

From: [Sandra Craig](#)
To: [DeMeo, Sharon M.](#)
Cc: [DeMeo, Sharon M.](#)
Subject: Public comment: Re: NPDES Draft Water Permit issued by EPA for SouthCoast Wind Project
Date: Wednesday, November 6, 2024 12:12:52 PM

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Environmental Protection Agency
Sharon DeMeo: demeo.sharon@epa.gov.

Re: NPDES Draft Water Permit issued by the US EPA New England for SouthCoast Wind Project BOEM Renewable Lease Area OCS-A 0521 in MA.

*Please confirm receipt of this email submission.
November 6, 2024*

Dear Ms DeMeo:

Please see below my comments and objections to EPA proposed issuance of NPDES Draft Permit No. MA0006018 for SouthCoast Wind's OCS-DC1 offshore substation's open loop once through cooling system that takes in and discharges seawater for non-contact cooling of heat produced in the conversion of electricity from AC to DC.

The Draft Permit as written, has several deficits that must be addressed in order to ensure compliance with the Clean Water Act which aims "to restore and maintain the chemical, physical, and biological diversity of the Nation's waters." 33 U.S.C. § 1261(a). The Draft Permit falls woefully short of this aim, and violates not only the CWA, but regulations promulgated by EPA pursuant to the National Pollutant Discharge Elimination System (NPDES) to effectuate them. The Draft Permit No. MA0006018 does not protect the environment; instead it will contribute to permanently destroying an essential and sensitive habitat for endangered and threatened species, and imperil them in the process.

I. General Comments:

Permittee SouthCoast Wind's offshore wind project envisages using OCS-DC1 to collect the high voltage AC power generated by dozens of wind turbine generators (WTG), and convert it to high voltage direct current (HVDC) for transmission to onshore electrical infrastructure in Massachusetts. (P 53/125 draft permit.) SouthCoast Wind applied to the EPA for an NPDES permit for OCS-DC1, authorizing pollutant discharges and cooling water withdrawals of 9.9 MGD (million gallons per day) at one of two new cooling water intake structures (CWIS) as part of its offshore wind farm project. The EPA has noted that it is only considering the permit in question, and is not taking a cumulative approach.

Located within an area recommended by the New England Fishery Management Council as a *Habitat Area of Particular Concern* for cod spawning and complex habitats, SouthCoast Wind farm is in close proximity to Nantucket Shoals. The area where it is located has also been identified as having high foraging value for the endangered North Atlantic Right Whale. This area also is a designated Essential Fish Habitat for 44 fish species and invertebrates.

The construction and operation of the massive industrial scale OSP and CWIS here in question— to mention a few components, involves the use of tons of steel, other metals, concrete, plastics and the heavy equipment, the chemicals, fuels and lubricants necessary to build, transport, install and operate the facility. The 4 supports to hold up the OSP are pounded into the seafloor which would have been previously leveled; the seafloor beneath the OSP eventually will be covered with acres of scour protection; the cable corridors for the incoming and outgoing inter-ray and transmission cables also must be dredged to allow them to be laid. Dredging will disturb the sediment, and the sediment plume created will blanket sand or mud dwelling benthic creatures in the process; one such creature, the sand lance is a food source for cetaceans. The conversion of massive amounts of AC to DC power gives rise to EMFs, particularly at and around the entry and exit of inter-ray and transmission cables. The process generates tremendous heat that must be cooled to allow for the converter to operate. The cooling process results in the impingement and entrainment of aquatic life, which according to NOAA can result in 100% mortality of these organisms (discussed below).

The Environmental Protection Agency (EPA) has articulated NPDES regulations and standards that spell out the general requirements of the Clean Water Act in terms of site specific provisions tailored to the activity discharging pollutants. The CWA specifies, "Any standard established pursuant to [section 1311 of this title](#) or [section 1316 of this title](#) and applicable to a [point source](#) shall require that the location, design, construction, and capacity of

cooling water intake structures **reflect the best technology available for minimizing adverse environmental impact.**” 33 U.S.C. § 1326(b). Several years ago, the EPA promulgated CWIS standards and rules for “new and existing facilities”, specifically including facilities discharging more than 2MGD (million gallons per day). While the EPA acknowledges the CWIS in question essentially is a “new facility”, and despite satisfying the basic terms of the New Facilities Rule, EPA determined that the proposed SouthCoast Wind OCS-DC1 is not covered by the New Facilities Rule. *As such, EPA decided that CWIS requirements for the Facility should be developed based on a case-by-case, Best Practices Judgement application of CWA § 316(b).* See 40 CFR § 125.90(b). EPA reached this conclusion because siting a CWIS well offshore in ocean waters poses distinct issues that were not considered by EPA when it originally developed and promulgated the “New Facilities Rule”. EPA has consistently addressed *offshore* facilities differently from other facilities and has taken the same approach for SouthCoast Wind’s OCSDC1.

Nevertheless, I take issue with this approach.

The CWA was enacted “to restore and maintain the chemical, physical, and biological diversity of the Nation’s waters.” The CWA mandates that NPDES standards require the design and construction of CWISs that “reflect best technology available in order to minimize adverse environmental impact.” 33 U.S.C. § 1326(b). As written, the Draft Permit fails to require, indeed EPA rejected, any technology, for example, a closed-cycle cooling system, that will substantially limit environmental harm, reduce impingement and entrainment of phytoplankton, zooplankton and copepods, eggs, larvae or other marine organisms, and protect rather than destroy protected or essential habitat in the process of the intake and discharge of almost 10MGD of seawater. While the permittee may propose which technologies to use to achieve pollutant parameters, the EPA is charged to determine the requirements needed for each facility to “achieve the best technology available for minimizing adverse environmental impact at that facility.”

EPA failed in this duty to achieve these statutory objectives: the Draft Permit does not adequately or sufficiently determine the sampling, monitoring or reporting SouthCoast must perform to maintain the integrity or water quality of the ocean, or protect the creatures that live in it. The cost or difficulty or delays caused by installing such equipment or implementing such sampling and monitoring must not be the reason for extending flexibilities or the controlling consideration in light of the magnitude of the risks involved, the impacts to threatened or endangered species and the harm caused to their habitat -ie., existential harm.

Off shore wind development in the North Atlantic is new and evolving as a technology and it is happening in the midst of climate change with a concomitant lack of empirical data to rely upon. In the absence of the latter, if the EPA relies on models or estimates, at the very least, EPA must demand compliance with the standards enacted to protect rather than tolerate, or indeed permit the degradation of the ocean. In the exercise of their “best professional judgement”, when doing so on a “case by case basis” or prescribing that “sufficiently sensitive EPA-approved methods” be used for analyses of pollutants or pollutant parameters (Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting Rule.7), the EPA may not forget the overarching objective of the CWA: to protect our National waters and minimize adverse impacts on them, and in particular minimize impingement where endangered, migratory, sport or commercial species are threatened.

Lack of Cumulative approach:

I object to EPA’s taking a case by case approach to issuing the Draft Permit in question, rather than applying the CWA’s provisions for new facilities (based on *its* Best Practices Judgement), specifically without considering the cumulative effects of the intake and discharge of 9.9 MGD millions of gallons per day of organism rich seawater from SouthCoast’s proposed OCS-DC1 CWIS, *along with the impacts from 2 or more additional converter substations and the 149 wind turbines it plans to construct, and all the other OSW projects either already up and running or in various stages of permitting.* Discharged water from this facility and presumably the additional 2 or more substations will be allowed to be heated to a maximum of 90 degrees F, chlorinated and contaminated with various pollutants, including, storm water run off containing oils, grease, SF6, glycol among others. The entirety of the SouthCoast project will be in close proximity to OCS-DC1, and as well to all the other wind farm lease areas which are currently proposed, or at various permitting stages under construction or up and running.

In addition, the EPA in its Draft Permit does not adequately take into consideration that, “in addition to its proximity to Nantucket Shoals, the OCS-DC1 and the entire area of the wind farm project is located within the area recommended by the NEFMC as a Habitat Area of Particular Concern (HAPC). Specifically, the OCS-DC1 location has been designated by NOAA Fisheries (27) as a HAPC for Summer Flounder Submerged Aquatic Vegetation (SAV). (28) NOAA Fisheries (29) has also identified this area as containing high foraging value for the endangered North Atlantic right whale, particularly during winter and spring months.” See 40 CFR §§ 125.122(a)(3), (4) and (5). See also Final Southern New England Habitat Area of Particular Concern Framework (February 2024).

