APPENDIX F

Coastal Zone Consistency Documentation and Land Use Tables

APPENDIX F.1 – COASTAL ZONE CONSISTENCY DOCUMENTATION

Appendix F.1
Coastal Zone Consistency Documentation

Appendix F.1 consists of documents relating to the coastal zone consistency determination for the proposed CHPE Project.

Appendix F.1 contains the following documentation:

- **F.1-1.** Correspondence from New York State Department of State (NYSDOS) to Mr. Sean Murphy on behalf of Champlain Hudson Power Express, Inc. (CHPE), The Applicant, June 25, 2010

- **F.1-2.** Correspondence from NYSDOS to Mr. Keith Silliman (c/o TRC) on behalf of the Applicant, November 22, 2010

- **F.1-3.** Appendix B of the Clean Water Act Section 404 Application (Attachment to F.1-2)

- **F.1-4.** Correspondence from NYSDOS to Mr. Sean Murphy on behalf of the Applicant, January 5, 2011

- **F.1-5.** Correspondence from Mr. Sean Murphy on behalf of the Applicant to Mr. Jeffrey Zappieri (NYSDOS), January 18, 2011

- **F.1-6.** Correspondence from Mr. Sean Murphy on behalf of the Applicant to Mr. Jeffrey Zappieri (NYSDOS), February 4, 2011

- **F.1-7.** Correspondence from Mr. Sean Murphy on behalf of the Applicant to Mr. Jeffrey Zappieri (NYSDOS), February 18, 2011

- **F.1-8.** Correspondence from NYSDOS to Mr. Sean Murphy on behalf of the Applicant, March 8, 2011

- **F.1-9.** Correspondence from NYSDOS to Mr. Donald Jessome (c/o CHPE), June 8, 2011

- **F.1-10.** Correspondence from Transmission Developers, Inc. (TDI)/CHPE to Mr. Anthony J. Como (U.S. Department of Energy), July 7, 2011

- **F.1-11.** Correspondence from NYSDOS to Mr. Sean Murphy on behalf of the Applicant, May 29, 2012

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STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001

DAVID A. PATERSON
GOVERNOR

LORRAINE A. CORTÉS-VÁZQUEZ
SECRETARY OF STATE

June 25, 2010

Mr. Sean Murphy
C/O HDR/DTA
970 Baxter Boulevard
Portland, ME 04103

Re: O-2010-0025
Champlain Hudson Power Express
Hudson River, Harlem River, East River,
Long Island Sound
General Correspondence

Dear Mr. Murphy:

Pursuant to our meeting of June 15, 2010 the Department of State (DOS) is providing a list of the following questions regarding the proposed installation of a High Voltage Direct Current electric transmission line from Canada to New York City and Connecticut. This does not constitute a formal request for information, does not indicate that a consistency certification has been submitted, and does not indicate that formal federal consistency review pursuant to 15 CFR part 930 has begun. This information is provided solely as guidance at the request of HDR/DTA and TRC to aid in their submittal of a complete application.

The alternative analysis provided with TDI's article VII application and provided to the DOS appears to fail to provide sufficient detail to allow for adequate review and comparison of potentially feasible alternatives to the transmission line as currently proposed. Generally, DOS encourages activities or development within or adjacent to water only when it is infeasible to conduct that activity or development in upland areas. Before specific future considerations can be given to sitting the proposed transmission line within the Hudson River, an expanded alternative analysis will be needed that specifically outlines and analyzes viable upland alternatives and demonstrates why such alternatives can be deemed infeasible to meet the stated project goals. Should TDI be able to demonstrate this, DOS foresees the following questions arising regarding the currently proposed underwater route. These questions are based on information received to date and meetings with HDR, TRC and TDI staff.

1) What capabilities exist to place the cable 15 plus feet below the river bottom?
2) What percentage of the route, as currently proposed, will be within the existing federal navigation channel?
3) Would the capacity exist for future transmission cables to be placed in the waterways or would the project's four cables occupy all usable space for the lifetime of the project? What capabilities exist, following installation, to bury the line deeper?
4) Will the DOE have any regulatory authority beyond the transmission cable?
5) What is plan for avoiding impacts to Haverstraw Bay? If proposed to occupy the federal navigation channel, please characterize discussions with other applicable regulatory agencies

regarding this route. Additionally, please characterize alternative upland routes around Haverstraw Bay.

6) Will the transmission cable follow a previously dredged navigation channel or otherwise disturbed area in Long Island Sound/East River/Harlem River?
7) Are the 2000 mw of power the maximum amount of electricity that the cable can transmit?
8) What research is being conducted regarding the anticipated turbidity associated with cable installation?
9) How much would the turbidity levels increase in relation to the depth of cable placement?
10) Does your alternative analysis examine the possibility of siting the cable along existing right-of-ways, such as the NYS Thruway, railroad beds, or existing transmission corridors?
11) Why does the project propose to split the transmitted electricity to two different markets?
12) What is the reasonably foreseeable maximum depth of the Hudson River Federal Navigation Channel if it were to be deepened during the design life of this project?
13) From Selkirk south, how much of the cable will be buried in the Hudson River and how much will be laid and protected?
14) What are the soil chemistries along the proposed route?
15) What are the potential effects of heat or EMF at the sediment/water interface? How does this change when the line transitions to an HVAC line in Manhattan?
16) What are the anticipated residual effects following decommissioning?
17) What is the anticipated effect of long term exposure to EMF, such as an individual transiting up or down the Hudson, parallel to the proposed line, as compared to an individual transiting a similar cable crossing of the river?

These questions have arisen based on a cursory review of material provided to date. DOS understands that the material submitted in support of the pending NYS Article VII proceeding was deficient in several regards and that additional information will be submitted in the coming months to supplement the Article VII application and to develop an environmental impact statement pursuant to NEPA.

If further information or clarification is required, please contact Matthew Maraglio at 518-474-5290 (email: matthew.maraglio@dos.state.ny.us) and reference our file number O-2010-0025.

Sincerely

Jeffrey Zappieri
Supervisor, Consistency Review Unit
Office of Coastal, Local Government and Community Sustainability

CC

US DOE: Dr. Jerry Pell
US ACOE/NY: Naomi Handell
NYS DEC Central Office: William Little
NYS DPS: Andrew Davis

STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001

DAVID A. PATERSON
GOVERNOR

RUTH NOÉMI-COLÓN
ACTING SECRETARY OF STATE

November 22, 2010

Mr. Keith Silliman
C/O TRC
10 Maxwell Drive
Clifton Park, NY 12065

Re: S-2010-0025
DOE Docket #: PP-362
NYS PSC Case: 10-T-0139
Champlain Hudson Power Express
Request for additional information and Preliminary comments on updated alternatives analysis

Dear Mr. Silliman:

The Department of State (DOS) has reviewed the Updated Alternative Analysis prepared for Champlain Hudson Power Express, Inc. (CHPE) dated November 05, 2010 and submitted during the above referenced Public Service Commission (PSC) Article 7 proceeding. DOS is currently acting in an advisory capacity to the PSC and will also be reviewing the CHPE project for its consistency with the New York State Coastal Management Program (NYSCMP) in separate proceedings pursuant to 19 CFR part 930 following receipt of a consistency certification from CHPE.

Beginning with our initial meeting with Transmission Developers Inc (TDI) and CHPE, and in each subsequent meeting, DOS has provided extensive pre-application comments regarding potentially applicable coastal policies, as well as identifying additional information that DOS anticipates will likely be necessary to complete its review of CHPE's forthcoming consistency certification. During our past discussions, DOS has routinely and consistently identified four potential areas of concern:

- Need for a complete and in-depth analysis of potential route alternatives that avoid or minimize impacts on coastal resources. Some of this information has been provided as part of the Updated Alternatives Analysis, but additional information and analysis (as identified in previous meetings and detailed in this letter) will be necessary;
- Operational and installation related affects of the proposed transmission line on *Significant Coastal Fish and Wildlife Habitats* (SCFWH). The need to avoid certain of these sensitive areas has been requested since our initial meeting and may be partially addressed by utilizing a western railroad corridor above Catskill; DOS is still awaiting confirmation of alternative route identification that will avoid impacts to Haverstraw Bay SCFWH.
- Operation and installation related affects of the proposed transmission line on commercial and recreational navigation. This has been sought since our initial meetings. Information on potential utilization and impacts of using channel side slopes is still needed.
- Assessment of impacts to commercial and recreational fisheries due to the operation of the proposed transmission line. DOS is still expecting detailed analysis of impacts on these resources, particularly in areas outside of designated SCFWH areas. As discussed previously, this analysis needs to identify measures for reducing impacts, where possible.

Once submitted, review of the applicant's consistency certification and accompanying necessary data and information may result in identification of additional policy concerns and information needs.

Alternative Analysis:

In response to requests by DOS and parties participating in the PSC proceeding to provide a full and complete analysis of potentially feasible alternatives to the proposed transmission line, TRC provided the above referenced document for review and comment by staff. TRC has requested comments from DOS and others in response to this document and as such DOS provides the following comments on those route alternatives that are sited south of Albany, NY.

Mid Hudson Rail Alternative (North of Kingston): The analysis did not identify any constraints to the western railroad route identified by the Department of Public Service (DPS) for the portion between Albany and Kingston. As such, the analysis should be expanded to include siting the proposed transmission line within this rail corridor to a point in the vicinity of Kingston. As discussed previously, utilizing this rail corridor alternative avoids impacts to several SCFWH sites.

Mid Hudson Rail Alternative (South of Kingston): The analysis identified multiple constraints to the western railroad route identified by DPS for the portion of the route south of Kingston. Many of the identified constraints appear to be linked to a strict focus on the rail corridor and lacked analysis of potential alternate non-rail route segments that could avoid these constraints.

In general, the identified constraints occur primarily in the vicinity of bridges, tunnels, in-water railroad fills, steep rock cuts, utility lines within the rail corridor, and proximity to existing structures.

a. Where bridges are identified as constraints, the analysis should be expanded to include an evaluation of the potential to attach the proposed transmission line to the bridge structure and provide for protection of the line through a conduit or other mechanism as well as an evaluation of alternative segments.

b. Where tunnels are identified as constraints, the analysis should be expanded to include siting the proposed line in the tunnel within a conduit or recessed into the sides or ceiling of the tunnel as well as alternative route segments that would avoid the tunnel.

c. Where in-water rock fills and steep rock cuts constrain the route, the analysis should identify alternative upland or in-water route segments that could allow the proposed line to avoid these constraints. In addition, the individual and total length of the identified fill and steep rock cut constraints should be presented to provide reviewers with perspective regarding their magnitude.

d. Where co-located utility lines were identified as constraints, it is unclear why existing above ground utility lines would be considered a constraint for a buried electric transmission line. The analysis should include a specific discussion regarding cable burial methods proximate to utility corridors within railroad corridors. In areas where existing structures constrain the route, the analysis should be expanded to include alternative route segments along existing road networks, parking facilities or short new right of way segments.

Existing Utility Corridors: An existing utility corridor was identified and evaluated. Many of the identified constraints were not substantiated with data, field visits or interviews and as such, it does not appear that there is enough information to eliminate this route as a viable alternative, especially since there is a lack of identification of the property interest within these utility corridors as well as a lack of communication between applicable property interests and the project sponsors. The several constraints that were identified and a response to these constraints follow:

a. Property acquisition may be required: The analysis does not identify where or why property acquisition outside of the existing utility corridor may be required or why property acquisition would make the alternative infeasible.

b. Access road reinforcement may be required: It is unclear why access road reinforcement is necessary, or if necessary, why such an action constitutes a development constraint. The access roads in question were constructed to support the installation and maintenance of large transmission towers, their associated foundations and miles of electrical transmission lines. As such, it is unclear how these same roads would not be able to support similar equipment to that required to establish the existing transmission line. Even if such reinforcement was deemed necessary, given modern application of best management practices for sediment and erosion control as well as stormwater infiltration and retention techniques, it is unclear why access road reinforcement should be viewed as development constraint rather than a requirement for construction.

c. Existing Business Impact: The analysis presented one business that would be impacted along the utility corridor route that would be impacted for approximately one month. The analysis should be expanded to indicate how this situation could be addressed.

d. Catskill Aqueduct: The analysis concludes that the New York City water supply aqueduct is "in the immediate vicinity" of the utility corridor route. It is unclear whether the installation of the proposed underground transmission cable would affect the aqueduct or if alternative route segments could alleviate any sitting difficulties associated with the aqueduct.

e. Waterbody Crossing: The analysis identifies several waterbody crossings that would be required along the utility corridor route, the longest of which does not exceed 1,700 feet. This 1,700 foot long crossing is identified as a constraint because a horizontal directional drill (HDD) in this location may be infeasible. However, given that a majority of the currently proposed underwater route would be installed via methods other than HDD and that HDD lengths are known to exceed 2,000 feet, it is unclear why such a waterbody crossing would be identified as a development constraint prior to site specific analysis.

f. Hudson River Crossing: A crossing of the Hudson River in the vicinity of Athens, NY would need to occur for the proposed transmission line to be sited within the identified utility corridor. The analysis states that the river could not be crossed at this point via HDD. Given that the currently proposed underwater route transitions from underwater to upland configurations via HDD and that a substantial length of the proposed route is to be installed via jet plow, it is unclear why an inability to utilize HDD to cross the entire river would be considered to be a development constraint.

g. Road Crossings: The analysis identifies road crossings perpendicular to the utility corridor as development constraints, However, it is unclear why road crossings along the currently proposed upland portion of the transmission line north of Albany, NY, would not also be considered as development constraints. The analysis should be expanded to include the justification for identifying road crossings along the utility corridor as development constraints.

Haverstraw Bay alternative: The analysis should be updated when the applicant completes their analysis. It is noted that the potential upland route to the west of Haverstraw Bay appears to be a viable route. Of particular importance, using this alternate route avoids the ecologically sensitive Haverstraw Bay SCFWH. The sensitive and significant nature of this habitat has been discussed by DOS on numerous occasions.

The analyzed alternatives should be reassessed prior to submitting your consistency application. Overall, the Updated Alternatives Analysis appears to take a very narrow view of identified alternatives to the currently proposed route and fails to adequately identify potential solutions to the constraints. There appear to be many broad statements relating to project feasibility that are not substantiated by research and fact and several of the identified constraints along the alternative routes south of Albany appear to be minor impediments along the currently proposed route north of Albany. Greater attention is to be paid to providing a comprehensive look at alternative routes and justifying identified route constraints as well as including alternative route segments should a justification to any constraints be identified.

Information Needs:

As previously discussed during many past meetings, both prior to and during the aforementioned Article 7 proceedings, the following information is necessary in order for DOS to provide substantive comments regarding potential coastal effects of the proposed project, assuming that the above referenced alternative analysis can be expanded to justify the currently proposed route. This information will also be required for DOS to complete its review of CHPE's forthcoming consistency certification

Commercial and Recreational Fisheries and SCFWHs:

Electro-magnetic fields - The proposed transmission cable is purported to utilize various technologies that would prevent the establishment of electric fields proximate to the cable. However, such technologies would not prevent the creation of magnetic fields surrounding the cables. The physical extents and relative intensities of these fields are unclear. As such, a cross-sectional representation of applicable electro-magnetic fields surrounding the proposed cable should be provided that characterizes all areas where artificial electro-magnetic fields are expected to be outside of natural ranges. Should alternate installation techniques, such as installation of the entire bi-pole within one trench, result in dissimilar electro-magnetic fields to the currently proposed installation technique, such information should be presented. Additionally, a consolidated summary, with references, of your mentioned extensive literature search relating to effects of electro-magnetic fields on commercial and recreational fisheries, should be provided. The in-water area exposed to the electro-magnetic fields proximate to the proposed cable is likely to be directly correlated to the depth that it is buried. As such, the expected achievable installation depths throughout all portions of the underwater route should be provided. This should include all areas where target depth is not attainable, thus necessitating non-native fill. As discussed extensively during pre-application conversations, DOS has concerns that the proposed line may, if sited within the Hudson River or other confined riverine systems, adversely affect commercial and recreational fisheries as well as habitat areas essential for their growth and development, especially those incorporated into the NYSCMP as SCFWHs.

SCFWHs are identified areas within New York State that are afforded special protections within the NYSCMP due to their uniqueness, species composition, human and wildlife levels of use, and degree of irreplaceability. DOS has routinely identified and discussed SCFWHs along the proposed transmission line's route and has repeatedly advised that SCFWHs should be avoided; if avoidance proved impracticable, the proposed line should be sited, subject to justification by applicable data, within previously disturbed areas such as dredged navigation channels or other dredged areas.

Navigation:

The proposed transmission line's potential effects on commercial and recreation navigation have routinely been identified as a concern of paramount importance to the NYSCMP. It will be necessary for the applicant to show their ability to attain appropriate burial depths within the side slopes of the federally maintained navigation channel and areas of the river typified by large "sand

waves." Repeated inquiry to CHPE regarding attainable depths in these areas has generally been deferred to an as yet unidentified Environmental Management and Control Plan (EMCP) contractor. Such information would be necessary to adequately assess the proposed project's potential effects on navigation. The project sponsors should recognize that, given the worldwide trend of increased vessel draft, possible future federal navigation channel expansion should not be precluded by the installation and operation of the proposed transmission line.

Please address the alternative analysis comments iterated above and provide responses and information to the identified data gaps as soon as possible. Given your desired timeframes, your prompt response is necessary for DOS's continual consultation and forthcoming timely review to result in an outcome amenable to TDI, CHPE Inc., and DOS.

If further information or clarification is required please contact Matthew Maraglio at 518-474-5290 (email: matthew.maraglio@dos.state.ny.us) and reference our file number S-2010-0025.

Sincerely,

Jeffrey Zappieri
Supervisor, Consistency Review
Office of Coastal, Local Government
and Community Sustainability

JZ/mm

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APPENDIX B

- **NEW YORK STATE DEPARTMENT OF STATE COASTAL MANAGEMENT PROGRAM - FEDERAL CONSISTENCY ASSESSMENT FORM**
- **NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM - CONSISTENCY ASSESSMENT FORM**
- **COASTAL CONSISTENCY ASSESSMENT SUPPLEMENT**

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT (please print)

1. Name: Champlain Hudson Power Express, Inc. & CHPE Properties

2. Address: Pieter Schuyler Building, 600 Broadway, Albany, NY 12207-2283

3. Telephone: Area Code (518) 465-0710

B. PROPOSED ACTIVITY

1. Brief description of activity:

The Project consists of a 1,000 megawatt (MW) underwater/underground HVDC electric transmission system extending from the international border between Canada and the United States to New York City. The Applicants propose to develop the CHPE Project to deliver clean and renewable sources of power to New York City.

2. Purpose of activity:

The stated purpose of the CHPE Project is to supply clean and renewable sources of power to the NY ISO load center in New York City without contributing to transmission congestion on the electric grid.

3. Location of activity:

See Attachments	See Attachments	See Attachments
County	City, Town, or Village	Street or Site Description

4. Type of federal permit/license required: USACE Section 404/10; USDOE Presidential Permit

5. Federal application number, if known: USACE File 2009-01089-EHA; PP-362

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known:

New York State Public Service Commission, Case 10-T-0139

C. COASTAL ASSESSMENT Check either "YES" or "NO" for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

1. Will the proposed activity result in any of the following:	YES	NO
a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)	☒	☐
b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)	☒	☐
c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)	☐	☒
d. Reduction of existing or potential public access to or along coastal waters? (19, 20)	☐	☒
e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9,10)	☐	☒
f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)	☐	☒
g. Siting of a facility essential to the generation or transmission of energy? (27)	☒	☐
h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)	☒	☐
i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)	☐	☒
j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)	☐	☒
k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)	☒	☐
l. Adverse effect upon land or water uses within the State's small harbors? (4)	☐	☒

2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:	YES	NO
a. State designated freshwater or tidal wetland? (44)	☒	☐
b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17,)	☒	☐
c. State designated significant fish and/or wildlife habitat? (7)	☒	☐
d. State designated significant scenic resource or area? (24)	☒	☐
e. State designated important agricultural lands? (26)	☐	☒
f. Beach, dune or barrier island? (12)	☐	☒
g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)	☐	☒
h. State, county, or local park? (19, 20)	☒	☐
i. Historic resource listed on the National or State Register of Historic Places? (23)	☒	☐

3. Will the proposed activity require any of the following:	YES	NO
a. Waterfront site? (2, 21, 22)	☐	☒
b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)	☐	☒
c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)	☐	☒
d. State water quality permit or certification? (30, 38, 40)	☒	☐
e. State air quality permit or certification? (41, 43)	☐	☒

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document)	YES	NO
	☒	☐

D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.

2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Champlain Hudson Power Express, Inc. & CHPE Properties

Address: Pieter Schuyler Building, 600 Broadway, Albany, NY 12207-2283

Telephone: Area Code (518) 465-0710

Applicant/Agent's Signature: _____ _____ Date: December 6, 2010

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the **New York State Department of State, Office of Coastal, Local Government and Community Sustainability, Attn: Consistency Review Unit, 1 Commerce Plaza, 99 Washington Avenue - Suite 1010, Albany, New York 12231.**

a. Copy of original signed form.
b. Copy of the completed federal agency application.
c. Other available information which would support the certification of consistency.

2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.

3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

*These state and local documents are available for inspection at the offices of many federal agencies, Department of environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

For Internal Use Only:
Date Received: _____

WRP no._____
DOS no._____

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM
Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's designated coastal zone, must be reviewed and assessed for their consistency with the *New York City Waterfront Revitalization Program (WRP)*. The WRP was adopted as a 197-a Plan by the Council of the City of New York on October 13, 1999, and subsequently approved by the New York State Department of State with the concurrence of the United States Department of Commerce pursuant to applicable state and federal law, including the Waterfront Revitalization of Coastal Areas and Inland Waterways Act. As a result of these approvals, state and federal discretionary actions within the city's coastal zone must be consistent to the maximum extent practicable with the WRP policies and the city must be given the opportunity to comment on all state and federal projects within its coastal zone.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, other state agencies or the New York City Department of City Planning in their review of the applicant's certification of consistency.

A. APPLICANT

1. Name: Champlain Hudson Power Express Inc. and CHPE Properties, Inc.
2. Address: Pieter Schuyler Building, 600 Broadway, Albany, NY 12207-2283
3. Telephone: 518-465-0710 Fax:_____ E-mail: bill.helmer@transmissiondevelopers.com
4. Project site owner:_____

B. PROPOSED ACTIVITY

1. Brief description of activity:

   The CHPE Project consists of a 1,000 MW HVDC transmission system extending from the International border between Canada and the U.S. and New York City, NY. The HVDC transmission system consists of two approximately 6-inch diameter HVDC submarine cables buried beneath the bed of Lake Champlain and the Hudson River. To bypass the Champlain Canal and a portion of the upper Hudson River, two 6-inch diameter HVDC land cables will be buried underground within a railroad right-of-way from Whitehall, NY to Coeymans, NY. The HVDC cables will terminate at an HVDC converter station located in Yonkers, NY. From Yonkers, NY, two bundles of three AC cables will continue south through the Hudson River, Harlem River, and East River and terminate at the planned Poletti Substation in Astoria, Queens NY.

2. Purpose of activity:

   The stated purpose of the CHPE Project is to supply clean and renewable sources of power to the NY ISO load center in New York City without contributing to transmission congestion on the electric grid.

3. Location of activity: (street address/borough or site description):

   The submarine and land cables will be located in the following counties: Clinton, Essex, Washington, Saratoga, Schenectady, Albany, Rensselaer, Greene, Columbia, Ulster, Duchess, Orange, Putnam, Rockland, Westchester, Bronx, New York, and Queens.
   The converter station will be located at multiple properties at the intersection of Wells Avenue and Atherton Street in Yonkers, NY.
   The interconnection point will be located to the north of the intersection of 20th Avenue and 31st Street in Queens, NY.

Proposed Activity Cont'd

4. If a federal or state permit or license was issued or is required for the proposed activity, identify the permit type(s), the authorizing agency and provide the application or permit number(s), if known:

   U.S. Department of Energy - Presidential Permit (PP-362);
   U.S. Army Corps of Engineers - Section 10/404 Permit (2009-01089-EHA);
   New York PSC - Article VII Certificate of Environmental Compatibility and Public Need (Case 10-T-0139)

5. Is federal or state funding being used to finance the project? If so, please identify the funding source(s).

   The Applicants have applied to the U.S. Department of Energy for a Federal loan guarantee in response to a DOE competitive solicitation "Federal Loan Guarantees for Electric Power Transmission Infrastructure Investment Projects," issued under Section 1705, Title XVII, of the Energy Policy Act of 2005.

6. Will the proposed project require the preparation of an environmental impact statement?
   Yes ✓ No _____ If yes, identify Lead Agency:

   U.S. Department of Energy

7. Identify **city** discretionary actions, such as a zoning amendment or adoption of an urban renewal plan, required for the proposed project.

   The Applicants are unaware of any required discretionary actions at this point.

C. COASTAL ASSESSMENT

Location Questions:	**Yes**	**No**
1. Is the project site on the waterfront or at the water's edge?	✓	
2. Does the proposed project require a waterfront site?		✓
3. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land underwater, or coastal waters?		✓

Policy Questions	**Yes**	**No**

The following questions represent, in a broad sense, the policies of the WRP. Numbers in parentheses after each question indicate the policy or policies addressed by the question. The new Waterfront Revitalization Program offers detailed explanations of the policies, including criteria for consistency determinations.

Check either "Yes" or "No" for each of the following questions. For all "yes" responses, provide an attachment assessing the effects of the proposed activity on the relevant policies or standards. Explain how the action would be consistent with the goals of those policies and standards.

