# U.S. ARMY CORPS OF ENGINEERS

# SUPPLEMENT TO THE DECEMBER 2010 APPLICATION AND RESPONSES TO ADDITIONAL INFORMATION REQUEST

# FOR THE CHAMPLAIN HUDSON POWER EXPRESS PROJECT

## Application Update

On December 6, 2010, Champlain Hudson Power Express Inc. and CHPE Properties Inc (collectively the "Applicants") submitted to the U.S. Army Corps of Engineers ("USACE") an application to obtain construction permits for the Champlain Hudson Power Express Project ("Project") pursuant to Section 404 of the Clean Water Act ("Section 404") and Section 10 of the Rivers and Harbors Act ("Section 10"). The application materials provided at that time were based on previous filings made with the New York State Public Service Commission ("Commission") in March and July of 2010 pursuant to Article VII of the New York State Public Service Law.

On February 24, 2012, the Applicants and thirteen parties (collectively "Settlement Parties") submitted a Joint Proposal of Settlement ("Joint Proposal") to the Commission, which represented a negotiated resolution of the issues arising in the context of the Article VII proceedings. The Joint Proposal presents the Settlement Parties' findings as to the public need for the Project, a summary of the proposed environmental protection, mitigation, and enhancement measures, and an alternatives analysis. The Joint Proposal also provided proposed Certificate of Environmental Compatibility and Public Need Conditions, Section 401 Water Quality Certificate Conditions, Environmental Management and Construction Plan ("EM&CP") guidelines, Best Management Practices ("BMPs"), compliance monitoring scopes, and other key documents. The Joint Proposal and accompanying documents were provided to your office during the week of February 27, 2012.

Accordingly, the Applicants are revising their December 2010 application to reflect agreements and conditions agreed to as part of the aforementioned settlement negotiations. Table 1 provides a list of documents which were submitted in December 2010 as part of the original application and the status of each as a result of the Joint Proposal. In addition, in a letter dated July 5, 2011 the USACE provided a series of comments and additional information requests for the originally submitted application (December 2010). Table 2 provides a list of documents which were developed in response to this request for additional information.

**Table 1: Status of Previously Submitted USACE Application Materials**

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| Joint Application Form | No changes to previously submitted document. |
| Joint Application Form Supplemental Information (Questions 5, 7, 9) | Document has been updated and is provided in Attachment A of this Supplement. |
| Project Purpose and Description | Document has been updated and is provided in Attachment A of this Supplement. |
| Attachment A: USGS Location Maps | Maps have been updated to reflect current routing and are provided in Attachment B of this Supplement. |
| Attachment B: Aerial Photo Imagery with Proposed Route | Maps have been updated to reflect current routing and are provided in Attachment C of this Supplement. |
| Attachment C: Plan View Maps - Submarine Route | Maps have been updated to reflect current routing and are provided in Attachment D of this Supplement. |

**Table 1: Status of Previously Submitted USACE Application Materials**

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|---|---|
| Attachment D: Plan View Maps - Upland Route | Maps have been updated to reflect current routing and are provided in Attachment E of this Supplement. |
| Attachment E: 2010 Marine Survey Summary Report | No changes to previously submitted document. |
| Attachment F: July 2010 Wetlands Delineation Report | Document has been updated to reflect current routing and is provided in Attachment F of this Supplement. |
| Attachment G: Wetlands Functions and Values Assessment | Document has been updated to reflect current routing and is provided in Attachment G of this Supplement. |
| Attachment H: Cross-Section Diagrams | Documents have been updated and are provided in Attachment H of this Supplement. |
| Appendix A: Permission to Inspect Property Form | No changes to previously submitted document. |
| Appendix B:<br>• New York State Department of State Coastal Management Program - Federal Consistency Assessment Form;<br>• New York City Waterfront Revitalization Program - Consistency Assessment Form;<br>• Coastal Consistency Assessment Supplement | No changes to previously submitted document. On June 8, 2011, NYSDOS issued its conditional concurrence for the Project subject to the Applicants' acceptance of five conditions. The Applicants indicated that they had accepted these conditions in a letter to your office on July 7, 2011, which can be provided upon request. |
| Appendix C: Copy of 401 Water Quality Certificate Application | No changes to previously submitted documents. However, the Applicants re-filed their request for a Water Quality Certificate on February 24, 2012 as part of their Joint Proposal submittal. The Joint Proposal also provided a proposed Water Quality Certificate which was supported by the Settlement Parties. |
| Appendix D: Alternatives Analysis | Supplemental information has been provided based on requested information in the USACE letter dated July 5, 2011. Updated analysis is provided in Attachment I. |

**Table 2: Additional Information Not Previously Submitted**

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| Attachment I: Revised Alternatives Analysis | Alternatives Analysis has been updated to provide information requested by the USACE in the July 5, 2011 letter. |
| Attachment J: Federal Navigation Channel Plans & Cross-sections | |
| Attachment K: Cable Placement and Burial Depths in Lake Champlain | |
| Attachment L: Environmental Questionnaire | |
| Attachment M: Water Quality Modeling Reports for Lake Champlain and the Hudson, Harlem, and East Rivers. | |
| Attachment N: Revised Environmental Assessment | |
| Attachment O: Best Management Practices Manual | |
| Attachment P:<br>• Latitude/Longitude Coordinates along the Project Route<br>• Distances between the Cables and the Federal Navigation Channels along the Project Route | Information provided on a CD. |

# USACE Additional Information Request

In a letter dated July 5, 2011, the USACE provided a series of comments and additional information requests in reaction to the originally submitted application (December 2010). The Applicants have provided responses to this letter below. For ease of reference, each comment and request for additional information has been numbered.

