Testimony of
Daniel Glenning

DIRECT TESTIMONY

OF

DANIEL GLENNING

December 9, 2009

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I. Introduction

Q. Please state your name and business address.

A. My name is Daniel Glenning. My business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. Please state your position with National Grid ("National Grid").

A. My position is Manager of Distribution Substation Project Management. I manage six in-house Project Managers at National Grid. I work with these project managers, as well as contract project managers, to fully develop the scope, schedule and cost estimates for projects. I also work with the project managers and National Grid's program office to ensure all projects stay in compliance with all National Grid processes and procedures.

Q. Please summarize your educational background.

A. I have a BS in engineering from Clarkson University and have the completed the Naval Postgraduate School Certificate in Project Management/Program Management. I am also a certified Project Management Professional (PMP) by the Project Management Institute.

Q. What is your professional background?

A. I have been managing projects for National Grid for the past two and one-half years. I am responsible for initiating, planning, executing, controlling, and closing distribution substation capital projects. I also am or have been responsible for numerous transmission substation and transmission line projects. As part of this process, we proactively address schedule, technical, and cost risks so the projects can be successfully completed. Typically at National Grid there are approximately 260 distribution projects in various

project lifecycle states. Prior to National Grid, I managed projects, as a civilian project manager, for the United States Navy. During my career, I held a number of different positions as Program Manager, Project Manager, Engineering Manager, and various engineering positions. I managed new weapons and sonar system development projects for the Navy. I was responsible for developing project acquisition strategies that focused on cost and risk reductions, to ensure projects could achieve objectives, be completed on-time and within budget.

Q. Have you previously testified before the Rhode Island Public Utilities Commission ("Commission") or any other regulatory agency?

A. No.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to briefly describe the work that National Grid did with regard to potential transmission for the Deepwater Wind Block Island, LLC ("Deepwater Wind") project and the issues regarding the undersea transmission cable included in the proposal submitted by Deepwater Wind and Deepwater Wind Block Island Transmission, LLC ("Deepwater Transmission" and, together with Deepwater Wind, "Deepwater"), including its cost, ownership and operation. Deepwater's proposal was submitted in response to National Grid's request for proposals ("RFP") issued on July 31, 2009 and further described in the testimony of Mr. Milhous in this proceeding.

Q. What was your involvement with this project?

A. I was project manager responsible for the transmission-related aspects of the RFP and the response to it. I reviewed the initial Deepwater transmission proposal, coordinated with technical staff, management and counsel at National Grid, and provided feedback to Deepwater on the transmission cable proposal. I have met and communicated with Deepwater to identify issues with their proposal, and have asked Deepwater to re-evaluate the transmission proposal and investigate a number of options that could potentially be less expensive to National Grid's customers.

Q. Are you sponsoring exhibits to your testimony?

A. Yes. The following exhibits are included with my testimony:

1. The original transmission cost estimate submitted by Deepwater with its August 31, 2009 proposal in response to the National Grid RFP
2. September 15 letter from National Grid to Deepwater
3. Deepwater presentation, dated October 6, 2009, including revised cost estimate

II. Discussion of Transmission Proposal

Q. What did Deepwater originally propose for transmission for the project?

A. Deepwater's August 31, 2009 response to the RFP included a transmission proposal for the project. Deepwater proposed to interconnect the wind turbines with a 33kV submarine cable running from the wind turbines to Block Island. Deepwater would retain ownership of the 33kV cable. The transmission proposal included the following main elements: (i) a 69kV submarine cable connecting Block Island to the mainland at Narragansett, Rhode Island; (ii) a new National Grid transmission substation, adjacent to

the Block Island Power Company ("BIPCO") substation that contains a three-winding step-up transformer, with one of the step-up transformer windings (34.5kV) connecting to BIPCO and the other (69kV) connecting to the 69kV transmission cable; and (iii) a new National Grid 69kV to 34.5kV substation in Narragansett that would connect to the distribution system.

Deepwater's initial proposal in response to the RFP had an original cost estimate of $36.6 million for the transmission components of the project (this cost estimate is included as Exhibit 1 to my testimony). The cost estimate did not include the costs of any related upgrades to reinforce the National Grid transmission system.

Q. After receiving the Deepwater transmission proposal, what feedback did National Grid provide to Deepwater?

A. In a letter dated September 15, 2009 (Exhibit 2 to my testimony), National Grid asked Deepwater to revise its proposal to include an alternative for the transmission cable sized at 34.5kV, with an interconnection point at an existing substation at Wood River in Charlestown, Rhode Island. This alternative would eliminate the need for and cost of a new substation in Narragansett, and avoid the technical feasibility issue noted below.

Q. What were the interconnection options considered by National Grid and Deepwater?

A. One of the two Narragansett 34.5kV options connected to National Grid's 3302 line and the other connected to National Grid's 3307 line. The 3302 line is a 34.5kV radial line that originates at the Wakefield substation and terminates at an open recloser north of the Bonnet substation. This line comprises one 2/0 Cu conductor for its entire length. The 3307 line is a 34.5kV line that originates at the West Kingston substation and terminates at the Wakefield substation. The main line consists of 795 kcmil and loads are tapped at various points along the line.

At an October 6, 2009 meeting between Deepwater and National Grid, Deepwater updated its original transmission proposal, providing two 34.5kV interconnection options in Narragansett and one 34.5kV interconnection to our Wood River substation (which was the option we had suggested previously). The three options provided by Deepwater are shown in Exhibit 3 to my testimony, which is the presentation Deepwater gave to National Grid at the October 6 meeting. During this meeting with Deepwater, National Grid told Deepwater that the cost of interconnecting to the 3307 line, rather than the 3302 line, would be more expensive than re-conductoring the 3302 line to accommodate its wind project. After this meeting, Deepwater dropped the 3307 line interconnection option.

III. Technical Analysis

Q. What technical analysis has National Grid performed with regard to the transmission proposal?

A. National Grid provided an initial assessment to Deepwater that an interconnection point on line 3302 between the Wakefield and the Bonnet substations, as Deepwater initially proposed, could not support an energy injection of the magnitude contemplated. Additionally, as with any requested interconnection to National Grid's transmission system in New England, National Grid conducts certain technical interconnection studies pursuant to the requirements of the ISO New England Transmission, Markets and Services Tariff. The most important of these studies is the System Impact Study ("SIS"), which evaluates the impact of the interconnection on the reliability and operation of the interconnected transmission system. Upon Deepwater's request, National Grid initiated the SIS and is still in the process of conducting the SIS for this project. For the SIS, National Grid is considering a 34.5kV interconnection in Narragansett. This configuration is being studied because the cost estimate provided by Deepwater shows it as the least expensive option.

