ground penetrating radar, electromagnetic and electrical resistivity tomography surveys, groundwater well installation, down-hole geophysical logging, and water quality sampling and analysis.

If results of the geotechnical data reveal the presence of gravels, boulders, or cobbles, or with transitions from non-lithified materials into solid rock, then a monitoring procedure and a list of specialized equipment to be used such as special purpose drill heads or use of optimized drilling fluids will be described. A geologic risk assessment for the HDD will be performed for each proposed HDD location.

Engineering Plans and Profiles developed for each HDD will include Bore Path Layout Plans, including base maps of the surrounding area, horizontal bore path distances from existing features and staging locations with distances from existing features. Profiles of each HDD path will include the following: elevations of the bore path and existing features (including utilities), the radii of curvature, points of tangency and bore entry and exit angles. Engineering Plans associated with the HDD work will consist of duct bank sections, trench sections, transition pit or vault sections and details, cable/pipe support details and casing requirements. Methods to mark and protect collocated infrastructure and a detailed Restoration Plan (including pavement/sidewalk sections when applicable) will be provided. An As Built Profile for each HDD location will be developed upon completion of the Facility.

8.1.3 Installation and Performance Controls

During installation of each HDD, Certificate Holders will implement an access plan and an Environmental Impacts Mitigation and Restoration Plan to avoid and/or minimize impacts to the following, where applicable: aquatic and wetlands species habitats, rare and endangered plant and wildlife species, wetlands, drinking water aquifers, historic and cultural resources and nearby residents and commercial sites. Soil Erosion & Sediment Control Plans & Details, backfilling and borehole stabilization method descriptions and details, and dewatering methods and control descriptions will be provided as applicable. If hazardous materials are expected to be used and/or environmental contamination is known or expected to be encountered, a Hazardous Materials Handling and Hazardous Waste Disposal Plan and a Contaminated Materials Monitoring, Management and Remediation Plan will be developed.

In order to protect public and worker health and safety, Barrier Plans, a protective enclosure plan and protective work practices will be implemented. Barriers and protective measures implemented are intended to protect workers, non-essential personnel and bystanders. Requirements of the Occupational Safety and Health Administration OSHA Technical Manual (OTM) will be adhered to at all times

A Drilling Fluid Management and Disposal Plan will be implemented. The Bentonite used will be National Sanitation Foundation (NSF) certified and methods for recycling and reuse will be

created. The methods for handling and disposal of drilling fluids and drill cuttings will also be described in the plan.

During construction, a noise analysis and control plan will be implemented, as needed. Additionally, vibration monitoring procedures, a surface elevation survey and land deflection and subsidence monitoring plan will be developed and implemented, as needed. Where HDD operations will occur within one hundred (100) feet of existing structures, existing facilities and structures protection and foundation monitoring plan may be developed.

8.1.4 Site Specifics and Contingencies

Site specific environmental and cultural resource protection measures will be planned and implemented. Such measures may include Phase 1A and Phase 1B archeological studies and development of wildlife habitat restoration plans. Where HDD will be used at shoreline and water body crossings, a navigational coordination plan, cofferdam design details and a dredging plan will be provided, as applicable.

Where HDD will be performed in urban and residential areas and at road crossings, detailed traffic control plans will be provided. Certificate holders will obtain Revocable Consent / DOT Permits where necessary. Written descriptions of any anticipated impacts to vehicular and pedestrian traffic will be included in the plan. The detailed traffic plans shall exhibit, as appropriate to the setting, access widths, roads/sidewalks, business access ways, municipal access way widths, signage and channelizing devices, street/sidewalk closures and detours and temporary/final traffic signal plans.

In railroad rights-of-way, railroad traffic coordination plans will be developed and implemented. For installations in close proximity to railroad tracks, HDD activities will be in accordance with applicable requirements of the American Railway Engineering and Maintenance-of-Way Association ("AREMA") Manual for Railway Engineering. Additionally, HDD operations will adhere to applicable requirements of ASTM 'Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings', the National Electrical Safety Code ("NESC"), including Part 3: Safety Rules for Underground Lines, Sections 32 through 39, and the Plastic Pipe Institute PPI Standard TR 46 as applicable. The Plastic Pipe Standard can be found at http://plasticpipe.org/pdf/tr-46-hdd-guidelines.pdf.

8.1.5 Drilling a Pilot Hole

Drilling will progress beneath the obstacle towards the exit target on the other side. The pilot hole is drilled using a non-rotating small diameter drill string and a drill bit consisting of an asymmetric jetting head. The hydraulic cutting action of the drill head is remotely operated to control its orientation and direction. The position of the drill string is electronically monitored during the drilling operation. Directional corrections are made as necessary to ensure that the drill string maintains the desired profile and alignment.

The selected carrier fluid for this drilled crossing will consist of water and bentonite clay. The bentonite clay is a naturally occurring hydrated aluminosilicate composed of sodium, calcium, magnesium and iron that is environmentally benign. Bentonite drilling fluid is delivered to the cutting head through the drill string to provide the hydraulic cutting action, cooling of the cutting head, lubricate the drill bit, stabilize the hole, and to remove cutting spoil as the drilling fluid returns to the entry point of the pilot hole to a containment pit or tank. Typically, bentonite clay is returned to a reclaimer and processed to remove the cuttings. The bentonite is recycled for use as the drilling operation continues. Other materials that could be added to drilling fluid include polymers and soda ash.

The amount of drilling fluid used is determined by the length and diameter of the HDD bore as the drilling fluid completely fills the bore hole. Therefore, as the horizontal drilling proceeds more drilling fluid is required and as a result more bentonite must be added to provide enough drilling fluid with the characteristics needed to convey the excavated soil up to the surface. It is anticipated that the HDD bore diameter will be fourteen (14) inches. As a result, the amount of drilling fluid in the ground during the HDD boring process will be eight (8) gallons per running foot of HDD bore. Every one thousand (1,000) gallons of water/fluid will have about one and one-half (1.5) cubic feet of bentonite, 0.15 to 0.38 cubic feet of polymer, and one (1) pound of soda ash.

8.1.6 Expanding the Pilot Hole by Reaming

Enlarging the pilot hole is an incremental process accomplished with one to several reaming passes, depending upon the cable diameter and the subsurface geology. The rotating reaming/cutting tool is attached to the drill string at the exit point, and drawn back toward the drilling rig situated at the entry point of the pilot hole. Drill pipe is added behind the reaming tool as it progresses toward the drill rig to ensure that a continuous drill string is maintained in the drilled hole. Bentonite drilling fluid is again utilized during the reaming process to remove cutting spoil from the hole.

8.1.7 Cable Pulling

Once reaming is completed, the cable is attached to the drill string at the exit point, and drawn back toward the drilling rig at the entry location.

In the event that drilling fluid forces its way to the surface (a “frac-out”) associated with a HDD operation, immediate and appropriate action will be taken to assess the situation and to minimize and contain or stop the bentonite “frac-out” to the extent practicable. On-land a “frac-out” is easily controlled and contained with a variety of materials (lumber shoring, straw bales, earth berms, or sand bags). Water quality and downstream impacts resulting from an in-water “frac-out” can be minimized using containment buoys and silt curtains to control turbidity. In certain in-water situations, bentonite can be pumped (vacuumed) for removal and proper disposal. A contingency plan for “frac-out” mitigation or drill failure will be included in the EM&CP.

8.2 JACK AND BORE

Another method for trenchless installation is called J&B. This method involves pushing a casing of steel or other material, larger than the HDD pipe, through soils from one side of an existing road or railroad to the other. J&B is limited to a maximum length of several hundred feet limited by the soil friction that J&B equipment can overcome. In addition, only a straight generally horizontal casing can be installed. J&B also requires the subsurface material to be of consistent gravel, silt, clay, soft rock materials or a combination of these materials. Encountering variable materials and obstructions such as rock ledge surfaces, boulders or large cobbles is problematic.

J&B can be considered for stream crossings having uniform subsurface soil material (often not the case), but a high water table could require dewatering of the jacking and receiving pits. The first step in the J&B construction process is to clear and grade a flat work area at the each end of the proposed crossing to construct two working pits. The jacking pit contains a machine to jack sections of casing under the road or railroad, and auger the soil material that is punched out at the front end of the casing. The other receiving pit is located where the casing will exit on the opposite side of the road or railroad.

The jacking pit is typically ten (10) feet to fifteen (15) feet wide and twenty five (25) to forty (40) feet long and somewhat deeper than the bottom elevation of the casing to be installed. These sizes vary based on the casing diameter and crossing length which determines the size of the J&B machine needed. The casing depth under the road or railroad is usually deeper than in other areas causing the pits to be within the railroad or road theoretical embankment line and live load line criteria. Consequently these pits are typically shored on all sides to support the soil loads, to provide OSHA worker safety, and also to provide a backstop for the jacking machine.

The receiving pit can be significantly smaller, on the order of ten (10) feet to fifteen (15) feet square, but shored like the jacking pit, with an opening to receive the conduit. The J&B casing size can range from seven (7) inches to one (1) foot in diameter. Separate small diameter J&B casings can be driven simultaneously, each containing one cable, or a larger sizes can contain multiple cables or cable conduits.

The jacking/augering machine is leveled on the bottom of the jacking pit at a height that will provide for discharge and removal of the augered spoil and is oriented toward the receiving pit. The jacking begins pushing a single ten (10) to twenty (20) foot length of pipe and augering the punched-out soil material out of the casing. When the section is jacked to its full length, the jack is disconnected, moved back to receive another section of pipe. Steel pipe sections are then welded together, and the jacking/augering operation resumes. This is repeated until the leading section is pushed into the receiving pit.

Sheeting is then partially removed to allow soil excavation to the adjoining trenches which are typically at a shallower elevation and often not in alignment with the J&B casing. If cable conduits are used, they will be pulled into the trench and casing, respecting the minimum cable radius requirements. If multiple cable conduits are used they will be bundled using special spacers and pulled into the casing.

The cables are then pulled in through the casing and any other open trench, closed trench or HDD conduit between the design splice points, typically two thousand (2,000) to three thousand (3,000) feet apart. The annulus between the cable or conduits and the pipe casing is pressure grouted to provide both long-term load-bearing capacity of the casing and thermal transfer for the cables.

The remaining sheeting or shoring is removed from the pits as excavated material is replaced and compacted in accordance with highway or railroad requirements.

8.3 HORIZONTAL DIRECTIONAL DRILLING AND JACK AND BORE ROAD CROSSINGS

The following specifications will apply for HDD & J&B road crossings:

a) Owners/operators of other underground utilities in the area will be consulted during the EM&CP development and notified no less than thirty (30) days prior to the start of construction;

b) All existing underground facilities will be marked prior to the start of drilling or boring;

c) Jacking and receiving pits adjacent to the road shoulder will be clearly identified and barricaded to prevent them from being a hazard to pedestrian or vehicular traffic; and

d) Bore or drill pits will be fenced and marked if left open overnight.

Typical HDD, road crossings are shown in Figure 8-2. See Section 10.1 for additional information on road crossings.

8.4 HORIZONTAL DIRECTION DRILLING AT SHORELINE CROSSINGS

At the transition of the HVDC underwater cables from water to land, installation will be accomplished through the use of HDD methodology in order to minimize disturbance to the bank and near shore area. The HDD will be staged at the onshore landfall area and involve the drilling of the boreholes from land toward the offshore exit point. Conduits will then be installed the length of the boreholes and the transmission cable will be pulled through the conduits from the submarine end toward the land. A transition manhole/transmission cable splicing vault will be installed using conventional excavation equipment (backhoe) at the onshore transition point where the underwater and overland transmission cables will be connected. Locations of all proposed crossings will be identified and all HDDs will be engineered on a site-specific basis during development of the EM&CP.

During the site preparation of a land to water HDD an offshore reception area must be prepared in the lake or river. The prime challenge at the offshore HDD reception area is to minimize or prevent the loss of drilling mud. To mitigate against the loss of drilling mud two options are available; a temporary coffer dam, or a steel casing. The following variables determine which option is used – length of drill; depth of drill, elevation difference between drilling site and

reception site, geology of route, water depth at exit, and currents; all of the will be taken into account during the detailed design / EM&CP.

Steel Casing Installation

As a first step the riser would be installed at the desired offshore target location. The riser pipe must be large enough to accommodate the diameter of the HDD bore. In this case it is anticipated that the steel casing pipe would have a diameter of 48 inches. The steel casing pipe would be driven through the overburden on the river / lake bed by using a large pneumatic pipe ram on a barge mounted crane. The driven depth of the steel casing pipe would be dependent upon the specific geotechnical conditions at the reception location. The pipe is driven into the overburden at an angle to match the planned HDD bore slope at the exit. After the conduit has been pulled into the bore the steel casing is removed.

Cofferdam Installation

The cofferdam will be a three sided rectangular shape with the open side facing away from shore. The open side allows for manipulation and pull back of the conduits and cables. The area enclosed by the cofferdam will be approximately 16 feet wide by 30 feet long with the bottom excavated to a depth of approximately 8 feet below the channel bottom. The cofferdam will be constructed using steel sheet piles driven from a barge-mounted crane. The cofferdam is intended shore the sides of the exit pit and help reduce turbidity associated with the dredging and HDD operations. Approximately 140 cubic yards of sediment will be excavated from within the cofferdam. The dredged material will be temporarily placed on a barge for storage. At the end of cable installation, the exit pit will be backfilled with imported clean backfill material, as needed. The backfill will restore the bottom to the preconstruction grade. The cofferdam will remain in place through the backfilling operation to help control turbidity. At the completion of the backfill operation the sheet pile will be removed.

A visual and operational monitoring program will be implemented during the HDD operation to detect a fluid loss. This monitoring includes:

a) Visual monitoring of surface waters along the drill path and in the vicinity of the exit hole on a daily basis to observe potential drilling fluid breakout points.

b) Drilling fluid volume monitoring by technicians throughout the drilling and reaming operations for each HDD conduit system.

c) Implementation of a fluid loss response plan and protocol by the drill operator in the event that a fluid loss occurs. The response plan could include injection of loss circulation additives such as Benseal that can be mixed in with drilling fluids at the mud tanks, and other mitigation measures as appropriate.

9.0 UNDERWATER CABLE LAYING

The installation method for the underwater cable could be simultaneous or post-lay embedment operation for the majority of the route. The preferred installation method for the underwater cable shall be simultaneous embedment operation for the majority of the route. The preferred installation method will be determined on a site-specific basis and will be developed in the detailed engineering design that will be provided in the EM&CP.

Based on existing sediment types, cable installation technique will vary along the route. The methods for cable installation will follow the guidelines below. In addition, depending on the final engineering design of the cable, bipoles may be buried:

a) On top of each other in a single trench (preferred method in Hudson River);

b) Side by side in a single trench; or

c) Separately in two trenches.

During EM&CP Development all bridges, culverts or other infrastructure encountered along the route will be evaluated and the owner/operator will be consulted as necessary to ensure the Facility installation and operation will not interfere with safe operations of the facilities.

Along the underwater cable route, cable burial depths will vary by location, existing utilities, existing marinas, substrate type and regulatory requirements. In the Hudson, Harlem, and East Rivers, the cables will be buried to a target depth of cover of six (6) feet below the sediment water interface or the maximum depth reasonably achievable, and fifteen (15) feet below authorized navigation channel depths when crossing or within a federally maintained navigation channel or existing marina channels. The Certificate Holder shall notify NYSDEC and DPS staffs of all locations where the cable burial depth is less than six (6) feet and provide sound engineering justification for determining that the actual burial depth is the maximum reasonably attainable depth. In areas where the maximum reasonably attainable depth is less than four (4) feet the Certificate Holder shall submit a proposed plan for protection of the cables to NYSDEC and DPS for their review and incorporate the plan into the EM&CP. A burial depth of fifteen (15) feet below authorized navigation channel depths must be achieved when crossing or within federally maintained channels unless authorized by the United States Army Corps of Engineers ("USACE"). This will allow future dredging of the channel without disrupting the cable. Within Lake Champlain, the cables will typically be buried to three (3) feet to four (4) feet or the maximum reasonably attainable depth, whichever is shallower. However, in areas where burial to protect the cables from mechanical damage is not necessary based on good engineering practice (e.g., waters greater than on hundred fifty [150] feet in depth), the cables may be laid on the lake bottom.

A list of existing marinas will be developed and the dimensions of their respective marina channels identified and plotted. Locations of existing marinas will be indicated on the EM&CP Plan and Profile drawings. Marina operators will be given advanced notice of cable laying in their area and an opportunity to identify and discuss any concerns with the EPC contractor.

For each cable installation technique, the EPC contractor will constantly monitor and adjust cable laying activities during cable laying operations to ensure the cable is being laid and buried properly. The cable laying machine operators will be in constant communication with the cable laying technicians to ensure the cable rotating and delivery speed is synchronized with the cable laying linear speed. The cable installation will be monitored by the Aquatic Inspector to ensure construction objectives are met.

A Water Quality Monitoring Plan, consistent with the requirements of the Water Quality Certification, will be developed in the EM&CP for pre-installation jet plow and shear plow trials and cable installation.

9.1 WATER JETTING/HYDRO-PLOW

The proposed method for cable burial for the majority of the underwater cable route is a hydraulically-powered water jetting device that simultaneously lays and embeds the cable in the sediments. Various types of equipment referred to as a water jet or hydro-plow (CAPJET 50; CAPJET 650-1MW; Hydroplow III; CMI Jet Plow are examples) are deployed from a ship that is either dynamically or anchored positioned that can continuously lay and bury the cable.

This equipment uses pressurized water to fluidize the sediment. The pre-determined deployment depth of the jetting blades controls the cable burial depth using adjustable hydraulics on the water jetting device. The device is equipped with horizontal and vertical positioning equipment that records the laying and burial conditions, position, and burial depth. This information is monitored continually on the installation vessel.

Burial can be performed by either a towed or self-propelled burial machine. The self-propelled device moves forward by the reaction of the backward thrust of the hydraulic jetting power that is fluidizing the soil and keeping the trench open for the cable to sink into. The forward rate of progress is regulated by the varying types of sediment and the water pressure applied through the jets. The towed device is tethered to a surface craft, which then applies the pulling force as it moves forward. A skid or pontoon-mounted water jetting device or wheeled, frame-mounted water jetting device, deployed and operated in conjunction with the cable laying vessel, may be used.

There are pre-lay and post-lay embedment devices and the type of device will be determined by the sediment composition, bathymetric contours, navigation constraints, and the characteristics of adjacent habitat areas. For a pre-lay device, the cable is simultaneously fed into the trench as it is created by the plow. For a post-lay device, the cable has already been laid, the plow is lowered on the bottom and the cable placed inside the device, which then embeds it into the bottom as it is pulled forward. In either situation, the device is not self-propelled, but is instead tethered to a surface support vessel which supplies the pulling power. Usually, the bottom sediment is allowed to naturally backfill the trench over the cable by slumping of the trench walls, wave action, or bed load transport of sediments.

As there are various sediment types and significant resources found along the cable route, water jetting pressure will vary. In the unlikely event that the minimum burial depth (see Section 9.0) is not met during water jetting embedment and is not deemed impractical due to infrastructure or other barriers, additional passes with the water jetting device or the use of diver-assisted water jet probes will be utilized to achieve the required depth. Typical water jet pressures include: Sand and Silt - four hundred (400) to six hundred (600) pounds per square inch (psi), Soft Clay - six hundred (600) to eight (800) hundred psi and Hard Clay - eight (800) hundred to one thousand (1,000) psi.

In order to reduce the potential impact in sensitive areas, BMPs for cable installation include the following:

a) Construction work windows – Construction work windows may vary along the proposed route. Windows will be coordinated with regulatory agencies and identified in the Certificate Conditions.

b) Silt curtains – Proposed silt curtain locations will be identified in Plan and Profile drawings included in the EM&CP. The use of silt curtains and their location will depend on local hydrodynamics and navigation traffic. Silt curtains may be used near water drinking supply intake structures in Lake Champlain or in the Hudson River.

c) Water jetting operation parameter modifications – The primary modifications to the water jetting operation include a reduction in water jetting pressure and a reduction in water jetting rate of installation. Proposed areas where operational modifications may occur will be identified in Plan and Profile drawings included in the EM&CP. Operational modifications may occur as needed to avoid and/or minimize impacts in soft sediments or when crossing Significant Coastal Fish and Wildlife Habitats ("SCFWHs"). In addition, operational modifications may occur in the field, based on water quality monitoring results.

d) Installation using diver operated hand jet – For hand jetting, a support vessel provides pressurized water through a hose with a nozzle that is maneuvered by a diver. The diver works the sediment under the cable to create a trench into which the cable settles. This method will be employed for short distances only, typically less than one hundred (100) feet. Hand jetting is typically used at HDD exit and entry pits and cable crossing locations. Proposed areas where hand jetting will be utilized will be identified in the Plan and Profile drawings included in the EM&CP.

e) Monitoring system – The position of the cable installation equipment on the bed of the waterbody will be determined by the vessel's hydroacoustic positioning system. A transponder will be installed on the jetting machine. At regular intervals a signal will be sent to the cable laying vessel's transducer which will produce a unique code. The time difference between the beacon's answer and its direction will be used to locate the machine with respect to the vessel. The hydroacoustic signals will be processed by the navigation computer and the jetting machine position along the Facility route will be

reckoned and recorded. This datum will be sent in real time to the laying control computers.

9.2 SHEAR PLOW

For the shear plowing technique, a trench is made for the cable by towing a plow through the sediment of a waterbody, and the cables are simultaneously fed into the trench as it is created by the plow. The shear plow is not self-propelled, and does not contain jetting or hydro-plow capacity, but is instead tethered to a surface support vessel which supplies the pulling power. Usually, the bottom sediment is allowed to naturally backfill the trench over the cable by slumping of the trench walls, wave action, or bed load transport of sediments. When compared to jetting or hydro-plow operations, the shear plow results in a relatively narrower estimated trench and reduced sediment disturbance, as sediment cohesive strengths and burial depths suitable for shear plow use generally require less force.

Some issues which affect the suitability of shear plows for submarine cable installation and burial are sediment cohesiveness and burial depth. Use of the shear plow is typically limited to sediments that have shear strengths (kpa) less than 20 kpa. Also, shear plows are typically used with shallower burial depths (less than 3 ft), which generally reduces the overall amount (i.e., volume) of sediment disturbed during installation.

Sediment shear strength and proposed cable burial depth in the southern portion of Lake Champlain are suitable for use of the shear plow. The shear plow will be used in the sections of southern Lake Champlain as defined in the Certificate Conditions. The soft sediments of the lake bottom permit adequate penetration to embed the cable at the desired depth. This technique will be used because it does not employ pressurized water to fluidize the sediment to create a trench for the cable. This technique will reduce the potential dispersal of sediments in the shallow reach of Lake Champlain. The shear plow to be used in Lake Champlain will be fabricated specifically for the conditions in the southern part of the lake. The shear plow will be tested for efficacy and impact on water quality standards in trials before installation takes place. The deployment of the shear plow will be consistent with the Certificate Conditions and Water Quality Certification.

9.3 CONVENTIONAL DREDGING

Conventional dredging may be needed where the cable crosses the maintained navigational channel and within temporary cofferdams. Dredge areas will be identified in the Plan and Profile drawings included in the EM&CP. At maintained federal navigational channel crossings, conventional dredging will be used to pre-dredge the cable laying area so that subsequent water jetting will embed the cable to a depth of fifteen (15) feet below the authorized navigation channel depth as required by the USACE. Dredging will include sediment accumulated in the channel above its authorized depth as well as the material below the existing channel bottom. At each location, the dredged material will be placed in scows. A disposal site will be selected based, in part, on the results of sediment testing for the presence of potential contaminants. In accordance with federal and state regulations, the selected EPC Contractor will develop a detailed Dredge Plan and attain the necessary dredge and disposal approvals. Based on current

regulatory requirements, the following outline addresses the major components associated with dredging permit process:

a) Development of a dredge plan;

    i. Identification of dredge locations on map or survey based on hydrographic survey of each location
    ii. Estimate of dredge volumes
    iii. Develop pre-dredge sampling plan

b) Pre-application meeting with regulatory agencies, typically USACE and NYSDEC;

    i. Review proposed sampling plan
    ii. Coordinate dredging work windows and BMPs
    iii. Coordinate any specialized handling requirements

c) Conduct sediment sampling based on approved sampling plan;

d) Identify dredge spoil disposal options and locations;

e) Submit Joint Application;

f) Public notice and review period;

g) Permit approval; and

h) Contract dredge contractors.

Typically, sediment sampling is required within one (1) to three (3) years of applicant filing date thus the plan will be provided included in the EM&CP and coordinated with USACE and NYSDEC.

Sediment testing is required to determine the level of chemical contaminants present in the material to be dredged and to evaluate potential alternatives for placement of the dredged material. Physical and chemical characterization of sediments along the centerline of the Facility route conducted to support the Article VII Application and the initial estimates of dredging areas and volumes, provide a basis for developing a sediment sampling and analysis plan to meet regulatory requirements.

The following guidance documents will be used to develop the dredge plan:

a) United States Environmental Protection Agency ("USEPA")/USACE *Ecological Evaluation for Dredged Material Proposed for Ocean Disposal in the Marine Environment;*

b) Regional Implementation Manual New York/New Jersey Harbor *Guidance for Performing Tests on Dredged Material Proposed for Ocean Disposal;*

c) *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual* (Inland Testing Manual) for proposed dredging within Lake Champlain; and

d) New York State Department of Environmental Conservation's (2004) publication *Technical and Operational Guidance Series, In-Water and Riparian Management of Sediment and Dredged Material.*

Sediment testing results will determine the dredged material's suitability for ocean disposal or at various upland locations. Material dredged from the Hudson River will not be returned to the river. These sediments will be disposed of in a state approved waste disposal site, in accordance with New York State Solid Waste Regulations.

Sediment samples will be collected at each dredging location using the vibracoring sampling technique. Cores at each crossing will be collected at equidistant points along the crossing and based on the approved sampling plan.

Sediment cores will be visually analyzed for stratification and the sediment color, consistency, any structures present, and odor(s) will be described and recorded. The variation in sediment grain size within each core will be noted and measured from the top of the core prior to the cores being photographed. NYSDEC will be notified of any sediment cores that show distinct grain size stratification prior to compositing. The Certificate Holder will not composite single or multiple cores if grain size, TOC or likelihood of contamination history indicate that individual horizons within the core may be significantly different in sediment contaminant characteristics. Instead, the horizons will be sampled and analyzed separately.

Representative samples from each core will be taken for the analysis of grain size, total organic carbon ("TOC"), and percent moisture. If there is significant stratification or apparent variation in grain size and other properties at any significant interval in a core as determined in the field, NYSDEC will be notified prior to analysis in order to provide guidance on how to proceed.

The storage and preservation procedures for sediment samples prescribed in NYSDEC's Material Management and Testing Manual will be adhered to unless modified procedures are proposed and approved by NYSDEC prior to the commencement of sediment sampling. The sampling and analysis of sediment samples will also be undertaken in conformance with USEPA and USACE requirements.

Best Management Practices for Conventional Dredging

As part of the planning process for dredging, there will be consultations with NYSDEC and USACE at which time the BMPs will be identified for dredging permits prior to dredging. In addition to the requirements set forth in condition 99 of the Certificate Conditions, the following BMPs for conventional dredging may be required:

a) The dredge bucket shall be operated to control the rate of descent and to maximize the depth of penetration without overfilling the bucket;

b) Consideration shall be given to the placement option when selecting a barge type;

c) On-board inspectors shall be assigned to dredging operations to monitor and document compliance with all dredging requirements;

d) Dredging windows for cable installation shall be location-specific within the Hudson Estuary;

e) In order to minimize resuspension of solids, at least 24 hours of settlement shall be required prior to decanting of dredged materials. Barges may not be moved and dredged materials may not be disturbed during the settlement period. If the barge is moved or dredged materials are disturbed prior to decanting, the settlement period must be restarted;

f) The contractor shall demonstrate to the Aquatic Inspector's satisfaction that the bucket dredge operator has sufficient control over the bucket depth in the water and bucket closure so that the sediment resuspension from bucket contact with the bottom and bucket over-filling is minimized.

9.4 NON-BURIAL METHODS

Along the Facility route, areas where non-burial methods may occur include unavoidable bedrock areas, buried and unburied infrastructure and utility crossings, and in areas of potential highly contaminated sediments. In these areas, the HVDC cables will be laid on the lake bed, canal bed, river bed, or seabed with protective coverings. Concurrently, the hydro-plow or water jetting device will be lifted off the bottom, moved forward past the obstacle, and then re-deployed to the bottom once safely across the area of limiting surficial geology, an existing utility crossing, or contamination. Proposed areas where the cable will not be buried will be identified in the Plan and Profile drawings included in the EM&CP.

9.4.1 Cable Protection

In non-burial areas, the HVDC cables will be laid on the lake bed, canal bed, river bed, or seabed, and a protective covering will be installed to prevent cable damage. Alternatives are available for protection that would be selected for each area where cable protection is needed. These alternatives include; grout filled mattresses, articulated concrete mats, Uraduct®, and rock. The protective covering will occupy a portion of the natural substrate and at the same time, would become a new substrate on which aquatic life could colonize. Among alternatives available for cable protection, their potential effect on existing substrates and their value as alternative habitat vary substantially and would be dependent in-part on where they are used. Cable protection methods will be identified on a case-by-case basis after the results of a detailed marine route survey. Typical cable protection alternatives are described below.

For utility crossings, the owner of the utility will be contacted to coordinate the crossing and to identify owner requirements. The selection of a method of protection will include consideration of the utility owner's requirements.

In addition, potential habitat value will be considered when selecting cable protection alternatives especially in sensitive habitats. Cable protection methods can provide usable habitat for invertebrates and fish species. The selection of cable protection will be site specific and will avoid and/or minimize potential impacts. When selecting a cable protection method and size for the proposed and existing utility infrastructure, the following will be taken into consideration and made part of the analysis:

a) Local hydrodynamics;

b) Seabed slope; and

c) Ability of the materials to withstand water quality and sediment parameters (i.e., salinity, pH and temperature).

9.4.1.1 Grout Filled Mattresses

A grout filled mattress typically contains a number of pockets that can be filled with concrete grout. Concrete used in grout filled mattresses will be cured to prevent leaching prior to their use. Grout filled mattresses can be placed in layers to provide protection and areal coverage of the waterbody bed depending on site specific conditions, such as the width of the infrastructure corridor to be crossed. Figures 9-1 and 9-2 show grout filled mattresses that have been laid over a pipe that was placed on or just below the waterbody bottom. The grout filled mattress can then be carefully lifted and placed on the lake bed, canal bed, river bed, or seabed to provide direct protection to the cable which has been laid directly on the waterbody bottom.

Proposed areas where grout filled mattresses may be used will be identified in Plan and Profile drawings included in the EM&CP, following a detailed marine route survey.

9.4.1.2 Articulated Concrete Mats

Articulated concrete mats consist of concrete blocks interconnected by polypropylene ropes or steel cable forming a mat of selected sizes (Figure 9-3). The polypropylene ropes or steel cable between concrete blocks allow the articulated concrete mats to flex so that it can conform to the bottom, creating a low profile covering. Where steel cables are used, they will be galvanized or otherwise made impervious to corrosion, rust and degradation. Articulated concrete mats can be placed in layers to achieve greater amounts of protection if required, while maintaining as low of a profile as possible to avoid effects on local hydrodynamics and localized sedimentation. The articulated concrete mats are lifted off barges and lowered into the water and placed directly over the cable using a crane. Positioning is typically monitored by divers.

Proposed areas where articulated concrete mats may be used will be identified in Plan and Profile drawings included in the EM&CP, following a detailed marine route survey.

9.4.1.3 Uraduct®

Another option for cable protection is Uraduct®. Uraduct® is comprised of cylindrical half shells molded from a range of marine grade polyurethanes. The half shells overlap and interlock to form close fitting protection around the cables (Figure 9-4). Uraduct® is a custom made system and is manufactured to suit the type of cable, the level of protection required and location. An advantage of using Uraduct® is that it can be applied concurrently with cable installation. In addition, as it encapsulates the cable, it has a minimal vertical relief and does not cover the waterbody bed. Uraduct® may be used by itself or in conjunction with other protection measures as the site conditions require.

Proposed areas where the Uraduct® may be used will be identified in Plan and Profile drawings included in the EM&CP, following a detailed marine route survey.

9.4.1.4 Rock or Rip-Rap

Rock or rip-rap will be sized to remain in place under current and wave conditions expected at the site. Rock or rip-rap will be lowered from a supply barge using either a closed (clamshell) bucket dredge or an excavator. Rock or rip-rap placement will be monitored by divers to prevent over-or-under-placement of material.

Proposed areas where rocks or rip-rap may be used will be identified in Plan and Profile drawings included in the EM&CP, following a detailed marine route survey.

10.0 TRANSPORTATION AND UTILITY CROSSINGS

During Facility construction, minor and temporary impacts to existing infrastructure are possible where these features will be crossed by the cable route. In areas where the cables cross existing infrastructure such as roads, buried utility lines, or other features, the Certificate Holders will evaluate the impacts associated with each infrastructure crossing to determine whether open trenching or a trenchless method is appropriate. In addition, the Certificate Holders will coordinate with state and local authorities, railroad companies, and utility owners to minimize disruption of existing features to the greatest extent possible. CHPEI will join "Dig Safely New York" and DigNet and will coordinate with them for any underground construction work.

10.1 ROAD AND HIGHWAY CROSSINGS

Existing roadways will be crossed along the overland portions of the Facility, primarily along railroad rights-of-way. This section identifies the typical procedures to handle these crossings.

10.1.1 Preconstruction Planning

Where installation of the proposed cable will occur within a road or highway right-of-way, the Certificate Holders will contact the jurisdictional municipality or regulatory agency to ensure appropriate protection and safety measures are employed. The local jurisdictional entity could be the Town, Village, or County highway departments, the New York State Thruway Authority, or the NYSDOT. In preparing the EM&CP, the Certificate Holders shall consult with each transportation department or agency normally having jurisdiction over any roads, related structures, and rail facilities in the Facility vicinity that will be crossed by the certified facilities, or used for direct access to the ROW.

Where New York State highway right-of-way is to be occupied, all work will be performed in accordance with 17 NYCRR Part 131 of the Highway Law covering Accommodation of Utilities within State Highway right-of-way and the applicable design standards of the American Association of State Highway Transportation Officials ("AASHTO"), the guidance in *Requirements for the Design and Construction of Underground Utility Installations within the State Highway Right-of-Way* (NYSDOT 2007), the *Manual of Uniform Traffic Control Devices* ("MUTCD") (NYSDOT 2008b, USDOT 2009), the *Highway Design Manual* (NYSDOT), the *Policy and Standards for Entrances to State Highways* (NYSDOT), the *Requirements for the Design and Construction of Underground Utility Installations with the State Highway ROW* (NYSDOT 2007), the *Accommodation Plan* (NYSDOT 1995), and the NYSDOT 2008 *Standard Specifications*. Highway work permits will be required for any work in, on, over, or above State highway right-of-way, which includes facilities such as shoulders, guiderails, clear zones, vegetated areas, slopes, and drainage facilities in addition to the paved roadway. The Certificate Holders or their construction contractor on their behalf shall obtain highway work permits and use and occupancy permits from NYSDOT pursuant to 17 NYCRR Part 131, including, if necessary, the exception to the Accommodation Plan for Longitudinal Use of Freeway Right-of-Way by Utilities, for the construction, operation, and maintenance of the Facility in the right-of-way of State highways.

The Certificate Holders will coordinate with DPS and NYSDOT for all work to be performed in the State rights-of-way. Prior to submitting construction plans for any State right-of-way segment, the Certificate Holders will provide to DPS and NYSDOT a preliminary design marked to avoid conflict with potential future transportation projects that NYSDOT may seek to undertake in the future and shall offer to consult with NYSDOT concerning any comments it may offer and will use reasonable efforts to accommodate any NYSDOT concerns.

Prior to the start of in-street work, underground utilities that may be crossed or paralleled by the cable route will be identified and marked in the field. Owners of these other utilities will be notified in accordance with the requirements of 16 NYCRR Part 753.

The Certificate Holders will examine existing conditions and traffic flow and volume patterns to determine the appropriate construction methods for the area. Where in-road work will be extensive enough to require detours or road closings, a Maintenance and Protection of Traffic ("MPT") Plan will be completed in consultation with all affected agencies prior to the start of construction.

Maintenance and protection of traffic, including protection of the public from damage to persons and property within the limits of and for the duration of work within the state right-of-way, will be done in full conformance with the Section 619 – *Maintenance and Protection of Traffic of the NYSDOT Standards Specifications for Construction and Materials* (NYSDOT 2008a), and all addenda thereto. Additionally, all maintenance and protection of traffic activities, materials, and construction details will comply with the *Manual of Uniform Traffic Control Devices* (NYSDOT 2008b, USDOT 2009) and permits issued by NYSDOT. Short term and long term impacts due to construction on the roadways / crossings including the level of service will be evaluated in the EM&CP.

The Certificate Holders will consult periodically with state and municipal highway transportation agencies about traffic conditions near the Facility site and will notify each such transportation agency of the approximate date work will begin in its jurisdiction, using access points that take direct access from highways in that jurisdiction.

10.1.2 Road Crossing Methods

One of two basic road crossing methods will be used during construction: trenched (open cut) or trenchless (boring, or HDD). It is anticipated that the majority of crossings will be completed utilizing trenchless techniques, resulting in minimal disruption of existing traffic patterns. All crossings will be done perpendicular, or as close to perpendicular as feasible, to the roadway.

Typical roadway crossings are shown in Figures 10-1 through 10-4.

10.1.2.1 Trenched or Open Cut

Open cuts will be conducted where HDD is not feasible due to subsurface rock formations, excessive presence of boulders, or insufficient right-of-way to allow jacking, boring, etc.

The following specifications will apply for trenched road crossings:

a) Owners or operators of other underground utilities in the area will be consulted during the EM&CP development and notified no less than thirty (30) days prior to the start of construction. Notice provided after normal business hours or on weekends will not begin the notice period;

b) All existing underground facilities will be marked prior to the initiation of cutting or excavation;

c) Tree limbs, shrubs, cobble stones, or any other natural or man-made features that are at risk of damage will be temporarily moved, protected, or removed and stored. Where landscaping trees are affected, an arborist will be consulted regarding root cutting and pruning;

d) Detours, signage, and public notice will be posted no later than twenty four (24) hours prior to the initiation of construction;

e) Traffic flow will be provided in at least one lane of the road at all times or a detour will be provided. Flaggers or temporary traffic lights will be used where necessary to control traffic flow;

f) Any water control devices (roadside ditches, culverts, etc.) disturbed during excavation or construction will be restored immediately after cable installation;

g) Temporary restoration of the roadway will occur immediately after the cable is installed; and

h) All work within State highway right-of-way will be conducted in accordance with a highway work permit issued by NYSDOT and the requirements of 17 NYCRR Part 131.

10.1.2.2 Trenchless – Horizontal Directional Drilling or Jack and Bore

HDD and J&B and are common techniques used for transmission cable installation projects to avoid and/or minimize environmental impacts. Additionally, trenchless installation is a preferred technology because it minimizes surface disruption, restoration costs (roads, infrastructure), impacts on residents and businesses, and the volume of earth removal and long-term costs of trench settlement. The technology is used in many situations including the following: lake crossings, wetland crossings, canal and watercourse crossings, valley crossings, sensitive wildlife habitat, and road and railway crossings. The HDD and J&B processes are described in detail in Section 8.0.

The following specifications will apply for trenchless crossings of roads:

a) Owners/operators of other underground utilities in the area will be consulted during the EM&CP development and notified no less than thirty (30) days prior to the start of

construction. Notice provided after normal business hours or on weekends will not begin the notice period;

b) All existing underground facilities will be marked prior to the start of drilling or boring;

c) Jacking and receiving pits adjacent to the road shoulder will be clearly identified and barricaded to prevent them from being a hazard to pedestrian or vehicular traffic;

d) HDD or J&B entry and exit points will be fenced and marked if left open overnight; and

e) All work within State highway right-of-way will be conducted in accordance with a highway work permit issued by NYSDOT.

10.1.3 Longitudinal In-Road Construction

The following specifications will apply where the cable will be installed longitudinally within the roadway or its shoulder:

a) Owners/operators of other underground utilities in the area will be consulted during the EM&CP development and notified no less than thirty (30) days prior to the start of construction. Notice provided after normal business hours or on weekends will not begin the notice period;

b) All existing underground facilities will be marked prior to the initiation of cutting or excavation;

c) Tree limbs, shrubs, cobble stones, or any other natural or man-made features that are at risk of damage will be temporarily moved, protected, or removed and stored. Where landscaping trees are affected an arborist will be consulted;

d) Detours, signage, and public notice will be posted no later than twenty four (24) hours prior to the initiation of construction;

e) All areas of open trench unable to be plated will be barricaded and lit with warning lights prior to the end of the construction day;

f) Driveways and drainage ditches will be temporarily restored at the end of each working day;

g) Access to driveways will be maintained to the maximum extent practicable;

h) Temporary patch of asphalt road cuts will begin immediately after backfill;

i) Temporary patch of major road damage (i.e., ruts, potholes, grade loss, etc.) will begin immediately after backfill; and

j) All work within State highway right-of-way will be conducted in accordance with a highway work permit issued by NYSDOT.

10.1.4 Signs

Traffic and construction signage will be provided in accordance with the *NYSDOT's Manual of Uniform Traffic Control Devices* (NYSDOT 2008b) and, within State highway right-of-way, a highway work permit issued by NYSDOT. Placement of signs will be determined in consultation with the applicable jurisdictional agency. At a minimum, signs will be placed at the following distances:

a) Signs announcing construction at one thousand (1,000) and five hundred (500) feet;

b) Signs picturing workers at three hundred (300) feet; and

c) Blast warning signs at one thousand (1,000) feet, if blasting is to take place within fifty (50) feet of the road.

Flaggers will be present at all times when equipment is crossing any road, when equipment is being loaded or unloaded, and where two lane traffic has been reduced to one lane. All flagging operations will comply with 17 NYCRR Part 131.

10.1.5 Repairs and Restoration

Restoration of roadways will be designed in consultation with the appropriate jurisdictional agency. Any restoration on NYSDOT highway rights-of-way shall be in strict compliance with the specifications of a NYSDOT highway work permit. Restoration of any road surface will generally follow the sequence outlined below:

a) Return of road shoulders (maximum fifteen (15) feet) to original grade immediately following backfill;

b) Placement of a temporary road surface will take place immediately after backfill in accordance with state or municipal standards or permit requirements;

c) Permanent repair of asphalt roads as soon as practicable, but in any event within six (6) months of backfill;

d) Permanent repair of other roads damaged during construction will occur during final restoration of that segment of the Facility route;

e) Permanent repair of dirt and gravel roads (ruts, potholes and loss of grade) will occur during final restoration; and

f) Permanent repair of shoulder, guiderail, drainage, clear zone, signs, and other highway and railroad conditions.

10.2 RAILROAD CROSSINGS

Active rail lines will be crossed using trenchless methods, not by open cut trenching. The following measures will be followed for all railroad crossings:

a) The railroad right-of-way will be surveyed for the presence of underground utilities and structures;

b) Owners/operators of other underground utilities in the area will be consulted during the EM&CP development and notified no less than thirty (30) days prior to the start of construction. Notice provided after normal business hours or on weekends will not begin the notice period;

c) NYSDOT will be notified of any crossings of railroad lines;

d) All existing underground facilities will be marked prior to the initiation of cutting or excavation;

e) The Certificate Holders will coordinate all work with the owner/operator of the rail line to ensure the safety and integrity of the HVDC cable and railroad facilities crossed;

f) In the event that the railway is abandoned or the operator has no specifications, the Certificate Holders will refer to and apply construction specifications provided by the American Railroad Engineers Association; and

g) Any temporary or permanent crossing of an intercity rail passenger line or commuter rail service line must be applied for and approved by NYSDOT, pursuant to Section 97 and Section 97-a of the Railroad Law.

10.3 UTILITY CROSSINGS

Additional precautions, as described below, to avoid damage to existing electric, gas, telecommunication, water, wastewater, sewer and stream facilities that could be affected by the siting or construction of the Facility and to ensure the safety of workers. Existing facility owners will be contacted prior to the beginning of any pre-construction activities and throughout the Facility design process, and protection measures and specifications for existing utility facilities will be negotiated with the facility owners and filed with the Commission for approval in EM&CP documents and plans. Additional measures for the protection of utility infrastructure are set out in Certificate Conditions 27 to 29 and must also be complied with.

10.3.1 Overhead Electric Facilities

The Facility will cross many overhead electric facilities along the Facility route. Impacts to these facilities are expected to be minimal given the underground installation of the Facility.

