

VINEYARD WIND

VIA Electronic Mail and FedEx

November 9, 2018

Grover J. Fugate
Executive Director
Rhode Island Coastal Resources Management Council
Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, RI 02879-1900

Re: Vineyard Wind – CRMC File No. 2018-04-055

Dear Mr. Fugate:

As we discussed at our October 9, 2018 meeting with you and the Coastal Resources Management Council (“CRMC”) staff, and as a follow-up to our November 1, 2018 meeting (“November 1 Meeting”) with CRMC, the Governor’s Office, BOEM, and others, Vineyard Wind is submitting this letter and the attached information regarding Vineyard Wind’s ability to accommodate the fishing industry’s request that turbines be aligned in rows going in an east-west direction with 1 nautical mile (“nm”) separation distances between turbine rows. We also include herein the alternative layout discussed at the November 1 Meeting and included in our October 22, 2018 Construction and Operation Plan (“COP”) submission that reduces the area of the Wind Development Area (“WDA”) where turbines cannot be aligned in an east-west direction and which provides east-west fishing lanes along the southern portion of the WDA (the “COP Appendix III-R Alternative” shown in Attachment A).

As we also discussed at the November 1 Meeting, Vineyard Wind has been exploring the possibility of procuring a turbine model with a larger generation capacity (megawatts), which would decrease the number of required turbine locations and thereby further decrease the area of the WDA that cannot be aligned in an east-west direction. We are pleased to inform you that Vineyard Wind has been able to secure a larger turbine than we had previously anticipated, indeed it is the largest turbine commercially available in the world today. Even though use of this new turbine presents additional risk to the project by using a “first-in-series” turbine model, which has not yet received necessary design certifications, Vineyard Wind commits to employ this new turbine in order to avoid and minimize potential impacts to Rhode Island fishermen. We believe this extraordinary commitment, together with our proposed framework for a compensatory mitigation program, undeniably demonstrates that the project is consistent with the Rhode Island Ocean Special Area Management Plan (“Ocean SAMP”) and furthers Rhode Island’s goals to promote

offshore renewable energy while protecting commercial fisheries from significant adverse impacts.

Our commitment to use the larger turbine reduces the number of turbine locations from 94 to 84 and allows for several turbine layout options to be considered (the “Large Turbine Alternative WDA”). Attachment B provides three proposed layout options for the Large Turbine Alternative WDA. The locations depicted for each option are the planned and intended locations that we fully expect to use barring any unforeseen issues which are beyond our control. We do note, however, that in the unlikely event Vineyard Wind encounters unexpected surface or subsurface issues at a location, a turbine could be moved to an alternate location where required geological data already exists, but would still be located in the project envelope of the COP. Should this be necessary, the new turbine location would be chosen so as to be contiguous with the main turbine array, so as not to disrupt the planned east-west orientation of future turbines.

All of the Large Turbine Alternative WDA options further reduce the size of the WDA where turbines cannot be aligned in an east-west direction from the COP Appendix III-R Alternative. Each option may have certain advantages over others for minimizing potential impacts to commercial fishermen. From a technical perspective, all of the options are feasible for Vineyard Wind. Therefore, we are willing to adopt the option CRMC deems best aligned to address Rhode Island fishermen needs. As the Bureau of Ocean Energy Management’s (“BOEM”) review process is well underway and its draft environmental impact statement is scheduled to be published for public comment on December 7th, Vineyard Wind intends to withdraw the COP Appendix III-R Alternative as a viable alternative for consideration and instead, propose to BOEM the three Large Turbine Alternative WDA options as viable alternatives and mitigation measures for consideration in its National Environmental Policy Act review and decision on the project.

Table 1 below presents a comparison of each Large Turbine Alternative WDA options to the COP Appendix III-R Alternative, identifying the area of the WDA that cannot be aligned east-west and the percent reduction in the WDA from the originally proposed layout. It also provides a brief description of each option, which are more fully described herein and shown in Attachment B.

Table 1 Comparison of Turbine Layout Options

Turbine Layout Options	Number of Turbine Locations	Not East-West Turbine Area (sq. km)	% Reduction in Non East-West Area Relative to Originally Proposed Layout	Description
Appendix III-R Alternative	94	244	20% (18 sq. nm smaller)	This alternative layout was proposed in the October 22, 2018 COP update Appendix III-R. It provided considerable advantages over other layout options Vineyard Wind considered that require 94 locations to achieve 800 MW. This layout minimizes the area without east-west rows by creating east-west rows on the south edge of the WDA through the elimination of particular locations, resulting in a 20.3% reduction in non-east-west area relative to the originally proposed lay-out. In addition, four turbines would be at seemingly random, isolated locations far to the south of the main turbine area until adopted in a future project layout. This alternative is shown here for comparison purposes. Vineyard Wind is no longer proposing this alternative, as better options are available due to the decision to deploy the largest turbine commercially available.
Large Turbine Alternative WDA Option 1	84	239	22% (19.5 sq. nm smaller)	This option uses the largest turbine commercially available and needs only 84 turbine locations to achieve 800MW. The key advantage of this layout is that it creates 19.5 sq. nm of area for future east-west rows, while also eliminating the three turbine locations furthest to the north. The area to the north of the WDA is a squid “hotspot” and the most heavily transited area by fishing vessels travelling to and from fishing grounds. The main drawback of this option is that, even though it eliminates a considerable area without east-west turbine rows, it is the option with the largest area without east-west turbine rows.
Large Turbine Alternative WDA Option 2	84	232	24% (21.5 sq. nm smaller)	This option uses the largest turbine commercially available and needs only 84 turbine locations to achieve 800MW. The key advantage of this layout is that it has the smallest area without east-west rows. The area without east-west rows is confined to the north, which means that future build out of the remaining lease area to the south will be exclusively comprised of east-west turbine rows.
Large Turbine Alternative WDA Option 3	84	236	23% (20.4 sq. nm smaller)	This option uses the largest turbine commercially available and needs only 84 turbine locations to achieve 800MW. This option is a combination of option 1 and 2. It has the advantage of eliminating the furthest northeast turbine location, i.e. the closest turbine to the squid hotspot that occurs in an arc just south of Martha’s Vineyard and Nantucket. This layout has the second smallest area without east-west turbine rows.

While the Large Turbine Alternative WDA options presented in Attachment B minimize by more than 20% the total area that would not be aligned east-west, under all options only about 6% of the entire, combined Rhode Island/Massachusetts and Massachusetts Wind Energy Areas (“WEA”) would not have east-west rows as requested by the fishermen as a means to minimize impacts from offshore wind to commercial fishing in the region. Therefore, we believe it is appropriate to now consider other forms of mitigation related specifically to the area that would not have east-west rows. To that end, as you are aware, Vineyard Wind is seeking input from fishermen on what they would like to see in a compensatory mitigation program.

At the October 31, 2018 meeting organized by the Responsible Offshore Development Alliance (“RODA”), a number of ideas were suggested, and many were consistent with what Vineyard Wind has heard from fishermen through our own outreach efforts. Vineyard Wind desires to continue to collect input and feedback from fishermen and fishing organizations, CRMC, and other agencies in order to be able to propose a well-designed mitigation program. To this end, we intend to make an additional submission to CRMC that describes Vineyard Wind’s proposed compensatory mitigation program and the economic data upon which it relies. Vineyard Wind has retained an expert fisheries economist to provide an objective evaluation of the best available fisheries economics data.

We ask that this, and our compensatory mitigation proposal, when submitted, be included in the record and, in addition to Vineyard Wind’s COP (as updated and filed with BOEM on October 22, 2018 and also being provided today to CRMC via a share file), be considered in CRMC’s review of the project for consistency with Rhode Island’s enforceable policies set forth in the Ocean SAMP. We also incorporate by reference the information provided in our July 16, 2018 letter responding to CRMC’s three-month status review of the project. The factual information we have submitted for your consideration, as well as the measures proposed herein, demonstrate that the project is consistent with Rhode Island’s enforceable policies.

Vineyard Wind’s Commitments to Rhode Island Fishermen

As we have discussed, realigning the entire project layout in an east-west direction is not a feasible or reasonable alternative because it could not be implemented in a manner that allows Vineyard Wind to achieve the primary purpose of the proposed project, *i.e.*, to deliver 800 MW of power within a specified time and at a competitive price to Massachusetts ratepayers and to advance the interests of Rhode Island, Massachusetts, and the nation in providing new clean sources of energy. Given the technical and legal constraints associated with making any changes to the project at this late stage of the process, Vineyard Wind has spent many months exploring ways to best accommodate Rhode Island fishermen’s desire for an east-west turbine row arrangement within the WDA without putting the entire project at risk. In so doing, we are making six important commitments to fishermen in Rhode Island and elsewhere.

Vineyard Wind will:



1. **Utilize the world’s largest commercially available turbine, a “first-in-series”, which allows 22 turbine locations to be eliminated and significantly reduces the area of the WDA where turbines are not aligned in east-west rows.** Vineyard Wind is proposing several options for how the turbines could be laid out in the Large Turbine Alternative WDA scenario, as shown in Attachment B. Vineyard Wind is willing to adopt any of these options. This decision represents a significant commitment by Vineyard Wind.
2. **Implement a compensatory mitigation program to mitigate potential impacts to commercial fisheries that result from the area of the WDA not being aligned in east-west rows.** The details of the program will be developed with input from fishermen and described in our compensatory mitigation submission. Vineyard Wind anticipates that the program could be comprised of funding that is provided directly to impacted vessels and/or funding that supports community level programs focused on enhancing the safety and profitability of the Rhode Island fishing industry and the well-being of fishermen generally, as fishing will take place among turbines into the future (whether the Vineyard Wind or other projects).¹
3. **Implement a construction impacts mitigation program that mitigates project impacts to individual fishing vessels resulting from the construction of the project.** Details of this program will also be developed with input from fishermen, but we anticipate this program would likely be structured as funding to vessels that would be expected to be impacted because of their inability to operate in a particular area at a particular time due to project construction activities.
4. **Orient all future turbine installations in the remainder of the lease area in east-west rows and include a 1 nm separation distance between each row.** This measure, in combination with the removal of the 22 locations described above, will result in approximately 64 to 66% of our lease area having an east-west row alignment across the full width of the lease area, depending on which turbine layout option is adopted. Vineyard Wind also commits to work with adjacent lease holders to align rows across lease areas to the greatest extent feasible. In fact, we are already in communication with Bay State Wind to this end. We note that, to the best of our knowledge, no other RI/MA lease holder has yet committed to east-west rows with 1 nm wide separation as we are doing here.

¹ Vineyard Wind recognizes that for projects sited in state waters, the Ocean SAMP requires mitigation measures to be negotiated between the Council staff, the FAB, and the project developer, and then approved by the Council. However, because the project is sited in federal waters, Vineyard Wind’s compensatory mitigation program must also address input from stakeholders beyond Rhode Island, a process that began at the October 31, 2018 RODA meeting. We look forward to advancing those initial discussions with CRMC staff and the FAB.

- 5. Adopt the 2 nm wide “Consensus Transit Corridor Plan” which has consensus support from Rhode Island fishermen.** This Consensus Corridor Plan (the “Plan”) calls for a 2 nm wide corridor running at a northwest-southeast direction through our lease area, located to the south of the WDA as shown in Attachment C. The Plan was supported by most if not all fishermen, including Rhode Island fishermen, in attendance at the Massachusetts Fisheries Working Group meeting on September 20, 2018 (“FWG Meeting”). The Consensus Corridor Plan was also roundly endorsed by Rhode Island fishermen at the October 11, 2018 meeting organized by CRMC (“CRMC Meeting”). Support for the Plan has also been expressed to us by fisheries representatives and individual fishermen. Aside from fishermen, the Coast Guard has indicated its support of the Plan to BOEM; BOEM has posted the plan on its website so as to advise potential bidders in upcoming lease area auctions; and the Plan is also supported by the Massachusetts Coastal Zone Management (“CZM”) Office. See Attachment E.

As documented in the COP, AIS data shows that the large majority of the AIS-equipped vessel navigation in this area is by transiting fishing vessels, most of them travelling in a northwest-southeast direction. While these vessels likely do not have gear deployed while transiting, they are in a real sense “fishing” as many of these fishing vessels are regulated based on the amount of time they spend at sea. As such, the ability to safely and efficiently transit a particular area can be an important factor relative to the effectiveness and profitability of the vessel’s fishing trip. The available tracking data therefore also indicates that the Consensus Corridor Plan is supportive of both traditional transiting and fishing patterns in the region.

Unless a new transit corridor plan is developed that garners the same level of support from fishermen as the current plan, and also allows us to eliminate turbine locations for the purpose of accommodating the east-west row request, Vineyard Wind intends to use the current Consensus Corridor Plan for planning both the current project as well as any future projects.

In addition to the corridors included in the Plan, Vineyard Wind is supportive of an additional, north-south oriented corridor located to the east of our lease area. This north-south corridor is of particular importance to squid vessels operating out of Rhode Island. While this proposed corridor would not pass through our lease area, Vineyard Wind is supportive of the corridor as a matter of general wind industry policy as a means to further support the traditional use of the area by the Rhode Island fishing fleet.

- 6. Contribute to regional fisheries studies by providing funds, available expertise, and scientific resources.** Vineyard Wind has been a strong advocate for federal, state, or regional bodies to establish mechanisms to fund and organize fisheries studies to assess the cumulative impacts of multiple offshore wind projects on the fishing industry in Rhode Island and elsewhere, and to inform future project planning by the offshore wind industry generally.

Vineyard Wind's strong commitment to regional fisheries studies is evidenced by our being unique among the RI/MA lease holders in proposing a specific funding mechanism that would provide for on-going funding of such regional and/or long-term studies. Vineyard Wind continues to stand ready to support these studies once a mechanism to fund, design, and organize them is established.

The Project Will Not Have Significant Adverse or Long-term Impacts on Rhode Island Fishermen

In summary, the Vineyard Wind project will not have significant adverse or long-term impacts on Rhode Island commercial fishermen due to the cumulative, positive impacts of the following factors:

- 1) Adoption of the largest commercially available turbine reduces the area of the WDA where turbines cannot be aligned east-west by approximately 22 to 24% depending upon the option chosen, and represents approximately 6% of the total MA/RI areas designated for wind development;
- 2) Regardless of row orientation, fishermen may still fish in any area where the turbines are located;
- 3) Adoption of the Consensus Corridor Plan, which is supported by Rhode Island fishermen, will provide fishing vessels safe and efficient means to transit through the WEAs, thereby reducing the amount of time at sea and any associated costs;
- 4) Vineyard Wind's commitment to compensatory mitigation during the operation of the project, the details of which will developed in consultation with fishermen; and
- 5) Offshore construction activities will only occupy a specific area for limited period of times, and therefore will not preclude fishing activities in and around the area for long periods of time. Any residual impacts to fishermen will be mitigated through a construction period compensatory mitigation plan.