The project area is also a productive area for commercial and recreational fisheries. See 40 CFR § 122.122(a)(6). The highest revenue commercial fisheries in the project area include summer flounder/scup/black sea bass, mackerel, squid, butterfish,

small-mesh multi-species, and monkfish. The top ten species with the highest economic importance in the area (independent of combined fishery management plans) include Jonah crab, long-fin squid, summer flounder, scup, silver hake, monkfish, golden tilefish, American lobster, sea scallop and skates. See 40 CFR § 125.122(a)(7). Draft EIS, pp. 5.5.5-56 - 57.

The Draft Permit does not adequately protect against or mitigate the cumulative adverse effects from the killing - by entrainment or impingement —of billions of marine organisms, nor consider the interactions between primary production and other species, the impact on CO₂ emissions and O₂ production (Falkowski, 2012), and the effects on endangered species, including the NARW.

Before issuing a permit, the EPA (and BOEM) must analyze the interactions of all the stressors in the 22 million acres of planned off shore wind development in the Outer Continental Shelf. Individual stressors do not act in isolation and can have a negative synergistic effect that can accumulate and exponentially increase environmental damage. (BOEM, Draft Strategy for the NARW, p. 3).

EPA should not allow SouthCoast Wind or any other off shore wind developers to continue further development until a cumulative impact assessment includes a complete programmatic review and a full assessment of all interactions.

Conservation Status Must Be Considered:

The Draft Permit fails to consider the direct, indirect, and cumulative impacts of SouthCoast Wind on individual species in light of the species' particular conservation statuses (Table 4. Federally listed ESA Species Expected to Overlap with the OCS-DC1 Action Area.) Without this species-by-species analysis, the EPA cannot meaningfully consider the effects of SouthCoast Wind on the marine environment. EPA must go back and actually examine the cumulative impacts of the wind farm on a species-by-species basis using the most up-to-date models and telemetry data. EPA must also be transparent about uncertainties and gaps in the data and adopt a precautionary approach where endangered and protected species are at risk.

Biodiversity Threatened:

Executive Order 14008 mandates that the federal government support renewable energy projects that “conserve our land, waters, and biodiversity.” Mortality risk to endangered species, potential introduction of invasive organisms, and known, anticipated degradation of off shore marine habitat from the Project will all threaten biodiversity, violating Executive Order 14008's mandate. Moreover, given the health consequences of biodiversity loss, expansive wind farm installations could violate the internationally recognized Human Right to Health (UN, 2000). The federal government has an obligation under international human rights law to protect biodiversity as an important factor in human health (Hamley, 2022). Wind energy has documented risks to biodiversity (Voigt, 2019). The Draft Permit does not consider the latest scientific findings from the North Sea on biodiversity loss, nor does it address the relationship between biodiversity loss and human health.

Assumption of Habitat Replacement:

EPA minimizes the impacts of the project on marine life by insisting that marine creatures can simply avoid the OSS's and eventually the WTG's and find other habitats available elsewhere; however, this does not account for the fact that many species affected by SouthCoast Wind exhibit high site fidelity and as a result, may be less likely to simply move elsewhere. It also fails to account for the cumulative impact of the other projects in the lease area and how interactions between stressors might preclude the species from utilizing the “replacement” habitat. EPA must fully examine the impacts on wildlife that will occur from the loss of habitat, particularly on those species that exhibit high site fidelity, exhibit the location and availability of alternate habitats, and offer concrete evidence to support its assumptions that the impacts will be “minor” due to the existence of other suitable habitats

Sediment Plumes, Toxic Compounds, and Heavy Metals:

During construction and installation, jet plows, impact pile driving, leveling the seabed and laying scour protection, and currents flowing across the underwater and benthic portion of the OSS (substation converter) and associated transmission cables entering or emanating from the facility will re-suspend toxic heavy metals (Chen, 2022), re-introducing them into the food supply chain and threatening marine mammals (Huang, 2022). It is a well known historical fact, since the time of the industrial revolution, toxic compounds and heavy metals have settled not only in the lease areas off Rhode Island, particularly in Narragansett Bay, but in the Sakonnet River and the area of the EAST Passage where the transmission cables will run to shore. Bioaccumulation and biomagnification can increase the potential harm these compounds can cause. But, in SouthCoast COP Volume II, Section 5.2.2, in spite of the admission that “sediment chemistry data for the Sakonnet River was not available”, it was assumed “based upon the down-bay gradient, the river sediment contaminant concentration should be less than that of Mount Hope Bay. <https://app.box.com/s/nzzb6v51h3etuablbdzyunonpuwmxj1h> page 119/806. The sediments of

Mount Hope Bay showed evidence of contamination by heavy metal and organic pollutants, including arsenic, chromium, copper, iron, lead, mercury, to name a few. (Table 5-17). SEDIMENT CHARACTERISTICS AND CONTAMINANT CONCENTRATIONS FOR MOUNT HOPE BAY. This lack of testing and basing protocols without sufficient data, is a violation of the Clean Water Act (33 U.S.C §§ 1251 et seq.) and Seafood Safety Regulations (21 C.F.R. § 123).

The Draft Permit fails to adequately consider the implications or the significant health consequences of re-suspending sediment, toxic compounds in this area, and completely neglects to require prior testing of sediment, or to incorporate the latest scientific findings.

Introduction of foundation structures and associated scour protection:

EPA points out, the existing fine sand or sand/mud benthic habitat in the vicinity of the OCS-DC1 will likely be transformed into higher complexity habitat by introduction of the foundation structures and associated scour protection of the WTGs and the base under OCS-DC1. This, in turn, will likely alter the diversity and density of the biological community in the project area similarly to the way that artificial reefs affect the marine environment. See 71 Fed. Reg. 35014. See also Langhamer 2012; Glarou et al. 2020; Degraer et al. 2020.

This impact has not adequately been considered and should be, before issuance of the Permit. While marine life will attract to any introduced structure (unless repulsed by EMF's), that is not always a good thing. SouthCoast's project, indeed each offshore wind project should go through a siting and permitting process similar to what is required for artificial reefs given the material alterations to natural habitats and naturally occurring populations in the area. There has to be a scientific basis to assume this alteration restores or improves natural habitat resources. It is not sufficient simply to assert mitigation will benefit the natural ecology. Moreover, the possibility entrainment and impingement of any potential new species introduced as above described must be considered before issuance of a permit.

Water Pollution:

In addition to failing to consider the impacts of the resuspension of sediment, toxic compounds and heavy metals in the area of the substation converter, the Draft Permit also does not consider the cumulative impact of other interactions between aspects of the project that may degrade water quality. For example, The anti-corrosive coating on the OSS structure and wind turbines may leach significant levels of toxic heavy metals (lead and cadmium) (Reese, 2020) into the water. It is estimated that 50 gallons of marine paint will be used each year for touch ups. Besides its likely contribution to fugitive air borne emissions, this paint will chip and fall into the sea. Leading edge erosion emits microplastics containing Bisphenol A (BPA) and per- and polyfluoroalkyl substances (PFAS), known as "forever chemicals" if discharged into the ocean, will contaminate the marine food chain. Contaminating water in an area essential to fishing may violate the Clean Water Act (33 U.S.C §§ 1251 et seq.) and Seafood Safety Regulations (21 C.F.R. § 123). The Draft Permit does not adequately address this significant impact on the marine environment (or on human health). (https://docs.wind-watch.org/Leading-Edge-erosion-and-pollution-from-wind-turbine-blades_5_july_English.pdf). Indeed, a cavalier attitude is displayed when a "Bypass" of effluent limitations is allowed, and even anticipated (Draft Permit p23/125) when there is an "Upset", i.e., when conditions are beyond the permittee's control (Draft Permit p24/125). Moreover, notice can be also given of planned "non-compliance". How does this ensure the environment is being protected?

It is baked into the Draft permit, that SouthCoast can change its practices even if it means "increasing the quality or nature of pollutants discharged" (Draft Permit p25/125). Moreover, it is required to report an excess, but not required to halt operations; in fact, the permittee has 5 days to correct non-compliance. (Draft Permit p 26/125).

A lot of damage can occur in this time period. The appropriate approach would be to mandate halting operations when irreparable harm as proscribed by the Ocean Discharge Criteria Regulations (discussed below) will occur.

EMFs:

The Draft Permit does not consider the impact of EMFs in the vicinity of OCS-DC1 due to transmission cables entering and exiting the converter. EMF's could mask the ability for EMF-sensitive species to appreciate the earth's electromagnetic field. Sharks and other long-range migratory species use the earth's magnetic field to navigate. If local EMF's overwhelm the faint alterations in the earth's magnetic field that alert species to their location, then the project could devastate their ability to navigate, find food sources, and procreate. The EPA needs to consider the EMFs from a more global perspective.