10.3.1.1 Perpendicular Crossings

The following specifications will apply where construction or pre-construction activities are undertaken in an overhead electric line right-of-way:

a) The utility responsible for the operation and maintenance of the overhead electric line will be contacted and consulted throughout the siting and construction process concerning the proposed crossing as described in greater detail in Conditions 27 to 29 of the Certificate;

b) The responsible utility will be consulted concerning "safe minimum clearance" for construction machinery;

c) All guy wires, ground lines, and other surface or subsurface supports or facilities will be located prior to the initiation of construction; and

d) Depending on the length of cable to be installed, the voltage of the electric line to be crossed, and existing weather and topography, the cable and the associated construction equipment may need to be temporarily grounded. This activity will be performed in compliance with the National Electrical Safety Code ("NESC"), as applicable.

10.3.1.2 Overhead Linear Right-of-Way Co-occupation

The following specifications will apply where the cable will parallel an overhead electric line right-of-way:

a) The Certificate Holders will contact the owner of the overhead utility to determine appropriate safety precautions and minimum clearance requirements;

b) If voltages warrant, no ungrounded vehicle will be allowed within two hundred (200) feet of the electric line;

c) All vehicles on the right-of-way will be grounded if necessary by use of grounding strips or chain devices;

d) Vehicles parked overnight on the right-of-way will be grounded to an embedded ground rod by a cable;

e) Fuel trucks will have sufficient ground cables and clamps to complete an electrical bond with every vehicle to be refueled; and

f) The Safety Inspector will monitor construction equipment and warn operators if the safe minimum clearance zone is entered.

10.3.2 Underground Utility Crossings on the Overland Route

The following specifications will apply to construction and pre-construction activities in connection with underground utility crossings on the overland route:

a) The proposed Facility area will be surveyed for the presence of existing underground utilities to be crossed;

b) Owners/operators of other underground utilities in the area will be consulted during EM&CP development and notified no less than thirty (30) days prior to the start of construction;

c) All existing underground facilities will be marked prior to the initiation of cutting or excavation; and

d) Owners of the facilities crossed will be contacted no later than thirty (30) days prior to the initiation of construction and will be given all reasonable opportunity to be present during excavation and construction.

Typical underground utility crossings are shown in Figures 10-5 and 10-6.

10.3.2.1 Underground Linear Right-of Way Co-occupation

The following specifications will apply where the cable will parallel an underground electric line right-of way:

a) In situations where the cable will parallel an underground electric line right-of-way, the Certificate Holders will contact the owner or operator of the underground utility to determine appropriate safety precautions and minimum clearance requirements.

b) Owners/operators of other underground utilities in the area will be consulted during EM&CP development and notified no less than thirty (30) days prior to the start of construction.

10.3.3 Underwater Utility Crossings

The HVDC underwater cable route encounters numerous areas where existing submarine infrastructure (e.g., electric cables, gas pipelines, ferry cables, wastewater outfall pipes and diffusers, etc.) will need to be crossed. Crossings of utilities owned by a third party, such as present and planned cables, pipelines, wastewater outfall pipes and diffusers, and bridges will likely require crossing or co-location agreements, which may be negotiated in the preparation of the EM&CP for that segment of the Facility. Protection at crossings will be subject to these agreements as well. Details of some cable and pipeline positions and depth of burial may be privileged information which will be available in the crossing agreements. Proximity to existing utilities may vary and is dependent on state regulations, waterbody, and owner/operator. Detailed discussions on coordination, design and installation methodologies and safety issues

will be conducted with the owners of these infrastructures. After cable installation, the owners of the utilities will be notified within thirty (30) days of completion of work.

There are several different installation techniques that can be utilized when crossing existing infrastructure based on the type, burial depth, and existing protective coverings of the infrastructure. In many cases, it is anticipated that the underwater cables will be laid over the existing infrastructure with protective coverings (e.g., grout filled mattresses, articulated concrete mats, Uraduct®, or rock). The design of utility crossings will follow industry standards and the infrastructure co-location agreements. Many of the crossing types described below will utilize a protective sleeve applied to the new cable during installation to ensure minimum separation at the crossing point. The sleeve must extend a minimum of approximately fifteen (15) feet from each side of the crossing utility. The installed length will be sixty (60) to seventy five (75) feet to ensure this requirement is met.

10.3.3.1 Bridges

The proposed underwater cable passes under several bridges along the cable route. For each bridge crossing, the Certificate Holders will coordinate with the owner of the bridge regarding clearances, distance from abutments and existing infrastructure, cable burial and installation methods. Horizontal and vertical clearances for cable installation will be provided for final design included in the EM&CP. The Certificate Holders will provide notice to, and coordinate with NYSDOT for any bridge, regardless of ownership, that provides a crossing for, over, or under any street or highway.

10.3.3.2 Crossing Chain Ferry

A “chain-ferry” operates across the underwater cable route within Lake Champlain. The chain ferry utilizes ferry cables laid on the bottom of Lake Champlain. Typical penetration of the ferry cables into the lakebed will be assessed and if necessary, additional protection in the form of deeper HVDC cable burial at the crossing point or the use of an outer protection sleeve against abrasion will be installed. It is likely that the ferry cables will be temporarily removed to facilitate the installation of the underwater cables. The ferry cables will then be replaced over the top of the transmission cables. The ferry operator reports that its chains are replaced every four years; therefore, there may be an opportunity to coordinate the chain installation schedule with the ferry cable replacement schedule. Detailed coordination with the ferry operator will be required regarding cable installation techniques and timing.

10.3.3.3 Crossing of Fiber Optic and Telecommunication Cables

Crossing of a Fiber Optic (FO) or telecommunication cable, where feasible, will be at ninety (90) degrees for approximately one hundred and fifty (150) feet on each side of the cable. Within a distance of three hundred (300) feet of the crossing, the method of cable burial and protection will be selected based on the existing burial depth of the FO or telecommunication cable. The HVDC cables, including the section with sleeve protection, will be buried by water jetting or plowing to the specified depth, or as limited by the actual burial depths of the existing cables.

In some cases, existing telecommunication cables are buried less than three (3) feet; therefore, special measures may be utilized at the crossing site. Potential measures used for crossing shallow buried existing utilities may include the following: the use of protective sleeves on the HVDC cables along with burial until touching the existing cables, increasing the burial depth of the existing cables by water jetting at the crossing point prior to installing the HVDC cables, or cutting and re-splicing the telecommunication cables after installing the HVDC cables.

10.3.3.4 Crossing Over Gas or Oil Pipeline and Power Cables

It is assumed that the pipeline is buried to a depth that leaves the top of the pipeline at seabed level. Crossing of a pipeline will likely be at ninety (90) degrees for approximately three hundred (300) feet on each side of the pipeline at a mutually agreed position.

For deep-buried pipelines or cables, a protective sleeve will be applied to the HVDC cables at each crossing to provide a minimum separation between the HVDC cables and the existing infrastructure. The sleeve will be installed for up to eighty (80) feet to ensure that it will target the crossing point. The HVDC cables, including the portion with sleeve protection, will be buried by water jetting or plowing to the target depth or as limited by the actual burial depths of the existing pipeline or cable.

In instances where the existing pipeline or cable burial is shallow, a minimum separation between the new cable and the other cable or pipeline could be provided by pre-installing a grout filled mattress on top of the infrastructure at each crossing. The HVDC cables and the other cable or pipeline would then be post-lay protected. Exact specifications for each pipeline or cable to be crossed will be detailed in the EM&CP.

10.3.3.5 Crossing Under Gas or Oil Pipeline

Crossing under an existing pipeline may be feasible by HDD. At these types of crossings a HDPE conduit will be used to pull the cable. The HDPE pipe will be accessible above the seabed until the cable has been pulled through. Then the pipe ends could be jetted to the level of the cable at the entry and exit points. The pipe angle will likely be kept low to ease pulling and to avoid potential risk of upward force acting on the existing pipeline.

References - Section 10.0

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11.0 GENERAL CLEANUP AND RESTORATION

Prompt cleanup and restoration of all areas disturbed by construction activity is a priority of the construction schedule and sequencing. Timely cleanup and restoration assists in minimizing potential environmental impacts associated with the Facility. Procedures for cleanup and restoration are described in the following sections.

11.1 CLEANUP

During construction, the right-of-way will be kept free of debris and discarded material to the extent possible. As construction continues, each section of the right-of-way will be thoroughly cleaned after construction is completed on that particular section. Vegetation to be cleared will be identified on a site-specific basis on the EM&CP Plan and Profile drawings. Cleared vegetation will be disposed of in accordance with the appropriate disposal techniques described in Section 5.0. All fabricated debris resulting from construction will be disposed of at a State approved solid waste disposal site in compliance with all applicable environmental regulations. Trucks leaving the construction area will be loaded, pruned, and covered in accordance with applicable regulations. Under no circumstances will any fabricated or vegetation debris be burned or buried either on or off the right-of-way.

The Certificate Holders will remove existing debris from the Facility Construction ROW and will keep the permanent ROW free and clear of debris.

11.2 RESTORATION

The final stage of construction will consist of restoring the transmission cable right-of-way and work areas to their original condition and character as much as possible, compatible with the operation and maintenance of the Facility. The following section describes the restoration procedures in upland, non-agricultural areas within the overland route. For procedures in roadways, wetlands, and agricultural lands, refer to Sections 10.1.5, 19.0, and 20.7, respectively.

11.2.1 Non-Agricultural and Non-Urban/Residential Areas

11.2.1.1 Grading

Upon completion of the installation of the overland transmission cable, the surface of the right-of-way disturbed by construction activities will be graded to match the original topographic contours and to be compatible with surrounding drainage patterns, except at those locations where permanent changes in drainage will be required to prevent erosion that could lead to possible exposure of the cable. Where the trench areas have settled below ground level, it may be necessary to import topsoil to return an area to grade. HDD entry pits will be backfilled and the disturbed ground surface will be similarly graded.

11.2.1.2 Lime Application

Lime will be applied to the soil surface where necessary to achieve conditions favorable for seed establishment and development. The local Soil and Water Conservation District will be consulted regarding appropriate lime application rates. Lime will be applied under the direction and supervision of the Environmental Inspector.

11.2.1.3 Fertilizing

In areas where construction has affected the soil nutrient levels, fertilizer will be applied to restore soil productivity. The local Soil and Water Conservation District will be consulted regarding the appropriate formula and application rates for the affected areas. Fertilizer will be applied under the direction and supervision of the Environmental Inspector.

11.2.1.4 Aerating and Raking

Soil compaction in construction areas frequently occurs as a result of the movement of heavy equipment over soil. Soil compaction in the right-of-way is expected to be minimal because most vehicles and equipment will either be mounted on the track, or operating from existing access roads or fill associated with the railroad embankment. However, if compaction occurs, soils will be aerated. Aeration in grassy areas will be accomplished through the use of a mechanical power aerator. Following use of the aerator, the area will be thoroughly raked. If soil is compacted below trees, the area below the tree canopy will be aerated by probing holes in the soil, which then will be backfilled with clean sand.

11.2.1.5 Seeding and Planting

Seeding operations will commence only after an acceptable seedbed has been established, as described above. Seed will be applied by hand, cyclone seeder, drill, or culti-packer-type seeder at a depth of one-quarter (0.25) to one-half (0.5) inch. The seedbed will be firmed following seeding operation with a roller or light drag, except where culti-packer-type seeders or hydro-seeders are used. The entire seeded area will be watered with a fine spray until a uniform moisture depth of one (1) inch has been obtained. Mulching and anchoring of the mulch may be necessary in some areas (Section 20.6.3). On steep slopes, jute net will be used to provide stabilization. Fertilizer will be added at the appropriate rates after seed is applied. Seeding will take place under the supervision of the Environmental Inspector.

The seed mixture and rate of application will depend on the soil type, land use, available moisture, and season at the time of application. The local Soil and Water Conservation District and the landowner/operator will be consulted regarding appropriate seed mixtures and application rates. All seed mixes will be free of invasive species. All seedbag tags will be provided to the Environmental Inspector. Seeded areas will be monitored following restoration until a minimum vegetative cover of eighty (80) percent is achieved.

Where tree or shrub plantings are prescribed on the EM&CP, a post construction survival survey will be preformed one year after the plantings. If any tree or shrub has not survived or is in poor health, the tree/shrub will be replaced.

11.2.2 Restoration – Urban/Residential

Construction in urban or residential areas may require a variety of restoration activities. Above-ground and underground structures (*e.g.*, those related to water and gas services), street pavements, curbs, sidewalks, and other features may require repair or replacement as a result of construction.

Curbs, sidewalks, and streets damaged by construction will be restored to pre-existing condition or better. The Certificate Holders will consult, where applicable, the municipal road or highway department and/or the Regional Office or County Engineer of the NYSDOT in order to identify and incorporate applicable specifications for curb, sidewalk, or street restoration.

Except where replacement would inhibit or impair the safe operation of the cables, shade trees and ornamental shrubs disturbed or damaged by construction will be repaired or replaced, following construction. All vegetation replaced will have a minimum two (2) year survival guarantee. Limbs damaged by construction activities will be pruned to arboricultural specifications. Root loss or damage due to construction or construction-related soil compaction will be addressed by a trained arborist, and any prescribed treatments will be followed.

Groundcover will be restored in areas such as yards and lawns. Restoration work will include the spreading of topsoil, planting of native grass mixtures, and replacement of any damaged extant vegetation, if necessary.

11.2.3 Restoration – Railway Ballast

Upon completion of the installation of the overland transmission cable, the surface of the right-of-way disturbed by construction activities will be graded to match the original topographic contours and to be compatible with surrounding drainage patterns. Soil compaction in construction areas in the right-of-way is expected to be minimal because most vehicles and equipment will be operating from existing access roads or fill associated with the railroad embankment. Backfill or fill will be compacted to match surrounding grade. The ground cover will be returned to pre-existing conditions, by revegetating the ballast or stabilizing with ballast stone. To ensure proper restoration and protection of the railway ballast, CP and CSX will be consulted to ensure restoration meets the engineering requirements of the railways.

12.0 SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

12.1 REGULATORY CONCERNS

The Certificate Holders and its EPC Contractor will comply with all federal, state and local laws, regulations and regulatory agreements pertaining to immediate and follow-up reporting of environmental spills or releases of petroleum products or hazardous substances that occur during the construction phase of the Facility. While it has not been established at this point that the combined capacity of the oil-filled containers and equipment in use will be greater than one thousand three hundred and twenty (1,320) gallons at any one time, due to the potential for a discharge to waters of the United States a detailed SPCC Plan or its equivalent will be developed by the selected EPC Contractor for the Facility.

Federal Authority

If a facility or vessel discharges oil to navigable waters or adjoining shorelines, waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or Deepwater Port Act of 1974, or which may affect natural resources under exclusive United States authority, the owner/operator is required to follow certain federal reporting requirements. These requirements are found in two USEPA regulations – 40 CFR Part 110, Discharge of Oil regulation, and 40 CFR Part 112, Oil Pollution Prevention regulation.

Any person in charge of a vessel or of an onshore or offshore facility is subject to the reporting requirements of the Discharge of Oil regulation if it discharges a harmful quantity of oil to United States navigable waters, adjoining shorelines, or the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or Deepwater Port Act of 1974, or which may affect natural resources under exclusive United States authority.

A harmful quantity is any quantity of discharged oil that violates state water quality standards, causes a film or sheen on the water's surface, or leaves sludge or emulsion beneath the surface. For this reason, the Discharge of Oil regulation is commonly known as the "sheen" rule. Note that a floating sheen alone is not the only quantity that triggers the reporting requirements (e.g., sludge or emulsion deposited below the surface of the water may also be reportable).

Under this regulation, reporting oil discharges does not depend on the specific amount of oil discharged, but instead can be triggered by the presence of a visible sheen created by the discharged oil or the other criteria described above. Any facility owner/operator who is subject to the SPCC rule must comply with the reporting requirements found in §112.4.

A discharge must be reported to the USEPA Regional Administrator ("RA") when there is a discharge of:

a) More than one thousand (1,000) U.S. gallons of oil in a single discharge to navigable waters or adjoining shorelines; or

b) More than forty two (42) U.S. gallons of oil in each of two discharges to navigable waters or adjoining shorelines occurring within any twelve (12) month period.

When determining the applicability of the federal reporting requirement, the gallon amount(s) specified (either one thousand (1,000) or forty two (42)) refers to the amount of oil that actually reaches navigable waters or adjoining shorelines, not the total amount of oil spilled[1].

State Authority

Under the New York State Navigation Law, the person responsible for a discharge of petroleum must report the incident to the NYSDEC within two (2) hours of discovery. The law defines a discharge as "*any intentional or unintentional action or omission resulting in the releasing, spilling, leaking, pumping, pouring, emitting, emptying or dumping of petroleum into the waters of the state or onto lands from which it might flow or drain into said waters, or into waters outside the jurisdiction of the state when damage may result to the lands, waters or natural resources within the jurisdiction of the state.*"

For spills of chemicals other than petroleum, the New York State Hazardous Substance regulations (6 NYCRR Part 595) apply. According to these regulations, a "release" is defined as "any unauthorized pumping, pouring, emitting, emptying, overfilling, spilling, leaking, leaching, or disposing, directly or indirectly, of a hazardous substance or any other substance which results in the formation of a hazardous substance upon release so that the substance or any related constituent thereof, or any degradation product of such a substance or of a related constituent therefore, may enter the environment." Under these regulations, a "spill" is defined as "any escape of a substance from the containers employed in the normal course of storage, transfer, processing, or use."

Given that the Facility involves cable installation for many miles on land with wetlands, streams, and upland areas crossed as well as many more miles of cable installation on the bottom of Lake Champlain and the Hudson, East and Harlem Rivers, the requirements for spill prevention, control and countermeasures are varied. The Certificate Holders are committed to constructing the Facility in an environmentally sensitive manner, and will have contractual specifications for the construction contractor(s) to comply with the necessary federal and state regulations, and in one instance, international standards, associated with spill prevention, control, cleanup and reporting for spills occurring during the construction of the Facility.

12.2 SPILL CONTROL EQUIPMENT

The EPC Contractor will have the appropriate on-site personnel to control the source of the spill, release or leak and contain the spill, release or leak in as small an area as possible. To accomplish this, the EPC Contractor may utilize various types of control and cleanup methods and equipment depending on the spill location, material released and its volume.

[1] *Please see* "A Facility Owner/Operator's Guide to Oil Pollution Prevention," page 6, published by EPA in June 2010. *Available at* www.epa.gov/osweroe1/docs/**oil**/**spcc**/**spcc**bluebroch.pdf

12.2.1 Overland Construction Locations

A detailed SPCC Plan or its equivalent will be developed by the selected EPC Contractor for the overland portion of the Facility. For overland portions of the Facility, the EPC Contractor will immediately mobilize the appropriate on-site personnel to control the source of the leak and contain the spill or release in as small an area as possible. Activities include stopping the leak, deployment of on-site spill supplies, construction of earthen berms, etc.

Appropriate equipment, supplies and materials for containment and cleanup of oil and hazardous substances will be kept at the construction site(s) (i.e., construction site work area with ongoing construction activities and construction staging area) in the event of a spill. These materials include, but are not limited to, the following:

a) Commercially available spill kits for construction equipment;

b) Sorbents for containment and quick pick up of spilled liquids;

c) In-ground or above-ground containment structures such as berms, gutters, dikes, culverts, holding tanks, sumps, and collection systems;

d) Shovels, backhoes, etc., for excavation of contaminated materials;

e) Drums, barrels, temporary storage bags for containment and transportation of contaminated materials;

f) Absorbent pads, oil booms, mats, or equivalent; and

g) Washable, reusable rags for cleaning up small lubricant leaks onto machinery.

Spill control supplies will be clearly marked and readily accessible. Personnel will be instructed on their use prior to the start of construction.

It is the Certificate Holders' responsibility to ensure that spills are properly cleaned up by the EPC Contractor. This will be done by having the EPC Contractor clean up the spill followed by the Environmental Inspector verifying the cleanup has been successfully completed. It is the EPC Contractor's responsibility to properly dispose of spill cleanup wastes including contaminated soil, vegetation or water. In general, the following procedures will be followed:

a) Contaminated soil, vegetation, or water will be cleaned up in accordance with all NYSDEC guidance and regulations that are relevant to the spill material. The types and quantity of spill material as well as the method used for cleanup will be documented in writing by the personnel cleaning up the spill using the forms developed for the Spill/Release Cleanup and Reporting Guidelines.

b) All contaminated soil, vegetation or water will be collected and containerized as required by federal and state regulations and in accordance with the soil management plan

developed for this Facility. Contaminated materials will be collected until no visible or olfactory evidence of material spilled during construction remains;

c) Additional media specific testing of the spill location may be required to document adequate cleanup levels have been attained, based on federal and state regulations;

d) Testing may be required to determine the appropriate method of disposal. Analytical testing will be completed and documented by a qualified person. Based upon the results of the analytical testing, the material may be taken to an approved solid waste landfill or an approved hazardous waste treatment facility. No disposal of materials at the construction site or other work areas will be permitted; and

e) All cleanup and disposal operations will be monitored by the Environmental Inspector. The EPC Contractor will provide the Environmental Inspector with all the documentation associated with Spill/Release Cleanup Reports.

12.2.2 Vessels and Equipment Operating on the Water

Refer to Section 12.9 for further details concerning on-water and underwater spill prevention, control and countermeasures. Under the provisions of Section 312 (f)(3) of the Clean Water Act ("CWA") the Hudson River has been designated a no discharge zone with respect to discharges from marine sanitation devices ("MSD"). Vessels operating on the Hudson River equipped with type I or II MSD's must disable the capability of the MSD to discharge overboard in accordance with Section 33(e) NYS Navigation Law.

Any vessel greater than 79 feet LOA must comply with the requirements of the Vessel General Permit (VGP) and the applicable New York State Water Quality Certification conditions. http://cfpub.epa.gov/npdes/vessels/vgpermit.cfm

12.3 STORAGE AND HANDLING

This section covers storage and handling of fuels, oil, lubricants and other potentially hazardous materials for the overland construction activities. The transportation, handling, and storage of hazardous materials will be conducted in compliance with 49 CFR Parts 100-185 (US DOT Pipeline and Hazardous Materials Safety Administration). Construction materials will be stored in a manner that minimizes exposure to precipitation and runoff, where appropriate, or otherwise to prevent the contamination of stormwater and the environment.

Building component materials that are normally exposed to precipitation while being stored will be placed in upland areas away from all stormwater conveyances and will be stored in a manner that will not concentrate runoff. The EPC Contractor will have only the minimal amount of material at each work site necessary to complete the work at that site.

All construction materials stored onsite will be stored in a neat, orderly manner in appropriate containers with appropriate labels. Products will be kept in their original containers with the original manufacturer's label, unless the containers are not re-sealable and manufacturer's

recommendations for proper use and disposal will be followed. Original labels and Material Safety Data Sheets ("MSDS") will be retained for the period of time that the product is being utilized onsite in accordance with all applicable OSHA regulations (29 CFR 1926.33). Containers will not be stored on the ground, but will be stored in cabinets or on a stable working surface such as a portable trailer bed or other secure decking. Hazardous materials will be kept in restricted access areas and kept separate from other construction activities. Containers will be kept closed unless the material is being transferred. All transfer operations will be monitored and not left unattended.

The EPC Contractor will not store, mix or load chemicals labeled toxic or petroleum products within one hundred (100) feet of a wetland, river, creek, stream, lake, reservoir, spring, well or other ecologically sensitive site or existing recreational area along the Facility route. This applies to storage and does not apply to normal operation or use of equipment in these areas. All employees and/or other handlers of hazardous materials will be properly trained and instructed on the proper reporting and handling requirements.

12.3.1 Equipment Refueling

Field Refueling

a) When refueling land based vehicles, the EPC Contractor personnel or contractors at field locations are to bring vehicles or equipment to a designated access area located a minimum of one hundred (100) feet away from environmentally sensitive areas (such as wetlands, streams or drinking water sources). The contractor will coordinate with the Environmental Inspector to determine the appropriate location for all refueling operations. Paved areas are not preferred. These areas will be properly contained to prevent excess spillage during routine refueling. Spill containment devices and materials will be readily accessible at the refueling site. Any effluent resulting from these sites will be contained, treated or disposed of, as appropriate. The driver is to take all usual and reasonable environmental and safety precautions during refueling, such as connecting a safety grounding strap between the fuel tank and vehicle or equipment being refueled. The driver is also to frequently check for fuel spills, drips, or seeps during the refueling operation.

b) Small equipment such as pumps and generators will be placed in small containment pools or on absorbent blankets/pads, to contain any accidental fuel spills.

c) All refueling trucks will carry spill containment materials and the driver/operator will be trained in their use and responsibility after spills.

d) All fuel trucks, portable drums, and tanks will be inspected daily for leaks or signs of wear.

Grease, Oil and Filter Change

a) When a routine maintenance lubrication or oil change is scheduled on land based vehicles or equipment in the field, EPC Contractor personnel at field locations will bring vehicles or equipment to an access area away from environmentally sensitive areas (such as wetlands, streams or drinking water sources). Paved areas are not preferred. These equipment maintenance areas will be properly contained to prevent spillage during routine or emergency vehicle maintenance. Spill containment devices and materials will be readily accessible on site. Any effluent resulting from these sites will be contained, treated or disposed of, as appropriate. The driver will take all usual and reasonable environmental and safety precautions during routine lubrication and oil/filter changes. The EPC Contractor will wipe up all minor drips or spills of grease and oil at field locations.

Other Field Maintenance Operations

a) When other vehicle or equipment maintenance operations (such as emergency repairs) occur, EPC Contractor personnel at field locations will bring vehicles or equipment to an access area away from environmentally sensitive areas (such as wetlands, streams or drinking water sources) when possible. A paved area such as a parking lot or roadway will be used to minimize the possibility of spill or release to the environment.

b) All usual and reasonable environmental precautions will be taken during repair or maintenance operations. It is sometimes not feasible to move the affected vehicle or equipment from an environmentally sensitive area to a suitable access area, precautions will be employed to prevent oil or hazardous material release to the environment. These precautions include (but are not limited to) deployment of portable basins or similar secondary containment devices, use of ground covers (such as plastic tarpaulins), and precautionary placement of floating booms on nearby surface waterbodies. Any effluent will be contained and treated or properly disposed of.

12.4 SPILL RESPONSE PROCEDURES

An unintentional or accidental spill or release of any oil or chemical in any quantity on land or water must be reported to the "Spill Representative" in accordance with the *Spill/Release Cleanup and Reporting Guidelines*, to be developed prior to commencement of construction. These guidelines address immediate incident activities, reporting instructions, notifications and general cleanup procedures for spills occurring during the construction of the Facility.

On-Site Reporting Requirements

To fulfill release reporting obligations, the Spill Representative needs prompt (within fifteen (15) minutes of the spill or discovery of the spill), accurate and complete information for spills or releases occurring at the site. Therefore, all spills on-site will immediately be reported to the Environmental Inspector, who is responsible for obtaining all relevant spill information needed

to report the spill to the Spill Representative and complete the Environmental Compliance Field Spill Response Form. If the Environmental Inspector cannot be reached within the fifteen (15) minute period, the EPC Contractor will call the Spill Representative and notify the Environmental Inspector as soon as possible.

Off-Site Reporting Requirements

The Spill Representative is responsible for making all contacts to the federal, state, and local agencies relative to a reportable spill. Within two (2) hours of a discharge, the NYSDEC will be notified by telephoning the NYSDEC hotline at 1-800-457-7362. DPS staff will also receive notification of any reportable spills. The Spill Representative will also be responsible for contacting the National Response Center (NRC) at 1-800-424-8802 or 1-202-426-2675.

12.5 EXCAVATION AND DISPOSAL

It is the Certificate Holders' responsibility to ensure that spills that occur during the construction of the Facility are properly cleaned up by its EPC Contractor. This will be done by having the Certificate Holders personnel or its EPC Contractor clean up the spill, or having the EPC Contractor clean up the spill followed by the Certificate Holders personnel or the Environmental Inspector verifying the cleanup. The Certificate Holders will develop a list of approved waste cleanup contractors and approved waste disposal sites along the Facility area and will provide this information to the Environmental Inspector prior to the start of construction. The lists will be maintained in the Facility office for reference.

It is the EPC Contractor's responsibility to properly dispose of spill cleanup wastes including soils. In general, the following procedures will be followed:

a) Contaminated soils and vegetation will be cleaned up in accordance with standard procedures applicable to the spill material. The types and quantity of spill material as well as the method used for cleanup will be documented in writing by the personnel cleaning up the spill using the forms in the Spill/Release Cleanup and Reporting Guidelines developed for the Facility;

b) All contaminated soil will be collected and containerized as required by federal and state regulations. Contaminated materials will be collected until no visible or olfactory evidence of material spilled during construction remains; and

c) Testing may be required to determine the appropriate method of disposal. Analytical testing will be completed and documented by a qualified person. Based upon the results of the analytical testing, the material may be taken to an approved solid waste landfill or an approved hazardous waste treatment facility. There will be no disposal of materials at the substation or converter sites, in the right-of-way or other work areas in the Facility and surrounding areas.

12.5.1 Unanticipated Discoveries of Contaminated Soil and Trench Water

A Soil Management Plan to address soil sampling and handling of contaminated soils and trench water will be developed by the EPC contractor in consultation with DPS and NYSDEC and provided in the EM&CP.

If pre-existing contaminants are found in the soil excavated during construction or in trench water, construction activities will be stopped immediately in that area and the Environmental Inspector will be notified. The Environmental Inspector will report the condition to the Spill Representative, who will notify the NYSDEC and the DPS staff. Appropriate points of contact will be identified in the EM&CP. Consistent with the Soil Management Plan, construction in that immediate area may not be resumed until the contaminants of concern have been properly removed and/or the NYSDEC and DPS have issued an approval to continue construction activities in the area of concern. Any future construction activities at the referenced site where the contamination was located will be conducted in accordance with all conditions issued by the NYSDEC and DPS. A Remediation Plan will be developed for the Facility in consultation with NYSDEC and DPS.

12.6 HAZARDOUS WASTE CONTACT

The EPC Contractor will comply with all required regulations governing the onsite management and off-site disposal of hazardous wastes generated during construction of the Facility. During substation construction and pre-operational cleaning of substation equipment, some solvents and flushing materials may be used as a one-time event. These materials will be collected and disposed of properly. It is not anticipated that any hazardous wastes will be generated during the construction of the transmission facilities. Potential waste hauler/disposal contractors will be required to provide documentation showing that they have all necessary licenses in place prior to being awarded any work.

If hazardous waste is generated, the EPC Contractor will implement all requirements of NYS hazardous waste regulations including:

a) Train and instruct employees and/or other handlers of hazardous waste on the proper reporting, storage, inspection and handling requirements;

b) Separate hazardous waste from solid waste through segregation of storage areas and proper labeling of containers;

c) Use appropriate storage and, when necessary, NYSDOT approved transportation containers, along with secondary containment measures where applicable;

d) Verify that the hazardous waste transporters servicing the Facility have all required licenses, registrations and/or USEPA identification number and that the waste is disposed of at an approved/licensed facility prior to shipping hazardous wastes;

e) Transport all hazardous waste under a cradle-to-grave system of manifests;

f) Follow accurate recordkeeping requirements as to the quantity and nature of hazardous wastes generated onsite, and maintain a file of MSDS for all onsite chemicals; and

g) Prevent storage of hazardous wastes within one hundred (100) feet of a wetland, river, creek, stream, lake, reservoir, spring, well or other ecologically sensitive site or existing recreational area along the proposed rights-of-way.

If the odor, color, sheen, or content of excavated material excavated from the trench or other construction sites appears to be contaminated, the site will be managed in accordance with the Facility Soil Management Plan.

Should a fuel, oil, or chemical spill occur during construction, the spills on-site will immediately be reported to the Environmental Inspector, who is responsible for obtaining all relevant spill information needed to report the spill to the Spill Representative and complete the Environmental Compliance Field Spill Response Form. If the Environmental Inspector cannot be reached within the fifteen (15) minute period, the EPC Contractor will call the Spill Representative and notify the Environmental Inspector as soon as possible. The Spill Representative will notify NYSDEC and NRC, as applicable, within two (2) hours of the release. The EPC Contractor is also responsible for any and all response actions. Any contaminated soil will be removed from the worksite and disposed of in accordance with NYSDEC guidance. Refer to Section 12.4 for the reporting and cleanup procedures for spills.

12.7 NOTIFICATIONS OF HAZARDOUS MATERIAL

The on-site/vessel Safety Inspector will be responsible for contacting the U.S. Coast Guard ("USCG"), NYSDEC, DPS Staff, or other agencies with regard to reportable spills or releases. In the event of a reportable hazardous substance release, the following spill release reporting procedure will be implemented:

a) Notify the site/vessel supervisor/officer in-charge;

b) Notify the owner's health and safety officer;

c) Notify the Certificate Holders;

d) Contact the NRC for reportable spills from vessels or into navigable waters;

e) Contact NYSDEC;

f) Contact local police department having jurisdiction in the spill area;

g) Contact local fire department having jurisdiction in the spill area; and

h) Contact local emergency/ spill response officials having jurisdiction in the spill area.

Any observation of spills, leaking fluids or improperly stored fluids may trigger the issuance of a "stop work" notice by the Safety Inspector or the Environmental Inspector until the situation is resolved. All applicable regulations governing the storage, transport, use, and disposal of fluids, including 49 CFR Parts 100-185, and all reporting requirements for spills which occur during construction will be complied with.

A list of all chemicals used or stored and their appropriate MSDS will be kept on site and on-board each vessel as necessary, and provided to the USCG, fire department and local emergency management officials as necessary. All employees will be trained in the use, storage, handling, spill control, and first aid measures required for these chemicals in accordance with the OSHA and Construction Hazardous Communication Standard ("HAZCOM") (29CFR1926.59).

The on-site/vessel Safety Inspector will ensure that any non-hazardous material discovered during any activity is properly handled. The on-site/vessel Safety Inspector will also ensure that any hazardous materials encountered are handled in accordance with a management and handling plan tailored to such material or that is adequate to protect human health and safety and the environment, until such time as the nature of the material is known.

12.8 HAZARDOUS MATERIAL HANDLING AND WASTE DISPOSAL

Hazardous wastes are those materials that are specifically "listed wastes" per 6 NYCRR Part 371 and/or those that display hazardous wastes characteristics for ignitability, corrosivity, reactivity and/or toxicity. Petroleum products and hazardous waste (collectively "hazardous materials") will be managed in a manner to minimize the potential for threats to human health and the environment. The selected EPC Contractor will develop Hazardous Waste Management Procedures which will detail the management of hazardous waste on site in the event hazardous materials are discovered. The transportation, handling, and storage of hazardous materials will be in conducted in compliance with 49 CFR Parts 100-185 (US DOT Pipeline and Hazardous Materials Safety Administration).

The Safety Inspector will provide all contractors with an approved Hazardous Materials Handling, Storage and Disposal Procedure. Prospective waste hauling/disposal contractors will be required to provide documentation to the Safety Inspector showing that they have all necessary permits/licenses in place prior to being awarded the work.

The following waste handling and waste disposal procedure will be implemented:

a) Hazardous Materials such as oily rags used for equipment maintenance will be stored in appropriate five (5) gallon to fifty five (55) gallon drums;

b) Hazardous Materials will be properly packaged, with a written description and labeled as hazardous;

c) Hazardous Materials will be inspected at least weekly while stored on site;

d) Hazardous Materials will be transported via permitted transporters, hazardous waste manifest and permitted Treat, Store, Dispose, Recycle ("TSDR") facilities; and

e) The environmental health and safety officer will be notified of any Hazardous Materials that are generated and/or discovered.

12.9 ON-WATER AND UNDERWATER SPILL PREVENTION, CONTROL AND COUNTERMEASURES OF PETROLEUM PRODUCTS

It is not anticipated that there will be any on-water or underwater spills of petroleum products during underwater cable installation activities. However, if during the course of construction activities a spill does occur, all work will be stopped and the proper authorities will be notified. The selected EPC Contractor will develop a shipboard Oil Spill Contingency Plan ("OSCP") which will be provided to all staff working aboard ship.

The OSCP will be written in accordance with the requirements of 40 CFR part 110, Discharge of Oil regulation, and 40 CFR Part 112, Oil Pollution Prevention regulation, and to the extent applicable or useful of Regulation 26 of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto.

The purpose of the OSCP is to:

a) provide guidance to the master and officers on board the ship with respect to the steps to be taken when a pollution incident has occurred or is likely to occur;

b) identify any risks of petroleum products during the installation;

c) provide detailed plans for petroleum product spill prevention and minimization of the identified risks;

d) provide contingency procedures and possible countermeasure should spill occur; and

e) specify reporting requirements.

A detailed SPCC Plan or its equivalent will be developed by the selected EPC Contractor for the on-water and underwater portion of the Facility, a component of which will be the OSCP. This document will describe the oil and chemical storage operations during and after cable installation for the cable laying vessel and barge, and provide information on the prevention of spills, containment of spills, cleanup measures, and reporting procedures to be used in the event of a spill. Specifics of the plan will vary between contactors due to differences in technology employed and different vessels used. Spill prevention and response measures will be consistent with the spill prevention and planning requirements of the USEPA and NYSDEC. A copy of the plan will be posted on site at all staging areas and on board all vessels during construction of the Facility.

The SPCC Plan or equivalent and the associated OSCP will contain all information and operational instructions required by the USEPA regulations and the Guidelines issued by the International Maritime Organization ("IMO"). The Appendices of the OSCP will contain names, telephone, and fax numbers of all contacts referenced in the plan, as well as other reference material. The SPCC Plan or its equivalent will be included in the EM&CP.

13.0 COMMUNICATIONS PLAN

Communication between the Certificate Holders and federal and state agencies, local municipalities, emergency response providers and affected landowners will be coordinated on an ongoing basis during construction in order to facilitate a safe and proper Facility installation. General communication procedures are described below.

13.1 AQUATIC SAFETY AND COMMUNICATIONS PLAN

The selected EPC Contractor is responsible for developing an Aquatic Safety and Communications Plan for cable installation to be included as part of the EM&CP. The purpose of the plan is two-fold as it will include information regarding the daily underwater cable operations protocols as well as protocols for coordinating with waterbody regulatory authorities. The final Aquatic Safety and Communications Plan will meet regulatory permit conditions including OSHA 29 CFR 1926.106 working over or near water, as applicable.

Prior to and during cable installation, the EPC Contractor will follow USCG regulations for safely operating vessels and coordinate with USCG Waterways Management and Vessel Traffic Services. The plan will include the following information when coordinating with Waterways Management Office:

a) Start and completion dates for the Certificate Holders underwater cable route;

b) Cable installation work schedule;

c) The names of the work vessels;

d) The VHF radio channel(s) the vessels will be monitoring;

e) Twenty four (24) hour point of contact; and

f) Verification that all personnel have been cleared to work in New York/New Jersey Harbor and surrounding waters.

In addition, the plan will provide information for the local waterway users regarding underwater cable installation activities through USCG "Local Notice to Mariners". The following information will be provided:

a) Start and completion dates for the Certificate Holders underwater cable route;

b) Cable installation work schedule;

c) The names of the work vessels;

d) The VHF radio channel(s) the vessels will be monitoring;

e) Twenty four (24) hour point of contact;

f) Verification that all personnel have been cleared to work in New York/ New Jersey Harbor and surrounding waters; and

g) Chart location of cable installation.

Within the Hudson, Harlem and East Rivers, a USCG project notification form is required. Authorization is granted under the Ports and Waterways Safety Act (33 USC 1225(a)(2)(C). Violations of required safety measures may subject the EPC Contractor to civil penalty proceedings in accordance with 33 CFR 1.07. Within Lake Champlain cable installation activities can be coordinated with USCG Burlington Station.

In addition, the Aquatic Safety and Communications Plan will include information on coordination with New York State Canal Corporation ("NYSCC") as necessary. The EPC Contractor is responsible for knowing and following any applicable substantive requirements of NYSCC regulations.

The selected EPC Contractor will have to notify the DPS staff and the USACE that these notifications have taken place. In addition, there may be additional notification requirements based on waterbody and cable installation location to stakeholders and interested parties (i.e., pilot associations, ferry operators, agencies).

Consultation with agencies regarding cable installation activities will be accomplished through the implementation of regularly scheduled progress meetings. Additional meetings may be scheduled when requested to address special events or other activities.

All agencies having jurisdiction within the construction corridor will be notified of the progress meetings and additional meetings as needed. All cable installation activities will be coordinated with agencies having jurisdiction along the cable route.

The Certificate Holders are committed to provide a safe working environment for the health, safety and welfare of personnel involved in the cable installation. Before working on a vessel, all personnel will have read and signed-off on the General Health and Safety Plan and the Emergency Contingency Plan for the cable installation vessels.

The purpose of the General Health and Safety Plan is to describe the safety management system and the measures in place to ensure the safety of all personnel involved in the underwater cable installation activities. The General Health and Safety Plan contains contact information and procedures to be implemented in-case of emergencies.

A specific Health and Safety Plan ("HASP") will be prepared by the EPC Contractor for each activity by the EPC Contractor and/or subcontractor health and safety manager. This plan will be provided to all personnel prior to their working on underwater cable installation activities. Activity-specific HASPs will contain hazard communication information, hazard identification,

risk assessment and the information necessary to perform the work safely (e.g., MSDS, personal protective equipment to be used).

13.2 OPERATIONAL PHASE COMMUNICATIONS PLAN

The Certificate Holders will communicate regularly with local elected officials, property owners, and harbor operations and marina managers along the route. An annual notice will be mailed to inform them of the presence of the facilities and instruct them how to recognize and react to unusual activity in the area. The mailing will also provide contact information, emergency phone numbers, and safety information, including "Call Before You Dig" requirements.

14.0 OPERATIONS, RIGHT-OF-WAY MANAGEMENT AND MAINTENANCE

14.1 RIGHT-OF-WAY MAINTENANCE

Right-of-way maintenance is necessary to protect the overland cables from being disrupted or broken by tree roots, to maintain the function of permanent stormwater management or access control features, and to replace Facility location and identification markers as necessary. Right-of-way maintenance also serves to identify the area in which the underground cable has been laid and ensure appropriate access to the cable area is maintained in case of emergency. The Right-of-Way Management Plan will be developed in consultation with CP and CSX railroads to ensure conformance with their continual maintenance plans. In addition, any maintenance or operational activities within highway right-of-way or railroad bridges or structures will be performed in accordance with the applicable conditions of highway work permits, use and occupancy permits, leases, and/or other agreements. The Right-of-Way Management Plan will be provided in the EM&CP.

14.2 INSPECTION

After the Facility has been completed, on the ground inspectors will survey the overland right-of-way once a year and look for:

- vegetation on the right-of-way that may be capable of disrupting the cables below,
- line exposures at areas with steep slopes and stream banks,
- degradation of above ground support structures,
- locations requiring Facility marker replacement,
- unauthorized encroachments,
- permanent stormwater features requiring maintenance and
- vandalism.

The Aquatic portion of the Facility will be surveyed at least once every five (5) years and inspections will focus on verifying the depth of cable burial, condition of infrastructure protection measures and identifying areas where protection of the Facility or environment could be compromised.

Additional inspection and maintenance requirements will be developed in the Right-of-Way Management Plan.

14.3 VEGETATION MAINTENANCE

The Certificate Holders are committed to managing vegetation at their facilities in a safe, environmentally responsible and efficient manner in full compliance with all applicable laws and regulations. In this effort, the Certificate Holders are responsible for maintaining their right-of-way free from hazards and encroachments.

Most of the vegetation that will be impacted along the overland portions of the Facility corridor consists of previously disturbed herbaceous and/or shrubby cover within the existing railroad

rights-of-way. During operation of the Facility, vegetation management will be restricted to vegetation clearing on an as-needed basis to conduct repairs or maintenance along the transmission cables and/or selective cutting to prevent the establishment of large trees directly over the cables. Any vegetation management activities currently conducted by the railroads within the right-of-way will continue following the construction and operation of the overland transmission cable. A vegetation management plan for the operational period of the Facility will be developed and supplied in the EM&CP. The goal of the vegetation management plan will be to establish stable low growing vegetation with shallow root systems that will not interfere with the cables and, where the cables will be located within railroad property, will be consistent with the operation and maintenance of the railroads.

To insure the accurate identification of target and non-target vegetation, all vegetation management contractors are required to supply personnel familiar with the vegetation typically found growing on utility sites.

14.3.1 Mechanical Treatment

Vegetation along the right-of-way will primarily be managed by mechanical means. This will include such mechanisms as brush hogging/mowing or hand cutting. However, the use of feller-bunchers or other forestry harvesters is not recommended for vegetation management in visually sensitive areas within the Lakes to Locks Scenic Byway, i.e., State Route 22, right-of-way located within the Adirondack Park.

14.3.1.1 Mowing

Mowing consists of the cutting of vegetation by large rotary or flail mowers. These heavy-duty mowers, usually ranging from three (3) to eight (8) feet wide, are typically mounted on large four-wheel drive rubber tired tractors or tracked vehicles. This is the preferred mechanical technique, especially on sites where hand cutting would be inefficient and expensive.

14.3.1.2 Hand Cutting

Hand cutting consists of the use of chain and brush saws to remove the vegetation. This method allows for more selectivity in target vegetation and is the preferred method when terrain conditions make mowing infeasible. Hand cutting is the preferred method of vegetation maintenance in wetlands and other sensitive areas.

