AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, 33 U.S.C. §§ 1251 et seq. (the "CWA"),

City of Fall River Sewer Commission, Massachusetts

is authorized to discharge from the facility located at

Fall River Wastewater Treatment Plant
1979 Bay Street
Fall River, MA 02724 **and 18 Combined Sewer Overflow (CSO) Outfalls**

to receiving waters named

Mount Hope Bay Segment 61-06 , Class SB – CSO (Wastewater Treatment Plant Outfall 001 and CSO Outfalls # 002, 003, 004, 005, 006, 007 and 008); Taunton River Segment 62-04, Class SB - CSO (CSO Outfalls # 010, 011, 013 and 014); and Quequechan River Segment 61-05, Class SB Warm Water Fishery and CSO (CSO Outfalls # 009, 015, 016, 017, 018, 019 and 020)

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

The Towns of Freetown and Westport, Massachusetts and Tiverton, Rhode Island are Co-permittees for: Part I.B, Unauthorized Discharges; Part I.C, Operation and Maintenance of the Treatment and Control Facilities (which include conditions regarding the operation and maintenance of the collection systems owned and operated by the Towns); and Part I.D, Alternate Power Source. The permit number assigned to the Towns for purposes of reporting (using NetDMR through EPA's Central Data Exchange, as specified in Part I.I below) in accordance with the requirements in Parts I.B, I.C, and I.D of this permit are as follows: Freetown, Massachusetts: **MAC010382**; Westport, Massachusetts: **MAC020382**; and Tiverton, Rhode Island, **MAC030382**.

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the terms and conditions of Parts I.B, I.C, and I.D of this permit. The Permittee and Co-permittees are severally liable under Parts I.B, I.C, and I.D for their own activities and required reporting under Part I.I with respect to the portions of the collection system that they own or operate. They are not liable for violations of Parts I.B, I.C, and I.D committed by others relative to the portions of the collection system owned and operated by others. Nor are they responsible for any reporting under Part I.I that is required of other Permittees under Parts I.B, I.C, and I.D. The responsible departments for the Co-permittees are:

Town of Freetown Water and Sewer Commission Freetown Town Hall 3 North Main Street P.O. Box 438 Assonet, MA 02702	Town of Westport Westport Town Hall 816 Main Road Westport, MA 02790	Tiverton Wastewater District 400 Fish Road Tiverton, RI 02878

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature. [1]

This permit expires at midnight, five years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on December 7, 2000.

This permit consists of **Part I** including the cover page(s), **Attachment A** (Marine Acute Toxicity Test Procedure and Protocol, July 2012), **Attachment B** (Marine Chronic Toxicity Test Procedure and Protocol, November 2013), **Attachment C** (Reassessment of Technically Based Industrial Discharge Limits), **Attachment D** (NPDES Permit Requirement for Industrial Pretreatment Annual Report); **Attachment E** (PFAS Analyte List); **Attachment F** (Combined Sewer Overflow Outfalls); and **Part II** (NPDES Part II Standard Conditions, April 2018).

Signed this day of

Ken Moraff, Director
Water Division
Environmental Protection Agency
Region 1
Boston, MA

[1] Pursuant to 40 Code of Federal Regulations (CFR) § 124.15(b)(3), if no comments requesting a change to the Draft Permit are received, the permit will become effective upon the date of signature. Procedures for appealing EPA's Final Permit decision may be found at 40 CFR § 124.19.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to the Mount Hope Bay. The discharge shall be limited and monitored as specified below; the receiving water and the influent shall be monitored as specified below.

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Rolling Average Effluent Flow[5]	30.9 MGD[5]	---	---	Continuous	Recorder
Effluent Flow[5]	Report MGD	---	Report MGD	Continuous	Recorder
BOD_5	30 mg/L 7,730 lb/day	45 mg/L 11,600 lb/day	Report mg/L	5/Week	Composite
BOD_5 Removal[6]	≥ 85 %	---	---	1/Month	Calculation
TSS	30 mg/L 7,730 lb/day	45 mg/L 11,600 lb/day	Report mg/L	5/Week	Composite
TSS Removal[6]	≥ 85 %	---	---	1/Month	Calculation
pH Range[7]	6.5 - 8.5 S.U.			1/Day	Grab
Total Residual Chlorine[8,9]	42.5 µg/L	---	73.7 µg/L	3/Day	Grab
Fecal coliform [8,9]	88 MPN/100 mL	---	260 MPN/ 100 mL	3/Week	Grab
Enterococci [8,9]	35 cfu/100 mL	---	104 cfu/100 mL	1/Week	Grab
Total Recoverable Copper	22 µg/l	---	33 µg/l	2/Month	Composite
Total Recoverable Lead	48.3 µg/l	---	Report µg/l	2/Month	Composite
Ammonia Nitrogen[10] (April 1 – October 31)	17.4 mg/L	---	Report mg/L	1/Month	Composite
Total Kjeldahl Nitrogen[11] (May 1 – October 31) (November 1 – April 30)	Report mg/L Report mg/L	---	Report mg/L Report mg/L	1/Week 1/Month	Composite Composite

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[4]**
Nitrate + Nitrite[11] (May 1 – October 31) (November 1 – April 30)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Week 1/Month	 Composite Composite
Total Nitrogen[11]	Report mg/L	---	Report mg/L	1/Month	Calculation
Rolling Seasonal Average Total Nitrogen[12] (May 1 – October 31)	1,289 lb/day	---	---	1/Month	Calculation
PFAS Analytes[13]	---	---	Report ng/L	1/Quarter	Grab
Adsorbable Organic Fluorine[14]	---	---	Report ng/L	1/Quarter	Grab
Whole Effluent Toxicity (WET) Testing[15,16]					
LC_{50}	---	---	≥ 100 %	1/Quarter	Composite
C-NOEC	---	---	≥ 18 %	1/Quarter	Composite
Salinity	---	---	Report ppt	1/Quarter	Composite
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Composite
Total Cadmium	---	---	Report mg/L	1/Quarter	Composite
Total Copper	---	---	Report mg/L	1/Quarter	Composite
Total Nickel	---	---	Report mg/L	1/Quarter	Composite
Total Lead	---	---	Report mg/L	1/Quarter	Composite
Total Zinc	---	---	Report mg/L	1/Quarter	Composite
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Composite

Ambient Characteristic[17]	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Salinity	---	---	Report ppt	1/Quarter	Grab
Ammonia Nitrogen	---	---	Report mg/L	1/Quarter	Grab
Total Cadmium	---	---	Report mg/L	1/Quarter	Grab
Total Copper	---	---	Report mg/L	1/Quarter	Grab
Total Nickel	---	---	Report mg/L	1/Quarter	Grab
Total Lead	---	---	Report mg/L	1/Quarter	Grab
Total Zinc	---	---	Report mg/L	1/Quarter	Grab
Total Organic Carbon	---	---	Report mg/L	1/Quarter	Grab
pH[18]	---	---	Report S.U.	1/Quarter	Grab
Temperature[18]	---	---	Report °C	1/Quarter	Grab

Influent Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
BOD_5	Report mg/L	---	---	2/Month	Composite
TSS	Report mg/L	---	---	2/Month	Composite
PFAS Analytes[13]	---	---	Report ng/L	1/Quarter	Grab
Adsorbable Organic Fluorine[14]	---	---	Report ng/L	1/Quarter	Grab

Sludge Characteristic	Reporting Requirements			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
PFAS Analytes[13]	---	---	Report ng/g	1/Quarter	Grab[19]

Footnotes:

1. All samples shall be collected in a manner to yield representative data. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented as an electronic attachment to the applicable discharge monitoring report. The Permittee shall report the results to the Environmental Protection Agency Region 1 (EPA) and MassDEP ("the State") of any additional testing above that required herein, if testing is in accordance with 40 CFR Part 136.

2. In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers either to the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in the following ways: they may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

3. When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" to all non-detects for that reporting period and report the average of all the results.

4. A "grab" sample is an individual sample collected in a period of less than 15 minutes.

   A "composite" sample is a composite of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportional to flow.

5. The limit is a rolling annual average, reported in million gallons per day (MGD), which will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months. Also report monthly average and maximum daily flow in MGD.

A bypass of secondary treatment is subject to the requirements of Part II.B.4.and Part II.D.1.e. of this permit. The following information shall be reported as an electronic attachment to each March DMR summarizing each day there was a bypass of secondary treatment for the previous calendar year: date and time of initiation of bypass flow, influent flow at time of initiation (MGD), date and time of termination of bypass flow, influent flow at time of termination (MGD), duration of bypass (hrs), and total volume of bypass flow (MG).

6. The BOD_5 and TSS percent removal requirement does not apply during periods of wet weather. Wet weather is defined, for purposes of this requirement, as any period in which there is greater than 0.1 inches of rain and/or snowmelt.

7. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.).

   An optional pH study may be conducted by the Permittee at any time before the expiration date of the permit to support a request to expand the pH range to 6.0 S.U. The study must consist of at least 12 months of data collection and be designed based on guidance from MassDEP to verify that the discharge at 6.0 S.U. would not cause or contribute to an excursion of state water quality standards. For guidance on the study, the Permittee may contact MassDEP at massdep.npdes@mass.gov.

   Upon completion of the pH study, the Permittee must submit the results to MassDEP at massdep.npdes@mass.gov for review and approval. If approved, MassDEP will notify EPA that the pH adjustment is allowable, and the pH limit will change to 6.0 S.U. at that time.

8. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. Monitoring for total residual chlorine (TRC) is only required for discharges which have been previously chlorinated or which contain residual chlorine. If chlorine is not utilized during a particular monitoring period, TRC monitoring is not necessary and the Permittee may enter “NODI” code 9 (i.e., conditional monitoring) in the relevant discharge monitoring report.

   Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

9. The monthly average limits for fecal coliform and enterococci are expressed as a geometric mean. Monitoring shall be conducted concurrently with TRC monitoring, if TRC monitoring is required.

   For samples tested using the Most Probable Number (MPN) method, the units may be expressed as MPN. The units may be expressed as colony forming units (cfu) when using the Membrane Filtration method.

10. See Part I.G.3 for compliance schedule related to ammonia nitrogen.

11. Total Kjeldahl nitrogen and nitrate + nitrite samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen, as follows.

    Total Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) + Nitrate + Nitrite (mg/L)

    Total Nitrogen (lb/day) = [(average monthly Total Nitrogen (mg/L) * total monthly effluent flow (Millions of Gallons (MG)) / # of days in the month] * 8.34

12. The rolling seasonal total nitrogen limit is an average mass-based limit (lb/day), which shall be reported as a rolling 6-month average from May 1 through October 31. The value will be calculated as the arithmetic mean of the monthly average total nitrogen for the reporting month and the monthly average total nitrogen for the previous 5 months from May through October. Report both the rolling annual average and the monthly average each month.

    See Parts I.G.1 and I.G.2 for compliance schedule and optimization conditions related to nitrogen.

13. Report in nanograms per liter (ng/L) for effluent and influent samples; report nanograms per gram (ng/g) for sludge samples. Until there is an analytical method approved in 40 CFR Part 136 for PFAS, monitoring shall be conducted using Method 1633. Report in NetDMR the results of all PFAS analytes required to be tested in Method 1633, as shown in Attachment E. This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter following six months after the effective date of the permit.

14. Report in nanograms per liter (ng/L) for effluent and influent samples. Until there is an analytical method approved in 40 CFR Part 136 for Adsorbable Organic Fluorine, monitoring shall be conducted using Method 1621. This reporting requirement takes effect the first full calendar quarter following six months after the effective date of the permit.

15. The Permittee shall conduct acute toxicity tests (LC50) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in Attachment A and B of this permit. LC50 and C-NOEC are defined in Part II.E. of this permit. The Permittee shall test the Inland Silverside (*Menidia beryllina)* and the Sea Urchin (*Arbacia punctulata*). Toxicity test samples shall be collected during the same weeks each time of calendar quarters ending March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall be submitted as an attachment to the DMR submittal which includes the results for that toxicity test.

16. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachment A and B**, Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

17. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately outside of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachment A and B**. Minimum levels and test methods are specified in **Attachment A and B**, Part VI. CHEMICAL ANALYSIS.

18. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.

19. Sludge sampling shall be as representative as possible based on guidance found at https://www.epa.gov/sites/production/files/2018-11/documents/potw-sludge-sampling-guidance-document.pdf.

Part I.A., continued.

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

4. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical, chemical, or biological nature of the bottom.

5. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.

6. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.

7. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.

8. The Permittee must provide adequate notice to EPA-Region 1 and the State of the following:

    a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to Part 301 or Part 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 CFR Part 122 Appendix A as amended) discharging process water; and

    b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

    c. For purposes of this paragraph, adequate notice shall include information on:

        (1) The quantity and quality of effluent introduced into the POTW; and

        (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

9. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

10. In accordance with 40 CFR § 122.44(j)(1) the Permittee must identify, in terms of character and volume, any Significant Industrial Users (SIUs) discharging into the POTW subject to Pretreatment Standards under section 307(b) of CWA and 40 CFR Part 403. SIUs information shall be updated at a minimum of once per year or at that frequency necessary to ensure that all SIUs are properly permitted and/or controlled. The records shall be maintained and updated as necessary.

B. UNAUTHORIZED DISCHARGES

1. This permit authorizes discharges only from Outfall 001 (as listed in Part I.A.1) and eighteen (18) combined sewer overflow (CSO) outfalls (as listed in Attachment F) in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit. The Permittee must provide verbal notification to EPA within 24 hours of becoming aware of any unauthorized discharge and a report within 5 days, in accordance with Part II.D.1.e (24-hour reporting). Providing that it contains the information required in Part II.D.1.e, submission of the MassDEP SSO Reporting Form (described in Part I.B.3 below) may satisfy the requirement for a written report. See Part I.I below for reporting requirements.

2. The Permittee must provide notification to the public on a publicly available website within 24 hours of becoming aware of any of the following unauthorized discharges: (a) any discharge of partially treated wastewater, including blended wastewater; (b) any Sanitary Sewer Overflow that discharges through a wastewater outfall, either directly or indirectly, to a surface water of the Commonwealth; (c) any SSO that flows into a surface water of the Commonwealth and is the result of the sanitary sewer system surcharging under high flow conditions when peak flows cannot be conveyed to a POTW due to capacity constraints; and (d) any SSO that flows into a surface water of the Commonwealth and is the result of a failure of a wastewater pump station or associated force main designed to convey peak flows of one million gallons per day or greater. Such notification shall include the location and description of the discharge; the approximate dates and times the discharge or overflow began, and its duration; and the estimated volume. Fulfilling these requirements does not relieve the Permittee of the responsibility of complying with 314 CMR 16.00.

3. Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at https://www.mass.gov/how-to/sanitary-sewer-overflowbypassbackup-notification.

C. OPERATION AND MAINTENANCE OF THE TREATMENT AND CONTROL FACILITIES

1. Adaptation Planning

   a. *Adaptation Plan*. Within the timeframes described below, the Permittee and Co-permittee(s) shall develop an Adaptation Plan for the Wastewater Treatment System

(WWTS) [2] and/or sewer system[3] that they own and operate. Additional information on the procedures and resources to aid permittees in development of the Adaptation Plan is provided on EPA's Region 1 NPDES website at https://www.epa.gov/npdes-permits/npdes-water-permit-program-new-england. The Adaptation Plan shall contain sufficient detail for EPA to evaluate the analyses.

Component 1: Identification of Vulnerable Critical Assets. Within 24 months of the effective date of the permit, the Permittee and Co-permittee(s) shall develop and sign, consistent with the signatory requirements in Part II.D.2 of this Permit, an identification of critical assets[4] and related operations[5] within the WWTS and/or sewer system which they own and operate, as applicable, that are most vulnerable due to major storm and flood events[6] under baseline conditions[7] and under future conditions.[8] This information shall be provided to EPA upon request. For these critical assets and related operations, the Permittee and Co-permittee(s) shall assess the ability of each to function properly in the event of impacts[9] from major storm and flood events in terms of effluent flow (e.g., bypass, upset or failure), sewer flow (e.g., overflow, inflow and infiltration), and

2 "Wastewater Treatment System" or "WWTS" means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It does not include sewers, pipes and other conveyances to the wastewater treatment facility.
3 "Sewer System" refers to the sewers, pump stations, manholes and other infrastructure use to convey sewage to the wastewater treatment facility from homes or other sources.
4 A "critical asset" is an asset necessary to ensure the safe and continued operation of the WWTS or the sewer system and ensure the forward flow and treatment of wastewater in accordance with the limits set forth in this permit.
5 "Asset related operations" are elements of an asset that enable that asset to function. For example, pumps and power supply enable the operation of a pump station.
6 "Major storm and flood events" refer to instances resulting from major storms such as hurricanes, extreme/heavy precipitation events, and pluvial, fluvial, and flash flood events such as high-water events, storm surge, and high-tide flooding, including flooding caused by sea level change. "Extreme/heavy precipitation" refers to instances during which the amount of rain or snow experienced in a location substantially exceeds what is normal according to location and season.
7 "Baseline conditions" refers to the 100-year flood based on historical records.
8 "Future conditions" refers to projected flood elevations using one of two approaches: a) Climate Informed Science Approach (CISA): The elevation and flood hazard area that result from using the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science. These shall include both short term (10-25 years forward-looking) and long term (25-70 years forward-looking) relative to the baseline conditions and must include projections of flooding due to major storm and flood events using federal, state and local data, where available; b) Freeboard Value and 500-year floodplain Approach: The flood elevations that result from adding an additional 2 feet to the 100-year flood elevation for non-critical actions and by adding an additional 3 feet to the 100-year flood elevation for critical actions compared to the flood elevations that result from 500-year flood (the 0.2% -annual-chance flood) and selecting the higher of the two flood elevations.
9 "Impacts" refers to a strong effect on an asset and/or asset-related operation that may include destruction, damage or ineffective operation of the asset and/or asset operation. Impacts may be economic, environmental, or public health related.

discharges of pollutants (e.g., effluent limit exceedance).

Component 2: Adaptative Measures Assessment.[10] Within 36 months of the effective date of the permit, the Permittee and Co-permittee(s) shall develop and sign, consistent with the signatory requirements in Part II.D.2 of this Permit, an assessment of adaptive measures,[11] and/or, if appropriate, the combinations of adaptative measures that minimize the impact of future conditions on the critical assets and related operations of the WWTS and/or sewer system(s). This information shall be provided to EPA upon request. The Permittee and Co-permittee(s) shall identify the critical assets and related operations at the highest risk of not functioning properly under such conditions and, for those, select the most effective adaptation measures that will ensure proper operation of the highest risk critical assets and the system as a whole.

C*omponent 3: Implementation and Maintenance Schedule.* Within 48 months of the effective date of the permit, the Permittee and Co-permittee(s) shall submit to EPA a proposed schedule for implementation and maintenance of adaptive measures. The Implementation and Maintenance Schedule shall summarize the general types of significant risks[12] identified in Component 1, including the methodology and data used to derive future conditions[13] used in the analysis and describe the adaptive measures taken (or planned) to minimize those risks from the impact of major storm and flood events for each of the critical assets and related operations of the WWTS and the sewer system and how those adaptive measures will be maintained, including the rationale for either implementing or not implementing each adaptive measure that was assessed and an evaluation of how each adaptive measure taken (or planned) will be funded.

b. *Credit for Prior Assessment(s) Completed by Permittee* and/or Co-permittee(s)*.* If the Permittee and/or Co-permittee(s) have undertaken assessment(s) that were

10 The Permittee and Co-permittee(s) may complete this component using EPA's Climate Resilience Evaluation and Awareness Tool (CREAT) Risk Assessment Application for Water Utilities, found on EPA's website Creating Resilient Water Utilities (CRWU) (https://www.epa.gov/crwu), or methodology that provides comparable analysis.
11 "Adaptive Measures" refers to physical infrastructure or actions and strategies that a utility can use to protect their assets and mitigate the impacts of threats. They may include but are not limited to: building or modifying infrastructure, utilization of models (including but not limited to: flood, sea-level rise and storm surge, sewer/collection system, system performance), monitoring and inspecting (including but not limited to: flood control, infrastructure, treatment) and repair/retrofit.
12 In light of security concerns posed by the public release of information regarding vulnerabilities to wastewater infrastructure, the Permittee shall provide information only at a level of generality that indicates the overall nature of the vulnerability but omitting specific information regarding such vulnerability that could pose a security risk.
13 See footnote 8.

completed within 5 years of the effective date of this permit, or is [are] currently undertaking an assessment that address some or all of the Adaptation Plan components, such prior assessment(s) undertaken by the Permittee and/or Co-permittee(s) may be used (as long as the reporting time frames (set forth in Part I.C.1.a) and the signatory requirements (set forth in Part II.D.2 of this permit) are met) in satisfaction of some or all of these components, as long as the Permittee and/or Co-permittee(s) explains how its prior assessments specifically meet the requirements set forth in this permit and how the Permittee and/or Co-permittee(s) will address any permit requirements that have not been addressed in its prior or ongoing assessment(s).

c. *Adaptation Plan Progress Report*. The Permittee and Co-permittee(s) shall submit an Adaptation Plan Progress Report on the Adaptation Plan for the prior calendar year that documents progress made toward completing the Adaptation Plan and, following its completion, any progress made toward implementation of adaptive measures, and any changes to the WWTF or other assets that may impact the current risk assessment. The first Adaptation Progress Report is due the first March 31 following completion of the Identification of Critical Vulnerable Assets (*Component 1*) and shall be included with the annual report required in Part I.C.3 below each year thereafter. The Adaptation Plan shall be revised if on- or off-site structures are added, removed, or otherwise significantly changed in any way that will impact the vulnerability of the WWTS or sewer system.

