To: File, Taunton WWTP, NPDES No. MA0100897

From: Susan Murphy, Permit Writer

Date: March 11, 2015

Re: January 8, 2015 Supplemental Comments submitted by John Hall

EPA received the above document, characterized by the sender as “supplemental comments” on the Taunton WWTP Draft Permit, by email on January 8, 2015. Note the public comment period on the Draft Permit closed on June 17, 2013 and therefore this is not a timely comment pursuant to 122 C.F.R. 40 C.F.R. § 124.17(a)(2), and therefore no response is required. EPA has included the document in the Administrative Record for the Final Permit and considered the content of the comment as follows:

First EPA disagrees with the comment’s characterization of the Fact Sheet analysis. The commentor’s coining of a new term (“sentinel method”) to characterize some undefined aspect of EPA’s approach does not change the nature of EPA’s analysis, which is a reference based approach based on site specific data and used in conjunction with other information. The comment also mischaracterizes the FOIA response from EPA HQ.

With response to the impact of the Brayton Point thermal load reductions, EPA disagrees with the conclusions in the comment. EPA notes that the Swanson thermal plume modelling included with the submittal was already part of the Taunton Administrative Record; excerpts are reproduced below.

Summary:

1. This is not a model of DO concentrations. They do not have a DO model. They are taking a thermal model and tacking on a basic DO saturation/temperature equation.
2. The theoretical impact presented is on the DO saturation concentration (i.e. the maximum amount of DO that can be dissolved in water at a specific temperature), not the actual DO concentration.
3. In contrast, our conclusions are based on actual DO concentrations in bottom waters, which are well below saturation levels (i.e. sonde data 2011 and 2013 indicate average 63% saturation and never reach saturation). Raising the saturation concentration will not result in a corresponding rise in actual DO where concentrations are well below saturation.
4. Even in surface waters DO saturations swing between undersaturated and supersaturated, a pattern that corresponds to high chlorophyll concentrations and resulting diurnal oxygen swings. In these conditions it is very unclear what impact a relatively small (compared to the diurnal changes) change in saturation concentration might have on surface waters, let alone the subsequent transfer of that surface oxygen to bottom waters.

5. Actual data shows continuing low DO in bottom waters after elimination of the thermal plume (thermal loads were close to zero in 2013), based on sonde data and Brayton Point Station monitoring.

Moreover:

6. The temperature impact from eliminating the thermal plume is much less in bottom waters than the bay average (based on plume cross-sections in Swanson, 2006, Figures 20 and 21) so actual temperature difference (and related change in DO saturation) in the bottom waters where critical DO conditions exist is much less than suggested in the memo.
7. Also, the temperature impact from eliminating the thermal plume is less in the lower reaches of Mount Hope Bay (our reference area) than the bay average, Swanson 2006, Figures 15 and 17, and eliminating the thermal plume has no temperature impact in the Taunton River. See Swanson, 2006 at 153. Again this means that any related change in DO saturation is much lower than suggested in the memo.
8. The thermal plume did not affect Taunton River temperatures. Swanson, 2006 at 153. Taunton River naturally has warmer temperatures than lower Mount Hope Bay. Swanson, 2006, Figure 19. Temperatures in the lower Bay with the thermal plume were actually similar to natural temperatures in the Taunton River. See Swanson, 2006, Figures 15 and 17. So the thermal conditions in 2004-06 actually made lower Mount Hope Bay more comparable to the Taunton River and the thermal studies do not indicate need to correct for impacts of eliminating the thermal plume if any could be shown.

Citations above and chart images reproduced below are from:

Swanson, C., Kim, H.S. and Sankaranarayanan, S., Modeling of Temperature Distributions in Mount Hope Bay Due to Thermal Discharges from the Brayton Point Station. 13 Northeastern Naturalist 145 (2006).