Seismic Surveys:

The Project, like other offshore wind projects, uses high voltage, boomers (3000 V), sparkers (20-200Hz), and multi-beam echo sounders, side scan sonars (100-500 kHz), shallow and mid penetration sub-bottom profilers, ultra short baseline positioning equipment, and marine magnetometers to collect their high-resolution geophysical maps of the seabed, including the area of OCS-DC1. These mid-frequency seismic ranges can cause rectified

diffusion, which can initiate decompression sickness in marine mammals independent of any effect on the behavior of the animals. Decompression sickness can disorient, cause hearing loss, unconsciousness, and death. Moreover, all of these symptoms increase the risk of ship strikes. The Draft Permit fails to address this issue. The correlation between the unprecedented numbers of coastal whale deaths (UMEs) and the increase in seismic survey activity suggests that the Project may violate the MMPA and the ESA, and must be researched before any approvals are given.

Ocean Currents: Considering the Executive Order's dictum to tackle the climate crisis both at home and abroad, the the Draft Permit does not consider the global implications of the project's effect on ocean currents, wave height, and temperature stratification. EPA knows that offshore wind projects will decrease wave height, diminish current strength, and alter temperature stratification from BOEM's hydrodynamic modeling study (HDM, BOEM_2021-049). These changes could alter both the Atlantic Meridional Overturning Circulation (AMOC) and the Gulfstream. Because any decrease in the Gulfstream or the AMOC can have dramatic effects on currents, sea-level rises, (Goddard, 2015), and global weather patterns (Carrington, 2021), EPA should not issue any permit until these hydrodynamic changes are considered (and addressed by appropriate government agencies) in a global context, as the executive order indicates.

Local Climate:

Wind farms can increase local water and air temperatures, redistribute humidity, and alter atmospheric flow, thereby modifying local weather patterns and regional climate (Miller, 2018). The substation converter will in its operation raise ambient water temperatures sufficiently to affect fish larvae (Moyano, 2017), ocean currents (Christiansen, 2022), and vegetation (Diffendorfer, 2022). The EPA fails to adequately consider or to adequately address this issue. Relying on assumptions, models, and untested and unproven Best Judgment practices is not a sufficient approach, nor justification to be content with unknown and potentially significant adverse environmental impacts.

II. THERMAL Impact

Heat, considered a pollutant under Section 502(6) Clean Water Act, can affect metabolic and reproductive activities of aquatic organisms, and can be life threatening.

The EPA acknowledges prohibition of discharges *that alter the daily temperature cycle of the water body in magnitude or frequency*. (Draft Permit P62/125). This is because rapid change in ambient temperature affects marine life since the solubility of O₂ decreases as water temperature increases. This can impact the speed of egg development and the growth of offspring. Draft EIS p3.5.5-41, see also The Gold Book National Recommended Water Quality Criteria Table.

It is unclear what will actually be the maximum temperature of the 9.9 MGD millions of gallons per day of discharged effluent of OCS-DC1. The Draft Permit sets the maximum discharge temperature at 90 °F, but SouthCoast forecasts it will remain at 86°F, 83.3°F - or 79.5°F.

SouthCoast adjusted its forecast down from 86°F, by basing its calculation on "average monthly intake flow and variable speed drives" *of a proposed similarly sized wind-powered electric generating facility, using that data to estimate average monthly cooling water outfall temperatures*. The forecasted average monthly temperature is unvaryingly 26.4°C (79.5°F) from September through November and most of July and August. Id., (Draft Permit p. 12/14.)

It defies reason to assume outflow temperature will remain constant given the changes that will occur during operation, and the likelihood of fluctuations in the ambient temperature at the intake point, given climate change and industrialization of the 22 million acres of planned off shore wind development on the Outer Continental Shelf. **Nonetheless**, based on this model, EPA adopted SouthCoast's figure of 79.5°F (26.4°C) in the Draft Permit—but this forecast is not based on actual data and should not be relied upon given the significant part temperature plays in entrainment survival.

ii. The EPA has long held that all organisms passing through a facility's cooling water system would experience 100 percent mortality. (See EPA's 1977 Guidance for Evaluating the Adverse Environmental Impact of Cooling Water Intake Structures on the Aquatic Environment: Section 316(b) P.L. 92-500 (U.S. EPA, 1977).

The EPA reviewed entrainment survival studies: overall, the unreliability, variability, and unpredictability of entrainment survival estimates *support the use of the assumption of 0 percent survival in the benefits assessment*. There is no clear indication of any defensible estimate of survival substantially different from *0 percent* to use to calculate benefits for this rule. (page14/52: Section 316(b) Phase II Final Rule- Regional Studies, Part A: Evaluation Methods. Chrome [extension://efaidnbnmnnibpcajpcgclefindmkaj/https://www.waterboards.ca.gov/rwqcb3/water_issues/programs/duke_energy/docs/usepa_entrainment_survival.pdf](https://www.waterboards.ca.gov/rwqcb3/water_issues/programs/duke_energy/docs/usepa_entrainment_survival.pdf)

Given the sheer volume of hot water that will be discharged every day, and the estimated rather than actual temperature measurements proposed, SouthCoast must be held to conduct continuous thermal monitoring, as well as complete an Ambient Thermal Monitoring Study to confirm intake impacts, and furthermore, confirm that the extent and magnitude of the thermal plume is in fact equal to or less than forecasted modeling results.

III. Chemical Effluent :

Storm water run off and Oil and grease:

EPA acknowledges that Storm Water will come into contact with equipment, will be contaminated with oil and grease, and eventually will fall into outdoor drip trays; it will be then directed to a hazardous drain header, and on to a passive oil/ water separator (OWS) which is supposed to detect presence of oil over 5ppm. If the level is over that amount, it will be directed to a closed drain tank or bunker. But the closed drain tank will also be receiving discharges from converter transformer drain pits, back up generator and automatic diesel cleaning unit(s). All these contaminated fluids will be directed to an off shore transfer vessel for transport to an on shore treatment facility. Unfortunately, water contaminated with under 5ppm of oil will be discharged into to ocean.

Given harsh ocean conditions, to assure correct operation, EPA requires the flow through separator must be maintained at or below the maximum design flow rate, and that automatic alarms or diversion devices be activated when oil storage or capacity has been reached. (Draft Permit p 56/125). Hence, maintenance of these components is essential. (Draft Permit P 18,19/85) It is unknown what quantity of water contaminated with under 5ppm of oil will be discharged into the ocean. Unfortunately, due to danger, safety and logistical concerns, Oil Water Separator (OWS) waste water cannot be sampled during storms. And storms in the Northwest Atlantic arise with little or no notice. If a full closed drain is not emptied into an off shore transfer vessel before a major storm, or if there's a malfunction at any step of the way, to where will the contaminated water be directed?

Unsurprisingly, it is anticipated there will indeed be excesses over 5ppm since the Draft Permit requires a report of such excesses. (Draft Permit P57/125). Indeed EPA said in its September 23, 2024, Comment Matrix, "if EPA determines the "OWS's are not reliable" or their "analyzers won't reliably measure oil in water to the level of 5ppm," the EPA can "modify the permit" and require storage and subsequent treatment of storm water subject to industrial activity. Given that storage space on the substation is quite limited, and accidents can happen— indeed it is anticipated they will happen— coupled with operational uncertainties, and post incident correction delays, a Draft Permit should not be issued without specific provisions to actually prevent discharges that exceed the limits.

Furthermore, while the Draft Permit requires general BMPs for stormwater associated with the converter platform operation, the Draft Permit additionally requires the Permittee to develop, implement, and maintain a SWPPP for stormwater discharges associated with the converter platform operation. The SWPPP must contain the following elements (listed in Parts 6.2.1 through 6.2.5 of the 2021 MSGP) • Stormwater pollution prevention team; • Site description; • Drainage area site map; • Summary of potential pollutant sources; • Description of all stormwater control measures; and • Schedules and procedures pertaining to implementation of stormwater control measures, inspections and assessments, and monitoring.

The development and implementation of the SWPPP is an enforceable element of the permit. As the goal of the SWPPP is to reduce or prevent the discharge of pollutants to waters of the United States either directly or indirectly through stormwater runoff, unless and until the SWPPP is developed, with specifics regarding the selection, design and installation of control measures to meet the permit effluent limitations, the Draft Permit should not be issued.

pH:

The hydrogen-ion concentration in an aqueous solution is represented by the pH using a logarithmic scale of 0 to 14 standard units (S.U.). Solutions with pH 7.0 S.U. are neutral, while those with pH less than 7.0 S.U. are acidic and those with pH greater than 7.0 S.U. are basic.