We look forward to CRMC's feedback on the information presented in this filing so that we can address any outstanding issues and enable CRMC to reach a consistency determination.

Sincerely,



Erich Stephens
Chief Development Officer



Attachments

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VINEYARD WIND

SUBMISSION TO THE RHODE ISLAND COASTAL RESOURCES MANAGEMENT COUNCIL

November 9, 2018

I. The Primary Purpose of the Project is to Deliver 800 MW of Wind Generation Capacity at a Specified Price and Within a Specified Time

As previously reported to CRMC, Vineyard Wind was the successful bidder in response to the Massachusetts Section 83C Offshore Wind Energy Generation request for proposals, being awarded power purchase agreements totaling 800 MW of wind generation capacity. These long-term contracts with the Massachusetts electric distribution companies (Eversource, National Grid, and Unitil) have been executed and filed with the Massachusetts Department of Public Utilities (“DPU”) for review and approval. Now that the contracts have been executed, Vineyard Wind’s sole project purpose is to fulfill its obligations under the contracts to deliver 800 MW of power at the prices and within the time period specified in those contracts with the electric distribution companies, which together provide most of Massachusetts with its electrical energy. Once operational, Vineyard Wind’s 800 MW project will provide energy equivalent to power more than 15% of the homes in Massachusetts.

On August 1, 2018, the Massachusetts Department of Energy Resources (“DOER”) submitted a letter to the DPU urging approval of Vineyard Wind’s contracts because of the significant benefits the project would generate (*See Attachment D*). Importantly, DOER found that Vineyard Wind’s 800 MW project was superior to other proposals and would result in projected savings to ratepayers of approximately \$1.4 billion over the life of the contracts. In addition, the project assists Massachusetts in meeting its Global Warming Solutions Act goals and provides critically needed diversity to Massachusetts’, and the region’s, energy portfolio. Further, as the largest procurement of offshore wind generation in the U.S., the project creates jobs and spurs economic development.

The project will also benefit Rhode Island. With more than 400 miles of coastline, Rhode Island is particularly vulnerable to the impacts of climate change, which has brought more severe and frequent storms to the region in recent years. The increasing frequency of extreme weather events also poses serious energy and fuel security risks, particularly in light of the region’s dependence on natural gas to meet both electricity and heating needs. For these reasons, the Council expressly supports “the policy of increasing offshore renewable energy production in Rhode Island as a means of mitigating the potential effects of global climate change.” Ocean SAMP § 1150.2(1). Vineyard Wind’s injection of emission free, reliable offshore wind power into the New England grid will enhance the overall reliability of the electricity system, increase resource diversity, and contribute to a more climate resilient energy system.

Some of the key benefits Vineyard Wind’s project will deliver to the region’s ratepayers include a reduction in greenhouse gas emissions (GHG), lower power prices, and a decrease in demand for natural gas. A 2017 study conducted by Daymark Energy Advisors (“Daymark”), on behalf of Vineyard Wind, shows that our 800 MW project would lead to 588,000 fewer metric tons of carbon emissions annually, \$657 million (NPV 2022 dollars) in Locational Marginal Price benefits for New England ratepayers — other than Massachusetts ratepayers— over 20 years, and a reduction in demand for natural gas by the region’s electricity sector of about 22.8 million MMBtu per annum.

The fuel security, system reliability, and price suppression attributes of the project undeniably benefit all of New England. These benefits are perhaps best illustrated by how the project would have performed had it been operational during winter storm Grayson in early 2018, the so-called “bomb cyclone”. Another analysis conducted by Daymark study shows that during the 4-day storm event, our project would have displaced 61 million kilowatt hours of oil- and natural gas-fired generation, resulting in savings of over \$31 million for New England ratepayers and emission reductions totaling 67,485 metric tons of carbon dioxide, which is equivalent to removing 14,358 cars from the road for an entire year. Finally, the project also has the potential to create direct economic benefits in Rhode Island, as Vineyard Wind is seeking the opportunity to use Rhode Island ports for staging some components during project construction.

The Vineyard Wind project is also important to realizing Governor Raimondo’s commitment to a clean, affordable and reliable energy future, even if the output of the project will serve Massachusetts. As the first utility-scale offshore wind project in the country, the project is already stimulating significant investment interest in southeastern New England, including in Rhode Island businesses and infrastructure. The Vineyard Wind project is a critically important step towards realizing a viable offshore wind industry in the U.S., southern New England in particular, and therefore also furthers Rhode Island’s interest in being a hub of this new industry. Moreover, as multiple news outlets have reported, Vineyard Wind’s levelized price of 6.5 cents per kilowatt hour, including environmental attributes, is well below analysts’ expectations and sets a new record for U.S. offshore wind.² As a result of our project, offshore wind is now competitive with other types of energy generation and assures access to abundant clean energy resources for decades to come. This competitive pricing has shown the way to a U.S. offshore wind industry that is centered in southeastern New England and growing faster and larger than most analysts had predicted. This is yet another reason why the Vineyard Wind project puts Rhode Island in an excellent position for maintaining its leading role in this industry.

² By way of comparison, two Maryland projects contracted at approximately 13 cents per kilowatt hour, the Block Island project was priced at 24.2 cents per kilowatt hour, and the Cape Wind project was priced at 18.5 cents per kilowatt hour.

II. Reorienting the Project Layout in a Complete East-West Configuration with One Nautical Mile Spacing Between Turbine Rows is Not a Reasonable Alternative Because It Cannot Achieve the Project Purpose

In assessing alternative designs to Vineyard Wind’s proposal, it is critically important to understand that Vineyard Wind’s ability to deliver the significant benefits described above, by providing 800 MW of renewable energy at a competitive price, is directly tied to its ability to maintain its qualification for federal investment tax credits (“ITC”). In order to qualify for these tax credits, the value of which are directly passed on to ratepayers, Vineyard Wind must make continuous progress towards completion of the project and adhere to its construction schedule as set forth in COP Volume 1, section 1.5.3; this schedule requires onshore construction to begin in Q4 2019.³ To achieve this schedule, Vineyard Wind must have all necessary permits in hand by Q3 2019 at the latest in order to finalize construction financing. Investors require certainty to reduce risk and therefore will not invest in or lend to a project unless it is fully permitted.

CRMC should also be aware that the long-term contracts with the Massachusetts electric distribution companies contain certain project milestones that Vineyard Wind must meet, which the project schedule takes into account. These include obtaining the necessary permits, closing financing, acquiring any necessary real property, and meeting the guaranteed commercial operation dates, the earliest of which is January 15, 2022. Thus, Vineyard Wind must permit, finance, construct, connect to the grid, and begin to deliver power in less than 38 months.

BOEM’s current permitting schedule calls for a decision on Vineyard Wind’s COP by July 2019, which allows Vineyard Wind to obtain all other state and federal permits, close financing, and begin construction in Q4 2019, thereby maintaining qualification for the ITC. In addition, there are many other processes and instruments being put in place to allow Vineyard Wind to start construction in Q4 2019. These include, but are not limited to, procuring component design, supply and installation contractors, securing necessary vessels and port facilities, financing the project, fabricating necessary components under the direction of the CVA, and maintaining qualification for the ISO New England Forward Capacity Market. In short, any delay in BOEM’s approval process will have a domino effect and will most likely be fatal to the project.

Understanding these constraints, Vineyard Wind has spent significant time and resources examining the possible re-orientation of the project array in an east-west

³ Vineyard Wind has already qualified for the ITC at a level that provides for significant savings to ratepayers. However, in order to maintain this qualification, the project must both show “continuous construction”, as well as complete the project by a date certain. The IRS provides specific definitions as to “continuous construction”. Because of these various requirements, Vineyard Wind must arrange the financing and achieve Financial Close on the project by Q4 2019 in order to give its main contractors a so-called “Notice to Proceed” enabling them to start manufacturing and construction activities needed to finish by the end of 2021.

direction. Our conclusion is that it simply is not possible to do this for both technical and legal reasons, which are further detailed below.

A. Reorienting the Project Array is Not Technically Feasible

Each wind turbine foundation is specifically designed for the subsurface conditions at each planned turbine location using data collected from high resolution geophysical surveys (“HRG Surveys”), *e.g.*, side-scan sonar, bathymetry, magnetometers, and sub-bottom profilers. In addition, bore hole sampling and/or cone penetrometer tests conducted at each turbine location provide critically important information for understanding the soil and subsurface characteristics as well as interpreting the HRG data. Conducting these offshore surveys requires at least three months’ lead time for permitting, followed by at least four to five months of the actual offshore field work for the entire WDA, followed by at least another four to five months to analyze the data and report findings. Only then can the foundation design process begin, which takes approximately 10 to 12 months to complete. In order to fabricate and certify the foundations in time for offshore construction to begin as scheduled in summer 2020, foundation designs must be complete by May 2019. Given the schedule constraints described, Vineyard Wind collected all geological data necessary for foundation designs in Spring/Summer 2018, so that data necessary to design and procure the foundations would be available this Fall. And indeed, this design and procurement is now underway.

Any change in turbine locations would require geological data for that specific location before foundation design could begin. Reorienting the project array in an east-west direction with 1 nm spacing between turbines would cause all but approximately 19 turbines to be relocated to areas not previously surveyed and would place turbines in areas outside the WDA. Moreover, a reorientation of the array would require a redesign of the array cable layout, as all cable strings are carefully planned and balanced to have an equal number of WTGs on each string and to minimize the length of cables (to avoid unsuitable locations and reduce cost and losses). The 1 nm spacing between all turbines would also increase the amount of cabling required, raising additional engineering and cost considerations that would have to be addressed. Vineyard Wind would effectively have to start the project design and permitting process over and resurvey the entire project area, even though it has already spent over seven months (in addition to a reconnaissance survey in 2016) and many millions of dollars collecting and analyzing the data to support the current layout.

While the cost of redoing the HRG and geotechnical surveys is significant, the more important factor is the time required to collect and analyze the data. Vineyard Wind began collecting its data to support the current project layout in April 2018 and finalized the analysis of the data for submission to BOEM on October 22, 2018. Thus, not including the regulatory approval times

discussed below, it takes at least eight to 10 months to collect and analyze the data before foundation design could begin, which, as noted, then takes approximately 10 to 12 months to complete. Given that additional surveys could not begin until at least March 2019 due to weather, regulatory, and logistical constraints, foundation designs would not likely be completed before the end of 2020. The lead times necessary for certification and fabrication would most certainly push the start of construction into third quarter of 2021. With an expected construction period of up to 18 months, this delayed start would make it impossible for Vineyard Wind to meet its guaranteed commercial operation date of January 15, 2022. Moreover, Vineyard Wind would lose its qualification for the ITC thereby affecting the entire pricing structure for the project. For these reasons, reorienting the entire project array in an east-west direction with 1 nm spacing between turbines is not technically feasible to achieve the primary or essential purpose of the proposed project, *i.e.*, deliver 800 MW of generation capacity within a specified time at a specified price.

B. Regulatory Requirements Preclude Vineyard Wind from Reorienting the Project Array to a Complete East-West Orientation Within the Time Available

In considering the feasibility of reorienting the project array, Vineyard Wind also carefully considered the regulatory requirements for obtaining COP approval and, as part of this analysis, Vineyard Wind engaged in detailed consultations with BOEM staff (*i.e.*, the individuals who would be responsible for implementing any changes) regarding the impact to the permitting schedule of relocating even a limited number of turbines.

On the October 25, 2018 call with CRMC, BOEM and others, BOEM confirmed to CRMC that modifying the project layout to a complete east-west orientation would cause the project approval process to be delayed for at least one year because Vineyard Wind would have to submit geophysical data relevant to the design and siting of the turbines, as well as geotechnical data regarding the stratigraphic and geoengineering properties of the bottom sediment, which in turn affects the foundations or anchoring systems of any structure permanently or temporarily attached to the seabed (collectively “G&G Data”). 30 C.F.R. §585.626; BOEM COP Guidelines (2016).⁴ Vineyard Wind believes the regulatory process would be delayed even longer than the one year estimated by BOEM because of the time it would take for

⁴ The Ocean SAMP similarly requires “the results of adequate *in situ* testing, boring, and sampling at each foundation location, to examine all important sediment and rock strata to determine its strength classification, deformation properties, and dynamic characteristics.” Table 11.4. Indeed, the Ocean SAMP expressly requires that “a minimum of one boring shall be taken per turbine planned, and the boring shall be taken within 50 feet of the final location of the turbine.” *Id.* Thus, CRMC clearly recognizes the importance of G&G Data to the siting and approval wind turbine locations.

Vineyard Wind to collect and analyze the necessary data. Based on our current experience with collecting and analyzing the required G&G Data for the site, it would take eight to 10 months to complete the data collection and analyses, and likely longer because the east-west orientation and 1 nm turbine separation locates approximately 16 to some 18 turbines outside the WDA where no data has been collected or analyzed. Also, as BOEM explained to CRMC, it takes 90 to 120 days to obtain approval to conduct the work. Therefore, assuming Vineyard Wind could begin collecting G&G Data in March 2019, it would be eight to 10 months before Vineyard Wind would be in a position to submit the data to BOEM (i.e., Q4 2019 or Q1 2020), which would likely delay a decision on the COP until late 2020 or early 2021 thereby precluding Vineyard Wind from maintaining its qualification for the ITC and delivering power beginning in January 2022.⁵

C. Obtaining A Conditional COP Approval and Phasing (Segmenting) the Project Is Not a Technically Feasible or Reasonable Alternative

On the October 25, 2018 call with BOEM and others, as well as at the November 1 Meeting, CRMC raised the possibility of BOEM allowing Vineyard Wind to collect the additional G&G Data necessary for a complete east-west layout after a decision on the COP was issued. CRMC suggested that a “phased” approach would allow Vineyard Wind to start construction for turbines where G&G Data exists and, after the additional G&G Data is collected, allow construction to proceed on the remaining turbines. Such a “phased” approach is not technically or legally feasible for three important reasons.

