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Regarding: EPA Permit Number OCS-EPA-R2 NJ 02.

Please see and consider the comments below from the Save Long Beach Island organization on the proposed Clean Air Act Outer Continental Shelf (OCS) air permit for the Atlantic Shores South offshore wind project.

Save Long Beach Island Inc (Save LBI) is a coalition of citizens working together to protect the ocean and Long Beach Island and neighboring communities from the destructive impact of offshore wind projects. We are a not-for-profit, non-partisan organization and do not endorse any candidates or politicians, but we do aggressively pursue programs, policies, and actions to protect the Island, marine life and surrounding communities.

This proposed permit approval is of particular concern to us because many of our members frequent the Brigantine National Wilderness Area, in particular the area on southern Long Beach Island. We do not want to see its unique environment degraded by air contaminants .

### **Executive Summary**

#### **The Setting**

The Atlantic Shores South Project has been portrayed and recently approved by the lead agency, the Bureau of Ocean Energy Management (BOEM) and the primary cooperating agency, the National Marine Fisheries Service (NMFS) in its recently released Biological Opinion as consisting of 200 large 15 megawatt (MW) turbines requiring the pile driving of for the most part 15-meter diameter, thousands ton monopile foundations.

The Brigantine National Wilderness Area (BWA) is a unique, unspoiled area with stringent limits on air-quality related degradation, including a 24-hour fine particulate (PM 2.5) incremental limit of 2 micrograms per cubic meter (2ug/m<sup>3</sup>) concentration. That limit is based on a three-year average of the higher concentrations for each year.

#### **The Permit**

With this notice, the EPA is apparently proposing to endorse a disingenuous effort to segment the project, artificially cram its construction into one year, so it can artificially average that out

with much lesser impact over the next 2 years, and defeat the air quality protections afforded to the Wilderness area.

The permit application under review, EPA permit Number: OCS-EPA-R2 NJ 02, does not speak anywhere to the important averaging of 24-hour PM 2.5 concentrations, the primary concern at the Wilderness Area. It does not speak to such basic parameters as the number of hours required per day to pile drive one foundation, and the emissions from that.

It has apparently been recently revised to address only one “peak” year of air quality modeling of the construction, presumably including both foundation and wind turbine generator (WTG) installation, of a “project 1” of 141 turbines, a segmented part of the full 200 turbine Atlantic Shores South Project. The 141 turbines reflects the original project 1 and the overlap area in project 2, which comes to 136 turbines.

But the application shows in Table I-1 a three year time frame, from 2026 to 2028, for wind turbine foundation and wind turbine generator (WTG) installation. We assume from those apparent contradictions that no air quality modeling of either construction activity, or operations and maintenance activity that would logically follow the construction period, was assumed for 2027 or 2028.

Since the allowed 24-hour concentration increments at the BWA are based on a three-year average of the 98 th percentile number for each year, this improperly segments the project and artificially crams the construction into one year to show a low 3-year average concentration at the Wilderness Area.

According to Table I-1 of the application, construction of project 2 follows project 1 by a year. Therefore it cannot be legitimately excluded from the three-year averaging of concentrations that is required to show compliance with the allowed prevention of significant deterioration(PSD) increments at the Wilderness area.

Further, for actual construction, based on Epsilon Associate’s, the project’s permit manager, own estimate of 2.6 days required just for one turbine foundation installation in its letter to the EPA of October 28, 2022, and considering the NMFS’s pile driving restrictions from January through April, it requires 2.6 days per turbine times 200 turbines divided by 240 pile driving days a year, or a minimum of 2.2 years to complete the foundation installation. This extends the air quality modeling needed into the 3-year averaging period.

The Epsilon letter also says that the installation of the WTG itself adds “another” 1.5 days to the construction effort. Therefore assuming that is done sequentially after the foundation installation of 2.6 days, it requires 4.1 days to install the full turbine. Since all that effort starts with and is linked time wise to the pile driving, it is only permitted eight months a year. Therefore the full-time for turbine construction should be equal to 200 turbines times 4.1 days per turbine divided by 240 days a year or 3.4 years. Consequently the “higher” PM 2.5 emissions that are said to be associated with this full effort extend throughout and beyond the 3-year averaging period.

The modeled 3-year average for the fine particulate (PM 2.5) 24 hour-increment at the Wilderness Area is shown in Table 5-10 as 0.69 µg per cubic meter (ug/m3). Since that appears to be the result of averaging the first year concentration with two years of essentially no emissions, the actual first year concentration must have been three times that or 2.1 µg /m3.

**With foundation installation extending into the third year and full construction beyond that, and assuming the 98<sup>th</sup> percentile 24-hour yearly PM 2.5 concentrations are comparable, the 2.1 µg/m<sup>3</sup> for one year will occur each year and become the proper 3-year average. The emissions from the project's construction will then exceed the allowed increment of 2 µg/m<sup>3</sup> for the Brigantine Class I area. Therefore, even with the current underestimated yearly modeling as described below, the permit must be denied.**

Compounding that, there are other numerous problems with the averaging and the prediction of the yearly concentrations as shown below.

**The construction schedules are not consistent** between the air permit and the schedules assumed by the lead agency, the Bureau of Ocean Energy Management (BOEM) or the National Marine Fisheries Service (NMFS) in their Biological Assessment (BA) and Biological Opinion (BO) respectively prepared pursuant under the Endangered Species act and in the BOEM EIS.

The 141 turbine annual installation number is apparently based on the 2.6 days per foundation number from Epsilon Associates over a full year. The BOEM and NMFS schedules are based on the construction schedules in the Jasco Applied Sciences noise exposure modeling reports which assumed 1 day per foundation installation.