Discharges with pH values markedly different from the receiving water pH can have a detrimental effect on the ecosystem. Not only can sudden pH changes kill aquatic life, but pH can also affect the toxicity of other pollutants in the water. In open ocean environments with substantial water depth, a discharge should not change the receiving water pH by more than 0.2 S.U. outside of the naturally occurring variation or cause the pH to be outside of the range of 6.5 to 8.5 S.U. See EPA 1986 Quality Criteria for Water ("Gold Book"), p. 233.20.

As the Facility's discharge will be primarily comprised of once-through cooling water, EPA does not expect the pH of the effluent to be altered by more than 0.2 S.U. from the pH of the influent. However, the OCS-DC1 is unmanned and EPA only proposes monthly monitoring of the ambient pH (representative of the natural range) and effluent pH during commissioning to demonstrate that the pH of the effluent remains within the expected range of 6.5 to 8.5 S.U., and that the change in pH is not more than 0.2 S.U. outside of the naturally occurring variation. P 61/125 Ph

This frequency of monitoring is insufficient; The Draft Permit should mandate more frequent monitoring given the risk to aquatic life caused by sudden pH changes.

Sodium Hypochlorite: Chlorine Bleach:

i. Chlorination is one of the most widely used techniques for controlling biofouling in power plant cooling water systems. As such, massive quantities are discharged into the sea. Chlorine bleach will be discharged in outfall from SouthCoast's OCS-DC1 at quantities estimated between 64 to 95 kilograms per day. Both heat and the sodium hypochlorite are pollutants under CWA § 502(6). (P17/85 Fact Sheet).

Besides heated and chlorinated effluent from the heat exchange systems, periodic, pressure-based backwash from the in-line seawater filters also will be discharged, as well as effluent from intermittent shock treatment with chlorine to eliminate

accumulated biofouling, plus contaminated run off and oils, all in the area beneath the CWIS into the Atlantic Ocean. The proposed system will continuously generate sodium hypochlorite (NaOCl) by seawater electrolysis (electrochlorination). Doses between 1 part per million (ppm) and 4 ppm of hypochlorite will be injected continuously into the suction side of the intake with projected mass of chlorine discharged **daily of 63.5 kg**, assuming a typical flow of 6.81 million gallons per day (MGD) and **95 kg during maximum discharge flow of 9.9 MGD**. See NPDES Permit App, Comment Response Matrix, March 2023. (Draft Permit P18/85). In-line analyzers are supposed to continuously monitor the hypochlorite concentration of the discharge. However, the system itself will require regular cleaning and maintenance, and **"the analyzers need to be recalibrated regularly."** SouthCoast Wind Responses to EPA Comments (included in Excel spreadsheet attached to email dated August 5, 2024).

The Draft Permit should not be issued without maintenance and recalibration requirements specifically mandated. Monitoring backwash discharge should also be required as an additional safety check, as should analysis of intermittent shock treatment injection of chlorine to eliminate biofouling. The permit should not be issued without these measure and precautions specifically mandated.

ii. The Draft Permit proposes water quality-based TRO (Total Residual Oxidants) limits of 7.5 µg/L (0.0075 mg/L) as an average monthly value and 13 µg/L (0.013 mg/L) as a daily maximum value at the outfall. SouthCoast expects compliance with these TRO limits will be sufficient to protect aquatic life and consistent with technology available that can achieve chlorine concentrations near zero.

However, **EPA acknowledges that currently available analytical methods cannot detect TRO at the level of the water quality criteria.** To satisfy "sufficiently sensitive" compliance, in accordance with the National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting Rule, in situations where no EPA-approved methods for a pollutant can achieve minimum levels low enough to assess reasonable potential or to monitor compliance with a permit limit, *applicants must use the method with the lowest minimum level among the EPA-approved methods for the pollutant.*

As a result, EPA has set a compliance level of 30 µg/L for TRO in the Draft Permit, which is equivalent to the minimum level for the analytical method that has the lowest method detection limit of the methods approved under 40 CFR Part 136.

However, SouthCoast has indicated, "additional periodic sampling will need to be performed "to confirm accuracy level when [the] platform is visited." SouthCoast Wind Responses to EPA Comments (included in Excel spreadsheet attached to email dated August 5, 2024).

Given this lack of specific analytical methods, rather than SouthCoast opining on the need for additional "periodic" sampling, EPA must require a sampling schedule that will in fact protect aquatic life, and consistent with all technology available, achieve chlorine concentrations near zero, particularly given the need for the regular recalibration of the analyzers as above mentioned.

iii. Chlorination often leads to the formation of chlorination by-products (CBPs). Amongst these, trihalomethanes (THMs) are more predominant, relatively long-lived and are toxic to organisms. THM levels in the coastal marine environment are of great concern. https://www.researchgate.net/publication/286940480_Chlorination_by-products_and_their_discharge_from_the_cooling_water_system_of_a_coastal_electric_plant

EPA acknowledges: "Chlorine and chlorine compounds are toxic to aquatic life. Free chlorine is directly toxic to aquatic organisms and can react with naturally occurring organic compounds in receiving waters to form toxic compounds such as trihalomethanes." <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.epa.gov/system/files/documents/2023-05/draftma0004940permit.pdf>

The Draft Permit must require an analysis of possible concentration levels of THMs at various points in the cooling water system. Relying on "typical operating conditions", "reasonable potential" or "sufficiently sensitive" or "If the electro-chlorination is operated at proper dosage" assuming chlorine will be "completely consumed by the process" or assuming the discharge of chlorine will be "minimal under normal operation" — anticipates -indeed accepts —the fact that malfunctions or abnormal operations will occur and may result in formation of toxic compounds. It is an inadequate response to provide for mitigation after trihalomethanes have been formed. This approach clearly does not adequately protect marine life and violates the CWA.

Glycols:

Glycols including ethylene glycol, 1,2-propylene glycol, and diethylene glycol are widely used as heat transfer fluids and for deicing. There is limited data available regarding the toxicity of glycols to marine organisms. However, high glycol levels in a waterbody typically corresponded to higher BOD and COD levels, as glycols exhibit high levels of oxygen demand. Glycols do not have numeric water quality criteria, but they are oxygen demanding substances that may impact dissolved oxygen concentrations in the receiving water. P58/125 Draft Permit

Given the toxicity, and the anticipated possibility of the potential discharge of glycol related to inadequate treatment, human error, and/or equipment malfunction, the draft Permit should not allow the use of Glycol in this facility.

Sulfur Hexafluoride (SF6):

Sulfur hexafluoride (SF6) is used on wind turbine generators (WTGs) and offshore substations (OSSs) (also known as electrical service platforms (ESPs)). SF6 is used in switchgear, as an electrical and thermal insulator in electrical equipment, but it is also a powerful greenhouse gas, having a global warming potential (GWP) of 23,500 times that of carbon dioxide (CO2). SF6 has the highest GWP out of all the greenhouse gases addressed by the Intergovernmental Panel on Climate Change (IPCC) inventory protocols. Moreover, the effects of SF6 emissions on the climate are permanent and cumulative because of the long life of SF6 in the atmosphere (estimated half-life is 3,200 years).

While the electrical equipment that contains SF6 is designed to be sealed in order to minimize emissions of the gas to the atmosphere, the EPA acknowledges that SF6 gas can escape into the atmosphere as leaks due to aging over the 20 to 35-year lifetime of the equipment. EPA also acknowledges SF6 gas can be released during equipment manufacturing, installation, maintenance, servicing, and de-commissioning, thus not exclusively from what is usually considered a leak associated with faulty, damaged, or otherwise compromised equipment. See EPA's Assessment of the Use of Sulfur Hexafluoride (SF6) Gas Insulated Switchgears (GIS) within the Offshore Wind Sector August 24, 2023. chrome-

extension://efaidnbmnnnibpcajpcgiclfindmkaj/https://www.epa.gov/system/files/documents/2023-12/ocs-sf6.pdf

For example, SF6 may be emitted during transfers between SF6 gas cylinders and the GIS, and during initial charging and recharging. If the switchgear has a technical problem that requires all the SF6 to be removed in order to be repaired, then some may be emitted during transfers from the equipment to SF6 gas cylinders. The SF6 emissions during charging and transfers will come from purging air from the transfer lines after they are connected between the gas cylinder and the GIS, and from the residual SF6 in the lines and fittings after the transfer is completed. Similar loss mechanisms occur throughout the lifecycle of the GIS equipment as it is filled, repaired, and retired and the SF6 is reclaimed for reuse or for destruction.

In SouthCoast Wind's Outer Continental Shelf Air Permit Application (March 2023), the applicant states on p. 3-7 that SF6 will be present in high-voltage equipment on the OSPs. SouthCoast states that the OSPs will have eighteen 220 kV GIS that will each contain 275.6 pounds of SF6. The OSPs include both DC and AC equipment, and SouthCoast reports that vendors are able to provide medium and high voltage AC equipment that is SF6-free, but SF6-free DC equipment is not available.