IV. Transmission Cost Estimate and Impact

Q. What are some key assumptions that should be included in a sound cost estimate for transmission?

A. A sound cost estimate for transmission should include cost projections for such key cost categories as: (i) labor (including the various disciplines employed in the work); (ii) risks and related assumptions (including such risks as schedule slippage, weather, unforeseen

conditions and unavailability of materials); (iii) permitting; (iv) property rights acquisition; (v) materials; and (vi) equipment costs (including any needed spare parts).

Q. Did Deepwater provide National Grid with a transmission cable cost estimate that addressed these categories?

A. Yes. In addition to its original proposal, Deepwater has given National Grid two revised cost estimates, one on October 6, 2009 and another on November 6, 2009. On October 6, 2009, Deepwater provided National Grid with a high-level cost estimate for four different transmission options, with costs ranging from $44.8 million to $59.3 million, as shown in Exhibit 3 to my testimony. The cost estimate for a 69kV cable interconnecting in Narragansett increased from the original proposal's amount of $36.6 million to $46.8 million. Approximately $1.7 million of this increase was to provide spare transformers for the non-standard ones Deepwater had originally proposed; the remainder of the approximately $8 million increase was due to refinements to the cost estimate. The 34.5kV cable option recommended by National Grid was projected to have a cost of $44.8 million. On November 6, Deepwater sent National Grid a memorandum regarding the cost categories and a revised cost estimate. In this revised cost estimate, the estimated cost for the 69kV interconnection option changed from $46.8M to $41.4M. Cost estimates for many of the cost categories noted above were not included. Instead, Deepwater stated that a submarine cable project at this stage of development is difficult to break down into cost categories that match "material", "equipment" or "labor".

Based on the cost swings in Deepwater's budgetary numbers, and the unquantified risks associated with the transmission development for the project, National Grid has estimated the cost range of the transmission cable project to be between $35-$50 million. This budgetary number assumes a 34.5kV submarine cable interconnection with the 3302 line in Narragansett, Rhode Island. National Grid and Deepwater have been focused on negotiating the PPA and thus have not developed a more precise cost estimate at this time. While the developer bears the responsibility to develop a proper cost estimate, if National Grid were to develop an independent cost estimate, it would not have one ready before the SIS is completed, which is expected in February 2010.

Q. What options were considered by the parties for cost recovery for the transmission cable?

A. Two options have been considered by the parties to date. The first option would have Deepwater or another entity (which may be an affiliate of Deepwater) be completely responsible for constructing, owning and operating the cable. Under this option, the costs of the cable would be added to the existing pricing in a power purchase agreement between Deepwater Wind and National Grid (the "PPA"). The second option would have Deepwater or another entity (which, again, may be its affiliate) construct the cable and then turn over ownership and operation of the cable to National Grid. Under this option, National Grid would recover the revenue requirement for its investment through distribution rates under an arrangement that would have to be approved by the Federal Energy Regulatory Commission.

Q. What would be the cost impact of including the transmission costs in the PPA pricing?

A. Under the option where Deepwater or another entity (other than National Grid) would construct, own and operate the cable, the costs of the transmission cable would be included in the PPA pricing. Based on the cost range described above, this option would add at least $35-$50 million to the project construction cost to be recovered through the PPA.

Q. What is the current status of the negotiations between National Grid and Deepwater regarding the undersea transmission cable?

A. National Grid continues to work with Deepwater to refine its cost estimates and interconnection point for the undersea cable. National Grid is also interested in better understanding the permitting risks associated with the project and how those impact the transmission cable. Fifteen or more permits and approvals could be required for this project at the federal, state and local levels (in addition to property rights acquisition), with potential challenges associated with many of them. If National Grid is able to address the issues of cost, technical configuration and permitting challenges, it will move on to consider in more depth whether National Grid would take ownership of the cable once it is completed.

Q. What, if anything, has National Grid concluded regarding the ownership of the transmission cable?

A. Aside from the certainty that National Grid has no legal obligation to own, operate or otherwise participate in the transmission cable, National Grid has not made a decision about whether it will do so. The parties are in the early stages of the development of a transmission agreement and National Grid is continuing to carefully consider the cable and its related issues. However, it is National Grid's preference to own the transmission cable. Thus, for planning purposes, National Grid is assuming that Deepwater will construct the cable and transfer ownership of the cable at a cost that is yet to be determined. The cost would then be included in a transmission services agreement and/or tariff that is filed at the Federal Energy Regulatory Commission for review and approval. Prior to any federal filing, the agreement would be provided to the Commission in Rhode Island for Commission review, along with the transmission cable purchase agreement between the Company and Deepwater.

Q. Does this conclude your testimony?

A. Yes.

Glenning-Exhibit 1

DWW Initial Pricing – Section 2 from their proposal

Exhibit 1
Glenning Testimony
Docket No. 4111
December 9, 2009
Page 2 of 2

SECTION 2: PRICING

The cost of the Transmission System is ***not*** included in the energy supply cost bid in the RFP Response.

As discussed in National Grid's "Responses to Questions From August 10th Pre-Bid Meeting," the requirement for a transmission cable to connect the Town of New Shoreham Renewable Project to the mainland grid is somewhat unusual: this bi-directional facility will be both indispensable to the Renewable Project, by providing a link to National Grid, and indispensable to the Block Island Power Company, by providing access to the ISO-NE wholesale power market.

As such, DWBT agrees that development of the Transmission Project needs to be treated separately from the development of the Wind Farm. In particular, as discussed below, DWBT proposes to develop, finance and construct the Transmission Project on a build, own and transfer ("BOAT") basis, and to transfer it at completion to National Grid.

Furthermore, National Grid also acknowledged in dialogue following the Pre-bid Conference, that to the extent Federal Energy Regulatory Commission ("FERC") licensing of the Transmission Project is required that either National Grid or ISO-NE will undertake this activity. This will help ensure the most efficient transfer of asset ownership at date of commercial operation.

Based on DWBT's development of this facility to date, its estimated cost of construction will be between $25-30 million (see *Figure 2-1*). However, until such time as the interconnection studies have been completed and the siting of the Transmission Project has been finalized along with related electrical matters, a fixed-priced bid to build this cable facility is inappropriate at this time.

Instead, DWBT proposes to work collaboratively with National Grid to determine the most cost-effective route, and electrically optimal interconnection location, for this facility. DWBT also proposes to enter into an agreement with National Grid defining the terms by which DWBT will develop, finance and construct the Transmission Project and transfer to National Grid upon commercial operation. Additionally, DWBT proposes that should a FERC filing be required, it would be made by ISO-NE and/or National Grid, not DWBT.

The transfer price is to include:

- a management fee for DWBT;
- interest on financing during construction, if any;
- return on Deepwater 's equity (if any) used to fund construction; but,
- no development fee.