On a monthly basis the uniform installation rate of the air quality modeling scenario would place 56 turbine foundations into the seabed from June through September. But the BOEM and NMFS schedules call for 75 installations during that period.

Therefore, the daily and monthly schedules being assumed by the different agencies are not consistent raising questions about the accuracy of all of these documents. This needs to be reconciled with the thorough explanation of the time required for foundation installation, including within that the pile driving time itself, and for WTG installation.

**The modeling of 141 turbine installations in a year is also not environmentally conservative.**

Although not disclosed in the application, this unduly optimistic schedule would allow for a 3-year averaging of higher emissions from construction activity in the first year with lower emissions in the second and third year, resulting in an artificially low number to compare with the standards and increments. As mentioned above, and explained in detail herein, it is likely that the foundation installation alone will extend into the 3 years of the averaging period.

It is also not conservative with respect to the monthly schedule because it underestimates the higher number of planned installations in the summer months when atmospheric conditions are likely to be more conducive to receipt of higher PM 2.5 concentrations at the BWA.

### **Underestimated 24-Hour Impacts**

In addition, the 24-hour modeled concentrations, including the 98<sup>th</sup> percentile value, for a given year at the BWA are underestimated through: (a) the use of an unrealistic low number of pile driving hours per day required for one foundation placement, (b) the apparent averaging of maximum hourly turbine installation emissions with those of hours of non-operation, as opposed to modeling the maximum emission hours, (c) not considering night time pile driving during which atmospheric conditions are likely to be more conducive to the receipt of higher

concentrations at the BWA, and (d) the use of greater than warranted distances from the emission sources to receptors, among other discrepancies noted below.

Even with the artificial 3-year averaging and the yearly underestimates cited herein, the air quality modeling shows that the project consumes 35 percent of the allowed 24-hour PM 2.5 increment at the BWA of 2 ug/m<sup>3</sup>. With proper averaging and accurate modeled yearly high concentrations, it is quite likely that the 24-hour 2 ug/m<sup>3</sup> increment at the BWA will be exceeded.

Finally, the application does not disclose key factors as noted in the conclusions below that would allow the public to understand what is actually being modeled.

It is high time to put an end to the shortcuts being afforded by Agencies that know better to project proponents that even have difficulty finding substantive benefits for their projects. This permit application must not be approved. The application should be returned to Atlantic Shores for substantial revision to see whether with realistic and transparent assumptions whether it can meet the Wilderness Area criteria.

### **Detailed Comments**

#### **The NJ Regional Haze State Implementation Plan (SIP)**

The SIP addresses visibility at the Brigantine Wilderness Area (BWA), but only includes emissions from land sources, including those from other states. It does not include any sources from Outer Continental Shelf (OCS) wind energy development. In Table 2–3, It shows the need for a uniform rate of improvement of 0.28 deciviews per year for the 20 percent most visibility impaired days in order to meet visibility goals in 2064.

The air permit application contains an Appendix C with a visibility report dated February 29<sup>th</sup>, 2024 done by Ramboll America’s Engineering Solutions. It shows in Table 4 that the Atlantic Shores project alone causes visibility degradation at the BWA for about 30 days per year exceeding 0.5 deciviews. As shown above in the Executive Summary and in Section 2 below that degradation is expected to last for at least three years.

The 30 days constitutes about 8 percent of the worst visibility days so there is not a direct comparison between the Ramboll Report and the 20 percent in the SIP, but it’s fair to assume from the Ramboll Report that for the 20 worst days the increase in deciviews from the project would be comparable to the yearly rate of progress needed in the SIP.

The OCS offshore wind emission sources would therefore have a major adverse impact on the SIP rate of progress needed. Therefore the SIP needs to be redone to include them and provide new measures to offset their effect.

## Detailed Comments, the OCS Air Permit

### Introduction

The permit application under review, EPA permit Number :OCS-EPA-R2 NJ 02, has apparently been recently revised to address only one peak year of construction of a “project 1” of 141 turbines, a segmented part of the full 200 turbine Atlantic Shores South Project.

Since the allowed 24-hour concentration increments at the Brigantine Wilderness Area (BWA) are based on a 3-year average, and construction of project 2 of 59 turbines directly follows that first year according to Table I-1 in the application, this improperly segments the project to artificially show low average air contamination concentrations at the Wilderness Area. On the basis of this improper segmentation alone, this permit should be rejected.

Even for the segmented project, neither the air permit application or the EPA Fact Sheet present sufficient information to demonstrate compliance with the 24-hour fine particulate (PM 2.5) PSD increment at the BWA. Therefore the application should not be approved by the EPA. The application should never have been deemed complete by the EPA and released for public review.

Adherence to the allowed 24 –hour PM 2.5 PSD increment of 2 ug/m<sup>3</sup> is based on the 98th percentile value for a given year averaged over three years. Given that averaging, it is very important to have a realistic and detailed schedule of construction and operation and maintenance activities over the appropriate three year periods. This has not been provided.

With respect to securing an accurate 98 th percentile value for each year it is crucial to accurately portray the emission sources, the maximum hourly emissions levels, their duration and the atmospheric conditions that lead to the higher daily PM 2.5 concentrations at the BWA. Neither the air permit application or the EPA fact sheet presents this.

With respect to the averaging over the 3-year period, it is not even explained for PM 2.5 how many years of construction and how many years of operations and maintenance were included in the 3-year average calculations. Instead the application: (1) speaks only to an unrealistic one peak year installation of 141 turbines with no mention of the remaining 59 turbines for the full project, (2) does not state the number of hours used in the modeling to pile drive one foundation, or the number of days to install the full foundation and the wind turbine generator, (3) ignores the constraints imposed by its sister agencies that prohibit pile driving from January through April, all in an apparent attempt to (4) artificially cram the construction of a segmented part of the full project into 1 year so that it can average the higher air modeled concentrations from that with lower concentrations in years 2 and 3, in order to numerically stay below the PSD Class I increment. This would be unacceptable practice and should not be accepted by the EPA.

