

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

In the Matter of
Entergy Nuclear Operations, Inc. and
Entergy Nuclear Generation Co.

OADR Docket No. 2015-009
DEP File No: Waterways Application
No. W14-4157, Superseding Written
Determination
Plymouth, MA

REBUTTAL TESTIMONY OF STEPHEN B. SOVICK

I, Stephen B. Sovick, hereby depose and say:

1. My Pre-Filed Direct Testimony (“PFDT”) dated June 29, 2105 has been filed in the above-referenced matter.

2. This is my Rebuttal Testimony in response to the Pre-Filed Direct Testimony of the Respondents Massachusetts Department of Environmental Protection (“DEP”) and Entergy Nuclear Operations, Inc. and Entergy Nuclear Generation Co. (“Entergy”) in this matter.

3. In preparation for this Testimony I reviewed the Pre-Filed Direct Testimony of Entergy’s witnesses Eric J. Las and Philip D. Harizi and the Department’s witness David Hill and related documents.

4. There are at least three reasons why Las Exhibit 6 is does not depict the Low Water Mark and High Water Mark as that term is defined in 310 CMR 9.02:

- (a) Exhibit 6 is based on a map from 1866 that pre-dates the site alterations;
- (b) neither Exhibit 6 nor the Las PFDT show that the Chapter 91 jurisdictional boundaries of the Low Water Mark and High Water Mark were established by the present

arithmetic mean of water heights observed at low tide over a specific 19-year Metonic Cycle (the National Tidal Datum Epoch); and

(c) neither Exhibit 6 nor the Las PFT show that the boundaries were determined using hydrographic survey data from the National Ocean Survey of the U.S. Department of Commerce.

These three reasons are described further below.

5. Hill PFDT ¶ 13 says that DEP relied on the mapping project of the Massachusetts Office of Coastal Zone Management (“MassCZM”) to establish the Tidelands boundaries at the project site. See, Las PFDT ¶ 20 and Ex. 5 and Hill PFDT at ¶ 13 and Hill Ex. D. Hill states the MassCZM project “delineated presumptive lines for the historic high and low water marks which were based on historic shoreline maps.” Id.

6. DEP relied on the MassCZM 1866 map, T-1063, to “derive” the “low water line.” Hill PFDT ¶ 13.

7. I reviewed T-1063 from the MassCZM website at <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/tidelands.html> The historic high water mark appears to correspond generally to the boundary of the symbology for the marsh shown on T-1063.

8. Hill PFDT ¶ 13 testifies that the “historic shorelines” were “overlaid on to MassGIS aerial photos...” Hill did not provide a copy of the MassCZM map overlaid with the MassGIS aerial photos.

9. Hill testifies he determined the moorings were “landward of the historic low water mark” by “scaling distances for the location of the proposed moorings as shown on the project plans with the presumptive low water line shown on the Mapping Project” and

concluded “the project is located entirely within Private Tidelands.” Hill PFT ¶ Hill’s determination does not address the definition of Low Water Mark and High Water Mark in the regulations.

10. Since 1866, the Pilgrim site has been altered in order to accommodate Pilgrim’s construction and operations. Hill PFT, ¶ 6, 11, 12; duBois Rebuttal Testimony.

12. The MassCZM map T-1063 as produced by MassCZM shows only a “historic high water mark” and does not show a “historic low water mark.”

13. In August 2015, I spoke to the MassCZM GIS Manager Daniel W. Sampson who is responsible for maintaining the data on CZM’s coastal mapping project including T-1063. He confirmed that T-1063 as produced by MassCZM does not contain a historic low water mark.

14. Las PFDT ¶ 17 describes a bathymetric survey of the intake embayment in 2011 purportedly used to determine the current mean low water, current mean high water, spring low tide, and spring high tide elevations. Such a survey is not the equivalent of the method described in the Waterways Regulations, 310 CMR 9.02, Definitions of Low Water Mark and High Water Mark. These regulations define the Low Water Mark as the “present mean low tide line, as established by the present arithmetic mean of water heights observed at low tide over a specific 19-year Metonic Cycle (the National Tidal Datum Epoch), and shall be determined using hydrographic survey data of the National Ocean Survey of the U.S. Department of Commerce.” The definition of High Water Mark also refers to the 19-year Metonic Cycle and the hydrographic survey data.

15. Using the mean of the water height at low tide over the 19-year Metonic Cycle gives the elevation of the water at the surface at a certain location surveyed over a period

of time. For example, a buoy might be located in the bay and the water level a low tide would be measured and documented in relation to how high the water is at low tide over a 19-year period.