4. Will the proposed project result in revitalization or redevelopment of a deteriorated or under-used waterfront site? (1)		✓
5. Is the project site appropriate for residential or commercial redevelopment? (1.1)		✓
6. Will the action result in a change in scale or character of a neighborhood? (1.2)		✓

Policy Questions cont'd	Yes	No
7. Will the proposed activity require provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (1.3)		✓
8. Is the action located in one of the designated Significant Maritime and Industrial Areas (SMIA): South Bronx, Newtown Creek, Brooklyn Navy Yard, Red Hook, Sunset Park, or Staten Island? (2)		✓
9. Are there any waterfront structures, such as piers, docks, bulkheads or wharves, located on the project sites? (2)		✓
10. Would the action involve the siting or construction of a facility essential to the generation or transmission of energy, or a natural gas facility, or would it develop new energy resources? (2.1)	✓	
11. Does the action involve the siting of a working waterfront use outside of a SMIA? (2.2)		✓
12. Does the proposed project involve infrastructure improvement, such as construction or repair of piers, docks, or bulkheads? (2.3, 3.2)		✓
13. Would the action involve mining, dredging, or dredge disposal, or placement of dredged or fill materials in coastal waters? (2.3, 3.1, 4, 5.3, 6.3)	✓	
14. Would the action be located in a commercial or recreational boating center, such as City Island, Sheepshead Bay or Great Kills or an area devoted to water-dependent transportation? (3)		✓
15. Would the proposed project have an adverse effect upon the land or water uses within a commercial or recreation boating center or water-dependent transportation center? (3.1)		✓
16. Would the proposed project create any conflicts between commercial and recreational boating? (3.2)		✓
17. Does the proposed project involve any boating activity that would have an impact on the aquatic environment or surrounding land and water uses? (3.3)	✓	
18. Is the action located in one of the designated Special Natural Waterfront Areas (SNWA): Long Island Sound- East River, Jamaica Bay, or Northwest Staten Island? (4 and 9.2)		✓
19. Is the project site in or adjacent to a Significant Coastal Fish and Wildlife Habitat? (4.1)	✓	
20. Is the site located within or adjacent to a Recognized Ecological Complex: South Shore of Staten Island or Riverdale Natural Area District? (4.1and 9.2)		✓
21. Would the action involve any activity in or near a tidal or freshwater wetland? (4.2)	✓	
22. Does the project site contain a rare ecological community or would the proposed project affect a vulnerable plant, fish, or wildlife species? (4.3)	✓	
23. Would the action have any effects on commercial or recreational use of fish resources? (4.4)		✓
24. Would the proposed project in any way affect the water quality classification of nearby waters or be unable to be consistent with that classification? (5)		✓
25. Would the action result in any direct or indirect discharges, including toxins, hazardous substances, or other pollutants, effluent, or waste, into any waterbody? (5.1)		✓
26. Would the action result in the draining of stormwater runoff or sewer overflows into coastal waters? (5.1)		✓
27. Will any activity associated with the project generate nonpoint source pollution? (5.2)		✓
28. Would the action cause violations of the National or State air quality standards? (5.2)		✓

Policy Questions cont'd	Yes	No
29. Would the action result in significant amounts of acid rain precursors (nitrates and sulfates)? (5.2C)		✓
30. Will the project involve the excavation or placing of fill in or near navigable waters, marshes, estuaries, tidal marshes or other wetlands? (5.3)	✓	
31. Would the proposed action have any effects on surface or ground water supplies? (5.4)		✓
32. Would the action result in any activities within a federally designated flood hazard area or state-designated erosion hazards area? (6)	✓	
33. Would the action result in any construction activities that would lead to erosion? (6)		✓
34. Would the action involve construction or reconstruction of a flood or erosion control structure? (6.1)		✓
35. Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (6.1)		✓
36. Does the proposed project involve use of public funds for flood prevention or erosion control? (6.2)		✓
37. Would the proposed project affect a non-renewable source of sand ? (6.3)		✓
38. Would the action result in shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants? (7)	✓	
39. Would the action affect any sites that have been used as landfills? (7.1)		✓
40. Would the action result in development of a site that may contain contamination or that has a history of underground fuel tanks, oil spills, or other form or petroleum product use or storage? (7.2)	✓	
41. Will the proposed activity result in any transport, storage, treatment, or disposal of solid wastes or hazardous materials, or the siting of a solid or hazardous waste facility? (7.3)	✓	
42. Would the action result in a reduction of existing or required access to or along coastal waters, public access areas, or public parks or open spaces? (8)		✓
43. Will the proposed project affect or be located in, on, or adjacent to any federal, state, or city park or other land in public ownership protected for open space preservation? (8)	✓	
44. Would the action result in the provision of open space without provision for its maintenance? (8.1)		✓
45. Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreational space? (8.2)		✓
46. Will the proposed project impede visual access to coastal lands, waters and open space? (8.3)		✓
47. Does the proposed project involve publicly owned or acquired land that could accommodate waterfront open space or recreation? (8.4)		✓
48. Does the project site involve lands or waters held in public trust by the state or city? (8.5)	✓	
49. Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (9)		✓
50. Does the site currently include elements that degrade the area's scenic quality or block views to the water? (9.1)		✓

Policy Questions cont'd	Yes	No
51. Would the proposed action have a significant adverse impact on historic, archeological, or cultural resources? (10)		✓
52. Will the proposed activity affect or be located in, on, or adjacent to an historic resource listed on the National or State Register of Historic Places, or designated as a landmark by the City of New York? (10)	✓	

D. CERTIFICATION

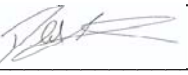
The applicant or agent must certify that the proposed activity is consistent with New York City's Waterfront Revitalization Program, pursuant to the New York State Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If the certification can be made, complete this section.

"The proposed activity complies with New York State's Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent Name: Champlain Hudson Power Express Inc. & CHPE Properties, Inc.

Address: Pieter Schuyler Building, 600 Broadway, Albany, New York, 12207

Telephone 518-465-0710

Applicant/Agent Signature:  Date: December 6, 2010

CHAMPLAIN HUDSON POWER EXPRESS PROJECT

COASTAL ZONE CONSISTENCY ASSESSMENT SUPPLEMENTAL INFORMATION

CHAMPLAIN HUDSON POWER EXPRESS PROJECT
COASTAL ZONE CONSISTENCY ASSESSMENT
SUPPLEMENTAL INFORMATION

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1.0 COASTAL ZONE CONSISTENCY ASSESSMENT

The Federal Coastal Zone Management Act and the New York State Waterfront Revitalization of Coastal Areas and Inland Waterways Act established direction for the appropriate use and protection of the nation's and New York State's coastal areas and waterways. As part of the New York State Coastal Management Program, 44 state coastal policies were developed. In some parts of the State, the coastal policies have been refined to take into account regional and local considerations. In New York City, the state coastal policies have been refined in the City's Waterfront Revitalization Program. Additionally, throughout the state, certain local municipalities have approved Local Waterfront Revitalization Programs (LWRPs) to address their specific local issues and concerns.

The Federal regulations that implement the consistency provisions of the Coastal Zone Management Act (CZMA) are found at 15 CFR Part 930, which establish the procedures to be followed in order to assure that federal agency activities are consistent with the enforceable policies of the New York State Coastal Management Program.

Any applicant for a federal agency license or permit is required to submit a certification that the proposed activity is consistent with all applicable state coastal policies. The consistency certification must include the following: a completed Federal Consistency Assessment Form; an identification of coastal policies affected by an applicant's proposed activity; a brief assessment of the effects of the activity on the applicable policies; and a statement indicating how the activity is consistent with each applicable policy.

A Coastal Management Plan Federal Consistency Assessment Form (FCAF) and a New York City Waterfront Revitalization Program Consistency Assessment Form (LWRP CAF) have been completed. The FCAF and the LWRP CAF identify those policies from their respective programs that are applicable or potentially applicable to the Project based on a review of the components of the Project located within the Coastal Area. Additionally, the Applicants performed a review of all other LWRPs that pertain to the territory within the Project area.

The CHPE Project has been sited and designed, and will be constructed and operated, in a manner that is consistent with the applicable New York State Department of State (NYSDOS) Coastal Management Program (CMP) State Coastal Policies, the New York City Local Waterfront Revitalization Program (LWRP) Coastal Policies, and all other applicable LWRPs within the Project area. The specific policies that are relevant to the Project are listed below and are accompanied by a brief description of the manner in which the Project is consistent.

2.0 NEW YORK STATE DEPARTMENT OF STATE COASTAL MANAGEMENT PROGRAM STATE COASTAL POLICIES

State Policy 2 - *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

The CHPE Project will involve solid state transmission cables buried and laid within waterways of the state (Lake Champlain, Hudson River, Harlem River, and East River).

The transmission cables will be sited, designed, and installed to avoid impacts to current and/or future water-dependent projects. The cables will make landfall and extend inland to a converter station in Yonkers, NY and a substation in Queens, NY. The cable landfall will be buried via HDD and will not affect the current and/or future siting of water-dependent uses at the waters edge with the exception of the required narrow utility easement (approximately 30 feet) for the buried cable. Additionally, the Yonkers converter station and the Queens substation are not located on waterfront properties.

State Policy 7 *- Significant Coastal Fish and Wildlife Habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

Where the transmission cables transition from land to water (i.e., Hudson River in Coeymans, NY) the Project will utilize HDD methods to install the cable. This method will be utilized to minimize disturbance to shoreline and nearshore coastal fish and wildlife habitats. The HDD entry/exit point is designed to enter/exit the water at a depth sufficient to avoid impacts to shoreline, intertidal and nearshore areas.

The proposed underwater cable route intersects with six Significant Coastal Fish and Wildlife Habitats (SCFWH): Esopus Estuary, Kingston Deepwater Habitat, Poughkeepsie Deepwater Habitat, Hudson rivermile 44-56, Haverstraw Bay, and the Lower Hudson Reach.

The deepwater area near the mouth of Esopus Creek is recognized as post-spawning and wintering habitat for shortnose sturgeon. The deepwater areas at Kingston and Poughkeepsie are recognized as spawning and wintering habitat for shortnose sturgeon. The deepwater area of Hudson Rivermile 44-56 is recognized as a spawning area for striped bass and wintering habitat for shortnose sturgeon. The deepwater area in Haverstraw Bay is recognized as wintering habitat for shortnose sturgeon. Atlantic sturgeon can also be expected to use this area, as well as overwintering striped bass. Shortnose sturgeon favor the channel areas of the Hudson and have been shown to use both naturally deep and dredged channels.

The Applicants will work cooperatively with agencies to determine appropriate work windows for cable installation in order to avoid Project activities during seasonal use of the aforementioned Significant Coastal Habitats. Where the Project route cannot avoid designated Significant Coastal Habitat, the cables will be installed within previously disturbed areas, such as the side slope of the federal navigation channel, which will also avoid the deep areas of the navigation channel favored by shortnose sturgeon.

State Policy 11 *- Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

Structures associated with the Project will be developed on a previously disturbed property in an urban/industrial zone and will not affect potential flooding or erosion in coastal areas. The cables associated with the Project will be buried underwater or

underground and the surface vegetation/topography will be restored to its original state. HDD methods will be utilized to install the cables at landfall locations in order to avoid impacts to the nearshore and shoreline areas.

State Policy 12 *- Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.*

See response to State Policy 11.

State Policy 15 *- Mining, excavation, or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

Along the majority of the Project's submarine cable route, cables will be buried approximately 3 to 4 ft beneath the lake/river bed utilizing a water-jetting machine. For these portions of the route, sediment will not be removed from the trench; instead, sediment fluidized during water-jetting will be allowed to naturally backfill the trench. Where the Project's submarine cable route crosses or is located within federal navigation channels, cable will be buried to the required depths utilizing water jetting techniques and where necessary, conventional dredging techniques. In the event that conventional dredging is required for cable installation and sediment removed from the trench cannot be re-used as backfill, such dredging will be kept to a minimum and the sediments will be appropriately re-used or disposed of pursuant to permit requirements. All portions of the submarine cable route will then be allowed to return to their pre-installation condition. Therefore, installation of the underwater portions of the transmission cable is not expected to interfere with natural coastal processes or increase erosion of adjacent lands.

State Policy 17 *- Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.*

At cable landfall locations, the cables will be installed via HDD methods to avoid impacts to the nearshore and shoreline areas.

State Policy 19 *- Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities.*

The Yonkers converter station site will be constructed on a private industrial site that is already disturbed and will not affect public access to the water.

Cables installation at shoreline crossings will be installed using HDD methods which will not result in impacts to public access to the waterbodies. Underwater cable burial will not result in impacts to public access. During construction, to protect the safety of the public, access will be restricted around active in-water construction locations. This work

will only occur on a small area of the overall waterbody and will be temporary in any one location, so impacts will be minor during the construction period.

State Policy 20 *- Access to publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.*

The Project will not affect access to publicly-owned foreshore lands or lands adjacent to the foreshore or the water's edge. See above response to State Policies 11 and 19.

State Policy 22 *- Development, when located adjacent to the shore, will provide for water-related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.*

The Project will not affect current or future development for water-related recreation at properties located adjacent to the shore.

State Policy 23 *- Protect, enhance and restore structures, districts, areas and sites that are of significance in the history, architecture, archaeology or culture of the state, its communities, or the nation.*

In general, the Project is unlikely to have a significant effect on standing historic structures, districts, areas or sites of significance within the Project's vicinity. With the exception of the newly constructed Yonkers converter station on a previously disturbed, industrial zoned area, the Project's infrastructure will be buried and will not have an effect on the viewshed. The converter station will be designed to match the character of the surrounding area, and is not expected to have an adverse impact on any historic properties in the vicinity.

The Applicants are in the process of conducting a detailed analysis of archaeological sites, historic properties, and shipwrecks along the Project route, including those resources listed in or eligible for inclusion in the National Register of Historic Places. The Project will avoid archaeological, historical and cultural resources to the greatest extent feasible. It is anticipated that, with appropriate avoidance and mitigation, no adverse impacts on these resources will occur.

State Policy 24 *- Prevent impairment of scenic resources of statewide significance.*

With the exception of the Yonkers converter station, the Project's principal components will be buried and will not have an effect on any viewsheds. The Yonkers converter station will be designed to match the character of the surrounding area, which includes existing industrial land use, and is not expected to have an adverse impact on any scenic resources.

State Policy 25 *- Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significant, but which contribute to the overall scenic quality of the coastal area.*

The transmission cables associated with the Project will be buried; there will be no overhead transmission cables. The Yonkers converter station will be built on an inland property in an existing industrial zoned area on a previously disturbed property. The converter station will be located within a building, which will be designed to blend with the architecture of the surrounding development. The Project will connect to an existing substation (currently under construction) on an inland property in Queens, NY. Therefore, the Project will not affect the overall scenic quality of the coastal area.

State Policy 27 *- Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Project has filed an application for a Certificate of Environmental Compatibility and Public Need (CECPN) under Article VII of the New York State Public Service Law. The Project will provide needed electricity to load centers in the NYISO via an HVDC transmission cable system that is primarily buried in the riverbed of coastal area waterways (Hudson River, Harlem River, and East River). The Project has been designed to utilize construction techniques to avoid or minimize environmental impacts. For example, the majority of the submarine cable will be installed using water-jetting methods, which minimize sediment transport and impacts to water quality. HDD methods will be used at cable landfall locations (i.e., Yonkers and Queens) in order to avoid potential impacts to nearshore and shoreline resource areas. Additionally, the Project's converter station and substation interconnections will be located on inland properties and will not require shorefront properties, other than narrow easements.

State Policy 28 *- Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding.*

Not applicable.

State Policy 30 *- Municipal, industrial, and commercial discharge of pollutants, including but not limited to toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

A three-dimensional hydrodynamic and time-variable water quality model was developed by the Applicants to assess water quality impacts and compliance with applicable water quality standards in the Hudson, Harlem and East Rivers. The model was used to simulate ten contaminants that were found in sediment cores collected during the Spring 2010 Marine Route Survey. The maximum model-computed concentrations of contaminants along the cable route were graphically presented and compared to New York State's water quality standards.

The effects of the proposed cable installation are projected to comply with state and national water quality standards that are based on protecting aquatic life from acute toxicity. These standards are the most appropriate criteria for the assessment of the proposed Project given the non-chronic (i.e., short-term) and incremental nature of the potential exposure to sediment contaminants resulting from the cable installation.

Effects of the proposed cable installation in portions of the Upper Hudson River PCB Superfund Site were also modeled. The model indicated that the projected maximum total PCB concentration during cable installation would be below the EPA's Engineering Performance Standard water quality criteria for dredging resuspension at the Hudson River PCBs Superfund Site (EPA 2003).

State Policy 32 *- Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

Not applicable.

State Policy 35 *- Dredging and filling in coastal waters and disposal of dredged material will be undertaken in a manner that meets existing state permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

During installation of the Project transmission cables, dredging and/or filling in coastal waters may be necessary in certain, limited areas. These areas may include limited areas of dredging within federal navigation channels or limited areas characterized as fill locations due to the use of rip rap or other protective cable coverings. However, subsequent to the installation of the Project, the area will be allowed to return to its original state.

The Applicants have conducted sediment sampling and analyses to characterize the sediment type and quality and has also conducted water quality modeling to ensure that the Project will be able to comply with applicable water quality standards. The Project will comply with all applicable federal and state laws and regulations regarding water quality, fish and wildlife habitats, wetlands, scenic resources, natural protective features, important agricultural lands, and important coastal resources in order to avoid or minimize potential affects to these resources by the Project. The Project will obtain all necessary permits associated with dredging or filling activities prior to commencement of work.

State Policy 36 *- Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

The Project transmission cables are solid state, i.e. they do not contain fluids. The cable installation equipment will likely include petroleum powered equipment; therefore, a spill prevention control and countermeasure (SPCC) plan will be developed and implemented, pursuant to state and federal regulations, during the use and/or storage of petroleum-containing equipment. The Project's converter station and substation interconnection may include the use or storage of petroleum or hazardous materials. An SPCC plan or its equivalent will be developed for these facilities.

Surface and groundwater resources, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources will be protected by implementing diligent management of any petroleum and hazardous materials during all construction and operation activities.

State Policy 37 *- Best Management Practices will be utilized to minimize the non-point discharge of excess nutrients, organics, and eroded soils into coastal waters.*

Soil erosion and sediment movement will be minimized during construction and operation via erosion control measures and soil stabilization protocols, which will be implemented as necessary to protect the aquatic resources in the area. The Applicants are developing standard Best Management Practices (BMPs) for construction that are currently under review by state agencies.

State Policy 38 *- The quality and quantity of surface water and groundwater supplies will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.*

The Project is comprised of solid state transmission cable; therefore, the cables do not contain any potentially polluting fluids. Equipment located at the converter station and interconnection site may contain petroleum or hazardous substances; SPCC plans or their equivalent will be developed to ensure that appropriate spill prevention, countermeasure, and contingency measures are implemented wherever Project features present a risk of spill or discharge to waters of the United States.

The Project is required to obtain a water quality certification pursuant to Section 401 of the Clean Water Act. The Project will comply with all requirements of the water quality certification.

Surface and groundwater resources will be protected by implementing diligent management of any hazardous substances on the sites and erosion control measures to prevent sediment transport to the waterway. Applicants have made Freedom of Information Requests for information on drinking water intake systems to four

municipalities who rely upon the Hudson River for water supply. The Applicants will employ Best Management Practices and other protocols so that potential impacts from the Project are commensurate with other natural processes and routine activities in the Hudson River (i.e., storm events, boat traffic, maintenance dredging of navigation channels, etc.)

State Policy 39 *- The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, Significant Fish and Wildlife Habitats, recreation areas, important agricultural land, and scenic resources.*

Surface and groundwater resources, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources will be protected by implementing diligent management of any solid wastes during all construction activities. Best Management Practices will be used to protect the aforementioned resources.

State Policy 40 *- Effluent discharges from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.*

Not applicable.

State Policy 41 *- Land use or development in the coastal area will not cause national or state air quality standards to be violated.*

The Project will obtain all applicable air quality permits; therefore, no violations of national or state air quality standards during its construction or operation stages.

State Policy 43 *- Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors: nitrates and sulfates.*

The Project will not generate emissions that release nitrates or sulfates to the atmosphere during operation.

State Policy 44 *- Preserve and protect tidal and freshwater wetland and preserve the benefits derived from these areas.*

Subsequent to cable installation, the area will be restored to its original condition. Therefore, any wetlands crossed by the land or submarine cables will remain wetlands after construction. At the Project's landfall locations (i.e., Yonkers and Queens), HDD methods will be used to install the cables in order to avoid potential impacts to nearshore and shoreline resource areas (i.e., wetlands). The HDD is expected to exit the water at a depth sufficient to avoid impacts to intertidal and foreshore areas.

The Yonkers converter station and the Queens interconnection point are located in industrial zones. No wetlands are located at these sites; therefore, construction at these sites will not result in any direct or indirect impacts to wetlands.

3.0 NEW YORK CITY LOCAL WATERFRONT REVITALIZATION PROGRAM COASTAL POLICIES

The CHPE Project is a HVDC transmission system extending from the international border between Canada and the United States to New York City. The Project's HVDC transmission cables will be buried either underground or underwater for the entire route. In New York City, the Project's transmission cables will be buried beneath the riverbed of the Hudson River, Harlem River, and East River before making landfall in Queens, New York where the cables will extend inland for approximately 1 mile to terminate at a spare bay at the 345-kV substation currently under construction by the New York Power Authority on land owned by Con Edison. HDD methods will be utilized at the landfall location in Queens, New York to transition the cables from water to land while avoiding impacts to the shoreline or nearshore areas. Because the cables will be located beneath the waters edge, no waterfront property in New York City is needed to develop this Project, with the exception of a narrow (approximately 30 ft) easement.

Local Policy 2.1 - *Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.*

The Project is not located in a designated Significant Maritime and Industrial Area (SMIA). The interconnection point at a substation currently under construction (land owned by Con Edison) in Queens, New York is located in a commercial/industrial zone and is not located on a waterfront site. The Project will be designed so as not to affect potential maintenance dredging activities within the navigation channels, which support and promote the development and operation of working waterfront uses. Therefore, the Project will not affect the promotion of water-dependent and industrial uses in SMIAs.

Local Policy 2.3 - *Provide infrastructure improvements necessary to support working waterfront uses.*

The Project's transmission cables will be sited outside the designated navigation channels wherever possible. In areas where a designated navigation channel cannot be avoided, the cables will either be buried within the side slopes associated with the navigation channel or buried within the navigation channel to the depth required by applicable federal and state agencies to avoid impacts to current or future dredging activities located within these navigation channels. The Project will have no other affects on infrastructure supporting the working waterfront uses.

In the event that dredging is required to install the Project's cables, dredge material will be characterized to determine the most appropriate/beneficial reuse or disposal for the material that will not interfere with working waterfront uses.

Local Policy 3.1 *- Support and encourage recreational and commercial boating in New York City's maritime centers.*

The Project is designed to have no long-term impacts to recreational and commercial boating in New York City's maritime centers. During the short-term construction phase of the Project, a cable-laying vessel will be utilized to transport and lay the cable on the riverbed, and a remote operated vehicle (ROV) will be utilized to bury the transmission cable beneath the riverbed. During the construction phase, notifications will be released to alert commercial and recreational boaters to avoid the areas where cable installation is underway, but such avoidance will be highly localized and of temporary duration. Subsequent to construction, there will be no impacts to recreational or commercial boating caused by the Project.

Local Policy 3.3 *- Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.*

During construction, the cable laying vessel is likely to have petroleum containing equipment on-board. The vessel will utilize best management practices to prevent potential spillage of petroleum products. The vessel will also be equipped and trained to control and respond to a spill in the unlikely event one occurs. The vessel will comply with all applicable laws and regulations related to discharges of waste from the vessel; no waste discharges are anticipated from the vessel. The Project's transmission cables are solid-state cables which contain no liquid, thereby eliminating the potential for a discharge from the cable.

Local Policy 4 *- Protect and restore the quality and function of ecological systems within the New York City coastal area.*

The Project will utilize specific construction windows and techniques designed to avoid or minimize potential impacts to important ecological systems. The Applicants will continue to work with the appropriate federal, state, and local agencies and stakeholders to incorporate best management practices to avoid and minimize any potential impacts to important ecological systems. Operation of the Project is not expected to result in any impacts to any important ecological systems, including those within the New York City coastal areas.

Local Policy 4.1 *- Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas, Recognized Ecological Complexes, and Significant Coastal Fish and Wildlife Habitats.*

The Project consists of the burial of HVDC and HVAC transmission cables within waterways of New York City. The cables will be installed primarily via water-jetting techniques, which are designed to minimize impacts to the riverbed and surrounding water quality. For short sections of the Project route, cable burial may not be feasible due to riverbed conditions (i.e., bedrock). In these locations, the cables will be laid on the riverbed with protective coverings (i.e., concrete mattresses or rip-rap). In these

instances, the protective coverings are not anticipated to represent a change in the ecological habitats because the rip-rap will be consistent with the pre-existing hard bottom habitat. Subsequent to installation, the ecological habitats will be allowed to return to their pre-existing condition through natural processes

Local Policy 4.2 *- Protect and restore tidal and freshwater wetlands.*

The Project has been designed to avoid or minimize impacts to tidal and freshwater wetlands. The transmission cables will be buried beneath the riverbed, which will subsequently be allowed to return to its pre-existing condition through natural processes.

Local Policy 4.3 *- Protect vulnerable plant, fish and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.*

The Applicants are consulting with federal, state, and local agencies, as applicable, regarding Endangered Species, Threatened Species, Exploitably Vulnerable Species, and Rare Species that may be located within the Project area. The Project will be designed to avoid or minimize impacts to these species to the greatest extent possible.

Local Policy 5.3 *- Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.*

Installation of the Project has been designed to comply with federal and state dredging permit requirements, where applicable. Construction windows and best management practices will be utilized to avoid or minimize impacts to water quality and associated aquatic life.

Local Policy 6 *- Minimize loss of life, structures, and natural resources caused by flooding and erosion.*

The Project will not affect flooding or erosion.

Local Policy 6.3 *- Protect and preserve non-renewable sources of sand for beach nourishment.*

The Project will not affect non-renewable sources of sand for beach nourishment.

Local Policy 8 *- Provide public access to and along New York City's coastal waters.*

The Project is a buried transmission cable and will not affect public access to or along New York City's coastal waters.

Local Policy 8.5 *- Preserve the public interest in and use of lands and waters held in public trust by the state and city.*

The Project will require a permitted corridor / easement for the transmission cables buried beneath the riverbed of the Hudson, Harlem, and East Rivers. However, the required easement will be narrow (~30 ft) and will not affect the public interest and use of lands and waters held in public trust by the state and city.

Local Policy 10 *- Protect, preserve and enhance resources significant to the historical, archaeological, and cultural legacy of the New York City coastal area.*

In the spring of 2010, a detailed marine route survey was completed along the Project's entire submarine route, which included the collection of data related to historical, archaeological, and cultural resources along the route. The Project route is being sited and designed based on the results of the spring 2010 survey (and additional surveys, where necessary) in order to avoid impacts to the resources identified.

4.0 LOCAL WATERFRONT REVITALIZATION PLAN (LWRP) ASSESSMENT

Municipalities that border coastal areas and inland waterways prepare LWRPs, in conjunction with the NYSDOS, for the preservation, enhancement, protection, development and use of the state's coastal and inland waterways. Projects which may impact coastal areas or inland waterways must be reviewed for consistency with those LWRPs that pertain to territory within the Project area. The information below includes a review of consistency with LWRPs for both the underwater portions of the Project and the terrestrial portions of the Project potentially located in close proximity to coastal or waterfront areas.

