MEMORANDUM

To: File, Taunton WWTP, NPDES No. MA0100897

From: Susan Murphy, Permit Writer

Date: March 13, 2015

Re: July 22, 2014 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 July 22, 2014. 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:

1. Peer Review Report re NHDES 2009 concerns a different type of analysis (stressor-response) than used here, and questions to peer reviewers did not address standard used for permit issuance. Prior peer review supported NHDES approach. As noted in supplemental comment, the underlying issue concerning validity of approach is addressed in timely filed comments.

2. Case cited concerns liability determination for a violation of water quality standards, not setting of permit limits. Causal standard is different. This issue also is addressed in timely filed comments.

MEMORANDUM

To: File, Taunton WWTP, NPDES No. MA0100897

From: Susan Murphy, Permit Writer

Date: December 15, 2014

Re: September 16, 2014 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 September 16, 2014. 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:

Professor Chapra mischaracterizes the nitrogen analysis, which does not contend that DO is the "single factor controlling the DO regime". Rather, TN discharges have reasonable potential to cause, or contribute to, cultural eutrophication leading to DO impacts, and reductions in TN loads are therefore necessary. This issue is addressed in the timely submitted comments.

Professor Chapra also seeks to distinguish estuaries as flowing, advective systems for which choice of TN as a stressor would be inappropriate. This characterization of estuarine systems is incorrect, as estuaries have both advective and dispersive transport. This aspect of estuarine water quality analysis is recognized in Professor Chapra's own textbook on water quality modelling:

> In particular we focus on aspects of estuarine transport that have a bearing on water-quality modeling. . . . Depending on the scale of the problem being addressed, the tidal motion can be perceived as being either advective or dispersive. For short-scale problems such as the discharge of highly reactive substances or spills, the motion would be perceived primarily as advection. On a longer time scale, however, the tides would move water back and forth in a cyclical fashion and the motion might be characterized as dispersive.
>
> In this lecture we limit ourselves primarily to the long-term perspective. Thus we focus on the steady-state condition averaged over a number of tidal cycles.

Chapra, *Surface Water Quality Modeling*, pp. 260-61 (1997). Professor Chapra's appendix concerns a purely advective system so is not on point; further it supports the relationship between total nutrient concentration and phytoplankton growth at downstream points where steady state has been reached; the nitrogen analysis at issue concerns downstream impacts under longer term steady state conditions. (EPA notes that the long time frame for reaching steady state in the Appendix plots is related to a low value assumed for the parameter k_g of 0.5 d^{-1}; whereas Chapra's textbook states, "It is known that the phytoplankton growth rate is on the order

of 2 d^{-1}" *Id.* at 604). The choice of TN as a stressor is addressed in the timely submitted comments.

EPA notes that all modeling involves simplifications; for example steady state analysis of water quality issues is always a simplification of dynamic processes but is recognized as having utility under appropriate time scales. See *id.* The specific assumptions identified by Chapra are addressed in the timely submitted comments.

MEMORANDUM

To: File, Taunton WWTP, NPDES No. MA0100897

From: Susan Murphy, Permit Writer

Date: March 13, 2015

Re: November 25, 2014 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 November 25, 2014. 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:

This "supplemental comment" has no substantive content and is essentially a restatement of issues in ongoing FOIA litigation. EPA notes that the Administrative Record for the Final Permit is available for public review and that this permit writer specifically invited this commenter to come to EPA's office to review said record; that invitation was declined.

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

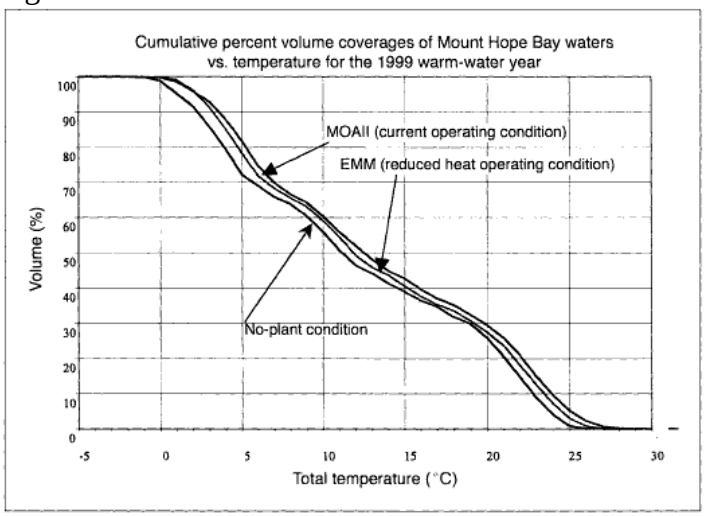

Figure 22. Volume coverage as a function of temperature over the 1999 yearly simulation for various Brayton Point Station heat loads: MOA II (current operating condition), EMM (reduced heat operating condition), and no-plant operating scenarios.