First, BOEM explained that while the regulations allow Vineyard Wind to seek a departure from the data requirements, the amount of data that would have to be deferred is significant and there would be several procedural steps that need to be addressed before a departure could be granted. One such example is the need to reopen the Section 106 Programmatic Agreement regarding G&G work, which would take time and delay the current permitting schedule. Perhaps most importantly, BOEM advised CRMC of legal precedent that precludes BOEM from segmenting its NEPA analysis. The

⁵ In November 2017, Vineyard Wind requested a departure from the regulations to allow Vineyard Wind to conduct the turbine and cable specific G&G Data beginning in Spring 2018, after COP submission but in time for BOEM to consider the data for its relevant reviews and consultations before issuing a decision on the COP; BOEM granted this request on January 19, 2018. Vineyard Wind submitted its COP to BOEM in December 2017 and on October 22, 2018 submitted the turbine and cable specific G&G Data and required analyses. Thus, as of October 22, 2018, Vineyard Wind has met the regulatory requirements for data required for COP approval. Vineyard Wind has expended tremendous resources, including tens of millions of dollars, to meet this deadline so that BOEM is in a position to issue a decision on the COP in July 2019. We mention this not because of the expense itself, but to demonstrate the importance of the schedule to the success of the project, and the high priority the company has put on maintaining the schedule in order to deliver a successful project to Massachusetts and the region.

referenced case involved the Cape Wind project where BOEM granted Cape Wind a departure from the regulations that allowed Cape Wind to collect certain geophysical data after lease/COP approval but before construction.⁶ That decision was challenged and ultimately appealed to the U.S. Court of Appeals for the District of Columbia, where the court held that BOEM violated NEPA because “[w]ithout adequate geological surveys, the Bureau cannot ‘ensure that the seafloor [will be] able to support’ wind turbines.” *Public Employees for Environmental Responsibility v. Hopper*, 827 F.3d 1077, 1083 (D.C. Cir. 2016). The D.C. Circuit further stated that “NEPA does not allow agencies to slice and dice proposals in this way.” *Id.*

Second, Vineyard Wind would not be able to close financing on the project with a conditional approval that deferred such a significant amount of the G&G Data to a future unknown date. Investors require permitting certainty to reduce risk. This is why Vineyard Wind has expended significant resources working with multiple federal and state agencies to ensure that it receives all required permits by Q3 2019. If Vineyard Wind cannot close financing, it will not be able to start construction in Q4 2019 and will lose its qualification for the ITC. As already noted, the loss of the ITC would upset the entire pricing structure for the project.

Finally, for technical and engineering reasons the project could not be constructed as CRMC suggests. For one, the project schedule requires on-going construction of each element of the project, not two distinct phases of construction as would be required by CRMC’s suggestion. Such on-going construction is necessary for both commercial reasons, including costs (regarding costs of multiple spread engagement and vessel availability), and schedule and risk management reasons (in order to ensure project is completed on schedule and the fact that on-going construction takes less time total than phased construction). Perhaps most importantly, constructing in phases, as suggested, is not practical for a number of technical reasons such as the need for turbines to have power once they are installed, the need to avoid jacking up vessels in the vicinity of buried cable, the importance of installing foundations before cable, having power available for turbines once installed, and installation of scour protection after installing cable. Breaking the construction into two phases also has the potential to increase environmental and fisheries impacts.

⁶ BOEM’s review of the Cape Wind project began before the current regulations were promulgated and therefore the EIS was issued at the lease stage and supplemented at later stages. Nevertheless, as CRMC proposes here, G&G Data collection was deferred until after COP approval but before construction, which the court held violated NEPA.

III. Vineyard Wind's Commitments to Rhode Island Fishermen

Even though it is not possible to reorient the entire project in an east west direction, Vineyard Wind takes seriously the fishermen's request to orient the turbine rows in an east-west direction as a means to avoid gear conflicts and mitigate the potential impacts of offshore wind generally (not just our project) on the regional fishing industry. Therefore, Vineyard Wind is making six important commitments to Rhode Island fishermen:

1. Vineyard Wind will utilize the largest commercially available turbine, which decreases the number of required turbine locations and thereby results in less area not aligned in an east-west orientation. Vineyard Wind is willing to adopt any of the Large Turbine Alternative WDA options shown in Attachment B. As this is the first turbine of this size to become commercially available, it presents some risk to the project, but it is a risk Vineyard Wind is willing to assume to minimize potential impacts to Rhode Island fishermen.
2. Vineyard Wind is committed to implementing a compensatory mitigation program that mitigates potential impacts to commercial fisheries as a result of a portion of the WDA not having east-west rows. The details of the program will be developed with input from fishermen and fully described in our compensatory mitigation submission. Vineyard Wind anticipates that the program could be comprised of funding that is provided directly to impacted vessels and/or funding that supports community level programs focused on enhancing the safety and profitability of the Rhode Island fishing industry and the well-being of fishermen generally, as fishing will take place among turbines into the future (whether the Vineyard Wind or other projects).
3. Vineyard Wind will implement a construction impacts mitigation program that mitigates project impacts to individual fishing vessels resulting from the construction of the project. Details of this program will also be developed with input from fishermen, but we anticipate this program would likely be structured as funding to vessels that would be expected to be impacted because of their inability to operate in a particular area at a particular time due to project construction activities.
4. Vineyard Wind will orient turbines in the remainder of the lease area in rows in an east-west direction with 1 nm separation between the rows. Vineyard Wind is also committed to working with adjacent lease holders so that, to the greatest degree practical, turbine rows would line up and continue across lease boundaries. We are already in communication with the leaseholder to the west for this purpose (the lease area to the east is not yet leased, but we will establish communication upon lease award, which is expected in December 2018).

5. Vineyard Wind will adopt the 2 nm wide “Consensus Transit Corridor Plan” that was developed through discussions among fishing stakeholders and state agencies, and presented during the FWG Meeting, and again at the CRMC Meeting; this transit lane is shown in Attachment C. Both federal and state agencies worked to synthesize input from fishing stakeholders to arrive at this layout, which represents a compromise of the various desired transit directions and corridor widths to/from priority areas identified by various fishing sectors and ports.

From a navigation safety perspective, this corridor provides options for vessels transiting through the adjacent Massachusetts and Rhode Island lease areas while maintaining a single heading. Scallopers, fixed gear, squid, and whiting/scup fishermen from Massachusetts, New York, and Rhode Island ports all agreed this was a workable compromise at the FWG meeting, and representatives of the Rhode Island fishing industry reiterated support for the transit corridor plan at the CRMC Meeting. As stated in a letter from CZM regarding Vineyard Wind’s Supplemental Draft Environmental Impact Report dated October 5th, 2018, “CZM believes that the working group consensus alternative is a balanced and feasible option that while perhaps optimal to none, is acceptable from a navigational safety perspective and represents a compromise approach to a very difficult issue.” (See Attachment E).

At the FWG Meeting and CRMC Meeting, the U.S. Coast Guard expressed support for these lanes, as did Rhode Island fisheries stakeholders. These meetings resulted in an unprecedented level of agreement among fishermen. For all these reasons, the consensus transit corridor plans that resulted from those discussions will be incorporated into Vineyard Wind’s project. Vineyard Wind also supports adopting a north/south transit lane directly to the east of the WDA to allow passage for fisheries travelling between squid and whiting fishing grounds.

Importantly, because the Consensus Transit Corridor Plan’s 2 nm wide transit corridor crosses the lease area to the south of the WDA, and does not pass through the WDA, Vineyard Wind can use eliminated turbine locations for the purpose of minimizing areas without east-west lanes. Vineyard Wind’s originally proposed turbine layout was designed to accommodate both fishing within the turbine area as well as fishermen who needed to transit from ports to the northwest of the lease area and pass through the turbine area out to fishing grounds to the southeast. In particular, the turbine rows were oriented so as to allow straight-line navigation in this northwest-southeast direction. The transit lane described above and now incorporated into Vineyard Wind’s long-term plans for the lease area is also designed to facilitate transiting navigation in this direction. By adopting this Consensus Transit Corridor Plan transit lane, the turbine rows can therefore be adjusted to better accommodate the request for an east-west row arrangement, while still maintaining a consistent transiting navigation option.

6. Vineyard Wind will contribute to regional fisheries studies by providing funds, available expertise, and scientific resources. Vineyard Wind has been a strong advocate for federal, state, or regional bodies to establish mechanisms to fund and organize these studies to assess the cumulative impacts of multiple offshore wind projects on the fishing industry in Rhode Island and elsewhere and has even proposed a funding model that could be used. Vineyard Wind stands ready to support these study programs once they are established.

IV. Background on Vineyard Wind's Efforts to Avoid and Minimize Potential Impacts to Fishermen

In an effort to accommodate Rhode Island fishermen's request, Vineyard Wind spent many months with its technical team examining possible ways to avoid and minimize potential impacts to Rhode Island fishermen. It is important to understand that while Vineyard Wind's project envelope identifies turbine sizes ranging from 8 to 10 MW, the largest commercially feasible and available turbine has until very recently been an approximate 8.5 MW turbine. Therefore, Vineyard Wind's initial efforts to avoid and minimize potential impacts to fishermen assumed the project would employ an 8.5 MW turbine, which would require 94 locations to realize an 800 MW project.

Given the technical and regulatory constraints discussed above, we first explored the number of turbine locations that could feasibly be relocated to areas where geophysical data has already been collected. At most, we were able to create two 1 nm mile fishing lanes within the array, and possibly a third ½ nm lane. We presented this possible option for turbine layout adjustment to leaders of the Rhode Island fishing industry, and learned from them that this adjustment would not meaningfully address their concerns. In addition, based on further discussions with BOEM staff, we concluded that even moving a limited number of turbine locations at this late stage would introduce considerable schedule risk, and so should not be undertaken unless there was a clear and significant advantage in doing so. Given that this approach would introduce significant risk with limited value to fishermen, it was not pursued further.

We therefore looked for ways to minimize the total area that would not ultimately have a fully east-west turbine row orientation. This led us to focus on the southern portion of the WDA and the interface with the remaining lease area which, as noted, Vineyard Wind will design in an east-west orientation. As shown in Attachment A, by selectively dropping 12 turbine locations (shown in red), Vineyard Wind was able to create three full (and a portion of a fourth) 1 nm wide east-west fishing lanes at the southern portion of the WDA, which limits the total turbine area of the current WDA without east-west lanes, and smoothly integrates with future turbines sited in an east-west direction (shown in blue) in the remaining lease area. The future turbine locations in blue are shown for illustrative purposes only, meant to represent the general arrangement of turbines, and are not necessarily the exact locations where future turbines might be proposed. By creating these three full and a partial fourth, 1 nm east-west fishing lanes the size of the originally proposed WDA where turbines

are not arranged in east-west rows was reduced by approximately 20% or 62 sq. km (18 sq. nm). Furthermore, when future turbines are built to the south, there would be no additional areas without east west rows extending the full width of the lease area, and therefore the total area without east-west rows would be limited to the 62 sq. km.

While we were considering options to modify the WDA within the constraints described, our commercial team was actively engaged with turbine manufacturers to evaluate the commercial feasibility of using a larger turbine. As we discussed at the November 1 Meeting, until this time, a larger turbine was not commercially available for the U.S. market. However, because of Rhode Island's urging to use a larger turbine at the November 1 Meeting, our commercial team redoubled their efforts, engaging in all-night negotiations, to allow us to commit to using a larger turbine. Vineyard Wind's successful procurement of this turbine, and our commitment to use it despite the risks of using a "first-in-series" turbine that has not yet received technical certifications, confirms our dedication to the successful coexistence of the offshore wind industry and commercial fishing interests.

V. Large Turbine Alternative WDA Options

While Vineyard Wind is pleased that it is able to commit to using the largest commercially available turbine for the project, doing so does present some risk to the project as it is the first use of a new turbine model in a new market. In particular, the new turbine will need to be certified for use in the U.S. on a timeline compatible with organizing financing. Nevertheless, Vineyard Wind is willing to accept this risk to avoid and minimize potential impacts to fishermen.

With use of this larger turbine, the project layout requires only 84 locations to produce 800 MW of power. This enables Vineyard Wind to eliminate 22 turbine locations and reduce the area of the WDA where turbines cannot be aligned in an east-west orientation, while allowing for several turbine layout options to be considered. Attachment B provides three proposed layout options for the Large Turbine Alternative WDA. The locations depicted for each option are the planned and intended locations we fully expect to use barring any unforeseen issues that are beyond our control. We do note, however, that in the unlikely event Vineyard Wind encounters unexpected subsurface issues at a location, a turbine could be moved to an alternate location where required geological and geophysical data already exists, but still located in the project envelope of the COP. Should this be necessary, the new turbine location would be chosen so that it is contiguous with the main turbine array, and does not to disrupt the planned east-west orientation of future turbines.

All of the Large Turbine Alternative WDA options have 84 turbine locations, which further reduces the size of the WDA where turbines cannot be aligned in an east-west direction compared to the COP Appendix III-R Alternative. Each option also retains the originally planned 1 nm northwest-southeast transit corridor that further enables transit and/or fishing within the WDA (in addition to the 2 nm wide corridor to the south of the turbine area which is part of the Consensus Corridor Plan). Each option

may have certain advantages over others for minimizing potential impacts to commercial fishermen. From a technical perspective, all of the options are feasible for Vineyard Wind. Therefore, we are willing to adopt the option CRMC deems best aligned to address Rhode Island fishermen needs.

Large Turbine Alternative WDA Option 1: At the November 1 Meeting, Vineyard Wind was expressly asked whether turbines located at the northern portion of the WDA could be moved to allow more space for fishing and transiting activities that occur north of the WDA. Option 1 responds to that request by eliminating the three northernmost turbine locations. As can be seen in Attachment A, under this option the northern most turbines are now approximately 1 nm farther from the area to the north of the WDA which is considered a squid “hotspot” and the most heavily transited area by fishing vessels travelling to and from fishing grounds. This option reduces the area of the WDA where turbines are not aligned east-west by 22%, meaning it is 19.5 sq. nm smaller than the originally proposed WDA. While this reduction in size is significant, it is slightly less than the reduction achieved by options 2 and 3.

Large Turbine Alternative WDA Option 2: This option retains the northernmost turbine locations which allows elimination of 22 turbines from the southern portion of the WDA. This option achieves the greatest reduction in the size of the WDA where turbines are not aligned east-west — a 24% reduction, which means it is 21.5 sq. nm smaller than the originally proposed WDA.

Large Turbine Alternative WDA Option 3: Option 3 is a combination of options 1 and 2 in that it removes the furthest northeastern turbine, which is closest to the squid hotspot that occurs in an arc just south of Martha’s Vineyard and Nantucket, and eliminates the remaining 21 turbines from the southern portion of the WDA. It reduces the size of the WDA by 23%, which means it is 20.4 sq. nm smaller than the originally proposed WDA.