There are 24 municipalities with LWRPs along the cable route, which are listed below in order from the Canadian border south to New York City:

- Town of Essex
- Village of Whitehall
- Town of Schodack/Village of Castleton-On-The-Hudson
- Village of Athens
- Village of Tivoli
- Village of Saugerties
- Town of Redhook
- City of Kingston
- Town of Rhinebeck
- Town of Esopus
- Town of Poughkeepsie
- Town of Lloyd
- City of Beacon

- City of Newburgh
- City of Peekskill
- Town of Stony Point
- Village Haverstraw
- Village of Croton on the Hudson
- Village of Ossining
- Village of Nyack
- Village of Sleepy Hollow
- Village of Piermont
- Village of Dobbs Ferry
- New York City

The Applicants conducted an evaluation of all 24 LWRPs, which consist of state waterfront policies refined to reflect local conditions and circumstances as well as local policies. Additional local policies that relate to the Project are evaluated on a case-by-case basis below. Overall, the LWRP evaluation indicates that the Project is consistent with all of the LWRPs within the Project's proximity.

Additional supporting information has been previously submitted to numerous federal agencies (USACE) and New York State agencies (NYSDOS, NYSDPS, NYSDEC, etc) as part of the March 30, 2010 application to the New York State Public Service Commission for Certificate of Environmental Compatibility and Public Need pursuant to Article VII of the Public Service Law ("Article VII Application"). In particular, Exhibit 4 of the March 2010 Article VII Application includes a comprehensive analysis of the affected environment along the proposed Project route. Additional supporting information was submitted in a supplemental filing in July 2010 ("July 2010 Article VII Supplement")

4.1 Town of Essex

The Town of Essex has identified Split Rock Mountain, Webb Royce Swamp, Essex "Station" and the Boquet River as significant fish and wildlife habitats. Split Rock Mountain, Webb Royce Swamp and Essex "Station" are adjacent to the coastal zone area and will not be affected by this project. The Boquet River discharges into Lake Champlain and will not be affected by this project.

Policy 5 *- Protect and restore ecological resources, including significant fish and wildlife habitats, wetlands and rare ecological communities (similar to State Policy 7).*

> This Project's component in the Town of Essex involves the placement of HVDC cables in the bed of Lake Champlain using water jetting and/or trenching to open up the benthic substrate, lay the cable and re-contour the bottom. The Applicants have and will continue to work cooperatively to ensure that the Project is designed, sited, installed, and operated in a manner that protects and restores important ecological resources.

Additional information regarding fish and wildlife habitats, wetlands, and rare ecological communities was submitted within Exhibit 4 of the March 2010 Article Application. Also, see above response to State Policy 7.

Policy 6 *- Protect and improve water resources (similar to State Policy 38).*

The March 2010 Application (Exhibit 4) included an evaluation of existing water quality along the submarine portions of the Project route. Subsequently, a marine route survey (July 2010 Supplement to Article VII Application) was performed, which sampled sediments for the presence of contaminants. Sediment chemistry and water quality are linked because cable installation will disturb sediments and have the potential to suspend contaminants.

The Applicants conducted a water quality modeling study to predict the distribution and movement of suspended sediment generated by water jetting for cable installation. The study provides a basis for estimating water quality effects and for developing a water quality monitoring plan. Additional sediment chemistry data will be collected to refine observed contaminant distribution and to provide current sediment chemistry data for specific locations for puposes of HDD and conventional dredging.

Water quality is assessed through limits on selected water quality parameters that are conditions of the Project permits. Compliance with these limits will be established through monitoring of installation process and adjustments to cable installation operations when needed to avoid non-compliance.

A suspended sediment and water quality monitoring plan will be developed in consultation with federal and state authorities and agencies, which will outline the mitigation measures to eliminate or minimize impacts to water resources along the route.

For additional information, see above response to State Policies 30 and 38.

Policy 6.3 *- "Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, and wetlands" (State Policies 34 and 35).*

The boundaries of any wetlands, streams and other water resources along the Project 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 mapped and prior to construction all field identified sensitive resources will be flagged to ensure resource protection. Protective measures will be implemented to ensure minimization of impacts to wetlands and other water resources potentially resulting from sedimentation, erosion, turbidity, unanticipated spills or leaks of fuel, and/or hazardous materials.

In general, impacts to marshes, estuaries, and wetlands in the Project area are expected to be temporary and limited to the construction-phase of the Project. The Project has been designed to avoid marshes, estuaries, and wetlands, wherever possible. Where wetlands

cannot be avoided, the Applicants will implement appropriate protection measures during construction to minimize and/or mitigate for any impacts to benefits derived from these resources. Draft protection measures are currently under review by state agencies but the final protocols are likely to include the following:

a) Applicants will minimize work within and across streams, wetlands, or other water resources to the extent possible during preconstruction, construction, operation, and maintenance activities.

b) Applicants will notify appropriate agencies at least five (5) business days prior to construction involving federal and/or state-regulated wetland crossings.

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.

d) To the extent possible, work which must be in a wetland shall be scheduled to be started and completed in the dry 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. The exception to this 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.

g) Construction equipment operating within wetlands will be limited primarily to those 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 will be 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.

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 hazardous materials.

l) Construction equipment will not be washed in wetlands or within one hundred (100) feet of any wetland unless specified to minimize the spread of invasive species. Run-off resulting from washing operation shall not be permitted to directly enter any watercourses or wetlands.

m) Any temporary access routes or parking areas adjacent to wetlands and waterbodies will be graded to direct runoff away from water resources.

n) Spoil or 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.

o) Unless work activities will resume within fourteen (14) days, Applicants 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.

p) 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.

4.2 Village of Whitehall

Policy 5.1 *- Protect significant coastal fish and wildlife habitats.*

The Applicants will work closely with NYSDOS, NYSDEC, the New York Natural Heritage Program (NYNHP) and local municipalities to avoid or minimize disturbance to these areas.

Additional information was provided in Exhibit 4 of the Article VII Application. Also, see above response to State Policy 7.

4.3 Town of Schodack and Village of Castleton-on-the-Hudson

Policy 7 *- The Town of Schodack and Village of Castleton-on-the-Hudson note that habitat protection is vital to ensuring the survival of fish and wildlife populations. The town has*

adopted the Significant Fish and Wildlife habitat "habitat impairment test" and defines "habitat destruction", "significant impairment" and "tolerance range."

See above response to State Policy 7.

Policy 7A - *The Papscanee Marsh and Creek habitat shall be protected, preserved and restored where practicable so as to maintain its viability as a habitat.*

Papscanee Marsh and Creek are listed as a Significant Fish and Wildlife Habitat with a significance rating of 48. This area will be avoided by the Project.

The Project will not destroy or cause significant impairment to any habitats in the Town of Schodack or Village of Castleton-on-the-Hudson.

See above response to State Policy 7.

Policy 7B - *The Schodack and Houghtaling Islands and Schodack Creek habitat shall be protected, preserved and restored where practicable so as to maintain its viability as a habitat.*

The Schodack and Houghtaling Islands and Schodack Creek habitat are listed as Significant Fish and Wildlife Habitat by the NYSDOS, with a significance rating of 77. A portion of this 1,800 acre parcel is an undeveloped state park.

This area will be avoided by the Project.

4.4 Village of Athens

All of the Village of Athens' policies were reviewed and found to be consistent with the assessment of State Policies described above.

4.5 Village of Tivoli

Policy 7 - *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

Sections of North and South Tivoli Bay are within the Village of Tivoli. This is a Significant Coastal Fish and Wildlife Habitat recognized by DOS with a significance rating of 162.

This area will be avoided by the Project.

Policy 7A - *The locally significant habitats of Stony Creek and the Hudson River along Tivoli's waterfront will be protected, preserved and improved. The Hudson River Bluffs, Tivoli Bay, and Stony Creek should be protected from overdevelopment.*

This Project will avoid Tivoli Bay and Stony Creek and will not induce development in the area.

4.6 Village of Saugerties

Policy 7 - *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

The Esopus Estuary has been designated a Significant Coastal Fish and Wildlife Habitat by the NYSDOS. It has a significance rating of 98. The boundary of the Esopus Estuary extends across the Hudson River. It is impossible to avoid the boundary area of the Esopus Estuary.

The proposed cable route will be sited on the east side of the Hudson River and will minimize impacts and would not result in a direct loss of habitat.

Policy 44A - *Preserve wetlands from development and pollution and encourage wildlife activity through enforcement of existing state regulations, establishment of wetland zones and undertaking measures to eliminate pollution sources.*

This is a local policy related to NYSDOS Policy 44.

See above response to Town of Essex Policy 6.3.

4.7 Town of Red Hook

Policy 7 - *Significant Coastal Fish and Wildlife Habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

Policy 7A - *Protect the areas identified as significant habitat areas by the NYSDOS as well as the creeks, kills, wetland and cove areas draining into and adjacent to the Hudson River from alteration and/or pollutant discharge by residential, commercial, agricultural or industrial uses in order to maintain their viability as habitat areas.*

There are three significant habitats in the Red Hook LWRP area: The Esopus Estuary, the Flats and North and South Tivoli Bays. Impacts to these areas will be avoided or minimized as described in the above response to State Policy 7.

Policy 23A - *Conserve, protect, preserve and, if appropriate, promote the adaptive reuse of places, sites, structures, views and features in the coastal area of the Town of Red Hook of special historic, cultural or archaeological significance or which by reason of association with notable people or events, or of the antiquity or uniqueness of architectural and landscape design particular significance to the heritage of the town.*

The construction of the buried cables will have no adverse impact on these resources.

Policy 38A - *Work to re-establish and maintain the Saw Killwater quality surveillance program.*

This local policy is not applicable as the Project is not in proximity to this resource nor will it affect it.

4.8 City of Kingston

Policy 7 - *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

Policy 7A - *The Rondout Creek habitat shall be protected, preserved and, where practical, restored so as to maintain its viability as a habitat.*

Rondout Creek is a Significant Coastal Fish and Wildlife Habitat recognized by NYSDOS with a significance value of 70.

This SCFWH will be avoided by the Project.

Policy 7B - *The locally important habitat at Kingston Point Park, also known as K.E.4, shall be protected, preserved and, where practicable, restored so as to maintain its viability as a habitat.*

This mudflat freshwater wetland area will be avoided by the Project.

Another Significant Coastal Fish and Wildlife Habitat recognized by NYSDOS is the Kingston Deep Water habitat with a significance rating of 110. This six mile long habitat extends from the City of Kingston to Rhinecliff and varies in depth from 30 to 50 feet.

A detailed discussion of potential impacts and mitigation for the Kingston Deepwater habitat is provided in Exhibit 4 of the March 2010 Article VII Application. Cable installation is not expected to result in a change in overall depths in the Kingston Deepwater Habitat, and sediment deposition beyond the trench is expected to be negligible. BMPs will be employed during cable installation to mitigate any potential adverse impacts.

See above response to State Policy 7.

4.9 Town of Rhinebeck

Policy 7 *- Significant coastal fish and wildlife habitats will be protected, preserved and, where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

Policy 7A *- The Vanderburgh Cove and Shallows Habitat shall be protected, preserved and, where practical, restored so as to maintain its viability as a habitat.*

Vanderburgh Cove and Shallows Habitat is a Significant Coastal Fish and Wildlife Habitat recognized by NYSDOS with a significance rating of 20.

These areas will be avoided by the Project.

Policy 7B *- The Kingston Deepwater Habitat shall be protected, preserved and, where practical, restored so as to maintain its viability as a habitat.*

The Kingston Deep Water Habitat is recognized by NYSDOS and has a significance rating of 110. This six mile long habitat extends from the City of Kingston to Rhinecliff and varies in depth from 30 to 50 feet.

A detailed discussion of potential impacts and mitigation for the Kingston Deepwater habitat is provided in Exhibit 4 of the Article VII Application. Cable installation is not expected to result in a change in overall depths in the Kingston Deepwater Habitat, and sediment deposition beyond the trench is expected to be negligible. BMPs will be employed during cable installation to mitigate any potential adverse impacts.

Policy 7C *- The Flats Habitat shall be protected, preserved and where practical, restored so as to maintain its viability as a habitat.*

The Flats Habitat is a Significant Coastal Fish and Wildlife Habitat recognized by NYSDOS with a significance rating of 118. This area is a four and one half mile long ridge running down the middle of the Hudson River. It is less than 10 feet deep at mean low water. The navigational channel runs down the Hudson River to the west of this area.

The Project is not expected to cross this SCFWH.

Policy 7D *- Support efforts to protect and enhance the natural resources of Ferncliff Forest, Snyder Swamp and the Mudder Kill.*

These areas will not be affected by this Project.

Policy 7E *- Protect the creeks, freshwater tidal wetlands, and freshwater tidal cove areas draining into and adjacent to the Hudson River from alteration and/or pollutant discharge by residential, commercial, agricultural or industrial uses.*

These areas will not be affected by this Project.

4.10 Town of Esopus

Policy 7 *- Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

Policy 7A *- The locally important Kingston and Poughkeepsie deepwater habitats shall be protected and preserved so as to maintain their viability as habitats.*

Since this LWRP was adopted, these two areas have been recognized as Significant Coastal Fish and Wildlife Habitats.

The Kingston Deep Water Habitat is recognized by NYSDOS and has a significance rating of 110. This six mile long habitat extends from the City of Kingston to Rhinecliff and varies in depth from 30 to 50 feet.

The Poughkeepsie Deep Water Habitat is recognized by NYSDOS and has a significance rating of 110. This habitat extends 14 miles from the Village of West Park to the Hamlet of Marlboro. Depths range from 30 to 50 feet with one area, Crum Elbow, having depths exceeding 125 feet.

A detailed discussion of potential impacts and mitigation for these SCFWHs is provided in Exhibit 4 of the Article VII Application. Cable installation is not expected to result in a change in overall depths in either the Kingston or Poughkeepsie Deep Water Habitats, and sediment deposition beyond the trench is expected to be negligible. BMPs will be employed during cable installation to minimize any potential adverse impacts.

Policy 7B *- The locally important Rondout Creek Habitat shall be protected and preserved so as to maintain its viability as habitat.*

Since the adoption of this LWRP, the Rondout Creek has been designated a Significant Coastal Fish and Wildlife Habitat by NYSDOS with a significance value of 70.

This significant habitat will be avoided by the Project.

Policy 7C - *The locally important Esopus Meadows Habitat shall be protected and preserved so as to maintain its viability as habitat.*

Since the adoption of this LWRP, Esopus Meadows Habitat has been recognized by the NYSDOS as a Significant Coastal Fish and Wildlife Habitat with a significance rating of 71. Esopus Meadows is a shoal of approximately 350 acres.

This area will be avoided by the Project.

Policy 7D - *The other identified local habitat "the map turtle basking rocks" shall also be protected from the adverse impacts of use or development.*

This area will be avoided by the Project.

4.11 Town of Poughkeepsie

Policy 7 - *Significant coastal fish and wildlife habitats will be protected, preserved and, where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

There are two Significant Coastal Fish and Wildlife Habitats in the Town of Poughkeepsie, the Poughkeepsie Deepwater Habitat and Wappinger Creek.

The Poughkeepsie Deep Water Habitat is recognized by NYSDOS and has a significance rating of 110. This habitat extends 14 miles from the Village of West Park to the Hamlet of Marlboro. Depths range from 30 to 50 feet with one area, Crum Elbow, having depths exceeding 125 feet.

Wappinger Creek is on the east side of the Hudson River between Poughkeepsie and Wappinger. It has a significance rating of 54.

This area will be avoided by the Project.

4.12 Town of Lloyd

Policy 7 - *Significant coastal fish and wildlife habitats will be protected, preserved and, where practical, restored so as to maintain their viability as habitats.*

See above response to State Policy 7.

Policy 7A - *To preserve and protect the viability of the Poughkeepsie Deep Water Habitat and the Shortnose Sturgeon, which is considered an endangered species.*

The Poughkeepsie Deep Water Habitat is recognized by NYSDOS and has a significance rating of 110. This habitat extends 14 miles from the Village of West Park to the Hamlet

of Marlboro. Depths range from 30 to 50 feet with one area, Crum Elbow, having depths exceeding 125 feet.

A detailed discussion of potential impacts and mitigation for these SCFWHs is provided in Exhibit 4 of the Article VII Application. Cable installation is not expected to result in a change in overall depths in the Poughkeepsie Deep Water Habitat, and sediment deposition beyond the trench is expected to be negligible. BMPs will be employed during cable installation to minimize any potential adverse impacts. Potential impacts and mitigation for shortnose sturgeon is described in the Article VII Application.

Policy 7B - *Protect, preserve and enhance the wooded bluffs of the Hudson River shore, which is habitat to the bald eagle (an endangered species), the osprey (threatened) and peregrine falcon as well as many other bird species.*

The Project will avoid these areas.

Policy 8A - *Protect fish and wildlife resources in the waterfront area from any possible hazardous wastes and other pollutants which may be present anywhere within the waterfront area, including the Costantino Landfill.*

This Project is designed to avoid disturbance of any hazardous wastes or other pollutants which may be present anywhere within the waterfront area, it will not generate hazardous wastes, and it incorporates protections to avoid introduction of other pollutants to that area.

Policy 18A - *Safeguard the vital economic, social and environmental interests of the Town of Lloyd and its citizens in the evaluation of any proposal for an additional Hudson River crossing - either a new bridge or second deck - which would impact the town*

This local policy is not applicable to this Project.

Policy 35A - *Spoils from dredging of the navigational channel of the Hudson River, or of any areas of the river or the coastline which may require it, shall not be disposed of in the Poughkeepsie Deepwater Habitat.*

If any dredge spoil results from this Project, it will be disposed of in accordance with all state, federal and local requirements, and will not be disposed of in the Poughkeepsie Deepwater Habitat.

4.13 City of Beacon

Policy 7A - *The Fishkill Creek Estuary and marsh shall be protected, preserved, and where practical, restored so as to maintain its viability as a habitat. This Significant Coastal Fish and Wildlife Habitat has a significance rating of 54 and consists of an 80 acre estuary. (West Point North map)*

This area will be avoided by the Project.

Policy 8A - *Prohibit the discharge of untreated effluent and pollutants from commercial and industrial facilities along Fishkill Creek.*

This local policy does not apply to this Project.

Policy 23A - *Encourage the restoration and adaptive reuse of large historic estates, such as the mill buildings on Fishkill Creek.*

The Project does not involve the opportunity to restore or reuse large historic estates.

Policy 35A - *Dredging shall not occur during fish spawning season and will not be carried out without a U. S. Army Corps of Engineers Section 10 and/or 404 permit, and /or DEC Part 608 and 663 permits.*

The Project will abide by specific conditions of issued USACE Section 10/404 and/or DEC Part 608 and 663 permits, which include fish spawning timing issues. In addition, construction activity will be timed to minimize impacts to fish spawning as described in Exhibit 4 of the Article VII Application.

Policy 35B - *Spoils should not be deposited in wetlands or significant fish and wildlife habitats as identified in the LWRP inventory.*

Dredge spoil as a result of this Project will be disposed of in accordance with all state, federal and local requirements.

Policy 35C - *Reclamation of spoils sites, including landscaping, shall be conducted where it is practical to do so.*

This Project does not involve the use of spoil sites, so reclamation is not appropriate.

Policy 35D - *Groundwater contamination shall be avoided.*

The installation of the cables along the bottom of the Hudson River is designed to avoid groundwater contamination.

Policy 35E - *Spoils site design will incorporate considerations for natural features, viewsheds, and shall, where feasible, conform to existing land form.*

Spoil site development is not a component of this Project; therefore, this policy does not apply.

Policy 35F - *No deposition shall occur without testing of sample soils for toxicity.*

If dredging occurs within the limits of Beacon, dredge spoil will most likely be removed for proper disposal rather than deposited back in the trench.

Policy 35G - *Toxic or hazardous dredge spoils shall not be deposited within the waterfront boundary. The potential of worked out mines as dredge spoil sites will be investigated.*

Any dredge spoil generated, as a result of this Project will be disposed of in accordance with all state, federal and local requirements.

Policy 44A - *Preserve and protect the Fishkill Creek Marsh to maintain its many intrinsic values.*

Fish Creek Marsh Significant Coastal Fish and Wildlife Habitat has a significance rating of 54 and consists of an 80 acre estuary.

This area will be avoided by the Project.

4.14 City of Newburgh

Policy 7A - *Activities that would adversely affect fish resident in or migrating through waters adjacent to Newburgh will be avoided.*

The Applicants will comply with this local policy by avoiding, minimizing or mitigating impacts to fisheries, as described in the above response to State Policy 7 and in Exhibit 4 of the Article VII Application.

Policy 8A - *New developments or expansion of existing facilities will not be permitted if such facilities introduce hazardous wastes or other pollutants into the environment or if they are unable to acquire the necessary state, federal, and local permits.*

This Project does not anticipate introducing hazardous wastes or other pollutants into the environment since the cables do not contain these substances and cables are the only project feature proposed for placement within the City of Newburgh.

Policy 18A - *Maintain and improve existing low and moderate income housing.*

This local policy is not applicable to this Project.

Policy 23A - *No changes in any exterior architectural feature, including, but not limited to, construction, alteration, restoration, removal, demolition, or painting, shall be made to identified resources except as hereinafter provided.*

This local policy is not applicable to this Project.

Policy 44 - *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

In addition to generally avoiding most tidal wetland habitats as described in Exhibit 4 of the Article VII Application, this Project will specifically avoid Quaissaick Creek tidal wetland, which is noted as locally important.

4.15 City of Peekskill

Policy 7A - *Fish and wildlife habitats of local importance are of value to the city and its natural resource inventory and shall be protected, preserved and, where practical, restored so as to maintain their viability.*

This local policy refers to Camp Smith Marsh, Annsville Creek, Peekskill Hollow Brook and the McGregory Brook, as well as Nose and Bald Mountains north of the city.

These habitats of local significance are not in proximity to the Project and will not be impacted by this Project.

4.16 Town of Stony Point

Policy 7A *- The Iona Island Marsh shall be protected, preserved and, where practical, restored so as to maintain its viability as a habitat.*

The Iona Island Marsh has a significance value of 71. It is comprised of approximately 270 acres of freshwater, tidal and brackish wetlands.

This area is along the west side of the Hudson River and will be avoided by this Project.

Policy 7B - *The Haverstraw Bay habitat shall be protected, preserved and, where practical, restored so as to maintain its viability as a habitat.*

Haverstraw Bay is a significant habitat with a significance value of 166. The bay encompasses a six mile stretch of the Hudson River from Stony Point to Croton Point. Average depth at mean low water is approximately 15 feet. Salinity in the area varies by year, but Haverstraw Bay is an important habitat for fish nurseries. The navigational channel is located on the west side of the bay and maintained at approximately 35 feet in depth.

The Applicants will move its cable into the previously and periodically disturbed side slope of the navigational channel so as to minimize impacts to Haverstraw Bay.

Policy 7C *- The Hudson River Mile 44 - 56 habitat shall be protected, preserved and, where practical, restored so as to maintain its viability as a habitat.*

This significant habitat runs from Cornwall Bay to Peekskill Bay. It is a 12 mile long deep water habitat reaching depths of up to 200 feet. The bay has strong currents and a rocky substrate. It is considered the southernmost extent of freshwater in the Hudson River and is an important spawning area.

Detailed information on potential impacts and mitigation are provided in Section 4.8.4.3 of the Application. Cable installation is not expected to result in a change in overall depths, and sediment deposition beyond the trench is expected to be negligible. BMPs will be employed during cable installation to minimize any potential adverse impacts.

Policy 23A *- Stabilize and revitalize the historic residences and neighborhoods on River Road, Munn Avenue and Grassy Point Road.*

This Project is not located in or near these areas and will have no impact on these resources, and so this policy is not applicable.

4.17 Village of Haverstraw

Policy 7A *- The Haverstraw Bay Habitat shall be protected, preserved and where practical, restored so as to maintain its viability as habitat.*

Haverstraw Bay is a significant habitat with a significance value of 166. The bay encompasses a six mile stretch of the Hudson River from Stony Point to Croton Point. Average depth at mean low water is approximately 15 feet. Salinity in the area varies by year, but Haverstraw Bay is an important habitat for fish nurseries. The navigational channel is located on the west side of the bay and is maintained at approximately 35 feet in depth.

The Applicants will move its cable into the previously and periodically disturbed side slope of the navigational channel so as to minimize impacts to Haverstraw Bay.

Policy 8A *- Control the introduction of new industries or technology which could increase the presence of hazardous materials within the Haverstraw coastal area.*

This Project's scope within the Village boundaries only involves the installation of HVDC cables, which do not contain any hazardous materials.

Policy 8B *- Encourage existing industrial productions or storage facilities to utilize the most current technologies available to minimize the potential threat from hazardous wastes or pollutants to the surrounding environment.*

This Project does not involve industrial or storage facilities.

Policy 23A - *Stabilize and revitalize the historic residences and neighborhoods on First Street and Hudson Avenue as well as other selected areas.*

This Project is not located in or near these areas and will have no impact on these resources; therefore, this policy is not applicable.

Policy 23B - *Preserve and protect underwater historic, archaeological and cultural resources in Haverstraw Bay.*

The Applicants proposes to place the underwater transmission cables within the existing navigational channel in Haverstraw Bay, which should minimize any potential impacts to underwater resources since these areas have been previously disturbed. Exhibit 4 of the Article VII Application provides a detailed discussion of underwater historic, archaeological and cultural resources in the vicinity of the Project.

4.18 Village of Croton on the Hudson

Policy 7A - *The quality of the Croton River and Bay Significant Fish and Wildlife Habitat and Haverstraw Bay Significant Fish and Wildlife Habitat shall be protected and improved for conservation, economic, aesthetic, recreational, and other public uses and values. Its resources shall be protected from the threat of pollution, misuse, and mismanagement.*

Croton River and Bay is a significant habitat with a significance value of 24. The bay is comprised of approximately 1,200 acres of submerged aquatic vegetation and mudflats and is located at the south eastern edge of Haverstraw Bay. Most of the Croton River has been diverted for public water supplies.

This area will be avoided by the Project.

Haverstraw Bay is a significant habitat with a significance value of 166. The bay encompasses a six mile stretch of the Hudson River from Stony Point to Croton Point. Average depth at mean low water is approximately 15 feet. Salinity in the area varies by year, but Haverstraw Bay is an important habitat for fish nurseries. The navigational channel is located on the west side of the bay and maintained at approximately 35 feet in depth.

The Applicants will move its cable into the previously and periodically disturbed side slope of the navigational channel so as to minimize impacts to Haverstraw Bay.

Policy 7B - *Materials that can degrade water quality and degrade or destroy the ecological system of the Croton River and Bay Significant Fish and Wildlife Habitat and the Haverstraw Bay Significant Fish and Wildlife Habitat shall not be disposed of or allowed to drain in or on land within the area of influence in the Significant Fish and Wildlife Habitats.*

No materials will be disposed of or allowed to drain into the Croton River and Bay SCFWH or the Haverstraw Bay SCFWH. The Project will be constructed with a Spill

Prevention, Control, and Countermeasure (SPCC) plan, which will be provided in the Environmental Management and Control Plans developed for in-water construction.