14.3.2 Chemical Treatment

Mechanical controls are the preferred method of vegetation management within the right-of-way. However, mechanical control methods can result in an increase in stem density due to re-sprouting of cut vegetation. Mechanical control methods can also become costly and dangerous in areas of dense target vegetation. In these instances, chemical control or a combination of mechanical and chemical treatment may be more effective than mechanical treatment alone.

Herbicide treatments allow for vegetation management with minimal disturbance to non-target species, habitat structure, and species diversity. In addition, chemical treatment treats the entire target plant, including the below-ground root system, preventing the re-sprouting that can occur following mechanical treatment.

The herbicides and treatment methods will be selected based on site sensitivity, target species composition and density, and treatment methods. Herbicides will not be used in certain areas if site sensitivity, regulations, permit conditions, or target species composition or height recommend otherwise. The most appropriate treatment methods will be chosen to meet the goals, objectives, and obligations of the Certificate Holders.

The following standards will apply for any chemical treatment:

a) A site-specific chemical treatment plan will be developed prior to the application of any herbicides. The plan will include an explanation of why mechanical methods are not adequate and will identify the area(s) to be treated, the herbicide(s) to be used, and the measures to avoid impacts to sensitive areas. The plan will include a monitoring program to determine the effectiveness of the treatment;

b) Herbicides will not be applied in the following sensitive areas;
   - Within one hundred (100) feet of drinking water supplies
   - Residential areas
   - Recreational areas

c) Sensitive areas and associated buffers will be identified in the treatment plan and flagged in the field prior to the application of herbicides;

d) Herbicides will only be applied under the direct supervision of a NYSDEC Certified Pesticide Applicator who either owns or is employed by a business or agency registered with NYSDEC for the purpose of herbicide application. The supervising certified applicator will be familiar with the provisions of the Facility's permits and will be present in the field to ensure compliance with BMPs for targeting species and for proper application of authorized herbicides;

e) Herbicides will not be applied during adverse weather conditions, such as high wind velocity or heavy rains;

f) All herbicides used will have valid registrations with both USEPA and NYSDEC;

g) Application of herbicides will conform to all label instructions and all applicable federal and state laws and regulations; and

h) No equipment wash water or excess herbicide will be allowed to enter surface waters including streams, lakes, ponds, and wetlands. Empty containers will be disposed of in accordance with applicable pesticide regulations.

Typical herbicide treatment methods that may be used include: basal treatments; stem injection; cut and treat methods; and non-stem specific treatment methods. The specific application method will be identified in the treatment plan, which will be provided in the EM&CP.

14.3.2.1 Stem-Specific Treatments

14.3.2.1.1 Basal Treatments

Basal treatments along the right-of-way can be effective where there are low densities of target species and in areas inaccessible to equipment. The herbicides are carried in a backpack tank or a tank on a vehicle and sprayed on the basal area of the vegetation from the roots up the stem at least twelve (12) inches and all around the circumference of the plant. Plants with thicker bark may require a greater amount of herbicide. The particular herbicide to be used in basal treatments will be determined by a NYS Certified Herbicide Applicator.

14.3.2.1.2 Stem Injection

Stem injection selectively treats target plants. It is a mechanical method where either a knife or a hatchet can be used to open the bark and the cambium layer and the wounds are then sprayed with an herbicide. More sophisticated tools include a Hypo-hatched, which chops and injects herbicide at the same time, and various types of drills that can drill into the cambium layer then inject herbicide.

14.3.2.1.3 Cut and Treat Methods

Cut and treat consists of the mechanical cutting of a target species followed by the application of herbicide to the phloem and cambium tissues of the stumps. This treatment method is used to prevent re-sprouts when hand cutting vegetation and to selectively treat target species with minimal impacts to the surrounding vegetation.

14.3.2.2 Non-Stem Specific Herbicide Applications

Non-stem specific herbicide applications are broadcast applications of herbicides either by spraying or depositing pellets. Common herbicides used in this manner are glyphosate spray, 2,4, Dichlorophenoxyacetic acid (2,4, D) and hexazinone pellets. Herbicides are applied with hand-operated pumps or motorized backpack sprayers. The herbicide can be directed to specific target vegetation for spot treatments or broadcast in dense thickets.

14.4 SITE ACCESS

14.4.1 Gates

If the railroad or other landowner requests gates on access roads used by the Facility, permanent gates will be installed to prohibit access by unauthorized vehicles. If requested, the gates will be installed at the end of the construction. See Figures 5-1A and 5-1B.

14.5 PERMANENT STORMWATER FEATURES

Inspection and maintenance frequencies and requirements for permanent stormwater management features will be identified in the Right-of-Way Management Plan, which will be included in the EM&CP.

14.6 FACILITY LOCATION AND IDENTIFICATION MARKERS

Maintenance requirements for Facility location and identification markers will be indentified in the Right-of-Way Management Plan, which will be included in the EM&CP.

14.7 ABOVE-GROUND FACILITIES

Qualified personnel will perform routine inspections and maintenance at all aboveground facilities including the converter station. The converter station will likely be considered "critical infrastructure" and so there will be required security features. Facilities which will be unmanned require, among other potential security measures, intrusion alarms, video cameras both inside the building and overlooking the yard, and cypher locks with Supervisory Control and Data Acquisition (SCADA) interlocks are provided on the doors. Lighting levels at the converter station will be dictated by the State Energy Code and Illuminating Engineers Association (IEA). Existing standards require general lighting levels of 3 foot candles per SF or less for general site security and up to 5 foot candles at specific locations (entry gate, building entry ways and similar location).

Although there are no components of the HVDC transmission cable system that require regular replacement, regular inspections in accordance with the manufacturer's specification of terminations and surge arrestors will be performed during scheduled outages to ensure equipment integrity is maintained. For example, insulators will be inspected and cleaned if there are excess deposits of industrial contaminants and soot. Additionally, metal parts, such as nuts, bolts, cable cleats, and grounding scraps will be inspected for corrosion and tightness. The Certificate Holders also anticipate the establishment of a building inspection and maintenance program to ensure the regular upkeep of the Facility and its grounds. This program would include, but not be limited to, landscape maintenance, vegetative management, and the inspection and repair of stormwater systems.

15.0 PROCEDURES FOR IDENTIFICATION AND PROTECTION OF SENSITIVE RESOURCES

Given the linear nature of transmission line projects it is common for many different types of habitats, land uses and sensitive areas to be encountered. In order to avoid and/or minimize impacts and ensure protection of the various resources that are crossed by the Facility, the Certificate Holders have identified numerous sensitive areas where the Facility will need to adjust standard construction procedures to minimize impact and ensure protection of various resources.

During the Article VII Application, studies and evaluations were conducted to identify areas along the cable route that the Facility will encounter. These evaluations identified a number of sensitive resources that warrant development of special construction procedures to avoid and/or minimize impacts to these resources. These areas include:

a) Threatened and Endangered Wildlife Species and Rare, Threatened and Endangered Plant Species (Section 16.0);

b) Cultural resources (Section 17.0);

c) Waterbodies (Section 18.0);

d) Wetlands and other water resources (Section 19.0);

e) Active agricultural lands (Section 20.0);

f) Invasive species (Section 21.0);

g) Alternate or conflicting land uses (Section 22.0);

h) Steep slopes, highly erodible soils and flood plains (Section 23.0);

i) Visual resources (Section 24.0);

j) Significant noise receptors (Section 25.0); and

k) Water quality.

The following sections describe the procedures for identifying each of the specific sensitive areas and the protection measures to be utilized in development of the EM&CP Plan and Profile drawings and provide guidance on how each of these resources will be addressed in consultation with applicable agencies and the selected EPC Contractor during the EM&CP process.

16.0 THREATENED AND ENDANGERED WILDLIFE SPECIES AND RARE, THREATENED AND ENDANGERED PLANT SPECIES

This section describes the federal and state TE species and their habitats and RTE plants, as well as significant natural communities that occur in terrestrial and/or aquatic habitats within or near the Facility area. This section also describes the methods that will be used to avoid and/or minimize impacts to these resource areas.

Procedures for the identification and protection of TE species and their occupied habitats and RTE plants, as well as significant natural communities are intended to ensure that potential impacts are avoided and/or minimized. Measures employed will include general procedures applicable to all TE species and their occupied habitats and RTE plants, as well as specific measures that will be developed through consultation with agencies including the NYSDEC, New York State Natural Heritage Program ("NYS Natural Heritage Program"), USFWS and National Marine Fisheries Service ("NMFS") if applicable.

Protection measures for all TE species and their occupied habitats and RTE plants include the following:

a) All known TE species occupied habitats and locations where RTE plants have been observed to be present will be clearly marked on the EM&CP Plan and Profile drawings;

b) The EM&CP Plan and Profile drawings will be provided to the NYSDEC, NYS Natural Heritage Program, and DPS Staff for review of mapped occupied habitat areas and locations where RTE plants have been observed to be present;

c) Locations of known TE species or RTE plant occurrences or habitat of TE species will be treated as confidential. The Certificate Holders will label any documents or plans containing information on TE species or RTE plants as "confidential" and will provide appropriate training to employees and contractors as to the confidential nature of this information;

d) As part of environmental training, the Certificate Holders will provide training to contractors and employees regarding known and potential TE species, RTE plants and significant natural communities that may be encountered, and the identification and protection measures that are included in this EM&CP; and

e) The Environmental Inspector will be responsible for ensuring that prescribed protection measures are appropriately utilized during construction.

16.1 OVERLAND ROUTE

The Certificate Holders conducted a preliminary review and identified the TE species, candidate and special concern species and their habitats, as well as RTE plants, with the potential to occur along the overland portions of the cable route as part of the Article VII Application. Primarily overland construction activities will occur along an existing railroad right-of-way.

Karner blue butterfly (*Lycaeides melissa samuelis*) and frosted elfin (*Callophrys irus*)

The cable route crosses areas mapped as Karner blue butterfly and frosted elfin habitat. The following measures will be implemented to protect the butterflies and their habitats, consistent with the Karner Blue Butterfly Impact Avoidance and Minimization Report submitted as part of this proceeding:

a) A qualified biologist will conduct surveys for the presence of Karner blue and frosted elfin butterflies within identified habitat areas for these two species prior to construction, in accordance with the USFWS and NYSDEC guidance document Karner blue butterfly *(Lycaeides melissa samuelis*) *Survey Protocols Within the State of New York* (May 2008);

b) Prior to the start of construction, the boundaries of any identified occupied habitat for Karner blue butterfly and frosted elfin within or immediately adjacent to construction workspaces or access routes will be clearly flagged in the field, and the Certificate Holder will conduct a walk-through as described in the Certificate Conditions to discuss and review measures to avoid and/or minimize impacts;

c) Disturbance or access through any flagged occupied habitat for Karner blue butterfly and frosted elfin will be avoided;

d) Contractors and construction crews will be trained on the locations and identification of the host plant, wild blue lupine (*Lupinus perennis*), for the Karner blue butterfly and frosted elfin, Construction personnel will be trained and instructed to avoid trampling or destruction of wild blue lupine plants;

e) Wild blue lupine is an early successional species that may regenerate following a variety of different environmental disturbances. If any previously unknown or unflagged areas containing wild blue lupine are encountered during preconstruction environmental inspection, construction, or restoration, the Environmental Inspector will delineate the boundary of the habitat with flagging in the field, and will collect Global Positioning System (GPS) data mapping its location;

f) The Certificate Holders will notify the DPS, the NYSDEC and the USFWS as soon as possible (within forty eight (48) hours) if any previously unidentified habitats containing wild blue lupine are discovered during preconstruction environmental inspection, construction, or restoration of the Facility. If additional protective measures are necessary to protect the Karner blue butterfly, frosted elfin or occupied habitat for these species, the Certificate Holders will temporarily cease any vegetation clearing,

construction, ground-disturbing, or vegetation management activities in the area, excepting any activities that may be necessary for immediate stabilization of the work site, until protective measures can be implemented. Work will only resume once NYSDEC and USFWS have been notified and recommended protective measures to avoid and/or minimize impacts to TE species and occupied habitat have been implemented;

g) During operation of the Facility, any vegetation management, emergency repairs, or other operational maintenance activities required within Karner blue butterfly and frosted elfin habitats will be implemented in accordance with the mitigation plan for these species; and

h) No herbicides or pesticides will be used within occupied Karner blue butterfly and frosted elfin habitat, except as approved by the USFWS and NYSDEC.

Indiana Bat (*Myotis sodalis)*

a) The Certificate Holders will identify and avoid and/or minimize impacts to large specimens of shagbark hickory (*Carya ovata*), which could potentially serve as maternity or roost trees.

16.2 UNDERWATER ROUTE

The Certificate Holders conducted a preliminary review and identified the TE, candidate and special concern species and their habitats, with the potential to occur along the underwater portions of the cable route as part of the Article VII Application. Dredge windows shall be established to avoid and/or minimize impacts, if any, on migration, over wintering, and spawning habitats of fish, birds, and other fauna during dredging operations. Dredging windows for cable installation shall be location specific within the Hudson Estuary.

Bald eagle (*Haliaeetus leucocephala*)

The following measures will be implemented to protect the bald eagle and its habitat:

a) Locations of bald eagle nests within one-half (0.5) mile of construction, based on data provided by the NYS Natural Heritage Program, will be identified.

b) If any blasting activities are necessary within one-half (0.5) mile of active bald eagle nests, the Certificate Holders will contact USFWS and NYSDEC for guidance to avoid and/or minimize the potential for noise-related disturbance;

c) If construction will occur within six hundred and sixty (660) feet of an active nest during the nest-building or breeding season (December to August), the Certificate Holders will contact USFWS and NYSDEC for guidance to avoid and/or minimize the potential for noise-related disturbance;

d) Environmental training for contractors and construction crews will include training on the identification of bald eagles and location of nests. Construction personnel will be instructed to report any sightings of potential eagle nests that were not previously identified by the NYS Natural Heritage Program; and

e) If any previously unidentified eagle nests are discovered, the Certificate Holders will report findings to the NYS Natural Heritage Program as soon as possible, and consult with the NYSDEC and USFWS for guidance to avoid and/or minimize the potential for disturbance, if needed.

16.2.1 Aquatic Threatened and Endangered Species

The potential presence of aquatic TE species along the cable route were identified as part of the Article VII Application (see Tables 4.9-1, 4.9-5, 4.9-6 and 4.9-7 of the Article VII Application). Area specific studies of TE species and their occupied habitats may be undertaken, in consultation with DPS, DEC and USFWS, to refine existing information for selected segments of the cable route prior to cable installation.

The overall installation plan will be designed to accommodate location-specific and season-specific restrictions to avoid and/or minimize potential impacts to aquatic life, including occupied habitat for aquatic TE species, designated Exclusion Zones, and SCFWHs.

The primary approach to protecting aquatic TE species will be avoidance and minimization measures. The underwater cable route was sited in moderately-deep to deep water, wherever possible, to avoid effects on the biologically diverse and productive shallow water habitats that are present in the Hudson River Estuary and the southern portion of Lake Champlain. In addition, confining the cable route to relatively deep water contributes to avoiding submerged aquatic vegetation ("SAV"), wetlands, mud flats, shoals, and tributaries.
Another component of the installation plan intended to protect aquatic resources and avoid and/or minimize impacts on aquatic TE species and habitat is to apply seasonal restrictions on work in the aquatic environment. Work windows are addressed in Section 26.0.

The following BMPs will be implemented to protect aquatic TE species and their occupied habitats:

a) The Certificate Holders will work closely with federal and state agencies to establish measures prior to construction commencement in order to avoid and/or minimize impacts to TE fish, marine mammals, and sea turtles along the cable route;

b) All in-water work will be conducted within applicable time windows recommended by NYSDEC, NYS Natural Heritage Program, USFWS, and/or NMFS (if applicable), including location-specific dredging windows in the Hudson River Estuary for the protection of TE fish, sea turtles, and marine mammals species along the cable route;

c) Environmental training for contractors and construction crews will include training on the identification of sea turtles and marine mammals. If any sea turtles or marine mammals

are sighted during underwater construction activities, construction personnel will be instructed to navigate barges and boats to avoid the animal, temporarily halt construction activities if necessary to avoid impacts with sea turtles or marine mammals. Any sightings of sea turtles or marine mammals will be reported to the NYS Natural Heritage Program, NYSDEC, USFWS and NMFS (if applicable) as soon as possible;

d) HDD will be used where the cables enter and exit waterbodies to avoid and/or minimize effects on shoreline and shallow water habitats;

e) Construction modifications to water jetting will occur when crossing sensitive habitats like Significant Coastal Fish and Wildlife Habitats ("SCFWHs") in the Hudson River and in the narrow section of lower Lake Champlain. The primary operational modifications during water jetting are a reduction in water jetting pressure and a reduction in water jetting speed. Proposed areas where construction modifications may occur will be identified in Plan and Profile drawings included in the EM&CP;

f) A closed environmental (clamshell) bucket dredge will be used to minimize sediment suspension at mechanical dredging sites for fine grained unconsolidated (silty) sediments;

g) A silt curtain weighted across the bottom and suspended on floats will be positioned to enclose the work site before commencing mechanical dredging. The curtain will remain in place and functional during all phases of the dredging operations and remain in place for two (2) hours after dredging termination;

h) The Environmental Inspector will have the authority to modify or suspend construction if any TE species are impacted in any way by construction activities;

i) The Certificate Holders will avoid directly transiting twelve (12) of the seventeen (17) designated Significant Coastal Fish and Wildlife Habitats within or in the vicinity of the Facility area, and will route the Facility outside of designated Exclusion Zones within the remaining five (5) Significant Coastal Fish and Wildlife Habitats to the maximum extent possible to avoid and/or minimize impacts to TE species;

j) Commencement of in-river work below the designated Haverstraw Bay Significant Coastal Fish and Wildlife Habitat shall occur during the high, or flood, tide condition in order to avoid and/or minimize impacts of resuspended sediments on the SCFWH of resuspended sediments on the habitat of Haverstraw Bay;

k) Vessels utilized in the installation of the cable will be operated at slower speeds in the New York Harbor region to avoid the potential for collisions with transient TE whale or sea turtle species; and

l) Cable routing and construction windows will ensure that these activities will avoid and/or minimize impacts to shortnose sturgeon or occupied habitats.

16.3 UNANTICIPATED DISCOVERY OF THREATENED AND ENDANGERED SPECIES

In the event that the Certificate Holders unexpectedly encounters any RTE species during the preconstruction, construction, or operation and maintenance phases of the Facility, the following measures will be implemented:

a) The Environmental Inspector will identify the area of the sighting or encounter, flag the boundaries of the newly identified occupied habitat or locations where RTE plants have been observed to be present along the overland portions of the cable route, and record GPS locations of the likely habitat boundary or the sighting location of any in-water TE species;

b) Any unanticipated sightings of TE species or observation of RTE plants will be reported as soon as possible to DPS Staff, NYSDEC, USFWS, or NMFS (if applicable). The Certificate Holders will consult with applicable resource agencies for measures to avoid and/or minimize impacts to TE species and their occupied habitat or RTE plants;

c) If TE species or their occupied habitats or RTE plants are discovered during construction activities, the Certificate Holders will temporarily halt construction activities, excepting any activity required for immediate stabilization of the area, to avoid and/or minimize the impacts to the species or habitat. Construction activities in the area will resume once protective measures, developed in consultation with DPS Staff, NYSDEC,USFWS, or NMFS (if applicable), are implemented;

d) If new TE species occupied habitat is identified or RTE plants are observed and verified, EM&CP Plans will be updated to show the new TE occupied habitat(s) and locations of RTE plants. Areas of TE occupied habitat and locations of RTE plants along the overland route will also be flagged in the field; and

e) Construction personnel will be updated on the locations of any new TE species or occupied habitats or locations of RTE plants that are identified. These areas will be reported to the applicable resource agencies.

16.3.1 Significant Natural Communities

The following measures will be implemented to protect significant natural communities:

a) Significant natural communities will be shown on the EM&CP Plan and Profile drawings;

b) The EM&CP Plan and Profile drawings will be provided to the NYSDEC, NYS Natural Heritage Program, and DPS Staff for review of significant natural community mapping prior to start of construction;

c) Significant natural communities within or adjacent to the construction work space will be clearly flagged in field prior to the start of vegetation clearing or construction activity;

d) Access through or impact to any significant natural communities will be avoided and/or minimized; and

e) If access through a significant natural community is unavoidable, the Certificate Holders will develop additional measures, in consultation with appropriate agencies as applicable, to avoid and/or minimize any potential impacts.

17.0 CULTURAL RESOURCES

Studies previously conducted for the Facility have identified several historic and archaeological resources within the Facility's vicinity. Resources located along or adjacent to the transmission cable alignment include "historic properties" that have been listed in or determined to be eligible for inclusion in the National Register of Historic Places ("National Register"). The National Register Criteria for Evaluation (36 CFR § 60.4) provides that a building, structure, site, district, or individual object may be considered eligible for the National Register if it is significant in American history, architecture, archaeology, engineering, or culture. The quality of significance is present in historic properties that possess integrity of location, design, setting, materials, workmanship, feeling, or association and:

a) That are associated with events that have made a significant contribution to the broad patterns of our history; or

b) That are associated with the lives of persons significant in our past; or

c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant or distinguishable entity whose components may lack individual distinction; or

d) That have yielded or may be likely to yield, information important in prehistory or history.

A smaller subset of historic properties within the vicinity of the Facility has been designated as National Historic Landmarks ("NHL") by the Secretary of the Interior. NHL properties are properties listed in the National Register are considered significant historic places possessing exceptional value or quality in illustrating or interpreting the heritage of the United States.

Resources along the transmission cable alignment also include properties listed in or eligible for inclusion in the State Register, established under Section 14.09 of the New York State Parks, Recreation, and Historic Preservation Law. The State Register is maintained by the New York State Office of Parks, Recreation, and Historic Preservation ("OPRHP"), which functions as the State Historic Preservation Office ("NYSHPO"). All historic properties within the State of New York listed in or nominated for inclusion in the National Register are concurrently listed in the State Register.

Other sites reported in the vicinity of the cable route and aboveground facilities have not been subject to the same level of study or evaluation as properties listed in or determined eligible for inclusion in the State or National Registers. The nature and quality of available data regarding these unevaluated sites often varies significantly. In several instances, documentation regarding the integrity or geographical boundaries of these sites has not been collected or is not presently available. Several archaeological sites recorded during the early 20th century fall into this category, as do many of the shipwrecks reported along waterways that comprise portions of the cable route. Many of these resources may potentially be eligible for inclusion in the National

Register. However, in other instances, the integrity of these reported sites may be compromised or their geographical extent may be inaccurately reported. In either case, there is insufficient information currently available regarding these sites to make a recommendation or determination regarding their eligibility.

17.1 CULTURAL RESOURCES MANAGEMENT PLAN

The consultation process defined in 36 CFR Part 800 is the appropriate process to develop the specific control methods and requirements for additional identification and treatment of historic properties. Consistent with other PAs developed for large-scale federal permits or licenses, the Certificate Holders expect that the requirements for completing the identification of historic properties within the Facility's APE and the specific measures for avoiding, minimizing, or mitigating adverse effects to these resources will be included in the PA for this undertaking. In particular, the Certificate Holders shall develop a Cultural Resources Management Plan ("CRMP") in consultation with the NYSHPO and other Consulted Parties to provide for the identification and management of historic properties within the Facility's APE that may be affected by this undertaking. The Certificate Holders will develop the CRMP with the Consulted Parties prior to the commencement of construction activities associated with the Facility. The PA will likely require the Certificate Holders to address the following issues in the CRMP, including (but not limited to):

a) Completion of additional archaeological field reconnaissance studies and monitoring for underground and aboveground Facility portions of the Facility's APE.

   The Phase IA study identified the need for additional subsurface archaeological investigations to:

   i. Confirm the location and nature of previously reported archaeological sites identified during the Phase IA study;

   ii. Identify previously unreported archaeological sites within the Facility's prospective APE;

   iii. Define the boundaries of identified cultural deposits in relation to the Facility's prospective APE;

   iv. Evaluate the eligibility for listing cultural resources in the State and National Registers of Historic Places;

   v. Assess potential Facility effects on identified archaeological resources; and

   vi. Develop any recommendations for site avoidance, additional site evaluations, or measures to minimize or mitigate adverse effects.

   A proposed study plan was distributed as Appendix 1 of the HAA, Inc. August 2010 Phase IA report. The study plan includes details regarding proposed Phase IB Archaeological Field Reconnaissance studies, monitoring, and backhoe testing along

underground and aboveground Facility portions of the cable route. The Certificate Holders anticipate the Phase IB testing, archaeological monitoring, and backhoe testing will be completed in accordance with the specific methods and schedule developed in consultation with the NYSHPO and other Consulted Parties and defined in the CRMP.

b) Completion of additional studies to assess potential Facility effects on shipwrecks and other submerged sites.

Studies have been initiated to identify shipwrecks and other submerged archaeological resources within the Facility's prospective APE. As necessary, the CRMP will define a programmatic approach to completing additional studies required to assess the nature and character of these mapped and reported shipwrecks or other submerged resources with potential cultural significance, including archaeological deposits associated with adjacent terrestrial sites. The Certificate Holders anticipate that the specific methods, schedule, and requirements of these studies will be developed in consultation with the Consulted Parties and defined in the CRMP.

c) Control measures to avoid Facility effects on identified archaeological resources.

The preferred approach is to avoid impacts to archaeological and historic resources, regardless of their National Register status. The CRMP will provide measures and barriers for avoiding impacts to identified resources. Typically, measures and barriers to avoid known archaeological sites include installation of temporary fencing, and site delineation of Facility maps. Specific control measures and barriers will be developed in consultation with the NYSHPO and other Consulted Parties, as appropriate. In addition, cultural resources sensitivity training will be provided to all contractors and others that will be working on the Facility in a capacity that has the potential to cause ground disturbing activities in areas of known historic properties or areas where construction preparation work is being conducted prior to archaeological assessment of the area.

d) The process for conducting additional evaluations to determine their National Register eligibility of archaeological sites that cannot reasonably be avoided by Facility construction activities.

Phase IB field investigations may identify archaeological sites that cannot reasonably be avoided by Facility construction activities. In these instances, the Certificate Holders will undertake Phase II Site Evaluations. Phase II evaluations will collect sufficient site data to allow the NYSHPO to determine the National Register-eligibility of archaeological sites that cannot be avoided by Facility construction activities. Phase II evaluations typically include excavation of test units and additional sampling to (a) refine site boundaries, (b) determine temporal and/or cultural affiliation, (c) identify intra-site artifact/feature patterning, (d) assess site function and context, and (e) evaluate data potential and site integrity. The Certificate Holders anticipate that the specific methods and schedule for completing Phase II site evaluations will be developed in consultation with the NYSHPO and other Consulted Parties and defined in the CRMP.

e) Procedures for determining the appropriate measures to minimize or mitigate adverse effects on historic and heritage properties that cannot reasonably be avoided by Facility construction activities.

If impacts to a historic or heritage property cannot be avoided by Facility construction activities, the CRMP will provide a programmatic approach to determining the appropriate measures to minimize or mitigate adverse Facility effects in consultation with the NYSHPO and other Consulted Parties, as appropriate. Mitigation methods may include a Phase III Data Recovery, Historic American Building Survey/Historic American Engineering Record ("HABS/HAER") recordation, *in-situ* preservation (e.g., site armoring) or other site-specific mitigation measures. The Certificate Holders anticipate that the procedures for identifying the appropriate treatment measures in consultation with the Consulted Parties will be defined in the CRMP.

f) Procedures for the unanticipated discovery of archaeological resources.

The specific procedures for the unanticipated discovery of archaeological resources during Facility construction will be developed in consultation with the Consulted Parties and described in the CRMP. The Certificate Holders anticipate that the procedures defined in the CRMP will, at a minimum, include the immediate cessation of ground-disturbing activities in the vicinity of the discovery site, installation of temporary barriers to prevent unauthorized persons from accessing the site, and additional consultation with the NYSHPO and other Consulted Parties (as appropriate) to determine the appropriate treatment measures.

g) Procedures for the unanticipated discovery of human remains.

The procedures for the treatment and disposition of human remains discovered in association with archaeological testing or any ground-disturbing Facility construction activities are described in Section 17.3, below.

h) Identification and proposed treatment, avoidance, or mitigation of Facility effects on properties of traditional religious or cultural significance.

The CRMP will include provisions for identifying traditional cultural properties in consultation with Indian tribes whose interests may potentially be affected by Facility construction or operation. The procedures for determining the appropriate treatment, avoidance, or mitigation of Facility effects on these resources will be developed in consultation with the affected Indian tribe, the NYSHPO, and the other Consulted Parties, as appropriate.

i) Training

Supervisors responsible for construction activities resulting in ground disturbance will be trained on principles and procedures of the CRMP. The specific training requirements will be developed in consultation with the Consulted Parties and described in the CRMP.

j) CRMP implementation procedures

The CRMP will describe specific implementation procedures, including:

i. Parties responsible for coordinating activities conducted under the CRMP, including coordinating consultation and maintenance of relevant records;

ii. The use of qualified cultural resources professionals (Section 17.2, below);

iii. Staff/EPC Contractor training;

iv. Appropriate standards for cultural resources investigations (Section 17.4, below);

v. Standards and processes for artifact curation and/or repatriation;

vi. Procedures for amendment to the CRMP;

vii. Consultation requirements and contacts;

viii. Scheduling considerations.

17.2 USE OF QUALIFIED CULTURAL RESOURCES PROFESSIONALS

Cultural resources studies associated with the Facility and undertaken pursuant to the CRMP will be directed by qualified cultural resource professionals who meet or exceed the Secretary of the Interior's Professional Qualification Standards (36 CFR Part 61). These standards define minimum education and experience required to perform identification, evaluation, registration, and treatment activities.

17.3 PROCEDURES FOR THE INADVERTENT DISCOVERY OF HUMAN REMAINS

Treatment and disposition of any human remains that may be discovered will be managed in a manner consistent with the Native American Graves Protection and Repatriation Act (NAGPRA);[2] the Council's Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects (February 2007); and the *OPRHP/NYSHPO's Human Remains Discovery Protocol* (NYSOPRHP 2005). If human remains are encountered in the course of construction activities, the Certificate Holders will undertake the following actions in coordination with the NYSHPO bureau of OPRHP, Indian tribes, and other Consulted Parties, as applicable:

a) Any human remains discovered will be treated with the utmost dignity and respect;

b) Work in the general area will stop immediately, and the area will be physically secured and a barrier prohibiting vehicles, equipment, and unauthorized persons from accessing the discovery site will be put in place. The site will be protected from damage and disturbance to the fullest extent possible;

[2] Pursuant to 43 CFR Part 10, NAGPRA is only applicable when the underlying lands are in federal possession or control. However, in all cases, the principles described in NAGPRA's implementing regulations will serve as guidance for the Certificate Holders' actions should the remains or associated artifacts be identified as Native American.

c) Human remains and associated artifacts will be left *in-situ* and not disturbed. No human remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place;

d) The Certificate Holders will contact local law enforcement, the county coroner's office, the NYSHPO, and Indian tribes, as appropriate. Local law enforcement officials and the county coroner's office will examine the remains to determine if the remains are forensic or archaeological;

e) Within twenty-four (24) hours of any such discovery, the Certificate Holders shall notify the DPS Staff and OPRHP Field Services Bureau/NYSHPO. Treatment and disposition of any human remains that may be discovered shall be managed in a manner consistent with the Native American Graves Protection and Repatriation Act ("NAGPRA"); the Council's Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects (February 2007); and OPRHP/NYSHPO's Human Remains Discovery Protocol. All archaeological or remains-related encounters and their handling shall be reported in the status reports summarizing construction activities and reviewed in the site-compliance audit inspections

f) If the remains are determined to be Native American, the remains will be left *in-situ* and protected from disturbance until a plan for their protection or removal can be generated. The Certificate Holders will notify the NYSHPO and Indian tribes within twenty four (24) hours (during normal business hours) or as soon as possible after the discovery has been determined to be archaeological rather than forensic. The Certificate Holders will consult with the NYSHPO and Indian tribes to develop a plan of action, consistent with the guidance provided in the NAGPRA, the Council's 2007 Policy Statement, and the OPRHP/NYSHPO's Human Remains Discovery Protocol. Avoiding further disturbance of the remains is the preferred option;

g) If the human remains are determined to be non-Native American, the remains will be left *in-situ* and protected from disturbance until a plan for their avoidance or removal can be generated. The Certificate Holders will consult with the NYSHPO and other appropriate parties to determine a plan of action; and

h) Work will resume only after the completion of the necessary consultation and treatment.

17.4 STANDARDS FOR CULTURAL RESOURCES INVESTIGATIONS IN NEW YORK STATE

Cultural resource investigations associated with this Facility will be conducted in accordance with The New York Archaeological Council's (1994) *Standards for Cultural Resources Investigations and the Curation of Archaeological Collections in New York State*, adopted by the NYSHPO in 1995. Reports on cultural resources investigations will be prepared pursuant to the New York State Historic Preservation Office Phase I Archaeological Report Format Requirements (OPRHP 2005).

Procedures to identify heritage resource areas and special events that may be impacted by the Facility will be identified in the CRMP within the EM&CP. As part of the CRMP, site-specific mitigation measures will be developed to address any impacts to these areas. Mitigation measures may include, but are not limited to, restrictions on work space or access to sites, scheduling considerations, or work hour reductions.

Reference - Section 17.0

[NYSOPRHP 2005] New York State Office of Parks, Recreation and Historic Preservation. 2005. Historic Preservation Office Phase I Archaeological Report Format Requirements (OPRHP 2005) the Council's Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects (February 2007); and the NYSHPO's Human Remains Discovery Protocol.

18.0 WATERBODY CROSSING PROCEDURES AND PROTECTION MEASURES

18.1 INTRODUCTION

To minimize potential adverse environmental impacts, waterbodies, including any natural or artificial stream, river or drainage, will be crossed as quickly and safely as possible. Adherence to these construction procedures will increase the likelihood that stream flow and water quality will be maintained throughout construction. Most stream crossings will be completed using dry crossing techniques. Dry crossing means that the work area is kept dry either by installing control measures or by avoiding disturbance of the waterbody entirely (i.e., under the waterbody). Turbidity from the construction area will be contained and as a result water quality within the waterbodies will be maintained throughout the installation.

For construction purposes, waterbodies are separated into three main categories depending on the width of the waterbody at the time of the crossing. The categories are defined as follows:

a) Minor Waterbodies – include all waterbodies less than or equal to ten (10) feet wide at the water's edge at the time of construction.

b) Intermediate Waterbodies – include all waterbodies greater than ten (10) wide, but less than 100 feet wide at the water's edge at the time of construction.

c) Major Waterbodies – include crossings of more than one hundred (100 feet) wide at the water's edge at the time of construction.

18.2 MITIGATION MEASURES TO COMPLY WITH STANDARDS AND MINIMIZE IMPACT

Freshwater and saline surface waters are classified by the NYSDEC under regulation 6 NYCRR Part 701 according to their designated best uses. Best uses include drinking water supply, primary and secondary contact recreation, fishing, and fish, shellfish and wildlife propagation. In addition to water classifications New York regulations also identify those waters that have special protection because they support trout and/or trout spawning. New York State Water Quality Standards promulgated under 6 NYCRR Part 703 sets the required water quality criteria that must be met to support each of the best use, such as maximum coliform or minimum dissolved oxygen levels. In addition, the water quality regulations establish narrative standards. The most important of these standards, as it relates to waterbody crossings, are those related to turbidity. Pursuant to 6 NYCRR Part 703 the standard of no visible contrast applies to all waterbodies except those intermittent streams that were not mapped and given a classification.

18.2.1 WATERBODY CONSTRUCTION TIMING WINDOWS

Specific construction timing windows indicate when the cable installation can be performed for each waterbody. These windows are directly related to the waterbody type and stream classification designated for each waterbody. In general, the protection of significant fisheries

(i.e., trout streams) requires that construction only occur during specific dates, while waterbodies not classified as significant fisheries or waterbodies under which the cable is installed using HDD do not always have specific construction windows.

Most designated trout streams along the Facility route will be crossed using the HDD method, which, if performed correctly, will avoid disturbance of these streams. In those instances where the HDD method is used to install the cable to cross a waterbody there will be no time of year restrictions because the method does not require a disturbance to the bed or bank of the stream. If a dry crossing is proposed for any of stream designated as T or TS, the Certificate Holders will adhere to the proposed timing restrictions of October 1 through May 31.

A listing of waterbodies, including associated stream width, NYSDEC classification, proposed crossing method and any potential timing window will be developed during the EM&CP and provided to NYSDEC for review and DPS for approval prior to the start of construction. The Certificate Holders will notify DPS and NYSDEC staff at least five (5) days prior to construction involving stream crossings. Construction windows for underwater cable laying are specified in the Certificate Conditions and the Water Quality Certificate.

18.2.2 WATERBODY DRY CROSSING METHODS

There are three basic waterbody dry crossing methods that will be used for the Facility. Two of the methods involve the excavation of an open trench through the waterbody and the disturbance of the bed and bank of the stream is required. The difference between the crossing methods is the types of controls implemented to maintain water quality during construction. The other method involves installing the transmission line beneath the waterbody without disturbance to bed or bank of the stream. These methods are described in the following section and are as follows:

a) Flume Crossing Method;

b) Dam and Pump Crossing Method; and

c) HDD;

A fourth waterbody crossing method, Open Cut, is described below. The waterbody crossing methods will be chosen based on DPS width classification, NYSDEC stream classification and on conditions present during time of construction. Intermittent streams that are dry at the time of crossing may be crossed by open cut with prior approval from DPS and NYSDEC. Note that the preferred and any alternate crossing methods will be provided to DPS and NYSDEC staff for review and approval prior to the start of construction. Waterbody crossing methods will be identified on a site-specific basis and shown on the EM&CP Plan and Profile drawings. In all cases the transmission line must be installed a minimum of five (5) feet below the bed of the waterbody.

Waterbody crossing method procedures are described below. In addition, illustrations of these crossing methods are provided in Figures 18-1 through 18-3.

18.2.2.1 Flumed Crossing Method

Flumed crossing methods will use a flume pipe to redirect the stream across the work area and allow trenching to be done in drier conditions. Flumed crossings may be installed within minor and intermediate waterbodies during low flow conditions. For waterbodies crossed using the flume method, the cable will be lowered into the trench with the flume pipe(s) in place.

Stream construction preparation begins with the initial installation of the flume pipe(s) in the waterway. The openings to the pipe are then sand bagged (diked) around each end to prevent water from leaking under the pipe into the work area. The upstream dike is constructed first to channel the stream flow through the flume. The downstream dike will then be constructed to isolate the work area.

Once the stream construction preparation phase is complete and the stream is flowing fully within the flume pipe(s), the cable trench will then be excavated in drier conditions across the channel and under the flume. Dewatering of the isolated portion of the stream channel (between the two dams) can be performed to some degree. Under ideal circumstances the soils within this construction area would permit the complete dewatering of the site and a true dry crossing to take place.

Once the trench is complete, the cable will be carried into position and lowered into the trench on one side of the flume pipe. The cable is then threaded under the flume pipe into its final position within the stream channel at the bottom of the trench. Once the cable is installed, the trench will be backfilled immediately. Figure 18-1 shows a typical flumed crossing.

The following BMPs will be implemented for flumed crossings:

a) Once the pipe is installed, the openings to the pipe are then sand bagged (diked) around each end. Sandbags used during construction will be filled with sand free of silt, organics, and other material. Alternatively, steel plates welded to the flume(s) or other barriers can be used to dam the water instead of sand bags;

b) The flume pipe(s) installed across the trench will be sized to accommodate anticipated stream flows;

c) Any dewatering which takes place will be conducted as described in Section 7.7;

d) Trench spoil stockpiles will be placed within the construction right-of-way away from the stream edge to avoid sedimentation, but to preserve endemic soils;

e) The trench will be backfilled immediately following installation of the cable;

f) All flume pipes and dams will be removed as soon as stream bed and bank restoration is complete; and

g) Stream bed and banks for a distance of at least fifty (50) feet from the water's edge will be permanently restored with the exception of the equipment crossing if essential for the remaining construction activities.

18.2.2.2 Dam and Pump Crossing Procedures

Before the initiation of any in-stream activities, all material associated with the dam and pump site set-up must be on-hand. These materials include, but are not limited to the following:

a) Water barriers;

b) Downstream splash plate;

c) Pumps (primary and secondary) and hoses;

d) Fuel for pumps (stored at least one hundred (100) feet from waterbody); and

e) Spill prevention and control materials (including secondary containment for pumps located within one hundred (100) feet of wetland or waterbody).

18.2.2.2.1 Upstream Water Intake or Sump Hole

Once the necessary materials are on-location, site set-up may begin. The first step is to select an appropriate location for the pump intake hose(s) to be positioned. Depending upon the channel characteristics, either a naturally occurring deep spot or channel will be selected as a "sump" or a sump may need to be created to provide sufficient water depth for the screened hose intake(s). If a natural sump is not available for the intake hose, an in-stream sump will be created by excavating within the stream channel and surrounding the excavation using sandbags.

The following BMPs will be implemented at the intake or sump site:

a) All equipment, material, and construction personnel necessary for the crossing will be on-site before set-up begins;

b) Upon completion of the waterbody crossing any sandbags utilized for a sump will be removed and the stream channel restored to preconstruction condition; and

c) The sump will be of sufficient depth to prevent the entrainment of excessive amounts of sediment into the sump intake, hose and pump.

18.2.2.2.2 Pump Set-Up

During the assembly of the upstream and downstream water barriers, the pumping network will be setup to begin the transfer of water around the construction work area.

The pump intake and discharge hoses will be appropriately placed and of sufficient length, based upon site-specific conditions. The intake hose will be screened to prevent the entrainment of

fish. Discharge hoses will be provided with support over the ditch-line as needed to prevent excessive sagging and reduction of pumping capacity.

The number and sizes of pumps to be used at any crossing is dependent upon the volume of water flowing at the time the crossing is made.

BMPs to be implemented during pump set-up include:

a) Pumps will be fueled prior to placing them in position;

b) If it is necessary to refuel during the pump operation, extra care will be taken to avoid spillage and spill control materials will be readily available on site;

c) Secondary containment will be placed under the pumps as an additional precautionary measure to protect against accidental leakage or spill;

d) Fuel for filling the pumps will not be stored within one hundred (100) feet of the waterbody;

e) The intake hose will be screened to prevent the entrainment of fish;

f) The end of the discharge hose will be mounted upon a splash plate or similar device or in a manner that will dissipate the energy of the discharging water and reduce or eliminate streambed scour;

g) If hoses cross the temporary access road, they must be protected from traveling equipment;

h) Pump(s) will be of sufficient capacity to transfer twice the capacity of the entire streamflow around the construction work area; and

i) Reserve or backup pump(s) will be kept on site at all times.

18.2.2.2.3 Water Barrier Installation

Between the pump hose intake or sump hole area and the trench, as well as downstream of the trench, dams of relatively impervious material will be installed. The upstream dam will be completed first. Every reasonable effort will be made to construct the dams as water tight as possible.

The following BMPs will be implemented during water barrier installation:

a) Dams will be constructed of either sandbags, water bladders, steel plates, Porta-Dams or equivalent or “jersey barriers” and plastic sheeting or a combination thereof;

b) The dams will be constructed of sufficient height to allow adequate freeboard under reasonably expected water levels or flows and provide for some impoundment of water;

c) Prior to completion of the dams, the pump(s) must be started in order to provide downstream flow of water around the construction work area; and

d) The rate of pumping will be monitored to minimize draining of the intake sump and the resulting cessation in flow. Alternatively, pumping will be monitored and increased as necessary to prevent overtopping of the dams.

Figure 18-2 shows a typical dam and pump crossing.

18.2.2.3 Horizontal Directional Drilling

HDD will be used for protected stream crossings where practical. The HDD method is described in detail in Section 8.0. To the extent possible, boring entry and exit pits and staging areas will be located outside of waterbodies and wetlands.

18.3.3 OPEN CUT STREAM CROSSING METHOD

In general, the open cut method of construction consists of positioning construction equipment on the banks or in the waterbody itself, digging an open trench in the stream bottom, laying the cable and backfilling without the use of turbidity control measures. The open cut method will be employed only in those circumstances where an intermittent or perennial stream is dry at the time work is proposed and only with prior approval from the NYSDPS and in consultation with NYSDEC. Even after receiving approval from the NYSDPS the Certificate Holder must confirm with the Environmental Inspector that the stream to be crossed does not have any measurable flow at the time work is to commence. If the Environmental Inspector determines there is flow the Certificate Holder must employ a dry crossing method or delay work until there is no flow.

BMPs to be implemented for open cut crossings include the following:

a) All equipment, material, and construction personnel necessary for the crossing will be on-site before trenching begins;

b) Only the construction equipment needed to complete the waterbody crossing will be allowed in the channel;

c) Excavated material from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, will be placed at least ten (10) feet from the water's edge;

d) The excavated material will be placed in a stockpile area within the right-of-way protected by erosion control devices to prevent siltation of the adjacent resource area; and

e) In-stream trenching across the stream bottom will be isolated by the installation of trench plugs.