**Impacts to Federal Navigation Channels**

1. **The Corps of Engineers does not permit permanent structures within the length of the right of way, including side slopes, of a Federal navigation channel (perpendicular crossings are permitted). Installation may be accomplished by directional drilling from parts of state tracts that are outside the Federal right of way. For this project to be deemed acceptable from a navigation perspective, the cable alignment must remain outside the Federal channel right of way. Minimal utility crossings perpendicular to the Federal navigation channel will be evaluated on a case-by-case basis in consultation with regional harbor operations committees for navigation impacts when such crossings are unavoidable.**

   **Applicant Response:** The routing for the Project has been modified to largely avoid installation in or around maintained Federal navigation channels. However, as was discussed with the USACE at a meeting on August 18, 2011, the Applicants propose to align the cables within and in close proximity to the Federal navigation channels located in the narrows of Lake Champlain (Sheets 26 - 27 of Submarine Route Plan View Maps) and the Harlem River (Sheets 52 and 53 of the Submarine Route Plan View Maps). The Applicants request a meeting with USACE engineering staff to review this proposed configuration.

   Detailed plan and cross-section diagrams for the cable routing within the aforementioned areas are provided in Attachment J, which is based on the best available bathymetric information and the information obtained from USACE staff at the August 18, 2011 meeting. When reviewing these diagrams, please note that the line showing the extent of the Federal navigation channel for the narrows of Lake Champlain and for the Harlem River Federal Navigation Project is based on the official U.S. Army Corps of Engineers Project Sheet provided by the New York District. A spreadsheet summarizing the distance from the cables to a Federal navigation channel is provided on a CD in Attachment P as an Excel spreadsheet under the file name: Route_Distance_from_Navigation_Channel_20120222. Table 1 below summarizes the locations where the route is within two-hundred feet of Federal navigation channel.

2. **For those cases where utility crossings in a Federal channel are necessary, the following guidance applies: with the implementation of burial depths of four (4) feet below channels and fifteen (15) feet below authorized depths when crossing a federally maintained navigation channel, the proposed project would have minimal impact to navigation and future dredging of the Federal Channels. However, in areas where the channel's existing bottom is already deeper than, or almost as deep as, the required installation depth below authorized project depth, as determined by the USACE guidance: Minimum bottom cover for utility crossings under Federal**

**navigation channels shall be 7 feet below existing bottom. Both the "minimum bottom cover below authorized project depth" requirement *and* the requirement of sufficient bottom cover of existing channel bottom over the installed utility must be satisfied.**

**Applicant Response:** Detailed plan and cross-section diagrams provided in Attachment J show the Applicants' proposed depth of installation within the narrows of Lake Champlain and the Harlem River. The burial depths and installation methods proposed in lower Lake Champlain were developed to minimize environmental impacts given the shallow water depth in the area as well as the Applicants' understanding of the USACE's future development plans for this portion of the Federal navigation channel. The proposed installation within the Harlem River is based on the existing depth of the Federal navigational channel, bottom substrate and the number of existing infrastructure crossings. The Applicants request a meeting with USACE engineering staff to review this proposed configuration.

3. **Laying the cables on lake/river bed in limited areas with protective coverings would not be acceptable. All cables must be buried. Outside of channel areas, the burial depth requirement is four feet. Where existing utilities are crossed, other depths will be considered. All crossings must be identified.**

**Applicant Response:** The Applicants believe a reasonable case can be made for burial of three (3) feet as the standard for the Project within the entirety of Lake Champlain. The issue of burial depth within Lake Champlain was discussed at length as part of the Article VII settlement discussions. The Applicants developed a report discussing the proposed placement and burial depths of the cables within Lake Champlain that was submitted to the Settlement Parties on October 26, 2011 and is included in Attachment K of this Supplemental Application. The Applicants contacted two different marine engineering services, the U.S. Coast Guard ("USCG"), the Naval Facilities Engineering Command ("NAVFAC") and the International Cable Protection Committee ("ISCPC") to identify potential standards with regards to burial of submarine cables.

The Settlement Parties agreed that non-burial within Lake Champlain would be acceptable provided a report prepared by a recognized authoritative technical consultant demonstrated and concluded that public health and safety can be appropriately protected without such burial, and that the proposed installation method was approved by the Commission. The Applicants request a meeting with USACE staff to discuss this issue.

4. **Narrows of Lake Champlain (NLC) Federal Navigation Channel: As the Corps of Engineers does not permit permanent structures within the length of the right of way of a Federal navigation channel (crossings are permitted), the cables must be moved outside the NLC Federal navigation channel limits. A minimal number of cable crossings may be considered provided they meet burial requirements.**

**Applicant Response:** The detailed plan and cross-section diagrams provided in Attachment J show the Applicants' proposed installation within the narrows of Lake

Champlain. The Applicants request a meeting with USACE engineering staff to review this proposed configuration.

5. **Hudson River-Houghtaling Island: The Corps of Engineers owns in fee title an active upland dredged material placement site called Houghtaling Island on the east side of the Hudson River opposite New Baltimore, New York. Spud barges are used for dredge and attendant plant mooring(s) and to provide equipment and pipeline access to the site. In addition, considerable future marine activity is anticipated along the Houghtaling Island shoreline associated with the excavation and transport of previously placed sediments for beneficial uses. The proposed cable routing may have an unacceptable adverse impact upon Corps of Engineers operations in this area. The proposed cables must be re-routed to the upland or along the west side of the river for the entire length of the federally owned lands.**

   **Applicant Response:** Based on the revised cable routing, the Project will now be located overland from lower Lake Champlain to the Town of Catskill. Therefore, the Project route is not located in the Hudson River in the vicinity of Houghtaling Island. Plan view maps of the submarine and overland routes are included as Attachments D and E, respectively.