Figure from Swanson memo 2015

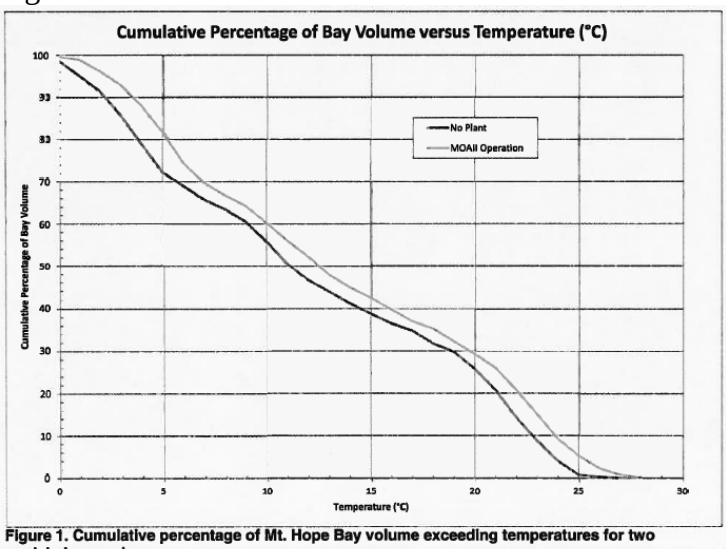

Figure 1. Cumulative percentage of Mt. Hope Bay volume exceeding temperatures for two modeled scenarios.

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.”

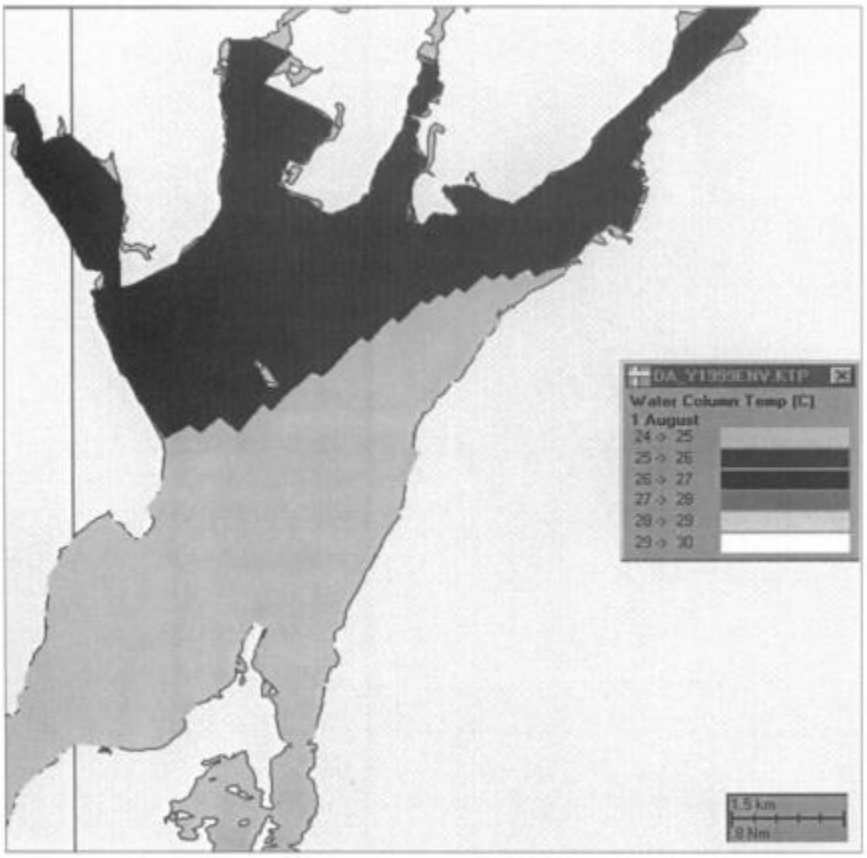

Figure 19. Plan view of daily mean water-column temperature for no-Plant hydrothermal model run on August 1, 1999.