Figure 18-3 shows a typical open cut crossing.

18.3 EQUIPMENT CROSSINGS

Construction equipment crossings will be installed across all waterbodies to gain continuous access along the railroad rights-of-way for construction operations where reasonable alternative access is not available. A listing of all waterbody construction crossings will be included on the EM&CP Plan and Profile drawings and submitted to the NYSDEC for review and to the DPS for approval prior to use. The EM&CP plan should include typical drawings for all construction crossing options. Equipment crossings will be carefully installed to comply with water quality standards by minimizing streambed and streambank disturbance and downstream erosion, scour, or siltation.

The primary objective will be to select the crossing for the particular waterbody that minimizes the amount of disturbance to the bed and bank of the stream and the placement of fill in the waterbody. As a result, the use of a bridge will be the preferred option for equipment crossings. Where a bridge is not feasible or practical the other available crossing methods will be considered. If environmental conditions require a change in the type of crossing for a stream, an EM&CP change notice will be required.

Equipment crossings will be constructed to allow for unrestricted flow and to prevent soil from entering the waterbody. Temporary crossings will be designed and constructed to withstand the two (2) year flood event. Construction equipment must cross waterbodies on bridges consisting of one of the following:

a) Clean rockfill and culverts;

b) Wooden equipment mats and/or culverts; or

c) Flexi-float or portable bridge.

See Figures 18-4 and 18-5 for Equipment Crossing typical details.

The following BMPs will be implemented for construction equipment crossings:

a) Vehicular access shall be prohibited where alternative access can be provided;

b) All crossing structures will be installed in a dry condition;

c) A temporary diversion channel, culvert, or pump-around will be constructed to prevent running water in the work area;

d) Excavated streambed material may be used to embed a culvert provided it matches the streambed materials upstream and downstream of the crossing site and would not be subject to undue erosion during work activities;

e) Measures such as large rocks or rock bags will be used in waterbodies with a sandy bottom to prevent the culverts from shifting or rolling;

f) Devices will also be placed at the outlet to the culverts to prevent scouring of the stream bottom where necessary;

g) Clean rock fill equipment crossings must be maintained periodically to remove soil from the rocks and to replace additional clean rock if needed;

h) After such equipment crossings are established, construction equipment will not be permitted to drive through the waterbody; and

i) Once the equipment crossing is installed, only the equipment necessary to construct the cable crossing will be allowed in the waterbody; and

j) The equipment crossings will be removed, and the original condition re-established once access in the area is no longer needed.

18.4 STREAM PROTECTION MEASURES, CLEANUP AND RESTORATION

Impacts to water quality will be minimized while work is being performed in streams and other bodies of water by implementing the following measures:

a) During construction, vegetated buffers at all waterbody crossings will be maintained. Where the vegetation exists along the railroad rights-of-way, a minimum fifteen (15) foot buffer will be maintained with existing trees and shrubs except for that portion of the bank that has been cleared for the construction path.

b) Where HDD is proposed, all vegetation will be maintained between the HDD entry and exit points;

c) Soil or excavated materials will be set back a sufficient distance from stream banks to prevent their entry into any stream or their causing the bank to collapse, unless either the bank or the excavated materials have been protected adequately, and no other storage area is available;

d) Equipment crossings will be carefully installed to minimize streambank disturbance. Installation of stream crossings, diversions of water during construction, and removal or restoration of crossings will maintain the original stream conditions and characteristics, unless minor manipulations to prevent stream bank erosion (e.g., placements of boulders, root wads, wing deflectors) are requested or approved by the DPS and NYSDEC;

e) Construction equipment and materials, fuels, etc., will not be stored within wetlands or within one hundred (100) feet of any stream or wetland system;

f) Construction equipment will not be refueled within wetlands or within one hundred (100) feet of any stream or wetland system;

g) Equipment will be well maintained and checked daily for leaks;

h) All laydown areas and equipment storage areas will be located a minimum of one hundred (100) feet from wetlands and streams.

i) No permanent structural shoreline protection or stabilization will be used, except where such protection is pre-existing.

j) Isolate in-stream work from the flow of water and prevent discolored (turbid) discharges and sediments from entering the water due to excavation, dewatering and construction activities;

k) Exclude the use of heavy construction equipment below mean high water until the work area is protected by an approved structure and dewatered, except where an emergency response requires immediate action and deviation from this requirement;

l) Stabilize any disturbed banks by grading to an appropriate slope, followed by vegetating or armoring the bank to restore pre-construction conditions, to prevent erosion and sedimentation into the waterbody;

m) Minimize soil disturbance, provide appropriate grading and temporary and permanent revegetation of stockpiles and other disturbed areas to minimize scour, erosion and sedimentation potential;

n) Protect all waters from contamination by deleterious materials such as wet concrete, gasoline, solvents, epoxy resins or other materials used in construction, maintenance and operation of the Facility;

o) Install effective erosion control measures on the downslope of all disturbed areas and maintain them in fully functional condition. These erosion control measures are to be installed before commencing any other activities involving soil disturbance;

p) Ensure complete removal of all dredged and excavated material, debris or excess materials from construction, from the bed and banks of all water areas to an approved upland disposal site where not suitable for backfill or reuse;

q) Ensure that all temporary fill and other materials placed in the waters of the river are completely removed and the original condition re-established, immediately upon completion of construction, unless otherwise directed by the NYSDEC.

Upon completion of backfilling operations, cleanup and restoration of the stream crossing, banks and bank approaches (at least fifty (50) feet adjacent to each bank) will be completed within twenty four (24) hours. If needed, stream banks will be re-established to original grade immediately after stream bank work is completed. The banks will then be permanently stabilized by seeding with native grasses, mulched and, if needed, planted with native shrub seedlings. If additional stabilization is needed jute netting or erosion control blankets will be used (Figure 18-6).

19.0 WETLAND AND OTHER WATER RESOURCES PROTECTION

19.1 INTRODUCTION

The boundaries of any wetlands, streams and other water resources along the Facility route have been identified in the field during development of the Article VII Application and supplemental filings. All delineated wetlands, streams and water resources will be depicted on the EM&CP Plan and Profile drawings and prior to construction all field identified sensitive resources will be flagged to ensure resource protection. Protection measures, as described below, will be implemented to ensure minimization of impacts to wetlands and other water resources resulting from sedimentation, erosion, turbidity, unanticipated spills or leaks of fuel, and/or other toxic materials.

19.2 WETLAND CONSTRUCTION PROCEDURES

Protection measures will be implemented to ensure minimization of impacts to wetlands, waterbodies, and adjacent areas resulting from sedimentation, erosion, turbidity, unanticipated spills or leaks of fuel, or other toxic materials. These protection measures include:

a) The Certificate Holders will minimize work within and across streams, wetlands, or other water resources to the extent possible during preconstruction, construction, operation, and maintenance activities;

b) The Certificate Holders will notify DPS and NYSDEC staff, and if within the Adirondack Park, APA staff, at least five (5) business days prior to construction involving state-regulated wetland;

c) Sediment and erosion control devices will be installed across the right-of-way on any slopes leading into wetlands and along the edge of the construction right-of-way, as necessary, to prevent spoil from flowing off the right-of-way into a wetland. Locations of sediment/erosion control devices will be identified on the EM&CP Plan and Profile drawings;

d) To the extent possible, work which must be in a wetland will be scheduled to be started and completed in the dry season or when the ground is frozen;

e) To expedite revegetation of wetlands, the top one (1) foot of soil will be stripped from over the trench, retained and later replaced. The exception to this requirement includes areas with standing water or saturated soils, areas where no topsoil layer is evident or areas where the topsoil layer exceeds the depth of the trench;

f) Construction vehicles and equipment will be limited to established access roads and construction work spaces depicted on EM&CP Plan and Profile drawings;

g) Construction equipment operating within wetlands will be limited primarily to what is needed to dig the trench, install the cable, backfill, and restore the right-of-way. All other construction equipment will use access roads in upland areas to the extent practicable;

h) To minimize disturbance and compaction in wetlands with saturated soils or standing water, either wide-tracked or balloon-tired equipment operating from timber corduroy or timber mats will be used. Imported rock, stumps, brush, or off-site soil as temporary or permanent fill is prohibited. Following construction, all materials used to stabilize the right-of-way will be removed;

i) Construction materials, including fuels, will not be stored within one hundred (100) feet of any surface water or wetland system, unless no alternative is available. If no alternative is available, the Environmental Inspector will ensure appropriate protection measures for spill prevention and control are implemented;

j) Construction equipment will not be refueled within one hundred (100) feet of any surface water or wetland system;

k) Spill response and mitigation procedures will be implemented in the case of any accidental spills of chemical, fuel, or other toxic materials;

l) Any temporary access routes or parking areas adjacent to wetlands and waterbodies will be graded to direct runoff away from water resources. If needed, at the determination of the Environmental Inspector, additional erosion control measures will be installed adjacent to wetlands and other water resource areas;

m) Spoil and excavated materials will be stored outside of wetlands and wetland adjacent areas. All stockpiled material will be stored at a sufficient distance to prevent sedimentation into any stream, wetland, wetland adjacent area, or other waterbody. If no storage area is available, spoil will be adequately protected and erosion and sedimentation control measures will be installed to prevent materials from entering adjacent areas. All excess material will be disposed of in approved upland locations;

n) Unless work activities will resume within seven (7) days, the Certificate Holders will stabilize disturbed soils as soon as possible and no more than seven (7) days upon temporary or permanent completion of ground-disturbing activities. If soil stabilization measures are not possible within seven (7) days due to snow cover, frozen ground, or other weather conditions, soils will be stabilized as soon as practicable; and

o) The construction right-of-way will be inspected periodically during and after construction until final restoration is complete. Erosion control or restoration features will be repaired as needed in a timely manner until permanent revegetation is successful.

19.2.1 Erosion and Sediment Control

Erosion and sediment control devices will be installed prior to soil disturbance activities as depicted on the EM&CP Plan and Profile drawings or as deemed necessary by the Environmental Inspector to protect the resource areas. The wetland boundaries will be depicted on the EM&CP Plan and Profile drawings and marked in the field prior to the onset of soil disturbing activities to ensure that spoil piles and other disturbed soil areas are confined and erosion and control devices will be employed to avoid sediment flow into wetland areas. In areas of active construction, erosion controls will be inspected on a daily basis by the Environmental Inspector and maintained or replaced as necessary.

Trench dewatering may become necessary during wetland crossing operations. Trench water will be pumped into a filter bag or sediment trap constructed of straw bales and filter fabric or silt fence so that no heavily silt-laden water flows into any wetland. The pump intake hose will not be allowed to be set on the trench bottom throughout dewatering. Care will be taken to ensure that natural drainage is not adversely affected. The basin and all accumulated sediment will be removed following dewatering operations, and the area will be seeded and mulched.

Straw bales, silt fence, or earthen berms will also be installed across the right-of-way at the base of all slopes located adjacent to wetlands or at the edge of the work area until right-of-way revegetation is complete. The construction area will be monitored to ensure that erosion control measures are functioning properly both during and following construction until final restoration is complete.

19.2.2 Clearing

In wetland areas, construction will be performed in a manner that minimizes disturbance to wetland vegetation. The following BMPs will be implemented during the clearing of wetland vegetation:

a) Clearing of existing vegetation in wetlands or in or near waterbodies will be limited to that material necessary to allow completion of construction activities and to allow for reasonable access for long-term maintenance;

b) Brush and trees will be cut at ground level leaving the root systems intact;

c) Tree stumps will only be removed directly over the trench and where necessary for safe access along the right-of-way;

d) If high soil moisture content or standing water exist in a wetland prior to construction, the use of heavy equipment will be limited to the extent practical to prevent rutting and soil profile mixing; and

e) Trees will be felled by hand and cut to lay flat on the ground and left in place unless doing so would prevent safe access to the site.

19.2.3 Access Roads

Construction in wetlands with standing water or saturated soils will be limited to the equipment necessary to clear the right-of-way, install the equipment crossings, dig the trench, install the cable, backfill and restore the right-of-way. All other construction equipment will be track-mounted or will use approved access roads located in upland areas to the maximum extent practicable.

The following BMPs will apply for all access roads in wetlands:

a) Swamp mats or low psi equipment or both will be used in wetland areas, if necessary, to minimize compaction and damage to the soil structure;

b) Rock fill, tree stumps or brush pads will not be used to support equipment in wetlands; and

c) Vehicles and equipment will be clean prior to entering areas near NYSDEC protected waters or wetlands.

If the Construction Inspector or Environmental Inspector determines that conditions are unsuitable for normal construction techniques, wetland access roads will be installed using the following equipment options: 1) swamp mats; 2) geotextile fabric and stone; and 3) bridges and flotation devices. The type of access road to be installed in a particular wetland area will be determined by the Construction Inspector and Environmental Inspector at the time of site preparation based on consideration of the following:

a) Presence and depth of standing water;

b) Moisture content and substrate composition; and

c) Type and size of construction equipment to be used.

All wetland access roads will be temporary and will be designed and installed to provide for complete removal with minimized disturbance to the wetland system. Construction details for each type of wetland access road will be provided in the EM&CP, with typical standards described below.

19.2.3.1 Swamp Mats and Timber Mats

In wetlands with high soil moisture content or standing water, prefabricated swamp mats, timber mats or hard plastic mats may be placed in the wetland to provide vehicular support, stability and safe operation of equipment (Figure 19-1). When swamp or timber mats are used in wetlands, the following standards apply:

a) Sufficient mats will be on site to complete the span of wetland to be crossed;

b) The mats to be used must be sufficiently wide, free from decay and sturdy enough to support the necessary equipment;

c) Previously used mats will be cleaned to prevent introduction of non-native species and other harmful materials to the wetland;

d) The mats will be removed post-construction by lifting along the reverse order of the work route and lifting the mat from the point of final equipment location and moving towards the point of starting equipment location; and

e) Mats will not remain in the wetland for more than four (4) months in the growing season unless specified on the EM&CP Plan and Profile drawings.

19.2.3.2 Geotextile and Stone

In wetland areas where conditions are not suitable or where suitable mats do not exist, a geotextile and stone road may be constructed in wetlands using the following standards:

a) The width of the road will be the minimum needed to safely pass a single vehicle through the wetland;

b) Prior to placing geo-textile fabric along the alignment of the wetland access road, all tree stumps will be cut flush with the ground as much as practicable;

c) A detailed description of the minimum requirements for the geotextile that will prevent tearing during use and removal (technical specifications, thickness, tensile strength, etc.) and specific examples of materials to be used will be included in the EM&CP.

d) A layer of clean crushed stone will be laid on top of the geotextile fabric. The road will be of sufficient depth to hold material in place and support equipment;

e) Geotextile fabric will extend well beyond the edge of stone placement to minimize stone entering the wetland and facilitate removal of the road;

f) Suitable cross drainage will be provided across the road for stream channels and surface flow;

g) All vehicular and construction equipment access will be confined to the road;

h) Upon completion of construction, all stone and filter fabric will be removed from the wetland. Similar to removing stabilized construction entrances at public roadsides, the Contractor will connect an excavator to the far end of the fabric and pull it backwards onto itself, causing the stone to pile up where it can be scooped up and removed with a backhoe or loader. Removal of temporary access roads in this manner will be done in segments;

i) Following removal of the stone and geotextile fabric, the wetland surface will be restored to its original contours and restored in accordance with the direction and guidance of DPS Staff and NYSDEC, and for wetlands within the Adirondack Park, of APA, (which may involve seeding or planting); and

j) Compensatory mitigation such as vegetation plantings or a project to address invasive species in wetlands will be considered in consultation with DPS staff and NYSDEC where gravel/stone in combination with geotextiles remain in place four months or longer.

19.2.3.3 Bridges and Flotation Devices

When the depth of water in a wetland exceeds twelve (12) inches, temporary pontoon or flotation bridges may be used (see Figure 18-5). If temporary bridges are used, the following specifications will apply:

a) For smaller wetlands that can be spanned, banks must be sufficiently stable to support both bridge and equipment;

b) All previously used flotation equipment will be cleaned prior to re-use; and

c) Trees are not to be used as guying anchors for bridge installations.

Where water levels are temporarily high due to recent storm events, the Construction Inspector and the Environmental Inspector may direct that construction be postponed until water levels subside. Weather conditions will be monitored to avoid ditching and pipe placement during inclement weather conditions wherever possible.

19.2.4 Trenching

Typical trench excavation procedures are identified in Section 7.3. BMPs to be implemented during trenching in wetland areas include the following:

a) The mixing of topsoil with subsoil will be minimized by using topsoil segregation construction methods in wetlands (except when standing water or saturated soils are present);

b) Trench plugs will be installed where necessary to ensure that the trench does not act as an underground drainage channel; and

c) Should it become necessary to remove water from the trench, it will be pumped to a stable, vegetated upland area (where practical) and filtered through a filter bag or siltation barrier. Refer to Section 7.7 for details on trench dewatering.

19.2.5 Backfilling

Backfill operations will commence immediately after the cable is installed and will continue until completed. The following standards and procedures will apply when backfilling within wetland areas:

a) Topsoil will be stripped from the trench and subsoil stockpile area (trench plus spoil side method) and placed on one side of the trench. Subsoil will be placed on the other side of the trench. The soils will then be returned to their original horizontal strata in the backfilled trench;

b) Only on-site native material will be used in backfill operations unless the native material does not meet specifications, or ledge rock is encountered in the trench. If imported material is used, it will be approved by DPS Staff and the NYSDEC;

c) Where topsoil has been segregated from the trench spoil, backfill will be done in reverse order with trench spoil returned first; and

d) Excess spoil will be removed off-site.

Refer to Section 7.3.5 for details on backfilling.

19.3 SPRINGS AND WELLS

The Certificate Holders will consult with all appropriate agencies, landowners, and local municipalities to determine the location of any springs or wells along the Facility route. All water wells within two hundred (200) feet of any point of the right-of-way will be identified in the EM&CP Plan and Profile drawings. Refueling and/or storage of toxic materials will not be allowed within two hundred (200) feet of any private water well or four hundred (400) feet of any municipal water well.

19.4 CLEANUP AND RESTORATION

Impacts to wetlands will occur primarily during the construction phase. Although some permanent forested wetland conversions to emergent marsh or scrub shrub wetland will occur in some areas, there will be no permanent filling of wetlands as a result of the cable installation. The Certificate Holders' approach to wetland restoration involves a combination of substrate and hydrology restoration, and vegetation establishment involving natural succession processes as a key component. The Certificate Holders will minimize the short and long-term impacts to all wetland types encountered along the Facility route, to the greatest practicable extent.

Restoration of wetland areas will be expedited by minimizing the duration of work and by restoring the preconstruction topographic and hydrologic conditions as quickly as possible following construction. Removal of stumps in wetlands will be limited to directly over the trench unless personnel safety requires additional stump removal. The stumps that are left in

place may promote natural regeneration within the construction right-of-way depending on the species. Except in standing water, saturated soils, or where ledge is encountered at the surface, the top twelve (12) inches of hydric soil in wetland areas over the trench will be segregated and stockpiled separately from subsoils. Once the trench is backfilled, the topsoil will be replaced over the trench to its original grade. This topsoil material typically contains an extensive propagule bank that aids in the revegetation of disturbed areas with herbaceous and woody vegetation.

The cleanup and final restoration phase is critical for mitigating long-term wetland impacts, and therefore will be closely monitored by the Environmental Inspector. During the initial restoration phase, all construction debris will be removed from the right-of-way. Segregated topsoil will be replaced, and wetland contours and drainage patterns will be restored to approximate original condition by matching that which exists in adjacent undisturbed areas. Restoring the grade, drainage patterns, and topsoil will promote the re-establishment of native hydrophytic vegetation. All materials placed in the wetland to facilitate access and construction will be removed in their entirety unless specified on the EM&CP Plan and Profile drawings.

Cleanup and final grading steps will commence within twenty one (21) working days after the trench is backfilled, weather conditions permitting. Restoration of the wetland (other than the travel way), will be completed within twenty four (24) hours after backfilling is completed. This will be done for a minimum distance of fifty (50) feet from the wetland edge. Restoration of the wetland will include but is not limited to: final grading, seeding with a native wetland seed mix, fertilizing, and mulching. High organic soils (as determined by NYSDEC, DPS, or the Environmental Inspector) will be graded back to original contours and left unmulched and unseeded to facilitate the germination of native seeds and sprouting of rhizomes from the seed bank. Following cleanup, the wetland will be evaluated for possible vegetative plantings. This will be done in consultation with the appropriate agencies.

19.4.1 Post-Construction Restoration Monitoring

The Certificate Holders will establish and implement a program to monitor the success of restoration upon completion of construction and restoration activities. The success of wetland revegetation will be monitored and recorded annually for the first two (2) years (or as required by permit) after construction, or longer, until wetland revegetation is successful. Wetland revegetation will be considered successful when the vegetative cover is at least eighty (80) percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of two (2) years, the Certificate Holders will develop and implement (in consultation with a professional wetland ecologist) a plan to actively revegetate the wetland with native wetland herbaceous plant species.

20.0 AGRICULTURAL LANDS

20.1 TYPES OF AGRICULTURAL LANDS

There are many types of agricultural land along the overland portions of the Facility. Agricultural land in this area consists of barns and outbuildings, pasture land, crop land, hay fields and access roads across the railroad right-of-way.

The Facility is not anticipated to impact agricultural land uses in the Agricultural Districts, given that installation of the Facility will occur within existing railroad rights-of-way. Potential impacts to agriculture land may occur if agricultural land is used for off-right-of-way access to the Facility or if agriculture lands are used for laydown areas. These areas will be identified during the development of the EM&CP Plan and Profile drawings. If the Facility staff identifies areas that may pose a risk to agriculture lands or operations, an Agricultural Inspector will be employed by the Certificate Holders to oversee the agricultural resources traversed by the Facility. The duties and qualifications of the Agricultural Inspector are described in Section 2.2.

20.2 CLEARING

The Agricultural Inspector and Environmental Inspector will be present for all clearing that takes place on or near agricultural land. Any necessary clearing of shrubs, hedgerows, and other woody vegetation will be performed as described in Section 5.0. Stumps, slash, or chips will not be piled or buried in active agricultural fields or improved pasture. Logs may be piled in areas designated by the landowner. Black cherry trees that must be cleared near any agricultural lands that could potentially be inadvertently consumed by livestock will be identified and removed from the area. Drying black cherry slash is toxic to livestock and will not be stockpiled in areas accessible to livestock. Any black cherry cleared will be removed from the livestock areas and disposed of elsewhere.

20.3 GRADING AND TOPSOIL SEGREGATION

20.3.1 Grading

Mats will be installed where repeated temporary access is necessary across agricultural fields. The mats will be layered where necessary to provide a level access surface. Once access is no longer required across agricultural areas, the mats will be removed and the Agricultural Inspector will use a soil penetrometer to determine if soil compaction has occurred as a result of construction activities. All compacted areas will be remediated as specified in Section 20.5.

Where the installation of mats is not practical, topsoil shall be removed. Any grading necessary for access roads constructed in active agriculture areas will first remove topsoil from the A horizonas described in Section 20.3.2, below. Geotextile fabric with gravel or stone on top will be placed on the B horizon for access roads. The use of topsoil stripping for construction access, as opposed to matting, shall only be allowed with approval from DPS Staff in consultation with Ag & Mkts.

All vehicle traffic and parking will be confined to the access roads and designated work areas to prevent damage to agricultural land. All disturbed areas will be restored following construction.

20.3.2 Topsoil Segregation – Cropland/Pasture/Grazing

Topsoil will be removed down to the B horizon and stockpiled next to the access road or stockpiled nearby. Excavated topsoil will be stockpiled separately from other excavated materials. Topsoil removal up to a depth of 16 inches may be required in specially-designated soils encountered along the route and identified in the EM&CP. The site-specific depth of topsoil to be excavated will be determined and monitored by the Agricultural Inspector during EM&CP development using the County Soil Survey and on-site soil augering, if necessary. During the clearing/construction phase, site-specific depths of topsoil stripping will be monitored by the Agricultural Inspector.

Topsoil stockpiles on agricultural areas left in place prior to October 31 will be seeded with Aroostook Winter Rye or equivalent at an application rate of 3 bushels (168 #) per acre and mulched with straw mulch at a rate of 2 to 3 bales per 1,000 sq. ft. Topsoil stockpiles left in place between October 31 and May 31 will be mulched with straw mulch at a rate of 2 to 3 bales per 1,000 sq. ft. Straw (not hay) mulch will be used to prevent soil loss on stockpiled topsoil from October through May.

20.4 DRAIN LINES

Where future surface and subsurface drainage plans have been identified, the Certificate Holders will provide adequate cover over the cable to allow for installation of major header drains and main drains across the trench without obstruction due to the burial depth of the cables. The Agricultural Inspector will determine the required elevations of the cable for clearance between the bottom of future drainage systems and the top of the cables. These depths will be specified in the EM&CP.

20.5 CLEANUP AND RESTORATION

Once construction activities are completed, gravel will be removed from along the access roads. Where the right-of-way route, work areas, access roads, and/or staging areas disturb agricultural areas during construction, subsoil will be decompacted to a depth of 18 inches with deep tillage by such devices as a deep ripper (subsoiler). Soil compaction results will be no more than 250 pounds per square inch ("PSI") as measured with a soil penetrometer. Following decompaction, all stone and rock material four (4) inches and larger in size will be removed from the surface. The disturbed areas will then be backfilled with topsoil and graded to restore the original soil profile. Finally, deep subsoil shattering will be performed with a subsoiler tool having angled legs. Stone removal will be completed, as necessary, to eliminate any additional rocks and stones brought to the surface as a result of the final subsoil shattering process. The topsoil will then be stabilized by seeding and/or mulching as described in Section 20.6. Subsoil decompaction and topsoil replacement will not be performed between October and May, unless approved on a site-specific basis by DPS and Ag & Mkts in consultation with the Agricultural

Inspector. In the event that subsequent construction or clean-up activities result in additional compaction, additional deep tillage will be performed to alleviate such compaction.

Segments of farm roads utilized for access will be improved as required following consultation with the farm owner and Ag & Mkts prior to use. Such improvements will include the installation of geotextile fabric and crushed stone. Fences, gates, and stonewalls disturbed during construction will be restored to their pre-construction condition, or as otherwise agreed to by the landowner (Section 5.8).

Farm drainage features affected by construction will be rebuilt to like-new condition upon completion of construction, or as otherwise agreed to by the landowner. A detailed drainage line repair procedure will be developed in the EM&CP for the repair of crushed or severed clay tile or plastic drain lines. The procedure will be developed by the Agricultural Inspector in consultation with the local Soil and Water Conservation District and landowner. Drawings showing the generic technique to be implemented for drain line repairs will be provided by the Certificate Holders in the EM&CP. All new plastic drain tubing will meet or exceed the American Association of State Highway and Transportation Officials ("AASHTO") M252 specifications. Functional stone drainage systems severed during cable installation will be repaired during the restoration phase. At the end of all construction, the ROW and respective work areas shall be thoroughly cleared of debris such as nuts, bolts, spikes, wire, pieces of steel, and other assorted items.

20.6 REVEGETATION

20.6.1 Seed Mixtures

After topsoil replacement, seedbed preparation (final tillage, fertilizing, liming) and seeding shall follow NYS Ag & Mkts recommendations as contained in *New York State Farmland: Seeding, Fertilizing and Lime Recommendations for Gas Pipeline Right-of-Way Restoration In Farmlands* (revised 6-15-2005) or as specified by the landowner. Seeding will be monitored for two (2) years after completion at least three (3) times per growing season.

20.6.2 Timing

Seed mixes will be applied during the appropriate season for the crop species selected. If the timing of restoration activities precludes the establishment of the chosen crop species, an annual cover crop to be planted will be chosen in consultation with the landowner or land manager. If restoration takes place outside of the growing season, the disturbed area will be stabilized with mulch.

20.6.3 Mulching

Mulch will consist of clean straw or hay from the affected agricultural property. The mulch will be spread uniformly in a continuous blanket of sufficient thickness to hold the soil in place.

20.7 REMEDIATION AND MONITORING

The Certificate Holders will provide for a monitoring and remediation period of two (2) years after the completion of the initial restoration. The Certificate Holders will employ an Agricultural Inspector on at least a part-time basis through this period. The remediation and monitoring phase will be used to identify any remaining agricultural impacts associated with construction that are in need of mitigation and to implement the follow-up restoration.

Conditions to be monitored include topsoil thickness, relative content of rock and large stones, crop production, drainage and repair of severed fences, etc. Impacts will be identified through on site monitoring of all agricultural areas along the trenched area and through contact with respective farmland operators, Ag & Mkts, and County Soil and Water Conservation Districts.

Topsoil deficiency will be mitigated with topsoil brought in from off-site that is consistent with the quality of topsoil on the affected site. Excessive amounts of rock and oversized stone material will be determined by a visual inspection of the right-of-way and periodic probes of the trench area. Results will be compared to other portions of the same field. All excess rocks and large stones will be removed and disposed of by the Certificate Holders.

On site monitoring will be conducted at least three (3) times during the growing season and include a comparison of growth and yield for crops on and off the Facility Construction Zone. When the subsequent crop productivity within the Facility Construction Zone is less than that of the adjacent unaffected agricultural land, the Agricultural Inspector, in conjunction with the Certificate Holders, Ag & Mkts, as well as other appropriate organizations, will help to determine the appropriate rehabilitation measures for the Certificate Holders to implement. During the various stages of remediation, all affected farm operators will be periodically apprised of the duration by the Agricultural Inspector.

21.0 INVASIVE SPECIES CONTROL PROCEDURES

The Certificate Holders has identified certain invasive species that potentially occur along the Facility route, on the basis of field surveys, published studies and data, and/or consultation with federal and state agencies. Invasive species are typically nonindigenous and include both terrestrial and aquatic species that can spread rapidly in the environment, resulting in the displacement of native species and sometimes causing economic impacts. The movement of vehicles, equipment and personnel, and the transport of materials and/or construction debris to and from areas that are inhabited by invasive species could result in the unintentional spread of these species. Additionally, areas that have been disturbed by human activity may provide opportunity for the colonization and spread of invasive species, which are often more disturbance-tolerant than the native communities. The Certificate Holders have included BMPs to control the transport of invasive species from areas where they may occur along the Facility route. Measures such as training personnel in the identification of invasive species, inspecting and cleaning vessels and equipment, and practices to encourage rapid stabilization, restoration and revegetation of disturbed work areas, have been incorporated to minimize any adverse impacts due to invasive species.

The Certificate Holders are aware that invasive species management is a topic of significant discussions within the State and new guidance and management plans are being developed. In order to provide the most current and site appropriate Invasive Species Management for the construction and operation of the , the Certificate Holders will develop an Invasive Species Management Plan in consultation with NYSDEC, DPS Staff, and APA (for portions of the Facility within the Adirondack Park) for inclusion in the EM&CP. This section describes some of the concerns and measures that will be addressed in the Invasive Species Management Plan for the Facility.

21.1 PLANTS

The presence of some invasive plant species in wetlands crossed by the Facility route was documented during the wetland delineation surveys which took place during October and November 2009 and April through June 2010. The NYSDEC and APA have compiled an Interim Invasive Plant Species (Table 21.1) list that includes:

Table 21.1
NYSDEC Interim Invasive Plant Species

Floating and Submerged Aquatic Plants	
Common Name	**Scientific Name**
Carolina Fanwort	*Cabomba caroliniana*
Rock Snot (diatom)	*Didymosphenia geminata*
Brazilian Elodea	*Egeria densa*
Water Thyme	*Hydrilla verticillata*
European Frog's Bit	*Hydrocharis morus-ranae*
Floating Water Primrose	*Ludwigia peploides*
Parrot-feather	*Myriophyllum aquaticum*
Variable Watermilfoil	*Myriophyllum heterophyllum*
Eurasian Watermilfoil	*Myriophyllum spicatum*

Table 21.1 NYSDEC Interim Invasive Plant Species	
Brittle Naiad	*Najas minorjed*
Starry Stonewort (green alga)	*Nitellopsis obtusa*
Yellow Floating Heart	*Nymphoides peltata*
Water-lettuce	*Pistia stratiotes*
Curly-leaf Pondweed	*Potamogeton crispus*
Water Chestnut	*Trapa natans*
Emergent Wetland and Littoral	
Common Name	**Scientific Name**
Flowering Rush	*Butomus umbellatus*
Bohemian Knotweed	*Fallopia bohemica*
Japanese Knotweed	*Fallopia japonica*
Giant Knotweed	*Fallopia sachalinensis*
Yellow Iris	*Iris pseudacorus*
Purple Loosestrife	*Lythrum salicaria*
Reed Canarygrass	*Phalaris arundinacea*
Common Reed-nonnative variety	*Phragmites australis* var. *australis*
Herbaceous Terrestrial	
Common Name	**Scientific Name**
Garlic Mustard	*Alliaria petiolata*
Wild Chervil	*Anthriscus sylvestris*
Mugwort	*Artemisia vulgaris*
Brown Knapweed	*Centaurea jacea*
Black Knapweed	*Centaurea nigra*
Spotted Knapweed	*Centaurea stoebe* ssp. *micranthos*
Canada Thistle	*Cirsium arvense*
Bull Thistle	*Cirsium vulgare*
Crown Vetch	*Coronilla varia*
Black Swallow-wort	*Cynanchum louiseae (nigrum)*
European Swallow-wort	*Cynanchum rossicum*
Fuller's Teasel	*Dipsacus fullonum*
Cutleaf Teasel	*Dipsacus laciniatus*
Cypress Spurge	*Euphorbia cyparissias*
Giant Hogweed	*Heracleum mantegazzianum*
Japanese Stilt Grass	*Microstegium vimineum*
Wild Parsnip	*Pastinaca sativa*
Cup Plant	*Silphium perfoliatum*
Vines	
Common Name	**Scientific Name**
Porcelain Berry	*Ampelopsis brevipedunculata*
Oriental Bittersweet	*Celastrus orbiculatus*
Japanese Honeysuckle	*Lonicera japonica*
Mile-a-minute Weed	*Persicaria perfoliata*
Kudzu	*Puerariamontana* var. *lobata*
Shrubs and Trees	
Common Name	**Scientific Name**
Norway Maple	*Acer platanoides*
Tree of Heaven	*Ailanthus altissima*

Table 21.1 NYSDEC Interim Invasive Plant Species	
Japanese Barberry	*Berberis thunbergii*
Russian Olive	*Elaegnus angustifolia*
Cherry Eleagnus	*Eleagnus multiflora*
Autumn Olive	*Elaegnus umbellata*
Glossy Buckthorn	*Frangula alnus*
Border Privet	*Ligustrum obtusifolium*
Amur Honeysuckle	*Lonicera maackii*
Shrub Honeysuckles	*Lonicera morrowii/tatarica/x bella*
Bradford Pear	*Pyrus calleryana*
Common Buckthorn	*Rhamnus cathartica*
Black Locust	*Robinia pseudoacacia*
Multiflora Rose	*Rosa multiflora*
False Spiraea	*Sorbaria sorbifolia*

21.1.1 Measures to Prevent or Control the Transport of Invasive Plant Species

On a Facility-wide basis, the Certificate Holders will perform the following measures to prevent or control the transport of invasive plant species:

a) Prior to construction, training will be conducted to educate Facility contractor(s) and subcontractor(s) on identifying invasive plant species and the site-specific protocol for preventing or controlling their transport throughout or off of the Facility site. These protocols include the various cleaning or decontamination methods to be used on the Facility. In addition, the contractors will be instructed to stay within access paths and work areas that are designated on the EM&CP Plan & Profile drawings to minimize ground disturbance;

b) Sediment and erosion control devices will be installed across the construction right-of-way on slopes leading into wetlands and along the edge of the construction right-of-way to prevent spoil from migrating into these areas. This will also help to prevent the dispersion of seeds from invasive plant species into uninfested wetlands during construction;

c) Vehicles, equipment, and materials (including swamp mats) will be inspected for, and cleaned of, any visible soils, vegetation, and debris before bringing them to the Facility area or moving them to the next wetland along the construction right-of-way. As specified under NYSDEC's General Permit for Routine ROW Maintenance Activities, DEC No. 0-0000-01147/00001:

    i. "Equipment used in areas containing invasive plant species will be power-washed and cleaned with clean water (no soaps or chemicals) before leaving the invasive-infested area or Facility ROW for another project, to prevent the spread of seeds, roots or other viable plant parts, and the wash water, including spray, will not be discharged within one hundred (100) feet of any stream, existing or proposed wetland or adjacent area, or stormwater conveyance (ditch, catch basin, etc). If sufficient space is not available or is precluded by terrain to provide a cleaning

station on site, upon approval of the Environmental Monitor, equipment used within an infested area may be power-washed adjacent to the area, provided that the wash water, including spray, does not discharge within one hundred (100) feet of any stream, existing or proposed wetland or adjacent area, or stormwater conveyance (ditch, catch basin, etc).

ii. Loose plant and soil material that has been removed from clothing, boots and equipment, or generated from cleaning operations will be a) rendered incapable of any growth or reproduction, b) disposed of off-site, or (c) handled as per paragraph iii) below. If disposed of off-site, the plant and soil material will be transported in a secure manner. Any off-site disposal must occur at either a landfill-incinerator or a State-approved disposal facility.

iii. If upon completion of work, the area remains infested with invasive plant species, the invasive material cleaned from equipment used within the same construction area may remain within the infested area, provided that no filling of a wetland will occur."

d) Revegetation of wetlands will be expedited by stripping the topsoil from over the trench, except in areas with standing water or heavily inundated soils, or where no topsoil layer is evident or where it exceeds the depth of the trench. Topsoil will then be stockpiled separately from subsoil to insure preservation of the native seed bank;

e) Following cable installation, the trench will be backfilled and the area recontoured to its original grade. Segregated topsoil will be replaced and natural drainage patterns restored to facilitate natural re-establishment of native vegetation;

f) The restored right-of-way will be seeded with an invasive species free seed mix immediately after final regarding to create a rapid cover over the disturbed right-of-way and help to prevent establishment of invasive species which typically colonize disturbed sites;

g) Expediting construction in and around wetlands and limiting the amount of equipment and construction activities within wetlands will reduce the amount and duration of disturbances. In addition, equipment used will be tracked or balloon-tired, often operating on top of timber mats or corduroy. This will minimize the amount of heavily disturbed soils in which invasive species might colonize;

h) To the extent practicable, water for dust control and other uses will come from municipal water supplies or other potable sources. If surface waters are used, equipment will be disinfected afterwards;

i) To the extent practicable, the movement of invasive-plant-infested soils, gravel, rock, and other fill materials to relatively-invasive-plant-free locations will be avoided. Soil, gravel, rock, and other fill material will come from invasive-plant-free sources on and off the site, if such sources are available; and

j) Revegetation of disturbed areas will utilize seed and other plant materials that have been checked and certified as noxious-weed-free.

21.2 INVASIVE INSECT CONTROL

The Asian Longhorned Beetle (*Anoplophora glabripennis*) and the Emerald Ash Borer (*Agrilus planipennis*) are two insects that the NYSDEC has identified as a potential problem to native trees and vegetation. If, during construction, these insects are found, they will be reported to the NYSDEC regional forester. In addition, prior to construction, training will be conducted to teach Facility contractor(s) and subcontractor(s) to identify invasive insect species and the Facility-wide protocol for reporting to the NYSDEC regional forester. Unmerchantable timber will be provided as firewood to interested parties pursuant to the substantive requirements of NYSDEC's firewood restrictions to protect forests from invasive species found in 6 NYCRR Part 192.5.

21.3 AQUATIC INVASIVE SPECIES CONTROL PROCEDURES

An aquatic invasive species is defined in the National Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990 as: A nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities dependent upon such waters. For the purposes of this Facility, the term "aquatic" is intended to include freshwater, marine, estuarine, and wetland species (NYSDEC 2010). During cable installation, the Certificate Holders, will comply with all federal, state and local ordinances for *Invasive Species Best Management Practices*. This includes, but is not limited to, boat decontamination and/or washing and ballast water provisions.

The cable route traverses a range of aquatic environments, including deep and shallow limnetic habitats, freshwater wetlands and riverine habitats, freshwater tidal riverine habitats, estuarine, and marine conditions. Within these environments, a wide range of invasive, non-native plant and animal species proliferate. Within the Lake Champlain basin, twelve (12) invasive mollusks and six (6) invasive crustaceans have been identified, and the Hudson River and Estuary has experienced considerable invasion, with over one hundred (100) non-indigenous species established since colonial times (Mills et. al. 1996).

Cable installation activities will utilize available BMPs to prevent or minimize the spread of invasive plants and animals within Lake Champlain and the Hudson, Harlem and East Rivers. In general, these BMPs entail careful inspection of construction equipment prior to movement of equipment from one water body to another (e.g., trailering of small vessels). Vessel hulls, decks, propellers, lower units on outboard motors, and mooring lines will be washed and inspected carefully to remove aquatic plants, attached mussels and crustaceans, etc., prior to relocation of the vessels/equipment to another portion of the cable route or another waterbody.

On a Facility-wide basis, the Certificate Holders will perform the following measures to prevent or control the transport of aquatic invasive species in accordance with applicable regulations and guidance from NYSDEC and the New York Invasive Species Council:

a) Train and educate Facility contractor(s) and subcontractor(s) to identify aquatic invasive species and site-specific prescriptions for preventing or controlling their transport throughout or off of the Facility site;

b) Require that vessels, equipment, and materials be inspected for, and cleaned of, any visible vegetation, algae, organisms and debris before bringing them to the Facility area;

c) Train Facility contractor(s) and subcontractor(s) on the various cleaning or decontamination methods to be used on a site-by-site basis for the Facility;

d) Require that vessels, equipment, and materials be inspected for, and cleaned of, any visible vegetation, algae, organisms and debris before leaving the waterbody for another; and

e) Where the NYSDEC has identified the presence of Rock Snot or Didymo *(Didymosphenia geminata)*, any footwear used in streams or waterbodies will be soaked in a one (1) percent solution of Virkon® Aquatic for ten (10) minutes before leaving the area adjacent to the affected waterbody.

f) No vessel discharges of ballast water or sanitary waste will be allowed within the Facility area.

21.4 FRESHWATER

The freshwater environments along the cable route include the shallow and deep water habitats within Lake Champlain, fringing lacustrine wetlands within embayments of Lake Champlain, and riverine and wetland habitats in the upper Hudson River. A variety of non-indigenous, invasive species have been documented from Lake Champlain, and the Upper Hudson River; notable species include:

Zebra mussel

The invasive non-native zebra mussel (*Dreissena polymorpha*) arrived in Lake Champlain in the early 1990s and has since colonized the entire basin system. Zebra mussels are filter feeders that consume large quantities of plankton. The result has been increased water clarity and subsequent aquatic plant growth in shallow areas of the lake which has dramatically altered the lake's native benthic community. The zebra mussel has also colonized the tidal freshwater portion of the Hudson River Estuary but is excluded from the lower Estuary and the marine portion of the cable route by the species' intolerance of saline water. Zebra mussels readily attach to hard surfaces by mean of byssal threads, and are transported throughout a waterbody, or from one waterbody to another on vessel hulls, floating docks, pontoon, and other submerged or floating construction equipment.

The Certificate Holders will perform the following measures to prevent or control the transport of zebra mussels:

a) All construction equipment will be carefully inspected and washed-down to remove attached mussels (and other epiphytes) from hulls, decks, and mooring lines.

Spiny Water Flea (*Bythotrephes cederstroemi*)

This invasive zooplankter is widely distributed throughout the Great Lakes and the St. Lawrence Seaway. It has recently been documented in Sacandaga Lake, which connects to Lake Champlain and the Hudson River via the Sacandaga River and Lake Champlain Canal. To date, no spiny water fleas have been collected within Lake Champlain or the upper Hudson River; however, it is anticipated that it will make its way into these waterbodies in the near future. Spiny water fleas are difficult to detect by virtue of their small body size and transparent appearance, and they readily attach to vessel mooring lines and other submerged structures.

The following measures will be performed to prevent or control the transport of spiny water fleas:

a) All construction vessels and equipment (including mooring lines) will be washed and inspected prior to leaving a waterbody for another.

Rusty Crayfish

A variety of crayfish species are present in the Hudson River and Lake Champlain drainages, many of which are non-native to the region. However, the rusty crayfish (*Orconectes rusticus)* has in recent years rapidly expanded within the Hudson drainage and nearby waters, where it has competitively displaced other native and non-indigenous crayfish species.

Although it is unlikely that rusty crayfish would be encountered in the deeper waters where the majority of cable installation activity is likely to take place, the following measures will be employed to prevent transportation of rusty crayfish (or other macrocrustaceans) from one waterbody to another:

a) Equipment used in shallow waters and stream crossings will be inspected for and cleaned of rusty crayfish (or other macrocrustaceans) prior to leaving a waterbody for another.