The application also underestimates the 24 hour PM 2.5 98th percentile number at the BWA for a given year through a series of improper and unrealistic assumptions in its air quality modeling.

The air quality modeling: (5) apparently uses an unrealistic low number of hours required to pile drive one foundation and does not present the maximum hourly emission rates for those hours or explain how are are derived, (6) apparently significantly lowers the daily source emissions modeled by averaging hourly emissions over periods of construction activity with non-activity periods during the day as opposed to modeling the maximum hourly emissions, (7) does not

consider occurrences of night time pile driving that will likely be needed during which atmospheric conditions may be more conducive to higher received concentrations at the BWA, (8) does not model the planned higher monthly foundation installation rates in the summer during which atmospheric conditions may be more conducive to the receipt of higher concentrations at the BWA, (9) does not clearly disclose what emission sources are modeled during both construction and operations and maintenance periods, (10) apparently uses a greater distance from the construction emission sources to the BWA than that for the closest turbine location, (11) does not use atmospheric meteorological conditions that are representative of the offshore area, and that would likely be more conducive to higher received concentrations at the BWA and (12) does not disclose foundation size and annular dimensions which can significantly affect foundation installation hours, daily installation rates and daily emissions.

Each of these flaws is elaborated on below following the numbering in the above paragraphs. Other issues are also presented in Sections 13 through 21.

It is also shown below that with proper assumptions, the 24-hour PM 2.5 increment at the Wilderness area will likely be exceeded. Therefore, this permit application should not be approved.

### **1. Project Segmentation and Conflicting Descriptions and Schedules**

Under Section 7(a)(2) of the ESA, 16 U.S.C. § 1536(a)(2), the EPA must ensure that any action authorized, funded, or carried out by the EPA is not likely to jeopardize the continued existence of any federally listed endangered species or threatened species or result in the destruction or adverse modification of such species' designated critical habitat. If the EPA's action (i.e. permit issuance) may affect a federally listed species or designated critical habitat, Section 7(a)(4) of the ESA and relevant implementing regulations at 50 C.F.R. part 402 require consultation between the EPA and the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS), depending on the species at issue. See 16 U.S.C. §1536(a)(2); see also 50 CFR §§ 402.13 and 402.14. Further, the ESA regulations provide that where more than one federal agency is involved in an action, the consultation requirements may be fulfilled by a designated lead agency on behalf of itself and the other involved agencies. See 50 CFR §§ 402.07. The EPA believes that its OCS permitting actions are interrelated to, or interdependent with the Bureau of Ocean Energy Management's (BOEM's) SAP and COP approvals pertaining to the OCS projects in the Atlantic Planning Areas. Accordingly, pursuant to 50 C.F.R. 402.07, EPA requested that BOEM serve as the designated lead agency for the purposes of fulfilling the agencies' collective obligations under Section 7 of the ESA.

**The construction schedules are not consistent between the OCS air permit and the schedules assumed by the lead agency, the BOEM or the NMFS in their Biological Assessment (BA) and Biological Opinion (BO) respectively prepared pursuant to the Endangered Species act, and in the BOEM final EIS.**

In this OCS air permit application Atlantic Shores has created a fictitious segmented project of 141 turbines all apparently to be fully installed (foundation plus turbine) in one year. The BOEM final EIS and Record of Decision approved projects 1 and 2 for 201 turbines, with 100 turbine foundations alone anticipated to be installed in a year. In addition, Atlantic Shores has

submitted a request for State award for the two projects. The OCS air permit application should have been based on the 200 anticipated turbines for projects 1 and 2.

As shown in Table I–1 of the air permit application, wind turbine foundation installation for projects 1 and 2 is only separated by a year. Since the 24-hour air quality standards and increments are based on a 3- year average the additional 60 turbines should have been modeled. Absent such explanation it appears that they have not.

On a monthly basis the uniform installation rate of the air quality modeling scenario is not consistent with the BOEM and NMFS schedules. It would place 56 turbines foundations into the seabed from June through September, but the BOEM and NMFS schedules call for 75 installations during that period. This can underestimate impact at the BWA because summer conditions are likely to be more conducive to higher received concentrations there.

### **Questions Regarding Foundation Installation Schedules Used for other Environmental Reviews.**

All this raises serious questions as to the accuracy of the different construction schedules being assumed for the Clean Air Act, the Marine Mammal Protection Act , the Endangered Species Act, and the National Environmental Policy Act reviews.

The estimate of 2.6 days per foundation installation provided by the permitting contractor, Epsilon Associates, in support of the air permit in its letter to the EPA of October 28, 2022 raises serious questions about the foundation installation schedules that have been assumed for the BA, BO and the environmental impact statement (EIS).

Those schedules assumed 201 turbines installed over 2 years. They are based on specific monthly numbers in the Jasco Applied Science Underwater Acoustic Impact Assessment Report of 10 August 2022 in Appendix B, Table 3. That schedule assumed, over a two-year period, that 35 foundations could be installed in June, 45 in July, 37 in August, 32 in September and 29 in October for a total of 178 installations. But based on the Epsilon 2.6 days per foundation number only 11 can be installed in one month, or 110 turbines foundations in 2 years over that five month period.

This leaves a deficit of 68 turbines foundations not accounted for in the Jasco schedule. About 20 of those might be accommodated in December (2 years) where little installation is currently shown, but this still leaves a deficit of 48 turbines foundations. At a rate of 11 foundation installations per month, the construction schedule for the BO, BA and final EIS would have to extend at least four months into spring and summer of the third year, which raises issues regarding the Take estimates in those documents and the basis for the BO.