2. Sewer System

Operation and maintenance (O&M) of the sewer system shall be in compliance with 40 CFR § 122.41 (d) and (e) and the terms and conditions of the Part II Standard Conditions, B. Operation and Maintenance of Pollution Controls which is attached to this Permit. The Permittee and Co-permittee(s) shall complete the following activities for the collection system which it owns:

a. Maintenance Staff

The Permittee and Co-permittee(s) shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Provisions to meet this requirement shall be described in the Sewer System O&M Plan required pursuant to Part I.C.2.e. below.

b. Preventive Maintenance Program

The Permittee and Co-permittee(s) shall maintain an ongoing preventive maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. Plans and programs to meet this requirement shall be described in the Sewer System O&M Plan required pursuant to Part I.C.2.e. below.

c. Infiltration/Inflow

The Permittee and Co-permittee(s) shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to control I/I shall be described in the Sewer System O&M Plan required pursuant to Part I.C.2.e. below.

d. Sewer System Mapping

The Permittee shall maintain a map of the sewer collection system it owns. Within 30 months of the effective date of the permit, the Co-permittee(s) shall prepare a map of the sewer collection system it owns. The map shall be on a street basemap of the community, with sufficient detail and at a scale to allow easy interpretation. The sewer system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies. If any items listed below, such as the location of all outfalls, are not fully documented, the Permittee and Co-permittee(s) must clearly identify each component of the dataset that is incomplete, as well as the date of the last update of the mapping product. Such map(s) shall include, but not be limited to the following:

(1) All sanitary sewer lines and related manholes;

(2) All combined sewer lines, related manholes, and catch basins;

(3) All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);

(4) All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;

(5) All pump stations and force mains;

(6) The wastewater treatment facility(ies);

(7) All surface waters (labeled);

(8) Other major appurtenances such as inverted siphons and air release valves;

(9) A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

(10) Interconnections with collection systems owned by other entities;

(11) The scale and a north arrow; and

(12) The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

e. Sewer System Operation and Maintenance Plan

The Permittee shall continue to implement a *Sewer System Operation and Maintenance Plan* for the portion of the system it owns. Within 24 months, the Co-permittee(s) shall prepare and submit a *Sewer System Operation and Maintenance Plan* for the portion of the system it owns. The Plan shall be available for review by federal, state and local agencies as requested. The Plan shall include:

(1) A description of the collection system management goals, staffing, information management, and legal authorities;

(2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and

(3) A preventive maintenance and monitoring program for the collection system;

(4) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;

(5) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;

(6) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;

(7) A description of the Permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts;

(8) An educational public outreach program for all aspects of I/I control, particularly private inflow; and

(9) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

3. Annual Reporting Requirement

The Permittee and Co-permittee(s) shall submit a summary report of activities related to the implementation of its O&M Plans during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31 (for the Co-permittee(s), the annual report shall begin the first March 31 following 24 months from the effective date of the permit). The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;

b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;

c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;

d. A map with areas identified for investigation/action in the coming year;

e. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit;

f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's 30.9 MGD design flow (24.7 MGD), or there have been capacity related overflows, the report shall include:

(1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and

(2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

g. The Adaptation Plan Progress Report described in Part I.C.1.c above (beginning the first March 31 following 24 months from the effective date of the permit).

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the Permittee and Co-permittee(s) shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works it owns and operates, as defined in Part II.E.1 of this permit.

E. INDUSTRIAL USERS AND PRETREATMENT PROGRAM

1. Legal Authority

The Permittee has been delegated primary responsibility for enforcing against discharges prohibited by 40 CFR 403.5 and applying and enforcing any national Pretreatment Standards established by the United States Environmental Protection Agency in accordance with Section 307 (b) and (c) of The Clean Water Act (Act), as amended by The Water Quality Act (WQA), of 1987.

The Permittee shall operate an industrial pretreatment program in accordance with the General Pretreatment Regulations found in 40 CFR Part 403 and the approved pretreatment program submitted by the Permittee. The pretreatment program was approved on September 28, 1983, and has subsequently incorporated substantial modifications as approved by EPA. The approved pretreatment program, and any approved modifications thereto, is hereby incorporated by reference and shall be implemented in a manner consistent with the following procedures, as required by 40 CFR Part 403.

The Permittee must have or develop a legally enforceable municipal code or rules and regulations to authorize or enable the POTW to apply and enforce the requirements of Sections 307(b) and (c) and 402(b)(8) and (9) of the Act and comply with the requirements of § 403.8(f)(1). At a minimum, this legal authority shall enable the POTW to:

a. Deny or condition new or increased contributions of pollutants, or changes in the nature of pollutants, to the POTW by Industrial Users where such contributions do not meet applicable Pretreatment Standards and Requirements or where such contributions would cause the POTW to violate its NPDES permit;

b. Require compliance with applicable Pretreatment Standards and Requirements by Industrial Users;

c. Control through Permit, order, or similar means, the contribution to the POTW

by each Industrial User to ensure compliance with applicable Pretreatment Standards and Requirements. In the case of Industrial Users this control shall be achieved through permits or equivalent control mechanism identified as significant under § 403.3(v), as required by § 403.8(f)(1)(iii);

d. Require (a) the development of a compliance schedule by each Industrial User for the installation of technology required to meet applicable Pretreatment Standards and Requirements and (b) the submission of all notices and self-monitoring reports from Industrial Users as are necessary to assess and assure compliance by Industrial Users with Pretreatment Standards and Requirements, including but not limited to the reports required in § 403.12;

e. Carry out all inspection, surveillance and monitoring procedures necessary to determine, independent of information supplied by Industrial Users, compliance or noncompliance with applicable Pretreatment Standards and Requirements by Industrial Users. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP, but in no case less than once per year, and with adequate maintenance of records, Representatives of the POTW shall be authorized to enter any premises of any Industrial User in which a Discharge source or treatment system is located or in which records are required to be kept under § 403.12(o) to assure compliance with Pretreatment Standards. Such authority shall be at least as extensive as the authority provided under section 308 of the Act;

f. Obtain remedies for noncompliance by any Industrial User with any Pretreatment Standard and Requirement. All POTW's shall be able to seek injunctive relief for noncompliance by Industrial Users with Pretreatment Standards and Requirements. All POTWs shall also have authority to seek or assess civil or criminal penalties in at least the amount of $1,000 a day for each violation by Industrial Users of Pretreatment Standards and Requirements in accordance with § 403.8(f)(1)(vii)(A); and

g. Comply with the confidentiality requirements set forth in § 403.14.

2. Implementation Requirements

The Permittee shall operate a pretreatment program in accordance with the General Pretreatment Regulations found in 40 CFR Part 403 and with the legal authorities, policies, procedures, and financial provisions of the approved Pretreatment program submitted by the Permittee. The approved Pretreatment program, and any approved modifications thereto, is hereby incorporated by reference and shall be implemented in a manner consistent with the following procedures, as required by 40 CFR Part 403:

a. In accordance with 40 CFR § 122.44(j)(1), Identify, in terms of character and volume of pollutants contributed from Industrial Users discharging into the POTW subject to Pretreatment Standards under section 307(b) of CWA and 40 CFR Part 403.

b. The Permittee must notify these identified Industrial Users of applicable Pretreatment Standards and any applicable requirements in accordance with 40 CFR § 403.8(f)(2)(iii). Pursuant to 40 CFR § 403.8(f)(6), prepare and maintain a list of significant industrial users and identify the criteria in 40 CFR § 403.3(v)(1) applicable to each industrial user.

c. The Permittee must carry out inspection procedures and randomly sample and analyze the effluent from Industrial Users and conduct surveillance activities in accordance with 40 CFR § 403.8(f)(2)(v), which will determine independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.

d. The Permittee shall receive and analyze self-monitoring reports and other notices submitted by Industrial Users in accordance with the self-monitoring requirements in 40 CFR § 403.12; This must include timely and appropriate reviews of industrial user reports and notifications to identify all violations of the user's permit, the local ordinance, and federal pretreatment standards and requirements.

e. The Permittee shall evaluate whether each SIU needs a plan to control Slug Discharges in accordance with 40 CFR § 403.8(f)(2)(vi). SIUs must be evaluated within 1 year of being designated an SIU. If required, the Permittee shall require the SIU to prepare or update, and implement a slug prevention plan that contains at least the minimum required elements in 40 CFR § 403.8(f)(2)(vi)(A-D) and incorporate the slug control requirements into the SIU’s control mechanism;

f. Pursuant to 40 CFR § 403.8(f)(2)(vii), the Permittee shall investigate instances of non-compliance with Pretreatment Standards and requirements indicated in required reports and notices or indicated by analysis, inspection, and surveillance activities.

g. The Permittee shall publish, at least annually, in a newspaper or newspapers of general circulation that provides meaningful public notice within the jurisdiction(s) served by the POTW, a list of all non-domestic users which, at any

time in the previous 12 months, were in significant noncompliance as defined in 40 CFR § 403.8 (f)(2)(viii).

h. The Permittee shall provide sufficient resources and qualified personnel to implement its Pretreatment program in accordance with 40 CFR § 403.8(f)(3);

i. The Permittee shall enforce all applicable Pretreatment Standards and requirements and obtain remedies for noncompliance by any industrial user. The Permittee shall develop, implement, and maintain an enforcement response plan in accordance with 40 CFR § 403.8(f)(5); and

j. Pursuant to 40 CFR § 403.8(g), the Permittee that chooses to receive electronic documents must satisfy the requirements of 40 CFR Part 3 – (Electronic reporting).

3. Local Limit Development

a. The Permittee shall develop, continually maintain, and enforce, as necessary, local limits to implement the general and specific prohibitions in 40 CFR § 403.5(c)(1) which prohibit the introduction of any pollutant(s) which cause pass through or interference and the introduction of specific pollutants to the waste treatment system from any source of non-domestic discharge.

b. The Permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 90 days of the effective date of the permit, the Permittee shall prepare and submit a written technical evaluation to EPA analyzing the need to revise local limits. As part of this evaluation, the Permittee shall assess how the POTW performs with respect to influent and effluent of pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety and collection system concerns. In preparing this evaluation, the Permittee shall complete and submit the attached form (see Attachment C – Reassessment of Technically Based Industrial Discharge Limits) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the Permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA

for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

4. Notification Requirements

a. The Permittee must notify EPA of any new introductions or any substantial change in pollutants from any Industrial User within sixty (60) days following the introduction or change, as required in 40 CFR 122.42(b)(1-3). Such notice must identify:

(1) Any new introduction of pollutants from an Industrial User which would be subject to Sections 301, 306, and 307 of the Act if it were directly discharging those pollutants; or

(2) Any substantial change in the volume or character of pollutants being discharged by any Industrial User;

(3) For the purposes of this section, adequate notice shall include information on:

i. The identity of the Industrial User;
ii. The nature and concentration of pollutants in the discharge and the average and maximum flow of the discharge; and
iii. Any anticipated impact of the change on the quantity or quality of effluent to be discharged from or biosolids produced at such POTW.

b. The Permittee must notify EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR § 122.29 (b);

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged; or

(3) The alteration or addition results in a significant change in the Permittee's sludge use or disposal practices.

c. The Permittee must notify EPA if the POTW modifies or intends to modify its Pretreatment Program.

d. The Permittee must notify EPA of any instance of pass through or interference, known or suspected to be related to a discharge from an Industrial User. The notification shall be attached to the DMR submitted EPA and shall describe the

incident, including the date, time, length, cause, and the steps taken by the Permittee and Industrial User to address the incident.

e. The Permittee shall notify all Industrial Users of the users' obligations to comply with applicable requirements under Subtitles C and D of the Resource Conservation and Recovery Act (RCRA) and that Industrial Users shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical as well as their obligation to notify the EPA Regional Waste Management Division Director, in writing of any discharge into the POTW of a substance, which, if otherwise disposed of, would be a hazardous waste under 40 CFR Part 261. Such notification must include:

(1) the name of the hazardous waste as set forth in 40 CFR Part 261;

(2) the EPA hazardous waste number; and

(3) the type of discharge (continuous, batch, or other).

5. Annual Report Requirements

The Permittee shall provide EPA with a hard copy annual report that briefly describes the POTW's program activities, including activities of all participating agencies, if more than one jurisdiction is involved in the local program. The report required by this section shall be submitted no later than one year after approval of the POTW's Pretreatment Program, and at least annually thereafter. The report must include, at a minimum, the applicable required data in Appendix A to 40 CFR Part 127, a summary of changes to the POTW's pretreatment program that have not been previously reported to EPA, and any other relevant information requested by EPA. Beginning on December 21, 2025 all annual reports submitted in compliance with this section must be submitted electronically by the POTW Pretreatment Program to EPA or initial recipient, as defined in 40 CFR § 127.2(b). Electronic submittals shall be in compliance with this section and 40 CFR Part 3 (including, in all cases, subpart D to Part 3), 40 CFR § 122.22(e), and 40 CFR Part 127 (Part 127 is not intended to undo existing requirements for electronic reporting). Prior to this date, and independent of 40 CFR Part 127, EPA may also require POTW Pretreatment Programs to electronically submit annual reports under this section if specified by a particular permit or if required to do so by state law.

The Permittee shall provide EPA with an annual report describing the Permittee's pretreatment program activities for the twelve (12) month period ending 60 days prior to the due date in accordance with 40 CFR § 403.12(i). The annual report shall be consistent with the format described in Attachment D (NPDES Permit Requirement for Industrial

Pretreatment Annual Report) of this permit and shall be submitted by **October 31** of each year.

6. Beginning the first full calendar year after the effective date of the permit, the Permittee shall commence annual sampling of the following types of industrial discharges into the POTW:

    - Commercial Car Washes
    - Platers/Metal Finishers
    - Paper and Packaging Manufacturers
    - Tanneries and Leather/Fabric/Carpet Treaters
    - Manufacturers of Parts with Polytetrafluoroethylene (PTFE) or teflon type coatings (*e.g.*, bearings)
    - Landfill Leachate
    - Centralized Waste Treaters
    - Known or Suspected PFAS Contaminated Sites
    - Fire Fighting Training Facilities
    - Airports
    - Any Other Known or Expected Sources of PFAS

    Sampling shall be conducted using Method 1633 for the PFAS analytes listed in Attachment E. The industrial discharges sampled, and the sampling results shall be summarized and included in the annual report (see Part I.E.5).

F. SLUDGE CONDITIONS

1. The Permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR § 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to § 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the Permittee's sludge use and/or disposal practices, the Permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices:

    a. Land application - the use of sewage sludge to condition or fertilize the soil

    b. Surface disposal - the placement of sewage sludge in a sludge only landfill

    c. Sewage sludge incineration in a sludge only incinerator

4. The requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g., lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.

5. The 40 CFR Part 503 requirements include the following elements:

   a. General requirements

   b. Pollutant limitations

   c. Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)

   d. Management practices

   e. Record keeping

   f. Monitoring

   g. Reporting

   Which of the 40 CFR Part 503 requirements apply to the Permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the Permittee to assist it in determining the applicable requirements.

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year, as follows:

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

   Sampling of the sewage sludge shall use the procedures detailed in 40 CFR § 503.8.

7. Under 40 CFR § 503.9(r), the Permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the Permittee contracts with another "person who prepares sewage sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from

sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the Permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR § 503.7. If the ultimate use or disposal method is land application, the Permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR § 503 Subpart B.

8. The Permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by February 19 (see also "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted electronically using EPA's Electronic Reporting tool ("NeT") (see "Reporting Requirements" section below).

G. SPECIAL CONDITIONS

1. The rolling seasonal average nitrogen limit of 1,289 lb/day will be subject to the following compliance schedule.

    a. Within one year of the effective date of the permit, the Permittee shall investigate alternative operational approaches to reduce year-round nitrogen discharges using its existing equipment and implement operational changes as appropriate to optimize nitrogen removal at the existing facility until the facility upgrade is completed. A report describing the optimization investigation and including a schedule for implementing any recommended actions shall be submitted with the first annual report.

    b. Within one year of the effective date of the permit, the Permittee shall evaluate and identify appropriate treatment process upgrades necessary to meet the new total nitrogen permit limit.

    c. Within two years of the effective date of the permit, the Permittee shall complete design of the facility improvements required to achieve the new total nitrogen permit limit.

    d. Within three years of the effective date of the permit, the Permittee shall initiate construction of the facility improvements required to achieve the new total nitrogen permit limit.

    e. Within four years of the effective date of the permit, the Permittee shall substantially complete construction of the facility improvements required to achieve the new total nitrogen permit limit.

f. Within five years of the effective date of the permit, the Permittee shall optimize nitrogen removal of the upgraded facility to achieve the new rolling seasonal average total nitrogen permit limit (in accordance with Part I.G.2.a below). The new rolling seasonal average total nitrogen permit limit shall go into effect five years from the effective date of the permit.

The Permittee shall provide an annual report to EPA and MassDEP regarding the status of the facility upgrade and compliance with this schedule, to be submitted as an electronic attachment to the DMR at each deadline described above.

2. The Permittee shall optimize the facility to remove nitrogen as specified below.

a. Concurrently with Part I.G.1.f above, the Permittee shall complete an evaluation of alternative methods of operating the wastewater treatment facility to optimize the removal of nitrogen in order to minimize the annual average mass discharge of total nitrogen. The methods to be evaluated include, but are not limited to, operational changes designed to enhance nitrification (seasonal and year-round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management.

During the months of November to April, all available treatment equipment in place at the facility shall be operated (unless equal or better performance can be achieved in a reduced operational mode) but the addition of a carbon source (that may be necessary in order to meet the total nitrogen limit during the months of May to October) is not required.

Within five years of the effective date of the permit, the Permittee shall submit a report to EPA and the State documenting this evaluation and presenting a description of recommended operational changes and shall begin to implement these recommended operational changes in order to minimize the year-round discharge loading of nitrogen.

b. The Permittee shall submit an annual report to EPA and the State, by February 1st of each year, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous calendar year and the previous five (5) calendar years. If, in any year, the treatment facility discharges of TN on an average annual basis have increased, the annual report shall include a detailed explanation of the reasons why TN discharges have increased, including any changes in influent flows/loads and any operational changes. The report shall include all supporting data.

3. Ammonia Nitrogen Compliance Schedule

   The ammonia nitrogen limit will be subject to the same compliance schedule specified in Part I.G.1 described above. During the compliance schedule, the Permittee shall monitor and report the concentration of ammonia nitrogen in the effluent as specified in Part I.A.1 above.

H. COMBINED SEWER OVERFLOWS

1. During wet weather (including snowmelt), the Permittee is authorized to discharge storm water/wastewater from the following CSO outfalls: 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 013, 014, 015, 016, 017, 018, 019 and 020 (See Attachment F of this Permit).

2. The effluent discharged from these CSOs is subject to the following limitations:

   a. The discharges shall receive treatment at a level providing Best Practicable Control Technology Currently Available ("BPT"), Best Conventional Pollutant Control Technology ("BCT") to control and abate conventional pollutants and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants. The EPA has made a Best Professional Judgment ("BPJ") determination that BPT, BCT, and BAT for combined sewer overflow ("CSO") control includes the implementation of Nine Minimum Controls ("NMC") specified below. These Nine Minimum Controls and the Nine Minimum Controls Minimum Implementation Levels which are detailed further in Part I.H.3. are requirements of this permit.

      (1) Proper operation and regular maintenance programs for the sewer system and the combined sewer overflows;

      (2) Maximum use of the collection system for storage;

      (3) Review and modification of the pretreatment program to assure CSO impacts are minimized;

      (4) Maximization of flow to the POTW for treatment;

      (5) Prohibition of dry weather overflows from CSOs;

      (6) Control of solid and floatable materials in CSOs;

      (7) Pollution prevention programs that focus on contaminant reduction activities;

      (8) Public notification to ensure that the public receives adequate notification of CSO occurrences and impacts;

(9) Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

b. The discharges shall not cause or contribute to violations of federal or state Water Quality Standards.