**Alternatives Analysis**

6. **Be advised that per 40 CFR 230.1(a) except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. As per 40 CFR 230.10(a)(1) practicable alternatives include activities which do not involve a discharge of dredged or fill material into waters of the United States. 40 CFR 230.10(a)(2) states that an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. The following alternatives should be fully evaluated: a) overland transmission line using existing highway corridors and/or utility corridors; b) railroad right-of-way (ROW) underground transmission line route; c) any New York State Department of Public Service proposed alternatives; d) any combination of route alternatives that would have less impact to the aquatic environment than the proposed route.**

   **Appendix D, Page 9: Buried HVDC Transmission System Collocated along Freeway Corridor-this alternative was previously rejected in part due to the project development timeline. Now that the timeline has changed, this alternative can be fully evaluated.**

   **HDR August 25, 2010 Supplement to Least Environmentally Damaging Practical Alternative Analysis: recalculate proposed route impacts based on the above listed in-water installation requirements; provide the additional proprietary and confidential information related to the cost/benefit analysis; if there have there been changes in the DOE funding situation that would impact the cost/benefit analysis, readjust the**

**calculations; if the impacts listed in Table 2 do not include submarine anchor drag/anchor sweep impacts, add those impacts to the table; provide quantitative information for the amount of material to be deposited outside the proposed submarine route for all installation methods (jetting, plowing, dredging); in Table 2, specify temporary and permanent impacts.**

**Applicant Response:** See Attachment I.

**General Comments**

**7. All project plans must be black and white and legible.**

**Applicant Response:** Project plans, which are provided in Attachment D, are in black and white and are legible.

**8. Submit a completed Environmental Questionnaire (copy attached).**

**Applicant Response:** A completed Environmental Questionnaire is provided in Attachment L.

**9. Provide the names and addresses of property owners adjacent to your work site in the attached Excel spreadsheet. If the file becomes too large to email, please submit the data on a CD.**

**Applicant Response:** Due to potential landowner sensitivities as well as the confidentially requirements of the settlement process, the Applicants postponed obtaining the names and addresses of property owners from municipal offices until the Joint Proposal was submitted. The Applicants expect to submit this information on a CD in early March.

**10. Provide a list of latitudes and longitudes at each mile marker of the proposed route.**

**Applicant Response:** The latitudes and longitudes at each mile and tenth of a mile marker of the proposed cable route are provided on a CD included as Attachment P with this Supplemental Application under the file name: Coordinates of Mileposts_013112. The coordinates for each mile along the Project route from the international border to the Luyster Creek substation are provided in the Supplement Information to the Application Form included as Attachment A of this Supplement Application.

**11. As requested in our July 7, 2010 letter (copy attached), provide copies of any modeling, videos, or other supporting information to verify the level of sediment disturbance. Your August 25, 2010 letter indicated these materials would be available in the 3rd quarter of 2010.**

**Applicant Response:** In October 2010, the Applicants prepared Water Quality Monitoring Reports for the submarine portions of the route including Lake Champlain, Hudson River, Harlem River, and East River. The Lake Champlain Water Quality Monitoring Report was supplemented in January 2011 to include an assessment of cable installation via shear

plow. The aforementioned Water Quality Monitoring Reports are included as Attachment M.

**12. Provide a mitigation plan, as per 33 CFR 332. The mitigation plan must include an explanation of how temporary and permanent impacts will be mitigated. It must also include sequencing of avoidance, minimization, and compensation for temporary and permanent impacts.**

**Applicant Response:** The Applicants understand that a mitigation plan is required but request further consultation with the USACE in order to confirm the cumulative temporary and permanent impacts with the USACE prior to submitting this document.

**13. Provide more detailed, close-in plan and cross-section views of the three specific land-to-water or water-to-land proposed project locations.**

**Applicant Response:** The Project will involve the following seven (7) major land-to-water or water-to-land transition areas:

1. Water (Lake Champlain) to Land (Dresden, NY) – refer to Submarine Route Plan View Map Sheet 27, and Terrestrial Route Plan View Map Sheet 1;
2. Land (Catskill, NY) to Water (Hudson River) – refer to Submarine Route Plan View Map Sheet 28, and Terrestrial Route Plan View Map Sheet 333;
3. Water (Hudson River) to Land (Stony Point, NY) – refer to Submarine Route Plan Map View Sheet 45, and Terrestrial Route Plan View Map Sheet 334;
4. Land (Clarkstown, NY) to Water (Hudson River) – refer to Submarine Route Plan Map View Sheet 46, and Terrestrial Route Plan View Map Sheet 354;
5. Water (Harlem River) to Land (Bronx, NY) – refer to Submarine Route Plan View Map Sheet 53, and Terrestrial Route Plan View Map Sheet 355;
6. Land (Bronx, NY) to Water (East River) – refer to Submarine Route Plan View Map Sheet 54, and Terrestrial Route Plan View Map Sheet 357; and
7. Water (East River) to Land (Queens, NY) – refer to Submarine Route Plan View Map Sheet 54, and Terrestrial Route Plan View Map Sheet 360.

The Applicant has provided detailed plan and cross-section diagrams representational of these transitional areas in the figures entitled “Typical Terrestrial Transition” (Figure 176764-UM-41) and “Typical Splice Vault” (Figure 176764-UM-35), which are included in Attachment H.

**14. Does the proposed cable route impact Anchorage Areas 18 and 19?**

**Applicant Response:** Anchorage No. 18-A is located in the Hudson River 250 feet west of the Bronx parallel to West 231st Street north to West 261st Street in the Bronx. As shown on Submarine Route Plan View Map Sheets 51 and 52, the proposed cable route does not intersect Anchorage No. 18-A.

Anchorage No. 19 is located south of the George Washington Bridge in the Hudson River. The cable route is not located in this portion of the Hudson River and, therefore, there would be no impact to Anchorage No. 19 from the proposed cable route.

**Cumulative Impacts**

**15. Are any other transmission lines or other projects proposed from Canada to New York along the same route? Should the proposed transmission line be constructed, how many other transmission lines could be located along the same route?**

**Applicant Response:** The Applicants are unaware of any other proposed transmission lines or other projects which would connect power generated in Canada with New York City along this same route. It is beyond the Applicants' ability to predict how state and federal regulatory authorities may evaluate projects that adopt a similar routing.

