

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of)
Entergy Nuclear Generation Company)
Entergy Nuclear Operations Inc.)
Pilgrim Nuclear Power Station)
License Renewal Application)

Docket # 50-293 LR

REPLY AFFIDAVIT OF ALEX MANSFIELD

1. My name is Alex Mansfield and I live at 14 Puritan Lane, Marshfield, Massachusetts. I am the Ecology Director at Jones River Watershed Association, Inc. (JRWA) in Kingston, Massachusetts.

2. I am providing this affidavit in the above-referenced matter to respond to the Affidavit of Michael D. Scherer (Scherer Affidavit) submitted in support of Entergy's answer opposing the March 8, 2012 motion of JRWA and Pilgrim Watch to reopen and for a hearing.

3. My qualifications, background, and expertise are described in the affidavit I submitted in the above-referenced matter in support of the motions of JRWA and Pilgrim Watch, and will not be repeated here, but are incorporated by reference herein.

4. In this Affidavit, I respond to three subjects addressed in the Scherer Affidavit. First, cold stunning of federally endangered sea turtles in Cape Cod Bay; second, NOAA sighting data

for North Atlantic Right Whales in Cape Cod Bay; and third, mortality rates for river herring, a candidate species under the federal Endangered Species Act.

Federally Endangered Sea Turtles:

5. The Scherer Affidavit ¶¶ 29 to 47 addresses the potential of four federally endangered sea turtles to be present at, or impacted by, the Pilgrim Nuclear Power Station (PNPS) cooling water intake structure (CWIS). Scherer states, for example, "...early life stages of sea turtles are not present in the vicinity of PNPS...healthy juvenile sea turtles are present in the Bay, but are not reasonably expected in the immediate vicinity of PNPS...impaired sea turtles, as a function of cold stunning, move with prevailing currents away from PNPS, and therefore are also not credibly expected to encounter PNPS's CWIS. Scherer Aff. ¶ 29. He concludes, "no sea turtle has ever been observed impinged or swimming in the PNPS intake embayment." *Id.*, ¶ 36.

6. Scherer's conclusions in ¶¶ 29 and 36 about healthy and impaired juvenile and adult sea turtles "encountering PNPS's CWIS" and becoming impinged or swimming in the PNPS intake embayment does not fully address the thermal conditions at the PNPS *discharge* location.

7. Under the PNPS1991 NPDES permit, modified in 1994, PNPS is allowed to discharge heated water into Cape Cod Bay. The permit allows for a temperature increase from intake to discharge of up to 32 degrees Fahrenheit, and a daily maximum temperature of up to 102 degrees Fahrenheit during all seasons of the year. PNPS NPDES Permit, A.2.a.

8. The Scherer Affidavit states, "If during the fall, the water temperature declines too quickly, sea turtles may become "cold stunned." ¶ 32. The reference for this statement (Morreale et al. 1992) is not a study that addresses, or even mentions, cold stunned turtles. Scherer further states, "Beginning in November, when the water temperature in the Bay nears 50°F, some sea turtles can become cold stunned, at which point they may travel with prevailing winds and

currents, often washing up on shore, an event known as “stranding.” ¶ 32 It is not known why sea turtles sometimes fail to migrate south prior to declines in water temperature that result in cold stunning. One factor not discussed in the Scherer Affidavit is whether elevated water temperatures at industrial facility discharge points, such as the PNPS cooling water *discharge* may attract turtles and entice them to stay in northern waters longer than they would in the absence of the heated discharge plume.

9. The Scherer Affidavit suggests that the stranding locations of federally endangered sea turtles in Cape Cod Bay is *not* a good indicator of where cold stunning takes place. In ¶33 the Scherer Affidavit states, “It is not known whether stranded turtles are stunned inside the Bay or are swept into the Bay already in cold stunned condition. However, well-known studies of currents in Massachusetts Bay and Cape Cod Bay readily explain observed stranding patterns, and offer a clear and cohesive understanding of how cold-stunned turtles are carried in Cape Cod Bay, including in the vicinity of PNPS.” Id. ¶ 32. Scherer further states, “...Cape Cod Bay’s prevailing circulation pattern creates a net south flowing current in front of PNPS, which should carry cold stunned turtles south past PNPS and to the southeastern shore, where they would wash ashore.” Id. ¶ 34.

10. It has not been well documented where in Cape Cod Bay the actual cold stunning of sea turtles occurs. Cold stunned turtles in the vicinity of PNPS should be carried by prevailing currents away from PNPS to the southeastern shore of Cape Cod Bay where they would wash ashore.