To aid evaluation of these options, Attachment F overlays each option on the tow track graphic submitted to the record by the Commercial Fisheries Center of Rhode Island (“CFCRI”), which was reported to represent tow tracks over a 20-year period.⁷ In our view, the graphic suggests that over a 20-year period, tows in an east-west direction occur principally in the area to the south and west of the WDA where turbines will be aligned in an east-west direction (indicative locations shown as aqua dots). Fishing occurs in more random directions where turbines cannot be aligned east-west (locations shown as green dots). Indeed, in many respects fishing in this area appears to occur largely in a northwest-southeast direction consistent with the

⁷ As CRMC is aware, Vineyard Wind requested that CRMC analyze the track line graphic to obtain a more reliable assessment of actual fishing effort by year and season. RI DEM informed us that based on discussions with CFCRI, it is not possible to analyze the data upon which the graphic is based because the dates attributed to the tracks may not be indicative of actual fishing dates, nor may a single track represent the number of tows performed on a particular track.

layout in that area and with the contours within the WDA. In any case, the graphic demonstrates that the layout options provide a reasonable alternative to accommodate Rhode Island fishermen. In addition, fishermen have indicated that certain species that mobile gear fishermen target are fished along “seams” that may be contours, depths, or bearing lines. Attachment G provides 2016 AIS track line data from 16 individual Rhode Island- based vessels traveling under 4 knots overlaid on Vineyard Wind’s most recent bathymetry of the WDA. The Attachment shows that contours and depths, *i.e.*, seams, within the WDA are not aligned in an east-west direction or that fishing AIS track lines don’t strictly occur in an east-west direction

IV. Input from Rhode Island Fishermen

Vineyard Wind has been actively engaging with Rhode Island fishermen as we have explored options for minimizing potential impacts to fishermen. Our Fisheries Representative, Crista Bank, has had numerous communications with Fisheries Advisory Board (“FAB”) Chairman Lanny Dellinger, CFCRI Executive Director Fred Mattera, Town Dock representatives Donald Fox and Katie Almeida, and others to keep them informed of how Vineyard Wind was trying to address their concerns and to solicit feedback from them. Ms. Bank has also reached out to fishermen from Massachusetts and other states who may fish in the lease area. The general feedback from Rhode Island fishermen has been that the only acceptable alternative is to completely realign the turbines in an east-west direction with 1 nm between each row. As will be discussed in more detail in our mitigation submission, the best available data does not support a finding that the WDA is an area of high fishing activity or that fishing necessarily occurs in a strictly east-west direction.⁸

Rather, there appears to be concern among fishermen that the Vineyard Wind project is precedent setting and that any compromise with Vineyard Wind will have a domino effect resulting in future projects also not having an east-west layout. As CRMC is aware, at the July 26, 2018 FAB meeting, Vineyard Wind was directly told by FAB members that it was “important that we prevail in this discussion as an industry and that lends itself to the next development so that we prevail in that one as well”, that anything less “is not negotiable,” and Vineyard Wind “is going to cave on this one.”⁹ While we understand fishermen’s concerns about the impact of offshore wind development on their industry as a whole, CRMC must base its decision making on the facts before it and the merits of Vineyard Wind’s proposal.

However, the Vineyard Wind project is not precedent-setting with respect to its layout. Rhode Island fishermen have already received commitments from all current lease holders, including Vineyard Wind, that for all future projects in waters important to Rhode Island fishermen, turbines will be aligned in an east-west

⁸ Vineyard Wind notes that the Ocean SAMP principles include basing “all decisions on the best available science.”

⁹ See Transcript of July 26, 2018 Vineyard Wind meeting with the FAB at pages 40 and 94.

direction. Vineyard Wind has further committed to a 1 nm distance in between rows. While Vineyard Wind is not sure if other developers have also committed to 1 nm distance between rows, if they have not so committed Vineyard Wind's commitment for full 1 nm spacing between rows will actually serve as an example for other projects, and would therefore be a desirable precedent for fishermen.

Moreover, in its October 19, 2018 Final Sale Notice for the remaining portions of the Massachusetts Wind Energy Area (ATLW-4A), BOEM includes lease terms that require lessees to "extend any BOEM-approved vessel transit corridors in adjacent lease areas, unless BOEM determines that such corridors are not necessary or can be modified." 83 Fed. Reg. 53,089. In addition, in its supplemental information for bidders, BOEM puts bidders on notice that an additional north-south transit corridor has been identified as an important need for the fishing industry to allow vessels to transit between the squid grounds, fished during the day, and the whiting grounds, fished at night. Furthermore, CRMC has requested that its Geographic Location Description ("GLD") be expanded to include these new lease areas and through the GLD or other authority, CRMC can establish a policy that turbine rows should be aligned in an east-west direction. Thus, any uncertainties that the Vineyard Wind project will set standards for future projects in the area is simply unfounded.

Rather, the area where turbines will not be aligned in an east-west direction accounts for a relatively small area (approximately 6%) of the Massachusetts and Rhode Island/Massachusetts WDAs. Moreover, as discussed above, the evidence presented by fishermen themselves shows that this small area is not where fishermen routinely trawl in an east-west direction. It is also not an area that yields large revenues for the Rhode Island fishermen compared to other areas, which is shown in the data analysis conducted by the Rhode Island Department of Environmental management and by CRMC's submission to the National Oceanographic and Atmospheric Administration requesting to amend its GLD.¹⁰ By providing the Large Turbine Alternative WDA options and committing to a compensatory mitigation program, Vineyard Wind has clearly demonstrated that the project will not have significant long-term impacts on Rhode Island commercial fishermen.

Finally, Vineyard Wind wants to acknowledge for the record that meaningful communications between federal and state agencies, the fishing industry, and the offshore wind industry has not been ideal for all parties involved. There is a need to create a better system that allows fishermen to be better heard on key issues important to them at both local and regional levels so that developers can reliably incorporate concerns early in their planning and design of projects.

The expressed desire for an east-west alignment of turbine rows is a case in point. Throughout BOEM's entire public process on establishing the Massachusetts WEA, including multiple joint taskforce meetings between Rhode Island and Massachusetts

¹⁰ As noted, Vineyard Wind has retained an expert fisheries economist to evaluate the best available data. His expert report will be submitted with Vineyard Wind's compensatory mitigation proposal.

in which CRMC was an active participant, the expressed need to align turbines in an east-west direction was never raised. Nor is there any mention of an east-west agreement between mobile and fixed gear fishermen in the Ocean SAMP. Indeed, the Ocean SAMP discusses that mobile and fixed gear fishermen alternate use of the Cox's ledge area during certain times of the year to avoid gear conflict, not that they fish in any particular direction. Additionally, Vineyard Wind began informal discussions with Rhode Island fishermen in 2011 to obtain information about fishing activity in our lease area, including several meetings with members of the FAB. The need for an east-west alignment was never raised nor were any concerns regarding the turbine layout and gear conflicts. For example, Vineyard Wind presented to the FAB on July 24, 2017, and received many detailed questions and comments regarding the project, but there was no request or mention of an east-west turbine row layout. It was not until after Vineyard Wind submitted its COP that the east-west alignment was raised, which is far too late in the process for Vineyard Wind, or any other developer, to make wholesale changes to a project.



VINEYARD WIND

Attachment A - COP Appendix III-R Alternative



VINEYARD WIND

Attachment B - Large Turbine Alternative WDA Options

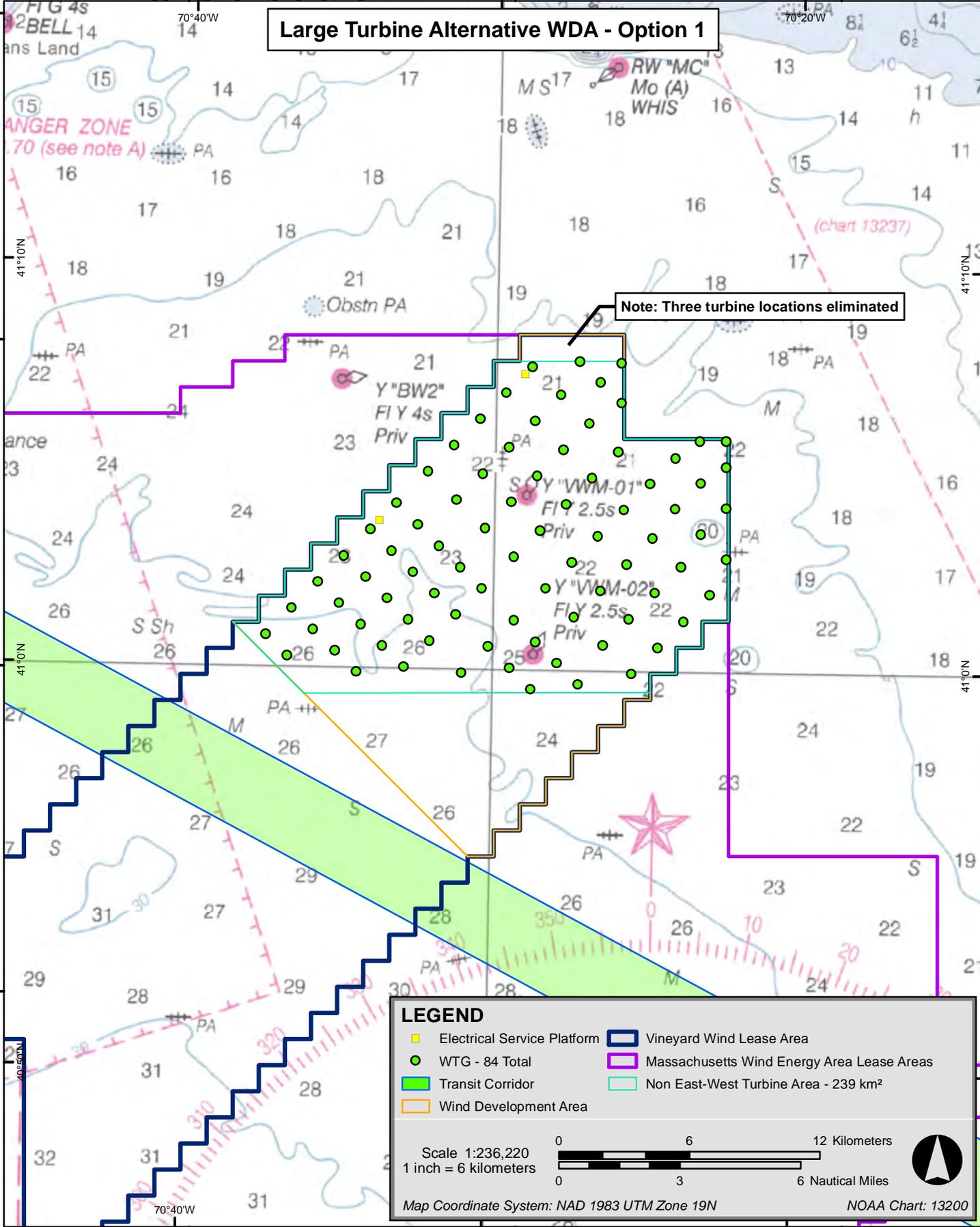
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Large Turbine Alternative WDA - Option 1



Note: Three turbine locations eliminated

LEGEND

- Electrical Service Platform
- WTG - 84 Total
- Transit Corridor
- Wind Development Area
- Vineyard Wind Lease Area
- Massachusetts Wind Energy Area Lease Areas
- Non East-West Turbine Area - 239 km²

Scale 1:236,220
1 inch = 6 kilometers

0 6 12 Kilometers
0 3 6 Nautical Miles

Map Coordinate System: NAD 1983 UTM Zone 19N
NOAA Chart: 13200

Vineyard Wind Project



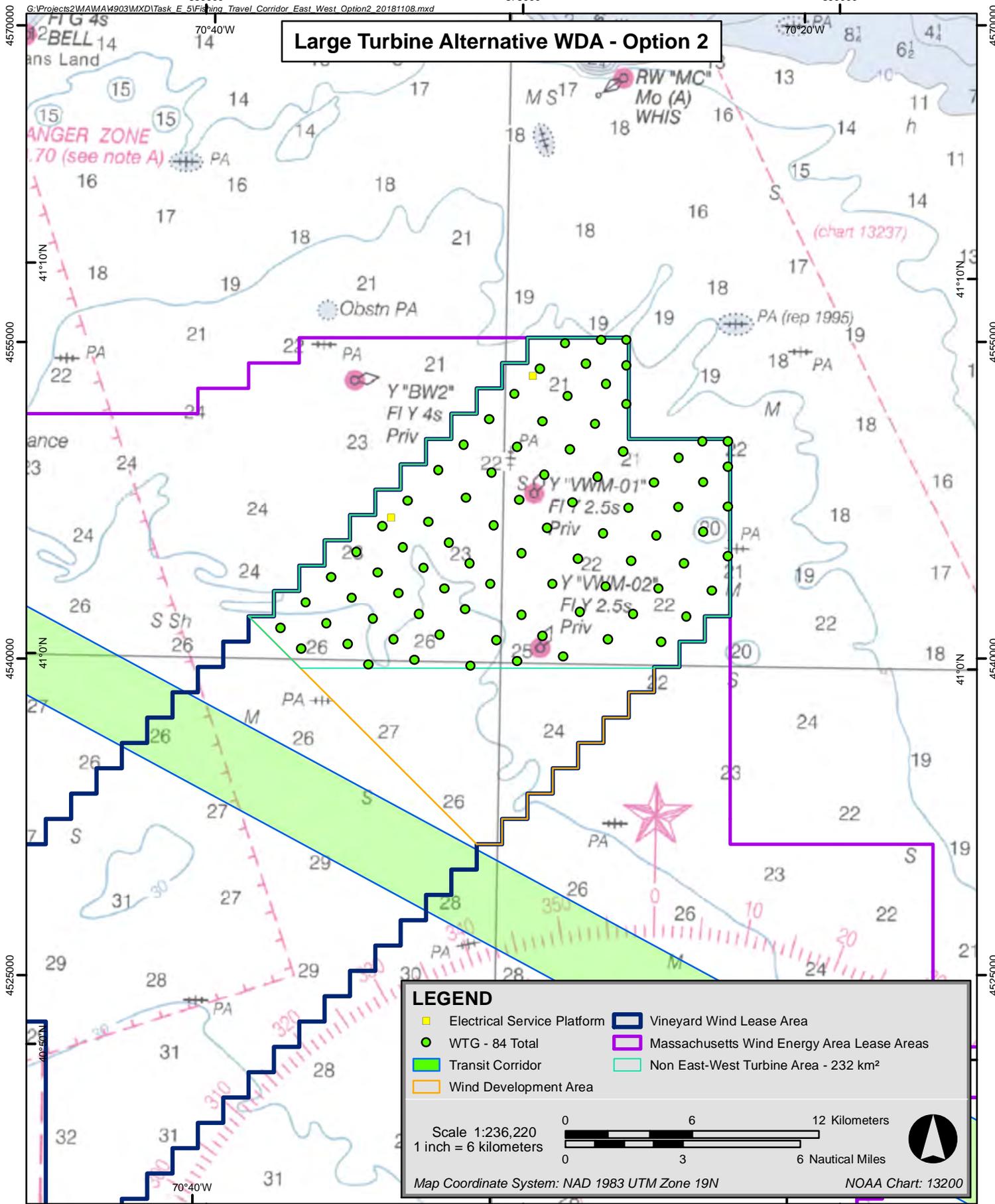
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Large Turbine Alternative WDA - Option 2