Eurasian Water-Milfoil

Several species of non-indigenous submerged aquatic plants occur in the Lake Champlain and Hudson River drainages. Of these, the most aggressive invader is Eurasian water-milfoil (*Myriophylum spicatum*). Eurasian water-milfoil is widespread in Lake Champlain, particularly the southern end of the lake, in the Champlain Canal, and also in the Hudson River, where it is abundant in shallow areas throughout the tidal freshwater portion of the estuary and into the brackish estuary as far south at Piermont, New York. Eurasian water-milfoil continues to occupy an extensive range throughout the lake. New infestations of Eurasian water-milfoil are discovered nearly every year. Fragments attached to trailered boats are the likely cause of these overland introductions.

The Certificate Holders will perform the following measures to prevent or control the transport of Eurasian water-milfoil:

a) Existing submerged plant beds will be avoided where possible. For the majority of the cable route in the lake, water depths exceed those that support submerged plant beds; it is only in the narrow southern end of the lake that cable installation activity is likely to occur in proximity to these habitats;

b) Construction in infested areas will take place only during non-germination periods; and

c) Vessel hulls, decks, mooring lines and submerged construction equipment will be carefully inspected and cleaned prior to deployment to another location.

Water Chestnut

Water chestnut, an annual aquatic plant native of Europe, Asia, and Africa, was first documented in Lake Champlain in the early 1940s in shallow bays in the southern end on both the Vermont and New York shores. It is generally assumed that water chestnut seeds entered Lake Champlain on boats traveling through the Champlain Canal from the Mohawk or Hudson River, where it had initially become established in the 1870s. Water chestnut displaces other aquatic plant species, is of little food value to wildlife, and forms dense mats that alter habitat and interfere with recreational activities. Currently, extensive growth of water chestnut in southern Lake Champlain restricts boat traffic and other recreational uses.

Prevention and minimization of the transport of water chestnut from one portion of the cable route to another, especially from the lower end of Lake Champlain to more northern reaches, is similar to that for other aquatic vegetation species. The following measures will be performed to prevent or control the transport of water chestnut:

a) Existing submerged plant beds will be avoided where possible. For the majority of the cable route in the lake, water depths exceed those that support water chestnut beds; it is only in the narrow southern end of the lake that cable installation activity is likely to occur in proximity to these habitats;

b) Construction in infested areas will take place only during non-germination periods; and

c) Vessel hulls, decks, mooring lines and submerged construction equipment will be carefully inspected and cleaned prior to deployment to another location.

Invasive Wetland Plants (e.g., Common Reed, Purple Loosestrife)

In the event that cable installation or activities will entail construction or transport of equipment through freshwater wetlands in the vicinity of Lake Champlain or of the upper Hudson River), care will be taken to avoid the spread of invasive wetland plant species, notably common reed (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*). In wetland areas, where these invasive species are known to occur, the following measures will be implemented:

a) Construction equipment and field gear (including waders or rubber boots) will be inspected and washed to remove stems, root or rhizome structures and marsh sediments which could contain seeds of these species.

21.5 ESTUARINE

The estuarine environments along the cable route include the shallow and deep water habitats within the lower Hudson, Harlem and East Rivers, and fringing tidal wetlands within the freshwater tidal and brackish portions of the lower Hudson River. A variety of non-indigenous, invasive species have been documented from the lower Hudson River and nearby coastal waters. Notable species include:

Atlantic Rangia

Native to the United States Gulf coast, the Atlantic rangia (*Rangia cuneata*) bivalve was first introduced in the lower Hudson River Estuary in 1988 and is now abundant in the Tappan Zee and Haverstraw Bay. Potential vectors of introduction to East Coast waters include ship ballast water and oyster restoration programs (using Gulf Coast shells or live oysters). The long-term ecological significance of the Atlantic rangia's introduction to the Hudson River is poorly understood; however, the potential effects of a successful benthic suspension feeder on trophic dynamics, native bivalves, and plankton communities in the lower Hudson River may be significant.

Unlike zebra mussels, Atlantic rangia are not able to attach to hard surfaces, and remain partially buried in the substrate. Thus, they are not able to "hitchhike" from one waterbody to another by attaching to vessel hulls or construction equipment. Nonetheless, care will be taken during construction or trenching activities in the lower Hudson to be sure that sediment containing Atlantic rangia is not transported to other coastal waters.

The following measures will be performed to prevent or control the transport of Atlantic rangia:

a) Vessel decks, hulls, and construction equipment will be carefully inspected and washed prior to moving to a new waterbody.

Invasive Estuarine Crustaceans

Three invasive crustaceans may be encountered among rocky shoreline habitats or man-made structures (e.g. bulkheads, cribbing, piers) in the marine portion of the cable route (Hudson River and Harlem/East Rivers). The Asian shore crab (*Hemigrapsus sanguineus*), native to the western Pacific, began to aggressively spread along the United States East coast in the 1990s and is now abundant in many shoreline areas, particularly in the vicinity of jetties or rock revetments as well as in natural rocky intertidal areas. The Asian shore crab is an aggressive omnivore and may out-compete native crustaceans such as blue crabs (*Callinectes sapidus*) and American lobster (*Homarus americanus*) for nursery and foraging habitat. The European green crab (*Carcinus maenus*) is native to the northeast Atlantic and Baltic seas but has colonized coastal areas and estuaries worldwide, mainly via introduction of early life stages present in ballast water and in

association with bivalve shells transported for aquaculture. Green crabs out-compete native crustaceans for food resource and habitat and they are aggressive predators on small bivalves, posing a serious threat to commercial shellfish and aquaculture industries in areas where this species has colonized. Both green crabs and Asian shore crabs are already widely distributed within shallow coastal environments in the northeast and mid-Atlantic United States.

Recently, another invasive crustacean has appeared in the Hudson River Estuary - the Chinese mitten crab (*Eriocheir sinensis*). Native to eastern Asia, the Chinese mitten crab is an important food in its native waters and supports a large aquaculture industry. The Chinese mitten crab is highly prolific and omnivorous, competing aggressively with native macrocrustacean populations where it has become established. Burrowing activity by Chinese mitten crabs resulted in extensive damage to shoreline infrastructure in western European rivers during the latter part of the 20th Century. Currently, the Hudson River population is being monitored. While observation/collections have increased within the past several two to three years, mitten crabs have not yet been implicated in population or ecosystem impacts such as competitive displacement of the native Hudson River blue crab.

Vessel hulls, props, lower units, and any sampling equipment of field gear used in the lower Hudson Estuary or East River portion of the cable route will be inspected to prevent the transport of adult green crabs, Asians shore crabs, or mitten crabs to other coastal waterbodies; however, the early life stages of these crabs are planktonic, and would be difficult, if not impossible to detect if they were to be attached to submerged construction equipment or mooring lines. As such, it will be necessary to wash all equipment with freshwater to remove species at this life stage.

In accordance with BMPs for other invasive species, the following measures will be performed to prevent or control the transport of invasive crustaceans:

a) All vessel hulls, submerged construction equipment, and mooring lines used in the lower Hudson Estuary or East River will be carefully inspected and washed with freshwater prior to moving to a different waterbody.

References - Section 21.0

[NYSDEC] New York State Department of Environmental Conservation. Interim List of Invasive Plant Species in New York State. Accessed online on September 23, 2010 at: http://www.dec.ny.gov/animals/65408.html

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[NYSDEC & APA] Inter-Agency Guidelines for Implementing Best Management Practices for the Control of Terrestrial and Aquatic Invasive Species on Forest Preserve Lands in the Adirondack Park, accessed online on July 25, 2011 at:

http://www.adkinvasives.com/documents/ADKTerrestrialandAquaticGuidelinesv3.25.10-FINAL.pdf

Mills, E.L., M.D. Scheuerll, D.L. Strayer and J.T. Carlton. 1996. Exotic species in the Hudson River Basin: A history of invasions and introductions. *Estuaries* 19:814-823.

22.0 ALTERNATIVE/CONFLICTING LAND USES

Procedures for identification of competing land uses in the Facility area are designed to ensure, when practicable, uninterrupted use by the public. Overland construction activities will primarily occur along an existing railroad right-of-way. The construction schedule will be established to minimize disruption to any identified competing land uses along the right-of-way.

Existing New York State Geographic Information Systems ("NYSGIS") data and local and regional land use maps were used to identify land use categories within six hundred (600) feet of the Facility right-of-way as part of the Article VII Application. This initial work will be re-confirmed as appropriate with special interest given to areas with sensitive land uses including: schools, health care facilities, churches, scenic areas and parks, and residences. Additional inquiry for some of these sensitive land use areas include:

a) Schools

   Schools will be identified from NYSGIS and other existing databases, and local and regional school internet sites. Local and regional school departments may be contacted as necessary.

b) Health Care Facilities

   Hospitals, nursing homes, and urgent care facilities along the Facility route will be identified through NYSGIS databases and internet searches. These facilities will be notified as appropriate.

c) Churches

   In addition to identification of churches along the Facility route, other areas of religious significance (e.g., cemeteries) will be identified.

d) Scenic Areas and Parks

   Scenic areas and parks along the Facility route will be identified and mapped as part of the EM&CP Process. The managing authority for each area will be consulted to determine if there are any potential uses or special events that may need consideration during construction work.

e) Residences

   Residential land owners with property adjacent to the Facility route will be identified. A list of these landowners along the underground and aboveground portions of the Facility will be compiled with contact information, and contacted to discuss the Facility, construction schedule, and any potential concerns.

Special concerns or timing issues will be noted on the construction drawings. Areas of sensitive land use, as described above, located within six hundred (600) feet of the work area will be mapped on the construction drawings. Landowners and others using the facilities described above may experience temporary disturbance and traffic inconvenience associated with construction activities, primarily at locations where the existing rights-of-way cross public roadways that will be used by construction vehicles to access the right-of-way. These effects will be temporary and, in general, most disturbances will last for only a brief period of a few days or a week at any particular location.

To minimize potential construction effects to adjacent landowners, the Certificate Holders will provide timely information to adjacent property owners or tenants regarding the planned construction activities and schedule, and will coordinate with NYSDOT, county officials in Washington, Saratoga, Schenectady, Albany, Greene, Ulster, Rockland, Westchester and New York Counties, and local police departments, as applicable, to develop and implement traffic control measures that ensure safe and adequate traffic operations along roadways used by construction vehicles. Permits for oversize and/or overweight construction or other vehicles that exceed the legal dimensions and weights for vehicles on State highways will be obtained from NYSDOT pursuant to 17 NYCRR Part 154.

23.0 STEEP SLOPES, HIGHLY ERODIBLE SOILS AND FLOOD PLAINS

This section describes how steep slopes, highly erodible soils, and floodplains along or adjacent to the Facility route were identified and the BMPs to be implemented in these sensitive locations.

Steep slopes and potentially highly erodible soils located along the Facility route were identified during a desktop analysis for the Article VII Application and additional field review conducted during development of the EM&CP may also identify areas where soil conditions are more susceptible to erosion. These areas will be identified on the EM&CP Plan and Profile drawings and site specific prescriptions to avoid or minimize impact will be identified.

A one hundred (100) year floodplain is determined based on the area with approximately one (1) percent annual chance of flooding. The Certificate Holders reviewed FEMA Flood Insurance Rate Mapping ("FIRM") along the Facility route and identified one hundred (100) year floodplains in the Article VII Application. Floodplains will be identified on the EM&CP Plan and Profile drawings.

BMPs for addressing erosion and sediment control will be installed prior to and maintained in acceptable condition throughout the duration of any clearing and earthmoving operations. Erosion and sediment control devices will be installed in accordance with general permit conditions and regulatory approvals. Additional mitigation measures for steep slopes, highly erodible soils and floodplains are included here and will be implemented by the Environmental Inspector where necessary to prevent adverse impacts. Temporary measures will be continually monitored and maintained until the permanent ground cover within the affected area is established. At that point, temporary measures will be removed from the site.

23.1 CONSTRUCTION – STEEP SLOPES

Protection measures will be implemented to ensure minimization of impacts to erodible soils on steep slopes during construction, including the following:

a) The Certificate Holders will minimize work on steep slopes to the extent possible during preconstruction, construction, operation and maintenance activities;

b) Steep slopes and highly erodible soils will be delineated in the field prior to the start of construction;

c) The Environmental Inspector will replace flagging, as needed, so that boundaries of steep slopes, highly erodible soils and other sensitive areas are clearly marked in the field;

d) Erosion and sediment controls will be installed, as needed, before any ground disturbing activities occur, and will be maintained throughout the construction period until soils are properly stabilized in accordance with *New York Standards and Specifications for Erosion and Sediment Control, SPDES General Permit* and the facility-specific SWPPP;

e) Extra work spaces and material storage areas will be located off of steep slopes, if possible;

f) Any temporary access routes or parking areas adjacent to steep slopes will be graded to direct runoff away from the exposed soils. The Environmental Inspector will determine if additional erosion control measures such as water bars or temporary open-top box culverts will be necessary based on site-specific conditions;

g) In additional to the stormwater management methods outlined in the SWPPP, in areas of steep slopes stormwater management will be designed to promote sheet flow and prevent stormwater from entering an open trench on a steep slope via berms or other physical means;

h) On steep slopes, construction vehicles and equipment will be limited to established access roads and construction work spaces depicted on EM&CP Plan and Profile drawings;

i) Stormwater infiltrating the ground surface immediately adjacent to the trench line may seep into the trench (higher pressure to lower pressure) carrying soil particles with it. This may increase erosion and cause instability of the trench walls. If this condition is present, temporary trench stabilization will be installed;

j) After installation is completed and the trench is backfilled, the Certificate Holders will immediately prepare the site for restoration;

k) Any stockpiled material or spoil required to be stored on steep slopes will be protected with silt fencing and straw bales, and will be covered or stabilized;

l) Disturbed soils on steep slopes will be stabilized at the end of each work day; and

m) Vegetation clearing on steep slopes will be minimized to the extent possible.

Additional details on stormwater management devices are described in Section 4.0.

23.2 RESTORATION – STEEP SLOPES

Restoration is the primary mitigation measure during unavoidable construction in highly erodible soils, as standard conservation treatment and management may not be adequate to prevent erosion in these locations. Restoration of steep slopes will include the following:

a) All structural controls on steep slopes that have not been permanently stabilized will be inspected once each week or within twenty four (24) hours after a one-half (0.5) inch or larger rain event. Maintenance of structural controls will be in accordance with the sediment and erosion control plan;

b) Gullied, rilled, or rough sites will be smoothed and shaped to permit the use of equipment for plantings. If seed beds cannot be immediately established, mulch will be applied immediately following site preparation;

c) The soil will be pulverized to a minimum depth of four (4) inches and harrowed to a uniformly smooth surface. Lime and fertilizer will be incorporated during seed bed preparation;

d) Grass and legume site preparation will be in accordance with Natural Resources Conservation Service ("NRCS") standard *Establishing Grasses and Legumes on Critical Areas (Specification 342-1), November 2006*;

d) Fertilizer and lime will be applied in accordance with the NRCS standard *Nutrient Management* (Specification 590-1);

e) Seed will be planted on a well prepared firm seedbed. To achieve best results on steep slopes and floodplains, the freshly prepared seed bed will undergo cultipacking before and after planting. If a cultipacker cannot be used at the area, water truck spray will be used to settle a freshly prepared seedbed before planting, followed by harrowing before planting seed. Seed will be covered lightly. Seeds will not be sowed into a wet seed bed;

f) On steep slopes where straw mulch is used at planting sites, the Environmental Inspector will determine if the straw will be anchored by crimping or punching the straw into the soil with hand implements as an alternative to hydromulching or erosion control blankets. On slopes greater than 2:1, where crimped straw mulch is used, a tackifier will be applied to increase stability;

g) If restoration is completed before or after the planting season for permanent cover, a temporary cover will be planted to limit soil erosion until the permanent cover can be established. Temporary cover of winter wheat (ninety (90) pounds per acre broadcast) will be used. Permanent seed will be applied with a no-till drill into the stubble after the crop has been mowed or directly into the soil through the standing crop;

h) Solid sod may be applied at some steep slope locations where establishment of vegetative cover from seed or plantings is impractical. In such cases, solid sod will be placed on a well prepared firm soil base. Areas to be sodded will be watered to wet the soil two to three inches deep on the day of planting, prior to placement of the sod. Special care during water application is paramount to ensure the soil is watered to the proper depth and to prevent erosion or sedimentation. Steps taken will include:

    i. If sod is utilized, sod must be ninety (90) percent pure and free of weeds and weedy grasses.

    ii. Sod must not be allowed to dry out, freeze, or overheat after harvesting and prior to placement.

    iii. Sod must be transferred and placed within twenty four (24) hours of harvesting.

iv. Cut sod must be at least two (2) inches thick, excluding top growth.

v. Sod will be fit closely together.

vi. Joints will be staggered.

vii. Roll or tamp sod after placement to ensure contact of the grass roots with the soil.

viii. On slopes greater than 4:1, secure the sod to the soil with wooden pegs or staples.

ix. Cover the upper edge of the sod area with soil retention blankets. Use wire staples to secure soil retention blankets.

x. Immediately after sod installation, water the sod until moisture penetrates to the soil beneath.

xi. Maintain adequate soil moisture for at least two weeks to insure establishment of the sod.

23.3 POST-PLANTING EROSION CONTROL – STEEP SLOPES

All planted areas except those to be used for hay, grazing, or where solid sod was applied will be mulched with small grain straw or grass mulch as needed until the planting is established. Mulching will be completed in accordance with NRCS *Mulching Practice* Code 484 and the SSESC. Two (2) tons per acre of small grain straw or hay will be applied. Mulch will be applied evenly resulting in ninety (90) percent groundcover. Where erosion hazards are very high (>15 percent slope), rolled erosion control products (fiber mats) and hydroseeding will be used.

23.4 POST-RESTORATION MONITORING – STEEP SLOPES

Successful vegetation restoration is the primary mitigation measure against soil erosion on steep slopes. As a result, the post-restoration monitoring will be more aggressive initially than the monitoring proposed for the remainder of the route.

a) Inspections will be completed monthly from months zero (0) to six (6), every other month from months six (6) to eighteen (18), then semi-annually from months eighteen (18) to thirty (30). Inspections will include assessment for rill formation, loss of mulch, and erosion features; and

b) The status of the vegetation and erosion control features will be documented. If erosion repairs are completed and an area is essentially re-seeded, the monitoring schedule will return to the beginning. If the repairs are minor, supplemental, or not required, the monitoring schedule will revert to the general Facility route schedule following the 30th month.

23.5 CONSTRUCTION – FLOODPLAINS

The following standards will apply when working in floodplains:

a) Work within floodplains will be minimized to the extent possible during preconstruction, construction, operation and maintenance activities;

b) Boundaries of one hundred (100) year floodplains will be highlighted with streams, wetlands, and other water resources on the EM&CP Plan and Profile drawings;

c) The boundaries of floodplains within the construction area and along access routes will be re-flagged prior to the start of work. The Environmental Inspector will replace flagging, as needed, so that boundaries are clearly marked in the field;

d) Temporary access roads will, where possible, be constructed using native soils to minimize imported materials that may require removal when the road is deactivated. Where the addition of imported materials is necessary to provide a stable road base these will be kept to an absolute minimum consistent with the duration of use and loads to be carried;

e) Where construction equipment must cross floodplains with saturated soils, a crossing method will be selected that is appropriate to the site-specific conditions pertaining to soil moisture, vegetative characteristics, and depth of topsoil layer;

f) In floodplains with saturated soils (i.e., water at or near the surface), prefabricated wooden mats or equivalent will be used to provide support for equipment. These will remain in place until the completion of construction in that segment of the Facility route and, if appropriate, restoration. If final restoration will not occur until the next growing season wooden mats or equivalent will be removed until restoration resumes;

g) Unless required for a permanent floodplain crossing, all prefabricated mats will be removed from temporary access ways no later than following final restoration;

h) Low pressure wide tracked equipment may be used in floodplains with saturated soils without support, depending on substrate type and degree of saturation (e.g., water depth) and on the extent of rutting caused by this equipment;

i) In floodplains with non-saturated soils that have a firm substrate, standard construction equipment may be utilized;

j) Where practicable, existing access ways will be used in floodplains;

k) The need for and placement of additional erosion controls in floodplains will be determined on a site-specific basis, based on factors such as weather conditions during all work activities, vegetative cover, hydrologic regime, and the construction sequence. All plans will be represented on the EM&CP Plan and Profile drawings;

l) Such temporary erosion controls in floodplains will be removed in a timely manner after restoration is complete;

m) Disturbed portions of floodplains will be regraded to restore preconstruction contours and normal hydrology;

n) On floodplains, spoil or excavated materials will be stored at least hundred (100) feet from wetlands and streams wherever possible. All excavated materials will be stored at a sufficient distance to prevent sedimentation into any stream, wetland, wetland adjacent area, or other waterbody, or erosion of the stream bank. If no other storage area is available, spoil will be covered and erosion/sedimentation control measures will be installed to prevent materials from eroding and entering into adjacent areas from stormwater or flooding;

o) Excavated material in floodplains that is determined to be excess material will be disposed of in approved upland locations outside of the floodplain; and

p) For construction activities along segments of the route that follow railroad rights-of-way, floodplain areas will be avoided where possible through the use of railroad access. Use of low ground pressure vehicles and minimal use of permanent fill will be given high priority during design of construction access in flood-prone areas.

q) No construction equipment or Facility materials shall be left, parked, staged, or stockpiled within a designated floodplain for longer than twenty-four (24) hours at a maximum.

r) Cut timber and slash will not be stacked or stockpiled piled on floodplains.

23.6 RESTORATION-FLOODPLAINS

All construction in floodplain areas will be restored to pre-facility conditions. Native vegetative cover will be restored to the extent practicable and no fill will be allowed. If fill is necessary, the Environmental Inspector must ensure the material matches the physical characteristics of the original material.

a) There will be no permanent change in topography within any designated floodplain.

b) Upon completion of the construction activities, all disturbed areas will be stabilized in accordance with the most current version of the SSESC.

24.0 VISUAL RESOURCES

This section identifies visual resources within or adjacent to the Facility area and measures to minimize visual impacts on these resources. Visually sensitive resources have been identified in the following sections of the Article VII Application:

a) The *Visual Assessment Report* identifies visual resources within the vicinity of the proposed permanent aboveground facilities located in Yonkers and Astoria, New York.

b) *Exhibit 4, Section 4.2 Land Use* of the Article VII Application identifies visual resources within six hundred (600) feet of the construction corridor.

c) *Exhibit 4, Section 4.10 Historic Resources* of the Article VII Application, identifies historic resources along the construction corridor.

Although permanent visibility and visual impacts of the Facility are not anticipated other than at locations of above-ground facilities including the proposed converter station, substation, Facility marking signs and areas of significant tree removal, there will be temporary visual impacts during construction. The majority of visual impacts will be caused by the large equipment necessary for Facility construction which will be seen along the Facility route for a limited amount of time. Visual impacts due to Facility construction will be unavoidable. There will be numerous types of construction vehicles and ancillary equipment setups that pertain to various construction methodologies (Sections 5.0, 6.0, 7.0 and 8.0, respectively).

Good housekeeping practices and removal of temporary stormwater and erosion controls such as silt fence, straw bales, and mulch, construction debris or blast rock during the various stages of construction will serve as safe operation procedures as well limiting visual impact. Tree protection measures for visually sensitive areas are described in Section 5.7. Restoration of these areas is described in Section 11.2.2.

Converter station site tree protection measures and landscape planting measures will be developed for preserving and restoring screening or other important vegetation including specimen trees, landscape screens, park lands, and other sites.

24.1 OVERLAND CABLE IMPACTS

Primarily overland construction activities will occur along an existing railroad right-of-way. The construction corridors are expected to range between twenty (20) to fifty (50) feet wide. Temporary visual impacts along the overland portions of the Facility route due to construction activities are expected to be of short duration, ranging from a few days to a few weeks in a given area. Due to the variety of subsurface material that could be encountered, it is not possible at this point to specify how long work crews might remain in a particular area.

In certain instances or for portions of the work it will be necessary for vehicles to arrive and depart from work areas via local roadways, thereby increasing visible truck traffic. When

possible, the majority of supplies and equipment for cable laying will be transported along the railroad.

Existing vegetation that serves as a buffer in visually sensitive areas, such as road crossings, scenic areas, and viewpoints, will be maintained where the vegetation will not interfere with the integrity of the cables or safe installation of the Facility. Buffer vegetation in sensitive visual areas that will be retained will be clearly marked on the EM&CP Plan and Profile drawings and marked in the field to avoid unintentional clearing.

Visual impacts associated with clearing are expected to be minor. Most of the vegetation that will be impacted along the overland portions of the Facility route consists of previously disturbed herbaceous and/or shrubby cover within the existing railroad rights-of-way, which for the most part does not provide any visual buffer of the railroad corridor from adjoining properties. Herbaceous vegetation and successional shrubs within the areas impacted by construction are expected to recover quickly following restoration and stabilization of the construction corridor. In some instances additional off-railroad right-of-way property will need to be utilized for temporary construction work space. In very limited areas permanent right-of-way will be required away from the railroad right-of-way. In areas of construction outside of the railroad right-of-way a greater potential exists for removing significant buffer vegetation between sensitive receptors and the railroad. Each of these areas will be evaluated on a case by case basis with the involved landowner and mitigation measures will be taken if appropriate. To minimize impacts to forested communities and the potential for visual impacts, the Certificate Holders will minimize clearing in visually sensitive areas to the minimum necessary to properly install the cables.

Vegetative buffers in visually sensitive areas will be restored, as necessary, except where replacement would inhibit or impair the safe operation of the cables. All vegetation replaced will have a minimum one (1) year survival guarantee. Limbs damaged by construction activities will be pruned to arboricultural specifications.

Temporary erosion controls will be removed once revegetation is established. Revegetation will be monitored until there is a minimum of eighty (80) percent regrowth.

Permanent visual impact at the converter station is expected to be minimal. The converter station will be housed in a commercial building that is similar in visual appearance to the adjacent buildings. Facility outdoor lighting will be designed to avoid, to the extent feasible, off-site lighting impacts. Exterior lighting design will be based on an assessment of lighting illumination levels needed for worker and workplace safety. A lighting plan will be provided as part of the converter station site plan review in the EM&CP documents. Use of task lighting, and full cutoff fixtures with no dropdown optics will be assessed in lighting evaluation and specification plans.

The Facility is proposed to interconnect to an existing substation so there will be no visual impact associated with this facility component.

24.2 ON-WATER AND UNDERWATER CONSTRUCTION

During underwater cable installation there will be increased vessel activity along the affected waterbodies. Cables will be laid by specialized cable laying vessels or a specially outfitted laybarge, depending on navigation constraints along the route. There are no methods to visually mitigate these activities. The increase in temporary construction traffic along the underwater portion of the Facility route is expected to be minimal. The temporary nature of Facility construction vessels may add temporal interest in the river and lake landscapes traversed by the Facility route.

25.0 NOISE IMPACT AND MITIGATION

25.1 NOISE SENSITIVE RECEPTORS

Significant or sensitive noise receptors include, but are not limited to, residences, schools, hospitals and libraries. Sensitive receptors along the Facility route will be identified prior to cable installation construction. Prior to the commencement of construction activities for the Facility, a more detailed survey will be conducted to identify noise sensitive areas in close proximity to the cable route. The receptors will be identified through a review of aerial photography and during the detailed EM&CP walk over and appropriate noise mitigation plans will be developed.

A noise mitigation plan will be developed for the converter station site that will include: hours of construction; materials handling and construction related activities; use of low noise equipment (transformers, fans and etc.); Facility design to avoid community complaints from noise levels or the generation of pure tones.

25.2 REMEDIATION AND CONTROL

25.2.1 Noise Control Measures for Equipment and Linear Construction

Construction work in the vicinity of any single receptor along the Facility route will likely last a few days to a week, as construction activities move along the cable route. Construction will typically include the following activities:

a) Site clearing and preparation;

b) Vegetation removal;

c) Mobilization and equipment delivery;

d) Trenching and cable laying;

e) Cable pulling/splicing;

f) Horizontal boring/jacking (if required);

g) Pile-driving and sheeting/shoring installation;

h) Backfilling and right-of-way restoration;

i) Electrical equipment installation; and

j) Commissioning and start-up.

A variety of construction equipment sources will be associated with each phase. Provided below is a listing of typical ranges of equipment sound levels from the construction equipment associated with each construction phase at a standard distance of fifty (50) feet and a distance of four hundred (400) feet.

Table 25.1
Construction Phase Noise Levels of the Transmission Line

Construction Phase	Construction Equipment Noise Levels (dBA)	
	50 Feet	400 Feet
Site Clearing and Preparation	60 to 90	42 to 72
Trenching	60 to 90	42 to 72
Cable Laying	50 to 90	32 to 72
Backfilling	73 to 84	35 to 66
Cable Pulling/Splicing	50 to 80	32 to 62

Source: Ebasco Environmental –Sound Cable Project (1987).

Site clearing includes the use of industrial mowers and chain saws as needed. Removal of vegetation will not be significant enough to affect noise propagation offsite. As presented above, maximum noise levels associated with the construction equipment are anticipated to not exceed ninety (90) decibels ("dBA") at a distance of fifty (50) feet.

The noise levels presented are those that would be experienced by people outdoors. A building will provide significant attenuation of associated construction noise impacts. For instance, sound levels can be expected to be up to twenty seven (27) dBA lower indoors with windows closed. Even in homes with windows open, indoor sound levels can be reduced by up to seventeen (17) dBA (USEPA 1978).

In addition to these mitigating factors, noise control measures for cable construction include the following:

a) Locating equipment yards and marshalling areas away from noise-sensitive receptors as practical;

b) Installing improved mufflers on heavy construction equipment when used in close proximity to noise sensitive areas;

c) Utilizing low-noise technologies (e.g., vibratory pile drivers) as appropriate;

d) Limiting construction of high noise level activities (e.g., wood chipping, pile driving, rock drilling, blasting, excavation and loading) to non-overnight hours as much as possible when construction is conducted in close proximity to noise-sensitive receptors; and

e) In extreme cases, install temporary sound barriers to reduce noise levels or offer temporary lodging for residents adversely affected.

25.2.2 Noise Control Measures for Point Source Producers

Noise control measures for point sources (e.g., HDD, or other activities that remain in a single location for an extended period of time) including the following:

a) Limiting construction to non-overnight hours as much as possible when construction is conducted in close proximity to noise-sensitive receptors; and

b) Installation of temporary wooden sound barriers to reduce noise levels.

25.3 CONVERTER STATION

Specific noise control measures are not anticipated for the converter station. The proposed converter station building itself is a noise control measure that will act to both reduce noise from sources inside the building, and will act as an effective barrier of facility sources (e.g., cooling fans and transformers) to offsite noise sensitive areas. No other noise control measures are anticipated for operational noise.

26.0 CONSTRUCTION WINDOWS

26.1 OVERLAND CONSTRUCTION

The Certificate Holders have worked closely with federal and state agencies to establish construction windows (i.e., no work windows) to avoid and/or minimize any potential impacts to TE species and their occupied habitats, or RTE plants, sensitive resources, and any identified NYSDEC-protected streams. The following construction windows for work along the overland portion of the Facility are proposed:

a) Work that must occur within any identified NYSDEC-protected streams (Class C/Standard T or higher Class/Standard streams or regulated adjacent area) will be highly restricted to avoid or minimize impacts to stream banks, water quality, and wildlife. More specifically, most designated trout streams are anticipated to be crossed using the HDD method thereby avoiding disturbance of these streams. If a dry crossing is proposed and approved by DPS and NYSDEC for any of these streams, the Certificate Holders will adhere to the proposed timing restrictions of June 15 through September 30 and discuss and develop, as necessary, mitigation measures with the appropriate agencies.

b) The Certificate Holders will avoid construction within or immediately adjacent to occupied Karner blue butterfly and/or frosted elfin habitats during the adult flight periods (approximately May-August) to avoid and/or minimize potential mortality of adults that may be nectaring or traveling between habitat areas. Because adult flight periods may vary from year to year, the Certificate Holders will contact NYSDEC prior to starting construction within any identified habitat areas to confirm that adults have not emerged.

c) The Certificate Holders will avoid construction during scheduled events at cultural resource sites and heritage areas as identified in the EM&CP.

Any potential timing windows will be provided to DPS and NYSDEC staff and other resource agencies for review prior to the start of construction. Details on construction timing and exclusions will be included in the EM&CP.

26.2 UNDERWATER CONSTRUCTION

The Certificate Holders will avoid designated Exclusion Zones and SCFWHs to the maximum extent possible. All in-water work will be conducted within the construction windows specified in the Certificate Conditions and the Water Quality Certificate.

HISCOCK & BARCLAY LLP

George M. Pond

Partner

June 4, 2012

Hon. Jaclyn A. Brilling
Secretary
New York State Public Service Commission
Three Empire State Plaza
Albany, New York 12223-1350

Re: Application of Champlain Hudson Power Express, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law for the Construction, Operation and Maintenance of a 1,000 MW High Voltage Direct Current Circuits from the Canadian Border to New York City
Case 10-T-0139

Dear Secretary Brilling:

Champlain Hudson Power Express, Inc. ("CHPEI") and CHPE Properties, Inc. ("CHPE Properties" and, collectively with CHPEI, the "Applicants") respectfully submit the attached Stipulation between Applicants and the Consolidated Edison Company of New York, Inc. ("Con Edison"). This Stipulation has also been signed by New York State Department of Public Service. The remaining signatories to the February 24, 2012 Joint Proposal in this proceeding have been provided this Stipulation and have no objection to its filing.

The revised Certificate Condition 15 agreed to in this Stipulation replaces in its entirety Condition 15 of the Certificate Conditions submitted with the February 24, 2012 Joint Proposal in this proceeding.

The purpose of the Stipulation is to make clear Applicants intention to develop and operate the Facility at issue in this proceeding on a purely merchant basis and without reliance on cost-of-service rates or contracts between Applicants and any utility or any state or municipal.

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Also Admitted In: District of Columbia

entity or any instrumentality thereof. As the Stipulation makes clear, Con Edison reserves its right to continue to object to any provisions of the JP other than those specifically addressed in this Stipulation.

Respectfully submitted,

/s/ George M. Pond

George M. Pond
Attorney for Champlain Hudson Power Express, Inc. and CHPE Properties, Inc.

cc: Hon. Michelle Phillips (w/encl.)
Hon. Kevin J Casutto (w/encl.)
All parties on the service list in Case 10-T-0139 (w/encl.)

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Also Admitted In: District of Columbia

BEFORE THE NEW YORK STATE
PUBLIC SERVICE COMMISSION

In the Matter of	
Application of Champlain Hudson Power Express, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law for the Construction, Operation and Maintenance of a High Voltage Direct Current Circuit from the Canadian Border to New York City.	Before Hon. Kevin J. Casutto Hon. Michelle L. Phillips Administrative Law Judges **STIPULATION**
P.S.C. Case No. 10-T-0139	

WHEREAS, on February 24, 2012, a Joint Proposal (JP) of Settlement was filed by Champlain Hudson Power Express, Inc. and CHPE Properties (collectively, "Applicants") for approval to construct and operate a 1,000 MW transmission facility running from Quebec, Canada to New York City (the "Facility"); and

WHEREAS, the Facility consists of a High Voltage Direct Current transmission line from the Canadian border to the property of Consolidated Edison Company of New York, Inc. ("Con Edison") in Astoria, Queens, New York ("Astoria") and a converter station at Astoria (collectively, the "HVDC Transmission System") and a 345 kV Alternating Current line from Astoria to the Con Edison Rainey Substation (the "Astoria-Rainey Cable"); and

WHEREAS, as originally proposed, the JP, and specifically the certificate conditions proposed for incorporation in the Certificate of Environmental Compatibility and Public Need (the "Certificate") (Appendix C to the JP), provides for the construction and operation of the HVDC Transmission System and the recovery of the costs associated with the use of the Astoria-Rainey Cable by shippers also using the HVDC Transmission System on a merchant basis (the "Merchant Facilities"), but further provides for the opportunity for Applicants to seek Commission approval for a "change [in] their business model" and "alternative or additional means of financing" under proposed Certificate Condition 15(b); and

WHEREAS, Con Edison has contended that this Certificate Condition 15(b) would provide Applicants the opportunity to shift the risks and costs of the Merchant Facilities from the

Project's investors to utility ratepayers, and Con Edison has further contended that Certificate Condition 15(b) would give Applicants the "right to pursue a bailout of their investors by utility ratepayers"; and

WHEREAS, Applicants disagree with Con Edison's claims in this respect but desire to resolve this issue on an amicable basis; and

WHEREAS, on May 18 and May 22, 2012, Applicants proposed certain changes to Certificate Condition 15 designed (i) to clarify their intention to develop the Merchant Facilities entirely on a merchant basis and without the use of any cost-based rates; and (ii) to delete the reservation of rights for Applicants to seek a change in their business model and alternative or additional means of financing for the Merchant Facilities; and

WHEREAS, in their Ruling on Motion dated May 25, 2012, Administrative Law Judges Michelle Phillips and Kevin Casutto (the "ALJs") concluded that there was still a possibility that Applicants might change their business model and distinguished Applicants' proposal from that of the developers of the projects in Cases 08-T-0034 and 08-T-1245, which the ALJs found had significantly lessened concerns that those projects would switch from merchant to cost-based rates by demonstrating "that 50% or more of those projects' output was subject to identified and firm commitments at the time the Commission granted the certificates"; and

WHEREAS, the ALJs also expressed concern in their May 25, 2012 Ruling on Motion that Applicants had retained their rights to apply to FERC for cost-based rates for the Merchant Facilities; and

WHEREAS, the undersigned parties agree that the revisions to Certificate Condition 15 proposed by Applicants requiring the costs of the Merchant Facilities to be recovered on a purely merchant basis and providing that the Certificate would immediately be deemed invalid in the event that the Certificate Holders seek to recover any of the costs of the Merchant Facilities in cost-of-service rates set by a Federal or State regulatory entity, or to include any such costs in utility rate base, should be included in the Certificate approved by the Commission in this proceeding; and

WHEREAS, the undersigned parties also agree that as a further measure to ensure the financial soundness of the Facility, Certificate Condition 15 should be further amended to provide that Applicants may not commence construction of the Facility until they have submitted to the Commission a compliance filing demonstrating that they have secured binding commitments from one or more financially responsible entities committing to take and pay for no less than 750 MW of Firm Transmission Service over the Facility for a period of no less than twenty-five (25) years; and

WHEREAS, the undersigned parties also wish to address the concerns of the ALJs regarding Applicants' rights to seek approval by FERC of cost-based rates pursuant to Section

205 of the Federal Power Act, 16 U.S.C. §824d, in violation of the commitments made in Certificate Condition 15(b); and

WHEREAS, the undersigned parties agree that Certificate Conditions 15 (b) and (e), as further revised herein, will protect Con Edison's customers by requiring Applicants to construct and operate the Merchant Facilities solely on a merchant basis without recourse to any rates based upon cost-of-service or including any such costs in utility rate base; and

IT IS HEREBY STIPULATED AND AGREED, that Condition 15 of the proposed Certificate shall be deleted in its entirety and replaced with the revised Certificate Condition 15 attached to this Stipulation as Attachment 1; and

IT IS FURTHER STIPULATED AND AGREED, in response to the ALJs' concern that Applicants have retained their rights to apply to FERC for cost-based rates for the Merchant Facilities, that in exchange for the Commission's issuance of a Certificate on the basis described in the JP, as modified by this Stipulation, except as allowed by the Certificate, Applicants agree to waive all their rights under section 205 of the Federal Power Act, 16 U.S.C. § 824d, to file cost-based rates with FERC for the Facility; and

IT IS FURTHER STIPULATED AND AGREED, that upon filing by the Applicants of this Stipulation with the Commission, Con Edison would no longer contend or file testimony contending in this proceeding that Applicants are seeking "a right to pursue a bailout of their investors by utility ratepayers" on the ground that this concern is addressed by the provisions of the changes to proposed Certificate Condition 15 agreed to herein and that this revised Condition will fully protect Con Edison's customers; and

IT IS FURTHER STIPULATED AND AGREED, that upon filing by the Applicants of this Stipulation with the Commission, Con Edison would no longer contend or file testimony in this proceeding contending that the alleged $11 billion costs of the Facility and related upgrades in Canada may be imposed on its ratepayers on the grounds that this concern is addressed by the provisions of the changes to proposed Certificate Condition 15 agreed to herein and that this revised Condition will fully protect Con Edison's customers; and

IT IS FURTHER STIPULATED AND AGREED, that after filing by the Applicants of this Stipulation with the Commission, the undersigned shall file statements supporting revised Certificate Conditions 15(b) and (e) in briefs, pursuant to the schedule set by the ALJs, and urging Commission adoption thereof; and

IT IS FURTHER STIPULATED AND AGREED, that Applicants shall file this Stipulation and these revised Certificate Conditions with FERC prior to the commencement of operation of the Facility and Con Edison will support Applicants in urging FERC acceptance thereof.

This Stipulation shall have no effect on any other provision of the JP or the proposed Certificate, or on any other objections Con Edison may have to the JP or the proposed Certificate. Con Edison reserves its right to continue to object to any other provisions of the JP and the proposed Certificate, and Applicants reserve the right to respond to such objections on any and all grounds.

[SIGNATURE PAGE FOLLOWS]

This Stipulation may be executed in counterparts, all of which shall collectively constitute a single agreement.

/s/ George M. Pond

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Dated: June 4, 2012

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Attachment A

15.

a. The Certificate is granted and the required determinations of the need for the Facility and that the Facility will serve the public interest, convenience and necessity are explicitly made contingent on Certificate Holders delivering a minimum of 1,550 MW of energy (including 550 MW of energy not flowing through the HVDC Transmission System) out of NYPA's Astoria substation. The Certificate Holders shall file a report documenting how they will achieve this level of deliverability prior to, or at the time they file their EM&CP for the first segment of the Facility. If the Certificate Holders cannot demonstrate compliance with this deliverability requirement, the Certificate Holders shall file with the Secretary a Request for Reconsideration of the need and public interest, convenience and necessity determinations made with respect to the Facility. The request shall be served on all parties to this proceeding and shall clearly state that all parties may submit comments on the filing within thirty (30) days of service. Such request shall explain why Certificate Holders believe that a lesser amount of energy deliverability is consistent with the Commission's findings that the Facility is needed and will serve the public interest, convenience and necessity. Such request shall include a discussion of each option the Certificate Holders considered as a means of achieving the minimum threshold level of deliverability. The Certificate Holders may not commence construction of the Facility unless and until the Commission has accepted the report or approved the request filed pursuant to this subpart.

b. The Certificate is granted and the required determination that the Facility will serve the public interest, convenience and necessity is explicitly made contingent on the HVDC Transmission System being developed, financed, constructed, and operated on a merchant basis with no reliance on cost-of-service rates set by either a federal or state regulatory

entity, and will not be included in utility rate base, either directly or through a contractual arrangement between Certificate Holders and any agency, authority or other entity of the State of New York, any municipal subdivision of the State of New York, any utility subject to cost-based regulation, or any instrumentality of any of the foregoing, and on the further condition that all costs associated with the use of the Astoria-Rainey Cable to deliver electric energy and capacity transmitted over the HVDC Transmission System will also be recovered exclusively on a merchant basis with no reliance on cost-of-service rates set by either a federal or state regulatory entity, and will not be included in utility rate base, either directly or through a contractual arrangement between Certificate Holders and any agency, authority or other entity of the State of New York, any municipal subdivision of the State of New York, any utility subject to cost-based regulation, or any instrumentality of any of the foregoing. Prior to, or at the same time they file their EM&CP for the first segment of the Facility, the Certificate Holders shall file a report documenting that they have received binding contractual commitments from one or more financially-responsible entities for a combined total of no less than 750 MW of Firm Transmission Service over the Facility for a period of no less than twenty-five (25) years. The Certificate Holders may not commence construction of the Facility unless and until the Commission has accepted this report. In the event that Certificate Holders seek to recover any of the costs of the HVDC Transmission System, or any of the costs associated with the use of the Astoria-Rainey Cable to deliver electric energy and capacity transmitted over the HVDC Transmission System, in cost-based rates set by a Federal or State regulatory authority, the Certificate shall be deemed invalid. In the event that the Certificate Holders recover all or any part of the costs of the HVDC Transmission System, or any of the costs associated with the use of the Astoria-Rainey Cable to deliver electric energy and capacity transmitted over the HVDC Transmission

System, under a contract between Certificate Holders and any agency, authority or other entity of the State of New York, any municipal subdivision of the State of New York, any utility subject to cost-based regulation, or any instrumentality of any of the foregoing, the Certificate shall also be deemed invalid. For purposes of this provision, the term "rates" shall include any charges established by NYPA or a utility operating under cost-based regulation, including without limitation base rates, surcharges, adjustments, or any other recovery mechanism.

c. The Certificate is granted and the required determination that the Facility will serve the public interest, convenience and necessity is explicitly made based on the cost estimate for the Astoria-Rainey Cable set out in Paragraph 23 of the Joint Proposal in this proceeding. Certificate Holders shall include as part of their EM&CP for the Astoria-Rainey Cable a report providing an updated construction cost estimate for the Astoria-Rainey cable, including supporting documentation. If the updated cost estimate exceeds the cost estimate in the evidentiary record of this proceeding by ten (10) percent or more, the Certificate Holders shall file with the Secretary a Request for Reconsideration of the determination of public interest, convenience and necessity made with respect to the Facility. The request shall be served on all parties to this proceeding and shall clearly state that all parties may submit comments on the filing within thirty (30) days of service. Such request shall explain how such increased cost would be consistent with the Commission's public interest, convenience and necessity determination made in this proceeding.

d. Upon commencement of construction, the Certificate Holders shall file with the Secretary monthly reports showing the costs for the Astoria-Rainey Cable as they occur, broken out as follows: excavation costs, traffic control costs, cable installation costs, splicing

costs, thermal back fill, manhole and vault costs, costs relating to damage to other facilities (gas, electric, telephone, fiber optic cables, sewer, water, etc.), engineering costs, inspector costs, fines, cable costs, and all other costs by category. The reports shall include the names of the individuals responsible for providing the information, along with their contact information, and shall contain all supporting documentation.

e. Subject to the limitations of Condition 15(b), nothing contained in this Certificate shall be construed as affecting in any way the rights of Certificate Holders to unilaterally make application to the Federal Energy Regulatory Commission ("FERC") for a change in rates, terms and conditions, charges, classification of service, Service Agreement, rule or regulation under section 205 of the Federal Power Act ("FPA") and pursuant to FERC's rules and regulations promulgated thereunder.