Figure 2-1: Transmission Project Budget

DWBT Preliminary Budget Estimate	
Offshore Cable Supply and Installation	$26.4
Onshore Cable Supply and Installation	$4.3
Substation Supply and Installation	$4.3
Permitting & Site Control	$0.9
Interconnection (Studies and Upgrades)	$0.9
	$36.6

Daniel Glenning, PMP
Manager
Substation Project Management

nationalgrid

September 15, 2009

VIA EMAIL AND U.S. MAIL

Mr. Paul M. Rich
Chief Development Officer
Deepwater Wind, LLC
56 Exchange Terrace, Suite 100
Providence, RI 02903

Re: Proposal for Block Island Wind Farm

Dear Paul:

I am following up on the letter you received [earlier today] from my colleague, Mat Milhous, regarding the additional information needed with respect to your proposal to enter into a power purchase agreement, which includes a proposed undersea cable between the mainland and Block Island (the "Proposal"), with National Grid through two subsidiaries, Deepwater Wind Block Island, LLC and Deepwater Wind Block Island Transmission, LLC (collectively, "DWW"). This letter describes the additional information that National Grid will need in order to evaluate your proposal with respect to the proposed transmission cable.

As discussed in Mat's letter, please revise the Proposal so that the interconnection point for the undersea transmission cable is either the West Kingston substation or the Wood River substation, consistent with our previous guidance on this point. Alternatively, if DWW wishes to continue to pursue an interconnection to the 3302 line, then at a minimum, the Proposal should be supplemented to account for the necessary reinforcements of the 3302, 3307, and 3308 lines and any upgrades required at the Peacedale, Bonnet Shores, Wakefield and West Kingston substations. The Proposal should also be revised to included procurement of spare transformers, as the ones currently proposed by DWW are non-standard. Third, the Proposal should be supplemented to include documentation demonstrating that DWW has obtained, or can obtain, the necessary real estate rights to support the proposed landfall at both Town Beach, Block Island and Narragansett Town Beach. Finally, regardless of which interconnection point DWW chooses for its proposed 69 kV line, we would like DWW to develop an alternative proposal for a 34.5kV connection at the Wood River substation.

Each proposal for the undersea transmission cable should include the following features:

- A detailed cost estimate including, but not limited to, man-hours, disciplines, risks, and material and equipment costs;
- A detailed projection showing DWW's cash flow during the construction process (i.e., demonstrating DWW's ability to finance the transmission cable project);
- A Level II/detailed Gantt schedule, with pricing overlapping, that fully addresses the permits needed to support land-based construction;
- Legible one-line diagrams; and

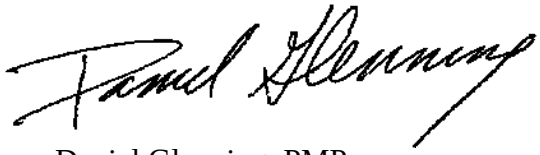
- Section 7 indentified some schedule assumptions. Please address the cost impact, if the assumptions turn out to be incorrect.

Additionally, DWW should supplement the Proposal with (1) a detailed Project Team description, including formalized teaming arrangements, and (2) reference projects and contact information for similarly scoped underwater cable projects completed within the last three to five years. Finally, we would suggest that DWW review the repair timeframes included in Section 6.3 of the Proposal (Submarine Cable System Maintenance), as we are of the opinion that they are unrealistic.

As Mat explained, R.I.G.L. § 39-26.1-7 imposes a very aggressive schedule for completing the necessary documents and filing those documents with the Rhode Island Public Utilities Commission. In order to be able to meet that schedule, it is imperative that you provide us with the information described above as quickly as possible and, in any event, at least one business day in advance of our next meeting scheduled for September 22 (i.e., by September 21).

Please feel free to contact me with any questions.

Very truly yours,



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Manager, Substation Project Management

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CLEAN ENERGY IS JUST OVER THE HORIZON

Block Island Transmission System

POI Selection Methology and Alternatives Analysis

October 6, 2009

Discussion Topics

- Block Island Assumptions
- Mainland Points of Interconnection Evaluated
  - Feeder 3302
  - Feeder 3307
  - Wood River Substation
- Cable Routes Evaluated
- Construction Methodology
- Cable Route Comparison and Budget Impacts

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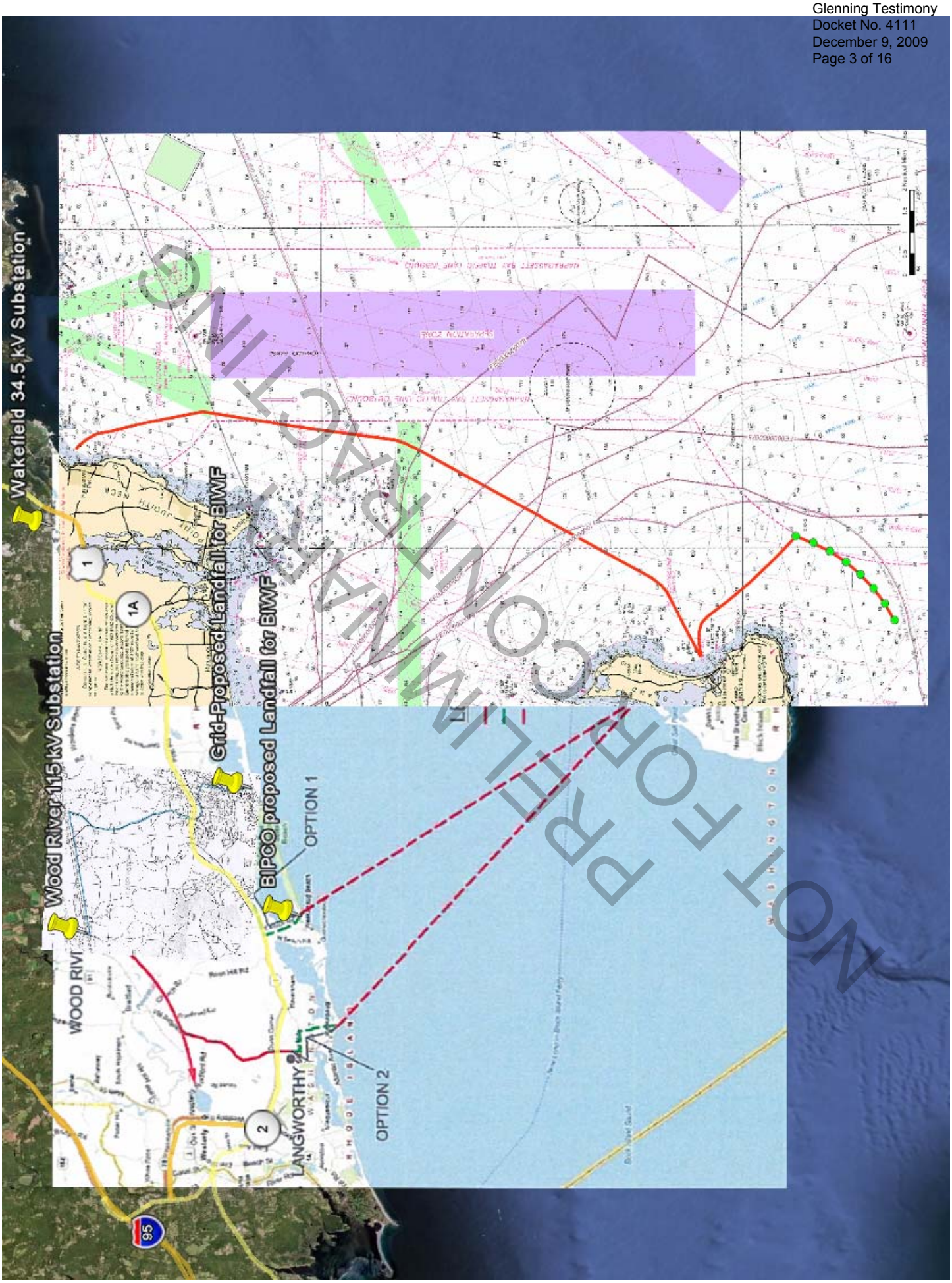