Policy 7C - *Storage of materials that can degrade water quality and degrade or destroy the ecological system of the Croton River and Bay Significant Fish and Wildlife Habitat or Haverstraw Bay Significant Fish and Wildlife Habitat shall not be permitted within the area of influence of the habitat unless best available technology is used to prevent adverse impacts to the habitat.*

This Project will not require the storage of materials that could degrade water quality or degrade or destroy the ecological system of the Croton River and Haverstraw Bay SCFWHs.

Policy 7D - *Restoration of degraded ecological elements of the Croton River and Bay and Haverstraw Bay Significant Fish and Wildlife Habitat and shorelands shall be included in any programs for cleanup of any adjacent toxic and hazardous waste sites.*

This local policy does not apply to the Project.

Policy 7E - *Runoff from public and private parking lots and from storm sewer overflows shall be effectively channeled so as to prevent oil, grease, and other contaminants from polluting surface and ground water and impact the Significant Fish and Wildlife Habitat.*

This local policy does not apply to the Project.

Policy 7F - *Construction activity of any kind must not cause a measurable increase in erosion or flooding at the site of such activity, or impact other locations. Construction activity shall be timed so that spawning of anadromous fish species and shellfish will not be adversely affected.*

Sediment and erosion control BMPs will be employed to minimize impacts outside of the construction area from erosion or stormwater. The buried cables will not measurably alter the riverbed elevation, thereby avoiding any possibility of increasing flooding or erosion. Construction activity will be timed to minimize impacts to fish spawning as described in Exhibit 4 of the Article VII Application.

Policy 7G - *Such activities must not cause degradation of water quality or impact identified Significant Fish and Wildlife Habitats.*

This Project will be constructed with BMPs in place that will minimize the potential for water quality degradation, other than localized and temporary increases in suspended sediment concentrations around the water jetting device. Impacts to identified SCFWHs have either been avoided through cable routing or will be minimized through the selection of jetting as the preferred burial method (Exhibit 4 of the Article VII Application).

Policy 44A *- Wetlands, waterbodies and watercourses shall be protected by preventing damage from erosion or siltation, minimizing disturbance, preserving natural habitats and protecting against flood and pollution.*

The Applicants expect to avoid any direct impacts to wetlands along the underwater portions of the transmission cable corridor (Exhibit 4 of the Article VII Application) and will minimize siltation and other disturbances associated with the Project. The Project Description of this Joint Application provides additional details on the proposed construction methods, which allow for rapid cable laying and burial with the least sediment disturbing methods possible.

4.19 Village of Ossining

Policy 7A *- The designated coastal habitat at the Croton River and Bay shall be protected, preserved and where practicable, restored so as to maintain its viability as habitat.*

Croton River and Bay is a significant habitat with a significance value of 24. The bay is comprised of approximately 1,200 acres of submerged aquatic vegetation and mudflats and is located at the southeastern edge of Haverstraw Bay. Most of the Croton River has been diverted for public water supplies.

This Project will avoid Croton Bay significant habitat.

Policy 7B *- The locally important coastal wildlife habitat at Crawbuckie Nature Area shall be protected and preserved so as to maintain its viability as a habitat.*

The Crawbuckie Nature Area is east of the Croton Bay significant habitat and will be avoided by this Project.

4.20 Village of Nyack

Policy 7A *- Protect the physical characteristics of the Hudson River along Nyack that support the varied fish populations found there. Nyack's LWRP notes that numerous species of fish are found in this area and implemented this local policy to protect them.*

This Project will not alter the physical characteristics of the Hudson River, other than generating minor and temporary increases in suspended sediments and a linear trench of fluidized sediments that will require some time to re-compact (Exhibit 4 of the Article VII Application).

4.21 Village of Sleepy Hollow

Policy 7A *- Fremont Lake and associated wetlands/watercourses and adjacent upland areas shall be protected, preserved, and, where practical, restored so as to maintain its viability as a locally significant habitat.*

Fremont Lake and its associated wetlands/watercourses and adjacent upland areas are not near nor will they be affected by this Project.

Policy 7B *- The Philipsburg Manor and Devries Field wetland/watercourse areas of the Pocantico River shall be protected, preserved, and, where practical, restored so as to maintain its viability as a locally significant habitat.*

These areas are not near nor will they be affected by this Project.

Policy 7C *- The Upper Pocantico River and Gorey Brook watercourse areas shall be protected, preserved, and, where practical, restored so as to maintain its viability as a locally significant habitat.*

These areas are not near nor will they be affected by this Project.

Policy 7D *- The Hudson River immediately adjacent and within 1000 feet of the village's shoreline shall be protected, preserved, and, where practical, restored so as to maintain its viability as a locally significant habitat.*

Installation of the cables will either occur at a distance of greater than 1,000 feet from the village's shoreline at this location or will involve only temporary disturbance to the riverbed, which will return to its pre-installation condition over time.

Policy 7E *- The lands in state ownership associated with the Rockefeller State Park Preserve and Old Croton Aqueduct Trail shall be protected, preserved, and, where practical, restored so as to maintain its viability as a locally significant habitat.*

These areas are not near nor will they be affected by this Project.

Policy 8A *- Control the introduction of new industries or technology which could increase the presence of hazardous materials within the Sleepy Hollow waterfront area.*

This Project's scope within the Village boundaries only involves the installation of HVDC cables, which do not contain any hazardous materials.

Policy 8B *- Encourage existing industrial production or storage facilities to utilize the most current technologies available to minimize the potential threat from hazardous wastes or pollutants to the surrounding environment.*

This Project does not involve industrial or storage facilities.

Policy 18A - *Protect the vital economic, social, cultural, and environmental interests of the village in the evaluation of any proposal for new roads, road widening or infrastructure.*

This local environmental policy is not applicable to this Project.

Policy 18B - *To protect the social interests of the village, proposed actions must give full consideration to the impacts of such actions on the community and cultural resources of the village and the quality of life such resources support.*

With the cables being buried in the bottom of the Hudson River, this Project will not impact the cultural resources of the village or the quality of life such resources support.

Policy 18C - *To protect the environmental interests of the village, proposed actions must give full consideration to the impacts of such actions on valuable and sensitive natural resources of the village.*

This Project will have negligible to minor impacts to certain resources (e.g. water quality, fisheries, benthos) of the Hudson River due to the temporary nature of the cable installation disturbance to the riverbed. Since the native sediments backfill the trench, the disturbed area represents a small fraction of the total area of the riverbed, and the increased suspended sediments are localized and disperse quickly so the impacted resources will return to its pre-installation condition quickly.

Policy 23A - *Preserve and enhance the structures, areas, or sites within the Village of Sleepy Hollow that are currently listed on the state and/or national register of historic places.*

This local policy does not pertain to the Project, since none of these resources will be altered or disturbed during cable installation.

Policy 23B - *Preserve and enhance the structures, areas, or sites within the Village of Sleepy Hollow that have been identified as being eligible for listing on the state and/or national register of historic places.*

This local policy does not pertain to the Project, since none of these resources will be altered or disturbed during cable installation.

Policy 23C - *Encourage the restoration and adaptive reuse of historic buildings such as the Philipse Manor Train Station.*

This local policy does not pertain to the Project, since none of these resources will be altered or disturbed during cable installation.

4.22 Village of Piermont

Policy 7A - *Protect the Piermont Marsh south of the pier and the Sparkill Creek by severely restricting it to passive recreational uses.*

Piermont Marsh is a Significant Coastal Fish and Wildlife Habitat with a significance value of 74. It is a 725 acre tidal wetland located along the west side of the Hudson River. The Sparkill Creek empties into this wetland area.

This area will be avoided by the Project.

Policy 8A - *The intentional dumping of oil or other pollutants into waterways and catch basins can be harmful to fish and wildlife resources, and such actions will be prosecuted.*

The Applicants and/or its contractors will not intentionally dump oil or other pollutants into the Hudson River.

Policy 8B - *The Rockland County sewer outfall line should be extended to deeper, faster flowing water. The outfall line should be rebuilt to maintain its integrity.*

This local policy is not applicable to this Project since the Project does not involve activities which would require the use of the Rockland County sewer or otherwise warrant the Applicants' involvement in this endeavor.

Policy 18A - *New development shall be designed to minimize impact on the availability of affordable housing and on the existing character and cultural resources of Piermont.*

The buried cables of this Project are consistent with this local policy.

Policy 23A - *The architectural review board shall review applications for building permits involving structures identified as being architecturally significant or structures adjacent to buildings or sites identified as historically or architecturally significant.*

This local policy is not applicable to this Project.

Policy 23B - *Place monuments and markers on structures and at sites important to the history of the Village of Piermont.*

This local policy is not applicable to this Project.

Policy 44A - *The Piermont Marsh should be protected from pollutants that would adversely affect the ecology of the marsh.*

Piermont Marsh will be avoided by this Project and any indirect effects will be minimized by the construction methods selected and the environmental protection

measures to be employed during construction, such as the implementation of SPCC plans for vessels installing the cables.

4.23 Village of Dobbs Ferry

The numbering of the policies for Dobbs Ferry differ from the numbering of these policies by NYSDOS. All policies have been reviewed and it has been determined that this Project will be consistent with the policies that might impact it. Specific policies are as follows:

Policy 6.1 - *Protect locally significant coastal fish and wildlife habitats.*

See above response to State Policy 7.

This Project will avoid or minimize impacts to SCFWHs to the greatest extent possible, both by the location of the cable corridor within the deeper waters of the Hudson River and the use of water jetting to bury the cable, which allows for faster burial than conventional dredging so that the duration and extent of suspended sediments are reduced. This installation method also allows for the initiation of riverbed recovery to occur sooner.

Policy 6.2 - *Support the restoration of Significant Coastal Fish and Wildlife Habitats wherever possible so as to foster their continued existence as natural, self-regulating systems.*

While not directly related to this Project, this Project will not interfere with or prevent restoration activities by others.

Policy 10.5 - *Promote the efficient management of surface waters and underwater lands.*

This Project will conform to this policy because of the selected location and proposed construction methods are designed to avoid more ecologically sensitive areas and minimize impacts to those lands and waters that cannot be avoided, as compared to other types of cable installation procedures.

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STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001

ANDREW M. CUOMO
GOVERNOR

RUTH NOEMÍ COLÓN
ACTING SECRETARY OF STATE

January 5, 2011

Mr. Sean Murphy for Champlain Hudson
Power Express, Inc. and CHPE Properties
C/O HDR/DTA HDR Engineering Inc
970 Baxter Blvd
Suite 301
Portland, ME 04103-5346

Re: F-2010 -1162 (formerly S-2010-0025)
U.S. Army Corps of Engineers/NY District Permit
Application #: 2009-01089-EHA
DOE Docket #: PP-362
NYS PSC Case: 10-T-0139
NYS DEC Regions 2, 3, 4 and 5
Champlain Hudson Power Express, construct/operate 1,000 MW underwater/underground HVDC electric transmission system extending between Canada and NYC.
Received Federal Consistency Assessment Form - Request for Additional Information

Dear Mr. Murphy:

The Department of State (DOS) received your Federal Consistency Assessment Form, consistency certification and supporting information regarding the above proposed project on December 08, 2010 and began its review pursuant to 15 CFR Part 930, Subpart D on that date. A full review of your consistency certification will be conducted as it does not appear that the above referenced activity meets the criteria for a General Concurrence.

Based on the information provided during the extensive pre-application consultation involving DOS and the applicant, as well as other state and federal agencies, DOS has elected to waive the requirement that a Final Environmental Impact Statement (FEIS) be submitted as necessary data and information to initiate federal consistency review. However, pursuant to 15 CFR 930.58(a)(2) and in accordance with New York State's Coastal Management Program (CMP), as amended in 2001, an FEIS is considered additional data and information necessary for DOS to complete its review. If the applicant fails to provide the FEIS, DOS may object to your consistency certification on the grounds of insufficient information. However, if during the six month review period, DOS determines that the FEIS is not necessary to complete the review process, DOS will notify you accordingly.

Pursuant to 15 CFR 930.58, the following additional information and data is necessary to enable the Department of State to adequately assess the consistency of the proposed activity with the New York Coastal Management Program:

1. Please provide a written response to all information requested by DOS in the letter to Keith Silliman of TRC Companies, Inc. dated November 22, 2010 (enclosed). To date, verbal responses provided to DOS from TRC Companies, Inc. and HDR have been inadequate and reflect the need to submit written responses that includes information as to the ability of TDI to site the proposed line within existing utility corridors and in the right-of-way of state and county roads.

2. The information provided in the application envisions burying the cable along the proposed submarine route in the Hudson River at depths of 3 to 4 feet, in conjunction with the use of concrete mattresses in yet to be identified areas where burial would be prohibitive because of the presence of bedrock. In some instances, a greater depth may be required to avoid either environmental or magnetic field impacts or navigational deepening. Please provide a technical analysis of the maximum attainable cable burial depth for the entire submarine portions of the proposed route and identify where the use of concrete mattresses would be necessary.

3. Please provide information pertaining to the suitability and feasibility of siting the proposed cables within areas of the Hudson, East and Harlem Rivers that were previously mechanically dredged.

4. Please provide scientifically verifiable estimates for magnetic field levels and ambient temperature increases in soil and water for cable burial depths of 4, 8, 12 and 15 feet and a scientific analysis of the impacts of the magnetic fields and temperature increases on aquatic species in the Hudson River, including impacts on migratory routes, feeding, spawning, and all life development stages for each burial depth.

5. Please state the design life of the proposed project.

6. Analyzing existing Hudson River dredging and navigational use data, and recognizing the trend in the use of deeper draft vessels in the Hudson River, please explain how TDI will adjust the depth of the buried cable in the riverbed to accommodate any future federal dredging and navigation projects over the design life of the proposed project. Please include a discussion as to whether or not the burial of the proposed cables would interfere with such anticipated navigational improvements to the Hudson River.

The information requested is necessary for DOS to assess the consistency of your consistency certification with CMP policy numbers 2, 5, 7, 8, 9, 10, 11, 19, 20, 21, 22, 23, 27, 33, 35, 37, 38, and 44. This list of potentially applicable policies should not be viewed as exhaustive as the applicability of additional coastal policies may become apparent during our review.

If this additional information and data is not provided within thirty days of the date of this letter, the Department of State may, pursuant to 15 CFR Part 930.63(c), object to the consistency certification for this proposed activity on the grounds of insufficient information.

If the Department objects to the consistency certification for this proposed activity, the consistency provisions of the federal Coastal Zone Management Act prohibit federal agency authorization of the activity, unless the Department's objection is overridden on appeal to the U.S. Secretary of Commerce. Such an appeal must be based on one or both of the grounds that the proposed activity is consistent with the objectives or purposes of the Federal Coastal Zone Management Act, or is necessary in the interest of national security.

As DOS will be soliciting comments from all applicable Local Waterfront Revitalization Program communities regarding the consistency of the proposed action with their programs, it may be beneficial for TDI to provide these communities with copies of all information, or a link to where the information can be retrieved electronically, pertaining to the above referenced consistency certification. When communicating with us regarding this matter, please contact Matthew Maraglio at 518-474-5290 (email: matthew.maraglio@dos.state.ny.us) and refer to our file #F-2010-1162.

Sincerely,

Jeffrey Zappieri
Supervisor. Consistency Review Unit
Office of Coastal, Local Government
and Community Sustainability

JZ/mm
c: COE/ NY District – Naomi Handell
U.S. DOE – Dr. Jeffrey Pell
NYSDEC/ Central Office – Chris Hogan
NYS DPS – Steve Blow

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January 18, 2011

Mr. Jeffrey Zappieri
Supervisor, Consistency Review
Department of State
Office of Coastal, Local Government and Community Sustainability
99 Washington Avenue, Suite 1010
Albany, NY 12231-0001

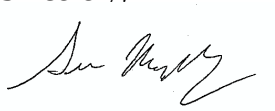
Subject: **Updated Alternatives Analysis**
Champlain Hudson Power Express Project

Dear Mr. Zappieri:

On behalf of the Applicants, please consider this letter to be the response to your letter of November 22, 2010 which provided comments from the New York State Department of State (DOS) on the Updated Alternatives Analysis developed for the Champlain Hudson Power Express Project (Project) as well as requested additional information. We appreciate the comprehensive nature of your response.

The Applicants are in receipt of your letter of January 5, 2011 and expect to provide a formal supplement to our request for coastal consistency review of the Project at some point in the near future. Thank you again for your interest in the Project and, as always, our staff can be available at your convenience to discuss any questions or concerns arising from this document.

Sincerely,



Sean Murphy
Senior Regulatory Specialist

cc: D. Jessome, CHPEI (electronically)
F. Bifera, Hiscock and Barclay (electronically)

HDR | DTA
HDR Engineering, Inc.

970 Baxter Boulevard
Suite 301
Portland, ME 04103-5346

Phone: (207) 775-4495
Fax: (207) 775-1031
www.hdrinc.com

Champlain Hudson Power Express, Inc.

Case 10-T-0139

In a letter of November 22, 2010, the DOS requested additional information related to four topics:

- Analysis of alternate routes;
- Impacts associated with installation and operation of Project on commercial and recreational navigation;
- Impacts associated with installation and operation of Project on Significant Coastal Fish and Wildlife Habitats (SCFWH); and
- Impacts associated with installation and operation of Project on commercial and recreational fisheries.

Each of these areas of concern is discussed below.

1. Alternatives Analysis

As your letter notes, the Applicants have previously presented route alternatives as part of federal and state permitting processes. The Updated Alternatives Analysis report which was submitted to settlement parties on November 5, 2010 describes the routes. This document also provides an initial analysis of the three alternative routes presented by the New York State Department of Public Service (DPS) in late October.

In response to your letter, as well as to similar lines of questioning raised by other parties, the Applicants have endeavored to provide a detailed analysis of routing constraints and alternatives along the DPS' "Western Hudson Alternative". In order to allow for ease of analysis, the Western Hudson Alternative has been divided into segments with reference to the corresponding Route Mile marker to better aid in identifying the end points.

Segments of the route which were identified as being reasonable, as well as feasible, based on known concerns (e.g. engineering, land ownership, environmental constraints) have been accepted by the Applicants. In completing this analysis, the Applicants adopted the following principles:

a. The minimization of in-water route length is not equivalent to minimizing environmental and societal impacts. Greater use of land-based corridors in these areas requires the crossing of a significant number of streams and wetlands, presenting the risk of greater cumulative impacts to resources. Available information indicates that the preferred in-water route will only have temporary impacts to the water bodies.
b. Existing land corridors often involve construction complexities such as buried utilities and other existing infrastructure, the overcoming of which can be

economically infeasible. Even if economically feasible, these routes would significantly delay the Project's in-service date, impose significant inconvenience to vehicle and/or rail traffic for commuters, and leave the cables less reliable and more subject to outages and disruptions due to accidents, rail and highway repairs and maintenance, and terrorism risks.

c. The multiple use of existing utility and transportation corridors has been a longstanding siting policy that now must be reconsidered in light of heightened concerns about terrorism. Increased security is required when installing new utility infrastructure in any new Right-of-Way (ROW). Submarine routes inherently offer enhanced security due to the absence of readily visible identification. Constructing a transmission line in its own ROW, rather than concentrating utility infrastructure in multiple use corridors, increases reliability by decreasing the chances that accidents and maintenance and repair work on other facilities will result in disruptions.

d. When considering overland alternatives the preference is to utilize state highways rather than local roads due to the generally more expansive width of available rights-of-way, which allows for greater construction flexibility, increased worker safety, and decreased disruption of normal traffic flow. The Applicants also strongly preferred utilizing public lands for the cable corridor rather than establishing a permanent easement on private lands, although temporary easements may be necessary on private lands for construction purposes.

In terms of overland alternatives, parties have questioned in the past why existing utility corridors have not been utilized. In the Alternatives Analysis submitted with the July Supplement, a buried utility line extending from the U.S. / Canada border to the New York region was evaluated but ultimately eliminated from consideration. Since that time, the Applicants spoke with the three utilities who own the ROWs under discussion and each voiced opposition to collocation with their facilities. The New York Power Authority noted that they were under the same statutory restrictions as the New York State Canal Corporation in terms of their ability to dispose of public lands and that they do not believe they would have the ability to grant the necessary long term land interests. National Grid expressed concern regarding the impact this Project would have on their system reliability and potential expansion of their own facilities within the ROW. A representative of Con Edison stated that for safety and reliability reasons they would not want the cables installed in near proximity to their tower foundations. In addition, their transmission lines within Westchester County are buried and their representative did not believe Con Edison could grant the right to use their ROW to a separate private entity. These conversations have confirmed the Applicants' previous position that any attempt to collocate the Project with an existing utility ROW would require the acquisition of land rights adjacent to the ROW either through purchase or eminent domain due to concerns by the ROW owners over the safety of their system and their desire to preserve the ROW for potential future expansion.

Route Mile 202 to 223 (Coeymans to Catskill)

The Project route as originally proposed would enter the Hudson River in Coeymans, New York by following the CSX Transportation (CSX) ROW. The Applicants have reviewed the CSX

ROW from Selkirk south to north of Catskill and identified no significant engineering constraints. From Catskill, the Applicants would propose laying the cables within the Route 23 ROW to enter the river at approximately Mile 223.5 of the original route. This alternative bypassed several SCFWH areas, including Stockport Creek and Flats, Vosburg Swamp and Middle Ground Flats.

Route Mile 223 to 233 (Catskill to Malden-on-Hudson)

From Catskill to Malden-on-Hudson (north of Saugerties), the Applicants note only one potential engineering issue, the Catskill Trestle which crosses Catskill Creek and Route 9. Previous conversations with CSX suggest that the cables could be attached to this structure. Following the railroad ROW until it intersects with Route 34, the cables could be laid in the roadway ROW to the east to connect with Riverside Road and then Riverside Drive. While the Project in general seeks to avoid local roads due to the more narrow rights-of-way and potential for local opposition, the relative shortness of this usage seems justified given the length of overland that would be enabled. The parking lot for the boat launch at the termination of this road will allow for a horizontal directional drill (HDD) into the Hudson River.

The Applicants believe that this portion of the Western Hudson Alternative is a feasible alternative but that it is not possible to install the cables upland south of this point to Kingston for the reasons discussed below. Based on this analysis, the Applicants are including this segment in their overall settlement proposal.

Route Mile 233 to 245 (Malden-on-Hudson to Kingston)

Siting in this segment is complicated by the dense development within the Ulster / Kingston area. As the CSX railroad travels beneath Route 209 in Ulster, the railroad corridor is bound on either side by existing transmission lines. Typically when collocating in a common ROW, the utility companies must maintain a specified separation from other facilities, which would not be possible along this segment. This is one of the concerns raised by utility companies about collocating with existing transmission lines (see above for a more extended discussion). The route in this area would have to collocate in the ROW of John M. Clark Drive, which runs parallel to the tracks until they both intersect with Route 157, at which point the transmission lines no longer run on both sides of the railroad ROW. The utilization of the roadway does not represent an obstacle but is presented so as to be clear that the Applicants would need to leave the railroad ROW in this area.

After passing through the Kingston railyard and over Route 32/Flatbush Avenue, the railroad corridor traverses the middle of St. Mary's Cemetery with an overhead transmission line on the western side of the railroad corridor. There is insufficient room between the cemetery (actual gravestones) and the railroad tracks along the eastern side of the railroad corridor to install the Project's cables. A roadway bypass would require utilizing the Route 32 ROW to access Farrelly Street to the east or Foxhall Avenue to the west. Utilizing either of these roadways would require traveling through residential neighborhoods where the houses are tightly packed and close to the roads, making installation extremely difficult and disruptive.

Immediately south of the cemetery, the railroad corridor extends through a heavily developed urban area where large buildings are located immediately adjacent to the railroad corridor (within ~10 feet), resulting in insufficient horizontal clearance to install the Project cables within this section of ROW. This level of development is intermittent until the railroad crosses a small bridge over Broadway. As with the roads proximal to the cemetery, the roadways that might be utilized as an alternative to this segment (e.g. Foxhall Avenue, Cornell Street, Ten Broeck Avenue, and Grand Street) also have buildings immediately adjacent to the roadway as well as residential houses where construction would be disruptive.

The Applicants also reviewed roadway alternatives that would bypass the city of Kingston. Route 9W could be accessed by following Route 157 east at the terminus of John M. Clark Drive. While Route 9W has a low density of development north of Route 32, it becomes a limited access highway (controlled-access road) once it crosses Route 32. The New York State Department of Transportation (NYSDOT) has indicated that the Federal Highway Administration would need to review installation in this segment and that the last review required 18 months. Route 32 becomes Flatbush Road and Flatbush Avenue as it passes within the city center and experiences the same high level of development as other roadways within the city.

Based on this analysis, the Applicants were unable to identify any reasonable alternative that traversed the municipalities of Ulster and Kingston and therefore the cables will need to enter the water prior to this point. Moving north along the railroad ROW, the track runs parallel to the Hudson River until it intersects with Route 31, at which point it veers to the northeast towards Saugerties. As the Esopus Estuary SCFWH stretches along the riverbank north from where Esopus Creek empties into the Hudson River, the entry point would need to be in or north of Malden-on-Hudson. From the ROW, Route 34 could be followed to the east into Malden-on-Hudson and private land accessed to allow for an HDD into the Hudson at approximately Mile 233 of the original route.

In terms of roadway alternatives, the only road that travels in relatively close proximity to the Hudson River is Route 32 with a separation distance of approximately one-half mile. However, this roadway, as well as Route 9W, traverses the Esopus Creek Bridge to cross the Esopus Creek. To date, the New York State Department of Transportation has indicated that they would not permit hanging cables on structures owned and operated by the agency. An HDD would be complicated by the depth of the gorge (approximately 75 feet), the gravity dam downstream of the bridge, and existing buildings at both ends of the bridge. There are no existing launch /exit sites that meet the necessary spacing criteria for a safe drill under these constraints. Therefore, Routes 9W and 32 south of Esopus Creek are considered inaccessible to the northern portion of the cable route and therefore not a feasible alternative.

Route Mile 245 to 254 (Kingston to West Park)

South of Kingston, the access point to the railroad will require that the cables be installed within Rondout Creek, which is a SCFWH. Rondout Creek is one of the largest freshwater tributaries

of the Hudson River Estuary and the concentrations of anadromous and resident freshwater fish are considered unusual in Ulster County. In addition, the Applicants are aware of significant issues associated with a now defunct gasification plant at the mouth of the creek currently undergoing remediation. If installation of the cables were to occur in this water body, it should be done outside of the fish spawning and incubation periods (March through July for most warm water species). The railroad ROW does not appear to have any significant engineering constraints until it intersects with Route 9W in West Park.