BEFORE THE NEW YORK STATE
PUBLIC SERVICE COMMISSION

In the Matter of	:	
Application of Champlain Hudson Power Express, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law for the Construction, Operation and Maintenance of a High Voltage Direct Current Circuit from the Canadian Border to New York City.	:	Before Hon. Kevin J. Casutto Hon. Michelle L. Phillips Administrative Law Judges **STIPULATION**
P.S.C. Case No. 10-T-0139	:	

WHEREAS, on February 24, 2012, a Joint Proposal (JP) of Settlement was filed by Champlain Hudson Power Express, Inc. and CHPE Properties (collectively, "Applicants") with the Public Service Commission (the "Commission") for approval to construct and operate a 1,000 MW transmission facility running from Quebec, Canada to New York City (the "Facility"); and

WHEREAS, the Facility consists of a High Voltage Direct Current transmission line from the Canadian border to the property of Consolidated Edison Company of New York, Inc. ("Con Edison") in Astoria, Queens, New York ("Astoria") and a converter station at Astoria (collectively, the "HVDC Transmission System") and a 345-kV Alternating Current line from Astoria to the Con Edison Rainey Substation (the "Astoria-Rainey Cable"); and

WHEREAS, in the JP, and specifically in the certificate conditions proposed for incorporation in the Certificate of Environmental Compatibility and Public Need (the "Certificate") (Appendix C to the JP), Applicants agree, subject to the provisions of the JP, to provide 1550 MW of energy deliverability out of the Astoria Annex 345 kV substation (the "Astoria Annex") owned by the New York Power Authority ("NYPA") and, to achieve that level of energy deliverability, the JP contemplates (1) the installation of the Astoria-Rainey Cable; and (2) the use of a Special Protection System ("SPS") or some other operational measure subject to individual approval by the New York Independent System Operator, Inc., the New York State Reliability Council or other applicable reliability authorities; and

WHEREAS, Con Edison objected to the use of an SPS or some other operational measure in comments it filed on March 16, 2012 and March 30, 2012, and subsequently in the testimony of Michael Forte, submitted on June 7, 2012 (the "Forte Testimony"), and it objects to any such use of an SPS or some other operational measure now and in the future; and

WHEREAS, to address certain reliability concerns on its 138 kV system, in February 2012, Con Edison announced plans for the installation of a feeder to connect the Astoria East Substation ("Astoria East") to the Astoria Annex (the "138-kV Feeder"), as well as a phase-angle regulator and a 345-kV/138-kV autotransformer (collectively, "Feeder 34091"), which facilities were installed and placed into service in May 2012; and

WHEREAS, Applicants, in their comments, dated March 30, 2012, noted that Con Edison's Feeder 34091, together with the Astoria-Rainey cable, would increase energy deliverability out of Astoria "to substantially in excess of 1400 MW"; and

WHEREAS, In the testimony of Larry Eng and Clem Nadeau, submitted by Applicants on June 7, 2012 (attached to this Stipulation as Attachment 1)(the "Eng-Nadeau Testimony"), Messrs. Eng and Nadeau testify to the results of Applicants' energy deliverability analysis and conclude that 1550 MW of energy deliverability out of Astoria can be achieved without using an SPS or other operational measures, provided that the following three conditions are met: (1) installation of the Astoria-Rainey Cable, (2) installation of Feeder 34091, and (3) the upgrading of the 138-kV section of Feeder 34091, so as to increase the long term emergency ("LTE") rating of this feeder to at least 333 MVA; and

WHEREAS, Con Edison agrees with Applicants' energy deliverability analysis as set out in Attachment 1; and

WHEREAS, the undersigned agree that upgrading the 138-kV section of Feeder 34091 to ensure that the overall LTE rating of the Astoria Annex 345-kV to Astoria East 138-kV interconnection would be no lower than 335 MVA, the LTE rating of the 345-kV/138-kV autotransformer ("the 138-kV Feeder Upgrade").

IT IS HEREBY STIPULATED AND AGREED that, Applicants will negotiate a definitive agreement with Con Edison pursuant to which Con Edison would install, and Applicants would pay for, the 138-kV Feeder Upgrade, provided such upgrade is required at the time the Facility commences commercial operation; and

IT IS FURTHER STIPULATED AND AGREED that the facilities connecting NYPA's Astoria Annex to Con Edison's transmission system as of the date of this Stipulation, together with the Astoria-Rainey Cable and the 138-kV Feeder Upgrade, if installed, would be sufficient to permit 1,550 MW of electricity to flow from the Astoria Annex into Con Edison's transmission system; and

IT IS FURTHER STIPULATED AND AGREED that so long as the facilities connecting NYPA's Astoria Annex to Con Edison's transmission system, together with the Astoria-Rainey Cable and the 138-kV Feeder Upgrade, if installed, are sufficient to permit 1,550 MW of electricity to flow from the Astoria Annex into Con Edison's transmission system, Applicants shall not use an SPS or other operational measures subject to individual approval by the New York Independent System Operator, Inc., the New York State Reliability Council or other applicable reliability authorities to increase energy deliverability out of Astoria; and

IT IS FURTHER STIPULATED AND AGREED that Condition 133 of the proposed Certificate shall be deleted in its entirety and replaced with the revised Certificate Condition 133 attached to this Stipulation as Attachment 2; and

IT IS FURTHER STIPULATED AND AGREED THAT Applicants hereby withdraw all interrogatories and requests for admission addressing deliverability, SPSs, and Feeder 34091; and

IT IS FURTHER STIPULATED AND AGREED that after filing by the Applicants of this Stipulation with the Commission, the undersigned shall file statements supporting revised Certificate Conditions 133 in briefs, pursuant to the schedule set by the ALJs, and urging Commission adoption thereof; and

IT IS FURTHER STIPULATED AND AGREED that, subject to all necessary approvals, Con Edison will install the 138 kV Feeder Upgrade, pursuant to a definitive agreement with Applicants; and

IT IS FURTHER STIPULATED AND AGREED that, upon the filing of this Stipulation, Con Edison shall not seek to admit the Forte Testimony into the record; and

IT IS FURTHER STIPULATED AND AGREED that, upon the filing of this Stipulation, no party to this Stipulation shall seek to file rebuttal testimony with respect to the issues addressed in the Forte Testimony and the Eng-Nadeau Testimony; and

IT IS FURTHER STIPULATED AND AGREED that nothing in this Stipulation shall be construed to require Con Edison to construct, reconstruct, maintain, operate, replace, repair or refrain from retiring Feeder 34091 or to grant to Applicants any right to use or rely on the continued existence of such feeder. Applicants further agree not to assert any objection in any proceeding to the retirement or removal of Feeder 34091 in the event Con Edison determines that such feeder is no longer needed to serve customer load. In such event, Applicants and Con Edison shall seek to negotiate an agreement providing for continued operation, repair, maintenance, upgrade and replacement of Feeder 34091 at Applicants' sole cost and expense. Any such upgrade shall meet all Con Edison engineering, design, and planning specifications and criteria in effect at the time that such work is performed. In the event Applicants are unable to meet their deliverability commitment, they may propose to use an SPS or other operational

measures and the undersigned may exercise all rights they had prior to execution of this Stipulation, including opposition to any proposed use of an SPS or other operational measures.

This Stipulation shall have no effect on any other provision of the JP or the proposed Certificate, or on any other objections Con Edison may have to the JP or the proposed Certificate. Except for Certificate Conditions 15 (b), and (e) and 133, Con Edison reserves its right to continue to object to any other provisions of the JP and the proposed Certificate, and Applicants reserve the right to respond to such objections on any and all grounds.

[SIGNATURE PAGE FOLLOWS]

This Stipulation may be executed in counterparts, all of which shall collectively constitute a single agreement.

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Dated: June 26, 2012

Case 10-T-0139

DIRECT TESTIMONY

OF

APPLICANTS' DELIVERABILITY PANEL CONSISTING OF

LARRY ENG
AND
CLEMENT E. NADEAU

SUBMITTED ON BEHALF OF CHAMPLAIN HUDSON POWER EXPRESS, INC. AND CHPE PROPERTIES, INC.

June 7, 2012

Case 10-T-0139

Direct Testimony of Larry Eng and Clement E. Nadeau

Q. Please state your names, titles and business addresses.

A. (Mr. Eng) My name is Larry Eng. I am a Staff Consultant with Siemens Power Technologies International. My office address is 400 State Street, Schenectady, New York 12301.

A. (Mr. Nadeau) My name is Clement E. Nadeau. I am a consultant with TRC Solutions, Inc. My business address is 835 Ladyfish Avenue Apartment 101, New Smyrna Beach, Florida 32169.

Q. Please describe your educational background and business experience.

A. (Mr. Eng) My educational background and business experience is summarized in Exhibit __ (ADP-1).

A. (Mr. Nadeau) My educational background and business experience is described in Exhibit __ (ADP-2).

Q. What is the purpose of your testimony in this proceeding?

A. Condition 15(a) of the proposed Certificate Conditions submitted with the Joint Proposal in this case (the "JP") would require Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. (the "Applicants") to establish that at least 1,550 MW of electricity can be delivered out of the Astoria Annex 345 kV substation (the "Astoria Annex") owned by the New York Power Authority ("NYPA") and located in Astoria, Queens, New York ("Astoria") into the transmission system of the Consolidated Edison Company of New York, Inc. ("Con Edison") in New York City. Our testimony will demonstrate that as a result of the construction of new transmission facilities installed since the JP was filed in this case, Applicants will be able to achieve the 1,550 MW of Total Transmission

Capability ("TTC") out of the Astoria Annex required by the JP without the need for any of the operational measures described in the JP, such as a Special Protection System ("SPS"), a Direct Transfer Trip ("DTT") relay, or a reliability rule exception (collectively, "Operational Measures").

In addition, we will present the results of a comprehensive study prepared by Mr. Eng using Siemens PTI's proprietary PSS®MUST and PSS/E computer programs. This study demonstrates that 1,550 MW of electricity can flow from the Astoria Annex into Con Edison's transmission system in accordance with NYISO normal transfer limit criteria. A copy of this study is submitted with this testimony as Exhibit ___ (ADP-3). Due to the confidential NYISO energy infrastructure information contained in this report, Applicants have requested confidential treatment for certain portions of this report.

In addition, we will also quantify the level of Capacity Resource Interconnection Service ("CRIS") rights available to projects interconnecting to the Astoria Annex and describe certain modeling of energy flows out of the Astoria Annex prepared by Mr. Eng for use by London Economics in their analysis of the energy price and emissions reductions flowing from the Facility.

1. TRANSMISSION FACILITIES AT NYPA's ASTORIA ANNEX

Q. Please describe the existing facilities connecting NYPA's Astoria Annex to Con Edison's transmission system.

A. NYPA's Astoria Annex is connected to Con Edison's transmission 345 kV system by two cable circuits. These cable circuits, known as NYPA's Q35L and Q35M circuits, both terminate at Con Edison's East 13th Street Substation. Each of these cable circuits has a normal rating of 538 MVA, a long term emergency ("LTE") limit of 621 MVA, and

a short term emergency ("STE") limit of 1,476 MVA. Recently, Con Edison has completed construction of a new transmission line connecting the Astoria Annex to its Astoria East 138 kV substation ("Astoria East") using a step-down transformer, a 138 kV Phase Angle Regulating Transformer, and a 138 kV cable (the "Astoria Annex PAR"). The Astoria Annex PAR was placed in service on May 9, 2012 and connects to Astoria East using the breaker position formerly assigned to U. S. Power Generating Company's recently retired Astoria 20 unit.

Q. How did you determine the ratings of the Astoria Annex PAR?

A. In February of 2012, Con Edison informed Applicants that the facilities comprising the Astoria Annex PAR would be identical to that of an existing PAR connection at Con Edison's Academy Substation and that the ratings for that existing PAR connection should be used to model the Astoria Annex PAR. In NYISO's 2010 Facilities Study base case, the Academy PAR connection is shown as having a normal rating of 273 MVA, an LTE rating of 333 MVA and an STE rating of 378 MVA.

Q. Is the Astoria Annex PAR a permanent part of the NYS Transmission System or could re-activation of Astoria 20 force Con Edison to disconnect the Astoria Annex PAR?

A. Con Edison expressly stated that the Astoria Annex PAR will be a permanent addition to its transmission system in its report to NYISO and its market participants announcing that upgrade. Excerpts of Update to Con Edison's Local Transmission Plan are annexed to this testimony as Exhibit ___ (ADP-4). Because this document may contain confidential infrastructure information of Con Edison, Applicants have also submitted this document on a confidential basis. Moreover, as previously noted, NYISO has already decided

to include the Astoria Annex PAR as a permanent addition to the NYS Transmission System in its planning database going forward. NYISO's recently issued 2012 Load and Capacity Report (the "Gold Book") states that Astoria 20 was retired as of April 11, 2012 and that the proposed retirement date of Astoria 40 was April 18, 2012.

Q. Please describe the Astoria-Rainey Cable proposed by the Applicants.

A. The Astoria-Rainey Cable will be constructed underground in conduits beneath city streets and will have a normal rating of 966 MVA, an LTE rating of 1050 MVA and an STE rating of 1289 MVA.

Q. Why have Applicants chosen to construct the Astoria-Rainey Cable with an LTE rating of 1050 MW?

A. Installing a cable circuit with an LTE rating of 1,050 MVA ensures that the Astoria-Rainey Cable will have sufficient capability when 1,550 MW of electricity is flowing through the Astoria Annex to withstand a stuck breaker contingency at the Astoria Annex which would result in the loss of either of the two existing cable circuits from Astoria to East 13th Street and the Astoria Annex PAR without loading the Astoria-Rainey Cable in excess of its LTE rating.

Q. Does the addition of the Astoria Annex PAR change this result in any way?

A. No. The 1,050 MVA LTE rating of the Astoria-Rainey Cable will be sufficient to avoid loading the Astoria-Rainey Cable in excess of its LTE rating in the event that a stuck breaker causes the simultaneous loss of one of NYPA's cable circuits from Astoria to East 13th Street and the Astoria Annex PAR when 1,550 MW are being delivered from Astoria. Thus, the only contingency that would result in loadings in excess of the LTE

ratings when 1,550 MW are being delivered from Astoria is the loss of the Astoria-Rainey Cable.

2. THERMAL LIMIT ANALYSIS

Q. With these facilities in place, how much energy can be exported from the Astoria Annex in the absence of any operational measures?

A. Approximately 1463 MW of electricity can be exported out of the Astoria Annex without the need for any operational measures.

Q. This figure is less than the sum of the LTE ratings of the facilities involved. Can you explain this difference?

A. Yes. The difference between this number and the sum of the LTE ratings (1575 MVA) is due to the distribution of power flow on these facilities. This power flow distribution is affected by pre-disturbance generation shift factors resulting from changes to the generation dispatch and the post-disturbance outage transfer factor resulting from the redistribution of power flow following a contingency.

Q. Is there any way to deliver 1,550 MW of electricity out of the Astoria Annex with the addition of only the Astoria-Rainey Cable but without the use of an SPS, DTT or other generation run-back scheme?

A. Yes. Rule B-R1.b of the NYSRC's Reliability Rules provides that:

> An underground cable circuit may be loaded to its STE rating following:
>
> Loss of Generation – provided ten (10) minute operating reserve and/or phase angle regulation is available to reduce the loading to its LTE rating within fifteen (15) minutes and not cause any other facility to be loaded beyond its LTE rating.
>
> Loss of Transmission Facilities – provided phase angle regulation is available to reduce the loading to its LTE rating within fifteen

(15) minutes and not cause any other facility to be loaded beyond its LTE rating.

Thus, to the extent that sufficient phase angle regulation is available in the Astoria Annex PAR to reduce the loading of the Q35L and Q35M cables below their LTE ratings within 15 minutes, and to the extent that such action can be accomplished without loading any other facility in excess of its LTE rating, at least 1,550 MW can be injected into the Astoria Annex without violating the NYSRC's Reliability Rules.

Q. Have you determined whether there is sufficient phase angle regulation in Con Edison's system to reduce the loads on the Q35L and Q35M cable circuits below LTE within 15 minutes after loss of the Astoria-Rainey Cable without loading any other facility in excess of LTE?

A. Yes. With the Astoria Annex injection at 1,550 MW and 224 MW flowing on the Astoria Annex PAR, the pre-disturbance angle on the Astoria Annex PAR was approximately 14 degrees. Shifting the Astoria Annex PAR setting to 23 degrees was sufficient to reduce the loading on the Q35L and Q35M circuits below their LTE ratings after the loss of the Astoria-Rainey Cable without loading any other facility in excess of its LTE rating. The angle range of the Astoria Annex PAR is +/- 25 degrees.

3. THE SIEMENS DELIVERABILITY STUDY

Q. Have you performed any studies to confirm that this result can be achieved?

A. (Mr. Eng) Yes. I performed such a deliverability study using Siemens proprietary PSS®MUST and PSS/E programs.

Q. Please describe the Siemens PSS®MUST program and explain how it can be used to accurately determine energy and capacity deliverability levels.

A. (Mr. Eng) The PSS®MUST program is designed to calculate electric transmission transfer capabilities and the impact of transactions and generation dispatch. Its results are used by transmission planners around the world to use their electric power grids more fully and to manage the effects of power transactions and dispatch changes. Specifically, the PSS®MUST program calculates the first contingency incremental transfer capability ("FCITC") to provide both the available transmission capability ("ATC") and TTC.

The determination of capacity deliverability levels was performed using a NYISO base case which has all generation considered for Capacity Resource Interconnection Service dispatched at a fixed percentage of their "PMAX" capability. The PSS®MUST program determines the NYC capacity deliverability capability from a substation by calculating the FCITC for a shift of generation from the substation to all other generators within NYC recognizing the Normal ratings of transmission facilities without contingencies and the STE ratings of transmission facilities with contingencies using emergency transfer limit criteria.

The determination of energy deliverability levels was performed using the NYISO capacity deliverability base case with modifications to the NYC generation dispatch and phase angle regulators to maximize the energy deliverability from the Astoria Annex substation and minimize the potential of overloading the other transmission facilities above their LTE ratings. The modifications were not significant because certain generators were found to have significant impact on the loading of the limiting transmission facilities. These modifications would be consistent with changes which would be made by NYISO's security constrained dispatch logic to minimize the production cost of generation within security constraints. The PSS®MUST program

determines the NYC energy deliverability capability from a substation by calculating the FCITC for a shift of generation from the substation to all other generators within NYC recognizing the Normal rating of transmission facilities without contingencies and the LTE rating of transmission facilities with contingencies using normal transfer limit criteria.

Q. How did you use the Siemens PSS/E program to assess the extent to which loads on NYPA's Q35L and Q35M cable circuits can be reduced below their LTE ratings within fifteen minutes by operation of the Astoria Annex PAR?

A. (Mr. Eng) The PSS®MUST program determined that the energy deliverability capability from the Astoria Annex substation without operator action was 1,463 MW. Using the PSS/E program on the modified capacity deliverability case, I increased generation at the Astoria Annex to 1,550MW and reduced generation at other generating facilities within New York City without increasing the power flow on any facility beyond its Normal rating. I then ran the program to determine the results of loss of the Astoria-Rainey Cable and noted that without any changes to pre-disturbance transformer or PAR settings, the power flows from the Astoria Annex to East 13th Street were only slightly higher than the 621 MVA rating of each of those cable circuits. I then changed the phase angle setting of the Astoria Annex PAR from its pre-disturbance setting of -14 degrees to -23 degrees and noted that the power flows from the Astoria Annex to East 13th Street were reduced below the LTE ratings of those cables, without exceeding the LTE rating of any other transmission facilities in NYISO Zone J.

Q. Please describe the results of this study.

A. (Mr. Eng) This study showed that under the dispatch conditions modeled, total energy deliverability out of the Astoria Annex was limited to 1,463 MW without any post-disturbance operator actions. With a post-disturbance shift of -9 degrees on the Astoria Annex PAR, the total energy deliverability out of the Astoria Annex was limited to 1,550 MW.

Q. In your study, did operation of the Astoria Annex PAR reduce all loads on the New York State Transmission System to below their LTE ratings without loading any other facility in excess of its LTE rating within fifteen minutes of a loss of the Astoria-Rainey Cable?

A. (Mr. Eng) Yes. As described in greater detail in Exhibit __ (ADP-3), this study demonstrates that there is sufficient phase angle regulation in the Astoria Annex PAR to meet this 15 minute requirement after loss of the Astoria-Rainey Cable when 1,550 MW of electricity is injected into the Astoria Annex. Accordingly, there is no need for an SPS, DTT or exception from the NYSRC's reliability rules to achieve this level of energy deliverability out of the Astoria Annex.

Q. Is 1,550 MW the maximum amount of electricity that can be exported from the Astoria Annex using existing facilities and post-contingency operation of the Astoria Annex PAR without violating applicable reliability requirements?

A. (Mr. Eng) No. By further modifying the generation dispatch used in the base case, it is possible to increase this figure further. For example, one dispatch study that I performed showed that the Astoria Annex PAR has sufficient capability to bring the loads on NYPA's Q35L and Q35M cables below their LTE ratings within fifteen minutes of a loss of the Astoria-Rainey Cable and without loading any other facility in excess of its LTE rating with exports from the Astoria Annex as high as 1,575 MW.

Q. **Would it be possible to export more than 1575 MW of electricity from the Astoria Annex using the existing facilities and the Astoria-Rainey Cable?**

A. Not without constructing further upgrades. Total energy exports from the Astoria Annex with the facilities described above would actually be limited to slightly less than 1575 MW. This figure represents the sum of the LTE limits of NYPA's Q35L and Q35M cable circuits (621 MVA each) and the LTE limit of the Astoria Annex PAR (333 MVA). Due to impedance differences between NYPA's Q35L and Q35M lines, the actual thermal limit of these facilities for loss of the Astoria-Rainey Cable would be slightly below 1575 MW.

Q. Since you performed this study, have you become aware of any other information concerning the ratings of the Astoria Annex PAR?

A. Yes. Recently, Applicants have learned from examination of NYISO's 2012 FERC Order No. 715 data base, which includes the Astoria Annex PAR, that this facility consists of three separate facilities with the following ratings:

> A 138 kV Phase Angle Regulator with a normal rating of 347 MVA, an LTE rating of 416 MVA and an STE rating of 464 MVA; and
>
> A 345/138 kV transformer with a normal rating of 268 MVA, an LTE rating of 335 MVA and an STE rating of 393 MVA; and
>
> A 138 kV cable with a normal rating of 263 MVA, an LTE rating of 304 MVA and an STE rating of 335 MVA.

Q. What is the significance of this information for your analysis?

A. The LTE rating for the 138 kV cable used in the Astoria Annex PAR provided in NYISO's 2012 FERC Order No. 715 base case is somewhat lower than the LTE rating used for the Astoria Annex PAR in my study. It may be necessary either to add another 138 kV cable circuit or to replace the conductors used for this cable circuit to raise the

LTE rating of this circuit closer to the 333 MVA LTE rating used in my study. With these minimal upgrades, the conclusions described above remain valid.

3. CAPACITY RESOURCE INTERCONNECTION SERVICE RIGHTS

Q. Please describe the amount of Capacity Resource Interconnection Service ("CRIS") presently available at NYPA's Astoria Annex.

A. In the Facilities Study for its Class Year 2010, NYISO found total CRIS rights out of NYPA's Astoria Annex to be limited to 1,155.8 MW. Of this amount, the NYISO 2012 Goldbook indicates that 576 MW is held by Astoria Energy 2; 315 MW is held by NYPA; and the remainder is unallocated. This limit was set by the combined normal ratings of NYPA's Q35L and Q35M cables, converted from unforced capacity ("UCAP") to installed capacity ("ICAP").

Q. How will the amount of CRIS at the Astoria Annex be affected by construction of the Astoria-Rainey Cable and the Astoria Annex PAR?

A. The actual level of CRIS rights resulting from these upgrades is not known at this time, as NYISO has not performed the studies required for that purpose. The Siemens PSS®MUST study suggests that construction of the Astoria-Rainey Cable and the Astoria Annex PAR can be expected to increase the total CRIS rights out of NYPA's Astoria Annex to approximately 1,261 MW. This limit is set by the need to avoid exceeding the normal ratings of the facilities connecting Con Edison's 345 kV Rainey Substation to its 138 kV Vernon Substation. The Siemens PSS®MUST study found that the addition of the Astoria Annex PAR by itself would not create any additional CRIS rights, because there do not appear to be any available CRIS rights at Con Edison's 138 kV Astoria East Substation at this time. However, as generators connecting to Astoria East retire and

their CRIS rights expire, additional CRIS rights may become available at the Astoria Annex as a result of the recently-completed the Astoria Annex PAR.

Q. Based on these calculations, what level of CRIS rights are Applicants likely to receive from NYISO?

A. No projects are proposing to connect to the Astoria Annex in NYISO's Class Year 2011 Facilities Study now underway. The Facility is not participating in that study, but is participating in NYISO's Class Year 2012 Facilities Study.

Until recently, it was not clear what level of CRIS rights, if any, the Facility would be able to obtain in the NYISO interconnection process. On May 30, 2012, NYISO advised Applicants that NYPA's former Poletti Plant would not be included in the base case for the 2012 Facilities Study. As a result, approximately 580 MW of CRIS rights will be available at the Astoria Annex without the need for any System Deliverability Upgrades ("SDUs"). Although Attachment S of the NYISO OATT specifies that these CRIS rights will be shared with other developers in the same class year, and the 250 MW Berrians 3 project is also in Class Year 2012, it is unlikely that this project will go forward if its energy output would be bottled by electricity delivered by the Applicants' 1,000 MW facility.

As previously noted, construction of the Astoria-Rainey Cable will add an additional approximately 105 MW of CRIS rights at the Astoria Annex. As a result of Con Edison's construction of the Astoria Annex PAR, which was only disclosed to Applicants in February of 2012, it is now possible that generator retirements at Astoria East may make additional CRIS rights available at the Astoria Annex in future years.

Q. What is the maximum amount of CRIS rights that Applicants can obtain from the existing facilities at the Astoria Annex and the Astoria-Rainey Cable?

A. The maximum amount of CRIS rights available to Applicants at the Astoria Annex using these facilities is limited by constraints on Con Edison's system to approximately 834 MW. To the extent that Applicants are able to obtain all these rights and their shippers are able to combine to them with an equal amount of capacity from the HydroQuebec control area, shippers using the Facility will be able to supply up to 834 MW of locational Installed Capacity to consumers in New York City. If the capacity of the Astoria Annex PAR is increased or additional connections are constructed between the Astoria Annex and Con Edison's 138 kV system, the amount of CRIS rights available to Applicants at the Astoria Annex could increase even further.

4. MODELING ANALYSIS FOR LONDON ECONOMICS

Q. Please describe the modeling work that Mr. Eng performed for London Economics.

A. (Mr. Eng) London Economics utilizes their POOLMod proprietary program to simulate the dispatch of generation resources in the market subject to least cost dispatch principals to meet projected hourly loads and technical assumptions on generation operating capacity and availability of transmission. In effect, POOLMod simulates locational-based marginal prices ("LBMPs").

POOLMod is a transportation-based model and uses a heuristic, serial-limited transportation algorithm to determine LBMPs subject to identified transmission limits. Exhibit ___ (ADP-5) illustrates the nine bubble POOLMod model I developed to represent the critical transmission constraints on the New York bulk transmission power system. This nine bubble model includes the following zones:

1. Upstate New York ("UPNY") includes the load and generation contained in NYISO Zones A-E, except for the Oswego 5 and 6 generators.
2. Capital includes the load and generation contained in NYISO Zones F, except for one of the three Athens combined cycle generators.
3. Oswego includes the Oswego 5 and 6 generators.
4. Southeast New York ("SENY") includes the load and generation contained in the NYISO Zones G-I and one of the three Athens combined cycle generators.
5. Long Island includes the load and generation contained in Zone K
6. The load and generation contained in NYISO Zone J was distributed in the following four bubbles based upon the distribution of load and generation represented in the NYISO 2012 FERC 715 Summer 2017 and Summer 2022 Summer peak load base cases:
    a. NYC 345 kV includes the load and generation on the NYC 345 kV transmission system and on the underling 138 kV transmission system in Manhattan and the Bronx, except for the Astoria Annex substation
    b. NYC 138 kV includes the load and generation on the NYC 138 kV transmission system in Brooklyn and Queens
    c. NYC Staten Island includes the load and generation in Staten Island
    d. Astoria includes the generation connected to the Astoria Annex substation.

Transfer limit analysis was performed on the NYISO 2012 FERC 715 Summer 2017 and Summer 2022 peak load base cases. The following table lists the transmission constraints developed for POOLMod based upon the transfer limit analysis and recognizing POOLMod's serial-limited transportation algorithm i.e. does not model transmission loop flows:

Constraint	MW
UPNY-Capital	2100
Capital-SENY	3100
Oswego-SENY	1300
SENY-NYC345	3675
SENY-Long Island	1250
Long Island-SENY	250
NYC345-NYC138	2350
NYCSI-NYC345	400
Astoria-NYC345	1550

7. CONCLUSION

Q. Does this conclude your direct testimony?

A. Yes.

Case 10-T-0139

EXHIBITS TO TESTIMONY

OF

LARRY ENG
AND CLEMENT E. NADEAU

June 7, 2012

Case 10-T-0139

EXHIBIT LIST

EXHIBIT ___ (ADP-1) Resume of Larry Eng

EXHIBIT ___ (ADP-2) Resume of Clement E. Nadeau

EXHIBIT ____(ADP-3) Siemens PTI Deliverability Study (Redacted Version)

EXHIBIT ____(ADP-4) Excerpt from Update to Con Edison's Local Transmission Plan

EXHIBIT ____(ADP-5) Diagram of the Topology used in the POOL Mod Analysis

Larry Eng

Staff Consultant

Career Highlights

Mr. Eng has more than 38 years of experience in power systems with an emphasis on electric power analysis of high voltage power systems (23 kV and above). His areas of expertise include:

- *Engineering analysis* and design requirements for the interconnection of generation and transmission facilities. Knowledge of planning and operating standards of the North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC), New York Independent System Operator (NYISO), and ISO New England (ISO-NE). Expertise in the performance of power flow, transient stability, and short circuit analysis.
- *Economic analysis* of the design and operation of interconnected bulk power transmission and generation networks. Expertise in the performance of production cost and economic dispatch analysis using programs such as GE MAPS and ABB GridView™.
- *Reliability analysis* of the security and adequacy of the interconnected bulk power transmission and generation networks. Expertise in performance security and adequacy analysis using programs such as GE MARS.

Mr. Eng joined the Siemens PTI staff in October 2011 and has been performing interconnection and NERC compliance studies.

Experience

Prior to joining Siemens PTI, Mr. Eng was an independent consultant (2005 to 2011) performing reliability and economic analysis in support of the NYISO Resource Needs Assessment (RNA), Comprehensive Reliability Plan (CRP), and the Congestion Assessment and Resource Integration Study (CARIS). Mr. Eng also provided consulting services to ISO-NE, performing interconnection studies from February 2007 to November 2008.

Mr. Eng retired from National Grid USA Service Company/Niagara Mohawk Power Corporation in February 2005, after 32 years of experience performing/directing electric power studies to ensure the security and adequacy of the New York transmission and subtransmission system to meet projected system load forecasts. During his 32 year tenure, Mr. Eng held the following positions:

- Consulting Engineer, National Grid USA Service Company 2002 – 2005
- Manager Electric Transmission Assets, Niagara Mohawk Power Corporation 1999 – 2002
- Director of Electric System Studies, Niagara Mohawk Power Corporation 1996 – 1999
- Manager Transmission Planning, Niagara Mohawk Power Corporation 1991 – 1996
- Supervisor of Transmission Planning, New York Power Pool 1979 – 1991

Education

MBA, State University at Albany, Albany, NY, 1994
ME, Electric Power Engineering, Rensselaer Polytechnic Institute, Troy, NY, 1973
BSEE, Cornell University, Ithaca, NY, 1972

Professional

Mr. Eng has been a Registered Professional Engineer in New York State since 1979.

Memberships and Certifications

He is involved in numerous task forces, working groups and subcommittees for multiple organizations, including:

New York Independent System Operator (NYISO)
- Transmission Planning Advisory Subcommittee
- Interconnection Issues Task Force

Northeast Power Coordinating Council (NPCC)
- Reliability Coordinating Committee
- Task Force on Coordinated Planning, Chairman
- Task Force on System Studies

New York State Reliability Council
- Executive Committee
- Reliability Rules Subcommittee

Mr. Eng. is Member of the IEEE.

CLEMENT NADEAU, PE

EDUCATION

B.S., Electrical Engineering, Union College, 1980
A.S., Applied Science, Hudson Valley Community College, 1973

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer, New York and Florida

AREAS OF EXPERTISE

Mr. Nadeau, PE has program management and technical experience in the following general areas:

- Electric and Gas Field Operations
- Electric and Gas Asset Management
- Bulk Power System Management
- Electric and Gas Wholesale Transmission Rates and Power Contracts
- Electric and Gas Pricing, Retail Rates and Marketing
- Engineering Planning and Engineering Technical Services

REPRESENTATIVE EXPERIENCE

Before his retirement in March 2007, Mr. Nadeau was Senior Vice President at National Grid responsible for electric and gas field operations including directing the maintenance and construction workforce for electric and gas facilities across the New York Service territory of National Grid.

Mr. Nadeau has also served as Vice President of numerous functions since May 1991 covering electric and gas asset management function, wholesale electric and gas business, strategic planning for the energy delivery business unit, large commercial and industrial customer account management, electric wholesale and retail and gas retail rate design, tariff administration and pricing programs and development and implementation of the company's marketing programs, bulk power system planning and operations.

Since his retirement from National Grid, Mr. Nadeau has been providing consulting services both independently and as an employee of TRC solutions. Mr. Nadeau has provided consulting services in the area of transmission interconnection, power supply, energy efficiency, resource planning, including economic analysis for a variety of clients including small utilities, large commercial customers and municipal/coop utilities.

Mr. Nadeau has served on a number of industry task forces and committees including Northeast Power Coordinating Council (NPCC) member representative, New York Independent System Operator (NYISO) Management Committee, New York State Energy Research and Development Authority (NYSERDA) System Benefits Advisory Committee, NYSERDA Combine Heat and Power Advisory Committee, Consumers Council of America Distributed Generation Committee, Chairman of the New York Transmission Owners Committee, participant Harvard Electricity Policy Group.

Chairman NYPP Operating Committee, NPCC Executive Committee, New York Power Pool (NYPP) 21st Century Committee, NYPP Planning Committee, NPCC Futures Task Force, NYISO Transition Committee, Electric Power Research Institute Power System Planning & Operations, NYPP/Ontario Hydro Operating Committee, NYPP/Pennsylvania New Jersey Maryland (PJM) Planning Committee, NPCC Operating Coordination Committee, NPCC Joint Coordinating Committee, NPCC Task Force on System Studies, North American Electric Reliability(NERC) Search Committee, NMPC/Ontario Hydro Operating Committee, NMPC/Hydro Quebec Operating Committee, Consumers Council of America Convergence Committee, New York Inter-Utility Security Task Force and have participated on several Interregional bulk power system studies.

Mr. Nadeau has testified on numerous occasions before the New York State Public Service Commission, Federal Energy Regulatory Commission and in numerous civil cases generally involving electricity rates, rate design and transmission and power contracts.

R016-12

TDI's NYC Merchant CHPE Transmission Project with POI at Astoria (NYISO Queue #305) With Astoria-Rainey 345kV Cable and Con Edison Astoria East PAR Transmission Reinforcement Deliverability Analysis

Prepared for

Transmission Developers, Inc.

Submitted by:
Larry Eng, Staff Consultant
Arthur Pinheiro, Senior Manager

April 30, 2012

Siemens PTI Project Number P/21-113470-B-5

Contents

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Executive Summary

A. Introduction

Siemens Industry, Inc., Siemens Power Technologies International (Siemens PTI) has conducted an evaluation of the power deliverability of the proposed interconnection of the Transmission Developer Inc. (TDI)'s HVDC Merchant Champlain Hudson Power Express (CHPE) Transmission Project, NY Queue #305 (the "Project") with the Astoria-Rainey 345kV cable and the Consolidated Edison Astoria East PAR transmission reinforcement. The Project is expected to inject 1,000 MW into Astoria 345 kV substation which is owned by the New York Power Authority.

The purpose of the deliverability study was to evaluate the capacity and energy deliverability capability at the Astoria 345 kV Substation for the existing system and with the addition of the Astoria-Rainey 345kV cable and the new PAR transmission reinforcement between the Astoria 345 kV and Astoria East 138 kV substations proposed by Consolidated Edison.

The deliverability study case for thermal analysis primarily utilized base case and PSS®MUST data which the NYISO utilized to perform the deliverability study for the Class Year 2010 Facilities Studies. Scope of Work

The thermal analysis was performed according to the following scope:

1. Capacity Deliverability Analysis

    a. Confirm the database and study techniques utilized in this study is consistent with the deliverability study performed for the NYISO Class Year 2010 Facilities Studies.

    b. Perform capacity delivery analysis to determine the capacity delivery limit for the Astoria 345 kV substation with the addition of the Astoria-Rainey 345kV cable and the Consolidated Edison Astoria East 138 kV PAR transmission reinforcement.

2. Energy Deliverability Analysis

    a. Determine the existing system energy delivery limit from the Astoria 345 kV substation.

    b. Perform energy delivery analysis to determine the energy delivery limit for the Astoria 345 kV substation with the addition of the Astoria-Rainey 345kV cable and the Consolidated Edison Astoria East 138 kV PAR transmission reinforcement.

B. Results of the Deliverability Study

The following results are based upon the Siemens PTI system studies:

1. Capacity Deliverability Analysis

    a. Table 2-1. Base Case Capacity Deliverability Capability confirms the database and study techniques utilized in this study is consistent with the deliverability study performed for the NYISO Class Year 2010 Facilities Studies.

    b. Table 2-1. Base Case Capacity Deliverability Capability also identifies the existing system capacity delivery limit from the Astoria 345 kV substation is 1,076 MW based upon the 538 MW pre-disturbance power flow on each of the E13th Street-Astoria 345 kV cables.

    c. Table 2-2. Capacity Deliverability Capability With Astoria-Rainey and CE Astoria East PAR identifies the Astoria 345 kV substation capacity delivery limit is increased from 1,076 MW to 1,175 MW based upon the 256MW pre-disturbance power flow on the Rainey-8W 345/138kV transformer.

2. Energy Deliverability Analysis

    a. Table 2-4. Existing System Energy Deliverability Capability from the Astoria 345 kV substation is 621 MW based upon the 621 MW post-contingency power flow of one of the E13th Street-Astoria 345 kV cable for the loss of the other E13th Street-Astoria 345 kV cable.

    b. Table 2-6. Energy Deliverability Capability With Astoria-Rainey Cable and CE Astoria East PAR identifies the Astoria 345 kV substation energy delivery limit is increased from 621 MW to 1463 MW based upon the 621 MVA LTE limit of one of the E13th Street-Astoria 345 kV cables for the loss of the Astoria-Rainey 345kV cable. With post-contingency power flow phase angle regulation, the Astoria 345kV substation energy limit could therefore be increased to 1550MW without a Special Protection Scheme (SPS).

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Section
1

Introduction

Siemens PTI has performed an analysis to investigate the deliverability capability of capacity and energy export from the Astoria 345 kV station. The analysis was performed using PSS®MUST software. The power flow base case and PSS®MUST data were provided by the NYISO. These are the same data that were utilized in the Class Year 2010 Facilities Study Part 2: Deliverability Study and System Deliverability Upgrade Facilities (SDU).

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Section
2

Deliverability Analysis

2.1 Capacity Deliverability Capability

2.1.1 Initial Base Case

Initially the capacity deliverability capability analysis was performed on the base case. The results of the PSS®MUST analysis are included in Appendix A.1 and summarized in Table 2-1. These results for the CHPE project confirm the results indicated in the "Table 7 – Capacity Deliverability within the NYC Capacity Region for the ATRA FCITC limit" of the NYISO report "Class Year 2010 Facilities Studies, Part 2 Studies (Sections 11, 12, 13 only): Deliverability Study and System Deliverability Upgrade Facilities (SDU), Final Report, July 14, 2011" with respect to the Berrians III project.

The base case used in this analysis has Poletti generation dispatched at 829 MW and the CHPE Q305 project at 158 MW. Thus, total generation dispatched at Astoria 345 kV station was 987 MW.

Table 2-1. Base Case Capacity Deliverability Capability

Astoria 345	Limiting Element	TDF	Pre Shift	Rating	Contingency
1076.5	E13ST 47-ASTORIA 345	-0.51	-493.1	538.0	Base Case
1079.6	E13ST 48-ASTORIA 345	-0.49	-492.9	538.0	Base Case
1163.2	RAINEY8W-345/138KV	-0.24	-213.8	256.0	Base Case
1167.0	RAINEY8W-VERNON 138	0.24	213.4	256.0	Base Case

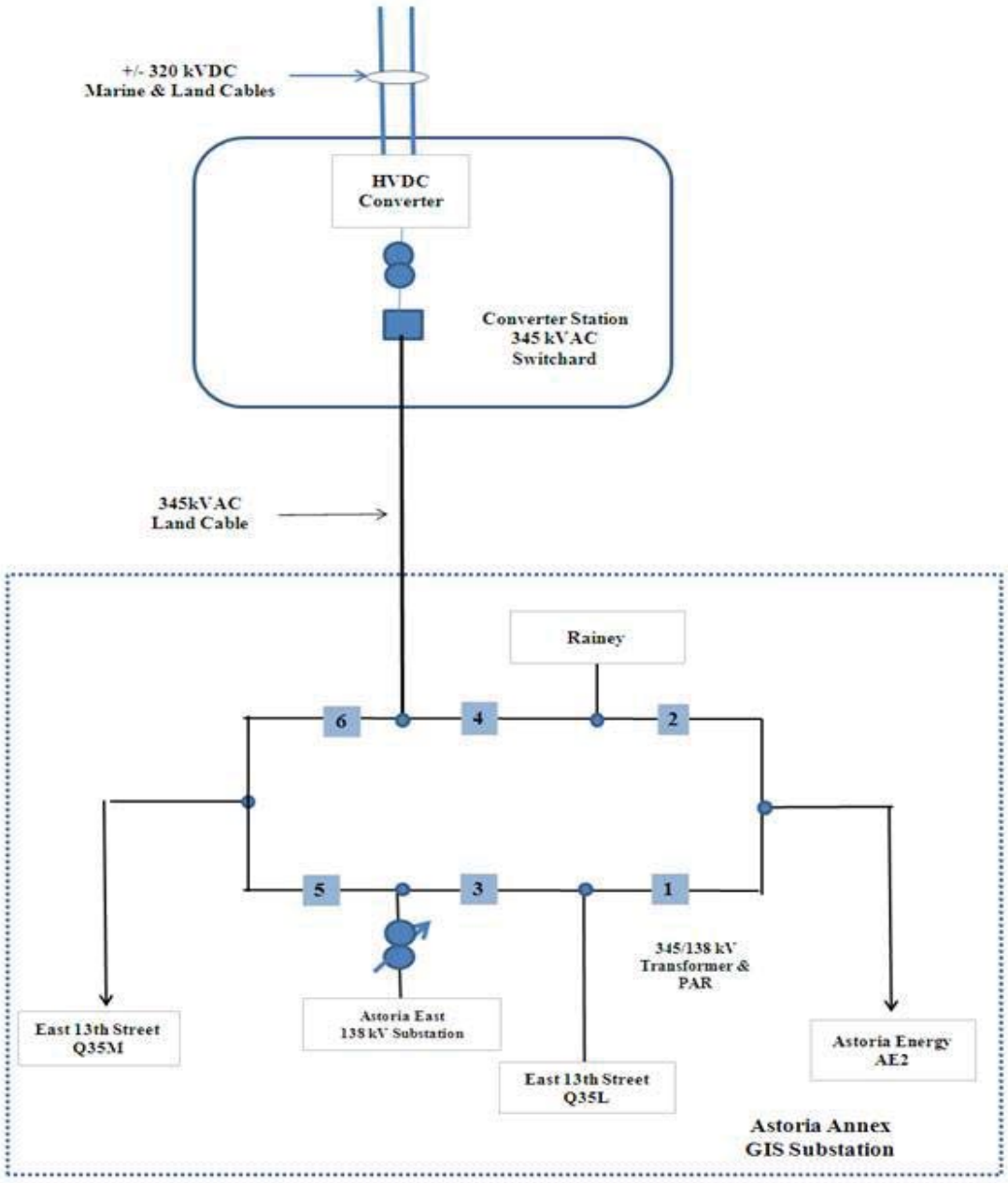
The small difference between the NYISO results and the results shown in Table 2-1 is due to the fact that the analysis presented in this report only considered the CHPE project. The NYISO analysis evaluated the Berrians III and South Pier Improvement.