### **2. Unrealistic and Realistic Foundation Installation Rates.**

The application does not present a clear statement of and justification for a daily and yearly foundation and wind turbine generator (WTG) installation rate. This is important because it determines the number of years required for construction which directly affects the averaging done for the 24-hour PM 2.5 increment over the 3-year period.

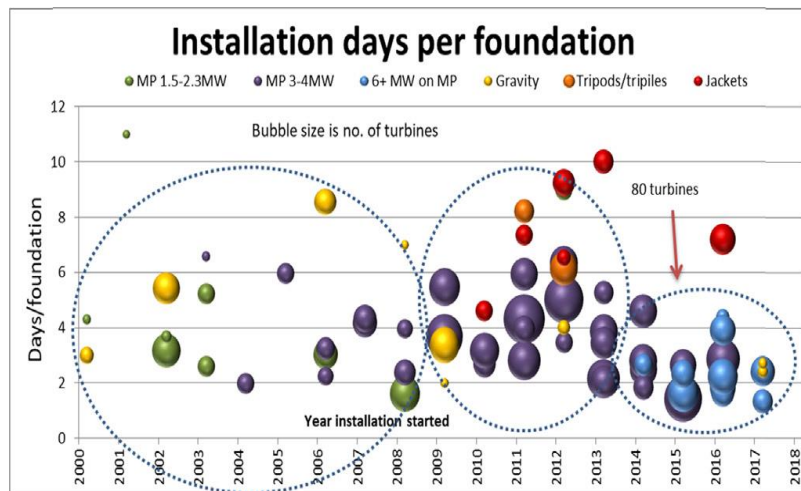
Table I–1 of the application states a project foundation installation of 10 months or 300 day duration and a three year construction period. Assuming that 300 days applies to the 141 segmented turbine project that is a rate of 2.1 days per foundation. The air permit modeling

speaks to a “peak” year of 141 turbines installed, without regard to seasonal restrictions or a rate of 2.6 days per turbine.

These rates are clarified in a letter from Epsilon Associates to EPA Region II of October 28, 2022 stating that “ **foundation installation** would take 62.05 hours(or **2.6 days**) and wind turbine generator (**WTG**) **installation another 35.5 hours (or 1.5 days)** to complete installation at each position”. According to that letter these two activities result in the higher PM 2.5 emissions.

The Epsilon Associates estimate of 2.6 days for foundation installation is supported by real world experience with installation times as shown below.

**Figure 1**



Overall picture of the time taken to install one foundation (without the turbine) for each OWF that has finished foundations installation.

Source: Offshore wind installation: Analysing the evidence behind improvements in installation time, Roberto Lacal-Aránz,\*, José M. Yustab, José Antonio Domínguez-Navarro a Joint Research Centre, European Commission, Petten, The Netherlands Department of Electrical Engineering, Universidad de Zaragoza, Spain.

As shown, the installation time for smaller 6-megawatt (MW) turbines on monopile foundations has leveled out at one every two days. It can only take longer for the larger diameter foundations here for the 15 MW turbine foundations here.

For those foundations, the two days per foundation is low because the steel surface area being driven into the seabed increases significantly for the larger turbines foundations here as opposed to the 6 MW turbines shown above.

The foundation being driven is a hollow cylinder of given diameter and shell thickness. The shell is making contact with the seabed. For the 6 MW turbines the foundation diameters are typically 7.5 to 8 meters (26 feet) with a shell thickness of 3.26 inches. The 15 MW turbine foundations here are 15 meters (50 feet) with a shell thickness of approximately 6 inches.

The circumference area being driven into the seabed for the 15 MW foundations is



approximately 12.3 ft.<sup>2</sup> as opposed to 3.6 ft.<sup>2</sup> for the 6 MW turbine, or 3.5 times as much. This is the area offering resistance to the pile driver. It is therefore reasonable to assume that it will take about three times as long to pile drive one of the 15 meter diameter foundations, as opposed to the 7.5 to 8 meter diameter foundations in the chart above.

This is confirmed by BOEM and Jasco Applied Science data. In its supplemental information for the Vineyard Wind 1 project Biological Assessment of May 11, 2020, the BOEM stated in table 4.1-1 that the time to pile drive a 7.5 meter diameter foundation was about three hours. In its August 10 report, Appendix B, Table 1, Jasco estimates the time required to pile drive a 15 meter monopile foundation at 8.6 hours, or about three times as long.

Considering the increased pile driving time, and longer times for other foundation construction activities for the larger monopiles, the calculation of the 24-hour increment at the BWA requires averaging the yearly 98<sup>th</sup> percentile numbers well into the 3 year period. This permit application has apparently and improperly considered only one year of higher construction emissions and concentrations, and averaged that with two years of lower emissions.

### **3. Ignoring Real World Monthly Constraints on Pile Driving**

The air permit application has ignored the real world constraints on pile driving imposed by its sister agencies.

It has assumed a uniform foundation installation rate throughout the year. But the NMFS Biological Opinion only allows pile driving from May through November.

The air permit application states that it modeled air quality concentration at the BWA throughout the year to be conservative, but this is not likely to be the case since more stable atmospheric conditions conducive to higher modeled concentrations at the shore, are more likely in the summer rather than the winter. Therefore, the air permit application should have modeled construction activities only for those mostly spring and summer months.

The air permit application has not stated the number of hours per day required to pile drive one foundation. That duration can be an important factor in calculating the 24-hour concentrations at the BWA. Depending on that number, there may also be a need to maintain pile driving at night to adhere to annual construction schedules, as discussed further below.