3. Nine Minimum Controls Minimum Implementation Levels

a. The Permittee must implement the nine minimum controls in accordance with the documentation provided to EPA and MassDEP or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the controls identified in Part I.H.3.b-g of this permit plus other controls the Permittee can reasonably undertake as set forth in the documentation.

b. Each CSO structure/regulator, pumping station and/or tidegate shall be routinely inspected, at a minimum of once per month, to ensure that they are in good working condition and adjusted to minimize combined sewer discharges (NMC # 1, 2 and 4). The following inspection results shall be recorded: the date and time of inspection, the general condition of the facility, and whether the facility is operating satisfactorily. If maintenance is necessary, the Permittee shall record: the description of the necessary maintenance, the date the necessary maintenance was performed, and whether the observed problem was corrected. The Permittee shall maintain all records of inspections for at least three years.

c. **Annually, no later than March 31st,** the Permittee shall submit a certification to MassDEP and EPA which states that the previous calendar year's monthly inspections were conducted, results recorded, and records maintained. MassDEP and EPA have the right to inspect any CSO related structure or outfall at any time without prior notification to the Permittee. Discharges to the combined system of septage, holding tank wastes, or other material which may cause a visible oil sheen or containing floatable material are prohibited during wet weather when CSO discharges may be active (NMC # 3, 6, and 7).

d. Dry weather overflows ("DWOs") are prohibited (NMC # 5). All dry weather sanitary and/or industrial discharges from CSOs must be reported to EPA and MassDEP orally within 24 hours of the time the Permittee becomes aware of the circumstances and a written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. See also Paragraph D.1.e. of Part II of this permit.

e. The Permittee shall quantify and record all discharges from combined sewer outfalls (NMC # 9). Quantification shall be through direct measurement. The following information must be recorded for each combined sewer outfall for each discharge event, as set forth in Part I.H.5.:

- Duration (hours) of discharge;
- Volume (gallons) of discharge;
- National Weather Service precipitation data from the nearest gage where precipitation data is available. Cumulative precipitation per discharge event shall be calculated.

The Permittee shall retain records of CSO discharges for a period of at least 3 years from the date of the sample, measurement, report or application.

f. The Permittee shall install and maintain identification signs for all combined sewer outfall structures (NMC # 8). The signs must be located at or near the combined sewer outfall structures and easily readable by the public from the land and water. These signs shall be a minimum of 12 x 18 inches in size, with white lettering against a green background, and shall contain the following information:

CITY OF FALL RIVER
WET WEATHER
SEWAGE DISCHARGE
OUTFALL (discharge serial number)

The Permittee shall place signs in English and include a universal wet weather sewage discharge symbol.

Where there are easements over property not owned by the Permittee that must be obtained to meet this requirement, the Permittee shall identify the appropriate landowners and obtain the necessary easements, to the extent practicable.

g. Public Notification Plan

(1) Within 180 days of the effective date of the permit, the Permittee shall submit to EPA and MassDEP a Public Notification Plan describing the measures that will be taken to meet NMC#8 in Part I.H.2 of this permit (NMC #8). The public notification plan shall include the means for disseminating information to the public, including communicating the initial and supplemental notifications required in Part I.H.3.g.(2) and (3) of this permit, as well as procedures for communicating with public health departments, including downstream communities, whose waters may be affected by discharges from the Permittee's CSOs.

(2) Initial notification of a probable CSO activation shall be provided to the public as soon as practicable, but no later than, two (2) hours after becoming aware by monitoring, modeling or other means that a probable CSO discharge has occurred. In addition to posting this notification to a website, this information may also be

communicated using other electronic means. The initial notification shall include the following information:

- Date and time of probable CSO discharge
- CSO number and location

(3) Supplemental notification shall be provided to the public as soon as practicable, but no later than, twenty-four (24) hours after becoming aware of the termination of any CSO discharge(s). In addition to posting this notification to a website, this information may also be communicated using other electronic means. The supplemental notification shall include the following information:

- CSO number and location
- Confirmation of CSO discharge
- Date, start time and stop time of the CSO discharge

(4) Annual notification - **Annually, by March 31st**, the Permittee shall post the annual report for the previous calendar year (described in Part I.H.4 below) on a publicly available website, and it shall remain on the website for a minimum of 24 months.

(5) The Public Notification Plan shall be implemented no later than 12 months following the effective date of the Permit.

4. Nine Minimum Controls Reporting Requirement

Annually, no later than March 31st, the Permittee shall submit a report summarizing activities during the previous calendar year relating to compliance with the nine minimum controls. The annual report shall include information on the locations of CSOs, a summary of CSO outfall monitoring data required by Part I.H.5 of this permit, and the status and progress of CSO abatement work.

5. Combined Sewer Overflow Outfall Monitoring

For each combined sewer overflow outfall listed in Part I.H.1 of this permit, the Permittee must monitor the following:

Parameters	**Reporting Requirements**	**Monitoring Requirements**	
	Total Monthly	**Measurement Frequency**	**Sample Type**
Total Flow	Report MG/Month	Daily, when discharging	Continuous
Treated Flow (Outfalls 011 and 013 only)	Report MG/Month	Daily, when discharging	Continuous

Total Flow Duration (Duration of flow through CSO)	Report Hours	Daily, when discharging	Continuous
Number of CSO Discharge Events	Report Monthly Count	Daily, when discharging	Occurrences
Rainfall	Total precipitation (inches)	Daily, when discharging	Calculation

a. For Total Flow, measure the total flow discharged from each CSO outfall during the month. For Total Flow Duration, report the total duration (hours) of discharges for each CSO outfall during the month. For Number of CSO Discharge Events, a single discharge event spanning more than one calendar day shall be reported as one discharge event.
b. For those months when a CSO discharge does not occur, the Permittee must indicate "no discharge" for the outfall for which data was not collected.
c. This information shall be submitted with the annual report required by Part I.H.4. of this permit.
d. National Weather Service precipitation data from the nearest gage where precipitation data is available. Cumulative precipitation per discharge event shall be calculated.

6. Combined Sewer Overflow Outfall Limitations and Monitoring Requirements for the Presidents Avenue CSO Treatment Facility (Outfall 011) and the Cove Street CSO Treatment Facility (Outfall 013)

In addition to the requirements for all CSOs listed above, during the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent from the **Presidents Avenue CSO Treatment Facility** and **Cove Street CSO Treatment Facility** through Outfalls 011 and 013, respectively, to the Taunton River and the discharge shall be limited and monitored as specified below.

Effluent Characteristic	**Effluent Limitation**		**Monitoring Requirements**	
	Average Monthly	**Maximum Daily**	**Measurement Frequency[1]**	**Sample Type**
Fecal coliform [2,3]	88 cfu/100 mL	260 cfu/100 mL	2/year	Grab
Enterococci [2,3]	35 cfu/100 mL	104 cfu/100 mL	2/year	Grab
Total Residual Chlorine [3]	0.075 mg/L	0.13 mg/L	2/year	Grab
pH [4]	Report Max and Min S.U.		2/year	Grab
BOD_5	Report mg/L and lb/day	---	2/year	Composite[5]
TSS	Report mg/L and lb/day	---	2/year	Composite[5]
Total Nitrogen	Report mg/L Report lb/day	---	2/year	Composite[5]

Effluent Characteristic	Effluent Limitation		Monitoring Requirements	
	Average Monthly	Maximum Daily	Measurement Frequency[1]	Sample Type
Whole Effluent Toxicity ("WET") Testing[6]				
LC_{50}	---	Report %	2/year	Composite[5]
Salinity	---	Report ppt	2/year	Composite[5]
Ammonia Nitrogen	---	Report mg/L	2/year	Composite[5]
Total Cadmium	---	Report mg/L	2/year	Composite[5]
Total Copper	---	Report mg/L	2/year	Composite[5]
Total Nickel	---	Report mg/L	2/year	Composite[5]
Total Lead	---	Report mg/L	2/year	Composite[5]
Total Zinc	---	Report mg/L	2/year	Composite[5]

Footnotes:

1. The Permittee shall conduct sampling twice per year, once in the second calendar quarter (April 1 – June 30) and once in the third calendar quarter (July 1 – September 30).

2. The Fecal coliform and *Enterococci* effluent limits apply for flows up to the maximum treatment capacity of 36 MGD for the Presidents Avenue CSO Treatment Facility (Outfall 011) or 54 MGD for the Cove Street CSO Treatment Facility (Outfall 013) and samples should be taken of the treated flow before being comingled with any untreated CSO flow after treatment. During a CSO overflow event at each outfall, the Permittee shall maximize flow through the CSO Treatment Facility to the extent practicable.

3. The fecal coliform and *Enterococci* monitoring shall be conducted concurrently with total residual chlorine monitoring. Hourly grab sampling shall be performed within the first two (2) hours of the start of the discharge, and every hour thereafter for a duration of four (4) hours. The average of all grab samples shall be reported as the "Average Monthly" value. The highest result of any single grab sample shall be reported as the "Maximum Daily" value.

   The total residual chlorine limits for the Cove Street CSO Treatment Facility (Outfall 013) will become effective after 24-months from the effective date of the permit. The Permittee shall monitor and report total residual chlorine during the initial 24 months.

4. Hourly pH grab sampling shall be performed within the first two hours of the start of the discharge, and every hour thereafter for a duration of four (4) hours. The minimum and maximum pH result of all grab samples shall be reported.

5. Composite sampling for each discharge event must represent an event duration of at least four (4) hours. Hourly grab sampling shall be performed within the first two hours of the start of the discharge and every hour thereafter for a duration of at least four hours, and all grab samples shall be combined into a single composite sample. If the event lasts longer than four hours, no further sampling is required. An event composite is considered to represent an event duration of at least four hours where (i) the composite represents at least four consecutive hours of flow through the facility; or (ii) the composite represents at least four hours of flow during a 24-hour period starting at approximately 8:00 am each day (+/- 2 hours) coinciding with the permittee's composite sampling schedule, if flow through the facility is discontinuous. If there are no CSO overflows of at least four hours within a given

reporting period (*i.e.*, second or third calendar quarter), the Permittee may report an appropriate "No Discharge" (NODI) code in the DMR for that reporting period.

6. The Permittee shall test the Inland Silverside (*Menidia beryllina*) and Mysid Shrimp (*Mysidopsis beryllina*) in accordance with test procedures and protocols specified in **Attachment A** of this permit.

7. Model or Dye Studies for CSO Treatment Facilities Discharge Locations

The Permittee shall conduct a model or dye study at each of the CSO Treatment Facility discharge locations once during the permit term to determine the dilution at the point of discharge during the applicable hydraulic condition in the WQS at 314 CMR 4.03(3). The Permittee should consult with MassDEP as to the applicable hydraulic condition for each discharge location. The completed model or dye studies must be submitted by the Permittee six months before the end of the permit term (concurrent with NPDES reapplication).

I. REPORTING REQUIREMENTS

Unless otherwise specified in this permit, the Permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and the State electronically using NetDMR no later than the 15th day of the month. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or the State. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

2. Submittal of Reports as NetDMR Attachments

Unless otherwise specified in this permit, the Permittee and Co-permittee(s) shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. See Part I.I.7. for more information on State reporting. Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the report due date specified in this permit.

3. Submittal of Industrial User and Pretreatment Related Reports

a. Prior to 21 December 2025, all reports and information required of the Permittee in the Industrial Users and Pretreatment Program section of this permit shall be

submitted to the Pretreatment Coordinator in EPA Region 1 Water Division (WD). Starting on 21 December 2025, these submittals must be done electronically as NetDMR attachments and/or using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/. These requests, reports and notices include:

(1) Annual Pretreatment Reports,

(2) Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,

(3) Revisions to Industrial Discharge Limits,

(4) Report describing Pretreatment Program activities, and

(5) Proposed changes to a Pretreatment Program

b. This information shall be submitted to EPA WD as a hard copy at the following address:

U.S. Environmental Protection Agency
Water Division
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (06-03)
Boston, MA 02109-3912

4. Submittal of Biosolids/Sewage Sludge Reports

By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

5. Submittal of Requests and Reports to EPA Water Division (WD)

a. The following requests, reports, and information described in this permit shall be submitted to the NPDES Applications Coordinator in EPA Water Division (WD):

(1) Transfer of permit notice;

(2) Request for changes in sampling location;

(3) Request for reduction in testing frequency;

(4) Report on unacceptable dilution water / request for alternative dilution water

for WET testing;

b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov.

6. Submittal of Sewer Overflow and Bypass Reports and Notifications

The Permittee and Co-permittee(s) shall submit required reports and notifications under Part II.B.4.c, for bypasses, and Part II.D.1.e, for sanitary sewer overflows (SSOs) electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

7. State Reporting

Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management
8 New Bond Street
Worcester, Massachusetts 01606

8. Verbal Reports and Verbal Notifications

a. Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to the State. This includes verbal reports and notifications which require reporting within 24 hours (e.g., Part II.B.4.c.(2), Part II.B.5.c.(3), and Part II.D.1.e).

b. Verbal reports and verbal notifications shall be made to:

EPA ECAD at 617-918-1510
and
MassDEP Emergency Response at 888-304-1133

J. STATE 401 CERTIFICATION CONDITIONS

1. This Permit is in the process of receiving state water quality certification issued by the State under § 401(a) of the CWA and 40 CFR § 124.53. EPA will incorporate appropriate State water quality certification requirements (if any) into the Final Permit.

MARINE ACUTE

TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **2007.0 - Mysid Shrimp (Americamysis bahia) definitive 48 hour test.**
- **2006.0 - Inland Silverside (Menidia beryllina) definitive 48 hour test.**

Acute toxicity data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use the most recent 40 CFR Part 136 methods. Whole Effluent Toxicity (WET) Test Methods and guidance may be found at:

https://www.epa.gov/cwa-methods/whole-effluent-toxicity-methods

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge and receiving water sample shall be collected. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any holding time extension. Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine[1] (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate

[1] For this protocol, total residual chlorine is synonymous with total residual oxidants.

prior to sample use for toxicity testing. If performed on site the results should be included on the chain of custody (COC) presented to WET laboratory.

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1 mg/L chlorine. If dechlorination is necessary, a thiosulfate control consisting of the maximum concentration of thiosulfate used to dechlorinate the sample in the toxicity test control water must also be run in the WET test.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol. Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6^{o} C.

IV. DILUTION WATER

Samples of receiving water must be collected from a reasonably accessible location in the receiving water body immediately upstream of the permitted discharge's zone of influence. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water is found to be, or suspected to be toxic or unreliable, ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is

species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first case is when repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use by the permittee and toxicity testing laboratory. The second is when two of the most recent documented incidents of unacceptable site dilution water toxicity require ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW with supporting documentation must be sent electronically to the NPDES Applications Coordinator in EPA Water Division (WD) at the following email address:

R1NPDESReporting@epa.gov

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the EPA Region 1 website at: www.epa.gov/aboutepa/epa-region-1-new-england (click on NPDES, EPA Permit Attachments, Self-Implementing Alternate Dilution Water Guidance) for important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

EPA Region 1 requires tests be performed using four replicates of each control and effluent concentration because the non-parametric statistical tests cannot be used with data from fewer replicates. The following tables summarize the accepted Americamysis and Menidia toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE MYSID, AMERICAMYSIS BAHIA 48 HOUR TEST[1]

1. Test type	48hr Static, non-renewal
2. Salinity	25ppt ± 10 percent for all dilutions by adding dry ocean salts
3. Temperature (^{o}C)	20^{o}C ± 1^{o}C or 25^{o}C ± 1^{o}C, temperature must not deviate by more than 3^{o}C during test
4. Light quality	Ambient laboratory illumination
5. Photoperiod	16 hour light, 8 hour dark
6. Test chamber size	250 ml (minimum)
7. Test solution volume	200 ml/replicate (minimum)
8. Age of test organisms	1-5 days, < 24 hours age range
9. No. Mysids per test chamber	10
10. No. of replicate test chambers per treatment	4
11. Total no. Mysids per test concentration	40
12. Feeding regime	Light feeding using concentrated Artemia naupli while holding prior to initiating the test
13. Aeration [2]	None
14. Dilution water	5-30 ppt, +/- 10%; Natural seawater, or deionized water mixed with artificial sea salts
15. Dilution factor	≥ 0.5
16. Number of dilutions [3]	5 plus a control. An additional dilution at the permitted effluent concentration (%

	effluent) is required if it is not included in the dilution series.
17. Effect measured	Mortality - no movement of body appendages on gentle prodding
18. Test acceptability	90% or greater survival of test organisms in control solution
19. Sampling requirements	For on-site tests, samples are used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must be first used within 36 hours of collection.
20. Sample volume required	Minimum 1 liter for effluents and 2 liters for receiving waters

Footnotes:

[1] Adapted from EPA 821-R-02-012.

[2] If dissolved oxygen falls below 4.0 mg/L, aerate at rate of less than 100 bubbles/min. Routine D.O. checks are recommended.

[3] When receiving water is used for dilution, an additional control made up of standard laboratory dilution water (0% effluent) is required.

EPA NEW ENGLAND TOXICITY TEST CONDITIONS FOR THE INLAND SILVERSIDE, MENIDIA BERYLLINA 48 HOUR TEST[1]

1. Test Type	48 hr Static, non-renewal
2. Salinity	25 ppt ± 10 % by adding dry ocean salts
3. Temperature	20°C ± 1°C or 25°C ± 1°C, temperature must not deviate by more than 3°C during test
4. Light Quality	Ambient laboratory illumination
5. Photoperiod	16 hr light, 8 hr dark
6. Size of test vessel	250 mL (minimum)
7. Volume of test solution	200 mL/replicate (minimum)
8. Age of fish	9-14 days; 24 hr age range
9. No. fish per chamber	10 (not to exceed loading limits)
10. No. of replicate test vessels per treatment	4
11. Total no. organisms per concentration	40
12. Feeding regime	Light feeding using concentrated Artemia nauplii while holding prior to initiating the test
13. Aeration[2]	None
14. Dilution water	5-32 ppt, +/- 10% ; Natural seawater, or deionized water mixed with artificial sea salts.
15. Dilution factor	≥ 0.5
16. Number of dilutions[3]	5 plus a control. An additional dilution at the permitted concentration (% effluent) is required if it is not included in the dilution series.
17. Effect measured	Mortality-no movement on gentle prodding.

18. Test acceptability	90% or greater survival of test organisms in control solution.
19. Sampling requirements	For on-site tests, samples must be used within 24 hours of the time they are removed from the sampling device. Off-site test samples must be used within 36 hours of collection.
20. Sample volume required	Minimum 1 liter for effluents and 2 liters for receiving waters.

Footnotes:

[1] Adapted from EPA 821-R-02-012.

[2] If dissolved oxygen falls below 4.0 mg/L, aerate at rate of less than 100 bubbles/min. Routine D.O. checks recommended.

[3] When receiving water is used for dilution, an additional control made up of standard laboratory dilution water (0% effluent) is required.

V.1. Test Acceptability Criteria

If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.2. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

In general, if reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary as prescribed below.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.2.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥3 standard deviations for IC25s and LC50 values and ≥ two concentration intervals for NOECs or NOAECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

VI. CHEMICAL ANALYSIS

At the beginning of the static acute test, pH, salinity, and temperature must be measured at the beginning and end of each 24 hour period in each dilution and in the controls. The following chemical analyses shall be performed for each sampling event.

Parameter	Effluent	Diluent	Minimum Level for effluent [*1] (mg/L)
pH	x	x	---
Salinity	x	x	ppt(o/oo)
Total Residual Chlorine [*2]	x	x	0.02
Total Solids and Suspended Solids	x	x	---
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005

Superscript:

[*1] These are the minimum levels for effluent (fresh water) samples. Tests on diluents (marine waters) shall be conducted using the Part 136 methods that yield the lowest MLs.

[*2] Either of the following methods from the 18th Edition of the APHA Standard Methods for the Examination of Water and Wastewater must be used for these analyses:

-Method 4500-Cl E Low Level Amperometric Titration (the preferred method);
-Method 4500-CL G DPD Photometric Method.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration

An estimate of the concentration of effluent or toxicant that is lethal to 50% of the test organisms during the time prescribed by the test method.

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See flow chart in Figure 6 on page 73 of EPA 821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See flow chart in Figure 13 on page 87 of EPA 821-R-02-012.

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Toxicity Test summary sheet(s) (Attachment F to the DMR Instructions) which includes:
    - Facility name
    - NPDES permit number
    - Outfall number
    - Sample type
    - Sampling method
    - Effluent TRC concentration
    - Dilution water used
    - Receiving water name and sampling location
    - Test type and species
    - Test start date
    - Effluent concentrations tested (%) and permit limit concentration
    - Applicable reference toxicity test date and whether acceptable or not
    - Age, age range and source of test organisms used for testing
    - Results of TAC review for all applicable controls
    - Permit limit and toxicity test results
    - Summary of any test sensitivity and concentration response evaluation that was conducted

Please note: The NPDES Permit Program Instructions for the Discharge Monitoring Report Forms (DMRs) are available on EPA's website at: www.epa.gov/compliance/discharge-monitoring-reports-avoiding-common-mistakes

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures;
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s);
- Reference toxicity test control charts;
- All sample chemical/physical data generated, including minimum levels (MLs) and analytical methods used;
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis;
- A discussion of any deviations from test conditions; and
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint.