Block Island Upland Cable Route

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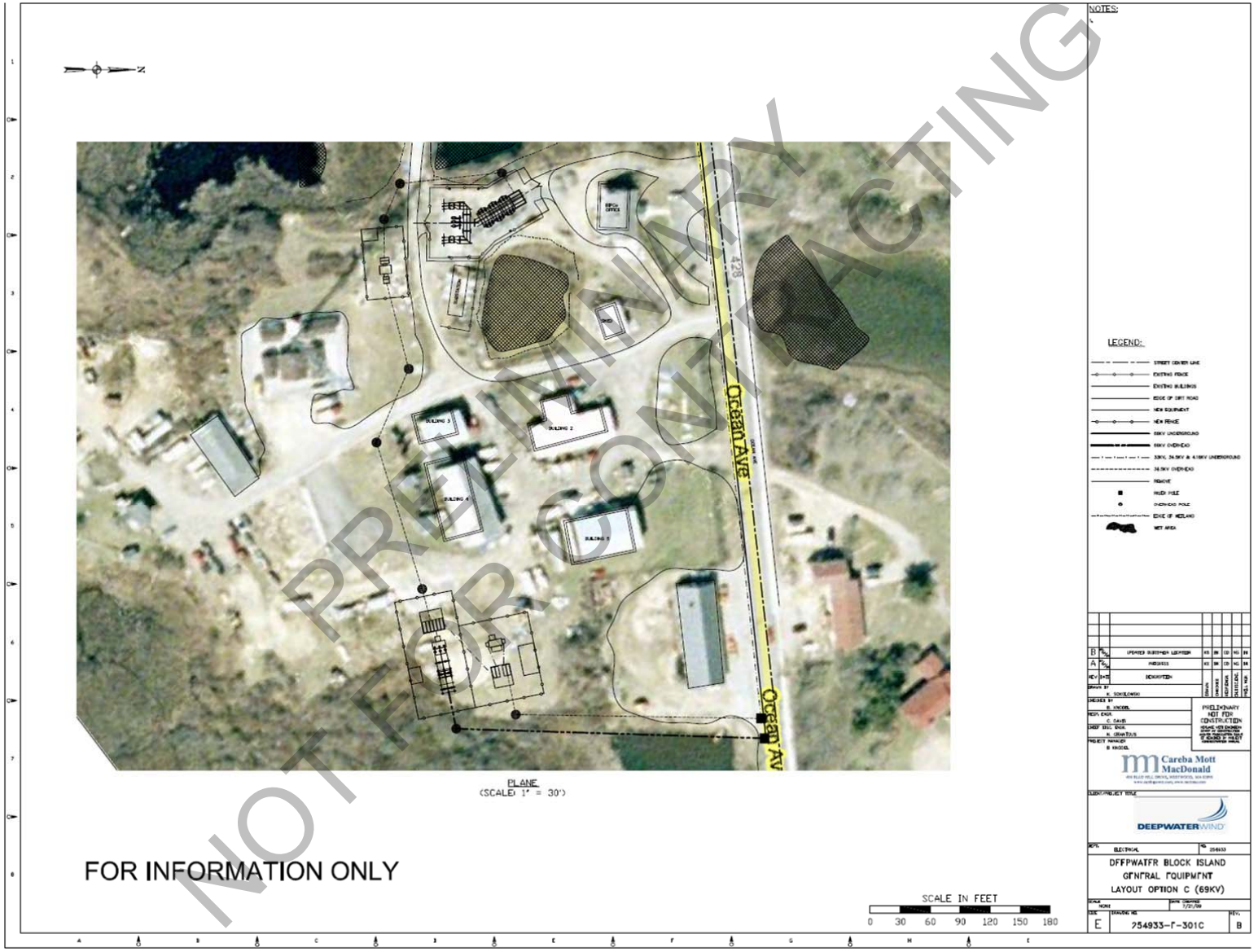
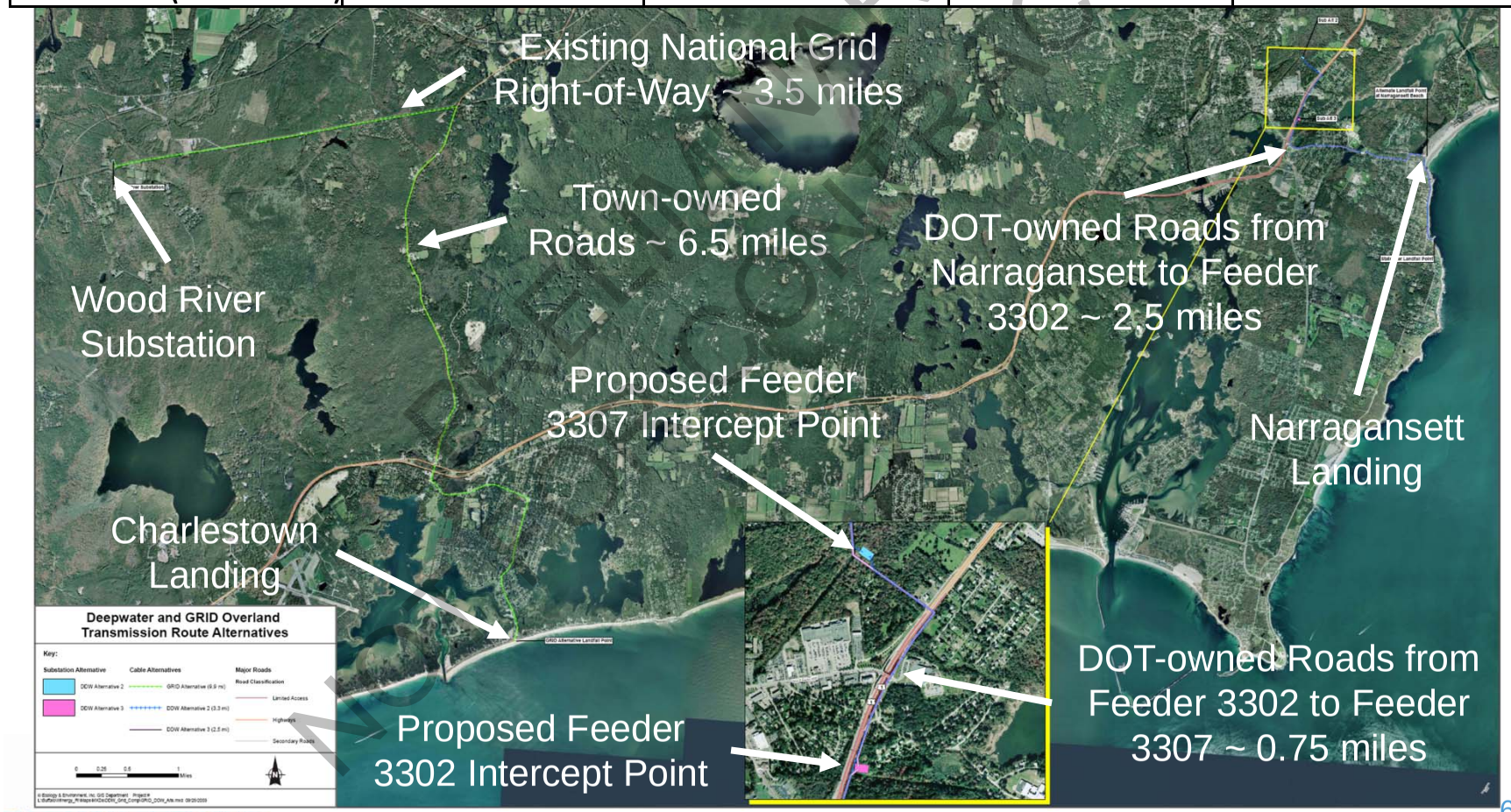
Block Island Substation