Vineyard Wind Project



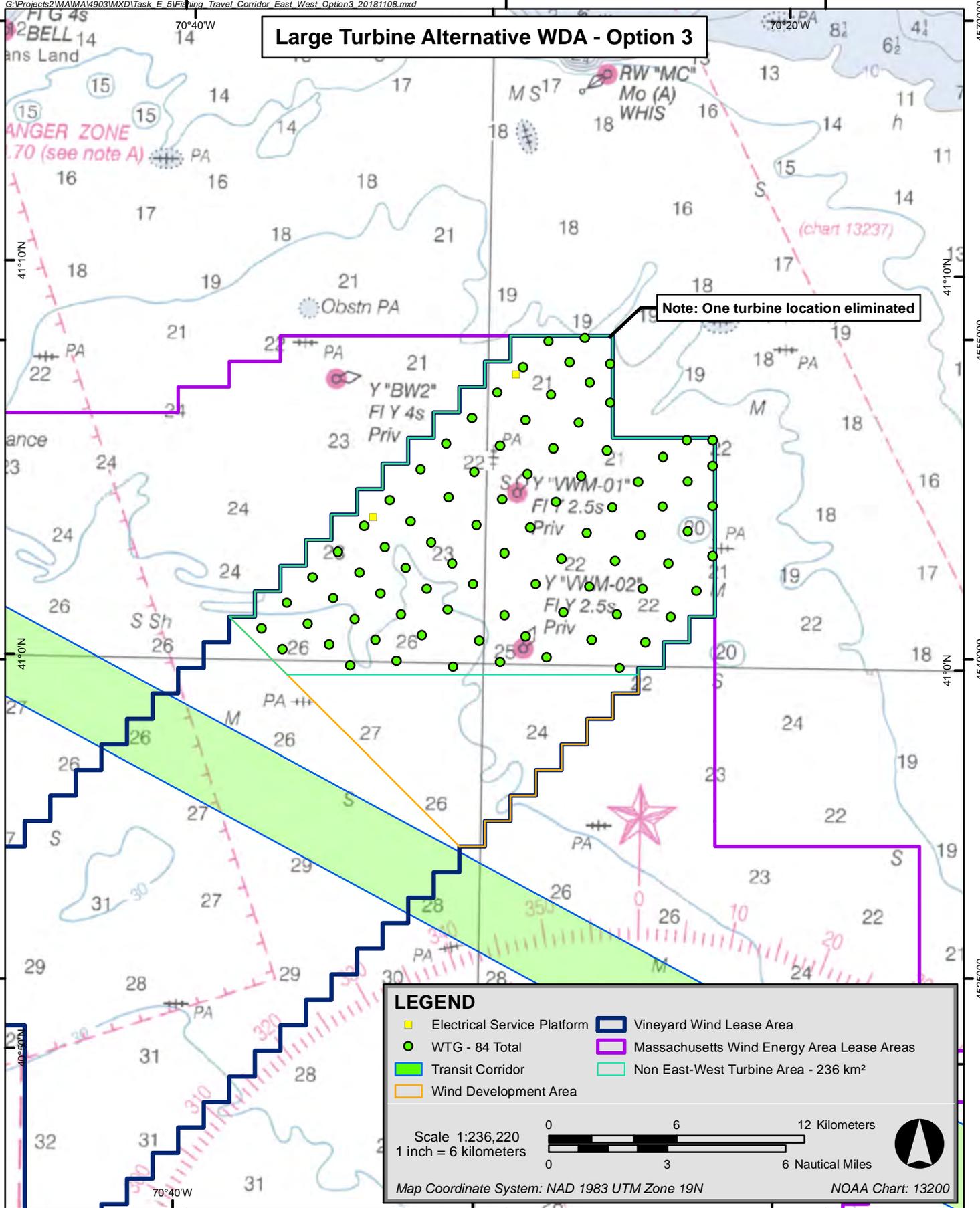
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Large Turbine Alternative WDA - Option 3



Vineyard Wind Project



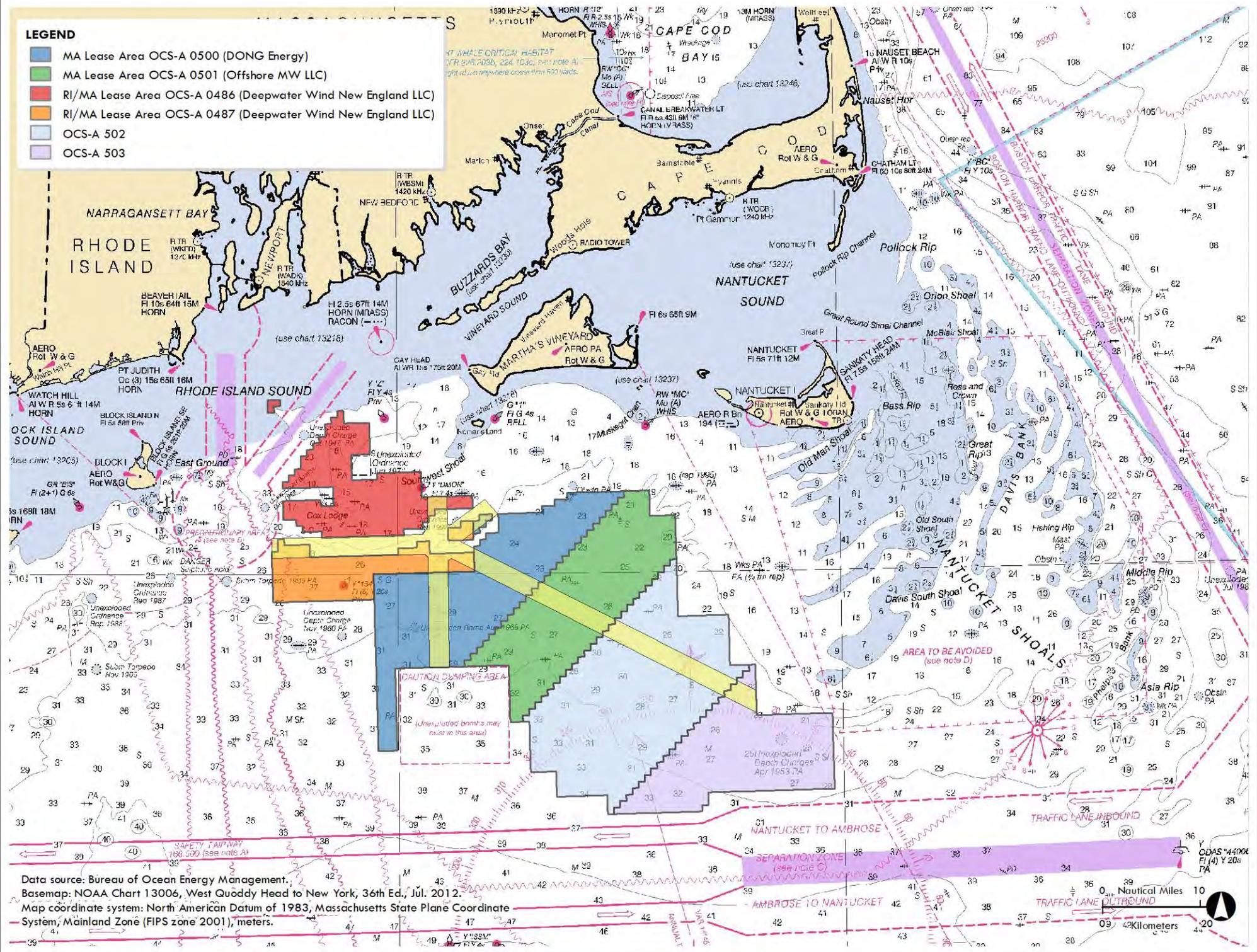


VINEYARD WIND

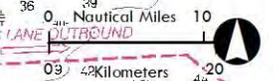
Attachment C - Consensus Transit Corridor Plan

LEGEND

- MA Lease Area OCS-A 0500 (DONG Energy)
- MA Lease Area OCS-A 0501 (Offshore MW LLC)
- RI/MA Lease Area OCS-A 0486 (Deepwater Wind New England LLC)
- RI/MA Lease Area OCS-A 0487 (Deepwater Wind New England LLC)
- OCS-A 502
- OCS-A 503



Data source: Bureau of Ocean Energy Management.
Basemap: NOAA Chart 13006, West Quoddy Head to New York, 36th Ed., Jul. 2012.
Map coordinate system: North American Datum of 1983, Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.





VINEYARD WIND

**Attachment D - Massachusetts Department of Energy Resources Letter
August 1, 2018**



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
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Charles D. Baker
Governor

Matthew A. Beaton
Secretary

Karyn E. Polito
Lt. Governor

Judith F. Judson
Commissioner

August 1, 2018

Mark D. Marini, Secretary
Department of Public Utilities
One South Station, 5th Floor
Boston, MA 02110

RE: Petitions for Approval of Proposed Long-Term Contracts for Offshore Wind Energy Pursuant to Section 83C of Chapter 188 of the Acts of 2016, DPU 18-76, 18-77, 18-78.

Dear Secretary Marini:

On July 31, 2018, Fitchburg Gas and Electric Light Company, d/b/a Unitil (“Unitil”), Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid (“National Grid”), and NSTAR Electric Company and Western Massachusetts Electric Company each d/b/a Eversource Energy (“Eversource”) (collectively, the “Electric Distribution Companies” or “EDCs”), filed long-term contracts for the Vineyard Wind project for review and approval by the Department of Public Utilities (“Department”), pursuant to Section 83C of Chapter 169 of the Acts of 2008, as amended by Chapter 188 of the Acts of 2016 (“Section 83C”). In accordance with Section 83C, the EDCs issued a Request for Proposals (“RFP”) on June 29, 2017 seeking offshore wind energy generation. The outcome of this process was the selection of the Vineyard Wind LLC (“Vineyard Wind”) combined 800 megawatts (“MW”) of offshore wind generation project (the “800 MW Vineyard Wind Project”)¹ and the execution of

¹ The long-term contracts provide for the delivery of an aggregate of 800 MW of Offshore Wind Energy Generation and related RECs which will be delivered in two phases with expected commercial operation dates (“COD”) of

cost-effective long-term contracts for the reliable offshore wind generation output and renewable energy certificates (“RECs”) of the 800 MW Vineyard Wind Project.

The Vineyard Wind offshore wind generation long-term contracts filed by the EDCs represent over a year’s worth of collaboration and consultation among the EDCs, the Department of Energy Resources (“DOER”), and Independent Evaluator (“IE”), and are a significant milestone in the Commonwealth’s transition to a clean, diversified energy portfolio. As detailed below, at a total levelized price of 6.5 cents/kilowatt hour (“cents/kWh”)(2017 Dollars) for energy and RECs, the Vineyard Wind offshore wind generation long-term contracts provide a highly cost-effective source of clean energy generation for Massachusetts customers.² As shown in the EDCs’ filings, on average, these contracts are expected to reduce customer’s monthly bills, all else being equal, approximately 0.1% to 1.5%.³ The 800 MW Vineyard Wind Project achieves the requirements and objectives of Section 83C and the Department’s regulations, 220 C.M.R. §23.00,⁴ including assisting the Commonwealth with meeting its Global Warming Solutions Act goals and supplying the Commonwealth with critical diversity to our energy portfolio through utilizing a technology with relatively high production during winter months. The implementation of this 800 MW Vineyard Wind Project has the potential to support Massachusetts’ “first mover” advantage in offshore wind development, providing greater opportunities for development of local supply chain and offshore wind industry jobs in the Commonwealth. This 800 MW Vineyard Wind Project is the largest procurement of offshore wind generation in the US, and will help spur development of local industry and economic development, including the use of the New Bedford Marine Commerce Terminal.

I. Section 83C Solicitation and Selection of Vineyard Wind

On April 28, 2017, pursuant to Section 83C, the EDCs proposed a timetable and method for solicitation of long-term contracts for offshore wind energy to the Department for review and approval. Subsequently, the Department approved the RFP, and the EDCs and DOER, (together the “Evaluation Team”), as monitored by the IE, conducted a highly competitive and robust solicitation for offshore wind generation projects. The RFP targeted 400 MW of generation but allowed proposals from 200 to 800 MW with the ability to select 800 MW if the larger proposal was superior to other proposals and was shown to provide significantly more net benefits to ratepayers. A total of 27 different proposals from three different bidders were received. The proposals ranged in capacity from 200 to 800 MW, contained various configurations of

January 15, 2022 for the first 400 MW (Phase 1) and January 15, 2023 for the second 400 MW (Phase 2). The long-term contracts each have a term of 20 years from the date of commercial operation.

² All dollar figures in this document are the result of using an evaluation of a multi-year net present value analysis as set forth in the RFP and are expressed in 2017 real dollars.

³ Exhibit JU-8, EDC Initial Filing (DPU 18-76, 18-77, 18-78).

⁴ Pursuant to Section 83C, the Department was required to promulgate regulations. The regulations required the long-term contracts for Offshore Wind Energy Generation resources to: 1) provide enhanced electricity reliability; 2) contribute to reducing winter electricity price spikes; 3) be cost effective to Massachusetts electric ratepayers over the term of the contract, taking into consideration potential economic and environmental benefits to the ratepayers; 4) avoid line loss and mitigate transmission costs to the extent possible and ensure that transmission cost overruns, if any, are not borne by ratepayers; 5) adequately demonstrate project viability in a commercially reasonable timeframe; 6) allow offshore wind energy generation resources to be paired with energy storage systems; 7) mitigate any environmental impacts, where possible, and; 8) create and foster employment and economic development in Massachusetts, where feasible.

transmission, and included various pricing options. Per the RFP, the evaluation process was comprised of three evaluation stages, including both a quantitative and qualitative assessment of bids. At the conclusion of the evaluation process, the Evaluation Team ranked the proposals, and the 800 MW Vineyard Wind Project was determined to be the lowest cost and highest ranked proposal.

The EDCs agreed to select one of the projects proposed by Vineyard Wind; however, they disagreed as to which specific project,⁵ with National Grid and Unitil favoring Vineyard Wind's 800 MW proposal and Eversource favoring Vineyard Wind's 400 MW proposal. Given that the EDCs failed to agree on whether the 800 MW or 400 MW Vineyard Wind bid should be selected, DOER followed Section 83C to consult with the IE and select the winning bid. DOER selected the 800 MW Vineyard Wind Project after determining, consistent with the RFP, that the 800 MW Vineyard Wind project meets the threshold of being superior to other proposals and is likely to produce significantly more economic benefits to ratepayers compared to the 400 MW project.

DOER found that the 800 MW Vineyard Wind Project was superior in terms of having the lowest total proposal price and highest levelized benefit (at net present value) of all proposals evaluated. Compared to the 400 MW Vineyard Wind proposal, it had significantly higher NPV net benefit to ratepayers. Further, the selection of the 800 MW Vineyard Wind Project is expected to exert downward pressure on future prices for offshore wind. In addition, contracting with 800 MW of offshore wind provides a unique opportunity to maximize the value of the federal investment tax credit ("ITC") as the value of the credit is scheduled to be gradually reduced and will not be available for projects that start construction after December 31, 2019.