11. Scherer’s Affidavit suggests that the location of sea turtle strandings is not a good indicator of where the turtle cold stunning takes place. Therefore, it is not correct to suggest that stranding locations away from the PNPS thermal discharge plume are not related to impacts from

the plume. Yet this is the basis for the Scherer Affidavit conclusion that, “Specifically, sea turtle stranding data for Massachusetts for the more than twenty year period from 1986 through 2007 indicate that, during this period, sea turtles have only rarely stranded in Plymouth County, where PNPS is located, as compared to Barnstable County, which comprises the Cape Cod portion of the Bay. (NMFS SEFSC 2012.). ...Consistent with this twenty-year dataset, stranding locations for the years 2003 and 2010 indicate that the vast majority of sea turtles stranded in Cape Cod occur on the south east shore of Cape Cod Bay. (Dodge et al. 2003, Mass Audubon 2012b).” Based on his own testimony that cold stunning may occur in one location, and stranding in another, it is inconsistent to say, as Scherer does, that data showing the location of sea turtle strandings data shows conclusively that PNPS operations have “no effect” on sea turtles. Based on Scherer’s description of Cape Cod Bay circulation patterns in his Affidavit at ¶ 34, prevailing currents should carry sea turtles that are cold stunned in the vicinity of PNPS away from the site to the southeastern shore of Cape Cod Bay, where they would wash ashore. Hence, it is expected that any sea turtles cold stunned in the vicinity of PNPS would be stranded *not* in Plymouth County but in the southeastern portion of the Bay. This is exactly where sea turtle strandings have occurred. See, e.g. PNPS EIS, NUREG-1437, Supp. 29, p. E-65

Federally Endangered Whales:

12. The Scherer Affidavit addresses federally endangered whales in ¶¶ 48 to 70. My first Affidavit showed that North Atlantic Right Whales are observed in the western portions of the Bay near PNPS. This testimony was provided to refute the NRC Staff conclusion in the 2006 BA that “continued operation of PNPS over the 20-year renewal period would have **no effect** on the North Atlantic right whale.” 2006 BA at p. E-70. (emphasis supplied)

The 2006 BA appears to have based this conclusion of “no effect” on the PNPS EIS, § 2.2.5.37, statement “no whales have been observed in the shallow waters off PNPS....” The Scherer Affidavit ¶50 attempts to refute the sighting data provided in my first Affidavit. Scherer provides information from a recent study that standardized NOAA’s sighting data for North Atlantic right whales, based on Sightings Per Unit Effort (“SPUE”) (Nichols et al. 2008). Two Figures from that report are reproduced here as Figures 3 and 4.

13. Figures 3 and 4 are highly consistent with the figures and information provided in my first Affidavit. The Nichols et al. 2008 report cited in the Scherer Affidavit and Figures 3 and 4 show that whether the data are portrayed as “raw” sightings (Figure 3) or are standardized by SPUE (Figure 4), North Atlantic right whales are found within a 6 mile radius of PNPS and within the “critical area” identified in the “Summary Report: Fish Spotting Overflight in Western Cape Cod Bay in 1993” (Fish Spotting Report) and reproduced in my first Affidavit. My first Affidavit does not dispute the data showing that North Atlantic right whale sighting densities are higher in the eastern portion of Cape Cod Bay as compared the western part; it only disputes the 2006 BA statement that “no [North Atlantic right whales] have been observed in the shallow waters off PNPS....” The data I have provided showing the presence of these whales within the 6 mile “critical area” should be taken into account in determining whether or not the PNPS operations will have “no effect” as the 2006 BA concludes. This data was not taken into account.