The COP (Volume 1, Table 3-26) indicates that significant amounts of SF6 will be housed in the gas-insulated equipment (over 16.5 tons) and that SF6 leaks during operations. Given that every molecule of SF6 contributes 23,500 x more than CO2 to greenhouse warming, and Scotland's disastrous leak of SF6 (Mavrokefaledis, 2022), we should not tolerate the risk of contributing to GHG emissions in our effort to mitigate climate change, particularly in the harsh ocean environment that increases the risk of accidental leakage.

EPA should insist that the developer eliminate all components with SF6.

IV. Unreasonable degradation and Irreparable Harm:

Under the Ocean Discharge Criteria Regulations, EPA may not issue an NPDES permit to authorize any pollutant discharge to waters of the territorial sea, the contiguous zone, or the ocean, **that the Agency determines would cause "unreasonable degradation** of the marine environment." 40 CFR § 125.123(b). EPA defines

"unreasonable degradation of the marine environment" to mean: " Significant adverse changes in ecosystem diversity, productivity, and stability of the biological community within the area of the discharge and surrounding biological communities."

By its own admission, during EPA's Public Hearing re the Draft Permit held on Nov 6, 2024, EPA confirmed it is focusing only on the permit before it. EPA admitted for the purpose of the permit in question, it does not consider long term cumulative and synergistic effects combined with all other wind projects. However, this approach jeopardizes species identified as endangered or threatened pursuant to the Endangered Species Act, and the species critical to the structure and function of the ecosystem, such as those important for the food chain and ocean health (including the sand lance), and thus violative of CWA § 403.

Thus EPA has failed to properly exercise its authority by failing consider the impacts of the construction, O&M and decommissioning of this facility for which Permittee seeks a NPDES permit, individually, and also in relation to the cumulative impacts of all the other wind projects up and running and / or planned, or to point to a scientific basis for asserting that there is no irreparable harm or permanent impact on natural habitat resources. Instead EPA simply relies on suggested mitigation of destruction, for example, by elimination of TWG's, or the creation or, indeed, acceptance of an altered state that may or may not benefit the natural ecology of the system.

The statute specifies, if EPA has insufficient information to determine that the discharge will not result in unreasonable degradation of the marine environment, then the the Agency may not issue a permit. EPA has failed to provide a scientific basis for its finding that activities covered by the Permit application here in question will not cause irreparable harm and

there are no reasonable alternatives to onsite disposal of the pollutants in question. See CWA § 403(c)(2); 40 CFR § 125.123(c). Given so much uncertainty, and lack of information, EPA should simply not grant the Draft Permit.

To issue the permit would fly in the face of Ocean Discharge Criteria Regulations which specify the factors to be considered in determining whether a discharge will or will not cause unreasonable degradation of the marine environment.

For example, the Draft Permit fails to adequately consider and account for: the quantities, composition and potential for bioaccumulation or persistence of the pollutants to be discharged.

In this regard, EPA has not adequately analyzed the chemical constituents in the OCS-DC1's discharge, the effects of dilution of pollutants at the proposed discharge location and /or beyond, the extent to which these constituents might be toxic in the marine environment, or reasonable alternatives to onsite disposal of the pollutants in question. See 40 CFR §§ 122.124. (P. 33/85 ,70/125 Draft permit). CWA § 403 (c) (2);40 CFR § 125.123(c). EPA anticipates that various chemicals inevitably will be discharged by accident, upset, in error and in excess of limits, while millions of gallons of effluent will be discharged 24/24 hours, 365/365 days for the next 25-30 years. This scenario will be played out not just at this facility and wind farm, but at all the other nearby OSW wind farms already up and running or in permitting stages, which include hundreds of TWG's and several CWISs. Any discharge of pollutants will be constant and their accumulation persistent, and any damage that will have occurred by the time decommissioning occurs, assuming it does occur, will be permanent.

Moreover, EPA has failed to adequately consider the likely and inevitable impacts and the permanence of the significant adverse changes— due to constant ocean water intake and discharge, and the introduction of EMF's and scour protection, etc. — in ecosystem diversity, productivity, and stability of the **biological community** within the area of the discharge and surrounding biological communities, including on benthic resources, and a number of species listed as threatened or endangered that are known to be present or may be present in the project area, including certain types of finfish, marine mammals, sea turtles, and seabirds. See Section 6.1 of this Fact Sheet. See also 40 CFR § 125.122(a)f.

This is a serious omission given the **importance of the receiving water area**: “The northeastern edge of the Lease Area is located about 3.1 miles (5 kilometers) from the 30-meter isobath boundary of Nantucket Shoals,” while the OCS-DC1 is intended to be located outside of a 6-mile (approximately 10-kilometer) buffer from the 30-meter isobath boundary of Nantucket Shoals. Draft EIS, pp. 3.5.5-56, 2-12.

The **receiving water** is notable because it provides, without limitation, spawning habitat, migratory pathways, EFH, and areas necessary for other functions or critical stages in the life cycles of marine life. BOEM's Draft EIS recognizes the importance of the complex habitat within Nantucket Shoals to several ecologically and/or economically valuable species, including the area's importance for Atlantic cod spawning. See Id., Section 3.5. Draft EIS, pp. 3.5.5-56, 2-12.the area. See 40 CFR § 125.122(a)(4). In addition to its proximity to Nantucket Shoals, the entire area of the SouthCoast project is located within the area recommended by NEFMC as a Habitat Area of Particular Concern (HAPC). Specifically, the OCS-DC1 location has been designated by NOAA Fisheries²⁷ as a HAPC for Summer Flounder Submerged Aquatic Vegetation (SAV).²⁸ NOAA Fisheries²⁹ has also identified this area as containing high foraging value for the endangered North Atlantic right whale, particularly during winter and spring months. See 40 CFR §§ 125.122(a)(3), (4) and (5). See also Final Southern New England Habitat Area of Particular Concern Framework (February 2024); October 27, 2022, November 18, 2022, and April 18, 2023, letters from NOAA Fisheries to BOEM.

The **permanent** nature of possible, likely and certain cumulative adverse impacts cannot be ignored. In the Draft Permit, the EPA has set certain discharge limits suggesting they will not result in unreasonable degradation of the marine environment. However, since EPA has not taken into consideration all the surrounding wind farms and their cumulative impacts, there is clearly insufficient information to set such limits or to determine that the discharge will not result in unreasonable degradation of the marine environment, hence EPA may not issue this permit. CWA, 40 CFR §125.122(a)(1)–(10).

Wind farms don't have fences. Thus the proposed elimination of up to six WTGs to reduce both potential impacts on foraging habitat and the resulting displacement of wildlife that would accompany such impacts, as a way to prevent the degradation of the marine environment, including endangered species is woefully insufficient, and flies in the face of the spirit and intent of the law. 40 CFR Part 125, Subpart M, and NPDES permits for discharges into the specified waters must comply with the ODC Regulations. CWA § 403(a).

Given the lack of a cumulative assessment and basing limits on estimations or reliance on unreliable systems, anticipated malfunctions, and accidents, the Draft Permit is woefully falling short of its duty to protect against **irreparable harm** as mandated by CWA, 40 CFR § 125.122(a)(1) – (10) and for this reason as well, should not be issued.

V. Entrainment :

i. The presence of life stages of fin-fish and invertebrates, marine organisms that may be impacted by impingement, entrainment, and entrapment at the CWIS cannot be denied; it is well documented in this project area. See NPDES Application, Section 4. Fin-fish **in the wind farm area** include pelagic, demersal, and highly migratory species. Recent seasonal trawl surveys in the vicinity of the offshore wind lease area, including adjacent lease areas, observed 81 taxa in the warm season and 71 in the cold season. (See Guida et al. 2017, pp. 3-18, 19, 20.) Catches were dominated by Atlantic herring, skates, and flounders during the cold season, and by butterfish, longfin squid, skates, hakes, scup, and spiny dogfish in the warm season. See id. As discussed in Sections 5.2.4 and 6 of the Drat Permit's Fact Sheet, numerous fin-fish species, including their early life stages easily susceptible to entrainment, will potentially be **present in the vicinity of the OCS-DC1**. Essential Fish Habitat (EFH) has been designated for a number of these species. See id. See also COP, Appendix N.

The entire area encompassed by the wind farm project is located within the area recommended by the New England Fishery Management Council as a Habitat Area of Particular Concern (HAPC) for cod spawning and complex habitats. (See February 2024 Final Southern New England Habitat Area of Particular Concern Framework.)