MEMORANDUM

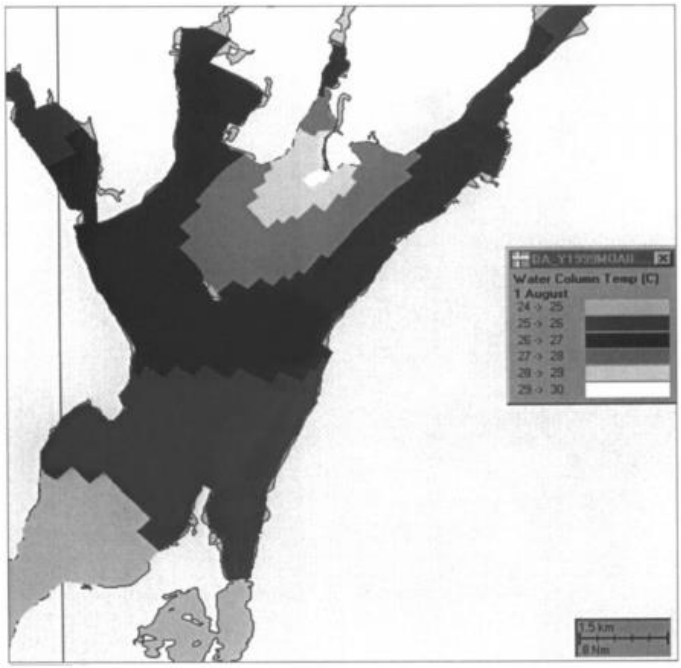

Figure 15. Plan view of daily mean water-column temperature for MOA II hydrothermal model run on August 1, 1999.

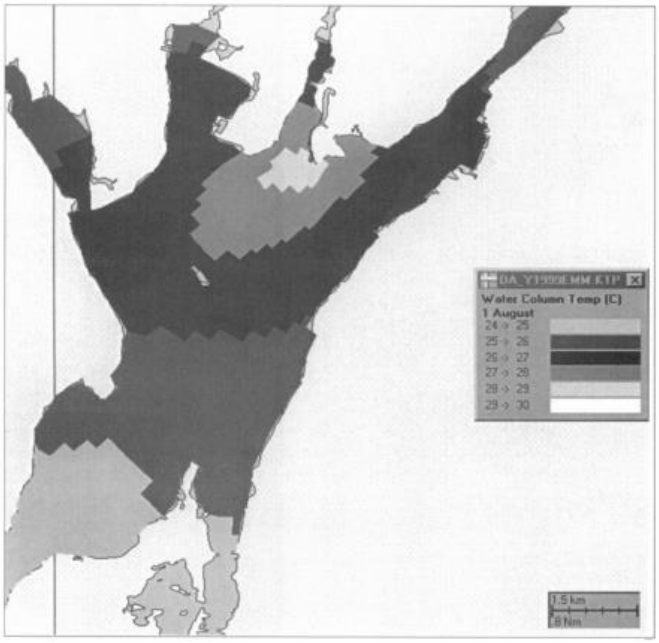

Figure 17. Plan view of daily mean water-column temperature for enhanced multi-mode hydrothermal model run on August 1, 1999.