II. The 800 MW Vineyard Wind Project Provides Significant Value to Massachusetts Ratepayers

As previously stated, the DOER strongly supports the 800 MW Vineyard Wind Project, and recommends that the Department approve the resulting offshore wind energy generation long-term contracts. The 800 MW Vineyard Wind Project is highly cost-effective procured through a rigorous and highly competitive RFP process that will provide offshore wind energy generation and RECs to the Commonwealth and effectively meets the requirements and objectives of Section 83C. Specifically, the 800 MW Vineyard Wind Project significantly aligns with the Commonwealth's goals of creating a clean, affordable, and resilient energy future for the Commonwealth.

The 800 MW Vineyard Wind Project contributes to the Baker-Polito Administration's goal of creating an affordable energy future. As detailed in the EDCs' filing⁶, the 800 MW Vineyard Wind Project will provide the Commonwealth with energy and RECs at a total

⁵ Exhibit JU-6, EDC Initial Filing (DPU 18-76, 18-77, 18-78).

⁶ *Id.* at Exh. JU-5, *see also* Exh. JU-4.

levelized price of 6.5 cents/kWh 2017 dollars over the term of the long-term contracts.⁷ This total price is materially below the levelized projected costs of buying the same amount of wholesale energy and RECs in the market, which is projected to be a total levelized price of 7.9 cents/KWh in 2017 dollars over the 20-year term of contract.⁸ Over the life of the contract, the 800 MW Vineyard Wind Project is projected to provide an average 1.4 cents/KWh of direct savings to ratepayers.

In addition to the direct market benefits from these fixed cost contracts described above, the 800 MW Vineyard Wind Project also provides indirect benefits. These indirect benefits include energy market price reductions and lower Renewable Energy Portfolio Standard (“RPS”) compliance costs through increased REC supply. Additionally, ratepayers receive the benefit of price certainty through a fixed cost contract. Overall, the total direct and indirect benefits to Massachusetts ratepayers from the long-term contracts with Vineyard Wind are expected to be 3.5 cents/kWh, or \$35.29/ megawatt-hours (“MWh”) on average over the term of the contract, with total net benefits of approximately \$1.4 billion.⁹

Section 83C allowed for proposals to provide options to create and foster employment and economic development in the Commonwealth, where feasible. The 800 MW Vineyard Wind Project includes a \$15 million initiative for acceleration of the offshore wind market including: a \$10 million offshore wind industry accelerator fund, \$2 million for workforce development and \$3 million for innovations in protecting marine mammals. Additionally, Vineyard Wind will further establish a Resiliency and Affordability Fund by contributing \$1 million each year for 15 years. The Fund will support the construction of battery energy storage and solar projects for the purpose of enhancing resiliency and providing low-income ratepayer benefit in the communities hosting the Vineyard Wind Project.

⁷ The price for energy and RECs in the Phase 1 of the long-term contracts begins at \$74 per MWh (nominal \$), and the price for energy and RECs in the Phase 2 long-term contracts begins at \$65 per MWh (nominal \$). Each long-term contract has a 20-year term, starting at the COD of the relevant project, and the prices described above escalate by 2.5 percent each year of that term which starts in 2022 and runs until 2043. The 20-year average cost of the two long-term contracts’ is \$84.23 per MWh in levelized nominal dollar terms. This is equivalent to a levelized net present value price in 2017 dollars of \$64.97 per MWh.

⁸ Projections of future energy market and REC costs are described in detail in the quantitative evaluation results.

⁹ *Id.* at Exh. JU-5, *see also* Exh. JU-4.

III. CONCLUSION

The 800 MW Vineyard Wind Project and the corresponding contracts provide a cost-effective source of reliable offshore wind energy for Massachusetts customers, meet the requirements of Section 83C, and are in the public interest. Accordingly, the DOER respectfully requests that the Department approve the long-term contracts filed by the EDCs.

Respectfully submitted by,

THE MASSACHUSETTS DEPARTMENT
OF ENERGY RESOURCES

By its attorneys,

/s/ Robert H. Hoaglund II

Robert H. Hoaglund II, General Counsel
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617.626.7300



VINEYARD WIND

**Attachment E - Massachusetts Coastal Zone Management Letter
October 5, 2018**



THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
OFFICE OF COASTAL ZONE MANAGEMENT
251 Causeway Street, Suite 800, Boston, MA 02114-2136
(617) 626-1200 FAX: (617) 626-1240

MEMORANDUM

TO: Matthew A. Beaton, Secretary, EEA
ATTN: Purvi Patel, MEPA Unit
FROM: Bruce Carlisle, Director, CZM
DATE: October 5, 2018
RE: EEA-15787, Vineyard Wind Connector

The Massachusetts Office of Coastal Zone Management (CZM) has completed its review of the above-referenced Supplemental Draft Environmental Impact Report (SDEIR), noticed in the *Environmental Monitor* dated September 5, 2018. These comments address the responsiveness of the SDEIR with regards to CZM's comments on the Draft Environmental Impact Report (DEIR), respond to new information provided since the SDEIR as part of the ongoing discussions between the proponent and state agencies, and review the proposed project with regards to the siting standards as stated in Ocean Management Plan (OMP) Regulations (301 CMR 28.00) which will provide a framework for the Final Environmental Impact Report (FEIR) review and the Secretary's Certificate on the proposed project. The SDEIR is largely responsive to comments and questions raised in CZM's comment letter on the DEIR. CZM commends Vineyard Wind for their efforts to address agency concerns throughout the MEPA review.

Project Description

Vineyard Wind proposes to install two 10-inch diameter 220 kV AC offshore export cables to connect its wind energy project, located within the federally designated Wind Energy Area off Massachusetts, to the existing electrical grid on Cape Cod. This proposal is part of a larger project that seeks to permit an 800-megawatt (MW) offshore wind farm under the jurisdiction of the Bureau of Ocean Energy Management (BOEM). Major elements of the total project include a wind turbine array, offshore electrical service platforms, offshore electric transmission to shore, onshore underground transmission, and an onshore substation. The SDEIR maintains two alternative offshore export cable corridors (a Western cable corridor and an Eastern cable corridor) which can make landfall at one of two potential sites (New Hampshire Avenue in Yarmouth and Covell's Beach in Barnstable). Each proposed cable construction corridor may be up to 810 meters wide. The Western corridor to the landing site at New Hampshire Avenue passes through 21.4 miles of state waters, while the Eastern corridor to the New Hampshire Avenue landing passes through 23.3 miles of state waters. Selection of the Covell's Beach landing site would result in corridors 20.9 and 22.6 miles long, respectively. Both proposed cable routes through Nantucket Sound include sections within the area of federal waters in the center of the sound. The cables will be buried approximately 1.5 to 2.4 meters below the seafloor and laid with a combination of hydroplowing (through flat, soft sediments), jetting (through small sand waves), suction dredging (through large sand waves), and mechanical dredging (through compacted sand/gravel/cobble). Dense aggregations of boulders will be avoided while solitary boulders will be removed from the cable pathway and placed in another location within the construction corridor.



Project Comments

CZM supports the responsible development of marine renewable energy to help meet state and regional greenhouse gas emission reduction goals as well as other statutory obligations. Vineyard Wind's offshore wind project has been developed through the federal planning and analysis, leasing, site assessment and construction and operations plan processes in which CZM has been an active participant since 2009. Through MEPA, NEPA, and federal consistency reviews CZM seeks to ensure that the project is consistent with state coastal program policies and applicable regulations.

In comments on the DEIR, CZM requested that Vineyard Wind provide clearer depictions of the proposed project relative to existing ocean resources and uses. The maps in Attachment A and the map books provided to CZM are largely highly responsive to this request. Due to project logistics relating to the processing of survey data, ongoing discussions with resource agencies, and still-to-be-confirmed cable laying methods, assessment of the project's avoidance and minimization of impacts to some sensitive resource areas is ongoing.

In the DEIR comments, CZM recommended that the information collected during the 2018 field campaign be used to demonstrate that Vineyard Wind's preferred cable route alternative avoids sensitive resources identified in the Ocean Management Plan (OMP) and, where avoidance is not practicable, minimizes potential impacts to those resources. After review of the information and analysis provided to date, CZM finds that Vineyard Wind has adequately demonstrated avoidance and minimization of potential impacts to core whale habitat areas, eelgrass, and intertidal flats in conformance with the siting standards of the OMP; however, more information is required in the FEIR on how the selected route and cable laying method(s) will minimize impacts to hard/complex seafloor resources. As Vineyard Wind is still processing and analyzing its 2018 field data, CZM looks forward to reviewing this information in the FEIR. This data should confirm the conclusions of Vineyard Wind's alternatives analysis and assessment of impacts. Similarly, CZM understands that the exact methods and equipment for dredging sand waves and installing the submarine cable will not be known until a contractor for such work is selected. Specific points and questions related to the OMP management standards, dredging methods and impacts, time of year restrictions, monitoring plans, and the Ocean Development Mitigation Fee are detailed below and should be addressed in the FEIR.

Massachusetts Ocean Management Plan

The OMP and its implementing regulations at 301 CMR 28.04(2) and (6) describe the management standards that apply to cables in the ocean planning area. The siting standard for activities in the ocean management planning area are presumptively excluded from the special, sensitive or unique (SSU) resource areas delineated on maps contained in the OMP. The presumptive exclusion may be overcome by a clear demonstration that (1) new, site-specific information provides more accurate delineation of the resource areas; or (2) no less environmentally damaging practicable alternative exists; and (3) all practicable measures to avoid damage to SSU resources have been taken and the activity will cause no significant alteration; and (4) the public benefits associated with the activity outweigh the public detriments to the SSU resource. For cable projects, the SSU resources that must be avoided are: hard/complex seafloor, eelgrass, intertidal flats, North Atlantic right whale core habitat, humpback whale core habitat, and fin whale core habitat. In the siting of cable projects for the transmission of offshore wind energy, the OMP management standards clarify that such cables are in presumptive compliance with the siting standards if: 1) investigations and surveys confirm the predominance of soft-bottom seafloor (i.e., the general absence of hard-bottom substrate) within cable corridors such that sufficient burial depths for cables can be reasonably expected, and that the presence of relatively small areas of hard-bottom substrate, such that the cable route cannot be

practicably located outside of these areas, within acceptable limits, is permissible; and 2) time of year controls are in place such that operations and dredging will avoid damage and cause no significant alteration to North Atlantic right whale core habitat, humpback whale core habitat, and fin whale core habitat. As stated above, CZM finds that Vineyard Wind has sufficient protocols in place to avoid impacts to endangered whales. The revised maps provided in the SDEIR show the extent of hard/complex seafloor in higher resolution than depicted in the OMP. Vineyard Wind has further delineated hard seafloor separately from complex seafloor (sand waves) and has made efforts to avoid hard seafloor when siting the proposed cable route. However, at this time, the amount of hard seafloor (areas of cobble and biogenic habitat) that cannot be avoided and may be impacted during the cable laying process are not fully known. CZM recommends that the FEIR clearly delineate and describe the extent and area of hard seafloor that is unavoidable and must be excavated or covered to successfully bury the cables. The FEIR should also present additional images obtained and habitat classification analysis conducted based on Vineyard Wind's field surveys and investigations for areas where identified hard bottom and biogenic habitats are within or proximate to the cable footprint.

The SDEIR provides a summary of impacts for the proposed cable routes (Table 1-4) and identifies that the western route through Muskeget Channel landing at Covell's Beach in Barnstable results in the least amount of impacts to the seafloor. In meeting the siting standards at 301 CMR 28.04(2)(b), it appears that the western route to Covell's Beach may represent the least environmentally damaging practicable alternative; however, further information and analysis to be presented in the FEIR may supersede this. Additionally, to meet the management standards in the OMP, Vineyard Wind should demonstrate, and clearly describe in the FEIR, how the public benefits of the proposed project outweigh the public detriments to SSU resources.

The method and machinery selected for the laying of the transmission cables is important to the avoidance and minimization of SSU resources. The OMP contains language that states that installation methods that achieve burial with minimal seabed disturbance—including footprint, width of trench, and sidecast and suspension of sediments—are strongly preferred. Such methods include jet plowing, remotely operated seabed tractors, and some towed seabed plows. The plan also states that all cable projects will need to have an approved plan for inspection and maintenance to ensure that adequate coverage is maintained. Vineyard Wind has conveyed that it seeks to maximize the use of trench fluidization through soft sediments as the preferred mode of cable laying. CZM agrees that simultaneous cable laying and burial in soft sediments (as opposed to trenching and laying the cable at a later time) is the preferred method for minimizing impacts. In areas of sand waves or other locations where dredging is required, CZM notes that the several dredging techniques presented in the SDEIR have different effects in terms of seafloor disturbance and sedimentation. It is clear from the additional modeling presented in the SDEIR that Trailing Suction Hopper Dredging (TSHD) has greater impacts than jetting or jetplowing. In order to reduce both direct impacts to habitat and biota on the seafloor and indirect sedimentation on these resources per the OMP requirements, Vineyard Wind should use the 2018 survey data to avoid or minimize laying cable in large sand waves (a process that requires TSHD), and maximize the use of fluidization and jetting (processes that allow simultaneous cable laying).

Under the OMP regulations at 301 CMR 28.04(3), proponents must avoid, minimize, and mitigate impacts to areas of concentrations of water dependent uses identified in the plan. Vineyard Wind's proposed steps to minimize impacts to recreational and commercial fishing activities and navigation include employing a Marine Coordinator to manage all construction vessel logistics,

enacting a 500-meter safety zone around all construction activities, and establishing a vessel traffic management plan and coordination with local pilots during construction. CZM encourages Vineyard Wind to provide notices to mariners to keep them apprised of specific construction activities and to minimize conflicts between construction vessels and recreational or commercial vessels in high transit areas, especially Muskeget Channel. In addition, DMF has a standard protocol for communicating the location and timing of survey activities to fixed gear fishermen. The protocol includes using various media sources (letters, texts, postcards, emails, website) to alert members of the Massachusetts Lobstermen's Association to the location and start time of a survey, to provide daily updates on activities, to answer inquiries from fishermen, and details a process for returning intercepted gear. CZM encourages Vineyard Wind to work with DMF and the fixed gear community to adopt a similar program to minimize impacts to this important commercial fishery during construction.

Transit Corridor and Turbine Spacing

While located in federal waters and therefore not under MEPA jurisdiction, the location and configuration of the turbines will have effects on resources and uses of the state's coastal zone. CZM's federal consistency review includes all of the elements of the proposed project in both the coastal zone and in federal waters. In our comments on the DEIR, CZM indicated that data from Vessel Monitoring Systems and Automatic Identification Systems show significant marine vessel navigational activity across the offshore wind lease areas, and that due to the high volume of vessel traffic (fishing and otherwise), the establishment of transit corridors is critically important to the safe passage of vessels. Since June, CZM has been working with the MA Fisheries Working Group on Offshore Wind (comprised of fishing industry representatives, representing various fisheries, gear types and ports) and the U.S. Coast Guard on the issue of identifying transit lanes through the offshore lease areas. Over the course of several meetings with significant discussion and consultation on a number of options and alternatives, general consensus was reached at the September 20th working group meeting on an alternative that provides safe options for vessels transiting through the adjacent wind energy lease areas via 2 nautical mile wide transit lanes to/from priority areas identified by various fishing sectors and ports. This alternative includes east/west and north/south transit lanes and a lane to the southeast ending just south of Nantucket shoals. Additionally, another north/south lane within the currently unleased areas (502 and 503) was discussed, to be revisited after the delineation of lease areas in BOEM's pending Final Sale Notice. We understand that discussions on this topic are still ongoing in other jurisdictions; however, CZM believes that the working group consensus alternative is a balanced and feasible option that while perhaps optimal to none, is acceptable from a navigational safety perspective and represents a compromise approach to a very difficult issue.