MARINE CHRONIC

TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable silverside chronic and sea urchin chronic toxicity tests in accordance with the appropriate test protocols described below:

- Inland Silverside (Menidia beryllina) Larval Growth and Survival Test
- Sea Urchin (Arbacia punctulata) 1 Hour Fertilization Test

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

https://www.epa.gov/cwa-methods/whole-effluent-toxicity-methods

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. Where there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a marine, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a fresh sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All fresh test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6^{o} C.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. For TRC analysis performed on site the results must be included on the chain of custody (COC) presented to WET laboratory. For the purpose of sample preparation, i.e. eliminating chlorine prior to toxicity testing, if called for by the permit, TRC analysis may also be performed by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing. According to Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992) dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1 mg/L chlorine.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol. Grab samples must be used for pH, temperature, and total residual oxidants (as per 40 CFR Part 122.21).

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable test acceptability criteria (TAC). When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternatedilution water (ADW) of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species.

Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an immediate decision for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing. For the second case, written notification from the permittee requesting ADW use and written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW with supporting documentation must be sent electronically to the NPDES Applications Coordinator in EPA Water Division (WD) at the following email address:

R1NPDESReporting@epa.gov

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the EPA Region 1 website at https://www.epa.gov/aboutepa/epa-region-1-new-england (click on NPDES, EPA Permit Attachments, Self-Implementing Alternate Dilution Water Guidance) for important details on alternate dilution water substitution requests.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

EPA New England requires that if a reference toxicant test was being performed concurrently with an effluent or receiving water test and fails, both tests must be repeated.

The following tables summarize the accepted Menidia and Arbacia toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND RECOMMENDED TEST CONDITIONS FOR THE SEA URCHIN, ARBACIA PUNCTULATA, FERTILIZATION TEST[1]

1. Test type	Static, non-renewal
2. Salinity	30 o/oo ± 2 o/oo by adding dry ocean salts
3. Temperature	20 ± 1°C temperature must not deviate by more than 3°C during test
4. Light quality	Ambient laboratory illumination
5. Light intensity	10-20 uE/m^2/s, or 50-100 ft-c (Ambient Laboratory Levels)
6. Test vessel size	Disposal (glass) liquid scintillation vials (20 ml capacity), presoaked in control water
7. Test solution volume	5 ml
8. Number of sea urchins	Pooled sperm from four males and pooled eggs from four females are used per test
9. Number of egg and sperm cells	About 2000 eggs per chamber and 5,000,000 sperm cells per vial
10. Number of replicate chambers	4 per treatment
11. Dilution water	Uncontaminated source of natural seawater or deionized water mixed with artificial sea salts
12. Dilution factor	Approximately 0.5, must bracket the permitted RWC
13. Test duration	1 hour and 20 minutes
14. Effects measured	Fertilization of sea urchin eggs
15. Number of treatments per test[2]	5 and a control. (receiving water and laboratory water control) An additional dilution at the permitted effluent concentration (% effluent) is required.

16. Acceptability of test	70% - 90% egg fertilization in all controls. Minimum of 70% fertilization in dilution water control. Effluent concentrations exhibiting greater than 70% fertilization, flagged as statistically significantly different from the controls, will not be considered statistically different from the controls for NOEC reporting.
17. Sampling requirements	For on-site tests, samples are to be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must be first used within 36 hours of collection.
18. Sample volume required	Minimum 1 liter

Footnotes:

[1] Adapted from EPA 821-R-02-014

EPA NEW ENGLAND RECOMMENDED TEST CONDITIONS FOR THE INLAND SILVERSIDE, MENIDIA BERYLLINA, GROWTH AND SURVIVAL TEST[1]

1. Test type	Static, renewal
2. Salinity	5 o/oo to 32 o/oo +/- 2 o/oo of the selected salinity by adding artificial sea salts
3. Temperature	25 ± 1°C, temperature must not deviate by more than 3°C during test
4. Light quality	Ambient laboratory light
5. Light intensity	10-20 uE/m^2/s, or 50-100 ft-C (Ambient Laboratory Levels)
6. Photoperiod	16 hr light, 8 hr darkness
7. Test vessel size	600 - 1000 mL beakers or equivalent (glass test chambers should be used)
8. Test solution volume	500-750 mL/replicate loading and DO restrictions must be met)
9. Renewal of test solutions	Daily using most recently collected sample
10. Age of test organisms	Seven to eleven days post hatch; 24 hr range in age
11. Larvae/test chamber	15 (minimum of 10)
12. Number of replicate chambers	4 per treatment
13. Source of food	Newly hatched and rinsed Artemia nauplii less than 24 hr old
14. Feeding regime	Feed once a day 0.10 g wet wt Artemia nauplii per replicate on days 0 – 2 feed 0.15 g wet wt Artemia nauplii per replicate on days 3-6
15. Cleaning	Siphon daily, immediately before test solution renewal and feeding
16. Aeration[2]	None
17. Dilution water	Uncontaminated source of natural seawater; or deionized water mixed with artificial sea salts

18. Effluent concentrations	5 and a control (receiving water and laboratory water control) An additional dilution at the permitted effluent concentration (% effluent) is required
19. Dilution factor	$\geq$ 0.5, must bracket the permitted RWC
20. Test duration	7 days
21. Effects measured	Survival and growth (weight)
22. Acceptability of test	The average survival of dilution water control larvae is a minimum of 80%, and the average dry wt of unpreserved control larvae is a minimum of 0.5 mg, or the average dry wt of preserved control larvae is a minimum of 0.43 mg if preserved not more than 7 days in 4% formalin or 70% ethanol
23. Sampling requirements	For on-site tests, samples are collected daily and used within 24 hours of the time they are removed from the sampling device. For off-site tests, samples must be first used within 36 hours of collection.
24. Sample Volume Required	Minimum of 6 liters/day.

Footnotes:

[1] Adapted from EPA 821-R-02-014

[2] If dissolved oxygen (D.O.) falls below 4.0 mg/L, aerate all chambers at a rate of less than 100 bubbles/min. Routine D.O. checks are recommended.

V.1. Test Acceptability Criteria

If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.2. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

In general, if reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary as prescribed below.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.2.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established upper control limits i.e. $\geq$3 standard deviations for IC25s values and $\geq$ two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

VI. CHEMICAL ANALYSIS

The toxicity test requires measurement of pH, salinity, and temperature at the beginning and end of each 24 hour period in each dilution and controls for both daily test renewal and waste. The following chemical analyses shall be performed for each initial sample as well as any renewal samples, if necessary pursuant to the requirement of Part III above.

Parameter	Effluent	Diluent	Minimum Level for effluent[*1] (mg/L)
pH	x	x	---
Salinity	x	x	ppt(o/oo)
Total Residual Chlorine [*2]	x	x	0.02
Total Solids and Suspended Solids	x	x	---
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005

Superscript:

[*1] These are the minimum levels for effluent (fresh water) samples. Tests on diluents (marine waters) shall be conducted using the Part 136 methods that yield the lowest MLs.

[*2] Either of the following methods from the 18th Edition of the APHA Standard Methods for the Examination of Water and Wastewater must be used for these analyses:

-Method 4500-Cl E Low Level Amperometric Titration (the preferred method);
-Method 4500-CL G DPD Photometric Method.

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported.

The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-014. Guidance for this review can be found at:
https://www.epa.gov/cwa-methods/whole-effluent-toxicity-methods

In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoint growth for *Menidia beryllina* as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-014.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value, for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for marine tests in Section 10.2.8.3, p. 54, Table 6 of EPA-821-R-02-014. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-

R-003, June 2000, Section 6.4.2. This document can be located under Guidance Documents at the following USEPA website location:

https://www.epa.gov/aboutepa/epa-region-1-new-england
(click on NPDES, EPA Permit Attachments)

If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-014, page 45

For discussion on Hypothesis Testing, refer to EPA 821-R-02-014, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-014, Section 9.7

2. *Menidia beryllina*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-014, page 181

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 182

Refer to growth data statistical analysis flowchart, EPA 821-R-02-014, page 193

3. *Arbacia punctulata*

Refer to fertilization data testing flowchart, EPA 821-R-02-014, page 312

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Toxicity Test summary sheet(s) (Attachment F to the DMR Instructions) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

Please note: The NPDES Permit Program Instructions for the Discharge Monitoring Report Forms (DMRs) are available on EPA's website at: www.epa.gov/compliance/discharge-monitoring-reports-avoiding-common-mistakes

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures;
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s);
- Reference toxicity test control charts;
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used;
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis;
- A discussion of any deviations from test conditions; and
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review.

ATTACHMENT C

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

Under 40 CFR §122.21(j)(4), all Publicly Owned Treatment Works (POTWs) with approved Industrial Pretreatment Programs (IPPs) shall provide the following information to the Director: a written evaluation of the need to revise local industrial discharge limits under 40 CFR §403.5(c)(1).

Below is a form designed by the U.S. Environmental Protection Agency (EPA - New England) to assist POTWs with approved IPPs in evaluating whether their existing Technically Based Local Limits (TBLLs) need to be recalculated. The form allows the permittee and EPA to evaluate and compare pertinent information used in previous TBLLs calculations against present conditions at the POTW.

Please read direction below before filling out form.

ITEM I.

* In Column (1), list what your POTW's influent flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present influent flow rate. Your current flow rate should be calculated using the POTW's average daily flow rate from the previous 12 months.

* In Column (1) list what your POTW's SIU flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present SIU flow rate.

* In Column (1), list what dilution ratio and/or 7Q10 value was used in your old/expired NPDES permit. In Column (2), list what dilution ration and/or 7Q10 value is presently being used in your new/reissued NPDES permit.

  The 7Q10 value is the lowest seven day average flow rate, in the river, over a ten year period. The 7Q10 value and/or dilution ratio used by EPA in your new NPDES permit can be found in your NPDES permit "Fact Sheet."

* In Column (1), list the safety factor, if any, that was used when your existing TBLLs were calculated.

* In Column (1), note how your bio-solids were managed when your existing TBLLs were calculated. In Column (2), note how your POTW is presently disposing of its biosolids and how your POTW will be disposing of its biosolids in the future.

ITEM II.

* List what your existing TBLLs are - as they appear in your current Sewer Use Ordinance (SUO).

ITEM III.

* Identify how your existing TBLLs are allocated out to your industrial community. Some pollutants may be allocated differently than others, if so please explain.

ITEM IV.

* Since your existing TBLLs were calculated, identify the following in detail:

  (1) if your POTW has experienced any upsets, inhibition, interference or pass-through as a result of an industrial discharge.

  (2) if your POTW is presently violating any of its current NPDES permit limitations - include toxicity.

ITEM V.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in pounds per day) received in the POTW's influent. Current sampling data is defined as data obtained over the last 24 month period.

  All influent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* Based on your existing TBLLs, as presented in Item II., list in Column (2), for each pollutant the Maximum Allowable Headwork Loading (MAHL) values derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For more information, please see EPA's Local Limit Guidance Document (July 2004).

Item VI.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period.

(Item VI. continued)

All effluent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLLs were calculated, please note what hardness value was used at that time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

  List in Column (2B) the current WQSs or "Chronic Gold Book" values for each pollutant multiplied by the dilution ratio used in your new/reissued NPDES permit. For example, with a dilution ratio of 25:1 at a hardness of 25 mg/l - Calcium Carbonate (copper's chronic WQS equals 6.54 ug/l) the chronic NPDES permit limit for copper would equal 156.25 ug/l.

ITEM VII.

* In Column (1), list all pollutants (in micrograms per liter) limited in your new/reissued NPDES permit. In Column (2), list all pollutants limited in your old/expired NPDES permit.

ITEM VIII.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants in your POTW's biosolids. Current data is defined as data obtained during the last 24 month period. Results are to be expressed as total dry weight.

  All biosolids data collected and analyzed must be in accordance with 40 CFR §136.

  In Column (2A), list current State and/or Federal sludge standards that your facility's biosolids must comply with. Also note how your POTW currently manages the disposal of its biosolids. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria will be and method of disposal.

In general, please be sure the units reported are correct and all pertinent information is included in your evaluation. If you have any questions, please contact your pretreatment representative at EPA - New England.

REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS (TBLLs)

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

In Column (1) list the conditions that existed when your current TBLLs were calculated. In Column (2), list current conditions or expected conditions at your POTW.		
	Column (1) EXISTING TBLLs	Column (2) PRESENT CONDITIONS
POTW Flow (MGD)		
Dilution Ratio or 7Q10 (from NPDES Permit)		
SIU Flow (MGD)		
Safety Factor		N/A
Biosolids Disposal Method(s)		

ITEM II.

EXISTING TBLLs			
POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)	POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)

ITEM III.

Note how your existing TBLLs, listed in Item II., are allocated to your Significant Industrial Users (SIUs), i.e. uniform concentration, contributory flow, mass proportioning, other. Please specify by circling.

ITEM IV.

Has your POTW experienced any upsets, inhibition, interference or pass-through from industrial sources since your existing TBLLs were calculated?
If yes, explain.

_____

_____

Has your POTW violated any of its NPDES permit limits and/or toxicity test requirements?

If yes, explain.

_____

_____

ITEM V.

Using current POTW influent sampling data fill in Column (1). In Column (2), list your Maximum Allowable Headwork Loading (MAHL) values used to derive your TBLLs listed in Item II. In addition, please note the Environmental Criteria for which each MAHL value was established, i.e. water quality, sludge, NPDES etc.				
Pollutant	Column (1) Influent Data Analyses Maximum (lb/day)	Average (lb/day)	Column (2) MAHL Values (lb/day)	Criteria
Arsenic				
Cadmium				
Chromium				
Copper				
Cyanide				
Lead				
Mercury				
Nickel				
Silver				
Zinc				
Other (List)				

ITEM VI.

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.

Pollutant	Column (1) Effluent Data Analyses		Columns (2A) (2B) Water Quality Criteria (Gold Book) From TBLLs Today	
	Maximum (ug/l)	Average (ug/l)	(ug/l)	(ug/l)
Arsenic				
*Cadmium				
*Chromium				
*Copper				
Cyanide				
*Lead				
Mercury				
*Nickel				
Silver				
*Zinc				
Other (List)				

*Hardness Dependent (mg/l - CaCO3)

ITEM VII.

In Column (1), identify all pollutants limited in your new/reissued NPDES permit. In Column (2), identify all pollutants that were limited in your old/expired NPDES permit.			
Column (1) NEW PERMIT Pollutants Limitations (ug/l)		Column (2) OLD PERMIT Pollutants	Limitations (ug/l)

ITEM VIII.

Using current POTW biosolids data, fill in Column (1). In Column (2A), list the biosolids criteria that was used at the time your existing TBLLs were calculated. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria would be and method of disposal.

Pollutant	Column (1) Biosolids Data Analyses Average (mg/kg)	Columns (2A) (2B) Biosolids Criteria From TBLLs New (mg/kg)	(mg/kg)
Arsenic			
Cadmium			
Chromium			
Copper			
Cyanide			
Lead			
Mercury			
Nickel			
Silver			
Zinc			
Molybdenum			
Selenium			
Other (List)			

ATTACHMENT D

NPDES PERMIT REQUIREMENT
FOR
INDUSTRIAL PRETREATMENT ANNUAL REPORT

The information described below shall be included in the pretreatment program annual reports:

1. An updated list of all industrial users by category, as set forth in 40 C.F.R. 403.8(f)(2)(i), indicating compliance or noncompliance with the following:
   - baseline monitoring reporting requirements for newly promulgated industries
   - compliance status reporting requirements for newly promulgated industries
   - periodic (semi-annual) monitoring reporting requirements,
   - categorical standards, and
   - local limits;

2. A summary of compliance and enforcement activities during the preceding year, including the number of:
   - significant industrial users inspected by POTW (include inspection dates for each industrial user),
   - significant industrial users sampled by POTW (include sampling dates for each industrial user),
   - compliance schedules issued (include list of subject users),
   - written notices of violations issued (include list of subject users),
   - administrative orders issued (include list of subject users),
   - criminal or civil suits filed (include list of subject users) and,
   - penalties obtained (include list of subject users and penalty amounts);

3. A list of significantly violating industries required to be published in a local newspaper in accordance with 40 C.F.R. 403.8(f)(2)(vii);

4. A narrative description of program effectiveness including present and proposed changes to the program, such as funding, staffing, ordinances, regulations, rules and/or statutory authority;

5. A summary of all pollutant analytical results for influent, effluent, sludge and any toxicity or bioassay data from the wastewater treatment facility. The summary shall include a comparison of influent sampling results versus threshold inhibitory concentrations for the Wastewater Treatment System and effluent sampling results versus water quality standards. Such a comparison shall be based on the sampling program described in the paragraph below or any similar sampling program described in this Permit.

At a minimum, annual sampling and analysis of the influent and effluent of the Wastewater Treatment Plant shall be conducted for the following pollutants:

a.) Total Cadmium	f.) Total Nickel
b.) Total Chromium	g.) Total Silver
c.) Total Copper	h.) Total Zinc
d.) Total Lead	i.) Total Cyanide
e.) Total Mercury	j.) Total Arsenic

The sampling program shall consist of one 24-hour flow-proportioned composite and at least one grab sample that is representative of the flows received by the POTW. The composite shall consist of hourly flow-proportioned grab samples taken over a 24-hour period if the sample is collected manually or shall consist of a minimum of 48 samples collected at 30 minute intervals if an automated sampler is used. Cyanide shall be taken as a grab sample during the same period as the composite sample. Sampling and preservation shall be consistent with 40 CFR Part 136.

6. A detailed description of all interference and pass-through that occurred during the past year;

7. A thorough description of all investigations into interference and pass-through during the past year;

8. A description of monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through, specifying parameters and frequencies;

9. A description of actions being taken to reduce the incidence of significant violations by significant industrial users; and,

10. The date of the latest adoption of local limits and an indication as to whether or not the permittee is under a State or Federal compliance schedule that includes steps to be taken to revise local limits.

Attachment E: PFAS Analyte List

Target Analyte Name	Abbreviation	CAS Number
Perfluoroalkyl carboxylic acids		
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorononanoic acid	PFNA	375-95-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluorotetradecanoic acid	PFTeDA	376-06-7
Perfluoroalkyl sulfonic acids		
Acid Form		
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluoropentansulfonic acid	PFPeS	2706-91-4
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Fluorotelomer sulfonic acids		
1*H*,1*H*, 2*H*, 2*H*-Perfluorohexane sulfonic acid	4:2FTS	757124-72-4
1*H*,1*H*, 2*H*, 2*H*-Perfluorooctane sulfonic acid	6:2FTS	27619-97-2
1*H*,1*H*, 2*H*, 2*H*-Perfluorodecane sulfonic acid	8:2FTS	39108-34-4
Perfluorooctane sulfonamides		
Perfluorooctanesulfonamide	PFOSA	754-91-6
N-methyl perfluorooctanesulfonamide	NMeFOSA	31506-32-8
N-ethyl perfluorooctanesulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids		
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanols		
N-methyl perfluorooctanesulfonamidoethanol	NMeFOSE	24448-09-7
N-ethyl perfluorooctanesulfonamidoethanol	NEtFOSE	1691-99-2
Per- and Polyfluoroether carboxylic acids		
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
4,8-Dioxa-3*H*-perfluorononanoic acid	ADONA	919005-14-4
Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6

Target Analyte Name	Abbreviation	CAS Number
Ether sulfonic acids		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA	113507-82-7
Fluorotelomer carboxylic acids		
3-Perfluoropropyl propanoic acid	3:3FTCA	356-02-5
2*H*,2*H*,3*H*,3*H*-Perfluorooctanoic acid	5:3FTCA	914637-49-3
3-Perfluoroheptyl propanoic acid	7:3FTCA	812-70-4

Combined Sewer Overflow Outfalls

Outfall	Latitude	Longitude	Location	Receiving Water
002	41° 40’ 48” N	71° 11’ 41” W	Mount Hope Avenue	Mount Hope Bay
003	41° 41’ 06” N	71° 11’ 24” W	Charles Street	Mount Hope Bay
004	41° 41’ 11” N	71° 11’ 17” W	Birch Street	Mount Hope Bay
005	41° 41’ 25” N	71° 11’ 07” W	Riverview Street	Mount Hope Bay
006	41° 41’ 48” N	71° 10’ 42” W	Middle Street	Mount Hope Bay
007	41° 41’ 58” N	71° 10’ 22” W	William Street	Mount Hope Bay
008	41° 42’ 05” N	71° 10’ 14” W	Ferry Street	Mount Hope Bay
009	41° 42’ 14” N	71° 09’ 36” W	Central Street	Quequechan River
010	41° 42’ 43” N	71° 09’ 21” W	City Pier	Taunton River
011	41° 43’ 02” N	71° 09’ 31” W	President Avenue	Taunton River
013	41° 43’ 35” N	71° 08’ 56” W	Cove Street	Taunton River
014	41° 43’ 60” N	71° 08’ 26” W	Alton Street	Taunton River
015	41° 41’ 49” N	71° 08’ 59” W	Plymouth Ave. – North	Quequechan River
016	41° 41’ 47” N	71° 08’ 56” W	Lowell Street	Quequechan River
017	41° 41’ 19” N	71° 08’ 22” W	Quequechan Street	Quequechan River
018	41° 42’ 15” N	71° 09’ 37” W	Heritage Park	Quequechan River
019	41° 42’ 06” N	71° 09’ 46” W	Canal Street	Quequechan R./Crab Pond
020	41° 42’ 01” N	71° 09’ 15” W	Third Street	Quequechan River

NPDES PART II STANDARD CONDITIONS
(April 26, 2018)[1]

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[1] Updated July 17, 2018 to fix typographical errors.