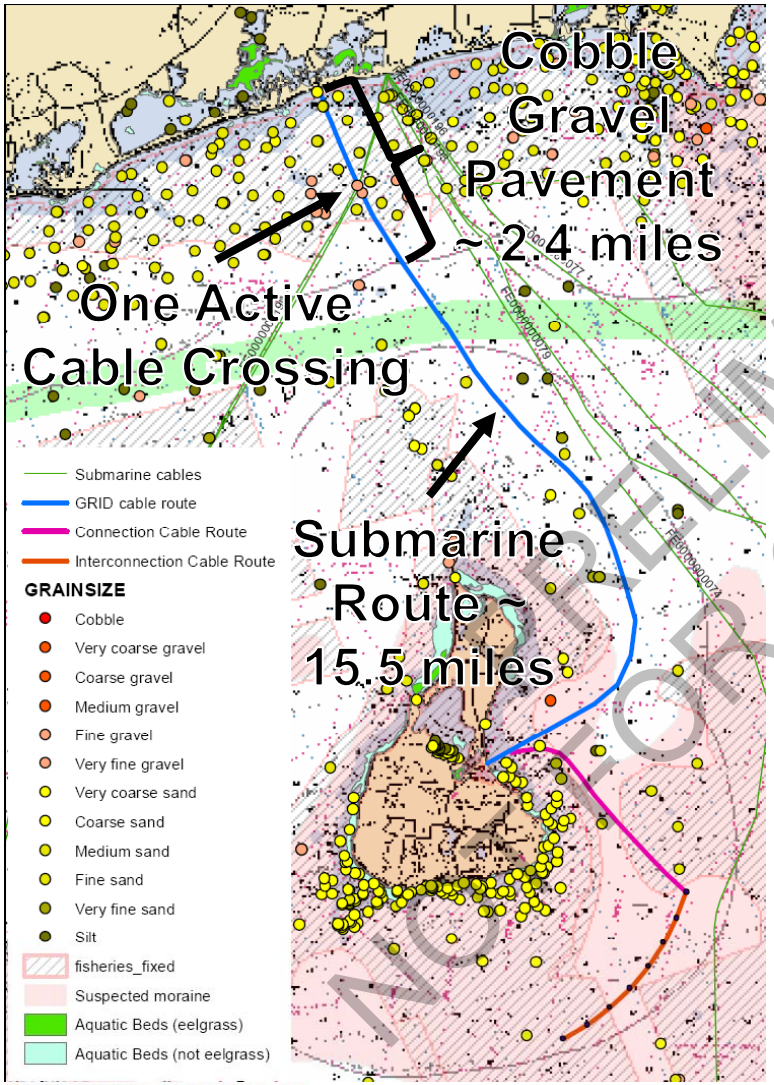
Points of Interconnection Evaluated

	Narragansett Landing			Charlestown Landing
	Intercepting Feeder 3302 (34.5 kV)	Intercepting Feeder 3302 (69 kV)	Intercepting Feeder 3307 (34.5 kV)	Wood River substation (34.5 kV)
Block Island Upland Cable Route	0.86	0.86	0.86	0.86
Submarine Cable Route	20.44	20.44	20.44	15.55
Mainland Upland Cable Route	2.52	2.52	3.27	9.92
TOTAL (Statute Miles)	**23.82**	**23.82**	**24.57**	**26.33**