The Applicants note that the ROW of Route 9W could also be utilized to travel north of Kingston. However, given that accessing the roadway would also require installation within the Rondout Creek SCFWH and that installation on a well-travelled road would be more disruptive than on a railroad line, the Applicants would recommend adopting the ROW alternative if it is determined that installation within the Rondout Creek is acceptable. The Applicants also considered utilizing Routes 81 /24 (River Road), which run parallel to the Hudson River but connecting to these roadways would require installing a significant length of the cable on privately-held land.

Route Mile 254 to 261 (West Park to Highland)

South of the intersection with Route 9W, the railroad line runs adjacent to the Hudson River and often the railroad lines are sited in a narrow opening between the edge of the Hudson River and large rock outcroppings or very steep terrain to the west. Installation in these areas will require either blasting of the bedrock to create a sufficient degree of separation from the railroad or an expensive HDD installation (assuming that there is available space for this technique). Using an internet mapping site that provided aerial photography, the Applicants identified sixteen distinct outcrops with an estimated average length 490 feet and a range of 230 to 1,020 feet. However, it should be noted that the desktop analysis only accounts for exposed outcroppings, so the actual extent of bedrock material may be far more extensive. In Highland, Oakes Road runs immediately adjacent to the railroad ROW for approximately 3,200 feet, so there is insufficient room to install the cables for much of this stretch. The Applicants consider installation in this section of railroad ROW to be at least impractical and likely infeasible.

The Applicants also considered the use of Route 9W, which initially travels through largely undeveloped countryside. Transmission poles border the western side of the road for less than 2 miles until it intersects with Upper North Road in Highland, so installation in this area would be on the eastern side. A short distance after the intersection with Upper North Road, Route 9W expands to four lanes. Over the next approximately 4 miles, the transmission system switches sides eight times. In order to maintain the required separation, the cables would need to cross underneath the roadway. As Routes 44 and 55 overlap with Route 9W in Highland, the transmission system poles occupy both sides of the roadway. In addition, the density of businesses with access points on the roadway increases. Route 9W also has two bridges before its connection with Route 44/55 for which there are no readily identifiable bypasses. The NYSDOT has indicated that there is no precedent for installation of a high voltage cable on a roadway bridge. The intensity of development as the highway enters Highland and high traffic volume would make utilization of Route 9W would make installation infeasible.

Route Mile 261 to 277 (Highland to Newburgh)

Immediately south of the intersection of the ROW with the Route 44 bridge, a maintenance road to the west of the tracks appears to have been built. The width of this road appears insufficient to meet CSX's minimum separation distance from the tracks. Between the Route 44 bridge and U.S. Highway 84 bridge in Newburgh, the Applicants identified eighteen rock outcrops that would significantly complicate installation if the railroad companies even allowed for the necessary construction activities. The average length of each outcrop is approximately 770 feet with a range of 160 to 2,950 feet. This segment also has seven instances where the railroad has water on both sides of the tracks for an average distance of 1250 feet. As was noted earlier, the desktop analysis only accounts for visible bedrock and so the actual length of ROW where upland construction is essentially infeasible may be far longer. A short distance south of the U.S. Highway 84 bridge the railroad occupies a raised berm. The cables would either need to be laid at the foot of the berm with HDDs for the road crossings or, in congested sections, the ROW of an alternate roadway such as Water Street would need to be accessed. The Applicants consider installation in this section of railroad ROW to be impractical.

In terms of roadway alternatives, Oakes Road passes under the Route 44 bridge but reaches a dead end within a mile. Other roadway route alternatives would need to be accessed through Highland and, as has been previously discussed; the level of development in the vicinity of the intersection of Routes 9W and 44 would prevent cable installation in a reasonable manner.

Following the Hudson River south from Highland, the first roadway to come in close proximity to the river is Old Indian Trail Road in Milton at approximately Route Mile 266. At its closest point, the road is adjacent to the railroad ROW and is less than a mile away from connecting to Route 9W. As Route 9W travels south, it traverses lightly to moderately developed areas. However, as was observed in a northern segment, the transmission poles cross the roadway multiple times which would require HDD drillings or open cut trenching at each location. The transmission line crossings are often to avoid natural and anthropogenic obstacles, thereby making installation of the Project's cables more problematic since cables would not only need to avoid the transmission lines but also these features.

As the road approaches Marlboro, development becomes more pronounced with the hamlet buildings directly adjacent to the roadway. South of the hamlet's center, the road has transmission poles on one side and a cemetery on the other for approximately 500 feet. Bypassing this section would require utilizing residential roads for approximately one-half mile. Continuing south, Route 9W continues to travel through low to moderate density developments, with transmission poles that cross the highway at infrequent intervals. The Applicants did not identify any engineering "fatal flaws" with this segment, but the high per-mile cost as well as the disruption to homes and businesses does not appear justified given the length of the bypass. In addition, as is discussed below, there are significant engineering constraints as the road passes beneath the Route 84 with no readily available bypass options.

Route Mile 277 to 280 (Newburgh to Cornwall-on-Hudson)

South of Newburgh, the Applicants did not identify any significant engineering constraints until the railroad reaches Cornwall-on-Hudson where Shore Road is proximal to the railroad tracks.

Within a one-half-mile distance of the Route 84 bridge, Route 9W experiences significant industrial development. In the center of Newburgh, the road is bordered by tightly packed residential homes, as well as occasional park and recreational facilities. South of Newburgh proper, Route 9W becomes a divided four lane highway for approximately 2 miles with transmission poles on the eastern side of the road. Once the divided highway ends, there is a bridge crossing of Moodna Creek which, based on previous conversations with NYSDOT about the use of their bridges, will require that the Project utilize an HDD drill as Route 9W crosses Route 107 in Cornwall, it transitions to a limited access highway and collocation of transmission cables in the ROW of limited access highways is highly restricted and discouraged by NYSDOT.

Route Mile 280 to 284 (Cornwall-on-Hudson to West Point)

As the railroad reaches Cornwall-on-Hudson, Shore Road runs parallel to the tracks for approximately 1 mile and for more than half that distance the Hudson River lies along the eastern side. The Applicants identified five rock outcroppings with an average length of 960 feet (range of 380 to 1,920 feet) and a berm through a water way extending approximately 300 feet. In West Point, River Road and the Upton Road run parallel to the railroad tracks with the Hudson River to the east for approximately 4,060 feet before entering the tunnel beneath West Point Military Academy. Given the engineering constraints presented over this relatively short segment, the Applicants do not consider it reasonable to utilize his route.

As previously discussed, Route 9W becomes a limited access highway in Cornwall and NYSDOT has indicated that it would likely restrict the collocation in the ROW of limited access highways. As an alternate route, the Applicants considered Route 218 which intersects the highway prior to the transition to a limited access roadway. Route 218, however, travels through the center of Cornwall-on-Hudson through tightly packed residential and commercial districts. Trees line both sides of road through the town, so that any installation would either require their removal or risk damage. Outside the town proper, Route 218 enters Storm King State Park and climbs up Storm King Mountain along a steep and windy roadway. As the road crosses the front of the mountain, there is an approximately one-half-mile stretch where the road has been carved out of the cliff face. Based on this engineering constraint, the Applicants do not consider this roadway to be a feasible alternative.

Route Mile 284 to 285 (West Point)

The tunnel beneath West Point extends for approximately 3,500 feet. The Applicants' insurance company has stated the cables must be fully protected to secure coverage. Installation of the cables within the tunnel ceiling would present a serious liability should any type of failure occur. Similarly, the railroad company has specified safety setbacks which could not be met within this

tunnel. Rock cuts into the sides of the wall are theoretically possible, although a geophysical analysis would be required to ensure there was no impact on the integrity of the tunnel. Past conversations with representatives of the railroad line suggest they would not allow this approach as it would require work within the tunnel for months, significantly impacting railway use. As the railroad leaves the tunnel, there is a short stretch (approximately 500 feet) where an Academy parking lot lies to the east and Williams Road to the west. The parking lot would need to be torn up to install the cables or an HDD enacted. The Applicants consider installation in this section of railroad ROW to be impractical.

There are no state roads in close proximity to either entrance to the tunnel. Both River Road and Upton Road are in close proximity to the water and connect into existing local roads; however, these roads are built perpendicular to the slope of the foothills of Storm King Mountain and the rights-of-way are narrow. In addition, the most likely alternatives are under the control of the Academy, which may not permit installation on a military facility. The Applicants believe that an in-water route is the most practical approach considering the short reach necessary to bypass this tunnel.

Route Mile 285 to 290 (West Point to Fort Montgomery)

As with earlier segments, the railroad runs parallel to the Hudson River. The Applicants identified ten rock outcroppings with an average length of 720 feet (range of 265 to 1,606 feet) and four water crossings with an average length of approximately 490 feet (range of 402 to 644 feet). In addition, the ROW travels through the Bear Mountain tunnel, which extends for approximately 800 feet. The Applicants consider installation in this section of railroad ROW to be impractical.

There are no state roads or local roads in close proximity to the water for this segment. Mine Dock Road in Fort Montgomery could be accessed if the cables came out of the water into the railroad ROW and were laid a short distance before entering the road; however, Mine Dock Road runs underneath Route 9W and private homes are located on either side of the bridge abutments. Therefore, the Applicants did not identify any overland alternative to this segment or specifically the Bear Mountain tunnel.

Route Mile 290 to 296 (Fort Montgomery to Haverstraw)

The Applicants identified six rock outcroppings with an average length of 490 feet (range of 190 to 860 feet) and seven water crossings with an average length of 1,080 feet (range 391 to 2,373 feet). In addition, north of Stony Point Lighthouse is an approximately 2,020-foot stretch of railroad where water is to the east and utility grade transmission lines are to the west. As the railroad curves around Dunderberg Mountain past Jones Point, River Road runs parallel to the tracks for approximately 1,400 feet. Further along the tracks, West Shore Drive in Tomkins Cove runs in close proximity to the railway for approximately 1,600 feet. The Applicants consider installation in this section of railroad ROW to be impractical due to the constrained ROW.

A steep rock embankment lies beneath the bridge that connects Route 6/202 into a round-about with Routes 9W/202 and the Palisades Interstate Parkway. The Applicants are unsure if this feature is considered part of the parkway and therefore unusable by a transmission system. Assuming Route 9W/202 is available, the roadway travels south through Bear Mountain State Park. Trees line both sides of the road, which is kept in a natural setting. The roadway passes a boat launch near Iona Island, whose bay is a SCFWH. The Applicants identified six rock outcroppings for an average length of 850 feet (range of 141 to 2,556 feet). The Applicants consider installation in this section of road to be impractical due to the extent of clearing, blasting and/or other activities that would be required within a state park for a relatively short overland segment.

Route Mile 296 to 303 (Haverstraw Bay)

The Applicants recently submitted a settlement proposal which would site the Project outside of Haverstraw Bay.

2. Commercial and Recreational Navigation

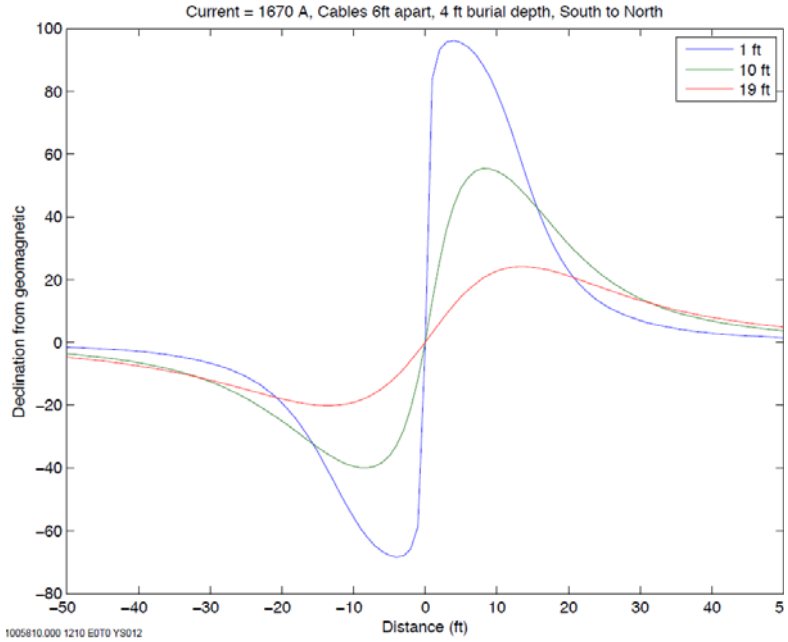
Impacts to commercial and recreational use of the waterways during the construction phase are expected to be minor and temporary. During Project construction, the presence and operation of the cable installation barges/vessels will create elevated noise levels and additional vessel traffic on these waterways. All Project work activities will be closely coordinated with the United States Army Corps of Engineers (USACE), the United States Coast Guard (USCG), local pilot associations and other local, state, and federal agencies 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.

Cables would be buried in a manner consistent with conditions and requirements imposed by the regulatory agencies; these conditions would include reasonably foreseeable maintenance and expansion activities associated with navigation channels. The presence of the cables will result in additional areas within these waterways where restrictions would be imposed on vessel anchorage. However, the proposed route avoids designated anchorage areas, so the overall impact is expected to be minor. The Applicants are not proposing to utilize the side slopes of the Federal navigation channel, as the overland routes proposed as part of settlement bypass those SCFWH where the DOS had previously identified it would be necessary to be in a disturbed area (e.g. Haverstraw Bay).

The DC magnetic field of the cables will not induce voltages or currents into communications equipment, including but not limited to marine radios, remote telephones, and cell phones. The only expected effect is a small effect on mechanical compasses when over the cables. An analysis by Exponent determined that, for cables buried at 4 feet and separated by a distance of 6 feet, the maximum deviance from magnetic north at 19 feet above the water would be an estimated 20 degrees at approximately 20 feet east or west from the cables (see Figure 1). The

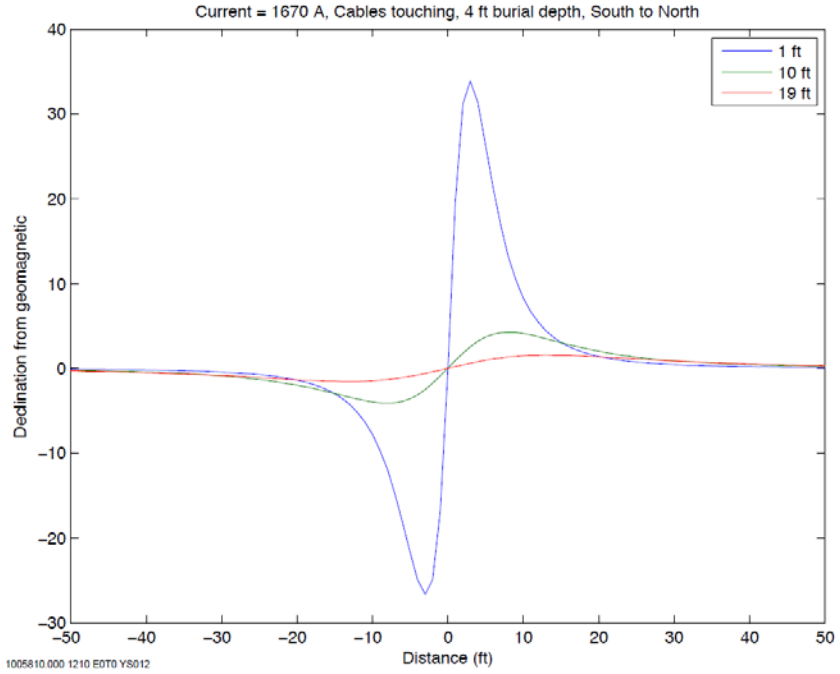
deviance from magnetic north is reduced to zero directly over the cables and at a distance of 50 feet from the cables.

Figure1: Deviation of a compass from magnetic north in degrees at 1, 10, and 19 feet above the sediment when cables are separated by 6 feet



The deviation of a compass from magnetic north was also estimated when the cables were in close proximity, as the Applicants are currently proposing. Under this scenario the expected declination from magnetic north would be less than 3 degrees at 19 feet above the cables and only within 10 to 20 feet of the cables (see Figure 2). As the cables are outside of the navigation channel (where vessel traffic will be heaviest) and the Hudson River is not open water, the impact of this deviance is expected to be minimal. Deeper burial of the cables would result in lowered effects.

Figure2: Deviation of a compass from magnetic north in degrees at 1, 10, and 19 feet above the sediment when cables are touching



In addition, there are no expected long term EMF exposure issues for individuals traveling along the Hudson River. The calculated magnetic field values at the surface of the Hudson River range from 38.7 to 57.3 milligauss (mG) [Appendix B, Request 14 of the supplemental document submitted to the New York State Public Service Commission on July 22, 2010]. 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). Current New York standards limit the maximum magnetic field at the end of a ROW of a major transmission line at 200 mG. None of the projected magnetic field exposures to commercial or recreational boaters would even remotely approach the limits recommended to protect human health by the International Commission on Non-ionizing Radiation Projection (NRPB, 2009).

3. Significant Coastal Fish and Wildlife Habitats

The potential impact of cable installation is addressed through an impairment test which evaluates the effects of the proposed action on a range of parameters that may be important in the ecological functioning of the designated habitat. The impairment test is used to determine if the proposed action would "destroy the habitat" or "significantly impair the viability of a habitat." The parameters used in the test involve physical processes, chemical characteristics, including pollutants and biological assemblages and processes. The installation of the cables requires a temporary physical alteration to a small portion of the designated habitat, but the evaluation of habitat destruction or impairment can only be addressed in the long term because natural habitats have the documented capacity to recover from disturbances, both natural and man-induced. An evaluation of the potential impacts to the designated habitat is provided below.

Physical Parameters

The major physical parameters influencing habitat in the designated areas are the dynamic tidal character of the Estuary and the geological setting of the habitat. These factors interact to shape the river channel and control the substrate, which, in turn, are major determinants of the biological community and biological activity in each of the designated significant habitats. The burial of the cables will temporarily disturb a small portion of the substrates in these areas, but because no Project structures will remain above bottom after installation, the tidal dynamics and geological processes (erosion and sedimentation) would be unaltered by the installation work. The physical processes would act on the disturbed area and reshape the substrate material into the same general configuration as existed before the cables were installed.

The only instances where there would be a change in the topography of a habitat area would be in places where rock outcroppings required that the use of grout filled mattresses. These coverings would remain as a permanent feature on the bottom, extending several feet above the existing substrate, and would modify river currents in a very small area. While these structures could induce sedimentation and scour in the near vicinity, their overall effect on river currents, sedimentation and scour would be negligible as they would be located in deep, swift water that would continue to dominate the hydrodynamics of the reach. The Applicants anticipate providing information regarding potential installation depths throughout the entire underwater route as part of their response to the DOS letter of January 5, 2011.

Biological Parameters

The use of water jetting to bury the cables in the substrate would temporarily impact the benthic community and organisms in the path of the cables and those adjacent to the pathway may be buried by sediment that settles along the trench. Cable installation and burial equipment (e.g., jet plow, shear plow or similar equipment) moves at variable speeds across the bottom but slowly enough (generally less than 0.5 feet/second) so that fish and mobile invertebrates can move away and avoid direct effects. Adverse effects on benthic community structure, food chain relationships, species diversity and predator/prey relationships among benthic organisms and between the fish and benthic trophic levels would be restricted to the area of disturbance and would not occur throughout these trophic levels in the undisturbed deepwater portion of the designated habitat, nor would they occur beyond the area of disturbance in the Hudson Estuary as a whole. The limited spatial distribution of effects ensures that the adjacent undisturbed benthic habitat can provide a source of recruitment of reproductive stages that can recolonize the disturbed areas.

If it is necessary to cross the Federal navigation channel, conventional dredging may be required for cable installation below the channel's authorized depth. Because dredging would take place at the bottom of the existing deep channel, there would be very limited spread of dredged material turbidity laterally across the shallow habitat adjacent to the channel. Dredged material would be brought to the surface for placement in scows for transport to the selected disposal location. Conventional dredging would employ best management practices (BMPs). These

BMPs would limit the spread of a surface turbidity plume, minimizing turbidity and sedimentation effects on the adjacent shallow water. Dredging proceeds slowly across the bottom so that fish and mobile invertebrates can move away and generally avoid direct effects. The limited spatial distribution of effects ensures that the adjacent undisturbed benthic habitat can provide a source of recruitment of reproductive stages that can recolonize the disturbed area.

The recovery of the benthic community and the re-establishment of its ecological relationships with other trophic levels after cable installation is contingent upon the re-establishment of the benthic substrate which supports the benthic community. Installation of the cables disturbs the sediment in a very small area of any cable segment, but does not remove the substrate material except in cases where dredging is required. Much of the existing sediment remains in the trench created for the cables.
The availability of organic and inorganic suspended sediment and the action of the tidal current regime are the primary factors influencing the configuration of the substrate surface. These factors would be unchanged by cable installation and would begin to reshape the disturbed sediments immediately. The disturbed sediments would compact over time and the surface sediment particles would be re-sorted by current action and the trench area would be comprised of similar grain size distribution to surrounding substrates. Benthic substrates are a dynamic habitat in that they are changing in response to the variability in the forces that are constantly acting on them. Cable installation would have no influence on the variability of these factors, thus the substrate will retain its natural dynamic characteristics.

The population characteristics of the benthic organisms, such as reproductive rates, mortality rates and population size are the results of habitat and biological interactions occurring on a spatial scale much greater than the area affected by cable installation. The substrate disturbance would have a direct, temporary effect on the localized community in the path of the cables. However, with recovery of the habitat and re-colonization of the area, the populations of benthic species would return to pre-installation levels because the factors influencing the reproductive and mortality rates would be the same as the rates prevailing over the entire distribution of these species in the Estuary. The cable installation would not alter the factors controlling these rates.

Where grouted filled mattresses are employed, they would represent a new substrate material. However, as they would be used only where rocky substrate is exposed or close to the surface, in many cases the existing hard surface substrate would be replaced by an alternative hard surface material. The concrete of the mattresses would be colonized by aquatic life that prefers hard surfaces, thereby the net change in aquatic life using the substrate would be minimal. The presence of the mattresses would have no effect on biological activity occurring above the bottom, such as spawning of striped bass or migratory movements of fish. Overwintering of fish in these deep channels would continue to take place as it does under existing conditions.

Chemical Parameters

The chemical characteristics of the water in the designated habitat areas are determined by the water mass movements in the Estuary. The levels of chemical constituents change continually throughout tidal cycling. The Hudson Estuary is well mixed, thus the magnitude of changes over

a tidal cycle are generally relatively small. The installation process does not introduce or extract any chemical constituents from the water, which limits the potential for a change to the water chemistry to the disturbance of the substrate during cable installation.
The sediment chemistry for the designated habitat areas shows that the sediments have generally low and variable levels of chemical contaminants. These contaminants are widespread in the Estuary, thus existing aquatic life are exposed to them throughout their lifecycles. Water jetting would resuspend the existing substrate along the cable route, but as discussed above, the vast majority of the sediment would remain within the trench. In areas where dredging may be conducted when crossing through navigation channels, the dredge material would be tested and placed at an approved disposal site. The concentrations and distribution of the existing contaminants may be slightly altered by the sediment disturbance, but average concentrations of these constituents would remain the same throughout the designated habitat areas. Some contaminants that are in the surface layer would probably be buried as the disturbed sediment settles into the trench. Because the aquatic life exposure to existing contaminants is not significantly altered by the installation process, there will be no impairment of ecological processes.

During the Project planning phase, the Applicants are using existing sediment quality data to site the cable route and, where possible, avoid known areas of high concentrations of contaminants. In addition, water quality modeling is being conducted to assess the potential impacts to water quality standards. If, based on model results, there are potential impacts to water quality standards. The Applicants will develop methods to minimize the impact to the maximum extent practicable during installation. In addition, during cable installation, CHPEI will perform water quality monitoring to assure water quality standards are met.

A three-dimensional hydrodynamic and time-variable water quality model was developed to assess water quality impacts and compliance with water quality standards in the Hudson, Harlem and East Rivers. The model was used to simulate ten contaminants that were found in sediment cores collected during the Spring 2010 Marine Route Survey. The maximum model-computed concentrations of contaminants along the cable route were graphically presented and compared to New York State's water quality standards. The effects of the proposed cable installation are projected to comply with water quality standards that are based on protecting aquatic life from acute toxicity, which are the most appropriate criteria for the assessment of the proposed Project given the non-chronic (i.e., short-term) and incremental nature of the potential exposure to sediment contaminants resulting from the cable installation. The projected maximum total PCB concentration is below the EPA's Engineering Performance Standard water quality criteria for dredging resuspension at the Hudson River PCBs Superfund Site (EPA 2003).

Project Impacts

The submarine cable route presented in the July 2010 Supplement to the Application for Certificate of Environmental Compatibility and Public Need was developed using the following criteria selected to minimize potential impacts on aquatic resources:

- Cable route sited in moderately deep to deep water to avoid shallow vegetated habitats;
- Avoid maintained navigation channels to the extent possible;

- Avoid Significant Coastal Fish and Wildlife Habitats to the extent possible; and
- Use cable installation and burial equipment that minimizes disturbance of the benthic substrate.

Originally presented to state and federal agencies as almost an exclusively submarine project, early consultation indicated significant concerns with cable installation in the Hudson River north of the Federal Dam at Troy due to significantly elevated levels of PCB and the uncertainties surrounding the schedule for the Hudson River Dredging Project dredging activities initiated in 2010. The Applicants accepted the admonitions of these agencies and non-governmental organizations that an overland route for this portion of the route should be adopted to reduce potential water quality impacts despite the increased construction costs.