2.1.2 Astoria-Rainey 345 kV Cable and CE Astoria East PAR Transmission Reinforcements

Analysis was performed to determine the capacity delivery capability with the CHPE Q305 project connected to the Astoria 345 kV Station and an Astoria-Rainey 345kV cable and the Consolidated Edison Astoria East PAR transmission reinforcement. The Astoria-Rainey

cable characteristics were assumed to be 2500MCM 345kV cable. The ratings of the 345kV cable were assumed to be 966 MVA normal, 1050 MVA LTE, and 1289 MVA STE. The Consolidated Edison Astoria East PAR transmission reinforcement includes a 345/138kV transformer, a 138kV Phase Angle Regulator (PAR), and a 138kV cable between the Astoria 345kV substation and the Astoria East 138kV switchyard. The 345/138kV transformer and PAR impedance, voltage/angle limits, and ratings were assumed to be similar to the existing 345/138kV transformer (273 MVA normal, 333 MVA LTE, and 378 MVA STE) and PAR (307 MVA normal, 372 MVA LTE, and 401 MVA STE) equipment at the Academy substation. The impedance of the 138kV cable was assumed to be 0.00016+j 0.00094.

The following Figure 1 illustrates the one-line diagram of the CHPE HVDC converter station, the Astoria-Rainey 345kV cable, and the Consolidated Edison Astoria East PAR interconnections to the Astoria 345kV substation. The Consolidated Edison Astoria East PAR interconnection to the Astoria East 138kV switchyard terminates at the breaker position presently utilized by the Astoria 2 generator lead.



The results of the PSS®MUST analysis is included in Appendix A.2 and summarized in Table 2-2. The Astoria 345kV capacity deliverability capability increased from 1076 MW to 1175 MW based upon the pre-disturbance power flow on the Rainey 345/138 kV transformer The ASTEPAR angle in the predisturbance case was 20.7 degrees and the power flow to the Astoria East 138 kV switchyard was 226 MW. The power flow to the Astoria East 138 kV switchyard with the ASTEPAR at zero degrees would have been 141 MW

Table 2-2. Capacity Deliverability Capability With Astoria-Rainey and CE Astoria East PAR

Astoria 345	Limiting Element	TDF	Pre Shift	Rating	Contingency
1174.9	RAINEY8W-345/138KV	-0.23	-211.7	256.0	Base Case
1176.6	RAINEY8W-VERNON 138	0.23	211.3	256.0	Base Case
1507.0	E13ST 47-ASTORIA 345	-0.50	-358.5	621.0	ASTORIA-RAINEY 345

2.2 Energy Deliverability Capability

The NYISO Deliverability test methodology used to determine the Capacity Resource Interconnection Service (CRIS) requires that generation in the rest of the region must be scaled uniformly. However, when energy deliverability is considered, it is conceivable that the transmission constraint may be relieved by using a security constrained economic dispatch.

Using distribution factor analysis, the generators identified in Table 2-3. were found to have significant impact on the loading of the Rainey 345/138 kV transformer.

Table 2-3. Generation Distribution Factors on Rainey 345/138 kV Transformer

Generator	DFAX
RNYGT4-7	0.55
KEYSPG-1	0.26
RAV 2	0.21
RAV 1	0.21
AST 5	0.16
POLETGT2	0.16
POLETGT1	0.16
POLETTI	0.16
AWGT1	0.16
AWGT2	0.16
AST 3	0.16
POLETSTG	0.16

Energy delivery analysis was performed on a modified base case in which generation was increased 132 MW at Ravenswood 2 and 132 MW was reduced at Ravenswood 3. The PSS®MUST data was also modified to exclude changes to the generators listed in Table 2-3. when generation was shifted from Astoria 345 kV station to the rest of NYC.

2.2.1 Existing System

Energy deliverability capability analysis for the existing system was performed on the modified base case with the post-contingency limits specified at the LTE ratings of the limiting facility. The results of the PSS®MUST analysis are included in Appendix A.3 and summarized in Table 2-4.. These results indicated that energy delivery out of Astoria would be 621 MW based upon one of the E13th Street-Astoria 345 kV cables 621 MVA LTE rating for the loss of the other E13th Street-Astoria 345 kV cable.

Table 2-4. Existing System Energy Deliverability Capability

Astoria 345	Limiting Element	TDF	Pre Shift	Rating	Contingency
621.0	E13ST 47-ASTORIA 345	-1.00	985.1	621.0	E13ST 48-ASTORIA 345
621.0	E13ST 48-ASTORIA 345	-1.00	985.1	621.0	E13ST 47-ASTORIA 345
1074.4	E13ST 47-ASTORIA 345	-0.51	-492.7	538.0	Base Case
1074.9	E13ST 47-ASTORIA 345	-1.00	-531.2	621.0	Astoria 345 SPS: 455MW TDI Q305 Runback

2.2.2 Astoria-Rainey 345kV Cable and CE Astoria East PAR Transmission Reinforcements

Energy deliverability capability analysis was performed on the modified base case with the Astoria-Rainey 345kV cable and the Consolidated Edison Astoria East PAR transmission reinforcements. Additional generation changes from the capacity delivery base case were required to reduce the impact of the Rainey-Vernon 345/135kV transformers on the energy delivery capability. These changes are illustrated in Table 2-5 below.

Table 2-5 Generation Changes With Astoria Rainey Cable and CE Astoria East PAR

		Capacity Disp	Energy Disp	Delta
Bus No	Bus Name	MW	MW	MW
126340	[KEYSPG-1 18.000]	139.6	89.6	-50
126341	[KEYSPST1 18.000]	64.9	44.9	-20
126652	[RAV 3 22.000]	363.9	573.9	210
126655	[AST 4 20.000]	238.5	218.5	-20
126677	[RNYGT4-7 13.800]	67.3	37.3	-30
126678	[RYYGT811 13.800]	68.6	48.6	-20

In addition there was need to change the two Parkchester PAR settings from 120MW to 90MW to reduce the loading in the E179 Street-Hellgate 138kV cable due to the increase in generation in the vicinity of the Astoria 138kV substations. The Astoria 138kV PAR setting was reduced from 266MW to 205MW. The results of the PSS®MUST analysis are included in Appendix A.4 and summarized in Table 2-6..

Table 2-6. illustrates that the energy delivery capability for the Astoria 345kV substation would be limited to 1,463 MW based upon the 621MVA LTE rating for one of the E13st-Astoria 345kV cables for the loss of Astoria-Rainey 345 kV cable.

Table 2-6. Energy Deliverability Capability With Astoria-Rainey Cable and CE Astoria East PAR

Astoria 345	LE From	TDF	Pre Shift	Rating	Contingency
1463.2	E13ST 47-ASTORIA 345	-0.51	-493.2	621.0	ASTORIA-RAINEY 345
1550.4	RAINEY8W-345/138KV	-0.15	-174.0	256.0	Base Case
1592.1	ASTORIA-RAINEY 345	-0.84	-543.3	1050.0	SB Astoria: E13ST 48-Astoria+ Ast138kV PAR

According to NYS Reliability Rules Manual Section B-R1.b “An underground cable circuit may be loaded to its STE rating following:

> Loss of Generation – provided ten (10) minute operating reserve and/or phase angle regulation is available to reduce the loading to its LTE rating within fifteen (15) minutes and not cause any other facility to be loaded beyond its LTE rating.
>
> Loss of Transmission Facilities – provided phase angle regulation is available to reduce the loading to its LTE rating within fifteen (15) minutes and not cause any other facility to be loaded beyond its LTE rating.

The one-line diagrams included in Appendix B illustrates the phase angle regulation capability of the Astoria 138kV PAR is sufficient to reduce the post-contingency power flows on the E13Street-Astoria 345kV cables to their LTE ratings without exceeding the LTE rating of any other facility with Astoria Energy II dispatched at 576MW and the CHPE project at 974MW. Therefore the energy delivery limit could increase from 1463MW to 1550MW, based upon the 621 MW post-contingency power flow on one of the E13th Street-Astoria 345 kV cables for the loss of the Astoria-Rainey 345kV cable contingency with PAR adjustment. Therefore no SPS is required to achieve the 1550MW energy deliverability limit.

Appendix B includes the following diagrams:

1. Pre-disturbance power flows with Astoria Energy II dispatched at 576MW and the CHPE project at 974MW.

2. Astoria-Rainey 345kV contingency post contingency power flows with pre-contingency PAR angles. The post contingency power flows on the remaining E13Street-Astoria 345kV cables are 646 and 639MVA which exceeds their LTE ratings of 621MVA but is less than their STE ratings of 1476MVA.

```
                2010 NYISO CLASS YEAR ATRA-D REV 3 TDI18-B AST345GEN1550
       2015 SUMMER PEAK LOAD W/ AST138PAR+AST-RAINEY L/O AST-RAINEY WO PAR ADJUSTMENT
                            OUTPUT FOR AREA 10 [NYC         ]
BRANCH LOADINGS ABOVE  95.0 % OF RATING SET B:

X--------- FROM BUS ----------X X---------- TO BUS -----------X       CURRENT(MVA)
  BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
126274 E13ST 47    345.00    10 147829 ASTOR345    345.00*   10  1    646.4   621.0   104.1
126275 E13ST 48    345.00*   10 147829 ASTOR345    345.00    10  1    639.1   621.0   102.9
```

3. Astoria –Rainey 345kV contingency post contingency power flows with post-contingency PAR angles. For this contingency, a reduction of 1 degree on one of the Astoria 138kV PAR would reduce the power flow on the E13Street-Astoria 345kV by approximately 5MW.. As the diagram indicates changing the angle the Astoria 138kV PAR from the -14 degree pre-disturbance angle to -23 degrees would reduce the E13Street-Astoria 345kV power flow below its LTE rating.

```
                2010 NYISO CLASS YEAR ATRA-D REV 3 TDI18-B AST345GEN1550
       2015 SUMMER PEAK LOAD W/ AST138PAR+AST-RAINEY L/O AST-RAINEY W PAR ADJUSTMENT
                            OUTPUT FOR AREA 10 [NYC         ]
BRANCH LOADINGS ABOVE  95.0 % OF RATING SET B:

X--------- FROM BUS ----------X X---------- TO BUS -----------X       CURRENT(MVA)
  BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
126274 E13ST 47    345.00    10 147829 ASTOR345    345.00*   10  1    606.2   621.0    97.6
126275 E13ST 48    345.00*   10 147829 ASTOR345    345.00    10  1    597.9   621.0    96.3
```

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Appendix

A

PSS®MUST Analysis Results

A.1 Base Case Capacity Deliverability Capability

PSS®MUST Analysis Results

FCITC Single Study

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 Interface-2  Interface    65 AST345         Init.Flow=      988.05 TDF= 1.0000
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														Open 147829 ASTOR345 345 148988 TDIQ305
			-165.7	-7	-7.1	822.4		Interface 24 Ontario-Mich			-0.07766	-12.9	0.0	SB:AST_345_5 TDIQ305 & Q35M-48
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10 T
														Open 147829 ASTOR345 345 148988 TDIQ305
			-165.3	-6.7	-6.8	822.7	*	Interface 24 Ontario-Mich			-0.07766	-12.8	0.0	SB:AST_345_3 TDIQ305 & Q35L-B47
														Open 126274 E13ST 47 345 126277 FARRAGUT
														Open 126274 E13ST 47 345 147829 ASTOR345
														Open 126274 E13ST 47 345 126869 E13 TX16 T
														Open 126274 E13ST 47 345 126870 E13 TX17 T
														Open 147829 ASTOR345 345 148988 TDIQ305
			-157.9	0.7	0.6	830.1		Interface 20 ABC-JK_PAR-I			0.55560	87.7	0.0	147829 ASTOR345 345 148988 TDIQ305 345
														Open 147829 ASTOR345 345 148988 TDIQ305
			-156.3	2.3	2.2	831.8		Interface 20 ABC-JK_PAR-I			0.55559	86.8	0.0	SB:AST_345_5 TDIQ305 & Q35M-48
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10 T
														Open 147829 ASTOR345 345 148988 TDIQ305
			-156.2	2.4	2.4	831.9	*	Interface 20 ABC-JK_PAR-I			0.55557	86.8	0.0	SB:AST_345_3 TDIQ305 & Q35L-B47
														Open 126274 E13ST 47 345 126277 FARRAGUT
														Open 126274 E13ST 47 345 147829 ASTOR345
														Open 126274 E13ST 47 345 126869 E13 TX16 T
														Open 126274 E13ST 47 345 126870 E13 TX17 T
														Open 147829 ASTOR345 345 148988 TDIQ305
			88.5	247.1	247	1076.5		126274 E13ST 47 345	147829 ASTOR345 3	1	-0.50705	-493.1	538.0	Base Case
			91.6	250.2	250.1	1079.6		126275 E13ST 48 345	147829 ASTOR345 3	1	-0.49295	-492.9	538.0	Base Case
			177.2	335.8	335.7	1165.3		126481 RAINEY8W 138	126562 8W DUM 1	1	-0.23835	-213.8	256.0	Base Case
			178.9	337.5	337.5	1167		126481 RAINEY8W 138	126507 VERNON-W 1	1	0.23835	213.4	256.0	Base Case
			370.5	529.1	529	1358.5		126295 RAINEY 345	126562 8W DUM 1	8	0.24516	165.2	256.0	Base Case
			383.1	541.7	541.6	1371.2		126480 RAINEY8E 138	126506 VERNON-E 1	1	0.24484	157.2	251.0	Base Case
			383.9	542.5	542.4	1371.9		126480 RAINEY8E 138	126561 8E DUM 1	1	-0.24484	-158.0	252.0	Base Case
			391.7	550.3	550.2	1379.8		126481 RAINEY8W 138	126562 8W DUM 1	1	-0.23835	-278.6	372.0	SB:Greenwood138_4N
														Open 126287 GOWANUSS 345 126429 GOWNUS2T
														Open 126428 GOWNUS2R 138 126429 GOWNUS2T
														Open 126428 GOWNUS2R 138 126434 GRENWOOD
														Remove unit 1 from bus 126257 GOWGT1A 13.8
														Remove unit 1 from bus 126259 GOWGT1B 13.8
														Remove unit 1 from bus 126258 GOWGT3A 13.8
														Remove unit 1 from bus 126289 GOWGT3B 13.8
														Remove unit 1 from bus 128666 Q261SO_PIER 13.8
														Remove unit 1 from bus 126308 NARRGT2A 13.8
														Remove unit 1 from bus 126309 NARRGT2B 13.8
			393.4	552	552	1381.5		126481 RAINEY8W 138	126507 VERNON-W 1	1	0.23835	278.2	372.0	SB:Greenwood138_4N
														Open 126287 GOWANUSS 345 126429 GOWNUS2T

A.2 Capacity Deliverability Capability With Astoria-Rainey 345kV Cable and CE Astoria East PAR

FCITC Single Study

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 2015 SUMMER PEAK LOAD W/ AST138PAR+AST-RAINEY
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Subsys.File C:\TDIQ305\Auxiliary files\CY2009_CY2010_.sub
Monit.File  C:\TDIQ305\Auxiliary files\CY2009_CY2010_AST138C.MON
Contin.File C:\TDIQ305\Auxiliary files\CY2010_ATRA_A.CON
Exclud.File C:\TDIQ305\Auxiliary files\cy2009-2010contingencies.exc

  Interface-1  Interface     64 TDIQ3           Init.Flow=       158.54 TDF= 1.0000
  Interface-2  Interface     65 AST345          Init.Flow=       986.00 TDF= 1.0000
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From	To	Transfer Level	FCITC	Interface-1	Interface-2	Flag	LE From	LE To	Ckt	TDF	PreShift	Rating	Contingency
Q305 Q308	J EXP	1000.0	-434.9	-276.3	551.1		Interface 20 ABC-JK PAR-I			0.06	26.9	0.0	148988 CHPEQ305 345 148993 CHPE305ST2 13.8
													Open 148988 CHPEQ305 345 148993 CHPE305ST2
			-434.9	-276.3	551.1		Interface 20 ABC-JK PAR-I			0.06	26.9	0.0	148988 CHPEQ305 345 148994 CHPE305ST3 13.8
													Open 148988 CHPEQ305 345 148994 CHPE305ST3
			-434.9	-276.3	551.1	*	Interface 20 ABC-JK PAR-I			0.06	26.9	0.0	148988 CHPEQ305 345 148992 CHPE305ST1 13.8
													Open 148988 CHPEQ305 345 148992 CHPE305ST1
			-166.5	-8	819.5		Interface 24 Ontario-Mich			-0.08	-12.9	0.0	147829 ASTOR345 345 148988 CHPEQ305 345
													Open 147829 ASTOR345 345 148988 CHPEQ305
			-164.6	-6.1	821.4		Interface 24 Ontario-Mich			-0.08	-12.7	0.0	SB:AST_345_5 TDIQ305 & Q35M-48
													Open 126275 E13ST 48 345 126277 FARRAGUT
													Open 126275 E13ST 48 345 147829 ASTOR345
													Open 126275 E13ST 48 345 126499 T11MPT
													Open 126275 E13ST 48 345 126867 E13 TX10 T
													Open 147829 ASTOR345 345 148988 CHPEQ305
			-164.3	-5.8	821.7	*	Interface 24 Ontario-Mich			-0.08	-12.7	0.0	SB:AST_345_3 TDIQ305 & Q35L-B47
													Open 126274 E13ST 47 345 126277 FARRAGUT
													Open 126274 E13ST 47 345 147829 ASTOR345
													Open 126274 E13ST 47 345 126869 E13 TX16 T
													Open 126274 E13ST 47 345 126870 E13 TX17 T
													Open 147829 ASTOR345 345 148988 CHPEQ305
			188.9	347.4	1174.9		126481 RAINEY8W 138	126562 8W DUM 1	1	-0.23	-211.7	256.0	Base Case
			190.6	349.1	1176.6		126481 RAINEY8W 138	126507 VERNON-W 1	1	0.23	211.3	256.0	Base Case
			384.7	543.2	1370.7		126295 RAINEY 345	126562 8W DUM 1	8	0.24	163.1	256.0	Base Case
			398.3	556.8	1384.3		126480 RAINEY8E 138	126506 VERNON-E 1	1	0.24	155.0	251.0	Base Case
			399.1	557.7	1385.1		126480 RAINEY8E 138	126561 8E DUM 1	1	-0.24	-155.8	252.0	Base Case
			405.1	563.6	1391.1		126481 RAINEY8W 138	126562 8W DUM 1	1	-0.23	-277.0	372.0	SB:Greenwood138_4N
													Open 126287 GOWANUSS 345 126429 GOWNUS2T
													Open 126428 GOWNUS2R 138 126429 GOWNUS2T
													Open 126428 GOWNUS2R 138 126434 GRENWOOD
													Remove unit 1 from bus 126257 GOWGT1A 13.8
													Remove unit 1 from bus 126259 GOWGT1B 13.8
													Remove unit 1 from bus 126258 GOWGT3A 13.8
													Remove unit 1 from bus 126289 GOWGT3B 13.8
													Remove unit 1 from bus 128666 Q261SO_PIER 13.8
													Remove unit 1 from bus 126308 NARRGT2A 13.8
													Remove unit 1 from bus 126309 NARRGT2B 13.8
			406.8	565.4	1392.8		126481 RAINEY8W 138	126507 VERNON-W 1	1	0.23	276.6	372.0	SB:Greenwood138_4N
													Open 126287 GOWANUSS 345 126429 GOWNUS2T
													Open 126428 GOWNUS2R 138 126429 GOWNUS2T
													Open 126428 GOWNUS2R 138 126434 GRENWOOD
													Remove unit 1 from bus 126257 GOWGT1A 13.8
													Remove unit 1 from bus 126259 GOWGT1B 13.8
													Remove unit 1 from bus 126258 GOWGT3A 13.8
													Remove unit 1 from bus 126289 GOWGT3B 13.8
													Remove unit 1 from bus 128666 Q261SO_PIER 13.8
													Remove unit 1 from bus 126308 NARRGT2A 13.8
													Remove unit 1 from bus 126309 NARRGT2B 13.8
			407.2	565.8	1393.2		126481 RAINEY8W 138	126562 8W DUM 1	1	-0.23	-276.5	372.0	SB:Greenwood138_4S
													Open 126426 GOWNUS1R 138 126434 GRENWOOD
													Open 126426 GOWNUS1R 138 126427 GOWNUS1T
													Open 126286 GOWANUSN 345 126427 GOWNUS1T
													Remove unit 1 from bus 126271 GOWGT2A 13.8

A.3 Existing System Energy Deliverability Capability

FCITC Single Study

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  PSS(R)MUST  10.2  -- Managing and Utilizing System Transmission --  TUE, NOV 01 2011  10:35 <FCT111.0>
 2010 NYISO CLASS YEAR ATRA-D REV 3
 2015 SUMMER PEAK LOAD W/ 2009 ERAG/MMWG & PJM RTEP 09 UPDATE
Case.File    C:\TDIQ305\CY2010_ATRA_Deliverablity_rev8_UDRproxygen_TDI6_ExistingSystem_ENERGYDELIVERY.sav
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Contin.File C:\TDIQ305\Auxiliary files\CY2010_ATRA_A.CON
Exclud.File C:\TDIQ305\Auxiliary files\cy2009-2010contingencies.exc

 Interface-1  Interface     64 TDIQ3            Init.Flow=       576.10 TDF= 1.0000
 Interface-2  Interface     65 AST345           Init.Flow=       985.12 TDF= 1.0000
```

From	To	Transfer Level	FCITC	EXPORT	Interface-1	Interface-2	Flag	LE From	LE To	Ckt	TDF	PreShift	Rating	Contingency
TDIQ305	J_EXP_TDIA	1000.0	-583.4	-4.8	-7.3	401.7		Interface 24 Ontario-Mich			-0.07762	-45.3	0.0	147829 ASTOR345 345 148988 TDIQ305
														Open 147829 ASTOR345 345 148988 TDIQ305
			-581.8	-3.2	-5.7	403.3		Interface 24 Ontario-Mich			-0.07762	-45.2	0.0	SB:AST 345 5 TDIQ305 & Q35M-48
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10
														Open 147829 ASTOR345 345 148988 TDIQ305
			-581.4	-2.8	-5.3	403.7		Interface 24 Ontario-Mich			-0.07762	-45.1	0.0	SB:AST 345 3 TDIQ305 & Q35L-B47
														Open 126274 E13ST 47 345 126277 FARRAGUT
														Open 126274 E13ST 47 345 147829 ASTOR345
														Open 126274 E13ST 47 345 126869 E13 TX16
														Open 126274 E13ST 47 345 126870 E13 TX17
														Open 147829 ASTOR345 345 148988 TDIQ305
			-575.1	3.6	1	410.1		Interface 20 ABC-JK PAR-I			0.55528	319.3	0.0	147829 ASTOR345 345 148988 TDIQ305
														Open 147829 ASTOR345 345 148988 TDIQ305
			-573.4	5.2	2.7	411.7		Interface 20 ABC-JK_PAR-I			0.55527	318.4	0.0	SB:AST 345 5 TDIQ305 & Q35M-48
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10
														Open 147829 ASTOR345 345 148988 TDIQ305
			-573.3	5.3	2.8	411.8		Interface 20 ABC-JK_PAR-I			0.55524	318.3	0.0	SB:AST 345 3 TDIQ305 & Q35L-B47
														Open 126274 E13ST 47 345 126277 FARRAGUT
														Open 126274 E13ST 47 345 147829 ASTOR345
														Open 126274 E13ST 47 345 126869 E13 TX16
														Open 126274 E13ST 47 345 126870 E13 TX17
														Open 147829 ASTOR345 345 148988 TDIQ305
			-364.1	214.5	212	621		126275 E13ST 48 345	147829 ASTOR345 345	1	-1.00000	-985.1	621.0	126274 E13ST 47 345 147829 ASTOR345
														Open 126274 E13ST 47 345 147829 ASTOR345
			-364.1	214.5	212	621		126274 E13ST 47 345	147829 ASTOR345 345	1	-1.00000	-985.1	621.0	126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 147829 ASTOR345
			-364.1	214.5	212	621		126274 E13ST 47 345	147829 ASTOR345 345	1	-1.00000	-985.1	621.0	SB:FARR 345 2W FGT TR4-48-O35M
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10
														Open 126277 FARRAGUT 345 126407 FGT_Y6
														Open 126277 FARRAGUT 345 126411 FGT_X4
			-364.1	214.5	212	621		126274 E13ST 47 345	147829 ASTOR345 345	1	-1.00000	-985.1	621.0	SER:Astoria-E13th-Farragut_Q35M&48_345
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10
			-364.1	214.5	212	621		126274 E13ST 47 345	147829 ASTOR345 345	1	-1.00000	-985.1	621.0	SB:FARR 345 2W
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10
														Open 126277 FARRAGUT 345 126407 FGT_Y6
														Open 126277 FARRAGUT 345 126411 FGT_X4
			-364.1	214.5	212	621		126274 E13ST 47 345	147829 ASTOR345 345	1	-1.00000	-985.1	621.0	SB:FARR_345_3W
														Open 126275 E13ST 48 345 126277 FARRAGUT
														Open 126275 E13ST 48 345 147829 ASTOR345
														Open 126275 E13ST 48 345 126499 T11MPT
														Open 126275 E13ST 48 345 126867 E13 TX10
														Open 126277 FARRAGUT 345 126405 FGT_Y4
														Open 126277 FARRAGUT 345 126413 FGT_X6
			-364.1	214.5	212	621		126274 E13ST 47 345	147829 ASTOR345 345	1	-1.00000	-985.1	621.0	SB:FARR_345_3W FGT TR6-48-Q35M

A.4 Energy Deliverability Capability With Astoria-Rainey 345kV Cable and CE Astoria East PAR

FCITC Single Study

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 PSS(R)MUST  11.0        -- Managing and Utilizing System Transmission --   THU, APR 05 2012   3:59 <FCT109.0>
 2010 NYISO CLASS YEAR ATRA-D REV 3 TDI18-B
 2015 SUMMER PEAK LOAD W/ AST138PAR+AST-RAINEY
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Subsys.File C:\TDIQ305\Auxiliary files\CY2009_CY2010_.sub
Monit.File  C:\TDIQ305\Auxiliary files\CY2009_CY2010_AST138C.MON
Contin.File C:\TDIQ305\Auxiliary files\CY2010_ATRA_A.CON
Exclud.File C:\TDIQ305\Auxiliary files\cy2009-2010contingencies.exc

  Interface-1  Interface    64 TDIQ3          Init.Flow=      158.53 TDF= 1.0000
  Interface-2  Interface    65 AST345         Init.Flow=      986.00 TDF= 1.0000
```

From	To	Transfer Level	FCITC	Interface-1	Interface-2	Flag	LE From	LE To	Ckt	TDF	PreShift	Rating	Contingency
Q305 Q308	J EXP	1000.0	477.2	635.7	1463.2		126274 E13ST 47 345	147829 ASTOR345 345	1	-0.51	-379.6	621.0	126295 RAINEY 345 147829 ASTOR345 345 1 78
													Open 126295 RAINEY 345 147829 ASTOR345 345 1
			492.5	651.1	1478.5		126275 E13ST 48 345	147829 ASTOR345 345	1	-0.49	-380.6	621.0	126295 RAINEY 345 147829 ASTOR345 345 1 78
													Open 126295 RAINEY 345 147829 ASTOR345 345 1
			511.1	669.6	1497.1		126274 E13ST 47 345	147829 ASTOR345 345	1	-0.51	-362.5	621.0	AstoriaSPS RAINEY 967
													Open 126295 RAINEY 345 147829 ASTOR345 345 1
													Remove unit 1 from bus 140909 CHPE305CT1 16.5 35.2 MW
			527.2	685.7	1513.2		126275 E13ST 48 345	147829 ASTOR345 345	1	-0.49	-363.7	621.0	AstoriaSPS RAINEY 967
													Open 126295 RAINEY 345 147829 ASTOR345 345 1
													Remove unit 1 from bus 148989 CHPE305CT1 16.5 35.2 MW
			564.4	722.9	1550.4		126401 RAINEY8W 138	126562 8W DUM 138	1	-0.15	-174.0	256.0	Base Case
			566.3	724.8	1552.3		126401 RAINEY8W 138	126507 VERNON-W 138	1	0.15	173.7	256.0	Base Case
			606.1	764.7	1592.1		126295 RAINEY 345	147829 ASTOR345 345	1	-0.84	-543.3	1050.0	AstSTKBPAR E13 47 965
													Open 126274 E13ST 47 345 147829 ASTOR345 345 1
													Open 147829 ASTOR345 345 148984 ASTORIA 8DUM 138 1
			613.2	771.8	1599.2		126295 RAINEY 345	147829 ASTOR345 345	1	-0.83	-543.4	1050.0	AstSTKBPAR_E13_48 966
													Open 126275 E13ST 48 345 147829 ASTOR345 345 1
													Open 147829 ASTOR345 345 148984 ASTORIA 8DUM 138 1
			675.0	833.5	1661		126481 RAINEY8W 138	126562 8W DUM 138	1	-0.15	-239.9	338.0	SB:Greenwood138_4N 963
													Open 126287 GOWANUS5 345 126429 GOWNUS2T 138 1
													Open 126428 GOWNUS2R 138 126429 GOWNUS2T 138 1
													Open 126428 GOWNUS2R 138 126434 GRENWOOD 138 1
													Remove unit 1 from bus 126257 GOWGT1A 13.8 41.0 MW
													Remove unit 1 from bus 126259 GOWGT1B 13.8 39.7 MW
													Remove unit 1 from bus 126258 GOWGT3A 13.8 42.5 MW
													Remove unit 1 from bus 126289 GOWGT3B 13.8 42.9 MW
													Remove unit 1 from bus 128666 Q261SO_PIER 13.8 64.0 MW
													Remove unit 1 from bus 126308 NARRGT2A 13.8 43.6 MW
													Remove unit 1 from bus 126309 NARRGT2B 13.8 44.3 MW
			676.8	835.4	1662.8		126481 RAINEY8W 138	126507 VERNON-W 138	1	0.15	239.6	338.0	SB:Greenwood138_4N 963
													Open 126287 GOWANUS5 345 126429 GOWNUS2T 138 1
													Open 126428 GOWNUS2R 138 126429 GOWNUS2T 138 1
													Open 126428 GOWNUS2R 138 126434 GRENWOOD 138 1
													Remove unit 1 from bus 126257 GOWGT1A 13.8 41.0 MW
													Remove unit 1 from bus 126259 GOWGT1B 13.8 39.7 MW
													Remove unit 1 from bus 126258 GOWGT3A 13.8 42.5 MW
													Remove unit 1 from bus 126289 GOWGT3B 13.8 42.9 MW
													Remove unit 1 from bus 128666 Q261SO_PIER 13.8 64.0 MW
													Remove unit 1 from bus 126308 NARRGT2A 13.8 43.6 MW
													Remove unit 1 from bus 126309 NARRGT2B 13.8 44.3 MW
			678.4	836.9	1664.4		126481 RAINEY8W 138	126562 8W DUM 138	1	-0.15	-239.4	338.0	SB:Greenwood138_4S 962
													Open 126426 GOWNUS1R 138 126434 GRENWOOD 138 1
													Open 126426 GOWNUS1R 138 126427 GOWNUS1T 138 1
													Open 126286 GOWANUSN 345 126427 GOWNUS1T 138 1
													Remove unit 1 from bus 126271 GOWGT2A 13.8 44.6 MW
													Remove unit 1 from bus 126328 GOWGT2B 13.8 44.3 MW
													Remove unit 1 from bus 126276 GOWGT4A 13.8 40.0 MW
													Remove unit 1 from bus 126329 GOWGT4B 13.8 41.5 MW
													Remove unit 1 from bus 147811 PAGTGOW1 13.8 26.4 MW
													Remove unit 2 from bus 147812 PAGTGOW2 13.8 26.8 MW
													Remove unit 1 from bus 126302 NARRGT1A 13.8 47.1 MW
													Remove unit 1 from bus 126303 NARRGT1B 13.8 44.8 MW

Appendix

B

Oneline Powerflow Diagrams

Oneline Powerflow Diagrams

Oneline Powerflow Diagrams

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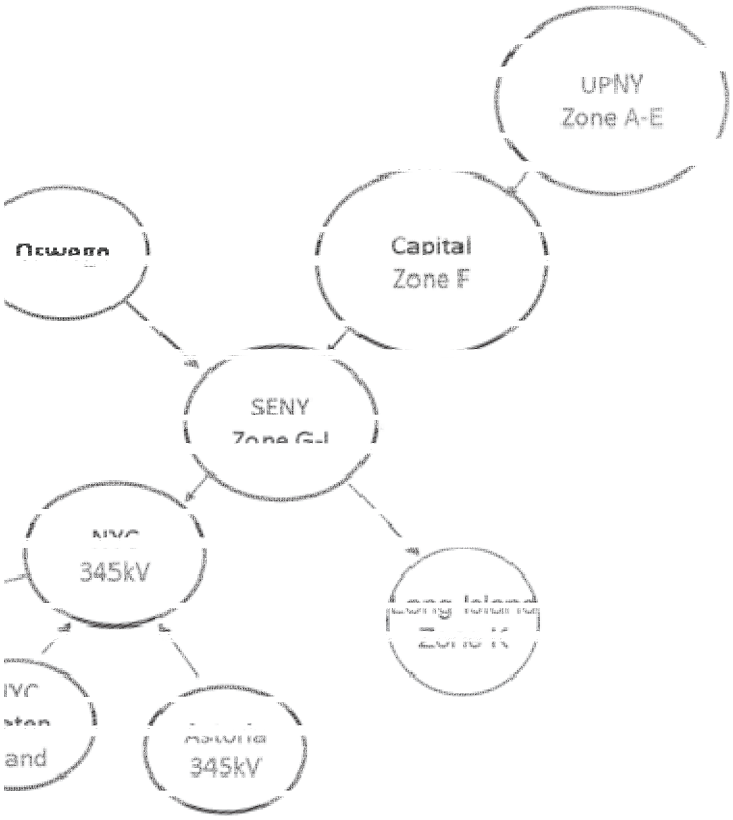
Update to Con Edison's Local Transmission Plan

For Presentation to the Joint
TPAS/ESPWG

February 16, 2012

Implementation of Transmission Solution

- Planning for a permanent solution to be in service prior to summer 2013
  - Work has started
  - Transformer and PAR are at hand from Con Edison spares
- Planning for an interim connection prior to summer 2012
  - Both interim and permanent are being worked on in parallel


UPNY
Zone A-E
Capital
Zone F
SENY
345kV
345kV

Comparison Document for Certificate Condition 133.

133. The Certificate Holders shall ~~pursue the implementation of operation measures and~~ file with the Secretary, no less than sixty (60) days prior to delivery of test energy from the Facility to the Astoria Annex SubstationSubstation~~substation~~ and the Rainey Substation, a report regarding the measures takentaken~~implementation of any Special Protection System or other operational measures (collectively, "Operational Measures") designed~~ to achieve the 1,550 MW deliverability commitment established in Condition 15(a) hereofhereof~~mitigate possible overloads from certain transmission outages~~, as well as copies of all studies, drawings, and backup documentation that support all ~~the design of~~ such measures. The ~~system. In addition, the~~ Certificate Holders shall provide a draft of such report to Con Edison for its review and comment at least thirty days prior to the filing of such report. The measures for achieving the 1,550 MW deliverability commitment specified by the Certificate Holders in that report shall not include a Special Protection System ("SPS") or other operational measures subject to individual approval by NYISO, the New York State Reliability Council or other applicable reliability authorities, unless Con Edison informs the Certificate Holders, no more than twenty five days after receiving Certificate Holders' draft report, that as a result of changed circumstances since the execution of the Stipulation in Commission Case 10-T-0139 on June __, 2012, it disputes Certificate Holders' conclusion that they can achieve 1,550 MW of energy deliverability out of the Astoria Annex Substation and into Con Edison's transmission system. In the event that Con Edison takes the position that Certificate Holders cannot meet the 1,550 MW energy deliverability commitment using such facilities, nothing in this Certificate shall limit Certificate Holders' right to propose to meet this deliverability commitment by using an SPS, other operational measures or

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any other measures, or the right of any party, including Con Edison, to object to the use of such measures. In such circumstances, the Certificate Holders shall include with their report all documentation for the design of any such SPS, other operational measures or other measures, with a complete description of all components and logic

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~~133.~~ diagrams.~~—~~ Prior to delivery of test energy to the Astoria Annex SubstationSubstation~~substation~~, the Certificate Holders shall provide documentation to DPS Staff that any such measuresmeasures~~Operational Measures~~ to be used by the Facility have received all required approvals from all applicable authorities, including without limitation NYISO and ~~-~~NPCC.

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133. The Certificate Holders shall file with the Secretary, no less than sixty (60) days prior to delivery of test energy from the Facility to the Astoria Annex Substation and the Rainey Substation, a report regarding the measures taken to achieve the 1,550 MW deliverability commitment established in Condition 15(a) hereof, as well as copies of all studies, drawings, and backup documentation that support all such measures. The Certificate Holders shall provide a draft of such report to Con Edison for its review and comment at least thirty days prior to the filing of such report. The measures for achieving the 1,550 MW deliverability commitment specified by the Certificate Holders in that report shall not include a Special Protection System ("SPS") or other operational measures subject to individual approval by NYISO, the New York State Reliability Council or other applicable reliability authorities, unless Con Edison informs the Certificate Holders, no more than twenty five days after receiving Certificate Holders' draft report, that as a result of changed circumstances since the execution of the Stipulation in Commission Case 10-T-0139 on June __, 2012, it disputes Certificate Holders' conclusion that they can achieve 1,550 MW of energy deliverability out of the Astoria Annex Substation and into Con Edison's transmission system. In the event that Con Edison takes the position that Certificate Holders cannot meet the 1,550 MW energy deliverability commitment using such facilities, nothing in this Certificate shall limit Certificate Holders' right to propose to meet this deliverability commitment by using an SPS, other operational measures or any other measures, or the right of any party, including Con Edison, to object to the use of such measures. In such circumstances, the Certificate Holders shall include with their report all documentation for the design of any such SPS, other operational measures or other measures, with a complete description of all components and logic

diagrams. Prior to delivery of test energy to the Astoria Annex Substation, the Certificate Holders shall provide documentation to DPS Staff that any such measures to be used by the Facility have received all required approvals from all applicable authorities, including without limitation NYISO and NPCC.

Hearing Exhibit 129

BEFORE THE NEW YORK STATE
PUBLIC SERVICE COMMISSION

In the Matter of Application of Champlain Hudson Power Express, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law for the Construction, Operation and Maintenance of a High Voltage Direct Current Circuit from the Canadian Border to New York City. P.S.C. Case No. 10-T-0139	Before Hon. Kevin J. Casutto Hon. Michelle L. Phillips Administrative Law Judges **STIPULATION ON CONVERTER STATION LOCATION**

WHEREAS, on February 24, 2012, a Joint Proposal of Settlement (the "JP") was filed by Champlain Hudson Power Express, Inc. and CHPE Properties (collectively, "Applicants") with the New York State Public Service Commission (the "Commission") seeking approval to construct and operate a 1,000 MW transmission facility running from Quebec, Canada to New York City (the "Facility"); and

WHEREAS, the Facility consists of a High Voltage Direct Current transmission line from the Canadian border to the property of Consolidated Edison Company of New York, Inc. ("Con Edison") in Astoria, Queens, New York ("Astoria"), a voltage source converter station at Astoria (the "Converter Station"), and a 345 kV Alternating Current line from Astoria to the Con Edison Rainey Substation (the "Astoria-Rainey Cable"); and

WHEREAS, Condition 21 of the Certificate Conditions contained in the JP provides that the Converter Station will be located on approximately five acres of an approximately 21 acre property owned by the Consolidated Edison Company of New York, Inc. ("Con Edison") directly adjacent to the Luyster Creek and commonly known as the "Luyster Creek Property;" and

WHEREAS, on March 16, 2012, Con Edison filed its Comments in Opposition to the JP contending, among other things, that siting the Converter Station on the Luyster Creek Property would interfere with Con Edison's planned development of a new Learning Center on that site to

the detriment of its ratepayers and it therefore opposed Applicants' proposal to locate the Converter Station on the Luyster Creek Property; and

WHEREAS, on June 7, 2012, Con Edison filed the direct testimony of Ms. Candida Canizio in which she explained the basis for Con Edison's objection to the use of its Luyster Creek Property for the Converter Station and the potential benefits to Con Edison and its ratepayers by selling the prime real estate on which the Learning Center is presently located and building a new training facility on the Luyster Creek Property that will better meet its needs: and

WHEREAS, on June 7, 2012, Con Edison filed the Direct Testimony and Exhibits of Mr. Stewart M. Fishbein and Mr. Kenneth H. Drucker, who presented preliminary designs for a new Learning Center to be located on the Luyster Creek Property based on an assessment of Con Edison's needs and site restrictions and who concluded that there is insufficient useable acreage at the Luyster Creek Property to accommodate both the new Learning Center and the Converter Station as presented in the JP (Hearing Exhibit 188, Attachment 7); and

WHEREAS, on June 28, 2012, Applicants filed the Rebuttal Testimony and Exhibits of Mr. Robert F. Fox, in which Mr. Fox modified the preliminary design of the new Learning Center in a way that continues to meet Con Edison's needs, moved the location of the Converter Station to the edge of the Luyster Creek Property and substantially reduced the footprint of the Converter Station (Hearing Exhibit 147), so as to allow both facilities to occupy the Luyster Creek Property; and

WHEREAS, also on June 28, 2012, Con Edison filed the Rebuttal Testimony and Exhibits of Mr. Stewart M. Fishbein and Mr. Kenneth H. Drucker; and

WHEREAS, the location and dimensions of the Converter Station on the Luyster Creek Property proposed by Mr. Fox in his Rebuttal Testimony are shown in the survey map of the Luyster Creek Property attached to this Stipulation as Hearing Exhibit 130 and the boundaries of which are depicted by a dark green line; and

WHEREAS, in Hearing Exhibit 130, Applicants' Converter Station and related facilities are located entirely on the property designated in that Exhibit as Subdivision Parcel A and consisting of approximately 4.5 acres ("Subdivision Parcel A") (the layout of the Converter Station within Subdivision Parcel A is for illustrative purposes only); and

WHEREAS, Applicants and Con Edison agree that the Luyster Creek Property can accommodate both the new Learning Center and Applicants' Converter Station, ring bus and related facilities only if Applicants' facilities are located entirely on and within Subdivision Parcel A: and

WHEREAS, the undersigned parties wish to resolve the issues surrounding the location of Applicants' Converter Station, ring bus and related facilities in an amicable manner; and

IT IS HEREBY STIPULATED AND AGREED that footnote 1 to Condition 1 of the Certificate Conditions proposed in the Joint Proposal filed in this proceeding on February 24, 2012 (the "Certificate Conditions") shall be deleted in its entirety; and

IT IS FURTHER STIPULATED AND AGREED that Condition 21 of the Certificate Conditions shall be deleted in its entirety and replaced with the following new Certificate Condition 21:

> "21. The Converter Station shall be located entirely on and within Subdivision Parcel A as shown on Hearing Exhibit 130 along Luyster Creek in the Astoria neighborhood of the borough of Queens ("Subdivision Parcel A"), a copy of which is annexed to these Certificate Conditions. The Certificate Holders shall be responsible for the cost of protecting or relocating any utility infrastructure during or as a result of construction activity by them in Subdivision Parcel A. The Certificate Holders may not use, occupy or take (by condemnation or otherwise) any other real property owned or occupied by Con Edison at Astoria for the Converter Station, a ring bus and related facilities that are required to complete the Facility without Con Edison's prior written consent."; and

IT IS FURTHER STIPULATED AND AGREED that Condition 22(f) of the Certificate Conditions shall be deleted in its entirety and replaced with the following new Certificate Condition 22(f):

> "(f) If Con Edison moves forward with its recently announced plan to interconnect a PAR to NYPA's 345 kV Astoria GIS Substation, the Converter Station may also include a four-breaker 345 kV GIS ring bus, which ring bus, if owned and operated by Applicants, shall be located entirely on Subdivision Parcel A and shall be interconnected at 345 kV to the Astoria-Rainey Cable, NYPA's Astoria GIS Substation and the Converter Station as described in Hearing Exhibit 125 to the Joint Proposal."; and

IT IS FURTHER STIPULATED AND AGREED that under no circumstances will Applicants seek any additional lands owned or occupied by Con Edison at Astoria for the location of the Converter Station, a ring bus and related facilities to be owned and operated by Applicants as part of the Facility without Con Edison's prior written consent, it being understood that such other properties are required by Con Edison for other purposes; and

IT IS FURTHER STIPULATED AND AGREED that, after filing by the Applicants of this Stipulation with the Commission, Con Edison shall refrain from cross-examination of any of Applicants' witnesses in this proceeding; and

IT IS FURTHER STIPULATED AND AGREED that Applicants shall refrain from cross-examination of any of Con Edison's witnesses in this proceeding; and

IT IS FURTHER STIPULATED AND AGREED that, after filing by the Applicants of this Stipulation with the Commission, the undersigned shall file statements supporting Commission acceptance or approval of this Stipulation; and

IT IS FURTHER STIPULATED AND AGREED that, in light of the agreement set out herein, there is no need for the Commission to review Con Edison's future plans with respect to the construction of a new Learning Center on the remainder of the Luyster Creek Property at this time; and

IT IS FURTHER STIPULATED AND AGREED that this Stipulation shall have no effect on any other provision of the JP or the proposed Certificate Conditions; and

IT IS FURTHER STIPULATED AND AGREED that Applicants shall file an Amended and Restated Certificate Conditions conforming with the agreements and stipulations entered into with Con Edison: and

IT IS FURTHER STIPULATED AND AGREED that this Stipulation resolves Con Edison's only remaining objection to the JP and, as a result, upon satisfaction of the immediately preceding stipulation, Con Edison will drop all of its objections to the JP and to the issuance to Applicants of a certificate of environmental compatibility and public need for the construction of the Facility on the terms agreed to herein and in the other agreements and Stipulations between Con Edison and Applicants.