### **4. Improper Averaging of Modeled Concentrations & Likely PSD Increment Exceedance.**

The 24-hour standards and allowed increments at the BWA for fine particulates (PM 2.5) is based on the 98<sup>th</sup> percentile number for a year averaged over three years.

The permit application under review, EPA permit Number: OCS-EPA-R2 NJ 02, has apparently been recently revised to address only one year of air quality modeling of the construction of a “project 1” of 141 turbines, a segmented part of the full 200 turbine Atlantic Shores South Project. But the application still shows in Table I-1 a three year time frame, from 2026 to 2028, for wind turbine foundation and wind turbine generator (WTG) installation. We assume from those apparent contradictions that no air quality modeling of either construction activity or operations and maintenance activity that would logically follow the construction period was done for 2027 or 2028.

Since the allowed 24-hour concentration increments at the BWA are based on a 3-year average of the 98<sup>th</sup> percentile number for each year, this improperly segments the project to artificially

show a low 3-year average concentration at the Wilderness Area based on just one year of construction activity. On the basis of this improper segmentation alone, this permit should be rejected.

The 3-year average for the fine particulate (PM 2.5) 24 hour-increment at the Wilderness Area is shown in Table 5-10 as 0.69 ug/m<sup>3</sup>. Since that is the result of averaging the first year concentration with two years of essentially no emissions, the actual first year concentration must have been three times that or 2.1 µg /m<sup>3</sup>.

We showed above in the Executive Summary and Section 2 above that with realistic assumptions just foundation installation of the full 200 project will extend into the third year. With WTG installation construction activity and associated emissions will encompass the entire three years of the averaging period.

**Assuming then that the 24-hour yearly foundation installation concentrations are comparable, the 2.1 µg/m<sup>3</sup> concentration at the BWA will occur each year and become the proper 3-year average. The emissions from the project's construction will therefore exceed the allowed increment of 2 ug/m<sup>3</sup> for the Brigantine Class I area. Therefore even with the current underestimated yearly modeling as described below, the permit must be denied.**

## **5. Underestimated Daily Construction Emissions**

The air permit application does not state the hours necessary to pile drive one foundation, but in its email of March 29, 2023 Atlantic Shores stated that it expects a single wind turbine generator (WTG) foundation pile driving installation activity to require only a limited number of hours, likely 3 to 6 hours of piling followed by several hours of less intensive transition piece installation and finishing works. It stated that the entire activity is estimated to require fewer than 12 hours of activity per day in a single location before moving to another WTG location

The 3 to 6 hours for pile driving is unrealistically low and not consistent with the assumptions for the BOEM Biological Assessment and the NMFS Biological Opinion. Those pile driving times are based on the August 10<sup>th</sup> Jasco Applied Sciences Noise Exposure Modeling report, Appendix B, Table 1, which assumes that 15,387 strikes are needed to pile drive a 15-meter diameter foundation, which at 2 seconds per strike requires 8.6 hours to pile drive one foundation-assuming no down time.

Three hour pile driving times have only been associated with smaller 7.5 meter diameter foundations according to the BOEM in its supplemental information for the Vineyard Wind 1 project Biological Assessment of May 11<sup>th</sup> 2020. The 3 to 6 hours is also inconsistent with statements made in the air permit application itself on page 1-11 that is anticipated that it will take a maximum of 7 to 9 hours to drive one monopile.

If a time frame for pile driving of 3 to 6 hours has been used in the air quality modeling then that could grossly underestimate the daily concentrations received at the Wilderness area. The pile driving time needs to be disclosed, corrected upward as necessary, and the modeling redone.

The air permit application should have disclosed what size monopile is being installed and how long it will take to embed it in the seabed. It is important to pin down the pile driving hours required because emissions are high during that activity and air pollutant densities at the

Wilderness area could increase for longer pile driving periods, depending on atmospheric conditions, including the degree of fumigation at the shore.

In comments on the air quality model of July 20, 2022, EPA staff raised concerns about the fumigation conditions at the BWA and elsewhere that affects the modeled concentration result. An analysis of the fumigation problem was also requested by EPA staff in a memorandum dated July 7, 2022 to the Modeling Clearing House within the Office of Air Quality Planning and Standards.

It was stated that this would be addressed in the application, and there is some discussion of the fumigation problem in appendix D referring to results shown in Table 2 and modeling files supporting the analysis being sent to EPA Region II. But there is no conclusion stated as to whether that has satisfied EPA concerns.

In its comments to Epsilon Associates of September 30, 2022 the EPA asked that clarification be provided as to whether emission rates used for the short term NAAQS and PSD increment modeling represented maximum hourly emissions, this has not been clarified in the air permit application or the EPA fact sheet, but it must be.

For these hours of construction pile driving activity, the application should have described how maximum hourly emission rates are derived. Again, this is crucial to determining an accurate 98th percentile number for the year. The application should have explained which sources and engines are involved in the pile driving operation, which operate concurrently to create the maximum hourly emissions, and whether there are any overlapping vessel activities and emissions. In internal EPA comments, a statistical analysis was requested to show these concurrently operating emission sources but this does not appear in the permit application or the fact sheet.

## **6. Improper Averaging of Daily Emissions.**

The air quality modeling should have been performed for more realistic hours per day to drive one foundation. Air pollutant densities at the wilderness area could accumulate and increase under stable atmospheric conditions for longer pile driving emission periods.

The modeling should be based on maximum daily emissions only during periods of construction, not averaged with periods of no activity. If the Atlantic Shores modeling has averaged 4-6 hours of pile driving emissions with 18 to 20 hours of no or little emission activity then it has significantly underestimated maximum hourly emission rates and the received air concentrations at the Wilderness area. This needs to be clarified in a revised All these in the water. application.