Recently, the Applicants have also proposed an additional 40 miles of upland routing as a replacement for approximately the same number of miles of in-water construction. In order to minimize water quality impacts and reduce the number of navigation channel crossings. This proposal, if adopted, would bypass the following SCFWH which were in proximity to the route presented in the July 2010 Supplement to the Application for Certificate of Environmental Compatibility and Public Need:

- Shad and Schermerhorn Islands
- Schodack and Houghtaling Islands
- Coeymans Creek
- Hannacroix Creek
- Mill Creek Wetlands
- Coxsackie Creek
- Coxsackie Island Backwater
- Stockport Creek and Flats
- Vosburg Swamp and Middle Ground Flats
- Haverstraw Bay
- Croton River and Bay

As discussed above, in their analysis of alternative routes the Applicants noted that there were no significant engineering constraints along the railroad ROW from Catskill to Malden-on-Hudson and have agreed to adopt this as part of their overall settlement proposal. The inclusion of this segment would mean the Project will bypass the following SCFWH:

- Rogers Island
- Catskill Creek
- Ramshorn Marsh
- Roeliff Jansen Kill
- Inbocht Bay and Duck Cove
- Germantown – Clermont Flat

Of the remaining SCFWH, the Applicants' route is adjacent to with nine resource areas and cross into six SCFWHs. In some cases the cable route passes close to the boundary of a SCFWH in the horizontal plane, but because of the criteria to place the cable in moderately deep to

deepwater, there is a substantial vertical separation of the installation corridor from the nearest SCFWH boundary. As discussed in the draft Best Management Practices (BMP) document submitted as part of the settlement process, the Applicants propose to use the following BMPs when installing the cable in and adjacent to SCFWH:

- Seasonal Constraints: It is anticipated that construction windows associated with in-water construction activities (i.e., dredging, cable laying, splicing, and burial activities) will be required by federal and state regulatory agencies. Regulatory agencies develop construction work windows in order to protect and minimize the potential impact on different species and on certain life stages. Within the Hudson River, the Department of State (DOS) has identified recommended work windows associated with SCFWHs. Table 1 identifies the expected work windows where the Project traverses the SCFWH areas. However, the Applicants recognize that seasonal construction windows may be imposed for areas where the Project comes in close proximity to other SCFWHs.
- Limited Duration of cable installation: The estimated duration of cable installation is relatively short in each SCFWH. Table 1 provides estimates of this time for each of the SCFWH where the Project traverse the habitat area.
- Water Quality Monitoring: The Applicants have proposed as part of settlement that jet plow trials with water quality monitoring in typical sediment conditions prior to installation to confirm BMPs for minimizing re-suspended sediment. In addition, water quality monitoring will be conducted during cable installation.
- Water jetting operation parameter modifications: If pre-installation water quality modeling indicates that there may be exceedances of water quality standards, modifications to the water jetting operation (including a reduction in water jetting pressure and a reduction in water jetting rate of installation) will be implemented. In addition, operational modifications may occur in the field based on water quality monitoring results.
- Silt Curtains: Silt curtains may be utilized in locations where proximal resources are considered particularly sensitive. The use of silt curtains and their location will depend on local hydrodynamics and navigation traffic.

Table 1: Agency Recommended Work Windows and Estimate Cable Installation Duration

Name	Recommended Closed Work Window	Estimated Cable Installation Duration (# days)
The Flats	Spring and Fall	5
Kingston Deepwater Habitat	N/A	9
Esopus Estuary	April-July (Warmwater fish spawning)	2
Poughkeepsie Deepwater Habitat	N/A	20
Hudson River Mile 44-56	May - July (striped bass spawning)	17
Lower Hudson Reach	Mid-November - Mid-April (Striped bass)	11

Route Refinements to Minimize Impacts

The Applicants' route crosses the following SCFWH because the habitat boundaries for one or more SCFWH extend from shore to shore or the SCFWH is located in the deep water portions of the Hudson River where the cables should be installed:

- Esopus Estuary
- The Flats
- Kingston Deepwater, Vanderburg Cove and Shallows, and Esopus Meadows Habitats
- Poughkeepsie Deepwater Habitat
- Hudson River Mile 44-56
- Lower Hudson Reach

The SCFWHs intersected by the cable contain similar physical conditions and similar important biological resources. Specific ecological values for these designated habitats include wintering and spawning habitat for shortnose sturgeon and important habitat for juvenile sturgeon. At Kingston and Poughkeepsie, the deepwater contains higher salinity water during the summer that provides the habitat for marine species that penetrate up the estuary. All SCFWHs would be important for migration during spring and fall. Spring migration could include adults of river herrings, American shad, and striped bass, in addition to shortnose sturgeon. Atlantic sturgeon also utilizes the estuary and would occur in these habitats or would migrate through them. American shad and striped bass spawn in these deepwater habitat or the adjacent shoals but their eggs and larvae are planktonic. A general description of expected impacts to these resource areas is provided below, followed by specific measures taken for each SCFWH.

<u>Esopus Estuary</u>
The Esopus Estuary SCFWH contains a complex of natural estuarine communities at the mouth of a major freshwater tributary of the Hudson River. The deepwater area is recognized as a post-spawning and wintering habitat for shortnose sturgeon. The littoral zone of the Hudson River adjacent to the creek mouth is also an important spawning ground for shad and serves as a spawning, nursery and feeding area for striped bass, white perch, herring, smelt, and most of the resident freshwater species.

Esopus Estuary also contains a number of shallow water habitats, but the proposed cable route avoids the Esopus river mouth and associated fresh-tidal wetlands and littoral zone areas. In the deepwater portion of the habitat, the original route spanned 1.24 miles. Recently the Applicants modified the route from Mile 235 to Mile 237 so that the centerline of the installation corridor was moved to the east when possible in order to further reduce the intersection with the habitat. This refinement not only shifts the centerline further from the mouth of Esopus Creek, it also reduces the length of cable route within the SCFWH to 0.31 miles in the deepwater portion of this SCFWH.

The utilization of the area by fish species can be protected by limiting installation work to existing work windows designed to protect these seasonal uses. Shortnose sturgeon favors the channel areas of the Hudson and has been shown to use both naturally deep and dredged channels. Cable installation would not alter channel depths or existing current regimes, and

following re-establishment of the benthic substrate the conditions that make this an important habitat for sturgeon would be unimpaired.

The Flats

The Flats is a large contiguous area of shallow, freshwater tidal flats. It serves as a spawning ground for American shad, with spawning occurring primarily on the extensive flats, shoals, sandbars and shallow areas near the mouths of tributary streams. The Flats also serve as spawning, nursery, and feeding habitat for striped bass, white perch, and various resident freshwater species. Shortnose sturgeon and Atlantic sturgeon may also use the area to feed (especially during slack water in late spring and summer).

For Route Miles 240.5 to 245.5, the route was modified so that the cables run along the western side of The Flats rather than the eastern. The western side is more heavily utilized as the maintained navigation channel occupies this portion of the river, so the cables will be sited along the maintained channel segment and the boundary of The Flats over a distance of approximately 0.5 miles at the northern end of the habitat. The Applicants would consider siting a silt curtain in this location, with the understanding that vessel traffic and hydrodynamics may present constraints. The silt curtain, if employed, would be in addition to BMPs such as seasonal restrictions and cable operational measures. Cable installation would not alter channel depths or existing current regimes, and following re-establishment of the benthic substrate the habitat value would be restored.

Kingston Deepwater, Vanderburg Cove and Shallows, and Esopus Meadows Habitats

The Kingston Deepwater SCFWH area contains six miles of continuous deep water from 30 feet deep to in excess of 50 feet deep. This deep water provides wintering habitat for shortnose sturgeon and supports spawning of sturgeon as well. With spawning occurring in this area, juveniles would also likely make use of this habitat. In addition, the higher salinity water in this deep section of the Estuary during summer low flows supports the upstream penetration of marine species in the Estuary.

For Route Miles 247 to 249, the centerline of the cable route was shifted slightly to the west to place it in deeper water between the Kingston Deepwater SCFWH and an area of shallow water. This refinement eliminates the only area in the original alignment where the cable route was in water less than 15 feet deep. In addition, a small reach of cable (Route Miles 252 to 252.75) was shifted to the east in order to remove it from the lower end of the Kingston Deepwater SCFWH.

The utilization of the area by fish species can be protected by limiting installation work to existing work windows designed to protect these seasonal uses. Shortnose sturgeon favors the channel areas of the Hudson and has been shown to use both naturally deep and dredged channels. Cable installation would not alter channel depths or existing current regimes, and following re-establishment of the benthic substrate the conditions that make this an important habitat for sturgeon would be unimpaired.

Poughkeepsie Deepwater Habitat

The Poughkeepsie Deepwater SCFWH area is a 14-mile reach of the Estuary containing a river bottom trench ranging from 30 feet deep to 50 feet deep over most of the area. A maximum

depth in excess of 125 feet occurs at Crum Elbow. This reach is spawning and wintering habitat for shortnose sturgeon, and marine fish species take advantage of the higher salinity water in the depths during low summer flows. The occurrence of larval shortnose sturgeon in this reach suggests that it may be important for juveniles of this species.

The Applicants are proposing three modifications to the original alignment in order to reduce the length of the Project within this habitat. For Route Miles 255 to 257.5, the cable route centerline was shifted to the east to place it between the boundary of the Poughkeepsie Deepwater SCFWH and shallow water along the east side of the river, thereby eliminating 1.9 miles of cable route within the SCFWH. Furthermore, the cable route was shifted to the east in Route Miles 264.5 to 265 to take advantage of relatively deep water outside the Poughkeepsie Deepwater Habitat. Finally, at the lower end of the Poughkeepsie Deepwater Habitat (Route Miles 267.5 to 268.5), the cables were shifted to the east so that the route was outside the SCFWH boundary for an additional approximately 1 mile.

The Poughkeepsie Deepwater is recognized as spawning and wintering habitat for shortnose sturgeon, an endangered species in the Hudson Estuary. Because sturgeon may be using this reach much of the year, installation would be scheduled when abundance in the area is low. The Applicants would consult with resource agencies on the best time to install cables in this reach. Shortnose sturgeon favors the channel areas of the Hudson and has been shown to use both naturally deep and dredged channels. Cable installation would not alter channel depths or existing current regimes, and following re-establishment of the benthic substrate the conditions that make this an important habitat for sturgeon would be unimpaired.

Hudson River Mile 44-56

Hudson River Mile 44-56 SCFWH is an approximate 12-mile reach of the Estuary where it passes through the Hudson Highlands. This is a narrow reach with very deep water, strong currents and extensive rocky bottom substrate. This reach is biologically significant because it remains freshwater through early summer and is a spawning area for striped bass and other anadromous species. The early juveniles of these species are carried through this reach to the productive shallows of Haverstraw Bay, Croton Bay and the Tappan Zee. In addition, this is a migration corridor for species moving upstream to the upper Estuary.

The recent survey of the cable route, including sub-bottom profiling, suggests that rock outcroppings are present in this reach of Estuary which may prevent burial of the cables. More refined profiling of the bottom would likely be undertaken before final placement of the cables. Where the cables cannot be buried, they would be laid across the bottom and covered with grout filled mattresses to protect them.

This deepwater area is recognized as a spawning area for striped bass and wintering habitat for shortnose sturgeon, an endangered species in the Hudson Estuary. These seasonal uses of the area can be protected by limiting installation work to existing work windows designed to protect these seasonal uses. Shortnose sturgeon favors the channel areas of the Hudson and has been shown to use both naturally deep and dredged channels. Cable installation would alter channel depths slightly where mattresses are used to protect the cables, but existing current regimes would remain as an important feature of this habitat area. These currents and recovery of the

substrate where the cable is buried would provide the conditions that make this an important habitat for striped bass and sturgeon.

Lower Hudson Reach

While this segment of the river has been heavily impacted by filling and development activities, it continues to support benthic, planktonic, and pelagic species. Striped bass in various life stages utilize the area for wintering between mid-November through mid-April. Yearling winter flounder can also be found wintering in this area during the same time period. In addition, several other fish species have been observed in surveys.

The utilization of the area by fish species can be protected by limiting installation work to existing work windows designed to protect these seasonal uses. The highest use of the habitat is during the winter season. Cable installation would not alter channel depths or existing current regimes, and following re-establishment of the benthic substrate the conditions that make this an important habitat for sturgeon would be unimpaired.

The installation of the Champlain-Hudson Power Express cables will not destroy SCFWH because the cables are buried and there will be no structures that could modify the natural processes that maintain the existing estuarine habitat community. A small portion of the deepwater habitat in the designated area will be temporarily impacted during and for a variable recovery time following the cable installation. Throughout installation and immediately after, the deepwater habitat will remain functional and will regain full ecological functionality through the action of unimpaired natural processes. In those small areas where concrete mattresses are used the change to habitat would be negligible and highly localized.

4. Commercial and Recreational Fisheries

The DOS has requested an assessment of the operational impacts of the Project on commercial and recreational fisheries. Once the cables are in place at the proper burial depth, the expectation based on numerous similar projects is that the in-water portion of the cables will be maintenance free. The only operational aspects of the cables with the potential to impact commercial and recreational fisheries are heat loss and electro-magnetic fields (EMF).

Heat Loss Effects

In its March application, the Applicants stated that there would be a negligible increase in the top 6 inches of sediment where the majority of benthic organisms reside. In response to a request from the DPS, the Applicants provided a coarse estimate of temperature rise at 0.2 meters below the seafloor assuming the cables were buried ~3 feet. The estimated average temperature rise associated with the HVDC cables would range from 1.20 degrees Celsius (°C) (gravel) to 1.50°C (sand) to 2.40°C (clay/silt) [Appendix B, Request 12 of the supplemental document submitted to the New York State Public Service Commission on July 22, 2010]. In response to an informal information request from the DOS, the Applicants applied the same formula for the HVAC cables resulting in a range of 0.70°C (gravel) to 2.30°C (clay/silt). For both cable systems, the

majority of heat was projected to be primarily dissipated through the sediments, below the sediment/water interface which is the biologically productive zone in the sediments.

In response to a further request made by the New York State Department of Environmental Conservation (NYSDEC), the Applicants contracted with Dr. William Bailey of Exponent to develop a more rigorous model of heat loss. This analysis examined the expected impacts on water temperature as well as sediment temperature and expected impacts on the biological community.

Water temperature

The average flow rate of water in the Hudson River is 13,600 cubic feet per second, but it can flow as slowly as 882 cubic feet per second[1]. The energy loss from the cable in the form of heat that would be required to heat water moving at the average flow rate of the Hudson River by just 1°C is 6,000 Watts/meter (W/m) assuming a 150-mile cable length. Even at the minimum water flow of 882 cubic feet per second, a 1°C temperature increase would require a cable loss of 430 W/m^2. The typical anticipated cable loss when the transmission line is in operation is 86.2 W/m (43.1 W/m per cable for two cables). Thus, the heat from the cable will have a negligible perhaps even immeasurable effect on water temperature anywhere along the length of the proposed cable installation and any water quality or biological effects in the water column would similarly be negligible.

Further, one can compare the water heating due to the cable heat loss to the heating of the river by the energy from the sun. Solar energy deposited on the surface of the earth is approximately 3.7 $kW\text{-}h/m^2$ per day, with daily variation (standard deviation) of 2.2 $kW\text{-}h/m^2$.[3] In the narrowest section of the Hudson River (992 feet), this produces average heating of 46,614 W/m with daily variation of 27,716 W/m; wider sections of the river will have a higher equivalent heating. The daily variation in the sun's heating is 321 times higher than the heating due to the proposed buried cables. The fluctuation in the sun's heat to the Hudson River over just one day is almost equivalent to a whole-year of heat loss from the installed cables. Hence, in any one day the heat input from the cable would be lost in the natural variability due to seasonal changes in length of daylight, meteorological conditions, and turbidity levels, and hence would have no water quality or biological effects within the water column.

Sediment temperature

Exponent performed a finite volume calculation of the temperature rise in the sediment below the seafloor surface. The model included two cables with heat losses of 43.1 W/m each, separated by 1.8 meters. The simulations were performed at cable burial depths of 3 feet (nominal burial depth), 6 feet (areas requiring additional protection), and 15 feet (crossing navigation channel).

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1 National Water Quality Assessment Program - The Hudson River Basin, http://ny.water.usgs.gov/projects/hdsn/fctsht/su.html .

2 All the calculations assume that water had a chance to mix at least once in its travel along 150 miles of the river.

3 Based on the data of the closest U.S. Department of Energy National Renewable Energy Laboratory monitoring station at Bluefield, West VA; http://www.nrel.gov/midc/bsc/

Simulations were performed for three common sediment types: sand, clay, and gravel. The simulation was conservative in that it assumed that moving water provides no forced convection cooling of the seafloor sediment, only natural (i.e. standing water) convection and conduction of the sediment was included. In reality, moving water increases convection by assisting in the movement of heat out of the soil into the overlying water layer, which then passes away from the heat source by flow induced by the river gradient as well as tides or density changes.

Many different authorities use $2^{o}K$ increase at 0.2 and 0.3 meter burial depth as a measure of cable induced heating (see Worzyk, 2009). For all burial depth and sediment types, the width of sediment which exceeds $2^{o}K$ increase in temperature is less than 6 meters (18 feet) at depth of 0.2 and 0.3 meters below the seafloor surface. The seafloor surface temperature calculated in Tables 2 through 4 greatly overestimates the actual temperature rise due to the conservative assumptions of the model. Actual temperature rise on the seafloor surface is going to be by a far lower amount given the conservative assumption of non-flowing water. This model is more accurate, however, for the 0.2-and 0.3-meter depth calculations because the conservative assumption has less influence on the heat movement in the shallow subsurface sediment than at the sediment-water interface.

Table 2: Three Feet Cable Burial Depth

Soil Type	Thermal Resistivity (K-m/W)	Peak temperature rise (^{o}K) @ 0.2 m Depth	Width of Sediment Above $2^{o}K$ (m) @ 0.2m Depth	Peak temperature rise (^{o}K) @ 0.3 m Depth	Width of Sediment Above $^{o}2K$ (m) @ 0.3m Depth	Peak temperature rise (^{o}K) @ seafloor surface	Width of Sediment Above $2^{o}K$ (m) @ seafloor surface
Gravel	0.55	3.3	3.2	4.4	4	1.3	0
Sand	0.67	4.02	3.75	5.36	4.5	1.6	0
Clay/Silt	1	6	4	8	5	2.32	2.9

Table 3: Six Feet Cable Burial Depth

Soil Type	Thermal Resistivity (K-m/W)	Peak temperature rise (^{o}K) @ 0.2 m Depth	Width of Sediment Above $2^{o}K$ (m) @ 0.2m Depth	Peak temperature rise (^{o}K) @ 0.3 m Depth	Width of Sediment Above $2^{o}K$ (m) @ 0.3m Depth	Peak temperature rise (^{o}K) @ seafloor surface	Width of Sediment Above $2^{o}K$ (m) @ seafloor surface
Gravel	0.55	2.26	2.36	2.89	4.5	0.9	0
Sand	0.67	2.75	3	3.52	5	1.1	0
Clay/Silt	1	4.1	6	5.25	6	1.7	0

Table 4: Fifteen Feet Cable Burial Depth

Soil Type	Thermal Resistivity (K-m/W)	Peak temperature rise (^oK) @ 0.2 m Depth	Width of Sediment Above 2^oK (m) @ 0.2m Depth	Peak temperature rise (^oK) @ 0.3 m Depth	Width of Sediment Above 2^oK (m) @ 0.3m Depth	Peak temperature rise (^oK) @ seafloor surface	Width of Sediment Above 2^oK (m) @ seafloor surface
Gravel	0.55	1.18	0	1.45	0	0.5	0
Sand	0.67	1.44	0	1.77	0	0.67	0
Clay/Silt	1	2.15	2.86	2.65	5	0.96	0

More recently, Exponent considered the likely effect of both the cables touching (i.e. within the same trench) and being separated by 6 feet. The results are shown in the table below. As can be seen, the maximum temperature when the cables touch is higher than when there is a separation distance of 6 feet at the 0.2 and 0.3 meter depth. However, this delta becomes minimal at the seafloor surface.

Table 5: Maximum Temperature Change in Celsius for Two Cable Configurations

	6 Foot Separation	**Cables Touching**
Water	0.00021	0.0038
Surface	1.2	1.0
0.2 meter depth	3.4	5.2
0.3 meter depth	4.3	6.7

Impacts from Heat

Published calculations of the temperature effects of operating cables are consistent in their predictions of elevated temperatures in the near vicinity of the cables (OSPAR Commission 2009). The underwater cable buried below the seabed would not pose a physical barrier to fish passage, and would allow benthic organisms to colonize and demersal fish species (including demersal eggs and larvae) to utilize surface sediments without being affected by the cable operation (Mineral Management Service 2008). The small increase in seabed temperature is considered to be within normal ranges of variation and no residual effects are predicted. The potential for increases in seawater temperature above these areas is negligible and no significant effects are predicted (Shetland HVDC Connection 2009).

Specifically, the temperature requirement of river herring (alewife and blueback herring) eggs is between 7 to 29.5°C, with the optimum temperature preference at 18°C. In the Hudson River, the upper lethal temperature limit for eggs is 29.7°C. The upper lethal temperature in the Hudson River acclimated to 14°C was 31°C (Mullen et al. 1986).

Atlantic sturgeon eggs are highly adhesive and are deposited on the bottom substrate, usually on hard surfaces (e.g., cobble). Hatching occurs approximately 94-140 hours after egg deposition at temperatures of 20°C and 18°C, respectively, and larvae assume a demersal existence (Gilbert 1989; Atlantic Sturgeon Status Review Team 2007). There is no information on survival of eggs

or early life stages of shortnose sturgeon in the wild. Many eggs reared in captivity die of fungus infections. However, spawning in freshwater typically occurs when water temperature increase to 8-9°C and ceases when water temperature reach 12-15°C. Spawning in the Connecticut River has been observed to occur at 18°C (National Marine Fisheries Service 1998).

Hatching of white perch occurs in 24 hours at 16°C to 20°C and in 144 hours at 11 to 16°C. Optimum hatching temperature was 14°C at a salinity of zero parts per thousand (ppt). The size of newly hatched larvae was related to temperature; the maximum length occurred at 16 to 18°C at all salinities (0 to 10 ppt) (Stanley and Danie 1983).

The estimated peak temperature rise at the seafloor surface for the cables separated by 6 feet at the 3 feet cable burial depth ranges between 1.30 to 2.32°C, the 6 feet cable burial ranges between 0.9 to 1.7°C, and the 15 feet cable burial ranges between 0.5 to 0.96°C. However, these estimated rise in seafloor surface temperature are an overestimation of the natural condition as it does not taken into account the cooling effect from the natural flowing of the Hudson River. The potential rise in temperature of the seafloor surface will be within the preferred temperature limits of the demeral eggs and larvae species that utilizes the bottom habitat of the Hudson River Estuary.

EMF Effects

By way of background information, electric (E) fields can be blocked by conducting materials, such as the sheathing and insulation that is typically used in underwater power cables. Therefore, there is no direct exposure of marine species to E fields. In its EIS for the array of subsea cables for the proposed Cape Wind Energy Project, MMS (2009) reached the same conclusions as the USACE (2004), finding that E fields from cables would be eliminated by the shielding and that there would not negative effects to the aquatic community.

Emission of magnetic (B) fields is not prevented by cable sheathing, sediment, or other materials, and therefore a weak induced electric (iE) field will be generated within close proximity to a transmission cable. B and iE fields resulting from both direct and alternating currents decrease quickly to background levels with distance from the cable. Using an EPRI model, the USACE (2004), estimated the peak intensities of B fields anticipated from the proposed Cape Wind Energy Project in Massachusetts would be strongest at the seabed directly over the buried cables and would quickly attenuate to approximately 10 percent of the peak intensity within 10 to 20 feet directly above the seafloor and 20 to 30 percent of the peak intensity within 10 feet horizontally from the AC cables. While burying the cable does not prevent the emission of these fields, it does result in an added buffer, putting distance between the cable and the marine biota over which the emissions will decrease (Exponent and Hatch 2009).

The “EMF emissions” of the cables do not vary between the marine and freshwater aquatic environments as they are a function of the cable, not the surrounding environmental conditions. The electric field of the proposed cables is totally shielded from the aquatic environment by the grounded metallic and ferromagnetic sheaths surrounding the cables. The metallic and

ferromagnetic sheaths will slightly attenuate the magnetic field of the cables but the magnetic field measured outside the cables in the lake or riverbed or water column would not be affected by the salinity of the water (fresh, brackish, salt water).

The Applicants provided a discussion of EMF in the Exhibit 4 of the March 30, 2010 Application for Certificate of Environmental Compatibility and Public Need (Application). In this same document, an Electric and Magnetic Fields report was provided in Appendix H. In the supplement to the Application, the Applicants supplied a revised Electric and Magnetic Fields report that include the expected field levels for the HVAC cables [Response 14, Appendix B and Attachment M, Request 12 of the supplemental document submitted to the New York State Public Service Commission on July 22, 2010]. As discussed in Section 2 above, Exponent has also calculated expected magnetic fields at depths of 1, 10, and 19 feet above the sediment for cables that are buried six feet apart and touching. The Applicants also anticipate providing additional data in response to the DOS letter of January 5, 2011.

Concern over the EMF effects has focused on the potential for influencing migration patterns and exposure to the fields. In order to better understand the best available information on these two issues, the Applicants are providing a literature review below.

Migration

Previous studies have indicated that the weak iE field generated by a transmission cable is within the range of detectability of electrosensitive species (Normandeau and Exponent 2010, Exponent and Hatch 2009, Centre for Marine and Coastal Studies at the University of Liverpool 2003). In a controlled experiment, Gill et al. (2009) evaluated the response of three species of electro-sensitive fish (two shark species and one ray species) to a buried subsea cable. They found that while some of the elasmobranchs responded to the EMF emitted in terms of both the general spatial distribution of one of the species tested, and at the finer scale level of individual fish of different species, they stated that this response varied within the species and also during times the cable being energized and not energized, day and night (Gill et al. 2009). While electro-sensitive species may detect the EMF, the effects do not appear to be significant (Centre for Marine and Coastal Studies at the University of Liverpool 2005; Scott Wilson Ltd. and Downie 2003; Sound & Sea 2002; USACE 2004; MMS 2009; Scottish Executive 2007; World Health Organization 2005; Exponent and Hatch 2010). The Scottish Marine Renewables Strategic Environmental Assessment reported that "Current research indicates that certain species of elasmobranchs are likely to be able to detect the level of electric field that will be generated by a typical export cable but the field would not cause an avoidance reaction. Furthermore, there is no evidence to indicate that existing cables have caused any significant impact on elasmobranch migration patterns" (Scottish Executive 2007).

Studies have also investigated the effect of electric and magnetic fields on fish movement and migration. Some migratory animals, including sea turtles, Pacific salmon, Japanese eel (*Anguilla* species), and spiny lobster, are thought to detect and orient to the earth's geomagnetic field during their travel (Lohmann et al. 2004, Hatch Acres 2006, Nishi et al. 2004, Karlsson 1985, Tesch et al. 1992), though it is thought that this is one of several potential mechanisms used for navigation (Groot and Maragolis 1998; Quinn et al. 1981). Crystals of magnetite have been

found in four species of Pacific salmon (Mann et al. 1988; Walker et al. 1988), and these crystals are thought to serve as a compass that orients to the earth's magnetic field (Valberg 2005, Scottish Executive 2007). In a study of chum salmon (*Oncorhynchus keta*) Yano et al. (1997) fit a tag that generated a 600 μT artificial B field around the head of the fish; there was no observable effect on the horizontal and vertical movements of the salmon when the tag's magnetic field was varied. Quinn and Brannon (1982) found that while salmon are thought to detect B fields, their behavior is probably governed by various stimuli as evidenced by the lack of effect of changing artificial B fields. Similar results were found in studies of Atlantic salmon: research of EMF effects showed that navigation and migration of Atlantic salmon was not expected to be affected by the B field produced by an underwater cable (Scottish Executive 2007).