A. GENERAL REQUIREMENTS

1. Duty to Comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA or Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

a. The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

b. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (83 Fed. Reg. 1190-1194 (January 10, 2018) and the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note. See Pub. L.114-74, Section 701 (Nov. 2, 2015)). These requirements help ensure that EPA penalties keep pace with inflation. Under the above-cited 2015 amendments to inflationary adjustment law, EPA must review its statutory civil penalties each year and adjust them as necessary.

(1) Criminal Penalties

(a) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than 2 years, or both.

(b) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

(c) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing

endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

(d) *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(2) *Civil Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(3) *Administrative Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty as follows:

(a) *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(b) *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit

condition.

3. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from responsibilities, liabilities or penalties to which the Permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

5. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

6. Confidentiality of Information

a. In accordance with 40 C.F.R. Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 C.F.R. Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or Permittee;
(2) Permit applications, permits, and effluent data.

c. Information required by NPDES application forms provided by the Director under 40 C.F.R. § 122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

7. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The Permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

8. State Authorities

Nothing in Parts 122, 123, or 124 precludes more stringent State regulation of any activity

covered by the regulations in 40 C.F.R. Parts 122, 123, and 124, whether or not under an approved State program.

9. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. *Bypass not exceeding limitations.* The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (c) and (d) of this Section.

c. Notice

(1) *Anticipated bypass*. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass. As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(2) *Unanticipated bypass*. The Permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (24-hour notice). As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or required to do so by law.

d. *Prohibition of bypass.*

(1) Bypass is prohibited, and the Director may take enforcement action against a Permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The Permittee submitted notices as required under paragraph 4.c of this Section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 4.d of this Section.

5. Upset

a. *Definition*. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or

improper operation.

b. *Effect of an upset.* An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph B.5.c. of this Section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. *Conditions necessary for a demonstration of upset.* A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the Permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated; and
(3) The Permittee submitted notice of the upset as required in paragraph D.1.e.2.b. (24-hour notice).
(4) The Permittee complied with any remedial measures required under B.3. above.

d. *Burden of proof.* In any enforcement proceeding the Permittee seeking to establish the occurrence of an upset has the burden of proof.

C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records of monitoring information required by this permit related to the Permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least 5 years (or longer as required by 40 C.F.R. § 503), the Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. Subchapters N or O.

e. The Clean Water Act provides that any person who falsifies, tampers with, or

knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The Permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. *Planned Changes*. The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 C.F.R. § 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements at 40 C.F.R. § 122.42(a)(1).

(3) The alteration or addition results in a significant change in the Permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. *Anticipated noncompliance*. The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. *Transfers*. This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Clean Water Act. *See* 40 C.F.R. § 122.61; in some cases, modification or revocation and reissuance is mandatory.

d. *Monitoring reports*. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices. As of December 21, 2016 all reports and forms submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by State law.

(2) If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 C.F.R. § 136, or another method required for an industry-specific waste stream under 40 C.F.R. Subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. *Twenty-four hour reporting.*

(1) The Permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances. A written report shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all

reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. *See* 40 C.F.R. § 122.41(g).
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. *See* 40 C.F.R. § 122.44(g).

(3) The Director may waive the written report on a case-by-case basis for reports under paragraph D.1.e. of this Section if the oral report has been received within 24 hours.

f. *Compliance Schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. *Other noncompliance.* The Permittee shall report all instances of noncompliance not reported under paragraphs D.1.d., D.1.e., and D.1.f. of this Section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph D.1.e. of this Section. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in paragraph D.1.e. and the applicable required data in Appendix A to 40 C.F.R. Part 127. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), §122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this Section.

h. *Other information.* Where the Permittee becomes aware that it failed to submit any

relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

i. *Identification of the initial recipient for NPDES electronic reporting data*. The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in Appendix A to 40 C.F.R. Part 127) to the appropriate initial recipient, as determined by EPA, and as defined in 40 C.F.R. § 127.2(b). EPA will identify and publish the list of initial recipients on its Web site and in the FEDERAL REGISTER, by state and by NPDES data group (see 40 C.F.R. § 127.2(c) of this Chapter). EPA will update and maintain this listing.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Director shall be signed and certified. *See* 40 C.F.R. §122.22.

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under paragraph A.6. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Director. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

E. DEFINITIONS AND ABBREVIATIONS

1. General Definitions

For more definitions related to sludge use and disposal requirements, see EPA Region 1's NPDES Permit Sludge Compliance Guidance document (4 November 1999, modified to add regulatory definitions, April 2018).

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and federal standards and limitations to which a "discharge," a "sewage sludge use or disposal practice," or a related activity is subject under the CWA, including "effluent limitations," water quality standards, standards of performance, toxic effluent standards or prohibitions, "best management practices," pretreatment standards, and "standards for sewage sludge use or disposal" under Sections 301, 302, 303, 304, 306, 307, 308, 403 and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in

"approved States," including any approved modifications or revisions.

Approved program or *approved State* means a State or interstate program which has been approved or authorized by EPA under Part 123.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Best Management Practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bypass see B.4.a.1 above.

C-NOEC or *"Chronic (Long-term Exposure Test) – No Observed Effect Concentration" means* the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 C.F.R. § 501.2, required to have an approved pretreatment program under 40 C.F.R. § 403.8 (a) (including any POTW located in a State that has elected to assume local program responsibilities pursuant to 40 C.F.R. § 403.10 (e)) and any treatment works treating domestic sewage, as defined in 40 C.F.R. § 122.2, classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the State Director, because of the potential for its sewage sludge use or disposal practice to affect public health and the environment adversely.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483and Public Law 97-117, 33 U.S.C. 1251 *et seq*.

CWA and regulations means the Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Daily Discharge means the "discharge of a pollutant" measured during a calendar day or any

other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Direct Discharge means the "discharge of a pollutant."

Director means the Regional Administrator or an authorized representative. In the case of a permit also issued under Massachusetts' authority, it also refers to the Director of the Division of Watershed Management, Department of Environmental Protection, Commonwealth of Massachusetts.

Discharge

(a) When used without qualification, *discharge* means the "discharge of a pollutant."

(b) As used in the definitions for "interference" and "pass through," *discharge* means the introduction of pollutants into a POTW from any non-domestic source regulated under Section 307(b), (c) or (d) of the Act.

Discharge Monitoring Report ("DMR") means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by Permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under section 304(b) of CWA to adopt or revise "effluent limitations."

Environmental Protection Agency ("EPA") means the United States Environmental Protection

Agency.

Grab Sample means an individual sample collected in a period of less than 15 minutes.

Hazardous substance means any substance designated under 40 C.F.R. Part 116 pursuant to Section 311 of CWA.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Indirect discharger means a nondomestic discharger introducing "pollutants" to a "publicly owned treatment works."

Interference means a discharge (see definition above) which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment and disposal.

LC_{50} means the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.

Maximum daily discharge limitation means the highest allowable "daily discharge."

Municipal solid waste landfill (MSWLF) unit means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 C.F.R. § 257.2. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, very small quantity generator waste and industrial solid waste. Such a landfill may be

publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

Municipality

(a) When used without qualification *municipality* means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of CWA.

(b) As related to sludge use and disposal, *municipality* means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal Agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management Agency under Section 208 of the CWA, as amended. The definition includes a special district created under State law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in Section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program."

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants;"

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source;" and

(d) Which has never received a finally effective NPDES permit for discharges at that "site."

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Director in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Director shall consider the factors specified in 40 C.F.R. §§ 125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System."

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge (see definition above) which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of Parts 122, 123, and 124. "Permit" includes an NPDES "general permit" (40 C.F.R § 122.28). "Permit" does not include any permit which has not yet been the subject of final agency action, such as a "draft permit" or "proposed permit."

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 C.F.R. § 122.3).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials

(except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq*.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train*, 8 E.R.C. 2120 (D.D.C. 1976), *modified* 12 E.R.C. 1833 (D.D.C. 1979)); also listed in Appendix A of 40 C.F.R. Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (b) not a "POTW."

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly owned treatment works (POTW) means a treatment works as defined by Section 212 of the Act, which is owned by a State or municipality (as defined by Section 504(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in Section 502(4) of the Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary industry category means any industry which is not a "primary industry category."

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced waste water treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 C.F.R. Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does

not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 C.F.R. § 122.2.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substance designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 C.F.R. §§ 110.10 and 117.21) or Section 102 of CERCLA (*see* 40 C.F.R. § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to section 405(d) of the CWA, and is required to obtain a permit under 40 C.F.R. § 122.1(b)(2).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe as defined in the regulations which meets the requirements of 40 C.F.R. § 123.31.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Toxic pollutant means any pollutant listed as toxic under Section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or waste water treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Director may designate any person subject to the standards for sewage sludge use and

disposal in 40 C.F.R. Part 503 as a "treatment works treating domestic sewage," where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 C.F.R. Part 503.

Upset see B.5.a. above.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Waste pile or *pile* means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States or waters of the U.S. means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate "wetlands;"

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

    (1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

    (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

    (3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. § 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test.

*Zone of Initial Dilution (*ZID) means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards.

2. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)
TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont.	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen

kg/day	Kilograms per day
lbs/day	Pounds per day
mg/L	Milligram(s) per liter
mL/L	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
Surfactant	Surface-active agent
Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
µg/L	Microgram(s) per liter
WET	"Whole effluent toxicity"
ZID	Zone of Initial Dilution

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

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT NUMBER: MA0100382

PUBLIC NOTICE START AND END DATES: February 1, 2024 – April 1, 2024

NAME AND MAILING ADDRESS OF APPLICANT:

City of Fall River Sewer Commission
One Government Center
Fall River, MA 02722

The Massachusetts municipalities of Freetown and Westport and the Rhode Island municipality of Tiverton are Co-permittees for specific activities required by the permit. See Sections 5.4 and 5.5 of this Fact Sheet and Sections I.B., I.C., I.D. of the Draft Permit. The responsible Town departments are:

Town of Freetown Water and Sewer Commission Freetown Town Hall 3 North Main Street P.O. Box 438 Assonet, MA 02702	Town of Westport Westport Town Hall 816 Main Road Westport, MA 02790	Tiverton Wastewater District 400 Fish Road Tiverton, RI 02878

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Fall River Wastewater Treatment Plant
1979 Bay Street
Fall River, MA 02724 and 18 combined sewer overflow (CSO) outfalls

RECEIVING WATER AND CLASSIFICATION:

Mount Hope Bay (MA61-06); Class SB - CSO [Outfall 001 and 7 CSOs]
Taunton River (MA62-04); Class SB - CSO [4 CSOs]
Quequechan River (MA61-05); Class B – Warm Water Fishery and CSO [7 CSOs]

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Appendices

1.0 Proposed Action

The above-named applicant (the Permittee) has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge from the Fall River Wastewater Treatment Plant (the Facility) into the Mount Hope Bay.

The permit currently in effect was issued on December 7, 2000, with an effective date of February 5, 2001, and expired on February 4, 2006 (the 2000 Permit). The Permittee filed an application seeking NPDES permit reissuance from EPA, as required by 40 Code of Federal Regulations (CFR) § 122.6. Since the permit application was deemed timely and complete by EPA on February 3, 2006, the Facility's 2000 Permit has been administratively continued pursuant to 40 CFR § 122.6 and § 122.21(d). The Permittee also submitted an updated reapplication on December 14, 2021, to provide more updated information to facilitate EPA's permit reissuance. EPA and the State conducted a site visit on November 28, 2023.

2.0 Statutory and Regulatory Authority for Setting NPDES Permit Requirements

Congress enacted the Federal Water Pollution Control Act, codified at 33 U.S.C. § 1251-1387 and commonly known as the Clean Water Act (CWA), "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except to the extent authorized under specific provisions of the CWA, one of which is § 402. *See* CWA §§ 301(a), 402(a). Section 402(a) established one of the CWA's principal permitting programs, the NPDES Permit Program. Under this section, EPA may "issue a permit for the discharge of any pollutant or combination of pollutants" on the condition that the discharge will comply with the standards specified in certain other provisions of the statute (e.g., CWA §§ 301, 306 and 403). CWA § 402(a)(1). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. *See* CWA § 402(a)(1) and (2). The regulations governing EPA's NPDES permit program are generally found in 40 CFR Parts 122, 124, 125, and 136.

"Congress has vested in the Administrator [of EPA] broad discretion to establish conditions for NPDES permits" in order to achieve the statutory mandates of Sections 301 and 402 of the CWA. *Arkansas v. Oklahoma,* 503 U.S. 91, 105 (1992). Technology-based effluent limitations (TBELs) represent the minimum level of pollutant discharge control that must be satisfied under Sections 301(b) and 402(a)(1) of the CWA. *See also* 40 CFR § 125.3(a). When limits more stringent than technology-based limits are needed to maintain or achieve compliance with state water quality standards (WQS), then NPDES permit must include water quality-based effluent limits (QBELs). See CWA §§ 301(b)(1)(C) and 401; 40 CFR §§ 122.4(d), 122.44(d)(1) and (5), 124.53, and 124.55.

2.1 Technology-Based Requirements

Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. *See* CWA § 301(b). As a class, publicly owned treatment works (POTWs) must meet performance-based requirements based on available wastewater treatment technology. *See* CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH. *See* 40 CFR Part 133.

Under CWA § 301(b)(1), POTWs must have achieved effluent limits based upon secondary treatment technology by July 1, 1977. Since all statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired, when technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. *See* 40 CFR § 125.3(a)(1).

2.2 Water Quality-Based Requirements

The CWA and federal regulations also require that permit effluent limits based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water. This is necessary when less stringent TBELs would interfere with the attainment or maintenance of water quality criteria in the receiving water. *See* CWA § 301(b)(1)(C) and 40 CFR §§ 122.44(d)(1), 122.44(d)(5).

2.2.1 Water Quality Standards

The CWA requires that each state develop water quality standards (WQSs) for all water bodies within the State. *See* CWA § 303 and 40 CFR § 131.10-12. Generally, WQSs consist of three parts: 1) the designated use or uses assigned for a water body or a segment of a water body; 2) numeric or narrative water quality criteria sufficient to protect the assigned designated use(s); and 3) antidegradation requirements to ensure that once a use is attained it will not be degraded and to protect high quality and National resource waters. *See* CWA § 303(c)(2)(A) and 40 CFR § 131.12. The applicable State WQSs can be found in 314 of the Code of Massachusetts Regulations, Chapter 4 (314 CMR 4.00).

As a matter of state law, state WQSs specify different water body classifications, each of which is associated with certain designated uses and particular numeric and narrative water quality criteria intended to help attain the designated uses. Then the state assigns one of the water body classifications to each water body in the state. When using chemical-specific numeric criteria to develop permit limitations, acute and chronic aquatic life criteria and human health criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. In general, aquatic-life acute criteria are considered applicable to daily time

periods (maximum daily limit) and aquatic-life chronic criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific human health criteria are typically based on lifetime chronic exposure and, therefore, are typically applicable to average monthly limits.

When permit effluent limitation(s) are necessary to ensure that the receiving water meets narrative water quality criteria, the permitting authority must establish effluent limits in one of the following three ways: 1) based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use," 2) based on a "case-by-case basis" using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, 3) in certain circumstances, based on use of an indicator parameter. *See* 40 CFR § 122.44(d)(1)(vi)(A-C).

2.2.2 Antidegradation

Federal regulations found at 40 CFR § 131.12 require states to develop and adopt a statewide antidegradation policy that maintains and protects existing in-stream water uses and the level of water quality necessary to protect these existing uses. In addition, the antidegradation policy ensures maintenance of high quality waters which exceed levels necessary to support propagation of fish, shellfish, and wildlife and to support recreation in and on the water, unless the State finds that allowing degradation is necessary to accommodate important economic or social development in the area in which the waters are located.

Massachusetts' statewide antidegradation policy, entitled "Antidegradation Provisions" is found in the State's WQSs at 314 CMR 4.04. Massachusetts guidance for the implementation of this policy is in an associated document entitled "Implementation Procedures for the Antidegradation Provisions of the Massachusetts Surface Water Quality Standards, 314 CMR 4.00." dated October 21, 2009. According to the policy, no lowering of water quality is allowed, except in accordance with the antidegradation policy, and all existing in-stream uses, and the level of water quality necessary to protect the existing uses of a receiving water body must be maintained and protected.

This permit is being reissued with effluent limitations sufficiently stringent to satisfy the State's antidegradation requirements, including the protection of the existing uses of the receiving water.

2.2.3 Assessment and Listing of Waters and Total Maximum Daily Loads.

The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. To meet this goal, the CWA requires states to develop information on the quality of their water resources and report this information to EPA, the U.S. Congress, and the public. To this end, EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both

§ 305(b) and § 303(d) of the CWA. The integrated list format allows states to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories: 1) unimpaired and not threatened for all designated uses; 2) unimpaired waters for some uses and not assessed for others; 3) insufficient information to make assessments for any uses; 4) impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) impaired or threatened for one or more uses and requiring a TMDL.

A TMDL is a planning tool and potential starting point for restoration activities with the ultimate goal of attaining water quality standards. A TMDL essentially provides a pollution budget designed to restore the health of an impaired water body. A TMDL typically identifies the source(s) of the pollutant from point sources and non-point sources, determines the maximum load of the pollutant that the water body can tolerate while still attaining WQSs for the designated uses, and allocates that load among to the various sources, including point source discharges, subject to NPDES permits. *See* 40 CFR § 130.7.

For impaired waters where a TMDL has been developed for a particular pollutant and the TMDL includes a waste load allocation (WLA) for a NPDES permitted discharge, the effluent limitation in the permit must be "consistent with the assumptions and requirements of any available WLA". 40 CFR § 122.44(d)(1)(vii)(B).

2.2.4 Reasonable Potential

Pursuant to CWA § 301(b)(1)(C), 33 U.S.C. § 1311(b)(1)(C), and 40 CFR § 122.44(d)(1), NPDES permits must contain any requirements in addition to TBELs that are necessary to achieve water quality standards established under § 303 of the CWA. In addition, permit limits "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) which the permitting authority determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality." 40 CFR § 122.44(d)(1)(i). To determine if the discharge causes, or has the reasonable potential to cause, or contribute to an excursion above any WQS, EPA considers: 1) existing controls on point and non-point sources of pollution; 2) the variability of the pollutant or pollutant parameter in the effluent; 3) the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity); and 4) where appropriate, the dilution of the effluent by the receiving water. *See* 40 CFR § 122.44(d)(1)(ii).

If the permitting authority determines that the discharge of a pollutant will cause, has the reasonable potential to cause, or contribute to an excursion above WQSs, the permit must contain WQBELs for that pollutant. *See* 40 CFR § 122.44(d)(1)(i).

2.2.5 State Certification

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate the State WQSs, or the State waives, or is deemed to have waived, its right to certify. *See* 33 U.S.C. § 1341(a)(1). Regulations governing state certification are set forth in 40 CFR § 124.53 and § 124.55. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects that the Draft Permit will be certified.

If the State believes that conditions more stringent than those contained in the Draft Permit are necessary to meet the requirements of either CWA §§ 208(e), 301, 302, 303, 306 and 307, or applicable requirements of State law, the State should include such conditions in its certification and, in each case, cite the CWA or State law provisions upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. EPA includes properly supported State certification conditions in the NPDES permit. The only exception to this is that the permit conditions/requirements regulating sewage sludge management and implementing CWA § 405(d) are not subject to the State certification requirements. Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through EPA's permit appeal procedures of 40 CFR Part 124.

In addition, the State should provide a statement of the extent to which any condition of the Draft Permit can be made less stringent without violating the requirements of State law. Since the State's certification is provided prior to final permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition.

It should be noted that under CWA § 401, EPA's duty to defer to considerations of State law is intended to prevent EPA from relaxing any requirements, limitations or conditions imposed by State law. Therefore, "[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition." 40 CFR § 124.55(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." *Id.* EPA regulations pertaining to permit limitations based upon WQSs and State requirements are contained in 40 CFR §§ 122.4(d) and 122.44(d).