**16. Discuss impacts to navigation during construction, temporary and permanent impacts to anchorage areas, and temporary and permanent impacts to existing and proposed utility lines that cross the Hudson River.**

**Applicant Response:** The submarine portions of the Project route are located in the waterways of Lake Champlain and the Hudson, Harlem, and East Rivers. Impacts to commercial and recreational use of these waterways are expected to be minor and temporary. During Project construction, the presence and operation of the cable installation vessels will create additional vessel traffic on these waterways. There will be sufficient room for navigation to continue safely in each water body. In addition, the Project will be sequenced in the Hudson River based on construction windows agreed upon during the settlement process with New York agencies and NGOs to avoid life-cycle or migratory impacts to Atlantic sturgeon, American shad, winter flounder, striped bass, and other anadromous fish populations, as well as resident species such as shortnose sturgeon using the affected areas. In general, it is anticipated that Project construction within the Hudson River will commence in July at the confluence with the Harlem River and continue north reaching Cementon by mid-October.

Prior to commencement of cable installation and during in-water construction, a Notice to Mariners will provide current information on the status of the project and required aids to navigation will be employed to warn mariners of the construction, where necessary. Provisions to accommodate navigation will be coordinated with the U.S. Coast Guard prior to commencement of cable installation and during active construction times by the Engineering, Procurement and Construction ("EPC") contractor.

Subsequent to installation of the cables, there will be no active Project-related impact to navigation. However, the presence of the cables will result in additional areas within these waterways where restrictions may be imposed on certain types of vessel anchorage. The proposed route avoids designated anchorage areas, so the overall impact is expected to be minor.

Typical utility crossing methods are shown in the diagrams provided in Attachment H of this Supplemental Application. The Applicants have utilized information derived from NOAA charts, the New York State Office of General Services, and the Marine Route Survey conducted in 2010 to identify existing utility lines. The known utilities are provided in the Supplement Information to the Application Form included as Attachment A of this Supplement Application. Under the terms of the Joint Proposal, the Applicants must "engineer, construct, and install the Facility so as to make it fully compatible with the continued operation and maintenance of Co-located Infrastructure ("CI")." Consultation with owners and operators of CI is required and the EPC contractor must comply with all procedures identified by the CI owners and operators when performing any work in the vicinity of CI. Owners and operators of CI will also be afforded the opportunity to review and comment upon the proposed location and design of the facility as well as the methods of construction in the vicinity of CI. The Applicants believe that the protections afforded to existing and proposed utility lines are sufficient to avoid or minimize any impacts to these features.

**Joint Application Form Supplemental Information – Question 7**

Section 4

**17. For proposed underwater installation methods, quantify the impacts to the lake/river bed from anchor drag caused by the anchor-positioned vessel and anchor mooring system.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

Section 5

**18. For proposed underwater installation methods, quantify the volume of material to be dredged, method of dredging, type of material, and material placement area. For fill proposed, provide the volume for each source and type of fill proposed.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

Section 6

**19. This section states that there is only one location, Haverstraw Bay, where the cable is proposed to be installed within the Federal navigation channel or along the side slopes. However, the project plans in Attachment C indicate in addition to Haverstraw Bay, the proposed cable is located in the federal navigation channel or side slopes from mile marker 99 through 225, 233, and 324 through 333. Please correct.**

**Applicant Response:** As discussed above in Response #1, the routing for the Project has been modified to largely avoid installation in or around maintained Federal navigation

channels. The Applicants propose to align the cables in close proximity to the Federal navigation channel in the narrows of Lake Champlain (Sheets 26- 27 of Submarine Route Plan View Maps), locating the cables near or at the top of the slide slope to the extent practicable given known obstacles present outside of the Federal navigation channel. The Applicants propose to site the cables along the outer edge of the Harlem River (Sheets 52 and 53 of the Submarine Route Plan View Maps), which in some instances is located within the Federal navigation channel and have proposed eleven (11) perpendicular crossings of the Federal navigation channel in order to minimize the total distance where the cables are located within the channel. Detailed plan and cross-section diagrams for the Project route located in the narrows of Lake Champlain and the Harlem River are included as Attachment J.

Section 8

**20. Mitigation Plan – mitigation is required for the conversion of forested wetlands.**

**Applicant Response:** As stated above in Response #12, the Applicants understand that a mitigation plan is required but requests to further consult with the USACE to confirm the cumulative temporary and permanent impacts with the USACE prior to submitting this document.

**Project Plans – Submarine Route**

**21. The submarine route plans are overlaid on NOAA navigation charts. There are numerous symbols on these charts that are not explained - instead the reviewer is referred to an unspecified NOAA website for details on chart symbology. To clarify the plans and avoid directing reviewers to other unspecified sources, insert a sheet to explain all symbology used on plan views.**

**Applicant Response:** A legend defining the (applicable) NOAA navigation chart symbology is included with the Submarine Route Plan View Maps provided in Attachment D.

**22. Show direction of ebb and flood of tide, datum (reference elevation).**

**Applicant Response:** Direction of ebb and flood of tide is shown on the Submarine Route Plan View Maps included in Attachment D.

**23. The plans do not clearly depict the details of the proposed project. The plans should clearly show that there is more than one trench. The dimensions of each trench and separation distance between trenches should be shown, including the conversion at the Yonkers Converter Station. Note, representational drawings are acceptable.**

**Applicant Response:** The HVDC transmission cables will be installed within a single trench throughout the submarine and overland portions of the route, with the exception of areas where Horizontal Directional Drill ("HDD") installation techniques will be utilized. For HDD installation, two separate boreholes will be advanced, one for each cable.

Revised plan and cross-section view drawings depicting the typical cable trench dimensions are included in Attachment H.

The Applications note that the proposed converter station is no longer proposed to be located in Yonkers, New York but is now proposed to be located in Astoria, Queens, New York. Please refer to the Terrestrial Route Plan View Map Sheets 361 and 362.

**24. Specify the distance between the proposed cable and the Federal navigation channel. Provide the state plane coordinates of the proposed route whenever it is within two hundred feet of the Federal navigation channel.**

**Applicant Response:** The distance from the proposed cables and any Federal navigation channel along the entire proposed route is provided on a CD in Attachment P as an Excel spreadsheet under the file name: Route_Distance_from_Navigation_Channel_20120222. Table 1 below summarizes the locations where the route is within two-hundred feet of the federal navigation channel.