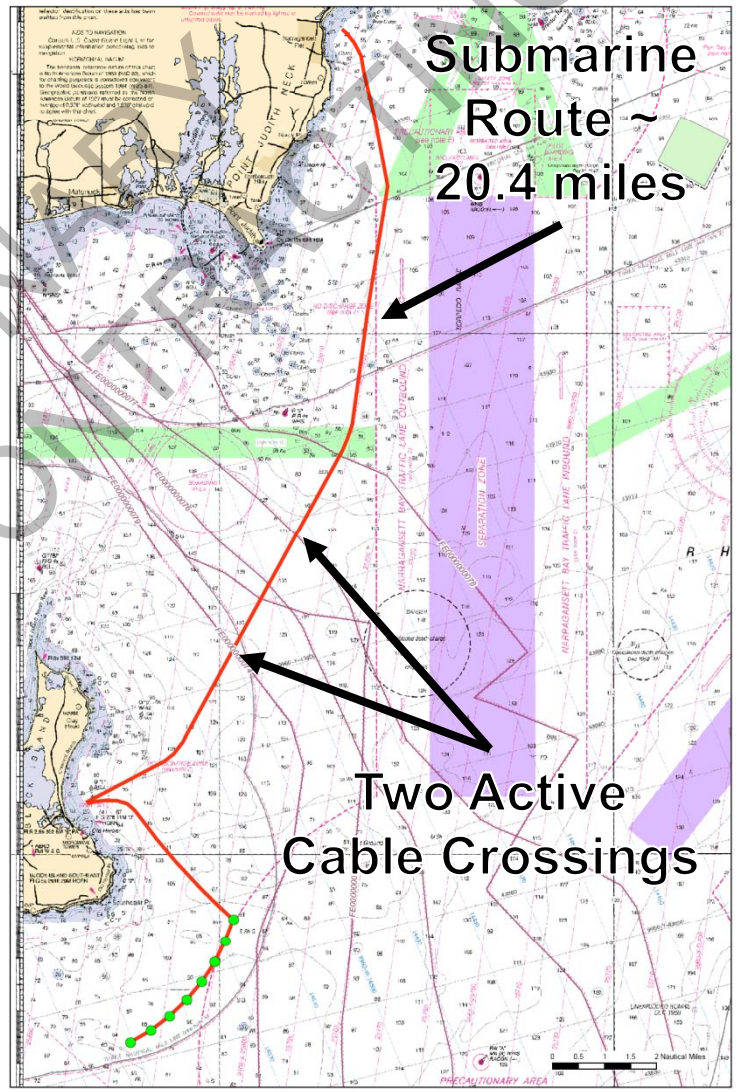


Submarine Cable Routes Evaluated

Charlestown Landing



Narragansett Landing



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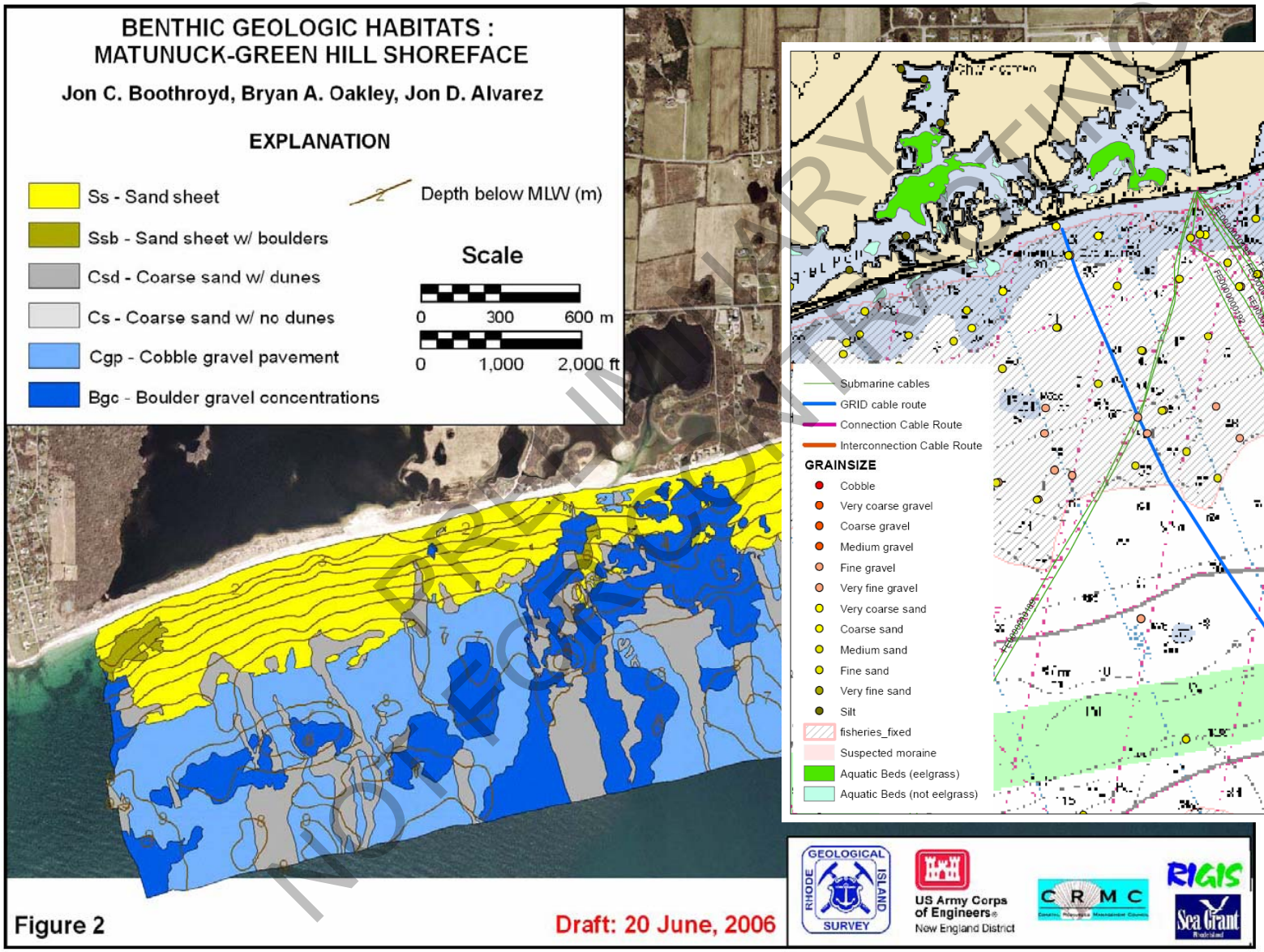
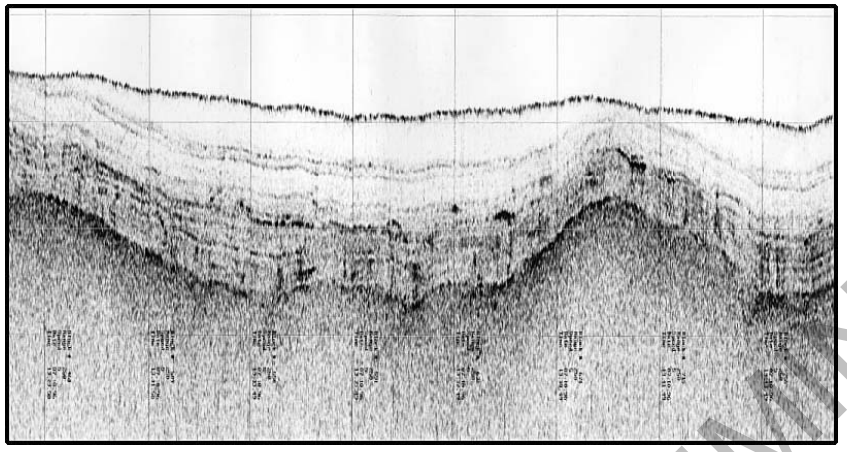
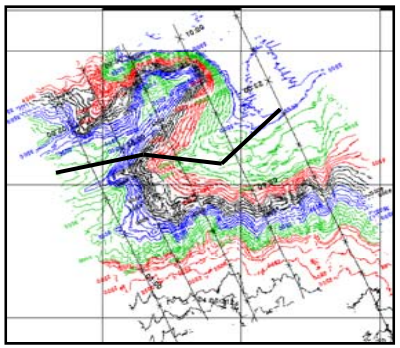
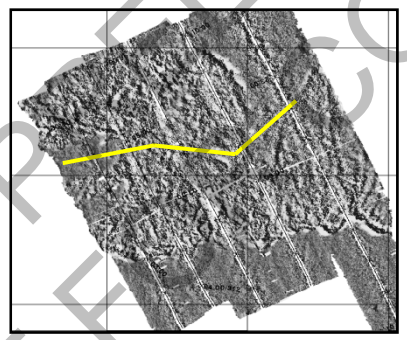
Environmental Considerations