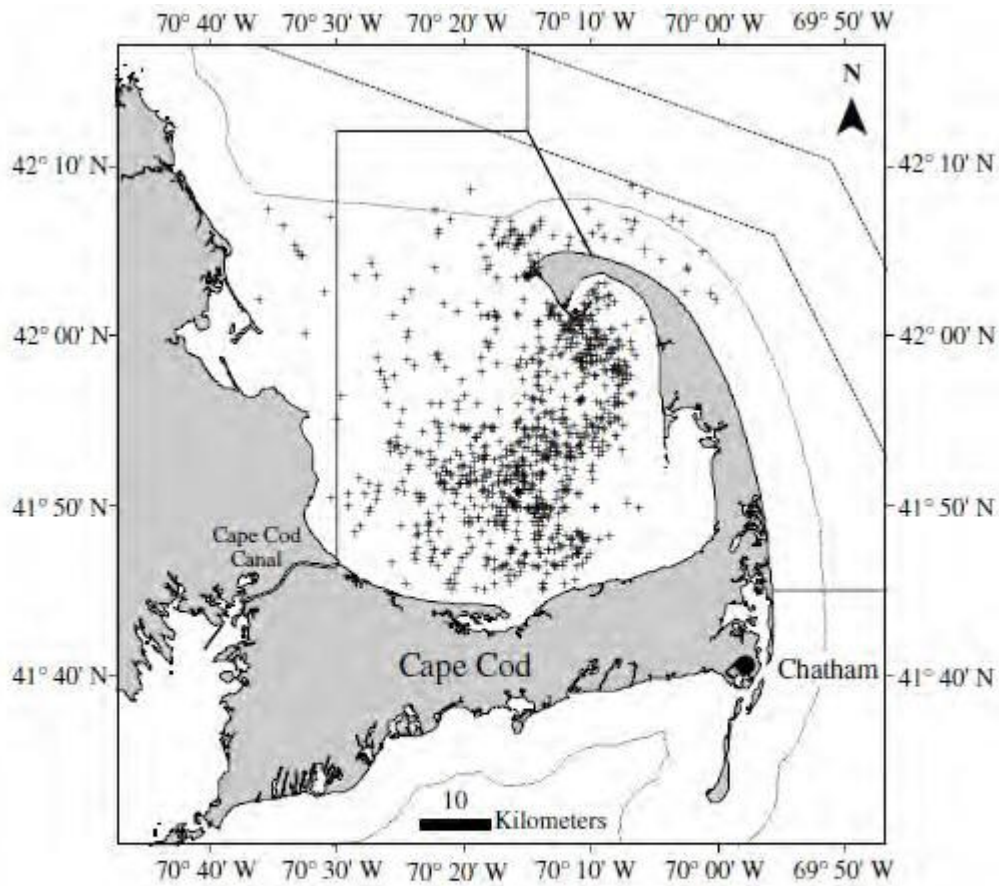


Figure 3

North Atlantic right whale (*Eubalaena glacialis*) sightings (+) recorded during valid aerial survey effort 1998–2002. A sighting is defined as one or more whales observed at the same time and location.