16. Hydrographic survey data relates to the 'science' of water features and includes bathymetry. A hydrographic survey also includes shoreline mapping, submerged feature mapping and identification, depth soundings (bathymetry), tidal and current characteristics, etc. A basic definition is found here:

<http://oceanservice.noaa.gov/facts/bathymetry.html>

Hydrographic survey data takes into account the dynamics of ocean currents during various weather conditions as opposed to a specific point in time. A hydrographic survey includes bottom makeup, frictional coefficients, flora and fauna, wave action and wave run-up.

17. What Las PFT ¶ 17 describes as a bathymetric survey is simply a measurement of the depth of the water at certain points. Neither DEP nor Entergy provide any data or records to show the vertical data over a period of time to which the bathymetric datum referred to in the Las PFT ¶ 17 is referenced.

18. Based on my review of the record and the Las and Hill PFDT, neither DEP nor Entergy used hydrographic survey data to establish the Tidelands boundaries at the project site.

19. Las states he used a bathymetric survey from 2011 to create Sheet 2 of the permit application and then put the "Chapter 91 jurisdictional boundaries" on Sheet 3. Las PFDT ¶s 17, 18. Las says that the elevations were correlated to the "Mean Low Water [] datum."

20. Las PFDT ¶ 18 refers to topographic data provided by the Town of Plymouth but does not describe or identify what this topographic data is. Topography is a measure of terrestrial elevations and therefore should not be used in determining high and low water marks.

21. The information described by Las in PFDT ¶ 18 is vague and does not fit the methodology described in the Regulations at 9.02 for determining the Low and High Water Marks. Entergy does not identify which, if any Metonic Cycle it used to establish the Mean Low Water and Mean High Water marks on Sheets 2 and 3 of the application.

22. Las Exhibit 6 does not show the present Low Water Mark or High Water Mark as that term is defined in the Regulations at 9.02. All Exhibit 6 does is overlay the 1866 T-1063 map, with DEP's addition of the "historic low water mark" which it inferred based on the shoreline on Beals and Thomas's map of where it claims the outhaul moorings, outhaul line, and land based moorings are located. This method is not what is called for by the 310 CMR 9.02 definition of Low and High Water Mark.

23. Las PFDT ¶ 24 states, "It does not seem possible that the current mean high water line would be landward of the concrete security wall at the Station." He provides no data to support this conclusion.

24. Hill's PFDT ¶7 gives his opinion about the Mean High Water Elevation and Mean Low Water Elevation at the project site. He relies on the National Geodetic Survey-Tidal Elevation data, Exhibit C to his testimony.

25. There is no indication that Las or Hill used the required method under 310 CMR 9.02 to establish the location of Private Tidelands.

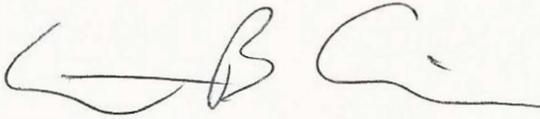
26. It is my opinion none of the information or maps submitted by Entergy or MassDEP in their PFDT show the Low Water Mark or High Water Mark as defined by the Regulations. They have not provided information that experts in my field reasonably rely on to establish present low and high water marks for purposes of construction or implementation of a project such as that proposed by Entergy.

27. In my PFT ¶ 15, I say that my Exhibit 2 shows the Historic High Water Mark and Historic Low Water Mark at the Project site. Exhibit 2 shows “Mean High Water” at 13.14 Feet and “Mean Low Water” at 3.39 Feet. Exhibit 2 and ¶ 15 are consistent because:

- a. As I explain in my PFT ¶ 10, I looked at the definitions of Historic Low Water Mark (HLWM) and Historic High Water Mark (HHWM). These definitions have an exception that says they apply to low and high water marks that existed prior to human alteration. Since the project site has been altered by fill, excavation, dredging, among other alterations, it is necessary to refer to the definitions of High and Low Water Marks. In my PFDT ¶ 15 I say that Exhibit 2 shows the HHWM and HLWM and by this mean that I applied these definitions, including the exception because the site has been altered. My Exhibit 2 therefore has the labels “Mean Low Water” and “Mean High Water.”
- b. On my Exhibit 2:
 - The dark orange line labeled “Mean High Water 13.14 Feet” is the “present mean high tide line” as used in the definition of “High Water Mark” in 9.02.

- The light orange line labeled “Mean Low Water 3.39 Feet” is the “present mean low tide line” as used in the definition of “Low Water Mark” in 9.02.

Signed under the pains and penalties of perjury this 18th day of September, 2015.

A handwritten signature in black ink, appearing to read 'S B S', written over a horizontal line.

Stephen B. Sovick