## **7. Failure to Consider Night Time pile driving**

The extended foundation installation times presented in the Executive Summary and Section 2 point to the potential need to continue pile driving at night to maintain the annual schedules in the Biological Opinion and the proposed MMPA rule making. The air permit application assumes no pile driving at night but the NMFS Biological Opinion allows that. Atmospheric conditions at night are potentially more conducive to higher received air pollutant concentrations onshore particularly in the summer months when the pile driving is concentrated as discussed above. Anticipated night time pile driving therefore needs to be addressed as it may determine the higher 98<sup>th</sup> percentile concentrations at the shore for a given year.

## 8. Monthly Installation schedules

The permit application is apparently based on a uniform monthly number of foundations driven over a 10 month period, which based on the 141 turbines would be 14 per month. The BOEM EIS and Biological Assessment and the NMFS Biological Opinion are based on monthly schedules of 18 foundations in June, 23 in July, 19 in August and 16 in September. These are higher than the 14 per month assumed in the permit application and it is expected that these summer months would have more air temperature inversions and lower wind speeds conducive to higher pollutant concentrations at the shore. Therefore the uniform monthly foundation rate assumption is not as stated in the application a conservative one.

## 9. Unclear Emission sources.

### A. Construction Emissions.

The statement in Section 4.2.1 of the application regarding source configuration for short term air dispersion modeling during construction that the modeling is “centered” on the offshore substation (OSS) install activity, around this activity are six other activities that could potentially occur in the vicinity of the OSS install activity is concerning and needs clarification. Does this mean that only foundation installation and WTG installations close to an OSS installation have been included in the yearly modeling? Does it mean that 141 installations have been modeled, but only at the OSS installation location and not at their real locations?

The application should have modeled the installation of all the 141 foundations and WTG’s at their real locations in the so-called peak year of modeling (see Section 10).

The source configuration discussion in Section 4.2.1 for short term air dispersion modeling during construction provides only a general discussion of activities during construction, it does not list or reference the specific emission sources that are included in the modeling. It says nothing about vessel support emissions which raises concern that the source configuration is not inclusive.

The permit application should be *specific* as to what the short term construction activity is and what vessels are being included in the short term calculations for each year *for pile driving, other foundation installation activities, WTG and offshore substation construction.*

For example, for foundation installation, It should specify whether or not emissions from bulk carriers, medium heavy lift vessels , jack up vessels, towing tugboats, transport barges, and service operation vessels are being included in the calculations. For offshore substation installation, it should specify whether large heavy lift vessels, medium heavy lift vessels, bubble curtain support vessels, towing tugboats, assistance tugboats and transport barges are included in the emission sources and air dispersion modeling calculations. It should also disclose whether any operations and maintenance, or vessel survey emissions occur concurrently with construction.

This is especially needed because on page 117 of the application Atlantic Shores raises a number of issues with respect to what should or should not be included, and it is unclear what the modeling has or has not included.

The EPA has provided some emission source information in its fact sheet but it is not approving its own fact sheet, it is approving a company’s application. This information must be provided in

the application so it is clear that the emissions that EPA is requiring for the air quality modeling are being included in that, as opposed to what Atlantic Shores is asking for. The general statement by Atlantic Shores that it has done the air quality modeling based on *its* interpretation of the EPA rules is unsatisfactory. This must be clarified and the modeling done based on EPA's interpretations of the rules, not Atlantic Shore's.

## **B. Operations & Maintenance Emissions.**

The air permit application does not explain what operation and maintenance activities are being modeled. It would appear that the modeled concentrations are low, considering the high risk of turbine component failure and the level of maintenance and repair expected for these large wind turbines. Prior studies of smaller turbines have indicated a high probability for major maintenance and repairs for a single turbine in one year, and here we have 200 turbines. In addition, the stresses on the larger turbines are greater than that for the smaller ones, pointing towards an even higher frequency of component failure occurrences. Therefore the permit needs to explain what the frequency and risk of component failure is, how it would be addressed, and what emissions would be incurred during these periods.

## **10. Modeling Distances**

It is not stated in the application and therefore unclear what distances from source to receptor are being used in the air quality PSD modeling. The discussion in Appendix C on the plume blight visibility analysis uses (Table 1) the centroid of the wind complex as the source location or 18 miles to the Wilderness Area receptor. The locations of the 24-hour construction emission sources in Figure B.3 of the application also places the foundation and WTG installs close to the center of the project complex, as opposed to the western boundary, which is considerably closer to the BWA.

There is a very significant difference between the distance from the centroid versus the distance from the closest turbine to shore, which is only 9.4 miles. Use of the centroid will significantly underestimate the 98th percentile value for a given year because it will not address the higher concentrations that are expected from the foundation and WTG installs on the western side of the complex.

The yearly modeling should have included the foundation and WTG installs at each of their actual locations to determine an accurate data set of daily received concentrations at the Wilderness area from which the 98th percentile can be obtained.

## **11. Non-Representative Meteorological Conditions.**

The application is using three years of meteorological data taken at the Atlantic City International airport. Such data is not representative of the atmospheric conditions offshore over which the pollutants are transported. Similar data was used by Atlantic Shores in its construction and operation plan (COP) to describe the frequency at which wind turbines would be visible and was found to be very inaccurate. It was in fact dismissed by Rutgers University staff who had sponsored the original study, and who agreed that it was not representative of offshore wind visibility conditions.

It is not clear why the meteorological observations from the Integrated Surface Database discussed in Appendix E, that were used for the visibility blight analysis, were also not used for the air quality modeling. That database appears to have more offshore condition representation.

This issue should have been addressed in the permit application.