MEMORANDUM

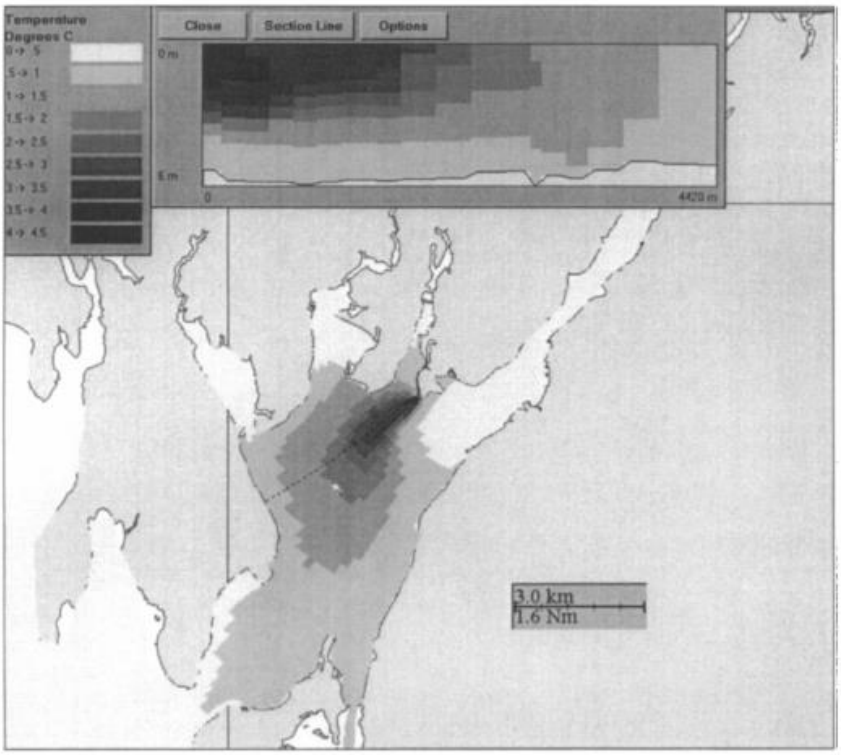

Figure 20. Plan view of surface temperature differences for the EMM hydrothermal model run relative to the no-plant run at maximum ebb. Vertical cross-sectional view from the outfall is seen in the insert.

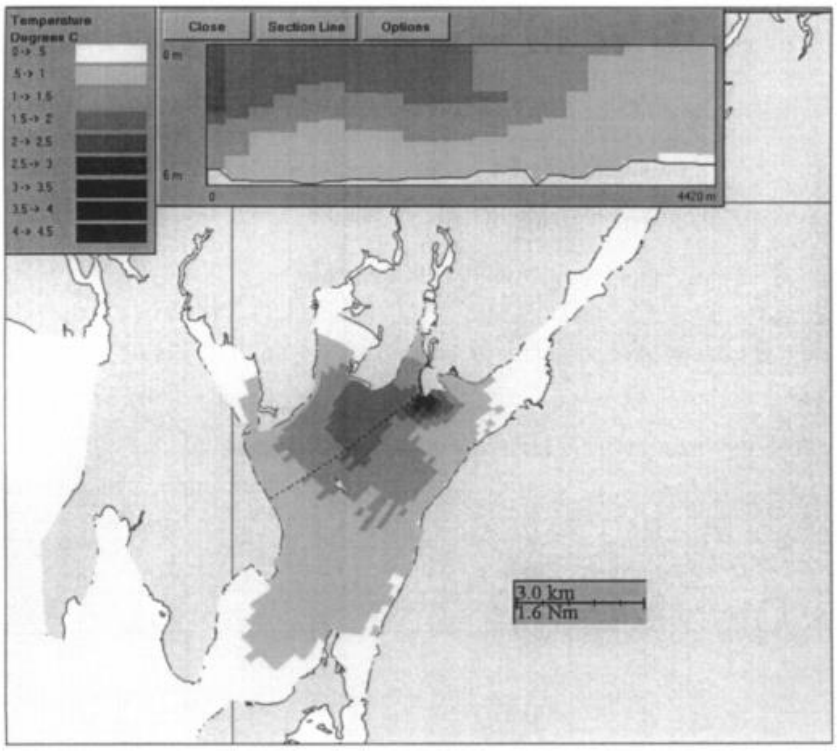

Figure 21. Plan view of surface temperature differences for the EMM hydrothermal model run relative to the no-plant run at maximum flood. Vertical cross-sectional view from the outfall is seen in the insert.