**25. Provide a sheet with the dimensions of all proposed filling in the waterways, including backfill, temporary fills, and identify the fill information in square feet. Include non-burial protection methods such as concrete mats, grout filled mattresses and protective ducts.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

**26. Provide the total area of impact to the lake and river beds, measured in square feet. Include trenching impacts, anchor sweep impacts, etc.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

**27. For dredging, specify the location and dimensions of the area to be dredged, method, type of material, location of fill and placement areas.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

**28. Specify proposed cable crossing locations and other non-burial locations. Note corresponding cross-views.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

**29. What is the difference between Sheet 15 and Sheet 16?**

**Applicant Response:** Sheet 15 of the Submarine Route Maps provided in December 2010 shows the proposed Project route from approximately Milepost 54.5 to 59 while Sheet 16 shows

the proposed route from approximately Milepost 59 to 62.5. These maps have been revised and replaced with those found in Attachment D.

**Project Plans – "Upland Route"**

**30. These plans should be renamed "Overland Route" as the proposed route does impact wetlands and waters of the United States and is therefore not an entirely "upland" route.**

**Applicant Response:** The maps showing the terrestrial portions of the route have replaced the term "upland" with "overland."

**31. Specify trench dimensions.**

**Applicant Response:** As shown in the Figure entitled "Typical Trench Cross Section" (Figure 176764-UM08) provided in Attachment H, the typical overland trench will be approximately four (4) feet wide and a minimum of four (4) feet deep.

**32. Specify the dimensions of all proposed filling in wetlands and waters, including backfill and temporary fill, including cofferdams and access roads. Specify temporary and permanent impacts. Specify type of fill material (for example, thermal sand, concrete plates). Specify placement location of any excavated material that will not be replaced after the proposed cable installation.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

**33. Provide the total area of impact to the wetlands and waters, measured in square feet.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

**34. Provide an index sheet that lists where impacts to wetlands and waters are found throughout the set of Sheets 1-237. Specify the purpose of the proposed culverts. Where are the permanent culverts located? Note corresponding cross-views. Some of the above requested information may be provided by modifying Table 4-1 and 4-2 of Attachment F and then including the tables in the drawing set.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A for a discussion of impacts to wetlands and waterbodies. As currently configured, the Applicants do not anticipate requiring the installation of culverts along the proposed route.

**Project Cross-section Views - Submarine Route**

**35. Cross-views should correlate to plan views.**

**Applicant Response:** Applicants have provided representational drawings in Attachment H, which do not necessarily provide information correlating to specific plan views. However, detailed plan and cross-section diagrams included in Attachment J correspond to Submarine Route Plan View Map Sheets 26-27 (narrows of Lake Champlain) and 52-53 (Harlem River).

**36. Sheet 3 shows a 6 foot separation between cables. Sheet 4 shows no separation between cables. Clarify the proposed separation distance between the two cables. Indicate the location that each cross-view represents in relation to the plan view drawings.**

**Applicant Response:** The Applicants have provided a revised drawing showing the typical submarine installation in Attachment H. The cables will be installed within a single trench and are expected to be touching or nearly so. The exception to this will be: 1) where the cables enter or exit the water via an HDD, as the boreholes for each cable could be separated by as much as thirty feet as they travel underground and 2) within Lake Champlain where water depths are greater than 150 feet and it is permissible to lay the cables on the lakebed.

**37. For dredging, specify location and depth of dredging and volume of material to be dredged. Specify dimensions of area to be dredged. Provide approximate side slope.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A.

**38. Show cable dimensions, trench dimensions, sidecasting dimensions, dimensions of all fills, including proposed grout bags, pillows and mattresses. Provide information for HVDC and HVAC cables.**

**Applicant Response:** The Applicants have provided representational drawings with trench dimensions in Attachment H. Additional information is included in Section 5 of the revised Project Purpose and Description provided in Attachment A. Based on the revised Project route, HVAC cables will no longer be installed underwater and per the terms of the Joint Proposal, the Applicants will not complete any sidecasting along the Project route.

**Project Cross-section Views - Overland Route**

**39. Provide water depths for in-stream work. Provide dimensions for proposed activities. Correlate cross-views to plan view drawings.**

**Applicant Response:** The waterbody crossing methods will be chosen based on the Commission‘s width classification system, New York State Department of Environmental Conservation (“NYSDEC”) stream classification, and on conditions present during the time

of construction. The most common waterbody dry crossing methods are: a) Flume Crossing Method; Dam and Pump Crossing Method; and HDD. Each of these are described below.

Flumed crossing methods will use a flume pipe to redirect the stream across the work area and allow trenching to be done in drier conditions. Flumed crossings may be installed within minor and intermediate waterbodies during low flow conditions. For waterbodies crossed using the flume method, the cable will be lowered into the trench with the flume pipe(s) in place. The figure "Typical Flumed Crossing" (Figure 176764-UM-13) included in Attachment H shows the standard layout for this installation approach and it is described more completely in Section 18.2.2.1 of the Best Management Practices ("BMP") Manual provided in Attachment O of this Supplemental Application.

The Dam and Pump Crossing method involves constructing temporary barriers upstream and downstream of a proposed crossing site and using a pump to divert water around the construction area. A portable pump is used as necessary to remove any standing water between the dams, thereby creating a "dry" construction area. The figure "Typical Dam and Pump Stream Crossing" (Figure 176764-UM-14) included in Attachment H shows the standard layout for this approach, and it is described more completely in Section 18.2.2.2 of the BMP Manual provided in Attachment O.

HDD is a trenchless installation process used to install cables beneath obstacles or sensitive areas utilizing equipment and techniques derived from oil well drilling technology. A pilot hole is drilled for each cable, a conduit is then installed and the cables are pulled through the conduit. The figure "HDD Multi-Stage Process" (Figure 176764-HDDM-03) included in Attachment H shows the standard layout for this approach and it is described more completely in Section 8 of the BMP Manual provided in Attachment O.

There is a fourth method of water body dry crossing called the open cut method, which generally consists of positioning construction equipment on the banks or on the bed of the water body itself, digging an open trench in the stream bottom, laying the cable and backfilling without the use of turbidity control measures. The open cut method will be employed only in those circumstances where an intermittent or perennial stream is dry at the time work is proposed and only with prior approval from the Commission and in consultation with the NYSDEC. Even after receiving approval from the Commission, the Certificate Holder must confirm with their Environmental Inspector that the stream to be crossed does not have any measurable flow at the time work is to commence.