2.3 Effluent Flow Requirements

Sewage treatment plant discharge is encompassed within the definition of "pollutant" and is subject to regulation under the CWA. The CWA defines "pollutant" to mean, *inter alia*, "municipal...waste" and "sewage…discharged into water." 33 U.S.C. § 1362(6).

Generally, EPA uses a discharger's effluent flow volume both to determine whether an NPDES permit needs certain effluent limitations and to calculate the limitations themselves. EPA practice is to use effluent flow as a reasonable and important worst-case condition in its reasonable potential and WQBEL calculations to ensure compliance with WQSs under CWA § 301(b)(1)(C). Should a facility's effluent flow exceed the flow assumed in these calculations, the in-stream dilution would be reduced, and the calculated effluent limitations might not be sufficiently protective (i.e. might not meet WQSs). Further, pollutants that do not have the reasonable potential to exceed WQSs at a lower discharge flow may have a reasonable potential to do so at a higher flow due to the decreased dilution in the receiving water (which, conversely, means there will be a higher concentration of the pollutants). In order to ensure that the assumptions underlying EPA's reasonable potential analyses and permit effluent limitation derivations remain sound for the duration of the permit, EPA may ensure the validity of its "worst-case" effluent flow assumptions through imposition of permit conditions for effluent flow.[1] In this regard, the effluent flow limitation is a component of an WQBELs because the WQBELs are premised on a maximum level flow. The effluent flow limit may also be necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs.

The limitation on wastewater effluent flow is within EPA's authority to condition a permit to carry out the objectives of the Act. *See* CWA §§ 402(a)(2) and 301(b)(1)(C); 40 CFR §§ 122.4(a) and (d), 122.43 and 122.44(d). A condition on the discharge designed to ensure the WQBEL and reasonable potential calculations account for "worst case" conditions is encompassed by the references to "condition" and "limitations" in CWA §§ 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.

Setting limits on effluent flow volumes is within EPA's authority to condition a permit to carry out the objectives and satisfy the requirements of the CWA. *See* CWA §§ 402(a)(2) and 301(b)(1)(C); 40 CFR §§ 122.4(a) and (d), 122.43 and 122.44(d). Regulating the quantity of pollutants in the discharge through a restriction on the quantity of effluent is also consistent with EPA's authorities under the CWA.

As provided in Part II.B.1 (Standard Conditions) of the proposed permit and 40 CFR § 122.41(e), the Permittee is required to properly operate and maintain all facilities and systems of treatment and control. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Consequently, an effluent flow limit is a permit condition that relates to the Permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation

[1] EPA's regulations regarding "reasonable potential" require EPA to consider "where appropriate, the dilution of the effluent in the receiving water," *id* 40 CFR §122.44(d)(1)(ii). *Both* the effluent flow and receiving water flow may be considered when assessing reasonable potential. *In re Upper Blackstone Water Pollution Abatement Dist.,* 14 E.A.D. 577. 599 (EAB 2010). EPA guidance directs that this "reasonable potential: analysis be based on "worst-case" conditions. *See In re Washington Aquaduct Water Supply Sys.* 11 E.A.D. 565, 584 (EAB 2004).

of the permit that has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 CFR §§ 122.41(d), (e).

EPA has also included the effluent flow limit in the permit to minimize or prevent infiltration and inflow (I/I) that may result in unauthorized discharges and compromise proper operation and maintenance of the facility. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes or deteriorated joints. Inflow is extraneous flow added to the collection system that enters the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity available for treatment and the operating efficiency of the treatment works and to properly operate and maintain the treatment works.

Furthermore, the extraneous flow due to significant I/I greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems. Consequently, the effluent flow limit is a permit condition that relates to the permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 CFR §§ 122.41(d), (e).

2.4 Monitoring and Reporting Requirements

2.4.1 Monitoring Requirements

Sections 308(a) and 402(a)(2) of the CWA and the implementing regulations at 40 CFR Parts 122, 124, 125, and 136 authorize EPA to include monitoring and reporting requirements in NPDES permits.

The monitoring requirements included in this permit have been established to yield data representative of the Facility's discharges in accordance with CWA §§ 308(a) and 402(a)(2), and consistent with 40 CFR §§ 122.41(h), (j), and (l)(9), 122.43(a), 122.44(i) and 122.48. The Draft Permit specifies routine sampling and analysis requirements to provide ongoing, representative information on the levels of regulated constituents in the discharges. The monitoring program is needed to enable EPA and the State to assess the characteristics of the Facility's effluent, whether Facility discharges are complying with permit limits, and whether different permit conditions may be necessary in the future to ensure compliance with technology-based and water quality-based standards under the CWA. EPA and/or the State may use the results of the chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to CWA § 304(a)(1), State water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including, but not limited to, those pollutants listed in Appendix D of 40 CFR Part 122.

NPDES permits require that the approved analytical procedures found in 40 CFR Part 136 be used for sampling and analysis unless other procedures are explicitly specified. *See* 40 CFR § 122.41 (j)(4). Permits also include requirements necessary to comply with the *National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting Rule*.[2] This Rule requires that where EPA-approved methods exist, NPDES applicants must use sufficiently sensitive EPA-approved analytical methods when quantifying the presence of pollutants in a discharge. Further, the permitting authority must prescribe that only sufficiently sensitive EPA-approved methods be used for analyses of pollutants or pollutant parameters under the permit. The NPDES regulations at 40 CFR § 122.21(e)(3) (completeness), 40 CFR § 122.44(i)(1)(iv) (monitoring requirements) and/or as cross referenced at 40 CFR § 136.1(c) (applicability) indicate that an EPA-approved method is sufficiently sensitive where:

- The method minimum level[3] (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or
- In the case of permit applications, the ML is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or parameter in the discharge; or
- The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter.

2.4.2 Reporting Requirements

The Draft Permit requires the Permittee to report monitoring results obtained during each calendar month to EPA and the State electronically using NetDMR. The Permittee must submit a Discharge Monitoring Report (DMR) for each calendar month no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool enabling regulated CWA permittees to submit DMRs electronically via a secure internet application to EPA through the Environmental Information Exchange Network. NetDMR has eliminated the need for participants to mail in paper forms to EPA under 40 CFR §§ 122.41 and 403.12. NetDMR is accessible through EPA's Central Data

[2] Fed. Reg. 49,001 (Aug 19, 2014).

[3] The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL). Minimum levels may be obtained in several ways: They may be published in a method; they may be sample concentrations equivalent to the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a lab, by a factor. EPA is considering the following terms related to analytical method sensitivity to be synonymous: "quantitation limit," "reporting limit," "level of quantitation," and "minimum level." *See* Fed. Reg. 49,001 (Aug. 19, 2014).

Exchange at https://cdx.epa.gov/. Further information about NetDMR can be found on EPA's NetDMR support portal webpage.[4]

With the use of NetDMR, the Permittee is no longer required to submit hard copies of DMRs and reports to EPA and the State unless otherwise specified in the Final Permit. In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR. Certain exceptions are provided in the permit, such as for providing written notifications required under the Part II Standard Conditions.

2.5 Standard Conditions

The Standard Conditions, included as Part II of the Draft Permit, are based on applicable regulations found in the EPA's NPDES permitting regulations. *See* 40 CFR Part 122.41 *See also, generally,* 40 CFR Part 122.

2.6 Anti-backsliding

The CWA's anti-backsliding requirements prohibit a permit from being renewed, reissued or modified to include with less stringent limitations or conditions than those contained in a previous permit except in compliance with one of the specified exceptions to those requirements. *See* CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l). Anti-backsliding provisions apply to effluent limits based on technology, water quality and/or state certification requirements.

All proposed limitations in the Draft Permit are at least as stringent as limitations included in the 2000 Permit unless specific conditions exist to justify relaxation in accordance with CWA § 402(o) or § 303(d)(4). Discussion of any less stringent limitations and corresponding exceptions to anti-backsliding provisions is provided in the sections that follow.

3.0 Description of Facility and Discharge

3.1 Location and Type of Facility

The location of the wastewater treatment plant, Outfall 001 to Mount Hope Bay, and the 18 CSOs are shown in Figure 1. The longitude and latitude of Outfall 001 is 41° 40' 40" N, 71° 11' 48" W. Outfall 001 is located approximately 932 ft offshore and approximately 20 ft below the mean low water level.

The Fall River Wastewater Treatment Plant (WWTP) is a secondary treatment wastewater treatment facility that is engaged in the collection and treatment of municipal, commercial, and industrial wastewater. Currently, the Facility serves approximately 88,000 residents in the City

[4] https://netdmr.zendesk.com/hc/en-us/articles/209616266-EPA-Region-1-NetDMR-Information

of Fall River as well as 2,000 residents in the Town of Tiverton, RI and commercial sites in Freetown and Westport, MA.

The Facility has a design flow of 30.9 MGD, the annual average daily flow reported in the 2021 reapplication was 26.0 MGD and the median annual rolling average flow for the last 5 years has been 25.8 MGD. As part of CSO minimization efforts (discussed further in Section 5.6 below), the peak capacity of the facility was increased to 106 MGD for primary treatment and disinfection and to 50 MGD for secondary treatment. Flows that exceed 50 MGD during wet weather receive primary treatment, bypass secondary treatment, are blended with the 50 MGD of secondary treated wastewater and the combined flow is then disinfected before being discharged through Outfall 001. Therefore, the Draft permit requires additional monitoring of bypass flow to better understand the operation of the facility during wet weather. A bypass of secondary treatment is subject to the requirements of Part II.B.4. and Part II.D.1.e. of this permit.

The Permittee is required to conduct a pretreatment program and currently serves 16 significant industrial users (SIUs) contributing industrial wastewater to the WWTP. Pollutants introduced into POTWs by a non-domestic source shall not pass through the POTW or interfere with the operation or performance of the treatment works. The industrial users are:

COMPANY	**CATEGORY**	**FLOW TO WWTF (1,000 gdp)**
Ashland Chem (ISP)	Organic Chemicals, Plastics and Synthetic Fibers*	90
Blount Fine Foods	Food Processing	275
Bolger + Ohearn	Textile	1
Border & Remington	Rubber/Chemical	42
Celldex Theraputic	Fermentation*	6.65
Fall River Landfill - BFI	Sanitary Landfill	3.5
Gold Medal	Food Processing	40
Mass Biologics	Research	1.5
N.E. Electropolishing	Metal Finishing*	5
Robbins	Metal Finishing*	0 (6.2)**
Sherle Wagner	Metal Finishing*	2
Spectrum Lighting	Metal Finishing*	1.5
Stop & Shop	Food Processing	45
Swan Dye & Print	Textile	704
Whirlpool (Am. Dryer)	Equipment Manufacturing*	45
Canned Heat Brewery	Brewery	1
	Maximum Total Flow	1.3 MGD

* Categorical Industry
** Zero discharge unless evaporation system goes down.

A quantitative description of the discharge in terms of effluent parameters, based on monitoring data submitted by the Permittee from October 2018 to September 2023 is provided in Appendix A of this Fact Sheet.

Additionally, EPA is adding three co-permittees to the Draft Permit. The Towns of Freetown and Westport, Massachusetts and Tiverton, Rhode Island own and operate sanitary wastewater collection systems that discharge flows to the Fall River WWTP. These municipalities are co-permittees for certain activities pertaining to proper operation and maintenance of their respective collection systems (*See* Part I.C. and I.D of the Draft Permit). Adding them to the Draft Permit ensures that they comply with requirements to operate and maintain the collection systems so as to avoid discharges of sewage from the collection systems. These co-permittees did not apply for permit coverage; with letters sent at the beginning of the public notice period, EPA waived application requirements for the three co-permittees. The legal basis for including municipal satellite collection systems as co-permittees is described in *In re Charles River Pollution Control District*, 16 E.A.D. 623 (EAB 2015)[5].

3.1.1 Treatment Process Description

The Fall River WWTP is an activated sludge treatment plant utilizing pure oxygen aeration. Influent enters the Facility and flows through a mechanical screen and aerated grit chambers, is split into four primary clarifiers, followed by four oxygenation tanks and three secondary clarifies. The effluent is disinfected by sodium hypochlorite and dechlorinated using sodium bisulfite before being discharged through Outfall 001 into Mount Hope Bay. A flow diagram of the Treatment Facility is shown in Figure 2.

The facility is currently under construction to improve the sludge dewatering capabilities, including installation of new gravity belt filters, new gravity belt thickeners and increased sludge storage. Sludge is dewatered and disposed under contract with a private hauler for incineration in Cranston, RI. Backup options for disposal include incineration in the Borough of Naugatuck, CT or surface disposal at the Turnkey Landfill in Rochester, NH. The average annual mass of sludge currently shipped for incineration is approximately 3,325 dry metric tons.

3.1.2 Collection System Description

The Fall River WWTP is served by a sewer system that is approximately 15% separate sanitary sewer system and 85% combined storm and sanitary sewer system. The portions of the sewer system in Freetown, MA, Westport, MA, and Tiverton, RI are all 100% separate sanitary sewer systems. A separate sanitary sewer conveys domestic, industrial and commercial sewage, but not stormwater. It is part of a "two pipe system" consisting of separate sanitary sewers and

[5] The decision is available at: https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Published%20and%20Unpublished%20Decisions/F89699D1A0710BCF85257DE200717A93/$File/Charles%20River%20Decision%20Vol%2016.pdf

storm sewers. The two systems have no interconnections; the sanitary sewer leads to the wastewater treatment plant and the storm sewers discharge to a local water body.

4.0 Description of Receiving Water and Dilution

4.1 Receiving Water

The Fall River WWTP discharges through Outfall 001 into Segment MA61-06 of Mount Hope Bay. This segment of Mount Hope Bay extends from just upstream of the Braga Bridge, Fall River/Somerset to the state border Fall River, MA/Tiverton, RI to the line from Brayton Point Somerset to MA/RI border approximately 3/4 of a mile due east of Spar Island, RI.

Mount Hope Bay is classified as a Class SB water in the Massachusetts WQSs at 314 CMR 4.05(4)(b). Class SB waters are designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated in the tables for shellfishing in 314 CMR 4.06(6)(b), these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas). The waters shall have consistently good aesthetic value.

Segment MA61-06 of Mount Hope Bay is listed in the final *Massachusetts Integrated List of Waters for the Clean Water Act 2018-2020 Reporting Cycle*[6] as well as in the *Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle*[7] as a Category 5 "Waters Requiring a TMDL" ("303(d) List"). The listed impairments are for chlorophyll-a, dissolved oxygen, enterococcus, fecal coliform, fish bioassessments and total nitrogen. To date the only TMDL that has been developed for this segment for any of the listed impairments is for bacteria.[8] The status of each designated use is presented in Table 1.

Table 1 – Summary of Designated Uses and Listing Status

Designated Use	Status
Aquatic Life	Not Supporting (Chlorophyll-a, Dissolved oxygen, Fish bioassessments, Total nitrogen)
Aesthetics	Not Assessed
Primary Contact Recreation	Not Supporting (Enterococcus)
Secondary Contact Recreation	Not Supporting (Enterococcus)
Fish Consumption	Not Assessed

[6] *Massachusetts 2018-2020 Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle,* MassDEP Division of Watershed Management Watershed Planning Program, Worcester, Massachusetts, December 2019.
[7] *Massachusetts 2022 Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle,* MassDEP Division of Watershed Management Watershed Planning Program, Worcester, Massachusetts, May 2023 (Partially approved list).
[8] The *Final Pathogen TMDL for the Narragansett/Mt. Hope Bay Watershed* (July 2010) is available at: https://attains.epa.gov/attains-public/api/documents/actions/MA_DEP/38904/107197.

Shellfish Harvesting	Not Supporting (Fecal Coliform)

In addition to having a Shellfishing qualifier, this segment also has a CSO qualifier which identifies these waters as impacted by the discharge of Combined Sewer Overflows (CSOs).

Within a few hundred feet south of the outfall, the Fall River discharge also impacts segments of Mount Hope Bay across the Rhode Island border. Like the segments of Mount Hope Bay in Massachusetts, the segments in Rhode Island are also impaired for dissolved oxygen, total nitrogen and fecal coliform as described in the *State of Rhode Island 2022 Impaired Waters Report* (December 2021).[9]

4.2 Ambient Data

A summary of the ambient data collected in the receiving water in the vicinity of the outfall that is referenced in this Fact Sheet can be found in Appendix A of this Fact Sheet.

4.3 Available Dilution

To ensure that discharges do not cause or contribute to violations of WQS under all expected conditions, WQBELs are derived assuming critical conditions for the receiving water[10]. The critical flow in rivers and streams is some measure of the low flow of that river or stream. State WQSs require that for rivers and streams, the lowest condition is the lowest mean flow for seven consecutive days, recorded once in 10 years, or 7-day 10-year low flow (7Q10) or in waters where flows are regulated by dams or similar structures, the lowest flow condition is the flow equaled or exceeded 99% of the time on a yearly basis, or another equivalent flow agreed upon by the State. See 314 CMR 4.03(3)(a) and (b).

In the development of the 2000 Permit, the dilution factor was estimated to be 5.67. More recently, in December 2013, the U.S. Food and Drug Administration (FDA), EPA, the Massachusetts Department of Marine Fisheries (MADMF), and the Rhode Island Department of Environmental Management (RIDEM) jointly conducted a dye-dilution study to assess the impact of the discharge on the receiving water and to update the available dilution. The final report from this study is included as Appendix C of this Fact Sheet.

Regarding the available dilution, page 11 of the report says the following:

> "The minimum dilution found via the boat tracking fluorometers on December 4th was 11.63:1, equivalent to a 5-point moving average concentration of 80.51 ppb. This level was found within several feet of the Fall River WWTP outfall pipe location."

[9] Available at: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/iwr22.pdf
[10] EPA Permit Writer's Manual, Section 6.2.4

Based on this finding, EPA has updated the available dilution ratio to 11.63:1 (equivalent to a **dilution factor of 12.63**). This updated dilution factor has been used in the analyses below to assess the near-field impact of the discharge with respect to toxicity and toxic pollutants to ensure that the discharge does not cause or contribute to a violation of water quality standards under critical flow conditions.

To ensure that discharges do not cause or contribute to violations of WQS under all expected conditions, WQBELs are derived assuming critical conditions for the receiving water[11].

5.0 Proposed Effluent Limitations and Conditions

The proposed effluent limitations and conditions derived under the CWA and State WQSs are described below. These proposed effluent limitations and conditions, the basis of which are discussed throughout this Fact Sheet, may be found in Part I of the Draft Permit.

5.1 Effluent Limitations and Monitoring Requirements

In addition to the State and Federal regulations described in Section 2, data submitted by the permittee in its permit application, in monthly discharge monitoring reports (DMRs) and in WET test reports from October 2018 to September 2023 (the "review period") were used to identify the pollutants of concern and to evaluate the discharge during the effluent limitations development process (*See* **Appendix A)**.The reasonable potential analysis is included in Appendix B and results are discussed in the sections below.

5.1.1 Effluent Flow

The effluent flow limit in the 2000 Permit is 30.9 MGD, as a rolling annual average flow, based on the Facility's design flow. The DMR data during the review period shows a maximum rolling annual average flow of 28.5 MGD. There have been no exceedances of the flow limit during the review period.

The Draft Permit continues the 30.9 MGD flow limit from the 2000 Permit. The Draft Permit requires that flow be measured continuously and that the rolling annual average flow, as well as the average monthly and maximum daily flow for each month be reported. The rolling annual average flow is calculated as the average of the flow for the reporting month and 11 previous months.

5.1.2 Biochemical Oxygen Demand (BOD_5)

5.1.2.1 BOD_5 Concentration Limits

[11] EPA Permit Writer's Manual, Section 6.2.4

The BOD_5 limits in the 2000 Permit were based on the secondary treatment standards in 40 CFR § 133.102; the average monthly limit is 30 mg/L and the average weekly limit is 45 mg/L. The DMR data during the review period shows that there have been no violations of BOD_5 concentration limits.

The Draft Permit proposes the same BOD_5 concentration limits as in the 2000 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains five per week.

5.1.2.2 BOD_5 Mass Limits

The mass-based BOD_5 limits in the 2000 Permit of 7,730 lb/day (average monthly) and 11,600 lb/day (average weekly) were based on EPA's secondary treatment standards and the design flow of the Facility. The DMR data from the review period shows that there have been no exceedances of BOD_5 mass limits.

Calculations of maximum allowable loads for average monthly and average weekly BOD_5 are based on the following equation:

$$L = C_d * Q_d * 8.34$$

Where:

L = Maximum allowable load in lb/day

C_d = Maximum allowable effluent concentration for reporting period in mg/L (reporting periods are average monthly and average weekly)

Q_d = Annual average design flow of Facility, in MGD

8.34 = Factor to convert effluent concentration (in mg/L) and design flow (in MGD) to lb/day

Average Monthly: 30 mg/L * 30.9 MGD * 8.34 = 7,730 lb/day
Average Weekly: 45 mg/L * 30.9 MGD * 8.34 = 11,600 lb/day

Therefore, the Draft Permit proposes the same BOD_5 mass-based limits as in the 2000 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains five per week.