Species of Concern

Vineyard Wind has previously presented information on how it plans to mitigate for construction noise disturbance and ship strikes to whales and turtles. In the SDEIR, Vineyard Wind presents a plan for avoiding eelgrass beds and horseshoe crab spawning off Covell's Beach in Barnstable, should that landing alternative be chosen. Discussions to find appropriate TOY for construction to avoid impacts to Piping Plovers, bay scallops, whelks, squid eggs, and diving/plunging birds are ongoing. In meetings with resource agencies, Vineyard Wind has proposed that it may be possible to begin construction of the energy export cables in the nearshore in one year, bury the partial cable segments, and then splice and continue laying the remaining cable lengths in the offshore portion of the project in the following year. The FEIR should include details as to how the construction activities will be timed, staged, and sequenced to minimize impacts to the species of concern mentioned above. CZM acknowledges that the cumulative result of the various TOY restrictions may severely limit, if not preclude, time available for cable installation. Vineyard Wind should continue

discussions with resource agencies to determine the highest priority TOY and identify other mitigating measures (such as clearing the cable route prior to work) that will allow for a sufficient window for cable installation.

Fisheries Resources

In the SDEIR, Vineyard Wind provided new modeling (discussed further in the next section) for jetplowing, that shows the predicted extent of sediment drape that might affect winter flounder eggs (deposition > 1mm) is confined to within about 100 meters of the cable trench. Sediment deposition associated with dredging techniques is greater. As stated above, Vineyard Wind has had discussions with DMF and NMFS regarding the best TOY for construction to avoid impacts to fisheries resources. A summary of these discussions and a possible construction sequencing solution should be provided in the FEIR.

Vineyard Wind presented a third-party analysis of the potential electromagnetic frequency (EMF) energy released by the proposed energy export cables. The results suggest that the AC magnetic fields associated with buried, subsea cables is very low and when acting on a “compass-like magnetic sensing system, would have a time-average force of zero.” Thus, the EMF energy from the cable is not expected to interfere with the navigational sense of marine organisms. Vineyard Wind concludes that the electrical energy from its cables will not be detected by marine organisms.

Vineyard Wind should continue to work with DMF and the Town of Yarmouth shellfish program to delineate shellfish resources within the proposed cable corridor in Lewis Bay. Details of how the cable could be sited to avoid high density shellfish areas and how TOY provisions could be employed to minimize impacts to resources in Lewis Bay should be presented in the FEIR.

Cable Installation

The SDEIR includes new modeling of the potential sediment plume and deposition associated with laying the cables. Three methods of cable laying are modeled: 1) “jet plowing” (hydroploving) where simultaneous fluidizing of the trench and cable laying occurs; 2) “TSHD” where a suction dredge excavates sand waves areas, material is placed in a hopper and then dumped a distance away from the cable trench, and the cable is laid some time later; and 3) “jetting” (mass flow excavation) where jets of water push small sand waves away from the desired trench area and the cable is laid simultaneously. Mechanical trenching, with a tool similar to a chain saw discussed previously by Vineyard Wind for removing packed sand/gravel/cobble areas, was not modeled. During jet plowing, the model results predict that deposition of sediments > 1 mm would be confined to within 100 meters of the cable. However, the modeling work assumes the jetplow trench would be 1 meter wide while published field evidence from the Block Island Wind Farm (BOEM 2017-027) indicates that this method leaves a trench 2 meters wide. CZM requests that Vineyard Wind describe why jetplowing for this proposed project would result in half the trench width than has been documented for a similar offshore export cable.

During TSHD activities, the modeling depicts a plume of sediment with Total Suspended Solids (TSS) > 10 mg/l that is predicted to extend 10 miles from the dredged area while TSS > 1000 mg/l is predicted up to 3 miles away during hopper overflow and dumping. However, the model results shown seem to integrate all of the sediment plume impacts over the entire course of the total days of dredging activity and do not represent what would be present on any given day. CZM recommends that the FEIR include the model results for a representative day, perhaps even with an hourly breakdown, to better understand potential effects on both sedimentation and on visibility for

diving birds. As stated above, CZM recommends that Vineyard Wind minimize TSHD activities and maximize the use of simultaneous cable lay and burial techniques (e.g., jetplowing and jetting) to minimize impacts to the seafloor.

As stated in the DEIR comment letter, CZM recommends that the modeled results be verified during the actual installation process. The SDEIR suggests that this monitoring activity might include a handheld turbidity meter deployed from a small vessel at various depths during dredging. CZM looks forward to working with Vineyard Wind and the resource agencies on the details of this monitoring program.

In previous comments, CZM suggested that Vineyard Wind use its field data and its hydrodynamic model to characterize the wave dynamics, currents, and sediment transport along the proposed cable route, particularly in areas of sand waves, to better understand whether the proposed depth of burial is sufficient to avoid the potential use of armoring. The SDEIR describes a cable burial survey effort initially after construction, every year for the first three years, every three years for the next 12 years, and every five years beyond that. The SDEIR describes that sections of cable that are identified as inadequately buried, will be buried using a secondary burial tool. CZM discourages the use of armoring due to the detrimental impacts which can include increased scouring of the seafloor adjacent to the hard cover, increased substrate providing a vector for invasive species colonization, and impacts to commercial and recreational fishing operations. CZM instead recommends additional efforts to bury the cable to the appropriate depth or covering the cable with sand bags and gravel/cobble cover, as appropriate to mimic adjacent seafloor conditions.

Sand Waves

Vineyard Wind estimates that the linear extent of sand wave dredging would be 1.4 to 2.2 miles (depending upon the corridor and landing point) and the volume of dredging required in sand waves to be 71,000 to 136,000 cubic yards. Vineyard Wind estimates that the dredged corridors through sand waves for both cables will be approximately 65 feet wide at the bottom and with a 4:1 side slope ratio. This suggests that cable corridors within a 10-foot sand wave would be 145 feet wide and within a 15-foot sand wave would be 185 feet wide. CZM's understanding is that the potential dredging estimates were calculated assuming a 65-foot width which, given the above information, would underestimate the volumetric impacts. CZM suggests that for the FEIR Vineyard Wind use field survey data on the height and extent of sand wave areas to provide an updated estimate of the volume of material that will need to be removed from the seafloor to allow for cable laying in sand wave areas.

At this time, Vineyard Wind has not identified the exact areas where dredged material will be deposited other than to state that hopper dredge spoils will be dumped to the east or west of the dredging area within the 810-meter cable corridor. As CZM stated previously, there should be resource assessment information for each proposed disposal area to ensure that sensitive benthic habitat or fisheries resources are not impacted during this aspect of construction. CZM recommends that Vineyard Wind use its survey data (bathymetry, videos, benthic grabs) in the FEIR to identify potential dredge disposal locations that minimize impacts to benthic resources and to establish areas where dumping will be avoided. For example, dredge material should not be placed on areas mapped by Vineyard Wind as biogenic habitats. Potential dredge disposal areas should be similar in sediment texture and structure as the sites from which the material is dredged (e.g., excavated sand waves should be deposited in a nearby sand wave site). CZM recommends that areas to be dredged and dredge disposal areas be clearly defined in maps, with supporting field data to confirm the mapped units. The

FEIR should include all interpreted and raw field data (photos, videos, bathymetry, sidescan, biological and sediment grab samples) and these data should be used to inform this process. In particular, CZM would like to see validation for areas mapped as biogenic structures and cobble or cobble mixes.

Monitoring Plan(s)

CZM's previous comments asked for information on monitoring plans related to:

- Real-time cable installation effects (turbidity, sediment drape, physical disturbance) so that actual effects can be compared to anticipated effects;
- Construction impacts to biogenic habitats, benthic infauna, and/or fisheries resources;
- Recovery times of various resources;
- Demonstration of the as-built cable condition to verify the appropriate depth of cable burial;
- Demonstration that the cable remains adequately buried over the long-term.

While Vineyard Wind has outlined a monitoring effort to address each of these subjects in the SDEIR, the details regarding specific methods, times of year, frequency, and locations are still to be determined. CZM looks forward to working with Vineyard Wind and the other resource agencies on the details of these monitoring plans and establishing a process for determining if established performance standards have been met.

Ocean Development Mitigation Fee

Pursuant to the OMP and its regulations, the project is subject to an Ocean Development Mitigation Fee. In the SDEIR, pursuant to the fee structure contained in the OMP, Vineyard Wind identified the proposed project as a Class II ocean development activity category and proposed \$240,000 mitigation for a predicted 27 acres of permanent hard cover in state waters to protect the energy export cables. CZM's position is that mitigation for the Vineyard Wind project should be based upon the full extent of the impact of the project including: direct cable laying and dredging area, dredged disposal area, sediment deposition area, and impacts to biota and habitat, as well as permanent hard cover. Based upon Vineyard Wind's estimates of area impacted by cable installation in state waters (Table 1-4), up to 94 acres of seafloor could be disturbed temporarily; 27 acres of seafloor could be permanently covered with hard cable protection; 166,000 cubic yards of sediment could be fluidized resulting in 200 acres covered in over 1 mm of sediment; and 136,000 cubic yards of sand waves could be dredged. As stated above, some of these impacts may be underestimated. The extent of the anticipated impacts would place the project in the Class III ocean development activity category (i.e., footprint greater than 20 acres). CZM looks forwards to further discussion with Vineyard Wind and the Secretary's office on the Ocean Development Mitigation Fee for the FEIR.

Federal Consistency

The proposed project is subject to CZM federal consistency review. For further information on this process, please contact, Robert Boeri, Project Review Coordinator, at 617-626-1050 or visit the CZM web site at www.state.ma.us/czm/fcr.htm.

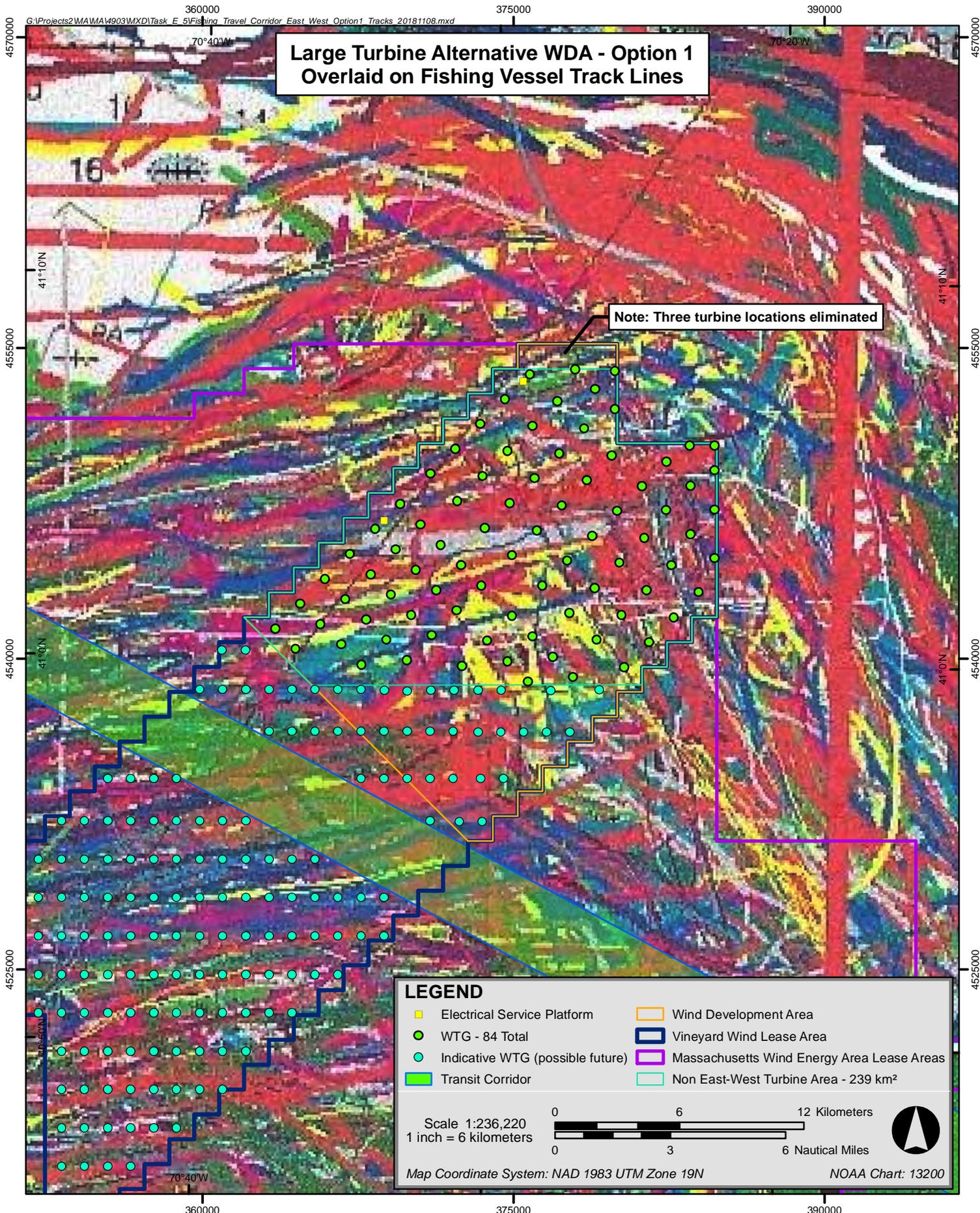
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cc: Yarmouth Conservation Commission
Barnstable Conservation Commission
Holly Carlson Johnston, Epsilon Associates, Inc.
Rachel Pachter, Vineyard Wind
Conrad Caia, Yarmouth Shellfish Constable
Dan Horn, Barnstable Shellfish Constable
Christopher Boelke, Sue Tuxbury & Alison Verkade, NMFS
Ed Reiner, EPA
Derek Standish, David Wong, DEP
Kathryn Ford, John Logan, Eileen Feeney, DMF