**Attachment E - 2010 Marine Survey Summary Report**

**40. This report states that there are several areas along the proposed underwater transmission cable route that will need to be investigated further for potential re-rerouting. When will this process be completed? When do you anticipate the submittal of a revised route?**

**Applicant Response:** The proposed route has undergone a rigorous evaluation with New York State agencies and stakeholders as part of Article VII settlement negotiations, resulting in the revised route presented in the Project Description in Attachment A and shown on the maps in Attachment D. The Applicants are not proposing any further revisions to the routing at this time.

**41. This report states that a benthic survey was not performed for the Hudson River because existing data is sufficient. Clarify which data will be used and whether this existing data is current.**

**Applicant Response:** A description of the benthic community in the Hudson River can be found in Section 7.1 of the Environmental Impact Report, which was revised in February 2012 to reflect the current Project route and is provided in this Supplemental Application in Attachment N. Below is a summary of the resources used in this section.

The benthic macroinvertebrates of the Hudson River form a well documented and diverse community that includes approximately 300 species of annelids, mollusks, crustaceans and insects (Levinton & Waldman 2006). The first systematic survey of the Hudson's benthic community was done by Townes (1937). In the 1970s, Ristich et al. (1977) and Weinstein (1977) surveyed the benthos from Poughkeepsie to Manhattan. In the 1980s, Simpson et al. (1984, 1985, and 1986) and Bode et al. (1986) surveyed the benthic community in the main channel of the Hudson from Troy to New Hamburg. Since 1990, Strayer et al. (1994, 1996, 1998), and Strayer and Smith (1996, 2000 and 2001) have studied the community from Troy to Newburgh (Strayer in Levinton & Waldman 2006).

In addition to benthic invertebrate studies, there is extensive sediment mapping in the estuary that was used in the initial siting of the cable route and to prepare a draft benthic monitoring plan for the pre- and post-installation periods (e.g., Simpson et al. 1984, 1985; NYSDEC 2012). The benthic mapping data are the foundation of the benthic monitoring plan in that it permits the selection of benthic habitat types for a comprehensive evaluation of cable installation on benthic resources. The older benthic surveys will provide perspective on changes to benthic resources prior to cable installation. While recent surveys are valuable for the planning of monitoring studies, the assessment of installation effects will utilize data from the full span of benthic studies on the Hudson. From this point of view, all of the extensive data on Hudson River benthic has a role in the assessment of cable installation effects.

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**42. This report states that it is likely that the benthic community along the proposed route would recover quickly following disturbance. What is this assumption based on?**

**Applicant Response:** A description of the benthic community in the Hudson River can be found in Section 7.1 of the Environmental Impact Report, which was revised in February 2012 to reflect the current Project route and is included in Attachment N. Below is a summary of the resources used in this section.

The expected recovery of the benthic community following cable installation is based on recent technical literature that reported on investigations of the ecological process of community recovery in different types of aquatic environments with different substrate types. The following reference list identifies major studies in this field and provides references to additional relevant studies.

The recovery of the habitat after cable burial limits the impacts to benthic life to a short-term effect, and because the need for maintenance of the cables (removal from the substrate) occurs very rarely, there will be no recurring effects on the substrate. The rate of recovery will vary by substrate type, benthic community composition, and potentially many

other factors. Many benthic species, via planktonic larvae, have evolved reproductive strategies focused on colonizing newly created or recently disturbed substrates. Other mobile benthic species will colonize the disturbed sediments from adjacent undisturbed areas. Studies which have investigated benthic recovery after disturbance in freshwater, estuarine, and marine environments support the position that recolonization is rapid. Functional habitat can develop within weeks in some communities and full functionality can return on the order of one year (LMS 1984; EEA, 1989a, 1989b).

Full recovery of the benthic community is contingent upon reestablishment of the physical habitat conditions that were present before the cable installation. The forces that shape the physical aspects of benthic substrates, primarily currents and sedimentation, operate on a scale far greater than the localized effect of cable installation. The disturbance related to installation will have no influence on these forces and, thus, they will begin to reshape the disturbed substrate immediately after installation is completed. Because the cable occupies a small volume of the substrate (approximately six (6)-inch diameter cable), and will in most instances be buried well below the sediment surface it will not interfere with the actions of these forces in reshaping the substrate. Important substrate factors for benthic organisms are the grain size distribution (sediment composition) and compaction within the substrate. The original conditions in the substrate are expected to become restored because the substrate is the parent material and the forces acting on the sediments are unchanged.

Those sections of the cable that will not be buried will have a protective covering consisting of various materials such as articulated concrete mattresses, grout pillows or Uraduct (plastic sheathing). These materials will represent new benthic substrates in the areas where they cover the original substrate. The rate of colonization of these materials by benthic invertebrates is difficult to estimate in different environments, such as a range of salinities and substrate types.

Concrete is known to be a suitable benthic substrate in marine environments but would probably be colonized more slowly in freshwater. Because the protective covering will be elevated above the surrounding bottom, the mounds created by the protective materials would provide substrate and retreats for larger invertebrates and fish. In addition, sediment may build up on these mounds and adjacent to them where they create localized impediments to flow that may induce sedimentation. Where protective coverings are needed because the cable cannot be buried due to rocky substrates, concrete mattresses may provide an alternative hard surface for the attachment epibenthic invertebrates.

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**Attachment F - July 2010 Wetlands Delineation Report**

**43. Table 2 includes forested wetlands under temporary impacts. However, the forested wetlands will undergo conversion, which is a permanent impact. Please correct in this section and throughout the project description.**

**Applicant Response:** Impacts to freshwater wetlands along the proposed overland route caused by the construction and operation of the proposed Project are summarized in Section 5 of the revised Project Purpose and Description included in Attachment A.