This HAPC, including Nantucket Shoals and the area surrounding it, has been observed to support Atlantic cod spawning and has high foraging value for the endangered North Atlantic Right Whale, particularly during winter and spring months. (See Letters from NOAA Fisheries to BOEM dated October 27, 2022, November 18, 2022, and April 18, 2023. See also Zemeckis et al. 2014.)

ii. NOAA recommends that a **sampling monitoring** plan be provided to the NMFS Habitat and Ecosystems Services “for review and comment prior to finalizing requirements of the NPDES permit to determine if increased sampling frequency and/or additional recommendations are necessary.” NPDES Permit No. MA0006018 2024 Fact Sheet Page 68 of 85

The EPA in fact admits there is a need

— to better characterize the number of organisms, and

— *to improve the estimates of the impacts of entrainment by providing data, including estimates of the entrainment of eggs, which are currently lacking.*

iii. But the Draft Permit narrowly requires a comparison of ichthyoplankton abundance at the intake location as compared to the full water column— or in the area beyond. This approach will provide sampling data of the types of organisms entrained at the intake in the moment, but it is indicative of a mind set that fails to build in wider protections.

The Permit must require Sampling that reflects the possibility that things can and will change very quickly in the ocean.

The EPA has simply failed to consider the unanticipated effects of the project’s impacts on the existing fine sand or sand/mud benthic habitat in the vicinity of the OCS-DC1, which will likely be transformed into higher complexity habitat by introduction of the foundation structures and associated scour protection of the WTGs and OCS-DC1, which in turn, will likely alter the diversity and density of the biological community in the project area similarly to the way that artificial reefs affect the marine environment. Climate change induced ocean temperature changes, in addition to the cumulative effects of the daily intake and discharge of millions of gallons of seawater, also need to be taken into consideration.

This narrow approach is inadequate to afford the wider protections intended by the CWA; any sampling and biological (ichthyoplankton and zooplankton) **monitoring** must reflect the wider implications as mentioned above and below, *not just for future permit re-issuance* based on site-specific, up to date data, *but to account and afford protection given current conditions evolving in real time.* This approach will **better** enable EPA to evaluate the BTA for minimizing entrainment and should be required in the Permit. (See 71 Fed. Reg. 35014. See also Langhamer 2012; Glarou et al. 2020; Degraer et al. 2020.)

Phytoplankton:

i. Near-shore coastal waters are typically the most biologically productive areas and replete with billions of Phytoplankton, some of Earth's most critical organisms. Phytoplankton live in the euphotic zone (zone in which light is available for photosynthesis); they generate about half our atmosphere's oxygen, as much per year as all land plants; they form the base of virtually every ocean food web. In short, they make most other ocean life possible. (South Coast NPDES EPA Permit No. MA0006018 2024 Fact Sheet Page 54 of 85.)

BOEM estimates billions of Phytoplankton will be entrained by the facility in the total daily inflow of millions of gallons of seawater and many millions impinging on the intake screens and filters. Studies from both China and the North Sea demonstrate that offshore wind projects can reduce plankton counts (Daewel, 2022), decrease biodiversity (Wang, 2022), and alter the distribution of plankton blooms (Slavik, 2018).

A mere 1% decrease in phytoplankton will cause an increase in CO2 emissions that outweighs any possible benefit from renewable energy sources (Malerba, 2019).

ii. Loss of these organisms will have enormous detrimental adverse impacts on:

-the carbon cycle: through photosynthesis these organisms transform inorganic carbon in the atmosphere and in seawater into organic compounds, making them an essential part of Earth's carbon cycle on.

- climate change: they take up carbon dioxide from the atmosphere and when they die they sink, carrying this atmospheric carbon to the deep sea, which is why phytoplankton is an important factor in carbon sequestration.

- the amount and the timing of plankton blooms.

- migratory species that arrive in exquisite timing with seasonal blooms.

- marine life due to increased presence of harmful algal blooms.

- ocean biogeochemical cycles of endangered species because plankton are a primary food source of zooplankton, including Krill, a major food source for whales, particularly the NARW. (Playing an integral part of a positive feedback loop, more whale feces mean more phytoplankton which means more krill, which can support more whales. How much baleen whales eat is directly proportional to how much they defecate. Whale feces is a major part of the

ocean's productivity, providing valuable energy and nutrients to a vast array of marine life forms.

<https://efaidnbmnnnibpcjpcglclefindmkaj/https://www3.epa.gov/region1/npdes/permits/2007/attachments/finalma0040266rtc.pdf>

iii. A review of scientific studies on the influence of large offshore wind developments on marine ecosystems was referenced by NOAA. (See study by Clark et al. 2014). According to NOAA, based on the state of the knowledge about the impact of OSW-induced changes to hydrodynamics on fishes (van Berkel et al. 2020), with respect to phyto- and zooplankton, most of the underlying cause-effect mechanisms affect the entire pelagic ecosystem. For example, it is anticipated that “vertical and lateral flows will be modified to the extent that stratification processes may be affected; also stratification has a governing effect on phytoplankton bloom formation via the distribution of nutrients and light availability (Christiansen et al. 2022). Plus there is a positive regional effect on biomass and productivity in areas that receive nutrient-enriched and phytoplankton-reduced water masses from OSW areas by currents that extend up to several 100s of km beyond the bounds of the OSW area. ...OSW-generated turbulent wakes have been shown to impact the large-scale stratification in larger-scale development scenarios (Carpenter et al. 2016).”

According to NOAA: “OSW structures modify oceanic responses, which may have significant effects on fundamental ecosystem processes. Disruptions in connectivity may pose a risk to certain subpopulations with planktonic larvae, warranting future localized investigations.”

Additional research is required “which should involve maintaining, and improving, integrated numerical models into OSW operational phases and linking pertinent results with targeted components of field experiment studies to verify observed structural changes and the corresponding impacts.” *Ecosystem Effects – Phytoplankton and Zooplankton*. Page 18. NOAA Technical Memorandum NMFS-NE-291. Fisheries and Offshore Wind Interactions: Synthesis of Science. The Draft Permit should require this research and modeling.

Ichthyoplankton and Zooplankton:

i. BOEM also estimates there will be millions of ichthyoplankton and zooplankton entrained in the OSC-DC1 cooling system, as stated above, with 100 percent mortality of entrained organisms. See Sunrise Wind Farm BOEM [chrome-extension://efaidnbmnnnibpcjpcglclefindmkaj/https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/SRW01_COP_AppN2_%20IchthyoplanktonEntrainmentAssessment.pdf](https://efaidnbmnnnibpcjpcglclefindmkaj/https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/SRW01_COP_AppN2_%20IchthyoplanktonEntrainmentAssessment.pdf).

ii. The loss of these organisms also will have enormous detrimental impacts on: >The *Daily Vertical Migration (DVM)* of these organisms plays a major role in the carbon cycle. As these animals return to the deep after feeding at the surface, their waste speeds up the rate at which carbon is transported to the ocean floor (carbon sequestration). Shifts in the intensity of DVM behaviors will have an adverse impact on the carbon cycle.

The impact of such shifts must be considered before a Draft permit is issued. <https://oceanexplorer.noaa.gov/facts/vertical-migration.html#:~:text=As%20the%20greatest%20migration%20on.life%20and%20the%20global%20climate>

>Furthermore, they are also a key food source for many marine fish species as well as the endangered North Atlantic right whale.

Over the permit term more frequent monitoring of these organisms should be mandated as it will provide valuable information about potential entrainment and will also provide valuable information about any changes in the densities of early life stages in the vicinity of the OCS-DC1 over time. NPDES Permit No. MA0006018 2024 Fact Sheet Page 71 of 85 OCS-DC1.

Fin fish eggs, larvae:

BOEM estimates the annual entrainment abundance of fish larvae in relation to SouthCoast ranges from 8.4 million to 176.2 million with a mean estimate of 84.0 million.

In its COP, most of the 44 species of fin fish and invertebrates identified by South Coast are designated Essential Fish Habitat (EFH), and have early life stages present in the wind farm vicinity (i.e., eggs and/or larvae) and also subject to entrainment. (See COP, Appendix N, Tables 4-1 and 42.)

While numerous studies, including sampling in the vicinity of the OCS-DC1, demonstrate that early life stages of aquatic life have been collected at depths of 100 m or less, including at the expected depth of the intake, significantly, BOEM points out the limitations in the available data. The data do not fully capture the annual entrainment abundance of all fish and life stages: all fish eggs and the larvae of less common taxa are excluded from publicly available EcoMon data set. (Affected Environment and Environmental Consequences 3.5.2-20 USDOJ | BOEM.)

Thus, all these organisms' early life stages must be identified and included in entrainment assessments. Failure to do so should preclude issuance of a Draft Permit.