MEMORANDUM

To: File, Taunton WWTP, NPDES No. MA0100897

From: Susan Murphy, Permit Writer

Date: March 11, 2015

Re: February 17, 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 February 17, 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:

EPA disagrees with the legal argument presented in the comment regarding the inclusion of a flow limit on the discharge of treated sewage from this facility. Such a flow limit is within EPA's authority under the Clean Water Act. Sewage treatment plant discharge is encompassed within the definition of "pollutant" and is subject to regulation under the Act. The CWA defines "pollutant" to mean, *inter alia*, "municipal . . . waste[]" and "sewage…discharged into water." 33 U.S.C. § 1362(6). The authorities cited in the submitted document are for the most part isolated sentences from unrelated authorities that appear to support the comment contention only when taken out of context, and do not concern the discharge of treated sewage. See *Orleans Audubon Society v. Lee*, 742 F.2d 901 (5th Cir. 1984) (installation of drainage culverts carrying clear water did not constitute discharge of a pollutant); *Bettis v. Ontario*, 800 F.Supp. 1113 (W.D.N.Y. 1992) (diversion of a natural stream is not a discharge of pollutants); 63 Fed. Reg 43586 (July 13, 2000) (impairment of instream flow due to withdrawals and diversions did not require a TMDL). The VA DOT case cited specifically concerns stormwater discharge, not treated sewage.

Further, EPA may use design flow to both determine the necessity for effluent limitations in the permit that comply with the Act, and to calculate the limits themselves. EPA practice is to use design flow as a reasonable and important worst-case condition in EPA's reasonable potential and water quality based effluent limitations (WQBELs) calculations to ensure compliance with water quality standards under Section 301(b)(1)(C). Should the discharge flow exceed the flow assumed in these calculations, the instream dilution would decrease and the calculated effluent limits would not be protective of WQS. Further, pollutants that did not have the reasonable potential to exceed WQS at the lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. In order to ensure that the assumptions underlying the Region's reasonable potential analyses and derivation of permit effluent limitations remain sound for the duration of the permit, the Region may ensure its "worst-case" effluent wastewater flow assumption through imposition of a permit condition for flow. Thus, the flow limit is a component of WQBELs because the WQBELs are premised on a maximum level of flow. In addition, the flow limit is necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed water quality standards.

MEMORANDUM

Using a facility's design flow in the derivation of pollutant effluent limitations, including conditions to limit wastewater effluent flow, is fully consistent with, and anticipated by NPDES permit regulations. 40 C.F.R. § 122.45(b)(1) provides, "permit effluent limitations…shall be calculated based on design flow." POTW permit applications are required to include the design flow of the treatment facility. *Id.* § 122.21(j)(1)(vi).

Similarly, EPA's reasonable potential regulations require EPA to consider "where appropriate, the dilution of the effluent in the receiving water," 40 C.F.R. § 122.44(d)(1)(ii), which is a function of *both* the wastewater effluent flow and receiving water flow. EPA guidance directs that this "reasonable potential" analysis be based on "worst-case" conditions. EPA accordingly is authorized to carry out its reasonable potential calculations by presuming that a plant is operating at its design flow when assessing reasonable potential.

The limitation on sewage effluent flow is within EPA's authority to condition a permit in order to carry out the objectives of the Act. *See* CWA §§ Sections 402(a)(2) and 301(b)(1)(C); 40 C.F.R. §§ 122.4(a) and (d); 122.43 and 122.44(d). A condition on the discharge designed to protect EPA's WQBEL and reasonable potential calculations is encompassed by the references to "condition" and "limitations" in 402 and 301 and implementing regulations, as they are designed to assure compliance with applicable water quality regulations, including antidegradation. Regulating the quantity of pollutants in the discharge through a restriction on the quantity of wastewater effluent is consistent with the overall structure and purposes of the CWA.

In addition, as provided in Part II.B.1 of this permit and 40 C.F.R. § 122.41(e), the permittee is required to properly operate and maintain all facilities and systems of treatment and control. Operating the facilities wastewater treatment systems as designed includes operating within the facility's design effluent flow. Thus, the permit's effluent flow limitation is necessary to ensure proper facility operation, which in turn is a requirement applicable to all NPDES permits. *See* 40 C.F.R. § 122.41.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

Memorandum

Date: April 9, 2015

Subject: Taunton MA Final Permit – Affordability Analysis

From: David Pincumbe

After the close of the public comment period, the City of Taunton and its representatives submitted additional cost information and affordability analyses. The new cost estimates represented a significant increase over previous cost estimates. As these cost estimates are speculative and unsupported, EPA has declined to rely on them for conducting an affordability analysis. Additionally, the updated affordability analyses submitted by the City and its representatives continues to utilize an incorrect figure for the number of households connected to the sewer system. Accordingly, EPA stands by its analysis contained in the Response to Comments issued along with the final permit.