**Attachment G - Wetlands Functions and Values Assessment**

**44. This section states that there will be no new fill in wetlands. However, the project plans indicate that thermal sand and concrete plates will be used during the installation of the proposed cable. Please correct.**

**Applicant Response:** See Section 5 of the revised Project Purpose and Description provided in Attachment A for a discussion of this issue.

**Appendix B**

**45. Page 27 of this section refers to "Section 4.8.4.3 of the Application." Please clarify as there is no section with this designation in the materials provided.**

**Applicant Response:** The reference is to the March 2010 Article VII Application submitted to the Commission. The Applicants regret this error. Please refer to the revised Project Purpose and Description included as Attachment A and the revised Environmental Impact Report included as Attachment P.

**46. Provide Exhibit 4 of the Article VII Application.**

**Applicant Response:** Exhibit 4 of the Article VII Application has been revised based on the conditions and routing established in settlement. The revised Environmental Assessment is provided in Attachment N.

# Table 1: Routing within 200 Feet of Federal Navigation Channel

| Milepost | Waterbody | Projection: NY State Plane East NAD 1983 US Feet | | Distance From Cables to Federal Navigation Channel (feet) |
|---|---|---|---|---|
| | | Northing | Easting | |
| 97.1 | Lower Lake Champlain | 1785288.670 | 790664.128 | 143.3 |
| 97.2 | Lower Lake Champlain | 1784761.165 | 790628.578 | 167.2 |
| 97.3 | Lower Lake Champlain | 1784270.888 | 790491.098 | 303.7 |
| 98 | Lower Lake Champlain | 1781317.092 | 788251.620 | 146.7 |
| 98.1 | Lower Lake Champlain | 1780909.812 | 787919.028 | 49.7 |
| 98.2 | Lower Lake Champlain | 1780531.515 | 787516.406 | 33.7 |
| 98.3 | Lower Lake Champlain | 1780138.587 | 787184.007 | 31.1 |
| 98.4 | Lower Lake Champlain | 1779700.791 | 786898.633 | 9.8 |
| 98.5 | Lower Lake Champlain | 1779252.147 | 786609.079 | 18.9 |
| 98.6 | Lower Lake Champlain | 1778814.515 | 786323.969 | 40.6 |
| 98.7 | Lower Lake Champlain | 1778332.516 | 786090.017 | 32.8 |
| 98.8 | Lower Lake Champlain | 1777853.912 | 785855.469 | 14.8 |
| 98.9 | Lower Lake Champlain | 1777404.281 | 785592.838 | 25.9 |
| 99 | Lower Lake Champlain | 1776942.881 | 785324.228 | 39.3 |
| 99.1 | Lower Lake Champlain | 1776467.008 | 785057.423 | 51.3 |
| 99.2 | Lower Lake Champlain | 1775964.471 | 784861.664 | 45.2 |
| 99.3 | Lower Lake Champlain | 1775445.689 | 784720.102 | 3.0 |
| 99.4 | Lower Lake Champlain | 1774941.742 | 784598.535 | 0.0 |
| 99.5 | Lower Lake Champlain | 1774449.437 | 784413.909 | 4.4 |
| 99.6 | Lower Lake Champlain | 1773999.323 | 784169.342 | 20.1 |
| 99.7 | Lower Lake Champlain | 1773576.319 | 783875.292 | 0.0 |
| 99.8 | Lower Lake Champlain | 1773191.430 | 783529.150 | 0.0 |
| 99.9 | Lower Lake Champlain | 1772919.729 | 783074.707 | 4.7 |
| 100 | Lower Lake Champlain | 1772685.573 | 782603.107 | 24.8 |
| 100.1 | Lower Lake Champlain | 1772336.707 | 782214.100 | 3.8 |
| 100.2 | Lower Lake Champlain | 1771855.375 | 781937.804 | 18.4 |
| 100.3 | Lower Lake Champlain | 1771353.258 | 781745.481 | 0.0 |
| 100.4 | Lower Lake Champlain | 1770864.736 | 781626.890 | 0.0 |
| 100.5 | Lower Lake Champlain | 1770371.852 | 781727.320 | 0.0 |
| 100.6 | Lower Lake Champlain | 1769892.909 | 781937.810 | 17.4 |
| 100.7 | Lower Lake Champlain | 1769405.853 | 782019.525 | 47.1 |
| 100.8 | Lower Lake Champlain | 1768894.654 | 782022.217 | 0.8 |
| 100.9 | Lower Lake Champlain | 1768383.084 | 781930.820 | 8.8 |
| 101 | Lower Lake Champlain | 1767851.119 | 781848.085 | 10.9 |
| 101.1 | Lower Lake Champlain | 1767343.523 | 781750.981 | 12.0 |
| 101.2 | Lower Lake Champlain | 1766826.608 | 781606.592 | 11.6 |
| 101.3 | Lower Lake Champlain | 1766344.480 | 781404.270 | 35.8 |
| 238.6 | Hudson River | 1155967.146 | 644405.702 | 60.0 |
| 238.7 | Hudson River | 1155529.900 | 644285.764 | 65.0 |
| 238.8 | Hudson River | 1155044.676 | 644152.667 | 70.5 |
| 238.9 | Hudson River | 1154612.815 | 644034.207 | 75.4 |
| 239 | Hudson River | 1154129.877 | 643901.736 | 80.9 |
| 239.1 | Hudson River | 1153579.966 | 643750.894 | 87.2 |
| 239.2 | Hudson River | 1153101.983 | 643619.782 | 90.5 |
| 239.3 | Hudson River | 1152616.082 | 643486.499 | 93.9 |
| 239.4 | Hudson River | 1152117.979 | 643344.133 | 91.7 |
| 239.5 | Hudson River | 1151617.110 | 643199.438 | 88.1 |