Atlantic Cod:

SouthCoast did not include life stages for Atlantic Cod, except for “adult”, in the Draft Permit's Appendix B. NOAA Fisheries has informed EPA the area (in proximity to OCS-DC1) has been documented as a spawning site for cod, thus

indicating that Atlantic cod eggs and larvae are expected in this area (Personal communication between J. Nagle, EPA and G. DiPreta, September 26, 2024).

Given the proximity of the OCS-DC1 to areas of known cod spawning activity, the potential for adverse environmental impacts to early life stages of Atlantic cod, the current status of the Southern New England (SNE) Atlantic cod population, and the limited sampling that was done of early life stages during peak spawning periods for Atlantic cod, EPA rightly determined that additional monitoring at least be conducted twice per month from December through April for Atlantic cod eggs, larvae and juvenile stages.

This monitoring is warranted and must be mandated in the Permit to quantify the density of early life stages and assess potential entrainment impacts from the CWIS, if the converter station cannot be relocated to a location closer to the 50 m isobath or greater. See: <https://www3.epa.gov/region1/npdes/permits/2024/finalma0004940permit-2024.pdf>

Whether the CWIS is relocated or not, given the absence of data collected heretofore by SouthCoast regarding Atlantic Cod, this deficiency needs to be rectified and an analysis made to determine if twice per month monitoring is sufficient under any circumstance.

The Draft Permit should not be granted unless and until a determination of whether the converter can be -or will be -relocated, and the adverse impacts of *not* moving it analyzed.

The significant resources necessary to conduct ichthyoplankton monitoring or any monitoring at an unmanned, offshore station must not deter or prevent the monitoring, analyses and mitigation required to comply with applicable laws.

Calanus finmarchicus (copepods):

Nearby Nantucket Shoals supports dense aggregations of zooplankton such as gammarid shrimp and copepods, which in turn, support higher trophic levels of wildlife. (See Jónasdóttir, S.H., et al.) EPA recognizes Nantucket Shoals are an important foraging area for endangered North Atlantic right whales and other cetacean species (e.g., harbour porpoises, sperm whales, humpback whales, minke whales, sei whales, fin whales). During the “spring bloom” in the western North Atlantic, live copepods feed on the phytoplankton abundance and direct this energy toward overall copepod growth, gonad development and egg production. (Draft EIS, p. G-49.) It is, hence, vitally important for the health and nutrition of copepods’ predators—including the NARW—to evaluate the possible effects of copepod entrainment. After being entrained and discharged from the cooling system process, as they fall to the seafloor, dead copepods’ carcasses, may still be a food source; however, as they decay they will rapidly lose their lipid levels (NFS 2011) and will not be of the quality of prey that can provide the energy or nourishment necessary to sustain NARW’s.

SouthCoast failed to adequately evaluate entrainment of *Calanus finmarchicus*, which EPA recognizes is a species of copepod important to the foraging base of the endangered North Atlantic Right Whale (*Eubalaena glacialis*). The adverse effects of copepod entrainment must therefore be analyzed before EPA issues a Draft Permit. (**Footnote)

*** Footnote: National Academies of Sciences, Engineering, and Medicine. 2024. Potential Hydrodynamic Impacts of Offshore Wind Energy on Nantucket Shoals Regional Ecology: An Evaluation from Wind to Whales. Washington, DC: The National Academies Press. <https://doi.org/10.17226/27154>. <https://nap.nationalacademies.org/read/27154/chapter/1>*

The NAS has made several recommendations regarding Observations and Modeling.

***Footnote continued: Regarding Observing potential impacts to the prey field of the NARW: BOEM and NOAA, and others should support, and in fact, require, the collection of oceanographic and ecological observations through robust integrated monitoring programs within the Nantucket Shoals region and in the region surrounding wind energy areas before and during all phases of wind energy development: surveying, construction, operation, and decommissioning. This is especially important as Right Whale use of the Nantucket Shoals region continues to evolve due to oceanographic changes and/or the activities and conditions relevant to offshore wind turbines.*

Recommended Observations should:

-Include concurrent measures of relevant physical processes and ecological effects through upper trophic levels at the turbine, wind farm, and regional scales.

-Be expanded to identify the links and relevant processes between zooplankton supply, abundance, and aggregation and right whale habitat use in the Nantucket Shoals region.

-Use combined observational and modeling studies to isolate potential effects of wind farms from those resulting from natural and/or other anthropogenic drivers, recognizing that this will take dedicated long-term studies.

-Sample zooplankton at the appropriate spatiotemporal scales necessary to characterize right whale prey availability, including zooplankton life history and behavior.

-Monitor right whale habitat use within and outside of wind energy areas.

-Maintain existing long-term monitoring programs to provide insight on regional and ocean-basin scale changes to right whales and their prey.

Recommended Modeling: *BOEM and NOAA, and others should support, and where possible require, oceanographic and ecological modeling of the Nantucket Shoals region before and during all phases of wind energy development: surveying, construction, operation, and decommissioning. This critical information will help guide regional policies that protect right whales and improve predictions of ecological impacts from wind development at other lease sites. This modeling should:*

-Include zooplankton life history and behavior modeled at appropriate scales.

-Identify and model the mechanisms that drive supply, abundance, and aggregation of zooplankton.

-Utilize improved hydrodynamic models that represent the mechanisms that drive regional transport, supply, and local aggregation processes.

-Be expanded to identify and incorporate the link between zooplankton supply, abundance, and aggregation and right whale habitat use in the Nantucket Shoals region.

-Be conducted at the appropriate spatiotemporal scales necessary to isolate effects driven by wind turbines from those resulting from natural and/or other anthropogenic drivers.

-Incorporate physical and ecological information pertinent to right whale foraging outside of the Nantucket Shoals Region, because right whale foraging in this region may depend on the availability of alternative foraging areas.

North Atlantic Right Whales:

NOAA scientists have documented North Atlantic Right Whale use of areas south of Martha's Vineyard and Nantucket and west of Nantucket Shoals. Right whales have typically appeared in Cape Cod Bay during spring, but in recent years they also have been arriving sooner, in greater numbers, and staying longer in waters off Southeast New England in and around the wind energy development areas.

in large numbers on Nantucket Shoals south of Martha's Vineyard and Nantucket, and in Cape Cod Bay." NOAA Fisheries. North Atlantic Right Whales On the Move in the Northeast. <https://www.fisheries.noaa.gov/feature-story/north-atlantic-right-whales-move-northeast>

The loss of a single whale's carbon sequestration due to the diminution of a nutritious food source, let alone an entire whale species, will increase the carbon footprint of this project (Chami, 2019).

Alarming, 224 Level B Incidental Harassment Authorizations (IHA) for NARW's are active and an even more alarming, 691 applications for Level B IHA's are in process. The eight (8) additional Level B IHA's SouthCoast has requested further endanger the precarious NARW population. These IHA's are in direct conflict with the mandate to protect and promote the recovery of the species. Operation of this CWIS will inevitably drive threatened whale species closer to extinction (Seals, 2017). With approximately 334 members alive today, the NARW faces extinction. The Unusual Mortality Event (UME) that began in 2017 has affected 20% of the population. Deaths outpace births. Pre-construction seismic surveys and impact drilling within whale habitats coincided with the onset of their UME and a recent NARW death (on 02/14/2023) substantiates this association.

The 1995 US Supreme Court case *Babbitt v. Sweet Home*, 515 U. S. 687 (1995), articulated the definition of "harm" under the Endangered Species Act (ESA) to include changes in habitat. In a 6-3 decision written by Justice John Paul Stevens, the Supreme Court held that habitat modification is a legitimate application of the word "harm." The Court found that the Court of Appeals was incorrect in assuming that the words in the definition of "take" only apply to actions involving direct contact with endangered animals. Based on the Act itself, the Court determined that the ordinary meaning of harm would in fact include changes in habitat that hurt the endangered animals. Also, the Court held that the intent of the Act to give broad protection to endangered species must include even actions that may have minimal or unforeseeable effects.

This precedent indicates that actions leading to even indirect or minimal habitat modifications can still qualify as "harm," broadening the scope of ESA protections to consider habitat impacts that might not immediately or obviously harm species but could still threaten their survival. Thus, *harm* in the definition of *take* in the Act means an act which actually kills or injures wildlife, and such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

The EPA has a legal obligation to protect the food sources and habitat of the NARW and thereby protect and promote the recovery of this and other endangered species. The Draft Permit violates the MMPA and the ESA. The Draft Permit does not adequately address this issue.