Construction Methodology: Marine Route Survey







- Bathymetry
- Side Scan Sonar
- Sub-Bottom Profiler
- Burial Assessment Survey
- Archeological Survey
- Route Position List (RPL)
- Finalize Cable Length

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Construction Methodology: Route Preparation

Pre-Lay Grapnel Run

Route Clearance

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Horizontal Directional Drilling (HDD)

- Disruption to coastal systems minimized through the use of horizontal directional drilling at cable landing sites

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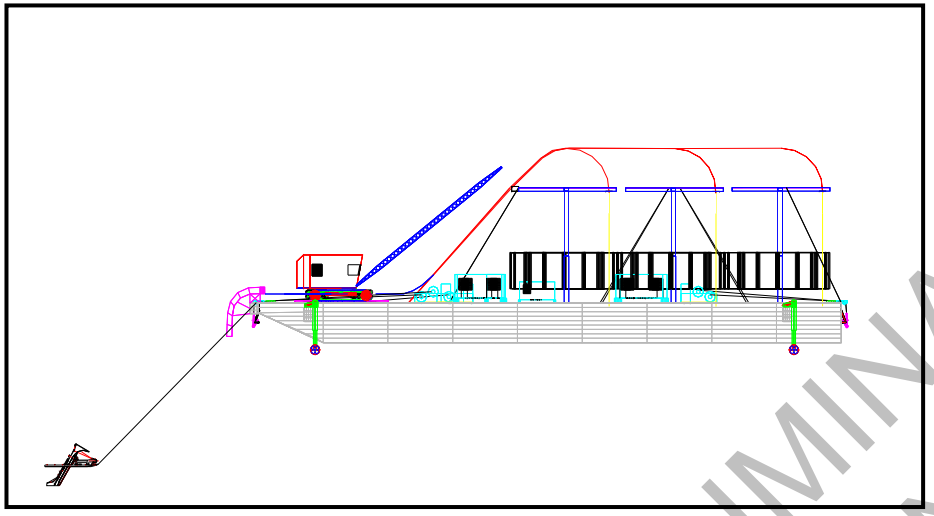
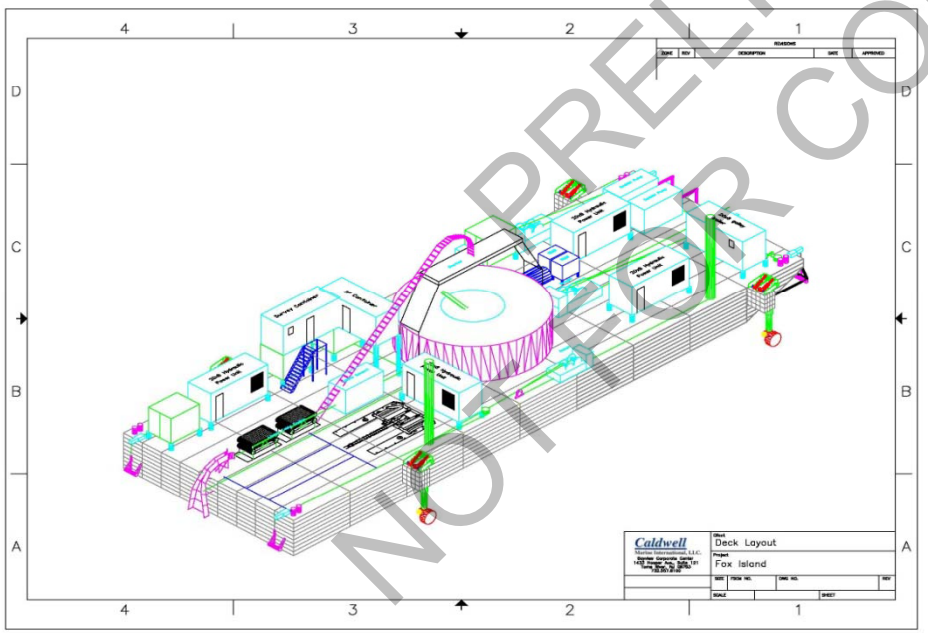
Construction Methodology: Laying Vessels