| 239.6 | Hudson River | 1151101.201 | 643115.582 | 147.2 |
| 239.7 | Hudson River | 1150574.099 | 642990.392 | 170.5 |
| 324.1 | Harlem River | 745256.179 | 650863.837 | 30.1 |
| 324.2 | Harlem River | 745093.873 | 651460.809 | 17.2 |
| 324.3 | Harlem River | 745216.864 | 652060.783 | 28.0 |
| 324.4 | Harlem River | 744675.596 | 652134.966 | 0.0 |
| 324.5 | Harlem River | 744238.271 | 652580.853 | 10.7 |
| 324.6 | Harlem River | 744409.347 | 653135.734 | 0.0 |
| 324.7 | Harlem River | 744367.561 | 653768.407 | 10.0 |
| 324.8 | Harlem River | 744044.251 | 654263.543 | 0.0 |
| 324.9 | Harlem River | 743737.169 | 654648.765 | 0.0 |
| 325 | Harlem River | 743431.294 | 655047.082 | 0.0 |
| 325.1 | Harlem River | 743047.453 | 655181.950 | 0.0 |
| 325.2 | Harlem River | 742549.501 | 655119.991 | 10.3 |
| 325.3 | Harlem River | 742045.623 | 655004.290 | 8.1 |
| 325.4 | Harlem River | 741462.064 | 655232.773 | 15.0 |
| 325.5 | Harlem River | 740958.249 | 654919.786 | 0.0 |
| 325.6 | Harlem River | 740724.741 | 654482.439 | 0.0 |
| 325.7 | Harlem River | 740276.410 | 654113.083 | 15.7 |
| 325.8 | Harlem River | 739842.947 | 653805.450 | 12.8 |
| 325.9 | Harlem River | 739429.845 | 653510.438 | 6.8 |
| 326 | Harlem River | 738964.748 | 653389.521 | 0.0 |
| 326.1 | Harlem River | 738367.078 | 653250.785 | 11.5 |
| 326.2 | Harlem River | 737955.976 | 652930.125 | 0.0 |
| 326.3 | Harlem River | 737598.240 | 652457.639 | 0.0 |
| 326.4 | Harlem River | 737293.531 | 652004.482 | 11.4 |
| 326.5 | Harlem River | 736810.638 | 651737.215 | 5.9 |
| 326.6 | Harlem River | 736355.184 | 651476.883 | 7.9 |
| 326.7 | Harlem River | 735893.760 | 651221.361 | 7.2 |
| 326.8 | Harlem River | 735428.562 | 650965.203 | 6.7 |
| 326.9 | Harlem River | 734938.844 | 650742.184 | 0.0 |
| 327 | Harlem River | 734484.303 | 650510.945 | 0.0 |
| 327.1 | Harlem River | 734018.694 | 650265.318 | 0.0 |
| 327.2 | Harlem River | 733534.873 | 650007.424 | 0.0 |
| 327.3 | Harlem River | 733047.095 | 649790.508 | 0.0 |
| 327.4 | Harlem River | 732553.962 | 649645.353 | 0.0 |
| 327.5 | Harlem River | 731966.902 | 649579.880 | 0.0 |
| 327.6 | Harlem River | 731423.022 | 649629.205 | 9.0 |
| 327.7 | Harlem River | 730944.641 | 649435.064 | 16.4 |
| 327.8 | Harlem River | 730435.345 | 649227.985 | 25.2 |
| 327.9 | Harlem River | 729993.810 | 649039.455 | 6.8 |
| 328 | Harlem River | 729549.729 | 648924.903 | 20.9 |
| 328.1 | Harlem River | 729052.897 | 648854.229 | 18.6 |
| 328.2 | Harlem River | 728465.055 | 648639.214 | 0.0 |
| 328.3 | Harlem River | 727959.387 | 648490.204 | 5.7 |
| 328.4 | Harlem River | 727405.961 | 648558.187 | 9.6 |
| 328.5 | Harlem River | 726914.965 | 648617.870 | 13.7 |
| 328.6 | Harlem River | 726436.441 | 648659.868 | 23.6 |
| 328.7 | Harlem River | 725897.889 | 648694.906 | 26.2 |
| 328.8 | Harlem River | 725385.782 | 648723.102 | 16.9 |
| 328.9 | Harlem River | 724867.609 | 648742.255 | 7.6 |
| 329 | Harlem River | 724316.199 | 648774.049 | 0.2 |
| 329.1 | Harlem River | 723835.779 | 648842.238 | 0.0 |
| 329.2 | Harlem River | 723338.210 | 648870.154 | 0.0 |
| 329.3 | Harlem River | 722795.818 | 648890.376 | 0.0 |
| 329.4 | Harlem River | 722276.902 | 648865.895 | 0.0 |
| 329.5 | Harlem River | 721759.933 | 648842.578 | 0.0 |
| 329.6 | Harlem River | 721263.148 | 648802.525 | 0.0 |
| 329.7 | Harlem River | 720751.812 | 648724.886 | 21.0 |
| 329.8 | Harlem River | 720194.311 | 648734.418 | 7.6 |
| 329.9 | Harlem River | 719641.843 | 649011.425 | 26.4 |
| 330 | Harlem River | 719161.026 | 649358.172 | 0.0 |
| 330.1 | Harlem River | 718852.884 | 649700.669 | 0.0 |
| 330.2 | Harlem River | 718559.805 | 650050.328 | 0.0 |
| 331.4 | East River | 715640.894 | 655163.268 | 370.2 |
| 331.5 | East River | 715402.082 | 655680.875 | 0.0 |
| 331.6 | East River | 715169.993 | 656183.909 | 28.1 |
| 331.7 | East River | 714945.951 | 656658.458 | 166.7 |
| 331.8 | East River | 714687.912 | 657077.158 | 252.6 |
| 331.9 | East River | 714336.810 | 657493.011 | 269.2 |
| 332 | East River | 713986.068 | 657908.438 | 202.3 |
| 332.1 | East River | 713620.476 | 658341.454 | 132.5 |
| 332.2 | East River | 713255.741 | 658773.454 | 568.7 |
| 332.3 | East River | 712871.602 | 659027.442 | 407.2 |
| 332.4 | East River | 712407.192 | 658815.100 | 290.1 |
| 332.5 | East River | 712018.327 | 658530.912 | 650.2 |
| 332.6 | East River | 711588.486 | 658216.777 | 1142.7 |
| 332.7 | East River | 711171.808 | 657912.261 | 1620.5 |