VI. Impingement:

While the Draft Permit requires *monitoring* for water quality and entrainment (organisms drawn into the cooling system), no such requirement has been set for the equally problematic phenomenon of **impingement*** of organisms on the water cooling intake screens**. (***)footnote below)

SouthCoast's and EPA's response to this crucial absence is to suggest that using *variable frequency drives* (VFDs) will address the question of monitoring impingement. Using a VFD reduces "intake flow to only the amount required to meet cooling water needs as driven by seasonal changes in water temperature and electrical demand, based on seasonal/monthly temperature variation of ambient seawater." Since entrainment and impingement impacts of CWISs are closely linked to the amount of water passing through the intake structure, the less water drawn in, the fewer organisms drawn in. SouthCoast has provided depth-averaged current speeds data "at depths from 82-148 feet from the surface". SouthCoast posits that organisms within a 227square-foot (21 m²) area around the intake will experience a 10% increase in current as compared to the estimated minimum current." (SouthCoast Wind Responses to EPA Comments (included in Excel spreadsheet attached to email dated August 5, 2024). However, plankton, eggs and larvae, free-floating or weak swimmers, and early life stages of some aquatic species, due to advection, will nonetheless be drawn into the CWIS along with the flow of cooling water-- in the millions. See 66 Fed. Reg. 65277.

Hence, even at a reduced intake flow, there will be significant potential for fish and other marine life mortality due to

impingement on the intake screens <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.epa.gov/system/files/documents/2024-10/draftma0006018permit-2024.pdf>.

Presumably, since it is a well established law of physics that occlusion (blockage) of a screen **increases** the velocity through portions of the screen that remains open (See 66 Fed. Reg. 65274 and 65302), EPA recognized that, "Maintaining ongoing TSV monitoring makes particular sense given that issues like biofouling could develop over time and cause changes to the through-screen velocity (TSV) at the Facility." (Draft Permit (page 69/85,107/125). But, instead of requiring actual monitoring of impingement, EPA's Draft Permit allows the use of an anti fouling coating on the screen, and requires SouthCoast to calculate TSV at point of entry through the screen (based on intake flow and pump speed) and report the maximum calculated TSV in the monthly discharge monitoring report. The calculation must account for the screen's blockage of the otherwise total open area of the intake opening. Coincidentally, this measurement is needed to confirm compliance with the permit limitation of 0.5 fps under all conditions.

However, using this method "as a **surrogate for actual impingement monitoring**" will not **tell us how many organisms are impinged, nor will it prevent or minimize adverse impact (killing) on the organisms that are in fact impinged.**

SouthCoast believes that "its intake system will minimize impingement" and "that the TSV will remain below 0.5 fps even if there is 33% occlusion and the pumps are operating at maximum capacity." Yet SouthCoast acknowledged during the August 28, 2024, meeting with EPA that when the cooling system is operational, the SouthCoast Wind **O&M team will need to study and optimize the system to meet permit limits.** See Notes from August 28, 2024, meeting between SouthCoast Wind and EPA. (Draft Permit p 69/85,107/125)

Given this uncertainty, EPA should instead require SouthCoast measure actual impingement and not simply allow the Permittee to use a surrogate method, or loosely prescribe that SouthCoast must "limit, diagnose and resolve" any exceedance of the 0.5 fps TSV limit **as soon as possible.**

EPA's "after the fact" approach, suggesting a reaction rather than proactive response, "to the maximum extent practicable", is woefully insufficient. After the fact responses, are simply too little and too late to prevent harm, and should not be permitted as they violate the Criteria and Standards for the National Pollutant Discharge Elimination System and the CWA's aim to minimize adverse environmental impact. See 40 CFR § 125.87(b); 66 Fed. Reg. 65274-5.

**** Footnote: EPA indicates in the Draft Permit that it is not aware of any studies that directly examine impingement mortality, entrainment, or entrapment at offshore converter stations associated with wind farms.*

Numerous studies, however, do demonstrate that offshore environments provide habitat for fish, shellfish, and other aquatic organisms that may be susceptible to impingement, and that many species present in offshore waters have early pelagic life stages that are quite vulnerable to entrainment. See 70 Fed. Reg. 71059. Not only may some aquatic organisms suffer direct harm from entrainment and

impingement, but other aquatic organisms may be indirectly harmed by a CWIS entraining or impinging the organisms that they prey upon.

Furthermore, EPA itself points out cases in which larger aquatic organisms, such as seals and sea turtles, have been harmed by entrapment in a CWIS. If seals and sea turtles could be entrapped by a specific CWIS, then entrapment by the CWIS certainly would also be a risk for juvenile and adult fish.

VII. Necessity for actual site-specific and project specific data:

Pertinent studies show that findings from one facility cannot be considered to be valid for another facility, when site-specific and facility-specific factors are determinative. This would apply as well to entrainment analyses. Case in point: a 2018 EPRI study, (***** Footnote*) [Entrainment Survival Transferability: Application of Prior Studies Under the 2014 § 316\(b\) Rule](https://www.epri.com/research/products/000000003002013685), that analyzed intake survival and power plant cooling systems. The study concluded that data from studies may only be considered in BTA determination, if the data are "relevant and representative", and can be transferred to the untested subject facility.

<https://www.epri.com/research/products/000000003002013685>

The 2018 study concluded that entrainment survival studies at existing power plants did not include directly comparable facilities or environments. It found, survival may vary greatly depending not only on intake water temperature, but fish species and life stages, and plant design. Variable speed drive pumps or other operational reductions in cooling water withdrawal may expose the entrained organisms to higher water temperatures. No rigorous, validated method or model was put forward that would allow survival rates to be accurately predicted (page 13/52 of the Study).

EPA should require actual site and project specific data prior to issuance of the Permit.

***** Footnote: This EPRI study analyzed entrainment statistics of a Hudson River power plant once through cooling system, and reported that absent lethal thermal and chemical stresses, certain fresh water species survived entrainment, but careful analysis shows the species usually found in salt water / the ocean did not. Eggs generally had higher survival rates than larval stages. Notably, included in the non-surviving group was the **Sand Lance**, which in its larval form is perhaps the most*

abundant of all fish larvae in areas such as the northwest Atlantic, serving as a major food source for [cod](#), [salmon](#), [whales](#)^[3] and other commercially important species, and the endangered Roseate Tern. <https://www.inaturalist.org/taxa/85574-Ammodytidae>.

VIII. More Frequent monitoring for Atlantic Cod

Additional monitoring for Atlantic cod early life stages (i.e., eggs, larvae, and juvenile stages (less than 25 mm)) must at least be conducted twice per month from December through April, if ultimately, EPA determines, for the Final Permit, that the converter station **cannot** be relocated to a location closer to the 50 m isobath or greater.

The monitoring frequency proposed is consistent with requirements in the Sunrise Wind NPDES permit. See

<https://www3.epa.gov/region1/npdes/permits/2024/finalma0004940permit-2024.pdf>

However, given the absence of data collected heretofore by SouthCoast regarding Atlantic Cod, this deficiency needs to be rectified and an analysis made to determine if twice per month monitoring is sufficient regardless of whether the CWIS is relocated or not. This should be required in the Permit.

IX. Relocating any open-loop cooling system CWISs away from the benthic ridge feature found along the 45 m isobath:

EPA has determined that the benefits of relocating any open-loop cooling system CWISs away from the benthic ridge feature found along the 45 m isobath warrant that it be included as a component of the BTA for minimizing entrainment impacts.

I agree this should be a prerequisite and mandated by the Draft Permit.

X. Alternative Technology:

Closed Loop -Alternative Technology should be insisted upon.

The unacceptable quantity and detrimental impacts of organisms entrained and impinged, begs the question: why is EPA not instead insisting upon additional / other BTA (Best Technology Available —such as closed cycle system or other means proposed and rejected) to monitor, measure, and mitigate?

While SouthCoast Wind *could* comply with CWA § 316(b)'s BTA requirement by installing closed loop or closed-cycle cooling technology, EPA is not mandating this technology in the Draft Permit.

A closed loop system would unequivocally significantly reduce the impact on marine organisms and the ecosystem upsets caused by the removal of plankton and the food chain, particularly for endangered species (such as NARW and other endangered species that forage in the vicinity of the OSC DC1 and in the nearby (including Nantucket Shoals and the Enhanced Mitigation Area- NARW prey). EPA should not wait to impose this requirement, regardless of the cost or difficulty to the permittee.

In sum, EPA should fulfill the mandate of the CWA, EPA, and more, and address the inadequacies in the Draft Permit. In doing so, it should ultimately disapprove the Draft Permit Application.

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Thank you for your time and consideration. I appreciate the opportunity to detail my concerns and have them entered into the administrative record.

My very best,
Sandra Craig
Indian Avenue, Middletown RI 02842

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