The temperature impacts noted in the 2015 memo from Swanson are the same as those presented in this 2006 article, see comparison of charts below. The one from the article shows 2 operating conditions and starts at -5° C but is substantively the same as the one we just got:

Figure from 2006 Northeastern Naturalist article

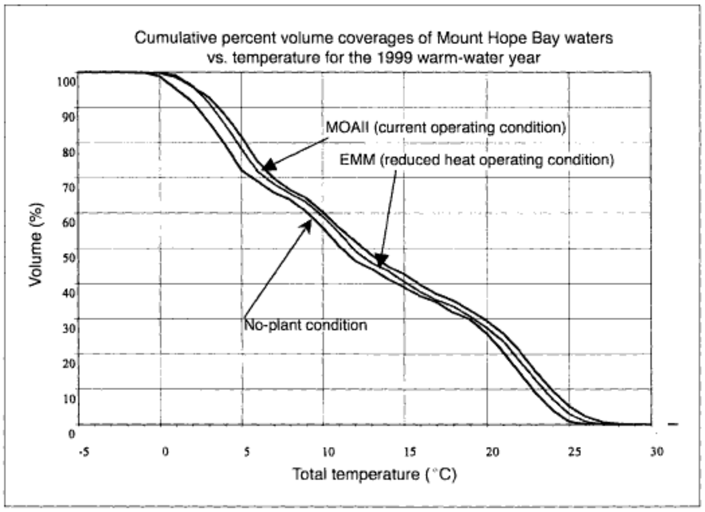

Figure 22. Volume coverage as a function of temperature over the 1999 yearly simulation for various Brayton Point Station heat loads: MOA II (current operating condition), EMM (reduced heat operating condition), and no-plant operating scenarios.

Figure from Swanson memo 2015

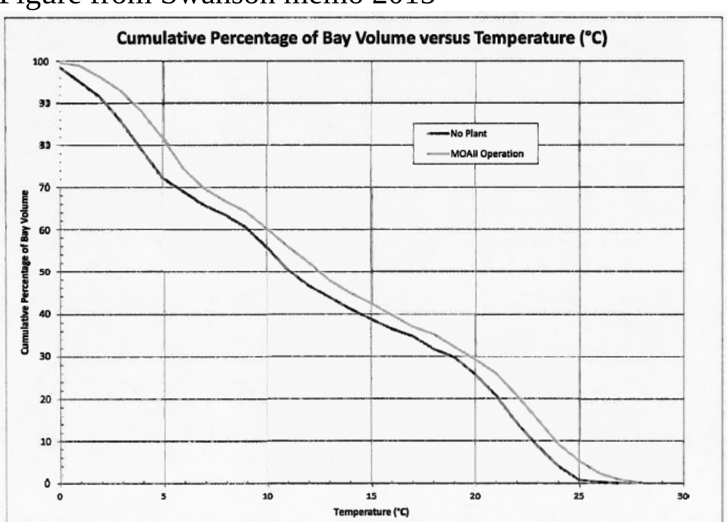

Figure 1. Cumulative percentage of Mt. Hope Bay volume exceeding temperatures for two modeled scenarios.

Page 153 “The thermistor surveys show that, in the Taunton River, events were driven mostly by tides, weather, and river flows, with no effect from the Brayton Point Station plume.”