5.1.3 Total Suspended Solids (TSS)

5.1.3.1 TSS Concentration Limits

The TSS limits in the 2000 Permit were based on the secondary treatment standards in 40 CFR § 133.102; the average monthly limit is 30 mg/L and the average weekly limit is 45 mg/L. The DMR data during the review period shows that there have been no violations of TSS concentration limits.

The Draft Permit proposes the same TSS concentration limits as in the 2000 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains five per week.

5.1.3.2 TSS Mass Limits

The mass-based TSS limits in the 2000 Permit of 7,730 lb/day (average monthly) and 11,600 lb/day (average weekly) were based on EPA's secondary treatment standards and the design flow of the Facility. The DMR data from the review period shows that there has been one exceedance of the weekly average TSS mass limit.

Calculations of maximum allowable loads for average monthly and average weekly BOD_5 are based on the following equation:

$$L = C_d * Q_d * 8.34$$

Where:

L = Maximum allowable load in lb/day

C_d = Maximum allowable effluent concentration for reporting period in mg/L (reporting periods are average monthly and average weekly)

Q_d = Annual average design flow of Facility, in MGD

8.34 = Factor to convert effluent concentration (in mg/L) and design flow (in MGD) to lb/day

Average Monthly: 30 mg/L * 30.9 MGD * 8.34 = 7,730 lb/day
Average Weekly: 45 mg/L * 30.9 MGD * 8.34 = 11,600 lb/day

Therefore, the Draft Permit proposes the same TSS mass-based limits as in the 2000 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains five per week.

5.1.4 Eighty-Five Percent (85%) BOD_5 and TSS Removal Requirement

The 2000 Permit did not include a percent removal requirement for BOD_5 or TSS. However, the permit required reporting of effluent and influent BOD5 and TSS, so EPA used the monthly average loads to calculate a percent removal each month. As shown in Appendix A, the BOD5 percent removal was below 85% three times out of the 60-month review period and the TSS percent removal was below 85% seven times out of the 60-month review period. Based on these results, EPA has determined that the facility is able to remove greater than 85% of the BOD_5 and TSS consistently and the few exceptions are likely due to periods of wet weather when influent loads are more diluted (due to stormwater captured by the portion of the collection system that is a combined stormwater and sewer system) and proper operation of the WWTP under these conditions to remove BOD_5 and TSS is less efficient.

Therefore, in accordance with the provisions of 40 CFR § 133.102(a)(3) and (b)(3), EPA has included a requirement in the Draft Permit that the 30-day average percent removal for BOD_5 and TSS be not less than 85%. However, this requirement only applies during periods of dry weather and does not apply during periods of wet weather, including snowmelt. When calculating the percent removal each month, the Permittee should only use influent and effluent data collected during dry weather, as defined in the permit. EPA notes that this requirement will ensure proper operation of the WWTP while not conflicting with the requirement to maximize flow to the treatment plant and minimize CSO discharges during periods of wet weather and/or snowmelt.

5.1.5 pH

Consistent with the requirements of Massachusetts WQS at 314 CMR 4.05(4)(b)(3), the Permit requires that the pH of the effluent is not less than 6.5 or greater than 8.5 standard units at any time. The monitoring frequency is once per day. The DMR data during the review period show that there have been 30 excursions below the minimum pH limitation and no excursions above the maximum pH limitation. Based on discussions with the Permittee, these are brief excursions of the minimum pH limit due to the pure oxygen treatment process. EPA expects that the facility upgrade to achieve the proposed nitrogen limit (discussed in Section 5.1.9.1 below) will also resolve these pH excursions.

The pH requirements in the 2000 Permit are carried forward into the Draft Permit as there has been no change in the WQSs with regards to pH. The limitations are based on CWA 301(b)(1)(C) and 40 CFR § 122.44(d).

An optional pH study (described in footnote 6 of Part I.A.1 of the Permit) may be conducted by the Permittee at any time before the expiration date of the permit to support a request to expand the pH range to 6.0 S.U. The study must consist of at least 12 months of data collection and be designed based on guidance from MassDEP to verify that the discharge at 6.0 S.U. would not cause or contribute to an excursion of state water quality standards. For guidance on the study, the Permittee may contact MassDEP at massdep.npdes@mass.gov.

Upon completion of the pH study, the Permittee must submit the results to MassDEP at massdep.npdes@mass.gov for review and approval. If approved, MassDEP will notify EPA that the pH adjustment is allowable, and the pH limit will change to 6.0 S.U. at that time. This change will occur based on the terms of the permit provision and will not require a permit modification.

5.1.6 Bacteria

The 2000 Permit includes effluent limitations for bacteria using fecal coliform bacteria as the indicator bacteria with a monthly geometric mean limit of 200 organisms/100 ml and a maximum daily limit of 400 organisms/100 ml. The DMR data during the review period shows

that there have been no exceedances of the monthly geometric mean fecal coliform limitation and two exceedances of the maximum daily limit.

The current MA SWQS at 314 CMR 4.05(4)(b)4.a state "Waters designated for shellfishing shall not exceed a fecal coliform median or geometric mean MPN of 88 organisms per 100 ml, nor shall more than 10% of the samples exceed an MPN of 260 per 100 ml…" Hence, the Draft Permit contains fecal coliform limits of 88 organisms per 100 ml (average monthly) and 260 organisms per 100 ml (maximum daily). These limits are more stringent than those in the 2000 Permit based on the updated water quality standards. The monitoring frequency shall remain the same at three per week.

Given that the maximum fecal coliform results during the review period were 15 organisms per 100 ml (monthly geometric mean) and 240 organisms per 100 ml (daily maximum, other than the two permit violations noted above), EPA has determined that the facility is able to achieve these more stringent limits upon the effective date of the permit and a compliance schedule is not necessary or warranted. EPA notes that the shellfishing uses of certain segments of Mount Hope Bay are not supported due to fecal coliform impairments, which further supports the need for these more stringent limits to apply immediately.

Additionally, the Draft Permit also includes a monthly average limit of 35 *enterococci* cfu/100 ml and a limit of no more than 10% of the samples shall exceed 104 *enterococci* cfu/100 ml, consistent with the MA SWQS at 4.05(4)(b)4.b and the *Final Pathogen TMDL for the Narragansett/Mt. Hope Bay Watershed* (July 2010)[12] for the protection of recreational uses in Class SB waters. These limits shall also be effective year-round and the monitoring frequency shall be once per week. Given that there is no data available to determine the level of *enterococci* in the discharge with respect to these new limits, EPA has included a one-year compliance schedule to allow the Permittee to optimize the disinfection process before the *enterococci* limits becomes effective.

5.1.7 Total Residual Chlorine

The Permittee uses chlorine disinfection. The 2000 Permit includes effluent limitations for total residual chlorine (TRC) of 42.5 µg/L (average monthly) and 73.7 µg/L (maximum daily). The DMR data during the review period show that there have been no exceedances of the TRC limitations.

The TRC permit limits are based on the instream chlorine criteria defined in *National Recommended Water Quality Criteria: 2002*, EPA 822R-02-047 (November 2002), as adopted by the MassDEP into the state water quality standards at 314 CMR 4.05(5)(e). These saltwater instream criteria for chlorine are 7.5 µg/L (chronic) and 13 µg/L (acute). Because the upstream

[12] See Table ES-2 of the TMDL at: https://attains.epa.gov/attains-public/api/documents/actions/MA_DEP/38904/107197.

chlorine is assumed to be zero in this case, the water quality-based chlorine limits are calculated as the criteria times the dilution factor, as follows:

Chronic criteria * dilution factor = Chronic limit
7.5 ug/L * 12.63 = 95 µg/L (average monthly)

Acute criteria * dilution factor = Acute limit
13 µg/L * 12.63 = 164 µg/L (maximum daily)

Given that these limits are less stringent than the limits in the 2000 Permit, the Draft Permit carried forward the prior limits based on anti-backsliding regulations discussed in Section 2.6 above.

5.1.8 Ammonia

The 2000 Permit does not include ammonia limits, but the Permittee was required to monitor effluent ammonia once per week from April to October and once per month from November to March. The permit also required effluent and ambient ammonia concentrations on a quarterly basis as part of the Whole Effluent Toxicity (WET) testing.

Ambient data, taken outside the influence of the Fall River outfall in Mount Hope Bay, is presented in Appendix A and shows the median concentration for the warm weather period (April 1 through October 31) is 0.11 mg/L and for the cold weather period (November 1 through March 31) is 0.23 mg/L.

The ammonia criteria in EPA's *Ambient Water Quality Criteria for Ammonia (Saltwater) - 1989*, (EPA 440/5-88-004) document are included by reference in the Massachusetts WQS (*See* 314 CMR 4.06 Table 29a). The marine water quality criteria are dependent on pH, temperature and salinity.

In determining whether the discharge has the reasonable potential to cause or contribute to excursions above the instream water quality criteria for ammonia, EPA used the mass balance equation presented in Appendix B for both warm and cold weather conditions to project the ammonia concentration downstream of the discharge. If there is reasonable potential, this mass balance equation is also used to determine the limit that is required in the permit.

To determine the applicable ammonia criteria, EPA assumes a warm weather (April through October) temperature of 25° C and a cold weather (November through March) temperature of 5° C. EPA used the ambient pH monitoring shown in Appendix A, which indicates that the median pH is 7.74 S.U. and the median salinity is 27.8 ppt.

Based on the information and assumptions described above, Appendix B presents the applicable ammonia criteria, the details of the mass balance equation, the reasonable potential determination, and, if necessary, the limits required in the Draft Permit. As shown, EPA

determined that there is reasonable potential to cause or contribute to an excursion of WQS for ammonia, so the Draft Permit proposed a new monthly average ammonia limit of 17.4 mg/L, applicable from April through October.

Based on the data in Appendix A, the facility discharged above this level in 6 of the 35 warm weather months during the review period with a maximum of 19.64. Therefore, EPA notes that the facility is not likely to be in consistent compliance with the new limit upon the effective date of the permit and a compliance schedule is appropriate for this new limit. EPA also notes that this permit reissuance will require a major facility upgrade to meet the new total nitrogen limit (as described in the Total Nitrogen section below) and that major upgrade will also bring the facility into compliance with this ammonia limit (given that ammonia is a component of total nitrogen and will be removed as total nitrogen is removed). EPA considers that the greatest environmental benefit in this case is to expedite compliance with the total nitrogen limit. Therefore, EPA has determined that it is appropriate to apply the same compliance schedule to the new ammonia limit that is proposed for the new total nitrogen limit. For details of this compliance schedule, see the Total Nitrogen section below.

Effluent and ambient monitoring for ammonia will continue to be required in the quarterly WET tests.

5.1.9 Nutrients

Nutrients are compounds containing nitrogen and phosphorus. Although nitrogen and phosphorus are essential for plant growth, high concentrations of these nutrients can cause eutrophication, a condition in which aquatic plant and algal growth is excessive. Plant and algae respiration and decomposition reduces dissolved oxygen in the water, creating poor habitat for fish and other aquatic animals. Recent studies provide evidence that both phosphorus and nitrogen can play a role in the eutrophication of certain ecosystems. However, typically phosphorus is the limiting nutrient triggering eutrophication in freshwater ecosystems and nitrogen in marine or estuarine ecosystems. Thus, for this receiving water, nitrogen is the nutrient of concern evaluated below.

5.1.9.1 Total Nitrogen

The Draft Permit includes a rolling seasonal average total nitrogen limit of 1,289 lb/day for the Fall River WWTP, in effect for the months of May through October, to address cultural eutrophication in Mount Hope Bay. In addition to this May to October numeric limit, the permit requires the Fall River WWTP to optimize the treatment facility operations for the removal of total nitrogen during the months of November through April using all available treatment equipment at the facility. The basis for this determination is set forth below.

a. Ecological Setting: the Taunton River Estuary, Mount Hope Bay, Narragansett Bay and Estuarine Systems Generally

The saltwater portions of the Taunton River (the "Taunton River Estuary") and Mount Hope Bay (the "Bay") are part of the greater Narragansett Bay Estuary system, which covers approximately 147 square miles within Massachusetts and Rhode Island. The Narragansett Bay Estuary is one of only 28 "estuaries of national significance" under the National Estuary Program ("NEP"), which was established in 1987 by amendments to the CWA to identify, restore and protect estuaries along the coasts of the United States.

The Bay is situated in the northeast corner of Narragansett Bay, lying within both Rhode Island to the south and west and Massachusetts to the north and east. The Bay connects to the East Passage of Narragansett Bay proper to the southwest, via a deep, narrow channel where the Mt. Hope Bridge crosses over from Aquidneck Island to Bristol Point, and to Rhode Island Sound to the South via the Sakonnet River (actually an embayment) between Tiverton, RI and Aquidneck Island. The Bay covers an area of 13.6 square miles and has a volume of 53.3 billion gallons at mean low water (MLW)[13]. The Bay has a tidal range averaging approximately 4.5 feet.

The Taunton River is the largest freshwater source to Mount Hope Bay. It discharges into the Bay from the north at Fall River. The Taunton River Estuary consists of the saltwater portions of the Taunton River, extending from the Braga Bridge at the confluence with Mount Hope Bay upstream to the Route 24 bridge (Taunton/Raynham). The Somerset WPCF discharge is within this stretch of the Taunton River, located just upstream of the Braga Bridge.

Estuaries are extremely significant aquatic resources. An estuary is a partially enclosed coastal body of water located between freshwater ecosystems (lakes, rivers, and streams; freshwater and coastal wetlands; and groundwater systems) and coastal shelf systems where freshwater from the land measurably dilutes saltwater from the ocean. This mixture of water types creates a unique transitional environment that is critical for the survival of many species of fish, birds, and other wildlife. Estuarine environments are among the most productive on earth, creating more organic matter each year than comparably sized areas of forest, grassland, or agricultural land.

Maintaining water quality within an estuary is important for many reasons. Estuaries provide a variety of habitats such as shallow open waters, freshwater and saltwater marshes, sandy beaches, mud and sand flats, rocky shores, oyster reefs, tidal pools, and seagrass beds. Tens of thousands of birds, mammals, fish, and other wildlife depend on estuarine habitats as places to live, feed, and reproduce. Many species of fish and shellfish rely on the sheltered waters of estuaries as protected places to spawn.

Moreover, estuaries also provide a number of recreational values such as swimming, boating, fishing, and bird watching. In addition, estuaries have an important commercial value since they serve as nursery grounds for two-thirds of the nation's commercial fish and shellfish, and support tourism drawing on the natural resources that estuaries supply (EPA, 1998). Consequently, EPA believes sound environmental policy reasons favor a pollution control

[13] http://www.smast.umassd.edu/MHBNL/report2003.php

approach that is both protective and undertaken expeditiously to prevent degradation of these critical natural resources.

Because estuaries are the intermediary between oceans and land, both of these geographic features influence their physical, chemical, and biological properties. In the course of flowing downstream through a watershed to an estuary, tributaries pick up materials that wash off the land or are discharged directly into the water by land-based activities. Eventually, the materials that accumulate in the tributaries are delivered to estuaries. The types of materials that eventually enter an estuary largely depend on how the land is used. Undisturbed land, for example, will discharge considerably fewer pollutants than an urban center or areas with large amounts of impervious cover. Accordingly, an estuary's overall health can be heavily impacted by surrounding land uses.

Unlike free-flowing rivers, which tend to flush out sediments and pollutants relatively quickly, an estuary will often have a lengthy retention period as up-estuary saltwater movement interacts with down-estuary freshwater flow (EPA, 2001). Estuaries are particle-rich relative to coastal systems and have physical mechanisms that tend to retain particles. These suspended particles mediate a number of activities (e.g., absorbing and scattering light, or absorbing hydroscopic materials such as phosphate and toxic contaminants). New particles enter with river flow and may be resuspended from the bottom by tidal currents and wind-wave activity. Many estuaries are naturally nutrient-rich because of inputs from the land surface and geochemical and biological processes that act as "filters" to retain nutrients within estuaries (EPA, 2001). Consequently, waterborne pollutants, along with contaminated sediment, may remain in the estuary for a long time, magnifying their potential to adversely affect the estuary's plants and animals.

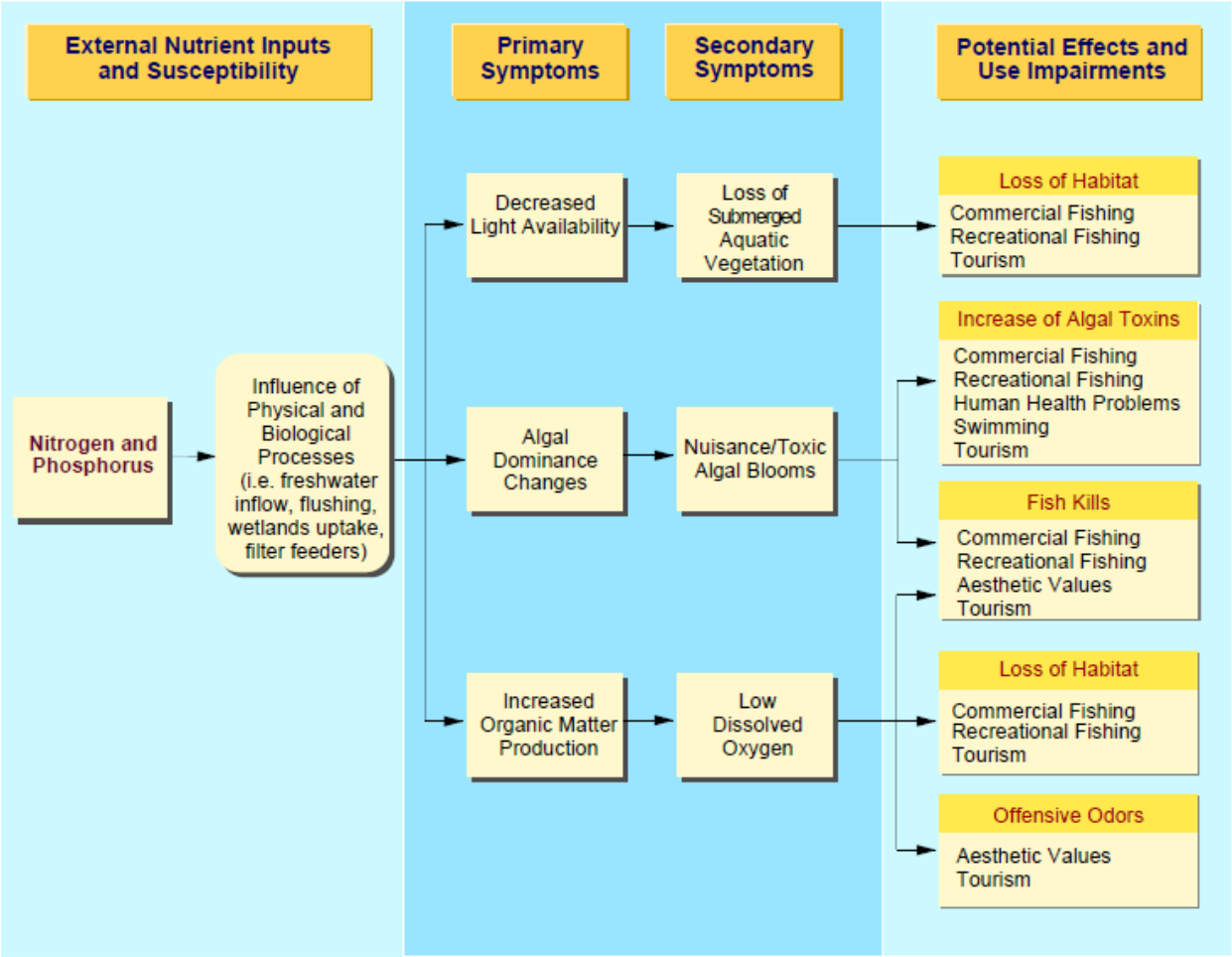
b. Effects of Nutrients on Estuarine Water Quality

The basic cause of nutrient problems in estuaries and nearshore coastal waters is the over enrichment of freshwater with nitrogen (N) and phosphorus (P) compounds. EPA defines nutrient over-enrichment as the anthropogenic addition of nutrients, in addition to any natural processes, causing adverse effects or impairments to beneficial uses of a waterbody (EPA, 2001).