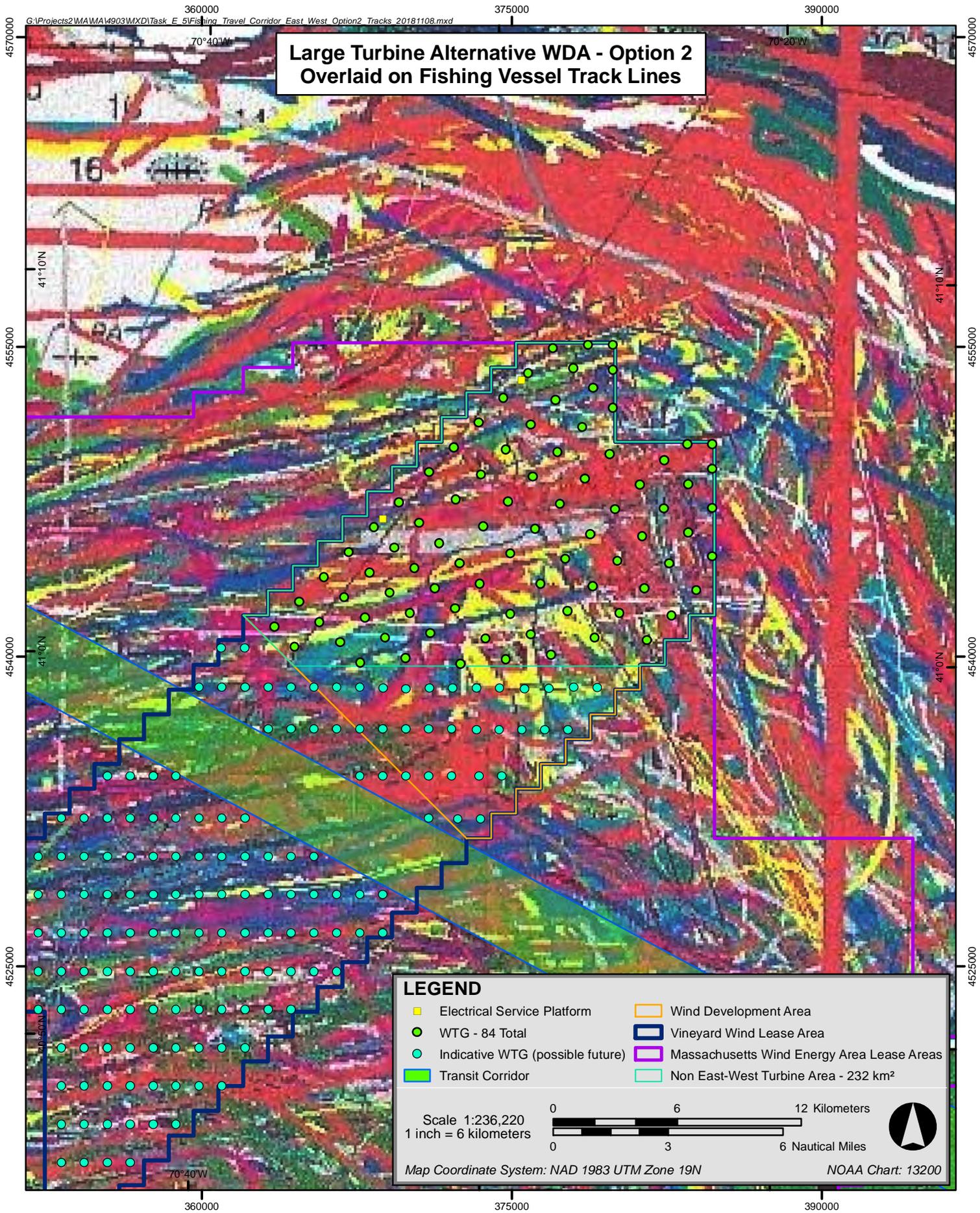
VINEYARD WIND

**Attachment F - Large Turbine Alternative WDA Options Overlain on
Tow Track Graphic**



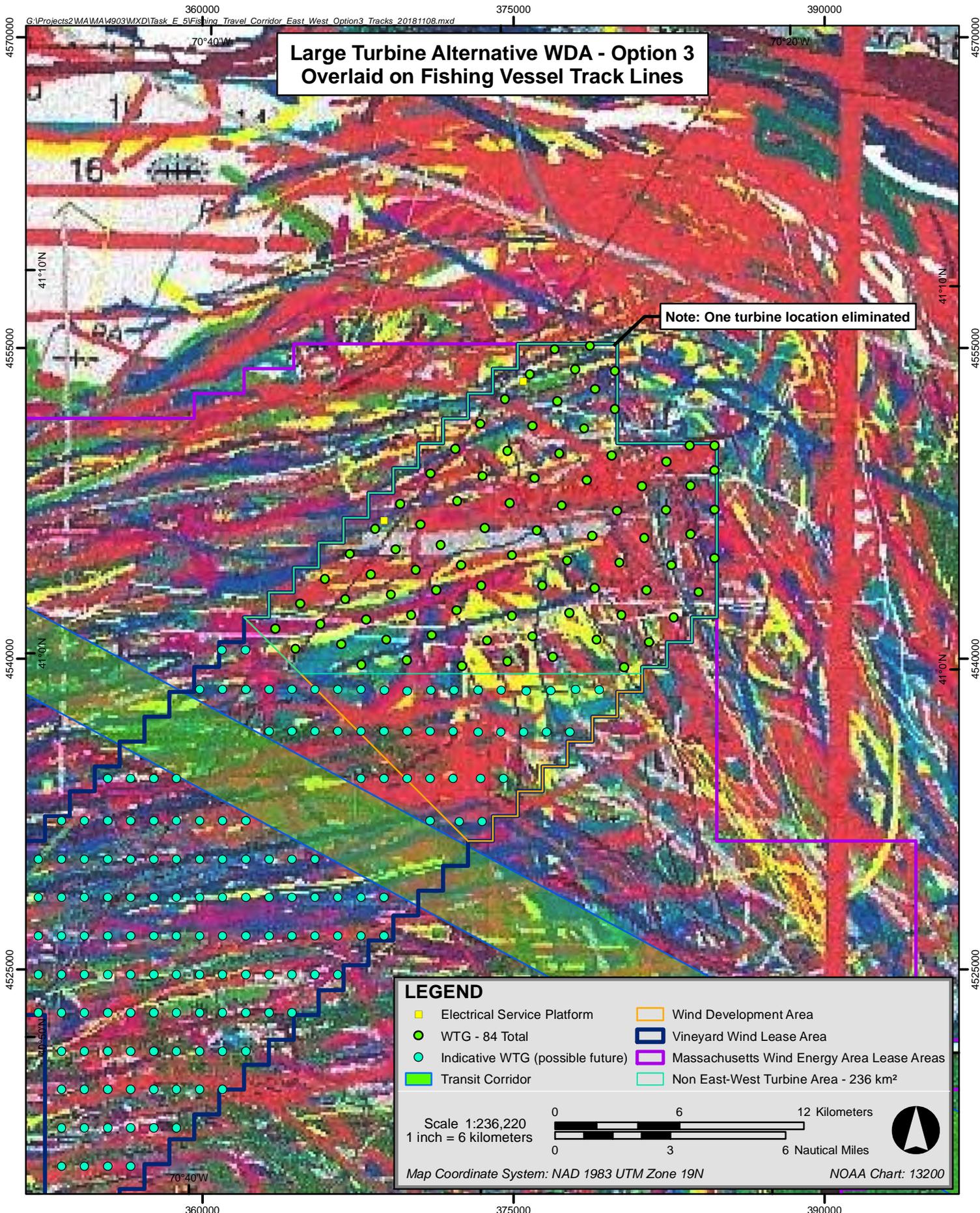
Vineyard Wind Project





Vineyard Wind Project





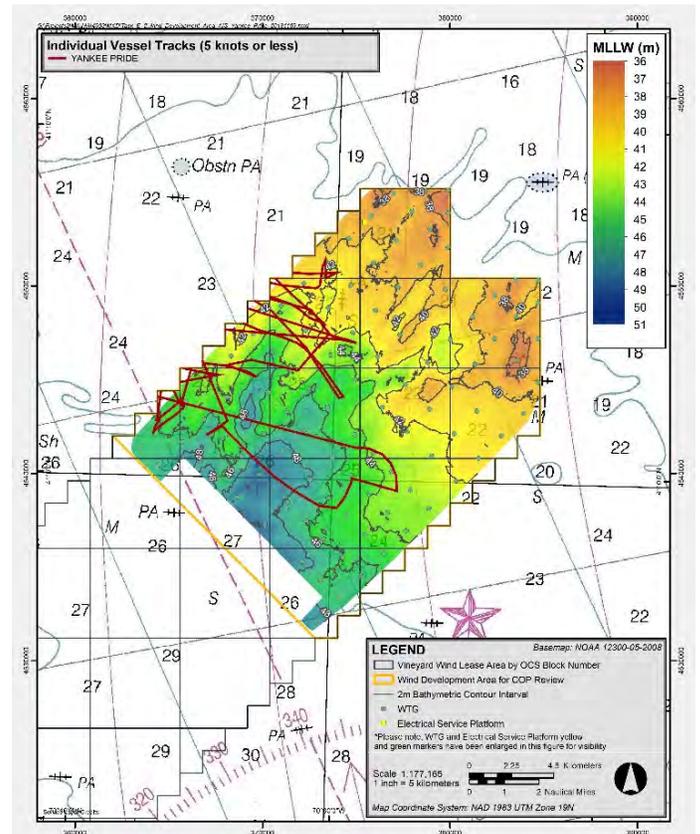
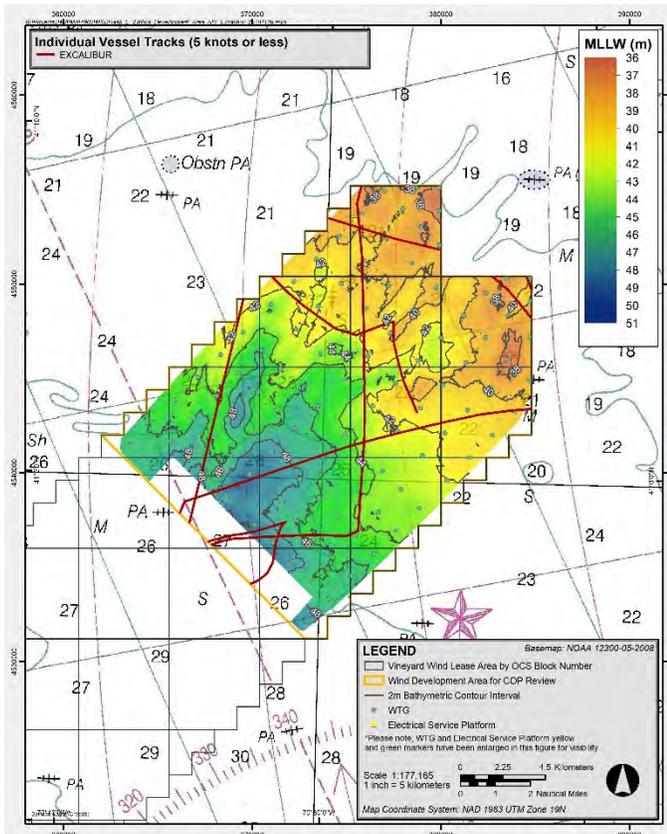
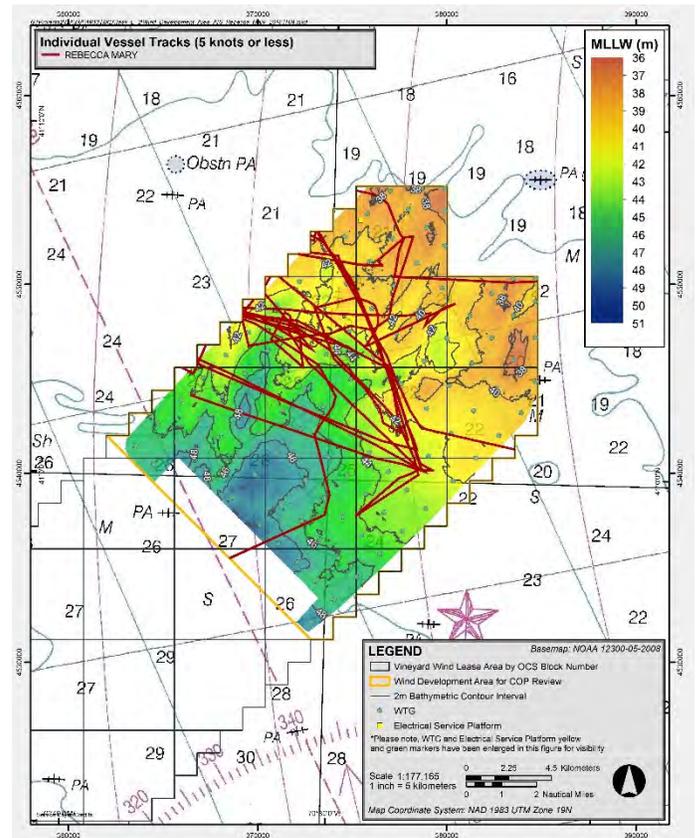
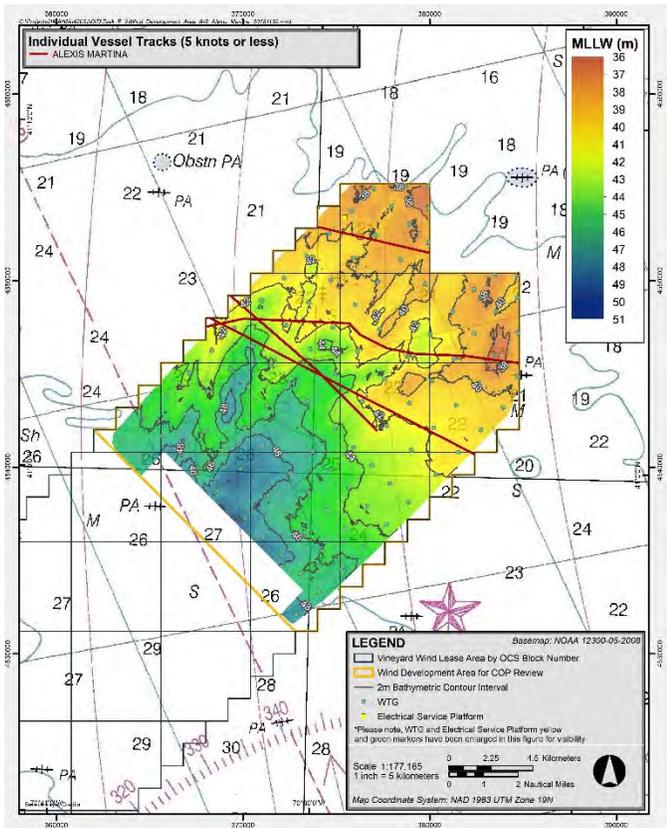
Vineyard Wind Project





VINEYARD WIND

Attachment G- Wind Development Area - AIS Vessel Track Data (2016)



Vineyard Wind Project



Figure 2
Wind Development Area – AIS Vessel Track Data (2016)