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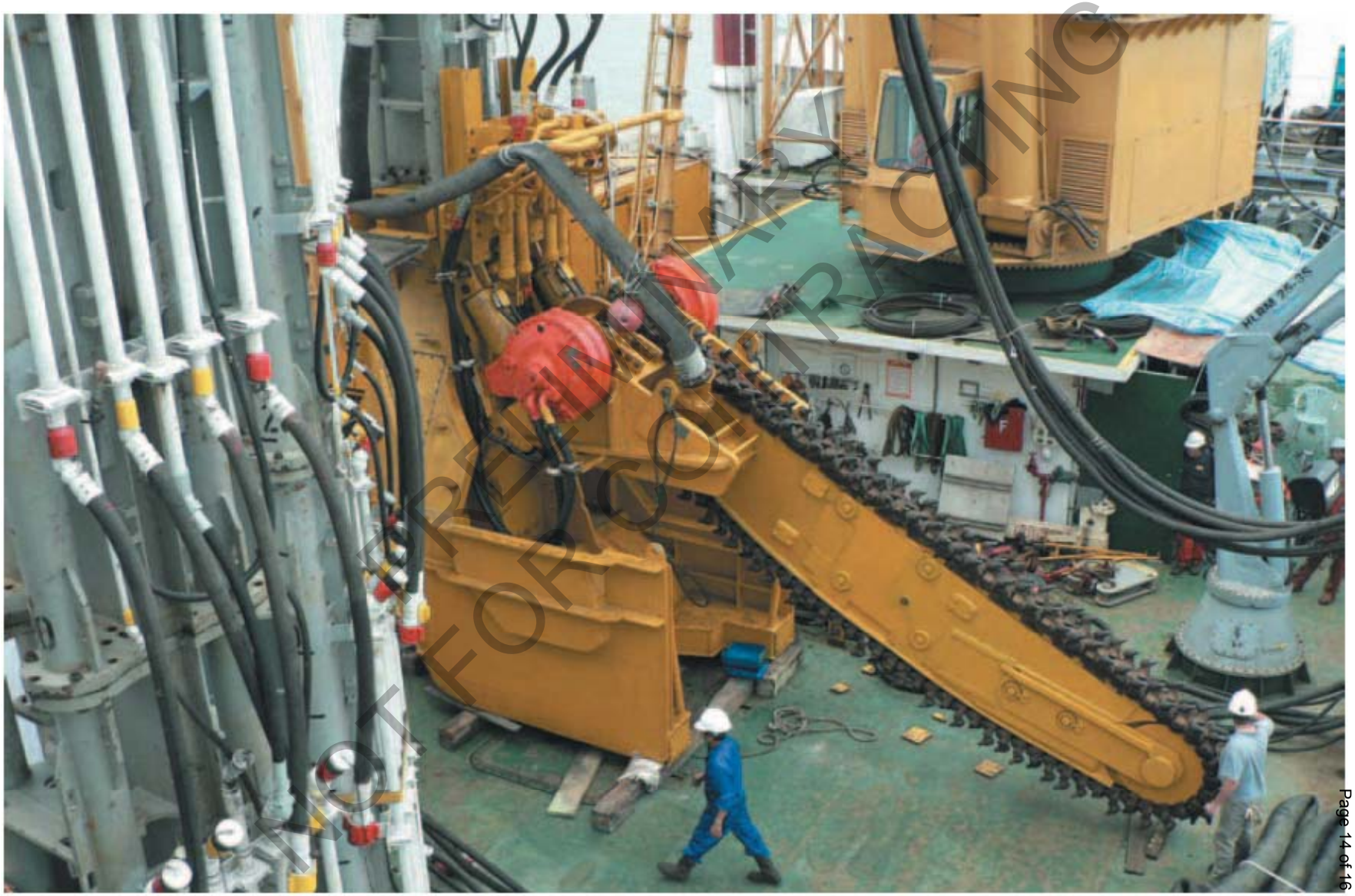
Construction Methodology: Jet Plowing

Construction Methodology: Rock Saw Trencher



Cable Route Comparison

Charlestown Landing

- Mainland Upland
  - Total upland route = 9.9 miles
    - 6.5 miles along town-owned roads (not DOT-owned); assume burined cable will be required
    - 3.5 miles in existing Grid ROW; assume overhead
  - Landfall on town-owned land near site of 1996 oil spill (3.9 million gallon)
- Submarine
  - 15.5 mile route through mostly soft sediment
  - 2.4 miles of cobble gravel pavement near mainland will require rock saw trencher
  - Impacts to benthic habitat will require signficant restoration
  - One active cable crossing

Narragansett Landing

- Mainland Upland
  - Total upland route depends on POI
    - 2.52 miles to 3302 intercept
    - 3.27 miles to 3307 intercept
  - All along DOT-owned roads
  - Buried cable required in Narragansett, but overhead may be possible along Route 1; Budgeted for all buried
  - Landfall at State-owned Pier (RI DEM)
- Submarine
  - 20.44 mile route through mostly soft sediment; Route designed to avoid gravel extending from Point Judith penninsual
  - Two active cable crossings; other out or service; to be cleared during pre-lay grapnel run

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Budget Impacts

		Narragansett Landing			Charlestown Landing
	THESE COSTS ARE ROUGH ORDER-OF-MAGNITUDE ESTIMATES AND HAVE A CONFIDENCE INTERVAL +/- 20%. THESE PRICES DO NOT INCLUDE (1) INTEREST DURING CONSTRUCTION, (2) PROJECT MANAGEMENT COSTS, (3) CONTINGENCY OR (4) SYSTEM UPGRADES.	Intercepting Feeder 3302 (34.5 kV)	Intercepting Feeder 3302 (69 kV)	Intercepting Feeder 3307 (34.5 kV)	Wood River substation (34.5 kV)
	Block Island Upland Cable Route	0.86	0.86	0.86	0.86
	Submarine Cable Route	20.44	20.44	20.44	15.55
	Mainland Upland Cable Route	2.52	2.52	3.27	9.92
	TOTAL (Statute Miles)	**23.82**	**23.82**	**24.57**	**26.33**
1	Interconnection Studies and Administration	$700,000	$700,000	$700,000	$700,000
2	Upgrades required for interconnection to existing National Grid, Northeast Utilities and BIPCO systems				
3	Permitting studies required by the jurisdictional agencies and cost implications of anticipated permit conditions, based on real examples of required mitigation, restoration, etc	$990,000	$1,990,000	$990,000	$2,465,000
4	Route engineering studies including marine route survey and upland surveys	$1,000,000	$1,000,000	$1,000,000	$1,000,000
5	Procurement and installation of transmission substation on Block Island, including protection, controls, metering and transformer(s), as necessary to (i) deliver power to BIPCO (whether from the mainland or from the wind farm) or (ii) deliver power from the wind farm to the mainland	$1,588,500	$3,572,500	$1,588,500	$1,588,500
6	Procurement and installation of all transmission cable systems - upland and marine - running from the Block Island substation to the mainland substation, including the cost(s) of: 1. Horizontal directional drilling on both Block Island and the mainland; 2. Route clearance, pre-lay grapnel runs and cable crossings for submarine cable routes; and 3. Jet plowing and any special equipment necessary to penetrate the cobble-gravel pavement near the south coast of Rhode Island 4. Upland cable burial, as necessary	$38,621,400	$35,681,150	$40,366,400	$49,049,910
7	Procurement and installation of mainland substation equipment, as necessary to facilitate (i) the injection of power from the wind farm and (ii) the withdrawal of power to serve Block Island	$669,250	$2,132,250	$669,250	$429,000
8	Acquisition of all necessary site control on Block Island, the mainland and in the submarine environment, incluidng cable crossing agreements	$1,240,000	$1,740,000	$1,540,000	$4,020,000
	TOTAL	**$44,809,150**	**$46,815,900**	**$46,854,150**	**$59,252,410**