## **12. Foundation Size**

The permit application does not specify the foundation size. The BOEM final EIS and Biological Assessment under the Endangered Species act are based on foundations of 15 meters in diameter which are quite large and have not been installed previously, potentially involving longer pile driving and foundation installation times as discussed in the Executive Summary , Section 2 and Section 5 above.

## **13. The Annual Average PM 2.5 concentration.**

The air permit application does not explain how the annual PM 2.5 calculation was done and what was averaged over a year. The application modeling results show a 24 hour PM 2.5 level at the Wilderness Area of 0.69  $\mu\text{g}/\text{m}^3$  and an annual average of 0.003  $\mu\text{g}/\text{m}^3$  . If the modeling portrayed 141 turbines being installed in one year and that involved many days then it is unclear why the annual average would be orders of magnitude lower than the daily number. This should be explained. If it is due to the use of very short time periods for pile driving averaged with long periods of little activity, then the annual calculation would be underestimated for reasons similar to what was discussed in Section 5 above.

## **14. U.S. Fish and Wildlife Confirmation.**

The EPA, in its letter of December 1, 2022, indicated that the application would not be complete pending confirmation from the Fish and Wildlife Service (FWS) that it is satisfied with the impact analysis for the air quality related values at the Brigantine Wildlife Area. We have not seen such confirmation, again raising questions as to why the application was deemed complete and released for public comment. The FWS position on this application should be disclosed.

## **15. Differing Assumptions for Air Quality Modeling versus Air Quality Related Values Modeling.**

They appear to be different approaches taken regarding the two sets of modeling. The application should explain why.

## **16. Use of a New Air Quality Model.**

The permit application is using a new model, the AERCORE/AERMOD approach as opposed to the traditional EPA Guideline model, the Offshore and Coastal Dispersion(OCD) model. The application presents alleged attributes of the new model, but the OCD model was also capable of dealing with offshore pollutant transport. The application presents no study confirming that the new model has been verified by measurement for accuracy for the offshore conditions here. Therefore, at a minimum there should be a demonstration that the new model is conservative with respect to the OCD model. The OCD model should be run with the same parameters as the new model and the two compared before the new model is used here. If the

new model is not conservative with respect to the OCD model, then an explanation is in order as to the reasons for that.

### **17. Alternative Sites, Sizes and Processes.**

The application states in Section 3.9.3 that per New Jersey Annotated Code 7.27–18.3 (c)2 an analysis of alternative sites within New Jersey and of alternative sizes, production processes, including pollution prevention measures, and environmental control techniques, demonstrating that the benefits of the newly constructed, reconstructed or modified equipment significantly outweigh the environmental and social costs imposed as a result of the location, construction reconstruction, or modification and operation of such equipment.

Not with standing the discussion following that paragraph no such alternative analysis for the proposed project has been conducted.

The process by which the New Jersey wind energy area was identified did not include any analysis of alternative sites or energy production options within New Jersey. it only considered limited offshore renewable energy areas that were circumscribed by the charge to the NJ Renewable Energy Task Force that conducted the site area selection process.

The process of awarding subsidies to the wind energy projects by the NJ Board of Public utilities under the Offshore Wind Economic Development Act at no point considered alternative energy sources within New Jersey.

Finally, at no point in the BOEM National Environmental Policy Act review process has analysis of alternative energy sites or energy production processes within NJ been included in any environmental assessments or impact statements, nor for that matter any alternative offshore areas other then the Task Force selected area.

Therefore, this section of the New Jersey Code has not been complied with.

### **18. Measurement and Enforcement**

40 CFR § 55.9 Enforcement states that Outer Continental Shelf (OCS) sources must comply with all requirements of 40 CFR Part 55 and all permits issued under it. Failure to do so is considered a violation of section 111(e) of the Act. All enforcement provisions of the Clean Air Act (CAA), including sections 113, 114, 120, 303, and 304, also apply to OCS sources and permittees.

Given the importance and uniqueness of the BWA, any air permit should include requirements for measurements of air pollutant concentrations at the BWA coincident with periods of offshore wind project construction. It should also have provisions to order cessation of construction activities should those measurements exceed predicted concentrations.

### **19. Liability**

The Atlantic Shores projects 1 and 2 have taken ownership of the air permit from its corporate sponsors, EDF Renewables and Shell New Energy. It is not clear that the project itself has sufficient financial resources or backing to pay for the environmental damages that might occur at the BWA from its activities. It should be stated whether the Atlantic Shores projects

themselves have such resources, or liability coverage in the form of insurance policies, surety bonds, letters of credit or other mechanisms.

This should be confirmed before any permit approval, and provisions for that included in any permit.

## **20. Notice of Intent.**

According to 40 CFR 55.4, a Notice of Intent (NOI) must be submitted to the United States Environmental Protection Agency (EPA) Regional Office for new or modified Outer Continental Shelf (OCS) sources. The NOI must also be sent to the air pollution control agencies of the Nearest Onshore Area (NOA) and any onshore areas next to the NOA. 40 CFR 55.4 only applies to sources located within 25 miles of a state's seaward boundaries.

It is not clear whether such notice was provided for the segmented project of this application.

It is also not clear why the application, once it was deemed complete on 8/21/2023 was not opened for public comment as required.

These should be explained.

## **21. Coastal Zone Management Act Consistency**

The federal Coastal Zone Management Act (CZMA) was enacted by the United States Congress in 1972 (16 §§U.S. Code 1451-1464) and is intended to protect coastal resources with an established goal to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zone.”

The conclusions reached in Appendix F regarding consistency of the project with the State’s CZMA rules rely in many cases only on certain biased sources of information and are flawed. There are numerous provisions of the State’s CZMA rules that are violated by this project. Some examples are provided below.