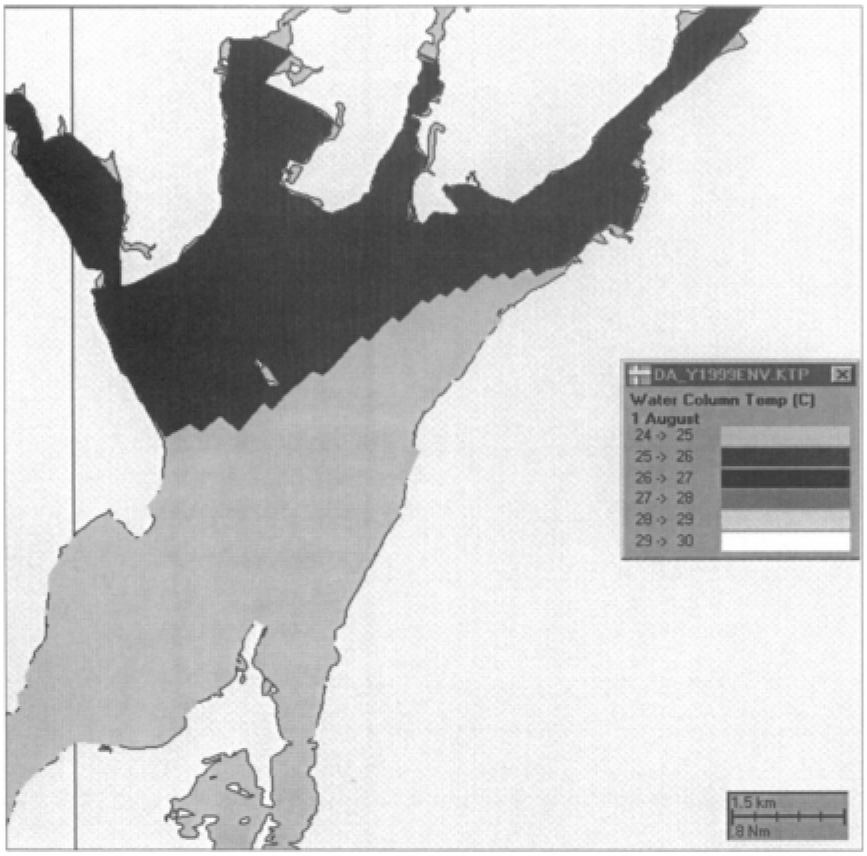

Figure 19. Plan view of daily mean water-column temperature for no-Plant hydrothermal model run on August 1, 1999.

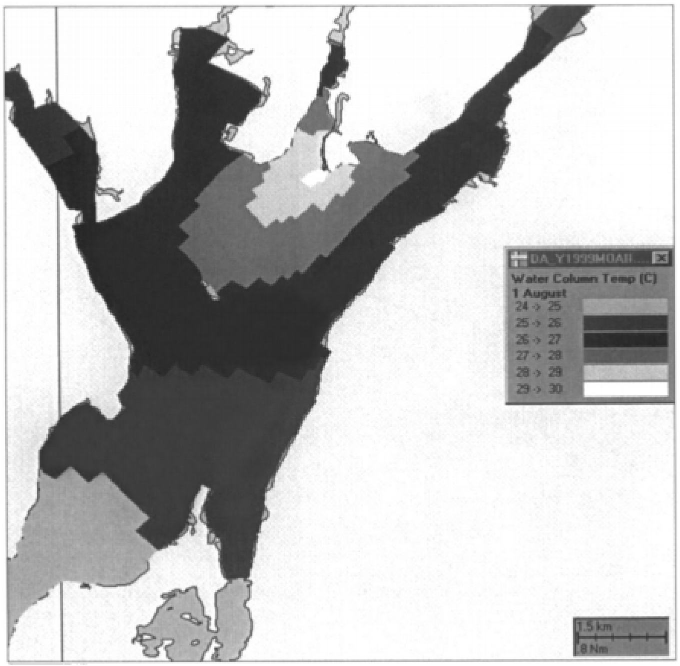

Figure 15. Plan view of daily mean water-column temperature for MOA II hydrothermal model run on August 1, 1999.

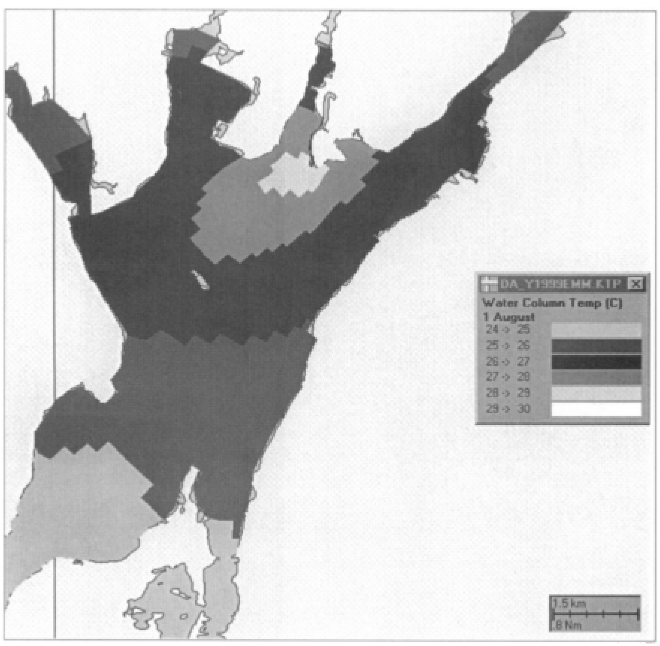

Figure 17. Plan view of daily mean water-column temperature for enhanced multi-mode hydrothermal model run on August 1, 1999.