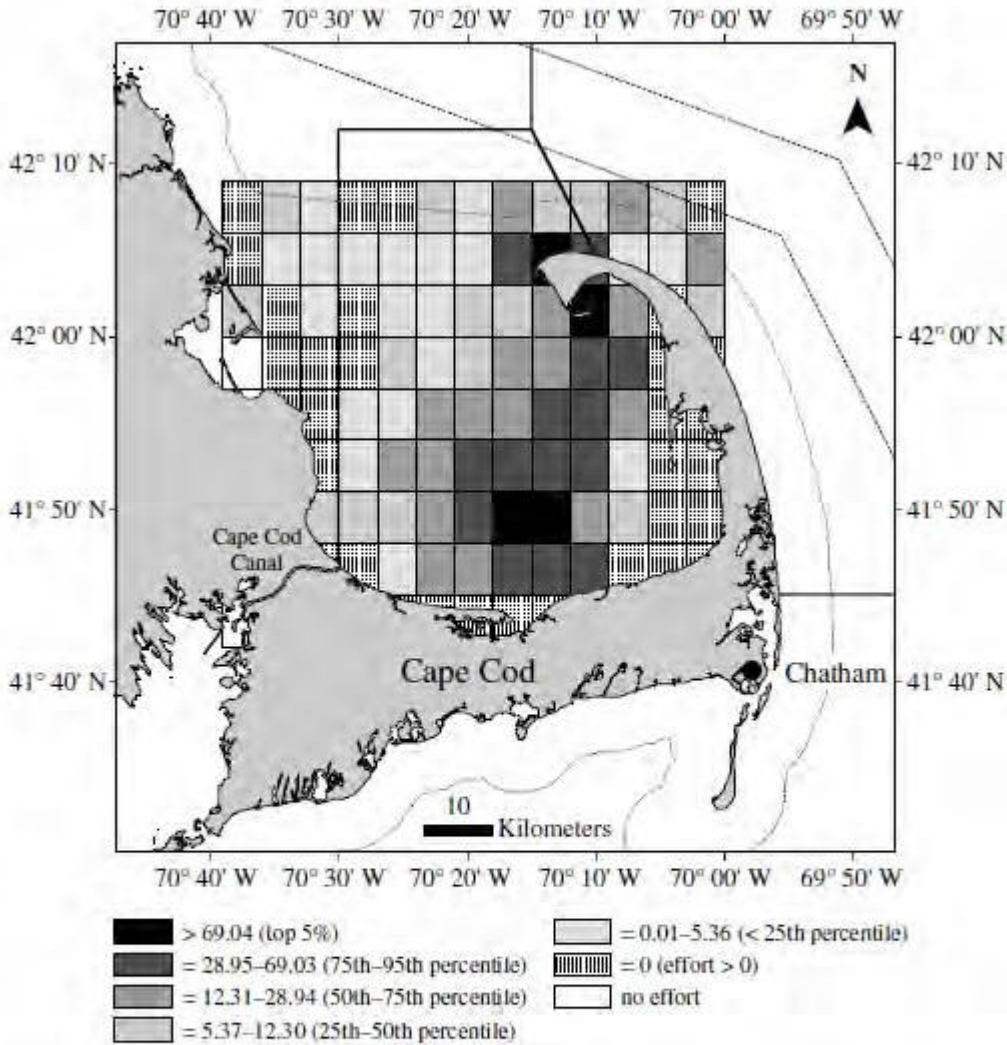


Figure 4

Overall mean North Atlantic right whale (*Eubalaena glacialis*) sightings per unit of effort (SPUE; number of whales/1000 km of survey effort) in Cape Cod Bay, 1998–2002. SPUE values are separated by quartiles, representing the top, second highest, third, and bottom quarters of the distribution. The upper quarter is further partitioned by identifying the top 5% of all values.

ESA Candidate River Herring

14. The Scherer Affidavit addresses river herring in ¶¶ 71-73. It states that “River herring impingement is likewise minimal. From 1980 to 2010, annual impingement at PNPS of alewives and blueback herring averaged 2,150 and 735 respectively, most, if not all, of which

were young-of-the-year fish.” Scherer Affidavit ¶73. The Scherer Affidavit does not give any scientific or factual basis or any context for declaring that the impingement is ‘minimal.’ This is a subjective conclusion. It is equally conceivable that the impingement of an annual average 2,885 (annual maximum = 41,128) of a federal candidate ESA species could be considered more than ‘minimal.’

15. The Scherer Affidavit ¶ 73 states, “Due to the high natural mortality rates of these species, the number of adult fish (i.e., maturing at age 3) that would be expected to survive from that number of juveniles is 38 and 2, respectively. Therefore, PNPS’s effect on river herring populations through impingement is also negligible at best.” It is unclear how Scherer arrives at this mortality rate, since he provides no citation for this statement. Regardless, the logic of the conclusion is circular. Mortality rates for river herring species include mortality from all sources – including impingement at industrial facilities like PNPS. It is therefore circular to compare overall mortality/survival rates against one mortality source that is included in the overall rate. If river herring were not impinged every single year for the past 30 years at PNPS at rates of up to 41,128 fish per year, the overall mortality rates for these species may be quite different.

16. The Scherer Affidavit fails to address the fact that starting in January 2006 Massachusetts Division of Marine Fisheries implemented a three year moratorium on the harvest, possession and sale of river herring (322 CMR 6.17). In 2008, the state moratorium was extended to the end of 2011. As of January 1, 2012 the Atlantic States Marine Fishery Commission (ASMFC) requires states to declare a moratorium on fishing for river herring unless a Sustainable Fishery Plan (SFP) is prepared and approved. Massachusetts has not prepared a SFP and continues to operate under the moratorium (322 CMR 6.17). Scherer does not provide

an explanation of any role the PNPS river herring impingement rates would play in this moratorium.

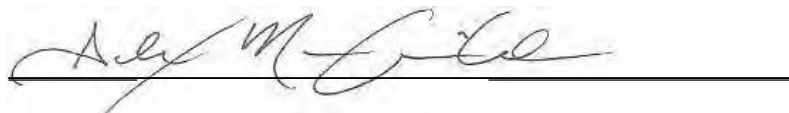
Impact of PNPS Thermal Discharge on Temperature of Cape Cod Bay Water and ESA species

17. The Massachusetts Coastal Zone Management Office (MCZM) has stated that “at least one modeling study predicts that hundreds of acres of Cape Cod Bay may increase by one degree Celsius or more due to thermal loading from the [PNPS] discharge.” June 27, 2000 letter attached to duBois Affidavit, submitted with Petitioners’ March 8, 2012 Motion.

As stated in the NRC Staff 2006 BA, “[h]abitat degradation, contamination and climate and ecosystem change are also possible threats to the [North Atlantic Right Whale] population.” Water temperature also impacts the migratory patterns of the endangered sea turtles. See, e.g., Scherer Affidavit ¶ 32, “In the fall, when water temperatures begin to decline, the sea turtles leave New England and the Bay, and travel south to warmer waters to overwinter.”

The Scherer Affidavit does not address the impact of PNPS thermal discharges on the migratory patterns, or the feeding, foraging or reproductive patterns on the endangered sea turtles or river herring.

Executed in Accord with 10 C.F.R. 2.304(d) on March 25, 2012



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