This project starting 9 miles offshore, with 1046 foot high turbines, closer than any other modern project in the entire world , clearly cannot comply with the visual resource protection provisions of Section 7.7-1.1(e)-1.i of the NJ CZMA rules. This is confirmed by simple geometry, and by the renditions in the EIS and the COP, which even depicting fewer turbines than will actually be seen, show that they are clearly visible from the shore even under overcast conditions.

The attempts by the agencies to dismiss this based on what was called the Rutgers Meteorological study are disingenuous. That study was of an undefined smaller object on land mostly around the Atlantic City airport. Meetings with Rutgers staff confirmed that those frequencies of visibility have nothing to do with the viewing of a 1046-foot high wind turbine off the open ocean.

The project clearly cannot comply with the 200 tourism job loss criteria of CZMA rule Section 7.7-15.4 (c) . Based on several public response survey studies, including the University of Delaware study sponsored by the BOEM, the tourism job losses will be in the thousands. Similarly, the project cannot comply with the net job gain criteria in any given year. The job gain



from the project in the operational years will be less than 100 whereas the tourism jobs are in the thousands and will persist.

There are many other examples where the project cannot reasonably comply with the NJ CZMA criteria, those will be provided in another forum.

## Conclusions

With this notice, the EPA proposes to endorse a cloaked and disingenuous effort to segment the project, and artificially cram its construction into one year so it can artificially average that out with lesser impact over the next two-year period and defeat the air quality protections afforded to the Wilderness area.

The 3-year currently modeled average for the fine particulate (PM 2.5) 24 hour increment at the Wilderness Area is shown in Table 5-10 as 0.69  $\mu\text{g}$  per cubic meter ( $\text{ug}/\text{m}^3$ ). Since that is apparently the result of averaging the first year concentration with two years of essentially no emissions, the **first year concentration must have been three times that or 2.1  $\mu\text{g}/\text{m}^3$ .**

Based on the project's own internal time estimates for foundation and WTG installation described above in the Executive Summary and Section 2, and the NMFS seasonal pile driving restrictions from January through April, the installation of just the foundations for the full 200 turbine project will extend into the spring and summer of the third year of the averaging period. This would require air quality modeling in the spring and summer of the third year, where conditions are likely to be more conducive to higher PM2.5 concentrations at the BWA. With WTG installation the construction period goes beyond 3 years.

**For those three years, assuming that the 98<sup>th</sup> percentile 24-hour PM 2.5 yearly foundation installation PM 2.5 concentrations are comparable, the 2.1  $\mu\text{g}/\text{m}^3$  will then become the minimum 3-year average and the emissions from the project's construction will exceed the allowed increment of 2  $\text{ug}/\text{m}^3$  for the Brigantine Class I area. Therefore even with the current underestimated yearly modeling as described above, the permit must be denied.**

The air permit application also lacks sufficient presentation of key factors and credibility. It needs to be more specific.

For the 24-hour standards and increments, it does not present the emission sources, the maximum hourly construction emissions that were modeled, their duration or the atmospheric conditions that lead to the 98th percentile value for a given year. It does not show how yearly concentrations were averaged.

The EPA should not approve such an exercise in obfuscation and lack of public disclosure, and therefore should not approve this permit. Rather it should have it revised and re-issued for review in a manner that makes the air quality impacts understandable to the public. The EPA should never have deemed the current application complete and issued it for public comment.

For turbine construction, for the daily standards and increments, that revision should include:

- Presenting the hours required and that were modeled for foundation installation, and within that for pile driving versus other activities, and then the hours for WTG installation
- A schedule of the number of foundations and WTG's constructed by year and month

- The yearly 98th percentile concentrations at the Wilderness area that were averaged over three years to compare to the PSD allowed increments.
- The day and month of each year that resulted in those yearly 98th percentile concentrations
- A description of the construction activity and a specific listing of all the emission sources that contributed to the 98th percentile concentration days, including vessel support
- The maximum hourly emission rates from those sources on those 98<sup>th</sup> percentile days
- The hourly duration of those maximum emissions during those days
- A description of the atmospheric stability, wind and other conditions for those 98th percentile days, and
- the distance from the emission sources to the receptor involved.

The same information should be provided for the maintenance and operation 98th percentile numbers.

For the annual standards, the revised application should show how that was calculated from the daily results.

In its letter of December 1, 2022, to Epsilon Associates stating that the application was not complete, the EPA identified a number of defects which have since not been demonstrated including statistical justification to address the potential for overlapping impacts and how intermittent emission sources are being addressed.

The EPA also indicated in that letter that it was awaiting confirmation from the U.S. Fish and Wildlife Service that it was satisfied with the modeling of the air quality related values. We have not seen such confirmation as discussed above in Section 14 above. Therefore, it is unclear why the application was later deemed complete.

In its letter of August 21, 2023 to Atlantic Shores, EPA deemed the application complete but also provided in Attachment 1 of that letter critical information that “must be supplemented” to support approvability of the project. This seems to be a contradiction of terms and a number of those issues have not been addressed in the current application including the modeling needed over a full 24-hour period.

This air permit application should be returned to Atlantic Shores and substantially revised to see if the revised modeling can meet the PSD allowed increments. It does not appear so based on the problems identified here.

If the application is reissued for comment It must present a transparent and clear case for the public to review and determine whether the justifications are plausible.

Provisions should be provided for in any permit approval for measurement confirmation of modeled results and cessation of construction activities should those measurements exceed predictions.

Given the uniqueness of the Brigantine Wilderness area, provisions should also be provided for in any permit approval for periodic inspection of the area and compensation from Atlantic Shores for any damage to the Wilderness Area.

Please advise whether these comments, along with others, will be placed in a public Docket and how they will be responded to.

Sincerely

*Bob Stern, Ph.D*

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