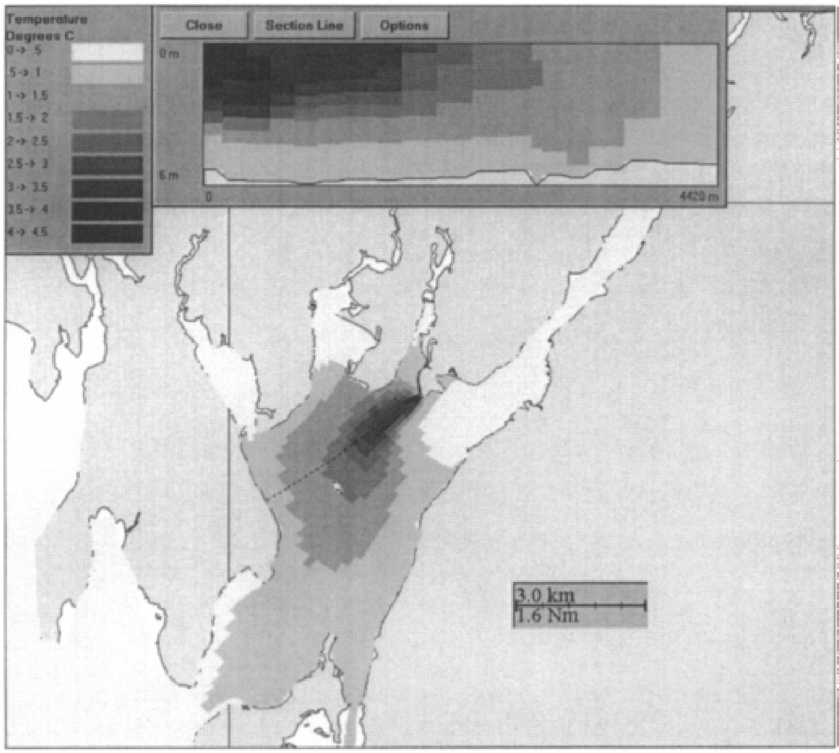

Figure 20. Plan view of surface temperature differences for the EMM hydrothermal model run relative to the no-plant run at maximum ebb. Vertical cross-sectional view from the outfall is seen in the insert.

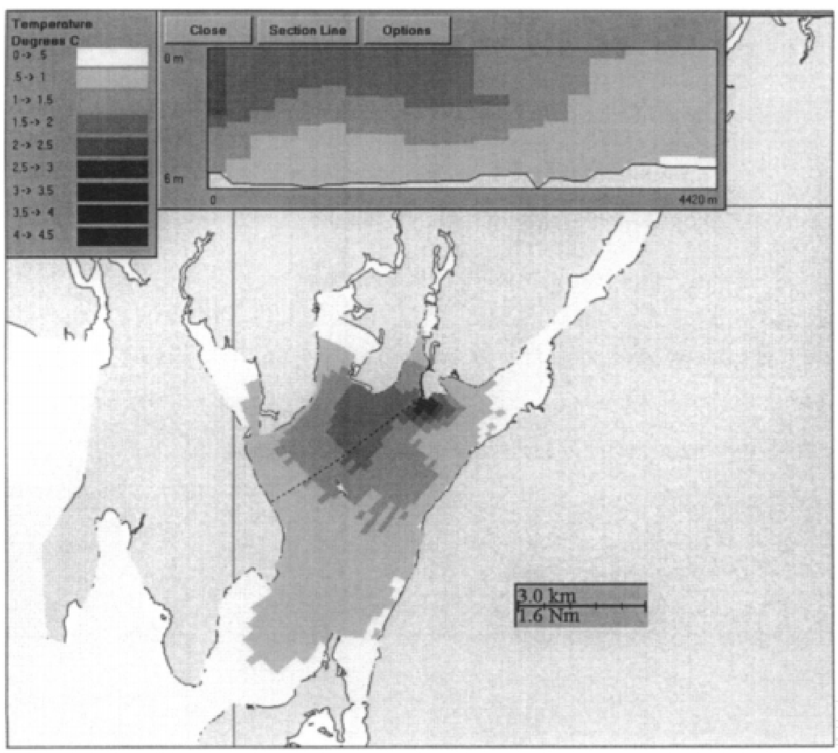

Figure 21. Plan view of surface temperature differences for the EMM hydrothermal model run relative to the no-plant run at maximum flood. Vertical cross-sectional view from the outfall is seen in the insert.