Within the Project area, potential aquatic species of concern include shortnose sturgeon, Atlantic sturgeon. Sturgeon are weakly electric fish and can use electroreceptor senses, along with other senses, to locate prey. In the one report related to Sterlet sturgeon (A. *ruthenus*) and Russian sturgeon (A. *gueldenstaedtii*) behavior in the presence of anthropogenic EMF, Basov (1999) found differing behavior at various E field frequencies and intensities:

- At 1.0 to 4.0 Hz at 0.2 to 3.0 millivolts/cm (mV/cm), responses were searching for source and active foraging,
- At 50 Hz at 0.2 to 0.5 mV/cm, response was searching for source, and
- At 50 Hz at 0.6 mV/cm or greater, response was avoidance.
- A study completed a year after the installation of submarine HVDC cables (1,300 A) in the Baltic Sea between Sweden and Poland detected no changes in the species composition, abundance or biomass of the area's invertebrate community (Andrulewicz et al. 2003).

For the Project area, a model of the expected declination from magnetic north expected from the cables (see Figures 1 and 2 above). For cables installed six feet apart at a four foot burial depth, at one foot above the riverbed there would be a maximum deviation of approximately 95 degrees within 10 feet of the cable, with no impact within approximately 40 feet from the cables. However, for cables installed next to each other (as the Applicants recently proposed), at one foot above the riverbed there is only a 35-degree declination within ten feet of the cable and the magnetic fields at all depths returns to background levels within 20 feet of the cables.

Exposure

A number of studies have investigated the effect of very strong magnetic fields on fish egg and larval development. Strand et al. (1983) reported that exposure of rainbow trout eggs, sperm, or fertilized eggs to a 1 Tesla (10,000 Gauss [G] or 1,000,000 milligauss [mG]) direct current (DC) magnetic field had only the slightest effect on the fertilization rate. Formicki and Winnicki (1998) reported that trout and rainbow trout embryos and larvae exposed to DC magnetic fields above 4 millitesla (mT) (40 G or 40,000 mG), exhibited incubation delays and longer and heavier bodies than controls exposed at levels up to 5.5 mT.

A weak increase in the permeability of egg shells of trout, rainbow trout, and sea trout to water was reported from ultrastructural observations of the shells after exposure to a 2 mT (20 Gauss or

20,000 mG) DC magnetic field in vitro (Sadowski et al., 2007). Sea urchins exposed to 30 mT (30 G or 30,000 mG) but not 15 mT (15 G or 15,000 mG) DC magnetic fields delayed development in early embryos and caused and increase in abnormalities of gut development (Levin and Ernst, 1997). Sudden exposure of carp embryos and larvae to DC magnetic fields of 50-70 mT (500-700 G or 500,000 mG-700,000 mG) is reported to increase heart rate by 5%, which then declined to resting levels in 15 minutes (Formicki and Winnicki, 1996). Trout larvae and fry tended to be attracted to magnets placed in experimental mazes that produced magnetic fields of 0.15-0.42 mT (1.5-4.2 Gauss or 1,500-4,200 mG).

Impacts from EMF

The Applicants have found no studies that demonstrated negative effects to aquatic life resulting from EMF (Bochert and Zettler 2006; Centre for Marine and Coastal Studies at the University of Liverpool 2005; Scott Wilson Ltd. and Downie 2003; Sound & Sea 2002; USACE 2004; Scottish Executive 2007; World Health Organization 2005; Hatch Acres 2006, Exponent and Hatch 2009). The USACE (2004) concluded that there would be no negative effects to fish species or the marine environment as a result of the 60 Hz B fields because the magnitude of the B fields proximal to the transmission cable would be limited to an extremely small space and decrease rapidly within a few feet of the cable.

In terms of migration, available information indicates that no single environmental stimulus, e.g., current flow, light, smell, taste, magnetic field, temperature, salinity, etc., dominates migratory behavior. Magnetic field stimuli seem ideal for navigating between distant regions, but locations for spawning and reproduction likely are determined by local, non-magnetic cues (Lohmann et al., 2008). Migratory species thus have the means to coordinate and make use of multiple cues and resolve discrepancies. For example, the orientation of salmon towards natal lakes in tanks without olfactory, taste, or current cues is not affected by a 90-degree shift in the horizontal component of the magnetic field during the day but is observed to change at night (Quinn, 1980).

Moreover, the magnetic field of the cable will accentuate or attenuate the magnetic field of the earth in a constant fashion along a narrow band of river bottom the length of the Hudson River as it will be aligned throughout this portion of the route in a constant relationship to the north-south pole magnetic of the earth. Other alterations to the geomagnetic field that fish and other fauna encounter in aquatic environments include magnetic anomalies in geologic sediments beneath sea and river beds, and numerous perturbations of the geomagnetic field by ferromagnetic objects on the bottom, e.g. sunken ships, gas and oil pipelines, communication cables with ferromagnetic armoring. Steel surface vessels will also significantly perturb the geomagnetic field as they sit at moorings or move through the water. Studies conducted in laboratories of prolonged exposure of marine fish and invertebrates to DC-produced B fields have not detected effects to orientation or movement compared to control organisms (Bochert and Zettler 2004, 2006).

Another important consideration is that, by and large, migrating fish species will not travel in the part of the water column closest to the buried cable. The strength of the field is greatest closest to the cable and diminishes quickly with distance. As migrating fish species tend to be in the

upper part of the water column (see Xie, 2002) and the average depth of the Hudson River varies between 40 feet in the southern section and 6 to 12 feet in the northern section (but with a 40-feet deep channel), the additional distance above the buried cables brings them into a region where the magnetic field characteristics will be closer to that of the earth's background geomagnetic field than at the river bottom. This separation distance diminishes the potential for negative effects on fish migration.

In evaluating the potential impacts due to exposure, the available literature indicates that there would be no adverse effect on egg and larval development. The Applicants' modeling predicted a DC magnetic field for 3652.7 mG at the river bed [Appendix B, Request 14 of the supplemental document submitted to the New York State Public Service Commission on July 22, 2010]. In contrast to DC magnetic fields that are reported to affect development at high intensities, delays in development are reported at lower intensities of 60-Hertz, alternating current magnetic fields (1,000 mG) in Japanese rice fish by Cameron et al. (1985) and sea urchins by Zimmerman et al. (1990). This data suggests that much greater magnetic fields are required than the proposed cable will produce, in order to create deleterious effects on eggs and larvae. In addition, as a percentage of the overall spawning numbers, the area of potential effect is small and extremely weak and would therefore represent a negligible effect of any kind on the number of eggs and larvae present during spawning.

It has been suggested that the research developed with respect to open marine systems may not be applicable to a river channel environment. However, a substantive change in the ambient geomagnetic field produced by the cables is confined to a limited distance around the cables. The DC magnetic field only will vary from a background level of 527 mG in the Hudson River by more than 20 percent within ± 16 feet on either side of a single cable and ± 4 feet on either side of cables laid 1.8 m apart at 20 - 40 feet above the river bed. In the lower estuary of the Hudson River where it is narrowest, this zone around the cable is a small fraction of the width of the river (about 5,000 feet) and as such is not likely to create a meaningful potential behavioral restriction within the cross sectional area of the river that fish would move through.

In summation, research studies on a variety of fish and other marine species have not reported adverse effects either in open marine systems or in small experimental tanks. The MMS has concluded that the B fields produced by the cables would not negatively affect marine life (MMS 2009). The World Health Organization (2005) reports that "none of the studies performed to date to assess the impact of undersea cables on migratory fish (e.g., salmon and eels) and all the relatively immobile fauna inhabiting the sea floor (e.g., mollusks), have found any substantial behavioral or biological impact." While it is not possible to "prove the negative", i.e. provide absolute assurance there will be no deleterious effect, repeated tests by multiple investigators have not shown any adverse effects at the relevant levels of exposure.

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HDR | DTA

February 4, 2011

Jeffrey Zappieri
Supervisor, Consistency Review Unit
New York State Department of State
Office of Coastal, Local Government, and Community Sustainability
99 Washington Avenue, Suite 1010
Albany, NY 12231-0001

RE: Champlain Hudson Power Express
F-2010-1162 (S-2010-0025)

Dear Mr. Zappieri:

On December 6, 2010, Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. (collectively the "Applicants") submitted their application for coastal zone consistency review to the New York State Department of State ("NYSDOS") for the Champlain Hudson Power Express project (Project). On January 5, 2011, your office submitted a request for additional information. Please consider this letter to be the initial response to that request.

Your letter identified six areas where supplementary information was necessary. We are providing a response to each of these below or, where the information is not available at this time, providing a schedule for submittal of these materials. The Applicants also note that, as the NYSDOS is aware, confidential settlement discussions pursuant to the Public Service Commission's Settlement Guidelines have been on-going since the submission of the request for a coastal consistency determination. In mid-January 2011, the Applicants and 14 parties to the settlement process were able to report to the presiding Administrative Law Judges ("ALJs") that there has been substantial progress on issues of concern, including the Project route. Based on the outcome of this process, the Applicants may be submitting a supplement to their application outlining not only any routing changes but also any other conditions or requirements that may be of interest to your agency.

1. **Please provide a written response to all information requested by the DOS in the letter to Keith Silliman of TRC Companies, Inc. dated November 22, 2010 (enclosed). To date, verbal responses provided to DOS by TRC Companies, Inc. and HDR have been inadequate and reflect the need to submit written responses that includes information as to the ability of TDI to site the proposed line within existing utility corridors and in the rights-of-way of state and county roads.**

   The Applicants submitted this response on January 18, 2011. The Applicants are available to discuss this document at your convenience.

HDR | DTA
HDR Engineering, Inc.

970 Baxter Boulevard
Suite 301
Portland, ME 04103-5346

Phone: (207) 775-4495
Fax: (207) 775-1031
www.hdrinc.com

2. **The information provided in the application envisions burying the cables along the proposed submarine route in the Hudson River at depths of 3 to 4 feet, in conjunction with the use of concrete mattresses in yet-to-be-identified areas where burial would be prohibitive because of the presence of bedrock. In some instances, a greater depth may be required to avoid either environmental or magnetic field impacts or navigation deepening. Please provide a technical analysis of the maximum attainable cable burial depths for the entire submarine portions of the proposed route and identify where the use of concrete mattresses would be necessary.**

   In response to this question, the Applicants are reviewing sediment core data from the marine route survey completed in the Spring of 2010 in order to estimate the likely depth restrictions along the route. Additional cable protection (i.e., concrete mattresses) would likely be required where the minimum depth for adequate protection of the cables cannot be achieved.

   The Applicants propose to provide this analysis by February 18, 2011. However, this analysis is preliminary and will likely be more "coarse" in scale. A more fine level of analysis will be available once the Engineering, Procurement, and Construction ("EPC") contractor is selected and completes the construction marine route survey. The Applicants are available to discuss these limitations at your convenience.

3. **Please provide information pertaining to the suitability and feasibility of siting the proposed cables within areas of the Hudson, East, and Harlem rivers that were previously mechanically dredged.**

   The Applicants' assumption is that this question is related to the potential use of the federal navigation channel or its side slopes, as this is the only dredged area that follows the Project route. On September 30, 2010, the Applicants participated in a conference call that included Randall Hintz, Chief of Operations Support at the U.S. Army Corps of Engineers ("USACE") for the greater New York City area, and Gerlyn Perlas, Chief of the Technical Support Section for the USACE, as well as representatives of the NYSDOS and U.S. Department of Energy. At this meeting, Mr. Hintz stated that installation of transmission cables within federal navigation channels was an issue at the national level. While the USACE had not gone as far as to prohibit installation along the length of the navigation channel, it was noted that the USACE would prefer for the cable to be installed outside of the channel.

   Over the course of the conversation, Mr. Hintz did state that installation of the cables within the side slope of the navigation channel could be acceptable, although certain depth requirements would need to be met. In order to understand the feasibility of this option, the Applicants contacted three nationally recognized cable installation companies to determine if installation within the side slope was feasible up to a depth of 12 feet. Two companies provided brief statements that it would not be possible to install the HVDC cables in the slope of the navigation channel, which is typically 30 degrees to the depth proposed, due to concerns about operating heavy jet plow machinery in rough riverbed terrain. The third

company suggested that, while they generally like to see less than a 10-degree slope for a standard jetting plow, under the right conditions it could be possible to install cable for short segments (less than 1 kilometer) with up to a 30-degree slope. Installation in a steep slope would require that there is sufficient water at the top of the slope, as well as adequate horizontal clearance from existing features (e.g., river banks, piers, piling) to allow for a vessel that is at least 20 meters wide and drafts 6 meters of water. If these conditions are not met, then it would not be possible for the vessel to complete the considerable maneuvering necessary to prevent the plow from running down the slope. This company was unaware of any existing burial equipment that might be able to cope with the steeper side slopes at the required depth and noted that, while a purpose built plow could be discussed, the installation would be complicated if the cables were bundled. Their conclusion was that significant detail would be necessary to select the right burial equipment (including water depth, slope angle, seabed properties, and the shoreline, including abandoned and dilapidated structures) and even then there would be segments where side slope burial was not possible.

At the same time, the Applicants also provided mapping of the location of the federal navigation channel in Haverstraw Bay along with available bathymetric data (see Attachment), as this was an area of concern at the time. Company 1 and 2 were unwilling to offer an opinion based on the level of information provided. Company 3 felt that the installation could occur near the top of the slope, although additional information on issues such as water depth would be necessary. As noted in the report to the ALJs in January, an overland bypass of Haverstraw Bay is currently under discussion as part of settlement negotiations so this issue may be rendered moot.

Based on the information provided by the installation firms, the Applicants do not believe it is feasible to install the cables within the side slopes of the federal navigation channel for the entire Project. There may be short segments where burial within the side slopes could be reasonably achieved, but existing conditions must meet the restrictions previously described.

4. **Please provide scientifically verifiable estimates for magnetic field levels and ambient temperature increases in soil and water for cable burial depths of 4, 8, 12, and 15 feet and a scientific analysis of the impacts of the magnetic fields and temperature increases on aquatic species in the Hudson River, including impacts on migratory routes, feeding, spawning, and all life development stages for each burial depth.**

   The Applicants have retained Exponent to produce the estimates requested and expect the results next week. HDR staff will then review this information and provided an analysis of impacts. The Applicants propose to provide this information no later than February 18, 2011 and hope to provide it earlier if possible.

5. Please state the design life of the proposed project.

The design life for HVDC cables is assumed to be thirty (30) years, although there are systems currently in place that have been shown to operate for longer periods.

6. Analyzing existing Hudson River dredging and navigation use data, and recognizing the trend in the use of deeper draft vessels in the Hudson River, please explain how TDI will adjust the depth of the buried cable in the riverbed to accommodate any future federal dredging and navigation projects over the design life of the proposed project. Please include a discussion as to whether or not burial of the proposed cables would interfere with such anticipated navigation improvements to the Hudson River.

The Applicants are not aware of any anticipated navigation deepening projects in the Hudson River for which the Project would interfere and believes that the proposed Project burial depths can avoid impacts to future projects. However, if the NYSDOS has specific projects in mind for this question, the Applicants request that these be identified so that a directed analysis can be completed.

The only intersection with the federal navigation channel would be where a crossing is necessary to avoid an environmentally sensitive area or other features. In these situations, the cables will be buried fifteen (15) feet below the Project authorized depths as required by USACE regulations. The Applicants have stated in other forums that additional burial depths are possible in these circumstances.

In addition, permit conditions for submarine cable projects routinely include a condition that the cable owner could be required to install the existing cable to a deeper depth at their expense should such measures be required. If these measures were required, a survey would be conducted to confirm that there is sufficient slack in the cables where the increased burial depth is required. If not, an additional length(s) of cable would be spliced onto the existing cables. Water jetting, hydraulic dredges, or, under worst case conditions, hand jetting would be employed to achieve the desired deeper depth.

We look forward to hearing your thoughts on the issues discussed in this letter. Please feel free to contact me at any time if you have any questions about the materials presented.

Regards,

Sean Murphy
Project Manager

Attachment

cc: Dr. Jerry Pell, U.S. Department of Energy
Don Jessome, Transmission Developers Inc.

HDR | DTA

February 18, 2011

Jeffrey Zappieri
Supervisor, Consistency Review Unit
New York State Department of State
Office of Coastal, Local Government, and Community Sustainability
99 Washington Avenue, Suite 1010
Albany, NY 12231-0001

RE: Champlain Hudson Power Express
F-2010-1162 (S-2010-0025)

Dear Mr. Zappieri:

On December 6, 2010, Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. (collectively the "Applicants") submitted their application for coastal zone consistency review to the New York State Department of State (NYSDOS) for the Champlain Hudson Power Express Project (Project). On January 5, 2011, your office submitted a request for additional information. On February 4, 2011, the Applicants provided a response to four of the six areas where supplementary information was necessary and this letter completes the Applicants' response.

2. The information provided in the application envisions burying the cables along the proposed submarine route in the Hudson River at depths of 3 to 4 feet, in conjunction with the use of concrete mattresses in yet-to-be-identified areas where burial would be prohibitive because of the presence of bedrock. In some instances, a greater depth may be required to avoid either environmental or magnetic field impacts or navigation deepening. Please provide a technical analysis of the maximum attainable cable burial depths for the entire submarine portions of the proposed route and identify where the use of concrete mattresses would be necessary.

In the Spring of 2010, the Applicants conducted a Marine Route Survey for a 300' wide corridor, using the centerline proposed in the Application for Certificate of Environmental Capacity and Public Need (Application) filed on March 30, 2010 with the New York State Public Service Commission (NYSPSC) on behalf of the Champlain Hudson Power Express project (Project). The Marine Route Survey included geophysical, sediment and benthic surveys:

- Geophysical surveys were conducted to investigate existing bottom features in the lakes, rivers and canals along the proposed route. Surveys were conducted using multi-beam bathymetry, side-scan sonar, magnetometer and sub-bottom profile.

HDR | DTA
HDR Engineering, Inc.
970 Baxter Boulevard
Suite 301
Portland, ME 04103-5346
Phone: (207) 775-4495
Fax: (207) 775-1031
www.hdrinc.com

- The sediment survey was conducted to collect information on the existing sediment type and quality along the proposed route.
- The benthic survey was conducted to augment existing benthic community data and will be used to assess potential impacts associated with the installation of the underwater transmission cable.

The Marine Route Survey followed the Aquatic Sampling and Analysis Plan and Sediment Sampling and Analysis Plan that was based on existing databases of sediment type and quality with the Hudson River and reviewed by the New York State Department of Environmental Conservation and the U.S. Army Corps of Engineers. These plans can be found in Attachment P of the Supplement to Application submitted to the NYSPCS in July of 2010.

Sediment sampling provided two basic types of information, the physical characteristics of sediments and chemical characteristics of sediment. A total of fifty-eight (58) samples (including landfall locations) were collected from the Town of Coeymans to Spuyten Duyvil or Project Mile 202 to 324. In the Harlem and East Rivers, seven sampling locations were identified from Project Mile 324 to 333, which is the current extent of the Project.

The proposed depth for the Champlain Hudson Power Express HVDC cables within the Hudson River is four (4) feet, except when the cables cross federally authorized navigation channels. The proposed burial depth is fifteen (15) feet below the authorized depth within federally authorized navigation channels. In order to characterize the sediments for cable installation, the core sample target depth was 1 foot below the proposed cable installation depth. In the Hudson River, core penetration depth ranged from 8 to 10 feet along the proposed route outside navigation channels. Within navigation channels, core penetration ranged generally from 18 to 19.5 feet. In the Harlem River, core penetration ranged from 1 to 18 feet, with multiple core attempts being made at three locations due to limited penetration and limited recovery.

Our analysis of likely cable burial depths achievable using hydro plowing was based on data collected during the Spring 2010 survey, including core penetration, sub bottom profiles, side scan sonar and bathymetry. Table 1 below provides a summary of the description of the results of the sub-bottom profiler provided in the Marine Route Survey Report (Attachment E of Supplement). In some locations there was little to no sub-bottom penetration but correlating core data to these locations indicated that cable installation using hydroplowing would be possible. Based on the information provided by the sub-bottom profile survey and the core data, the Applicants believe it is reasonable to assume that cable burial depths of up to six feet are obtainable for most of the Project route. However, this will be verified during the construction marine route survey.

TABLE 1
DESCRIPTION OF SUB-BOTTOM PROFILER RESULTS

Location	Description
Albany / Troy	Little to no sub-bottom penetration, although where penetration is obtained is generally 5 ft or greater.
Northern Catskills	Little to no sub-bottom penetration, although where penetration is obtained is generally 5 ft or greater.
Southern Catskills	Sub-bottom penetration generally below or approximately 5 feet.
Poughkeepsie	Sub-bottom penetration limited.
Newburgh Bay	Sub-bottom penetration to depths of 5 feet or more.
Hudson Highlands	Sub-bottom penetration achieved but sometimes limited to depth of less than 5 feet.
Tappan Zee / Haverstraw	Deep penetration throughout section.
Palisades	Sub-bottom approximately 15 feet below surface for majority of route.
Harlem River	Sub-bottom penetration typically to depth of 5 feet or greater, broken up by apparent rock outcrops.

Based on the project route presented in the Supplement, areas which the Marine Route Survey indicated are not likely suitable for cable burial (e.g., near rock outcroppings or existing utility areas) are presented in Table 2. The majority of these areas are associated with existing infrastructure or cable areas. Other areas not suitable for cable burial are generally associated with rock outcroppings that do not extend the full width of the waterbody. Re-routing of the cables at these locations is likely to avoid the need for installing additional cable protection. In the case of the Harlem River, designated cable and pipeline areas extend over substantial areas or occur frequently along the length of the river, so that the placement of protection over exposed cable may be continuous over several adjacent infrastructure elements. The detailed design developed as part of the Environmental Management and Construction Plan will optimize the placement of protection to minimize the area of the bottom covered by concrete mattresses or other protective devices.

An additional, more detailed analysis further refining maximum cable burial depths and need for additional cable protection will be available once the Engineering, Procurement, and Construction ("EPC") contractor is selected and completes the construction marine route survey. During detailed design, the location of existing infrastructure will be confirmed and the length of non-burial and the arrangement of protection will be developed. The 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. The design of each infrastructure crossing will be coordinated with the owner to meet their needs

As NYSDOS is aware, route modifications are being discussed during the confidential settlement discussions pursuant to the Public Service Commission's settlement guidelines. Any changes in the location of the transmission cables as a result of these discussions could impact the potential maximum burial depth. For example, if the centerline of the Project was shifted to shallower waters to avoid deep-water habitat, there could be a corresponding decrease in how deeply the cables could be installed. The Applicants therefore recommend that the analysis

presented here be considered tentative until a final routing has been agreed upon by some or all of the settlement parties.

TABLE 2
CABLE NON-BURIAL AREAS REQUIRING PROTECTION OVER CABLES

Cable Segment	Obstruction Type	Approx MP Begin	Approx MP End	Approx Length (ft)
Hudson River	Infrastructure Locations	219.8	220	1000
		220	220.3	1250
		220.5	220.7	1000
		220.8	221	1000
		245.2	245.6	2000
		260.8	261.6	3900
		267.2	267.4	1000
		271	271.4	2200
		275.8	276.7	4600
		286	286.3	1900
		294.9	295.1	1300
		297.5	297.8	1500
		309	309.3	1600
		313.9	314.1	1000
	Natural Barrier	208.8	209.0	1000
		209.9	210.1	1000
		211	211.3	1600
		220.8	221	1000
		267.2	267.4	1000
		284.1	284.5	2100
		287.6	287.8	900
Harlem River	Infrastructure Locations	324.1	324.2	600
		324.9	325.0	900
		325.2	325.3	840
		325.4	325.7	1500
		326.1	326.2	840
		326.3	326.5	1050
		328.3	328.5	930
		328.8	330.4	8450
		330.5	330.9	1950
East River	Infrastructure	334	334	1955ft-cable runs N-S

[1] Milepoint zero at Canadian border on Lake Champlain.
[2] Distances based on NOAA chart not survey data.

4. Please provide scientifically verifiable estimates for magnetic field levels and ambient temperature increases in soil and water for cable burial depths of 4, 8, 12, and 15 feet and a scientific analysis of the impacts of the magnetic fields and temperature increases on aquatic species in the Hudson River, including impacts on migratory routes, feeding, spawning, and all life development stages for each burial depth.

The Applicants retained Exponent Inc. to provide the estimates of magnetic field levels and ambient temperature increases associated with the depths provided. This report is provided in Attachment A of this document.

The potential effects of perturbations in water temperature and magnetic fields induced by the operation of the Champlain Hudson Power Express project (Project) are localized effects in the sediment at or below the surface of the river bed. Moreover, the sediment where the temperature rise is greatest is only a small portion of the cross section of the waterbody at any given location. The modeling of the distribution of temperature increase and change in magnetic field for burial depths of 4, 8, 12, and 15 ft. define the area and volume in which a potential change in exposure on aquatic life could occur, assuming that the organisms are sensitive to small changes in these factors. The modeling shows that the magnitude of changes diminishes with depth of burial starting at a level of minimal change for the 4 ft. burial depth.

The spatial relationship of the zone of influence of the cables to the overall habitat available is an important factor in assessing the potential for impacts. The location of the zone of influence on the bottom prevents the potential exposure of many species that utilize shoreline and shallow water habitats. The cable centerline was intentionally sited in moderately deep to deep water to avoid shallows. Those species which utilize bottom habitats in deep water would potentially have greater exposure to the zone of influence than other species. Among these species are sturgeon and catfishes, which are in close contact with and are feeding along the bottom. Many other species utilize the bottom for feeding, particularly in juvenile life stages, but this occurs primarily in shallow water. The eggs of many species are spawned on the bottom or deposited on the bottom after spawning in the water column but many of these species spawn over shallow water depths. The following sections address the specific activities of migration, spawning, feeding, and early developmental stages of fish.

Migration

Migration generally refers to the movement of large numbers of individuals moving in unison to a selected, preferred location, often for spawning. For this assessment many types of movements by large segments of the fish populations are included because any significant movement patterns could bring individuals within the zone of influence of the cables. Migrations and major movements follow a seasonal pattern thus the individuals involved would not be exposed to the influence of the cables at all times unless they lived year round in the Hudson and their preferred habitat was on the bottom in deep water. The concern for cables effects on migrations is that the change in magnetic field induced by the cables would confuse the migrating fish and divert them or perhaps delay their arrival at the spawning location at the proper time.