This Stipulation may be executed in counterparts, all of which shall collectively constitute a single agreement.

Hearing Exhibit 129

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Dated: July 11, 2012

BEFORE THE
PUBLIC SERVICE COMMISSION
STATE OF NEW YORK

Application of Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law for the Construction, Operation and Maintenance of a High-Voltage Direct Current Circuit from the Canadian Border to New York City	)	Case No. 10-T-0139

STIPULATION EXTENDING TIME FOR SUBMISSION OF TRUST AGREEMENT

WHEREAS, on February 24, 2012, a Joint Proposal of Settlement (the "JP") was filed with the New York State Public Service Commission by the Signatory Parties thereto (the "Signatory Parties"); and

WHEREAS, the following Signatory Parties have authorized Champlain Hudson Power Express, Inc. and CHPE Properties (collectively, the "Applicants") to state that they join with Applicants in supporting this Stipulation: the Staff of the New York State Department of Public Service ("DPS Staff"); the New York State Department of Environmental Conservation ("NYSDEC"), the New York State Department of State ("NYSDOS"), the New York State Office of Parks, Recreation and Historic Preservation ("NYSOPRHP"), the City of New York, New York ("New York City"), the New York State Council of Trout Unlimited ("Trout Unlimited"), Riverkeeper, Inc. ("Riverkeeper"), and Scenic Hudson, Inc. ("Scenic Hudson").

WHEREAS, the JP seeks approval for Applicants to construct and operate a 1,000 MW High Voltage, Direct Current transmission facility running from Quebec, Canada to New York City (the "Facility"), portions of which are to be located in the waters of Lake Champlain and the Hudson, Harlem and East Rivers; and

WHEREAS, Appendix C to the JP contains the Proposed Certificate Conditions that will govern construction and operation of the Facilities (the "Certificate Conditions"); and

WHEREAS, Section U of the Certificate Conditions provides for the establishment of the Hudson River and Lake Champlain Habitat Enhancement, Restoration and Research/Habitat Improvement Project Trust (the "Trust"), which is established solely for the purposes of protecting, restoring, and improving aquatic habitats and fisheries resources in the Hudson River

Estuary, the Harlem and East Rivers, Lake Champlain and their tributaries, in order to minimize, mitigate, study and/or compensate for the short-term adverse aquatic impacts and potential long-term aquatic impacts and risks to these water bodies from Facility construction and operation and for the administration of the Trust to the extent expressly authorized therein; and

WHEREAS, hearings on the JP were conducted on July 18 to 20, 2012, and initial and reply post-hearing briefs were filed on August 22 and September 7, 2012, respectively; and

WHEREAS, none of the parties opposing the JP raised any factual, legal or policy issues with respect to the provisions of Section U of the Certificate Conditions or with respect to the scope or purposes of the Trust generally in either their testimony or briefs in this proceeding; and

WHEREAS, Section U of the Certificate Conditions further requires Applicants to submit an agreement providing for the establishment of the Trust (the "Trust Agreement") within sixty (60) days after Applicants' receipt of the Certificate; and

WHEREAS, Section U of the Certificate Conditions also obligates Applicants to provide a total of $ 117 million in funding for the Trust as specified therein, with the first payment of $ 2.5 million due thirty (30) days after the closing of Applicants' financing for construction of the Facility (the "Closing"); and

WHEREAS, Condition 165(c) of the Certificate provides for the establishment within thirty (30) days of the Closing of a Governance Committee consisting of Applicants, DPS Staff, NYSDEC, NYSDOS, New York City, the New York State Adirondack Park Agency, NYSOPRHP; Trout Unlimited, Riverkeeper, and Scenic Hudson (the "Governance Committee"); and

WHEREAS, the parties designated in Certificate Condition 165(c) as members of the Governance Committee have met to discuss the form of the Trust Agreement and the Governance Agreement and are exploring the possibility of retaining an administrator to assist the Governance Committee in the performance of its duties under the Trust Agreement (the "Trust Administrator") as authorized by Section U of the Certificate Conditions; and

WHEREAS, the parties designated as members of the Governance Committee believe that additional time will be required to select a Trust Administrator and to prepare a Trust Agreement in a form acceptable to that Trust Administrator; and

WHEREAS, Applicants anticipate that the Closing will not occur prior to the fourth quarter of 2013;

IT IS HEREBY STIPULATED AND AGREED, that Section 165(a) of the Certificate Conditions shall be revised as follows:

> (a) Certificate Holders shall file an agreement providing for the establishment of the Trust (the "Trust Agreement") within ~~sixty (60)~~ one hundred and twenty (120) days after issuance of this Certificate. The trustee selected by Certificate Holders to oversee the Trust (the "Trustee") shall be, or shall be associated with, a bank accredited by doing business in the State of New York. Both the Trust Agreement and the selection of the Trustee shall be subject to review and approval by the Commission (in consultation with NYSDEC) and, if required, the New York State Comptroller, and Attorney General.

IT IS HEREBY FURTHER STIPULATED AND AGREED, that this increase in the time available to prepare the Trust Agreement is in the public interest and should be accepted by the Commission in order to give the parties designated as members of the Governance Committee the additional time required to select a Trust Administrator for the Trust and to prepare a Trust Agreement in a form acceptable to that Trust Administrator, while still leaving ample time for the Commission to review and approve the Trust Agreement prior to the funding of the Trust.

Respectfully submitted,

/s/ George M. Pond

George M. Pond
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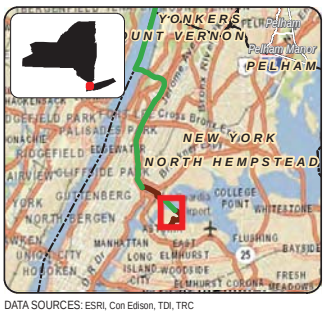
(518) 429-4200

Attorneys for Champlain Hudson Power Express, Inc. and CHPE Properties, Inc.

Dated: October 19, 2012



LEGEND

- 111.8 Milepost
- Terrestrial Route
- Submarine Route
- Proposed HDD Location
- Deviation Zone
- Astoria Converter Station Limits
- Town Boundary
- Village

TOWN NAME Road Name *Village Name*

Transmission Developers Inc.

Champlain Hudson Power Express Project

Champlain Hudson Power Express Inc.

Deviation Zone

Queens, NY

Prepared By: HDR | DTA & TRC 5/18/2012

DATA SOURCES: ESRI, Con Edison, TDI, TRC

Case No. 10-T-0139

Appendix A to the Joint Proposal

JP EXHIBIT LIST

Exhibit 1: General Information Regarding Application (Exhibit 1 to the Application)

Exhibit 2: Location of Facilities (Exhibit 2 to the Application)

Exhibit 3: Alternatives Analysis (Exhibit 3 to the Application)

Exhibit 4: Environmental Impacts (Exhibit 4 to the Application)

Exhibit 5: Design Drawings (Exhibit 5 to the Application)

Exhibit 6: Local Economic Effects (Exhibit 6 to the Application)

Exhibit 7: Local Ordinance Review (Exhibit 7 to the Application)

Exhibit 8: Other Pending Filings (Exhibit 8 to the Application)

Exhibit 9: Cost of Proposed Facilities (Exhibit 9 to the Application)

Exhibit 10: Description of Proposed Transmission Lines (Exhibit E-1 to the Application)

Exhibit 11: Other Facilities (Exhibit E-2 to the Application)

Exhibit 12: Underground Construction (Exhibit E-3 to the Application)

Exhibit 13: Engineering Justification (Exhibit E-4 to the Application)

Exhibit 14: Effects on Communication (Exhibit E-5 to the Application)

Exhibit 15: Effect on Transportation (Exhibit E-6 to the Application)

Exhibit 16: Agency Consultation (Appendix B to the Application)

Exhibit 17: Wetland Delineation Report (Appendix C to the Application)

Exhibit 18: Historic Sediment Sampling Location (Appendix D to the Application)

Exhibit 19**: Historic and Archeological Resource Mapping and Tables (Appendix E to the Application)

Exhibit 20: LEI Projected Energy Market and Emissions Impact Analysis Report (Appendix F to the Application)

Exhibit 21: Nexans Cable System Study Report (Appendix G to the Application)

Exhibit 22: Electric and Magnetic Fields Report (Appendix H to the Application)

Exhibit 23: Appendix A: Data Gaps and Deficiencies (Appendix A to the Supplement filed on July 29, 2010)

Exhibit 24: Appendix B: Requests for Additional Information (Appendix B to the Supplement)

Exhibit 25: Appendix C: Response to NYSDEC Comments (Appendix C to the Supplement)

Exhibit 26: Appendix D: Revised Project Description / Updated Facility Description and Resources (Appendix D to the Supplement)

Exhibit 27: Projected Energy Market, Capacity Market and Emissions Impact Analysis of the Champlain-Hudson Power Express Transmission Project for New York (Attachment A to the Supplement)

Exhibit 28: Revised Wetland Delineation Report (Attachment B to the Supplement)

Exhibit 29: Visual Assessment Report (Attachment C to the Supplement)

Exhibit 30: Noise Assessment Report (Attachment D to the Supplement)

Exhibit 31: Marine Survey Report (Attachment E to the Supplement)

Exhibit 32: Updated Ecological Mapping (Attachment F of the Supplement)

Exhibit 33: Threatened and Endangered Species Consultations (Attachment G of the Supplement)

Exhibit 34: Updated Design Drawings (Attachment H of the Supplement)

Exhibit 35: Revision of Exhibit 7 Local Ordinance Review (Attachment I of the Supplement)

Exhibit 36: Exhibit 9: Cost of Proposed Facility Supplemental (Attachment J of the Supplement)

Exhibit 37: Revision of Exhibit E-2 Other Facilities (Attachment K of the Supplement)

Exhibit 38**: Draft SRIS Report (Attachment L of the Supplement)

Exhibit 39: Revised Electric and Magnetic Fields Report (Attachment M of the Supplement)

Exhibit 40: Certificates of Service (Attachment N of the Supplement)

Exhibit 41: HVDC Classic Reference List (Attachment O of the Supplement)

Exhibit 42: Aquatic Sampling and Analysis Plan (Attachment P of the Supplement)

Exhibit 43: Supplemental Alternatives Analysis (Attachment Q of the Supplement)

Exhibit 44: List of Recreational Trails and Public Recreational Areas along Underwater Transmission Cable Route (Attachment R of the Supplement)

Exhibit 45: FOIL Letters sent to Public Drinking Water Systems (Attachment S of the Supplement)

Exhibit 46: Estimate Tax Impacts (Rough Estimates Only) (Attachment T of the Supplement)

Exhibit 47: Flood Insurance Maps (Attachment U of the Supplement)

Exhibit 48: State, County, and Municipal Land Use Plans, Comprehensive Plans and Master Plans; Local Laws, Codes, and Zoning Ordinances (Attachment V of the Supplement)

Exhibit 49: Replacement Maps (Attachment W of the Supplement)

Exhibit 50**: Feasibility Study Report (NYISO Queue #305) (Attachment X of the Supplement)

Exhibit 51: Consultations with Transportation Agencies (Attachment Y of the Supplement)

Exhibit 52: Public Notices (Attachment Z of the Supplement)

Exhibit 53: Public Information Plan (Attachment AA of the Supplement)

Exhibit 54: Filing with Federal Energy Regulatory Commission (Attachment AB of the Supplement)

Exhibit 55: National and State Heritage Areas, State Heritage Trails (Attachment AC of the Supplement)

Exhibit 56: Letter to Commission, dated August 6, 2010

Exhibit 57: Design Drawings (Attachment A to August 6, 2010 letter)

Exhibit 58: Updated Exhibit 7 (Attachment B to August 6, 2010 letter)

Exhibit 59: Letter to Commission, dated August 11, 2010

Exhibit 60: Design Drawings (Attachment to August 11, 2010 letter)

Exhibit 61: Response to Visual Assessment Information Needs Request (Attachment to August 11, 2010 letter)

Exhibit 62: Certificates of Service (Attachment to August 11, 2010 letter)

Exhibit 63: DPS-1 through DPS-190[1]

Exhibit 64: NYSDEC-1 through NYSDEC-6

Exhibit 65: APA-1 through APA-9

Exhibit 66: CHG-1 through CHG-17

Exhibit 67: COW-1 through COW-6

Exhibit 68: Entergy-1 through Entergy-2

Exhibit 69: IBEW-1 through IBEW-11

Exhibit 70: IPPNY-1 through IPPNY-39[2]

Exhibit 71: NYPA-1 through NYPA-12

Exhibit 72: NYSTA/CC-1 through NYSTA/CC-9

Exhibit 73: OPRHP-1 through OPRHP-3

Exhibit 74: RVK-1 through RVK-12

Exhibit 75: ADKC-1 and ADKC-2

Exhibit 76: APA Informal-1 through APA Informal-2

Exhibit 77: NYSDEC Informal-1

Exhibit 78: DOS Informal

[1] DPS-130 does not exist.
[2] IPPNY 36-39 do not include responses.

Exhibit 79: NYSDOT Informal-1 through NYSDOT Informal-5

Exhibit 80: RVK Informal-1

Exhibit 81: Informal IRs received verbally during the Settlement Conferences (Informal -1 through Informal-5)[3]

Exhibit 82: DPS Informal-1 through DPS Informal-23[4]

Exhibit 83: COY-1 through COY-14

Exhibit 84: Lake Champlain Water Quality Modeling (October, 2010)

Exhibit 85: Hudson, Harlem and East River Water Quality Modeling (October, 2010)

Exhibit 86: Champlain Hudson Power Express Project – Updated Alternatives Analysis (submitted on November 5, 2010)

Exhibit 87: Applicants' Letter to New York State Department of State regarding Updated Alternatives Analysis (January 18, 2011)

Exhibit 88 LEI Memo on the Results of the 2018 Test Year Modeling Analysis (distributed January 24, 2011)

Exhibit 89: Technical Review Report by ESS, submitted by Riverkeeper, Inc. and Scenic Hudson (January 21, 2011)

Exhibit 90: Revised Lake Champlain Water Quality Report with Shear Plow (January, 2011)

Exhibit 91: Letter to New York State Department of State (dated February 4, 2011)

Exhibit 92: Letter to New York State Department of State (dated February 18, 2011)

Exhibit 93: Harlem Rail Yard Layout Map (submitted on February 23, 2011)

Exhibit 94: Cultural Resources Analysis of Underwater Remote Sensing Data for Champlain Hudson Power Express dated February 22, 2011 and Revised Cultural Analysis Report dated August 09, 2011

Exhibit 95: Typical Construction Spreads along Route 22 (submitted on February 23, 2011)

Exhibit 96: Ballston Spa Alternative (submitted on February 23, 2011)

[3] Informal-4 does not exist.
[4] DPS Informal-16 does not exist.

Exhibit 97: Routing Map for Erie Boulevard, City of Schenectady (submitted on February 24, 2011)

Exhibit 98: Route Reconfiguration in Lake Champlain: Environmental Impacts (submitted on (February 28, 2011)

Exhibit 99: Certificate of Service on Additional Municipalities (submitted on March 4, 2011)

Exhibit 100: Applicants' Letter to New York State Department of State, dated March 18, 2011

Exhibit 101: Applicants' Response to New York State Department of Public Service review of ESS Report (submitted on 4/15/2011).

Exhibit 102: Description of Protected Areas within Hudson River (submitted April 29, 2011)

Exhibit 103 Memorandum from Exponent Inc on Effect of Bolt-on Split Pipe on DC Magnetic Field Levels, dated March 15, 2011

Exhibit 104: Meeting notes for meeting with Energy Subcommittee of the Harbor Operations Safety and Navigation Committee held on March 16, 2011 (submitted on March 28, 2011)

Exhibit 105: Upland Deviation Zone Report (submitted on May 20, 2011)

Exhibit 106: Fidelity Title Review (submitted on May 3, 2011)

Exhibit 107: Revised Noise Assessment Report (June 2011)

Exhibit 108: Comparative Analysis of Converter Station Sites (Yonkers, Astoria and Harlem River Yard Sites) (submitted on April 20, 2011, revised on February 6, 2012)

Exhibit 109: Karner Blue Butterfly (*Lycaeides Melissa samuelis*) Impact Avoidance and Minimization Report (submitted on June 17, 2011) and *confidential maps.* **

Exhibit 110: Amendment to Visual Assessment Report: Projected Converter Station in Astoria, NY. (June 16, 2011)

Exhibit 111: Revised Construction Cost of the Project (submitted on April 29, 2011)

Exhibit 112: CHPEI- 1 through CHPEI-14

Exhibit 113: IBEW Informal-1

Exhibit 114: CECONY-1 through CECONY-22, CECONY Informal-1 and 2, and CECONY to NYPA-1[5]

Exhibit 115: Revised and Updated Exhibit 7 to the Application (submitted on July 14, 2011), along with all local laws cited therein

Exhibit 116: Revised Electric and Magnetic Fields Report (July 2011)

Exhibit 117: List of cooling equipment at locations along the ROW

Exhibit 118: Lake Champlain Burial Depth Update (submitted October 26, 2011)

Exhibit 119: Revised Electric and Magnetic Fields Report for HVAC Cable

Exhibit 120: Revised Alternatives Analysis for Astoria-Rainey Cable (Revised February 7, 2012)

Exhibit 121: Revised Environmental Impacts assessment (February 7, 2012)

Exhibit 122: Report to the Parties regarding cable types (February 9, 2012)

Exhibit 123: Siemens PTI – TDI's Merchant CHPEI Transmission Project with POI at Astoria (NYISO Queue # 305 Deliverability Analysis)

Exhibit 124: Independent Study to Establish Parameters of the ICAP Demand Curve for the New York Independent System Operator, September 3, 2010, Revised September 7, 2010 and November 15, 2010.

Exhibit 125: Applicants' Report to Parties regarding Con Edison's Proposed Local Transmission Plan (February 14, 2012)

Appendix B: Description of the Facilities and Maps
Appendix C: Proposed Certificate Conditions and Monitoring Reports
Appendix D: Water Quality Certification
Appendix E: EM&CP Guidelines
Appendix F: Best Management Practices

**Confidential Document – Document was only filed with the ALJs.

[5] CECONY 20-22, and CECONY Informal 1 and 2 do not include responses.

Case 10-T-0139: Joint Proposal, Appendix B

Please note that Appendix B consists of a narrative description of the Project Facilities (3 pages) and maps depicting the Facilities. The maps are numerous, consisting of 33 Submarine Route map sheets, 568 Terrestrial Route map sheets, Route Maps 250k, consisting of 4 sheets; and Route Maps 24k, consisting of 40 sheets; a total of 645 map sheets.

A copy of the narrative description of the Project Facilities is attached to this Order. Due to the large number of map sheets, the Appendix B maps are not attached to this Order. The Appendix B maps are available electronically on the Commission's web page for this case. From the Department's home page (www.dps.ny.gov) navigate to Search, then type in the case number of 10-T-0139 and click search by case number. Filter the "Document Type" by "Joint Proposals and Stipulations." All documents for Appendix B are listed on the last two pages.

Upon request to the Secretary, copies of the maps will be provided, pursuant to Public Officers Law, Article 6, Freedom of Information Law, for a minimal fee equal to the cost of reproduction or copying. If you wish to access a record or records under FOIL, you must make your request in writing. Be as specific as possible when describing the record(s) you are requesting so we can provide you the desired records as quickly and efficiently as possible. The form is attached. You may send a completed copy via any of the following methods.

Mail to:
Records Access Officer
NYS Department of Public Service
Three Empire State Plaza
Albany, New York 12223

E-mail to: recordsaccessofficer@dps.ny.gov

Fax to: 518-486-5710

Case 10-T-0139

Appendix B to Joint Proposal

Project Description

The transmission system is comprised of two solid state (no fluids) high voltage direct current ("HVDC") electric cables, each approximately 6 inches in diameter, extending entirely within New York State from the International border to a converter station in Astoria, in the borough of Queens, New York City, New York. The transmission cables will be buried underwater or underground along the entire Project route, except where the cables are installed within conduits attached to existing bridge structures at locations including the Hudson River channel at Fort Edward, the Mohawk River, and Catskill Creek. From the converter station, high voltage alternating current cables ("HVAC") will be connected to a New York Power Authority ("NYPA") substation.

The Project originates at the International border between the United States and Canada and continues south within Lake Champlain for approximately 101.5 miles in waters of the state of New York. The cables will be located to the east of Rouses Point, Point au Fer, Chazy Landing, Point Au Roche and Cumberland Head, east of Valcour Island and the Four Brothers islands, and then run towards the New York – Vermont border near the middle of the lake. From Split Rock Point south the cables would be located closer to the New York shoreline. At Crown Point, the installation technology would shift from jet plow to shear plow. Proceeding southward, the waters of the lake become shallower, and the cables route is closer to the NY-Vermont border near the middle of the narrow water body.

In the town of Dresden, Washington County, New York, the transmission cables will transition from the water to the land via a horizontal directional drill ("HDD"). The cables cross submerged private lands, and then will transition from under Lake Champlain to upland within private property and land owned by the Delaware and Hudson Railway (D&H) and then enter the right-of-way ("ROW") of New York State Route 22. The cables would continue south within the Route 22 ROW until route mile ("RM") 111.9, except for a crossing of South Bay at RM 109.7. The cable route continues on Route 22 into the Village of Whitehall and then enters the Canadian- Pacific Railway ("CP") ROW on lands owned by the D&H within the Village of Whitehall. The transmission cables remain primarily within the CP ROW and lands owned by the D&H for approximately 65.1 miles, crossing the Washington County municipalities of Whitehall, Fort Ann, Hartford, Kingsbury, Fort Edward Town and Village; the Saratoga County municipalities of Moreau, Northumberland, Wilton, Greenfield, City of Saratoga Springs, Malta, Milton, Ballston, and Clifton Park; Schenectady County municipalities of Glenville, Rotterdam and the City of Schenectady. The transmission system has relatively minor deviations out of the CP ROW onto private and public lands for various engineering constraints, such as a narrow section of ROW, buildings, railroad developments, and sensitive habitat areas. In Schenectady, the proposed route leaves the CP ROW at RM 173 to be laid within Erie Boulevard to bypass a section of railroad bridges. The transmission cables re-enter the CP ROW around RM 173.6 but exits again at RM 173.7 to utilize largely vacant land to pass beneath Route I-890. The cables reenter the CP ROW at RM 174.3 and continue to the Town of Rotterdam.

Around RM 177 in Rotterdam, the cables transfer from the CP to the CSX Railroad ("CSX") ROW. The transmission system will be located within the CSX ROW southeasterly for approximately 22 miles through the Albany County municipalities of Guilderland, New Scotland, Village of Voorheesville, Bethlehem and Coeymans. At RM 199, the cables shift to a CSX ROW that runs south parallel to the Hudson River and the cables will be located within the Town of Coeymans and the Village of Ravena, and the Greene County municipalities of New Baltimore, Town and Village of Coxsackie, Town of Athens, and the Town and Village of Catskill. There are relatively minor deviations from the CSX ROW to accommodate features such as bridges, roadway crossings, and areas where the existing ROW is too narrow to permit cable installation while meeting established railroad clearance criteria.

In the Town of Catskill north of the hamlet of Cementon, the transmission cable route exits the CSX ROW at around RM 227.5 and turns easterly to follow Alpha Road, which terminates at a landing area at RM 228.2. At this point the cables will transition into the Hudson River via a HDD. The transmission cable will be located within the Hudson River south from Cementon for approximately 67 miles. The route is located so as avoid known sensitive habitat, potential cultural resources, contamination zones and navigation hazards to the extent achievable.

At RM 295.7, the cables transition from the Hudson River via a HDD and enter a CSX ROW in the Rockland County Town of Stony Point. The transmission cable follows the CSX route and public road ROW for a 7.7 mile long bypass of Haverstraw Bay, which has been identified as one of the most sensitive significant coastal habitats within the Hudson River. The route travels through the Town of Haverstraw, Village of West Haverstraw and Village of Haverstraw generally within the CSX ROW, although there are deviations to avoid infrastructure such as bridges and roadways. Around RM 300.8, the CSX ROW is bordered on the east and then on both sides by Haverstraw Beach State Park. At RM 301.4, an HDD is established to install the cables under Rockland Lake State Park and Hook Mountain State Park (comprising portions of Palisades Interstate Park) to enter the ROW of NYS Route 9W in the Town of Clarkstown. From RM 301.8 to 302.4, the cables will be located within the Route 9W ROW. At this point, another HDD will install the cables beneath the two parks and transition into Hudson River.

From RM 302.8 southerly of Haverstraw Bay, for approximately 20.7 miles the cables will be located within the New York State portion of the Hudson River. As with the other in-river segment, the routing has been set so as to avoid sensitive resources. The cable will then turn easterly and enter Spuyten Duyvill Creek and the Harlem River within the borough of Manhattan in New York City. The cable route will be located within the Harlem River for 6.58 miles, and then transition to upland via an HDD to enter a CSX ROW in the borough of the Bronx. The cables on and along CSX ROW will cross lands of NYSDOT, cross beneath the Robert F. Kennedy Bridge and the Hell Gate railroad bridge and then transition via an HDD to cross beneath the East River. The cables will transition to upland in the borough of Queens in New York City, and proceed easterly to the Luyster Creek converter station site in Astoria, north of 20th Avenue on lands of Consolidated Edison.

The converter station will be a "compact type" with a total footprint (i.e., building and associated equipment) of approximately 5 acres. Gas insulated HVAC cables will connect the converter station to NYPA's Astoria Annex 345 kV substation. If Con Edison proceeds with its recently announced plans to connect a phase angle regulating transformer ("PAR") to the Astoria Annex

substation, Certificate Holders will construct a four-breaker gas-insulated ring bus in a building to be located on the same parcel as the converter station, unless a preferable location for this ring bus can be found closer to the Astoria Annex.

From the Astoria Annex substation, another set of HVAC cables will be located within the streets of New York City for approximately three miles to the Rainey Substation. The cable will run north parallel along 20th Avenue before crossing 20th Avenue southwesterly onto 29th Street. The cable route would continue within 29th Street for one city block before turning to the northwest onto 21st Avenue and continuing within 21st Avenue until 23rd Street. The cable route will turn onto 23rd Street and continue southerly, including crossing under the Triborough Bridge, until 30th Drive. The cable route will then turn westerly on to 30th Drive and then southerly within 14th Street. The cable route would turn to the west onto 31st Drive for one city block before turning to the south onto 12th Street. The cable route would turn west onto 35th Avenue and continue to the Rainey Substation.

STATE OF NEW YORK
DEPARTMENT OF PUBLIC SERVICE
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NEW YORK STATE PUBLIC SERVICE COMMISSION
401 WATER QUALITY CERTIFICATION

Pursuant to: Section 401 of the Federal Water Pollution Control Act, 33 U.S.C. § 1341, and Article VII of the New York Public Service Law

Certification Issued to: Champlain Hudson Power Express, Inc.
CHPE Properties, Inc.
Pieter Schuyler Bldg.
600 Broadway
Albany, New York 12207

Location of Facility

Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. (collectively, "CHPE") proposes to construct, operate, and maintain a new 1,000 megawatt ("MW") high-voltage direct current ("HVDC") underwater/underground electric transmission facility ("HVDC Transmission System"). The HVDC Transmission System will interconnect with the transmission system of Hydro Quebec and will run from the Canadian border east of the Town of Champlain, New York to Astoria, Queens, New York ("Astoria"). The approximately three hundred thirty two (332) mile HVDC Transmission System will connect with an HVDC converter station at Astoria to be owned by CHPE. From the converter station will be connected by an underground 345 kV HVAC circuit to a gas insulated switchgear substation owned or to be owned by the New York Power Authority on property owned by the Consolidated Edison Company of New York, Inc. at Astoria. A 345 kV HVAC circuit will extend from the GIS Substation to Con Edison's 345 kV Rainey Substation located on the corner of 36th Avenue and Vernon Boulevard in Queens, New York (the "Astoria-Rainey Cable"). The HVDC Transmission System and the Astoria-Rainey Cable are referred to collectively herein as the "Facility." The details and justification for the Facility are contained in the administrative record in Case 10-T-0139.

Facility Description

The record in the proceeding on CHPE's application, as supplemented, for a Certificate of Environmental Compatibility and Public Need under Article VII of the New York Public Service Law ("PSL") has fulfilled the requirements necessary to determine whether the Facility will qualify for issuance of a Water Quality Certification ("Certification") pursuant to § 401 of the Clean Water Act (33 U.S.C. §§ 1251-1387). The Facility cables will be located primarily underwater within the lake- and riverbeds of New York waterways, including Lake Champlain and the Hudson, Harlem and East Rivers, with some segments of the Facility route being sited overland. Overland Facility segments will consist primarily of cable installations buried along: (a) existing railroad rights-of-way; and (b) existing roadway rights-of-way. In addition, to cross the Hudson

River at Fort Edward, the Mohawk River at Schenectady and Catskill Creek, the cables will be located in conduits to be attached to existing railroad bridge structures.

For the overland segments of the Facility, the cables will be buried via excavated trenches or Horizontal Directional Drilling ("HDD") methods. For underwater cable installation, the primary methods for installation will be jet plowing and/or shear plowing. Underwater cable installation techniques will vary based on a number of factors, including, but not limited to, sediment type, bathymetry, and existing infrastructure crossings.

Where the overland segments of the Facility route encounter streams and/or wetlands, the following methods may be used to minimize impacts: (a) flume crossing; (b) dam and pump; (c) HDD or Jack and Bore ("J&B"); and (d) open cut. The waterbody crossing methods are further described in the Facility's Best Management Practices documentation, which is used in the preparation of the Environmental Management and Construction Plan ("EM&CP"). Adherence to the EM&CP, required to be filed for approval by the New York State Public Service Commission ("Commission") as a condition of the Public Service Law Article VII Certificate of Environmental Compatibility and Public Need ("Article VII Certificate") in Case 10-T-0139, will serve to protect these resources.

Construction of the Facility will be in accordance with the Article VII Certificate and approved EM&CP.

Certification

The Commission hereby certifies, pursuant to § 401 of the Clean Water Act (33 U.S.C. § 1341(a)(1)) and Article VII of the PSL, that the Facility, as conditioned herein, complies with applicable requirements of §§ 301, 302, 303, 306 and 307 of the Clean Water Act as amended, and applicable New York State water quality standards, limitations, criteria, and other requirements set forth in 6 NYCRR § 608.9(a) and Parts 701 through 704, provided that all of the conditions listed herein are met. This Certification is issued in conjunction with the Article VII Certificate sought by CHPE in, and based on the record of, Case 10-T-0139.

Conditions

1. No in-water work shall commence until all pre-construction conditions related to such work contained in the Article VII Certificate and any Order approving the EM&CP for each affected Segment EM&CP have been met to the satisfaction of the New York State Department of Public Service ("DPS").

2. Construction and operation of the Facility shall at all times be in conformance with: (a) the Application (as amended and supplemented) and Joint Proposal of Settlement filed in Case 10-T-0139 to the degree not superseded by the Article VII Certificate, (b) all conditions of approval contained in the Article VII

Certificate, (c) the EM&CP, and (d) all conditions incorporated in any Order approving the EM&CP in Case 10-T-0139, to the extent such documents referenced in (c) and (d) above pertain to CHPE's compliance with New York State Water Quality Standards necessary and appropriate for issuance of, and compliance with, this Certification.

3. CHPE shall provide a copy of this Certification to the United States Army Corps of Engineers ("USACE"), as well as a copy of the Application, Joint Proposal, Article VII Certificate (when issued) EM&CP and Order(s) approving the EM&CP (when issued) in Case 10-T-0139, so that the USACE will have a complete record of the conditions that apply hereto.

4. CHPE shall provide all construction contractors performing work on the Facility complete copies of this Certification, the Article VII Certificate, the approved EM&CP, and Orders(s) approving the EM&CP for each Facility segment.

Classified Streams and Wetland Crossings Installation

5. For overland installation, no site preparation work shall be undertaken until all required erosion control measures have been installed.

6. During overland cable installation in all waters of the State, including classified streams and wetlands, there shall be no visible increase in turbidity that causes a visible contrast to background conditions forty (40) feet downstream of the installed cable centerline.

7. CHPE shall employ measures sufficient to prevent contamination of the waters of the State by silt, sediment, fuels, drilling fluids, concrete, leachate or any other pollutant associated with the installation of the Facility.

8. All in-stream work, as well as any work that may result in the suspension of sediments, is prohibited in all streams designated as "C(T)" and "C(TS)" streams during the trout spawning and incubation period commencing October 1 and ending May 31st.

9. Any debris or excess materials caused by the construction of the Facility shall be immediately and completely removed from the bed and banks of all water areas and transported to an appropriate upland area for disposal.

Lake and River Installation

10. Underwater construction in Lake Champlain and the Hudson, Harlem and East Rivers (including jet-plow and shear-plow trials) and pre-installation route clearing activities (including pre-lay grapnel run and associated obstruction and debris removal) shall occur within the construction windows set forth in Table 1 in the Article VII Certificate.

11. The following in-water activities may be undertaken at any time: physical, biological, geotechnical and cultural resource sampling, surveying and testing; marine surveys, mobilization and demobilization of vessels and equipment used for cable installation and cofferdam construction; cofferdam and steel casing rise pipe construction; dredging of cofferdams provided that the walls of the cofferdam extend above mean high water during dredging; HDD associated with either of the two foregoing items; post-installation surveys and sampling; locating and marking utility crossings and work to effect utility crossings; and, with prior notice to the DPS, the New York State Department of Environmental Conservation ("NYSDEC"), and the New York State Department of Health ("NYSDOH") emergency maintenance work.

12. During the jet plow and shear plow trials and underwater cable installation, CHPE shall implement the Suspended Sediment/Water Quality Monitoring Plan (hereinafter the "Water Quality Monitoring Plan"), to be developed pursuant to the approved Suspended Sediment / Water Quality Monitoring Plan Scope of Study included as Attachment 1 to the Article VII Certificate . CHPE shall operate the jet plow and shear plow in accordance with the operating conditions determined through the jet plow and shear plow trials described in the Water Quality Monitoring Plan to minimize suspension of *in situ* sediment, subject to the limitation of Condition 14(c), below.

13. If the jet plow trials demonstrate that the preferred operating conditions result in real-time, total suspended solids ("TSS") concentrations, measured five hundred (500) feet down-current of the jet plow, exceeding the TSS concentrations at an up-current background station by more than two hundred (200) milligrams per liter ("mg/L"), CHPE shall report such conditions to the Aquatic Inspector and work with DPS and NYSDEC to evaluate and implement modifications to the plow operating conditions to further reduce *in-situ* sediment suspension associated with the single pass installation procedure. If the shear plow trials demonstrate that the preferred operating conditions result in real-time TSS concentrations, measured five hundred (500) feet down-current of the shear-plow in the southern portion of Lake Champlain (south of Crown Point), exceeding the TSS concentrations at an up-current background station by more than one hundred (100) mg/L, CHPE shall report such conditions to the Aquatic Inspector and work with DPS and NYSDEC to evaluate and implement modifications to the plow operating conditions to further reduce in-situ sediment suspension associated with the single pass installation procedure. CHPE shall not utilize the jet plow or shear plow until they have demonstrated to the satisfaction of DPS staff their ability to achieve the TSS standards established herein through test trials.

14. Water Quality

    a. During jet plow and shear plow cable installation, CHPE shall sample and

measure turbidity (in units of Nephelometric Turbidity Units ("NTU")), TSS, hardness, and the concentrations of the chemical constituents identified in the table provided in Condition 14(d) below, within the water column of Lake Champlain and the Hudson, Harlem and East Rivers outside the effects of the installation event (the up-current background station) and down-current of the operating jet plow and shear plow described in the Water Quality Monitoring Plan. Up-current samples shall be collected at a location five hundred (500) feet up-current of the cable installation outside the effect of the jet plowing and shear plowing. Down-current samples shall be collected five hundred (500) feet down-current of the jet plow and shear plow. Samples shall be collected at near-surface, mid-depth, and near-bottom at each sampling location. Measured levels of metals shall be reported both as totals and as dissolved fractions, except mercury, which shall be reported as total mercury.

b. Suspended sediment plume monitoring and water quality monitoring shall be conducted at the locations and frequency set forth in the Water Quality Monitoring Plan.

c. If, during underwater cable installation, TSS concentrations monitored or measured at five hundred (500) feet down-current of the installation exceed TSS concentrations at an up-current background station by more than two hundred (200) mg/L or more than one hundred (100) mg/L in the southern portion of Lake Champlain (south of Crown Point), the Aquatic Inspector shall be immediately notified. CHPE also must attempt to notify the NYSDEC and DPS within twenty four (24) hours of any such TSS exceedance. CHPE shall immediately employ one or more of the following environmental protection measures: changing the rate of advancement of the jet plow or shear plow, modifying hydraulic pressures, or implementing other reasonable operational controls that may reduce suspension of *in-situ sediments*. If CHPE proposes to employ mitigation measures not otherwise provided for in this paragraph, they must first consult with the DPS, NYSDEC, and the Aquatic Inspector. In the event that DPS determines that the mitigation techniques are unable to reduce TSS concentrations below the maximum allowable threshold, underwater cable installation shall be suspended and CHPE shall consult with DPS and NYSDEC regarding alternative cable installation techniques. Nothing in this subsection is intended to require that cable installation methods be modified to prevent burial of the cables in a single trench to the depths specified in the Article VII Certificate through a single installation pass.

d. During underwater cable installation, the concentrations of the chemical constituents listed below (Table 1), as measured in the samples collected five hundred (500) feet down-current of the cable installation activities, shall not exceed the greater of: (A) the levels set forth below or (B) 1.3 times the highest ambient background level measured during the prior twenty four

(24) -hour sampling period up-current of the installation at the same depth as the down-current sample.

Table 1. Underwater Cable Installation Water Quality Standards

Route Mile	Water Body Class	Contaminant	Standard	Unit	Method	Reporting Limit
0-73.5	AA	Dissolved Arsenic	340	ug/l	EPA 200.7	10
		Dissolved Copper	calculate using measured hardness and (0.96) exp(0.9422 [ln (ppm hardness)] - 1.7)	ug/l	EPA 200.7	2
		Dissolved Zinc	calculate using measured hardness and 0.978 exp(0.8473 [ln(ppm hardness)] + 0.884)	ug/l	EPA 200.7	2
73.5-101.7	B	Dissolved Arsenic	340	ug/l	EPA 200.7	10
		Dissolved Copper	calculate using measured hardness and (0.96) exp(0.9422 [ln (ppm hardness)] - 1.7)	ug/l	EPA 200.7	0.1*
		Dissolved Zinc	calculate using measured hardness and 0.978 exp(0.8473 [ln(ppm hardness)] + 0.884)	ug/l	EPA 200.7	2
228.5-272.3	A	Phenanthrene*	45	ug/l	EPA 8270C	0.02
		Dissolved Cadmium	5	ug/l	EPA 200.7	0.02*
		Dissolved Copper	200	ug/l	EPA 200.7	0.1*
		Dissolved Lead	50	ug/l	EPA 200.7	0.02*
		Total Mercury	0.7	ug/l	EPA 1669	0.001
		Total PCBs	0.09	ug/l	EPA 8082	0.005*
272.3-290.3	B	Dissolved Arsenic	340	ug/l	EPA 0.7	10
		Dissolved Cadmium	calculate using measured hardness and (0.85) exp(1.128 [ln (ppm hardness)] - 3.6867)	ug/l	EPA 200.7	0.02*
		Dissolved Copper	calculate based on measured hardness using (0.96) exp(0.9422 [ln (ppm hardness)] - 1.7)	ug/l	EPA 200.7	0.1*

		Dissolved Lead	calculate using measured hardness and {1.46203 - [ln (hardness) (0.145712)]} exp (1.273 [ln (hardness)] - 1.052)	ug/l		0.02*
		Phenanthrene*	45	ug/l	EPA 8270C	0.02
		Dissolved Mercury	1.4	ug/l	EPA 1669	0.001
		Total PCBs	0.2 per aroclor	ug/l	EPA 8082	0.005*
290.3-324.0	SB	Dissolved Arsenic	63	ug/l	EPA 200.7	10
		Dissolved Cadmium	7.7	ug/l	EPA 200.7	0.02*
		Dissolved Copper	7.9	ug/l	EPA 200.7	0.1*
		Dissolved Lead	204	ug/l	EPA 200.7	0.02*
		Phenanthrene*	14	ug/l	EPA 8270C	0.02
		Total Mercury	0.05***	ug/l	EPA 1669	0.001
		Total PCBs	0.2 per aroclor	ug/l	EPA 8082	0.005*
324.1-332.5	I	Dissolved Arsenic	36	ug/l	EPA 200.7	10
		Dissolved Cadmium	7.7	ug/l	EPA 200.7	0.02*
		Dissolved Copper	7.9	ug/l	EPA 200.7	0.1*
		Dissolved Lead	204	ug/l	EPA 200.7	0.02*
		Phenanthrene*	14	ug/l	EPA 8270C	0.02
		Total Mercury	0.05***	ug/l	EPA 1669	0.001
		Total PCBs	0.2 per aroclor	ug/l	EPA 8082	0.005*

* Assumes low level analysis, compared to standard level
** Phenanthrene will be used as an indicator for the total concentration of Polycyclic Aromatic Hydrocarbons (PAHs).
*** Standard based on General Level Currently Achievable described in TOGS 1.3.10.

e. All water quality laboratory analyses required in this Certification must be conducted by a laboratory certified by the NYSDOH.

f. If the compliance criteria described in clause 14(d) above are exceeded at any time during the installation, additional water quality sampling shall take place at the location of the exceedance as described in the Water Quality Monitoring Plan.

g. Hardness shall be measured in each water quality sample collected. The analytical results for hardness shall be applied to calculate the standards for dissolved copper, dissolved zinc, dissolved cadmium, and dissolved lead where necessary, as described in clause 14(d) above.

15. Changes in the Conditions of the Water Quality Certification, if proposed by the date on which the proposed Environmental Management and Construction Plan (EM&CP) is filed, shall be reviewed together with the proposed EM&CP. Changes in the Conditions of the Water Quality Certification shall be governed by Condition 158 of the Article VII Certificate governing changes to the approved EM&CP.

16. Nothing in this Certification shall limit either (i) the authority of the DEC to monitor the environmental and health impacts resulting from the construction and operation of the Facility and to enforce applicable provisions of the Environmental Conservation Law (including those which provide for summary abatement authority) and applicable implementing regulations governing the environmental and health impacts resulting from such construction and operation, or (ii) any defenses to such enforcement that CHPE may be able to assert under applicable law.

Certified by:

1-18-2013
Date

Floyd E. Barwig, Director
Office of Energy Efficiency and the Environment
New York State Department of Public Service
Three Empire State Plaza
Albany, New York 12223