Based on the spatial distribution of the magnetic fields, it is apparent that only a small portion of any migrating fish population would come in contact with the zone of influence of the cables. The cables are aligned generally, parallel to the axis of the river, thus migrating fish could travel the full length of the Hudson without encountering the influence of the cables, even where the cables cross federal maintained navigation channels. Fish would encounter the

cables' influence only if they were migrating near the bottom and then only if they were aligned with the small zone of influence and stayed within the cable's influence. The model analyses show that there is very little change in total magnetic field (5.9%) 1 ft. above the river bottom beyond a distance of 10 ft. from the centerline of the cables buried at a depth of 4 ft. This zone of influence also extends 10 ft. above the centerline in the water column. For burial depths from 8 ft. to 15ft., the zone of influence diminished substantially. The magnetic deflection caused by the cables at a burial depth of 4 ft was ≥7.9 degrees within the same 10 ft. zone of influence around the cable centerline and diminished substantially at an 8 ft. burial depth, but only slightly more at greater depths.

For fish that enter the zone of influence around the cables, the potential for impact depends on whether or not the individuals could detect the induced changes and how they respond to the changes. There is technical literature that shows that some fish species can detect and use magnetic fields for navigation. This has been reported and studied with respect to Pacific and Atlantic salmon (Mann *et al.* 1988; Walker *et al.* 1988; Scottish Executive 2007; Yano *et al.* 1997; and Quinn and Brannon 1982). These studies did not detect an effect on fish behavior when magnetic fields around the fish were artificially altered. The lack of an effect may be due to the low level of induced change and the fact that the migrating fish are responding to a variety of stimuli. As there are no apparent impacts on individual fish this eliminates the potential for population level effects. The Hudson River is a highly developed estuary which contains many stimuli that could potentially direct or impact fish migration. There is no evidence that fish migrations in the Hudson have been or would be impaired by magnetic fields.

Spawning

As there are no apparent impacts on fish migrations, species utilizing the Hudson for spawning, including resident species, can access their preferred areas for spawning. The majority of fish species spawn in tributaries, shallow shoreline areas, and in open water in the pelagic zone. All of these areas are beyond the influence of the operating cables. The narrow zone of influence from cable operation provides a very large area of bottom habitat that is not influenced by the cables. See section on early life history development below.

Feeding

As with other aspects of potential cable effects, feeding behavior could be disrupted only in the area of river bottom influenced by the operating cables. Fishes feeding in shallow, shoreline areas of the river or in the pelagic zone would not be influenced by cable operation. Bottom feeding fish could move into and out of the zone of influence as they move in the search for food. It is also possible that the increase in water temperature could increase the production of food, in which case the cables could possibly stimulate feeding.

Sturgeon may use AC electronic signals emitted by prey to guide them to the prey (Basov 1999), but such electric fields will not be produced by the proposed cables. Altered magnetic

fields will be present in a small area as described above, but there is no evidence that these fields are a factor in the feeding behavior of sturgeon.

A study of the invertebrate community in the Baltic Sea in the vicinity of a new submarine cable and at control stations found no changes in the species composition, abundance, or biomass of invertebrates (Andrulewicz *et al.* 2003). In addition, based on the post-installation benthic survey conducted for the Neptune Regional transmission project the benthic community re-colonized the cable installation areas within several months of installation (Neptune 2005). At this location there would have been no loss of feeding opportunities for fishes. For the Project, the small increase in temperature of the sediment surface estimated by modeling (1ºC) would be expected to have a minimal effect on the production of benthic invertebrates that could be a food source of fishes. The increase in sediment temperature would be well within the temperature tolerances of the organism in the existing community, and the natural variability that these organisms are exposed to, thus, it would not depress or stimulate biological activity. The increase in sediment temperature would not impact feeding by fishes.

Life Stage Development

The potential exposure of early life stages to the cables will vary depending on their habitat preferences and movement patterns. The life stage with the greatest potential for exposure would be fish eggs and newly hatched larvae that settle to the bottom habitat that is within the zone of influence of the operating cables. At this time they are undergoing rapid physiological and anatomical changes.

A number of studies have investigated the effect of strong magnetic fields on fish egg and larval development. The magnetic fields in these studies were much greater than the changes in natural magnetic fields anticipated by the operation of the proposed transmission cables. Strand *et al*. (1983) reported that exposure of rainbow trout eggs, sperm, or fertilized eggs to a 1 Tesla (10,000 Gauss [G] or 1,000,000 milligauss [mG]) direct current (DC) magnetic field had only the slightest effect of the fertilization rate. Formicki and Winnicki (1998) reported that rainbow trout embryos and larvae exposed to DC magnetic fields above 4 millitesla (mT) (40 G or 40,000 mG) exhibited incubation delays and longer heavier bodies than controls exposed at levels up to 5.5 mT.

A weak increase in the permeability of egg shells in trout, rainbow trout, and sea trout to water was reported from ultrastructural observations of the shells after exposure to a 2 mT (20 G or 20,000 mG) DC magnetic field *in vitro* (Sadowski *et al*. 2007). Sea urchins exposure to 30 mT (30 G or 30,000 mG) but not 15 mT (15 G or 15,000 mG) DC magnetic fields delayed development in early embryos and caused increase in abnormalities of gut development (Levin and Ernst 1997). Sudden exposure of carp embryos and larvae to DC magnetic fields of 50-70 mT (500-700 G or 500,000-700,000 mG) is reported to increase heart rate by 5 %, which then declined to resting levels in 15 minutes (Formicki and Winnicki 1996). Trout larvae and fry tended to be attracted to magnets placed in experimental mazes that produced magnetic fields of 0.15-0.42 mT (1.5-4.2 G or 1,500-4,200 mG).

These studies show that much stronger magnetic fields than will be produced by the proposed Project are needed to impact the early life stages of aquatic organisms. As shown in the model, the change in magnetic field produced by the proposed cables are equal to or less than 30.3 mG, which is about 10-100 times lower than the magnetic field levels that are reported to produce adverse effects in the early life stages of fish that remain in the zone of influence for an extended period of time.

Older, mobile life stages of fish from early juveniles to adults would not be exposed to these low levels of magnetic fields for extended periods. After cable installation is completed the disturbed area of the bottom is expected to recover its benthic invertebrate community. After the cable is energized, the benthic community is not expected to differ significantly from adjacent benthic area, thus there will be no unique features that would attract or concentrate fish in the vicinity of the cable. Sturgeon and other species are expected to distribute themselves throughout the Hudson Estuary as they did prior to cable installation and have incidental contact with the zone of influence of the cables.

Summary of Potential Effects on Aquatic Life

Modeling analysis shows that the increase in sediment temperature, as well as changes in the natural magnetic fields (total magnetic field and compass deflection) is limited to a small area of influence confined to the river bottom and the water column directly above the cable centerline. The magnitude of induced change in water temperature is extremely small, probably not detectable, while the sediment surface temperature is elevated slightly more than 1ºC for all burial depths. These analyses are conservative in that they are based on an assumption of a clay/silt substrate. Because the water temperature change is negligible with a 4 ft. burial depth and sediment temperature varies little among the four burial depths assessed, placing the cable deeper than 4 ft. would have no benefit in terms of reducing potential temperature impacts on aquatic life.

With regard to magnetic field, the model analyses show that a 4 ft. burial depth produces a change in total magnetic field extended up to 30 ft. from the cable centerline depending on the arrangement of the two cables. The magnitude of the change diminishes rapidly beyond 10 ft. from the centerline. Greater burial depths reduce the magnitude of change and deflection and reduce the area influenced by the cable. For a biological 'compass' that responds to the horizontal component of the geomagnetic field, the least change in the background geomagnetic field would occur for a cable burial depth between 4 and 8 ft. of burial. Beyond 8 ft. the reduction in the change in deflection is small.

The available information on the effects of alterations in water and sediment temperature, and changes in the magnetic field on aquatic life shows no significant adverse effects on individual organisms for various biological functions. The technical literature is not specific to species in the Hudson, but it does cover a range of related organisms. Both species-specific studies as well as reviews of literature do not reveal any significant short or long-term effects from the operation of submarine electric cables. Given this lack of evidence of significant impacts, the low level of induced changes by the proposed cables and the small spatial extent of these

changes, the depth of burial does not appear to be a significant factor in the assessment of impacts on aquatic life in the Hudson. Placing the cable deeper than 4 ft. over most of its length may increase the area of the bottom disturbed during installation without providing any additional protection for aquatic life during project operation. On balance a burial depth of 4 ft. may represent the best arrangement to minimize overall effects from installation and operation of the cable.

We look forward to hearing your thoughts on the issues discussed in this letter. Please feel free to contact me at any time if you have any questions about the materials presented.

Regards,
HDR|DTA

Sean Murphy
Project Manager

Attachment

cc: Dr. Jerry Pell, U.S. Department of Energy
Don Jessome, Transmission Developers Inc.

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STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001

ANDREW M. CUOMO
GOVERNOR

RUTH NOEMÍ COLÓN
ACTING SECRETARY OF STATE

March 08, 2011

Mr. Sean Murphy for Champlain Hudson
Power Express, Inc. and CHPE Properties
C/O HDR/DTA HDR Engineering Inc
970 Baxter Blvd
Suite 301
Portland, ME 04103-5346

Re: ~~F-2010-1162 (formerly S-2010-0025)~~
U.S. Army Corps of Engineers/NY District Permit
Application #: 2009-01089-EHA
DOE Docket #: PP-362
NYS PSC Case: 10-T-0139
NYS DEC Regions 2, 3, 4 and 5
Champlain Hudson Power Express, construct/operate 1,000 MW underwater/underground HVDC electric transmission system extending between Canada and NYC.
Status of Consistency Review

Dear Mr. Murphy:

The Department of State is required to notify you of the status of our review of this project for its consistency with the New York State Coastal Management Program if a decision has not been issued within three months following commencement of our consistency review.

The completion of the consistency review for this project will require further coordination with the involved Federal, State, and local agencies.

A copy of this letter has been sent to the Department of Energy and the Army Corps of Engineers.

Please call Matthew Maraglio at (518) 474-5290 if you have any questions.

Sincerely,

Jeffrey Zappieri
Supervisor, Consistency Review Unit
Office of Coastal, Local Government
and Community Sustainability

c: COE/ NY District – Naomi Handell
DOE – Jerry Pell
NYSDEC/ Central Office - Christopher Hogan
NYS DPS – Steven Blow

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STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001

ANDREW M. CUOMO
GOVERNOR

CESAR A. PERALES
SECRETARY OF STATE

June 8, 2011

Mr. Donald Jessome, President/CEO
Champlain Hudson
Power Express Inc. and
CHPE Properties, Inc.
Pieter Schuyler Building
600 Broadway
Albany, NY 12207-2283

Re: F-2010-1162
U.S. Dept. of Energy #: PP-362
U.S. Army Corps of Engineers Application #: 2009-01089-EHA
NYS Public Service Commission Application #: 10-T-0139
Champlain-Hudson Power Express
1,000 megawatt HVDC electric transmission system from Canada to New York City
Conditional Concurrence with Consistency Certification

Dear Mr. Jessome:

The Department of State (DOS) has completed its review of the consistency certification and data and information for the above referenced project in accordance with the federal Coastal Zone Management Act (CZMA). Pursuant to 15 CFR 930.4 and 930.62, DOS conditionally concurs with the consistency certification for the project under the enforceable policies of the New York State Coastal Management Program (CMP).

This transmission project promises to deliver a tremendous supply of clean, renewable hydropower from Canada to the New York City Metropolitan Area, one of the nation's largest energy markets. If constructed as proposed and conditioned, the project can provide several important energy benefits. The electricity will serve the New York Independent Systems Operator (NYISO) load center in Zone J and adjacent zones, a high need area. Hydro-power, a renewable energy source, diversifies the State's energy portfolio. Because the electricity is predominantly generated by hydropower, it will improve air quality by displacing less clean generators and will not contribute to greenhouse gas emissions. Importantly, the project improves the State's ability to meet future market demand for low-cost electricity should current power sources go off-line or become obsolete.

The siting of the transmission project in State navigable waters and adjacent areas requires great care to ensure that commercial navigation is not adversely impacted, Significant Coastal Fish and

Wildlife Habitats (SCFWH) are not affected, recreational fishing activities are not substantially altered, migratory patterns of aquatic species are not permanently altered, re-suspension of estuarine sediments and associated contaminants is minimized and all other environmental impacts are minimized. The conditions attached to this concurrence ensure that the project can proceed in a manner that is both consistent with the enforceable policies of the CMP and achievable by the project applicant.

I. STATUTORY FRAMEWORK FOR CONSISTENCY REVIEW

The Coastal Zone Management Act (CZMA) authorizes a coastal state to review federal agency activities in or outside of the coastal zone affecting any land or water use or natural resource of the coastal zone for their consistency with the enforceable policies of the CMP.[1] Under this regulatory framework, the state coastal agency can concur with, conditionally concur with, or object to the consistency certification for a project. In this matter, DOS has conditionally concurred with the certification. If the conditions are met, the federal agencies can proceed to make decisions on the applications once amended.

Within 30 days of receipt of the conditional concurrence pursuant to 15 CFR 930.4 and 930.62, the applicant must amend its federal applications to include the State's conditions. The Federal agency or the applicant shall immediately notify the DOS if the conditions are not acceptable. If the application is not amended or either the Federal agency or the applicant notifies DOS that the conditions are not accepted, the conditional concurrence automatically becomes an objection.

Pursuant to § 930.63(e), the applicant has the opportunity to appeal the objection to the Secretary of the US Department of Commerce within 30 days after receipt of the conditional concurrence. Also, if either federal agency does not approve the application as amended by the State's conditions, then the applicant will have 30 days after receiving such notice from the federal agency to file an appeal.

In order to grant an override request, the Commerce Secretary must find that the activity is consistent with the objectives or purposes of the Coastal Zone Management Act, or is necessary in the interest of national security. A copy of the request and supporting information must be sent to the New York State DOS Division of Coastal Resources and the federal permitting or licensing agency. The Commerce Secretary may collect fees from you for administering and processing your request.

II. SUBJECT OF THE REVIEW

The applicant, Champlain Hudson Power Express, Inc. and CHPE Properties Inc, (hereafter CHPE),[2] proposes to construct, operate and maintain a 1,000 megawatt (MW) underground and submarine high-voltage, direct current (HVDC) electric transmission system. The transmission project will primarily transport hydropower generated electricity from sources in central and eastern Canada to provide a reliable supply of clean, renewable energy to meet future demand for electric power in the New York City Metropolitan Area and the lower Hudson Valley.

The project consists of two (2) approximately 6-inch diameter HVDC transmission cables connected as a single bi-pole originating at a point beneath the Richelieu River in the southern portion of

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[1] 16 U.S.C., Sec. 1456(c)(3)(A).

[2] The Applicant is a joint venture of TDI-USA Holdings Corporation (TUHC), a Delaware corporation, and National Resources Energy, LLC (NRE), a Delaware limited liability company. TUHC, the majority (75%) shareholder in the Applicant, is a subsidiary of Transmission Developers Inc. (TDI), a Canadian Corporation. NRE is a wholly owned subsidiary of National RE/sources Group, a limited liability corporation duly organized under the laws of the State of Connecticut.

the province of Quebec[3] and crossing the international border into New York. The cables will be buried beneath the beds of Lake Champlain and the Hudson River. To bypass the Champlain Canal and a portion of the upper Hudson River, two 6-inch diameter HVDC land cables will be buried underground within a railroad right-of-way from Whitehall, New York to Coeymans, New York. The cables enter the Hudson River at Coeymans and then continue generally south within the Hudson River bed terminating at a new alternating current (AC) converter station at Yonkers, New York.[4] After exiting the converter station, six (6) 345-kV AC cables enter the water and continue south under the Hudson, Harlem and East Rivers to the existing Poletti substation in Astoria, Queens.[5] The project will interconnect with the northeast regional grid in Zone J of the NYISO.

III. APPLICATIONS FOR REGULATORY APPROVALS

On January 27, 2010, the applicant filed an application with the Office of Electricity Delivery and Energy Reliability of the U.S. Department of Energy (DOE) requesting "Presidential Permit" authorization to construct and operate a two bi-pole, 2000 MW high-voltage direct current (HVDC) transmission system crossing the United States- Canada border to deliver electricity to markets in New York City, New York and Bridgeport, Connecticut. [6] This application was amended on August 5, 2010 by removing the 1000 MW bi-pole that terminated in Bridgeport, CT from the application. On June 18, 2010, DOE issued a public notice announcing its intention to prepare an Environmental Impact Statement to assess potential environmental impacts associated with granting a Presidential Permit for the project. On December 6, 2010, CHPE submitted an application to the U.S. Army Corps of Engineers (Corps) requesting authorization for the project pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899.

On December 8, 2010, the applicant provided to DOS a CZMA consistency certification for the project as a part of a joint application to New York State and the Corps certifying that "The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program." On January 5, 2011, DOS acknowledged receipt of this certification and notified the applicant that a Final Environmental Impact Statement (FEIS) would be considered as data and information necessary for DOS to complete its review of the consistency certification unless specifically waived. DOS has chosen to waive the FEIS requirement for purposes of commencing and conducting consistency review as the necessary information was obtained in submissions from the applicant, consultations with various New York State agencies and subject matter experts and participation in the New York State Public Service Law's Article VII[7] process in an advisory capacity. DOS has engaged in a constant effort to gather the data and information necessary to adequately consider the applicant's certification.

On March 30, 2010, CHPE filed an application for a Certificate of Environmental Compatibility and Public Need, a 401 Water Quality Certificate and other environmental permits with the New York State Public Service Commission (PSC)[8] in accordance with Article VII of the New York State Public

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[3] Submarine HVDC cables are currently proposed to begin within the Richelieu River, proximate to converter stations in southern Quebec.

[4] A convertor station is a required component of the project as the HVDC current needs to be converted to an HVAC current prior to entering the Poletti substation.

[5] The project's precise final route would be subject to a number of factors, including resource issues, permitting, land acquisition, and stakeholder agreement. All portions of the project located within the United States would be owned and operated by the applicant.

[6] Since the cable crosses an international border, the applicant is required to obtain a Department of Energy issued Presidential Permit. (See Federal Power Act § 202(e); 10 C.F.R. Part 205).

[7] Public Service Law Article VII governs the siting of major utility transmission facilities within New York State.

[8] New York State Public Service Commission, Rate Case 10-T-0139.

Service Law. Article VII establishes the review process for consideration of any application to construct and operate an electric transmission line with a design capacity of 100 kilovolts or more, extending for at least ten miles, or with a capacity of 125 kilovolts and over, extending for a distance of one mile or more. The applicant will also require authorization from the New York State Department of Environmental Conservation (DEC) under a State Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activity and from the New York State Office of General Services for easements to use and occupy State-owned underwater lands.

IV. OTHER FACTORS RELEVANT TO THE REVIEW

The New York City market for electricity consumes great amounts of energy in terms of kilowatt hours and pays some of the highest prices in the nation. In 2010, the average price of electricity paid by residential customers in New York City was estimated at 22.82 cents per kilowatt hour.[9] New York City is also an under-serviced market and hence an attractive market for major suppliers of electricity. The CHPE project helps to meet the increasing energy demand in this important market.

Governor Cuomo set forth an ambitious agenda for transitioning New York to a more environmentally sustainable energy economy through increased energy efficiency and a commitment to developing renewable energy technologies. In the *Cleaner, Greener NY: The New NY Agenda,*[10] the Governor stated "we can develop synergies between economic development and environmental improvement through the development of clean energy—we will create jobs while simultaneously reducing harmful emissions." The Governor has recognized that the provision of reasonably priced hydropower from Canada to serve New York City markets advances this goal.

During the 21st century, the energy "landscape" in New York changed in direct response to national and State energy objectives. A new generation of energy proposals are now emerging which pioneer newer, cleaner technologies and promote sustainable use and diversification of energy resources. The CPHE project offers the opportunity to meet future energy needs, while balancing reliability, cost, environmental and public health impacts, and economic growth. It would be the first sub-benthic electric transmission system of its scope and scale sited within the Hudson River and would be the first transmission system of this type and scale worldwide to be constructed in a confined, linear estuarine ecosystem.

As a navigable waterway, the Hudson River has served as a vital transportation link in the nation's and the State's commercial network. Since 1834, Hudson River navigational improvements have been a cooperative state/federal effort. Energy transmission facilities serving New York City have historically been routed overland, often parallel to the Hudson River shoreline and have been available to shippers with facilities along the river. Today the Hudson River serves an important group of water-dependant industries which operate at an economic advantage due to their direct access to and reliance on, as an integral part of such industry, the use of the river and nearby energy resources. The cost savings of water transportation (as compared to land and air transport) and access to reasonably priced energy resources are directly responsible for the location of certain industries along the Hudson River.

The Hudson River estuary serves as a spawning and/or nursery ground for important fish and shellfish species, such as striped bass, American shad, Atlantic and shortnose sturgeon, river herring and blue crab. More than 200 species of fish are found in the Hudson and its tributaries. The estuary contains

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[9] "Comparison of Electric Prices in Major North American Cities" (2010) Hydro Quebec. http://www.hydroquebec.com/publications/en/comparison_prices/pdf/comp_2010_en.pdf

[10] *Cleaner, Greener NY, The New NY Agenda* Andrew Cuomo, 8th in a Series, p. 15, available at http://d2srrmjar534jf.cloudfront.net/6/d4/3/1266/andrew_cuomo_cleaner_greener_ny.pdf.

the only significant acreage of tidal freshwater wetlands within the state. These wetlands, along with the river's brackish tidal wetlands and stands of submerged aquatic vegetation, constitute essential habitat that support the Hudson River's rich and biologically diverse web of life.[11] More than 16,500 acres of river habitat from Troy to the southern Rockland-Westchester County border are within designated SCFWHs.[12]

A rich biodiversity is evident within the Hudson River Estuary and across the Hudson River Valley and constitutes a disproportionate share of New York State's plant and animal species.[13] The Hudson River component of the National Estuarine Research Reserve System (NERRS), which focuses its research and monitoring programs on all of the Hudson River estuarine habitats, encompasses over 5,000 acres of freshwater and brackish tidal wetlands and uplands distributed at four distinct sites that span the middle 100 miles of the Hudson River estuary.[14] The coastal impacts of any proposed federal activity or project subject to federal approval proposed in this estuary must necessarily be reviewed for consistency with the State's CMP to ensure the continued viability of such habitats, while promoting economic growth and development.

V. COASTAL POLICY ANALYSIS

The CHPE project is likely to cause direct and/or indirect physical and biological impacts to coastal resources and uses in the coastal area throughout the construction phase and through its operation. Several impacts directly applicable to the installation and operation of the transmission system are applicable to several coastal policies.

Policy Analysis

State Policy 2 - Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.

The CHPE project will bury transmission cables within Lake Champlain, the Hudson River, the Harlem River, and the East River. While the project does not itself constitute a "water-dependent" use, several conditions ensure that the transmission cables will be sited and installed in a manner that facilitates water dependent economic uses and avoids interference with other important water dependent uses such as navigation and fishing.

This concurrence is conditioned upon the applicant's installation of the transmission lines in coastal waters 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. Separation from the water column is necessary to ensure that the risk of impacting existing water dependant uses, such as commercial and recreational fishing and boating, and potential future navigation channel improvements, will be minimized. These potential impacts are minimized by removing the transmission cables, the source of the impact, as far away as possible from the potential coastal conflict and placing them in close proximity to each other, while considering the effects of such an action on other water-dependant uses. Given the state of the available information, the cables can be expected to be at least six (6) feet below the sediment water interface for the majority of the route. Should the bi-pole occupy any federally maintained navigation channels it will be buried at least 15 feet below the authorized depth in a single trench within those channels. In this matter, the siting

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[11] New York State Coastal Management Program (CMP) Final Environmental Impact Statement (EIS). pp. II-2-8 to II-2-10.
[12] http://www.nyswaterfronts.com/consistency_habitats.asp
[13] Hudson River NERRS, Revised Management Plan. 2009-20014.
[14] From north to south the sites are: Stockport Flats (Columbia County), Tivoli Bays (Dutchess County), Iona Island and Piermont Marsh (Rockland County). See Hudson River NERRS, Revised Management Plan. 2009-20014.

of the cable at these depths will minimize conflicts with water based navigation by substantially avoiding anchor strikes and potential future navigational improvements.

Additionally, as proposed, the submarine cables will make landfall and extend inland to a converter station in Yonkers, NY and a substation in Queens, NY. This concurrence includes a condition that the cable landfall will be buried using horizontal directional drilling and will not affect the current and/or future siting of water dependent uses at the water's edge with the exception of the required narrow utility easement for the buried cable.

State Policy 3 – Further develop the State's major ports of Albany, Buffalo, New York, Ogdensburg and Oswego as centers of commerce and industry, and encourage the siting in these port areas, including those under the jurisdiction of state public authorities, of land use and development which is essential to, or in support of, the waterborne transportation of cargo and people.

The installation and operation of the transmission cables may affect navigation or future dredging activities which may, in turn, affect the operation of port facilities in New York City and Albany. However, the applicant has consulted with appropriate port facility operators and agreed to site the project in a manner that would not hamper or interfere with port activities.

This concurrence includes the previously stated condition regarding burial depth. Another condition requires that the applicant verify the transmission cables' burial depth on a periodic basis so that they do not become a hazard to navigation or marine resources.

State Policy 7 - Significant Coastal Fish and Wildlife Habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.

The applications pending before the federal agencies describe the transmission lines as being constructed within several SCFWHs, which are special management areas designated by DOS on the recommendation of the DEC. These habitats are provided important protections under State Policy 7 of the CMP.[15] Each SCFWH has been inventoried and a general assessment of potential impacts has been developed. As the project is currently designed, SCFWH areas will be affected through: a) disturbance-related impacts associated with the installation of the cables including increased turbidity, re-suspension of pollutants, direct physical disturbance to bottom substrates, and b) operational impacts associated with ongoing use and maintenance of the transmission system including magnetic fields surrounding the cables.

The direct effects on habitats resulting from the installation of project structures can be readily estimated based on the surface area disturbed and the densities and composition of the benthic community in that area. Operational effects are more difficult to predict and any predicted effects should be verified by monitoring. Installation of the project could also permanently alter benthic habitats over the longer term if the trenches containing electrical cables are backfilled with sediments of different size or composition than the previous substrate. The most certain way to minimize the impact on benthic habitats is by siting the cable route to avoid particularly sensitive habitats.

A substantial number of designated SCFWHs are located north of the Inbocht Bay and Duck Cove SCFWH (7.5' Quadrangle: Cementon, New York). These upper Hudson River habitats would be vulnerable to impacts from this type of project and therefore must be avoided. Additionally, by avoiding

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[15] The SCFWH assessments are available at www.nyswaterfronts.com and are fully incorporated into the CMP.