Eutrophication is an aspect of nutrient over-enrichment and is defined as an increase in the rate of supply of organic matter to a waterbody (EPA, 2001). Increased nutrient inputs promote a progression of symptoms beginning with excessive growth of phytoplankton and macroalgae to the point where grazers cannot control growth (NOAA, 2007). Phytoplankton is microscopic algae growing in the water column and is measured by chlorophyll-a. Macroalgae are large algae, commonly referred to as "seaweed." The primary symptoms of nutrient over-enrichment include an increase in the rate of organic matter supply, changes in algal dominance, and loss of water clarity and are followed by one or more secondary symptoms such as loss of submerged aquatic vegetation, nuisance/toxic algal blooms and low dissolved oxygen (EPA, 2001). In U.S. coastal waters, nutrient over-enrichment is a common thread that ties together a diverse suite

of coastal problems such as red tides, fish kills, some marine mammal deaths, outbreaks of shellfish poisonings, loss of seagrass and bottom shellfish habitats, coral reef destruction, and hypoxia and anoxia now experienced as the Gulf of Mexico's "dead zone." (EPA, 2001). Figure 3 shows the progression of nutrient impacts on a waterbody.

Figure 3. Nutrient enrichment model. Source: Bricker, 1999 as cited in EPA, 2001.



Estuarine nutrient dynamics are complex and are influenced by flushing time, freshwater inflow and stratification, among other factors. The deleterious physical, chemical, and biological responses in surface water resulting from excessive plant growth impair designated uses in both receiving and downstream waterbodies. Excessive plant growth can result in a loss of diversity and other changes in the aquatic plant, invertebrate, and fish community structure and habitat.

Nutrient-driven impacts on aquatic life and habitat are felt throughout the eutrophic cycle of plant growth and decomposition. Nutrient-laden plant detritus can settle to the bottom of a water body. In addition to physically altering the benthic environment and aquatic habitat, organic materials (*i.e.*, nutrients) in the sediments can become available for future uptake by aquatic plant growth, further perpetuating and potentially intensifying the eutrophic cycle.

Excessive aquatic plant growth, in addition, degrades aesthetic and recreational uses. Unsightly algal growth is unappealing to swimmers and other stream users and reduces water clarity. Decomposing plant matter also produces unpleasant sights and strong odors. Heavy growths of algae on rocks can make streambeds slippery and difficult or dangerous to walk on. Algae and macrophytes can interfere with angling by fouling fishing lures and equipment. Boat propellers and oars may also get tangled by aquatic vegetation.

When nutrients exceed the assimilative capacity of a water body, the ensuing eutrophic cycle can negatively impact in-stream dissolved oxygen ("DO") levels. Through respiration, and the decomposition of dead plant matter, excessive algae and plant growth can reduce instream DO concentrations to levels that could negatively impact aquatic life. During the day, primary producers (*e.g.*, algae, plants) provide oxygen to the water as a by-product of photosynthesis. At night, however, when photosynthesis ceases but respiration continues, DO concentrations decline. Furthermore, as primary producers die, they are decomposed by bacteria that consume oxygen, and large populations of decomposers can consume large amounts of DO. Many aquatic insects, fish, and other organisms become stressed and may even die when DO levels drop below a particular threshold level.

Nutrient over-enrichment of estuaries and nearshore coastal waters from human-based causes is now recognized as a national problem on the basis of Clean Water Act Section 305(b) reports from coastal States (EPA, 2001). Most of the nation's estuarine and coastal waters are moderately to severely polluted by excessive nutrients, especially nitrogen and phosphorus (NOAA, 2007; NOAA, 1999, EPA, 2006; EPA, 2004, EPA; and EPA, 2001). The State of Rhode Island has undertaken extensive efforts to reduce nitrogen discharges to Narragansett Bay proper to address eutrophic conditions there, with wastewater treatment facilities investing upward of $250 million on nitrogen removal upgrades. Letter from RI Governor Lincoln Chafee, December 22, 2014; see also Fact Sheet, Upper Blackstone Water Pollution Abatement District, NPDES No. MA0102369 (2008).

c. Water Quality Standards Applicable to the Taunton River Estuary and Mount Hope Bay

Under the MA SWQS, 314 CMR 4.00, surface waters are divided into water "use" classifications, including Class SA and SB for marine and coastal waters. The eastern portion of Mount Hope Bay (Segment MA61-06) is classified as a Class SB water, with designations for Shellfishing (Restricted and Conditionally Restricted Shellfish Areas) and CSO. Class SB waters are designated as a "habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated for shellfishing in 314 CMR 4.06(6)(b), these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas)." *See* 314 CMR 4.05(4)(b). Waters in this classification "shall have consistently good aesthetic value." *Id.*

Class SB waters are subject to class-specific narrative and/or numeric water quality criteria. *See* 314 CMR 4.05(4)(b)1 to 8. DO concentrations in Class SB waters "[s]hall not be less than 5.0 mg/L. Where natural background conditions are lower, DO shall not be less than natural background. Natural seasonal and daily variations that are necessary to protect existing and designated uses shall be maintained."

The western portion of Mount Hope Bay (Segment MA61-07) is designated as a Class SA – Shellfishing water. These waters are designated as an excellent habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation. In approved areas, they shall be suitable for shellfish harvesting without depuration (Approved and Conditionally Approved Shellfish Areas). These waters shall have excellent aesthetic value. *See* 314 CMR 4.05(4)(a). With respect to DO, the criteria for Class SA waters "[s]hall not be less than 6.0 mg/L. Where natural background conditions are lower, DO shall not be less than natural background. Natural seasonal and daily variations that are necessary to protect existing and designated uses shall be maintained." *See* 314 CMR 4.05(4)(a)1.

With respect to nutrients, both Class SA and Class SB waters are also subject to additional minimum standards applicable to all surface waters, as set forth at 314 CMR 4.05(5):

> Unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site-specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00 including, but not limited to, those established in 314 CMR 4.06(6)(c): Table 28: Site-specific Criteria. Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and BAT for non-POTWs, to remove such nutrients to ensure protection of existing and designated uses. Human activities that result in the nonpoint source discharge of nutrients to any surface water may be required to be provided with cost effective and reasonable best management practices for nonpoint source control.

In addition, the MA SWQS require:

> Aesthetics – All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.

See 314 CMR 4.05(5)(a).

Massachusetts has not adopted numeric criteria for total nitrogen or other nutrients. MassDEP has, however, used a number of indicators in interpreting its narrative nutrient standard. The DEP/SMAST Massachusetts Estuaries Project ("MEP") report, *Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators - Interim Report* (Howes et al., 2003) (Critical Indicators Report), was developed to provide "a translator between the current narrative standard and nitrogen thresholds (as they relate to the ecological health of each embayment) which can be further refined based on the specific physical, chemical and biological characteristics of each embayment. This report is intended to provide a detailed discussion of the issue and types of indicators that can be used, as well as propose an acceptable range of nitrogen thresholds that will be used to interpret the current narrative standard." This interpretive guidance has been used in a number of TMDLs for estuarine waters in southeastern Massachusetts.

The Critical Indicators Report finds the indicators of primary concern to be:

- plant presence and diversity (eelgrass, macroalgae, etc.)
- animal species presence and diversity (finfish, shellfish, infauna)
- nutrient concentrations (nitrogen species)
- chlorophyll-a concentration
- dissolved oxygen levels in the embayment water column

(Howes et al., 2003 at 11). With respect to total nitrogen, it concluded:

> It is not possible at this time to put quantitative nitrogen levels on each Water Quality Class. In fact, initial results of the MEP (Chatham Embayment Report 2003) indicate that the total nitrogen level associated with a particular ecological response can vary by over 1.4 fold (e.g. Stage Harbor versus Bassing Harbor in Chatham MA). Although between embayments nitrogen criteria may be different, it does appear that within a single embayment a consistent quantitative nitrogen criterion can be developed.

However, the Critical Indicators Report provides guidance for indicators, including total nitrogen, for various water quality classes. The nitrogen indicator ranges are based on long-term (>3 yr) average mid-ebb tide concentrations of total nitrogen (mg/L) in the water column. For "Excellent to Good" nitrogen related water quality conditions, equivalent to SA classification, the Report guidance is as follows: "Eelgrass beds are present, macroalgae is generally non-existent but in some cases may be present, benthic animal diversity and shellfish productivity are high, oxygen levels are generally not less than 6.0 mg/l with occasional depletions being rare (if at all), chlorophyll-a levels are in the 3 to 5 ug/L range. . . . For the case study, total nitrogen levels of 0.30-0.39 mg N/L were used to designate "excellent to good" quality areas." *Id.* at 21-22.

For SB waters, the Critical Indicators Report provides the following guidance for indicators of unimpaired conditions, to be refined based on data from the specific embayments: "benthic

animal diversity and shellfish productivity are high, oxygen levels are generally not less than 5.0 mg/L with depletions to < 4 mg/L being infrequent, chlorophyll-a levels are in the 3 to 5 µg/L range and nitrogen levels are in the 0.39 - 0.50 range. . . . eelgrass is not present . . . and macroalgae is not present or present in limited amounts even though a good healthy aquatic community still exists." *Id*. at 22.

"Moderate Impairment" is indicated by "Shellfisheries may shift to more resistant species. Oxygen levels generally do not fall below 4 mg/L, although phytoplankton blooms raise chlorophyll-a levels to around 10 µg/L. Eelgrass is not sustainable and macro-algae accumulations occur in some regions of the embayment. In the Case Study, embayment regions supporting total nitrogen levels >0.5 mg N/L were clearly impaired." Significant Impairment is indicated by total nitrogen concentrations of 0.6/0.7 mg/l and above. In "severely degraded" conditions, "algal blooms are typical with chlorophyll-a levels generally >20 µg/L, oxygen depletions to hypoxic levels are common, there are periodic fish kills, and macro-algal accumulations occur with both ecological and aesthetic impacts."

In addition to the Massachusetts water quality standards, water quality standards applicable to the Rhode Island portion of Mount Hope Bay must also be satisfied. As in Massachusetts, the Rhode Island portions of Mount Hope Bay are designated SB waters in the eastern portion and SA waters in the western portion of the Bay. Rhode Island, like Massachusetts, has specific numeric criteria for DO in SA and SB waters[14], and narrative criteria for nutrients[15] and

[14] 250-RICR-150-05-1. § 1.10(F). For waters with a seasonal pycnocline, not less than an instantaneous value of 4.8 mg/l more than once every three years above the seasonal pycnocline; below the seasonal pycnocline Aquatic Life Uses are considered to be protected if conditions do not fail to meet protective thresholds, as described below, more than once every three years. DO criteria presented here shall be protective of the most sensitive life stage – survival effects on larvae which affects larval recruitment – for both persistent and cyclic conditions. When instantaneous DO values fall below 4.8 mg/l, the waters shall not be (1) Less than 2.9 mg/l for more than 24 consecutive hours during the recruitment season; nor (2) Less than 1.4 mg/l for more than 1 hour more than twice during the recruitment season; nor (3) Shall they exceed the cumulative exposure presented in § 1.10(F)(3) of this Part.

For waters without a seasonal pycnocline, DO concentrations above 4.8 mg/l shall be considered protective of Aquatic Life Uses. When instantaneous DO values fall below 4.8 mg/l, the waters shall not be: (1) Less than 3.0 mg/l for more than 24 consecutive hours during the recruitment season; nor (2) Less than 1.4 mg/l for more than 1 hour more than twice during the recruitment season; nor (3) Shall they exceed the allowable cumulative DO exposure presented in § 1.10(F)(2)(d)(1)(AA) of this Part; (4) Cumulative low DO exposures in the 2.95 – 4.8 mg/l range shall be evaluated as described above in § 1.10(F)(2) of this Part but shall not exceed the information presented in § 1.10(F)(3)(e)(1)(AA) of this Part.

[15] § 1.10(B)(4). Nutrients - Nutrients shall not exceed the limitations specified in §§ 1.10(D)(1) (freshwater) and 1.10(E)(1) (saltwater) of this Part and/or more stringent site-specific limits necessary to prevent or minimize accelerated or cultural eutrophication.

§ 1.10(E)(1) None in such concentration that would impair any usages specifically assigned to said Class, or cause undesirable or nuisance aquatic species associated with cultural eutrophication. Shall not exceed site-specific limits if deemed necessary by the Director to prevent or minimize accelerated or cultural eutrophication. Total phosphorus, nitrates and ammonia may be assigned site-specific permit limits based on reasonable Best Available Technologies. Where waters have low tidal flushing rates, applicable treatment to prevent or minimize accelerated or cultural eutrophication may be required for regulated nonpoint source activities.

aesthetics.[16] The Rhode Island portions of Mount Hope Bay, like the Massachusetts portions are listed for impairments due to total nitrogen and dissolved oxygen. As discussed below, permit limits designed to meet water quality standards in the Massachusetts portions of Mount Hope Bay are expected to achieve water quality standards in Rhode Island as well.

d. Receiving Water Quality Violations

Mount Hope Bay has reached its assimilative capacity for nitrogen and is suffering from the adverse water quality impacts of nutrient over-enrichment, including cultural eutrophication. It is, consequently, failing to attain the water quality standards described above. The impacts of excessive nutrients are evident throughout Mount Hope Bay as indicated by historical studies (such as prior "State of the Estuary" reports, discussed below), a comprehensive monitoring study of the Taunton River Estuary/Mount Hope Bay in 2004-06[17], and ongoing monitoring conducted as part of the larger Narragansett Bay monitoring program[18].

Both Massachusetts[19] and Rhode Island[20] have documented these impairments in their reporting on impaired waters. Section 303(d) of the CWA requires states to identify those waterbodies that are not expected to meet surface water quality standards after implementation of technology-based controls.[21] The State of Massachusetts has identified the aquatic life designated use in Mount Hope Bay as impaired due to total nitrogen, dissolved oxygen, and chlorophyll-a. The State of Rhode Island has identified Mount Hope Bay as impaired for total nitrogen and dissolved oxygen. Table 2 below shows a list of impairments related to nutrient enrichment for these waterbodies.

Table 2. MA 2022 and RI 2022 303(d) Lists Nutrient-Related Water Quality Impairments

Waterbody	Segment ID	Impairment		
		Total Nitrogen	Dissolved Oxygen	Chlorophyll-a
Mount Hope Bay	MA61-06	x	x	x
Mount Hope Bay	MA61-07	x	x	x
Mount Hope Bay	RI0007032E-01A	x	x	
Mount Hope Bay	RI0007032E-01B	x	x	
Mount Hope Bay	RI0007032E-01C	x	x	
Mount Hope Bay	RI0007032E-01D	x	x	

[16] § 1.10(B)(2) Aesthetics - all waters shall be free from pollutants in concentrations or combinations that: d. Result in the dominance of species of fish and wildlife to such a degree as to create a nuisance or interfere with the existing or designated uses.
[17] Summary of Water Quality Monitoring Program for the Mount Hope Bay Embayment System (2004 – 2006). https://yosemite.epa.gov/oa/eab_web_docket.nsf/Attachments%20By%20ParentFilingId/DF70AFDDE7E11EF485257E6500529691/$FILE/ExJ_MtHopeBay_604bReport_FINAL081607.pdf
[18] Available at: http://www.dem.ri.gov/programs/emergencyresponse/bart/stations.php
[19] Available at: https://www.mass.gov/doc/final-massachusetts-integrated-list-of-waters-for-the-clean-water-act-2022-reporting-cycle/download
[20] Available at: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/iwr22.pdf
[21] There are no technology standards for nitrogen for POTWs.

While the Fall River WWTP discharges directly into Mount Hope Bay, EPA evaluated whether the nitrogen from this discharge also reaches upstream into the Taunton River and should also be evaluated with respect to impacts in that upstream waterbody. EPA has incorporated the findings of a dye study conducted in 2013 and published in 2017 for the Fall River WWTP discharge. The complete dye study is attached to this Fact Sheet as Appendix C. As shown in Figure 4 of the dye study, the Fall River discharge is significantly diluted (at least 1,872:1) by the time it reaches the Veterans' Memorial Bridge (approximately 1.5 miles upstream of the Braga Bridge, which is the approximate boundary between Mount Hope Bay and the Taunton River).[22] This level of dilution is in contrast to the impact shown along the entire eastern portion of Mount Hope Bay, with much less dilution (as low as 18.72:1, which is 100 times less dilution). Based on this finding, EPA has determined that the Fall River WWTP has a minimal impact on the lower portion of the Taunton River and no impact on portions of the Taunton River farther upstream. Therefore, EPA has focused this analysis for the Fall River discharge on the impacts in Mount Hope Bay because EPA considers Mount Hope Bay (Segment MA61-06) to be the most sensitive location impacted by the Fall River discharge of nitrogen. In other words, any nitrogen limits designed to address the major impact of the discharge to Mount Hope Bay would also be sufficient to address the relatively minimal impact (based on the significant dilution) to the Taunton River.

Regarding Mount Hope Bay, the Narragansett Bay Estuary Program have collected, compiled and analyzed monitoring data to produce "State of the Estuary" reports. These "State of the Estuary" reports are critical because they depict status and trends in the estuaries' environmental conditions. In the most recent 2017 State of the Estuaries Report (the "2017 SOE Report"), the program noted, that "(t)he Hypoxia Index and the Spatial Surveys reveal areas where low levels of dissolved oxygen in bottom water tends to be a problem, including the Providence-Seekonk River Estuary, Upper Bay, and Greenwich Bay, with sporadic events in the Upper West Passage, and *Mount Hope Bay fixed sites* (Deacutis et al. 2006, Melrose et al. 2007, Codiga et al. 2009, Prell et al. 2016)." (NBEP 2017, at 291) (emphasis added)

In 2017 as part of the Narragansett Bay monitoring program, MassDEP installed two monitoring stations. These two stations were deployed in the Massachusetts portion of Mount Hope Bay. Data published[23,24] for these stations shown in Figure 4 below confirms continued periods of low DO in Mount Hope Bay below the Massachusetts criteria. EPA notes that these water

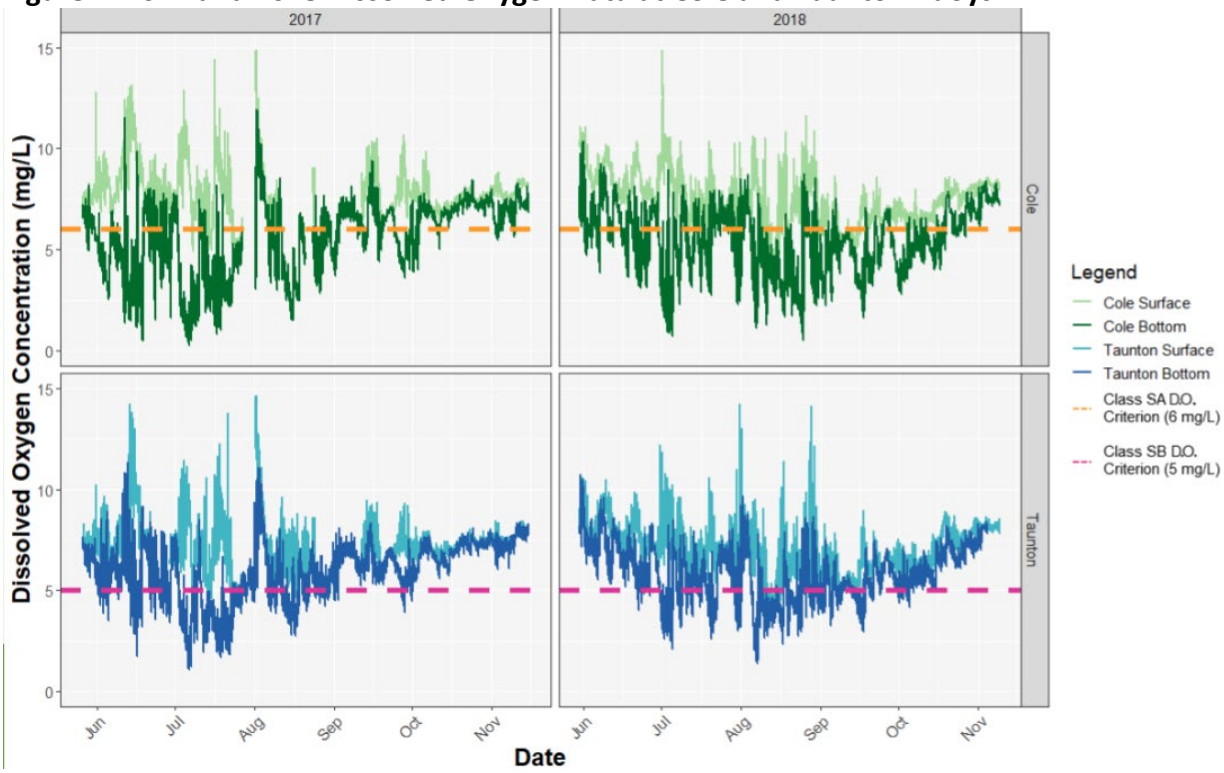
[22] In prior permits for other WWTFs in this watershed (i.e., Middleborough [MA0101591, issued May 2014], MFN Regional [MA0101702, issued September 2014], Taunton [MA0100897, issued April 2015], Bridgewater [MA0100641, issued September 2016], and Brockton [MA0101010, issued January 2017]), EPA chose a location approximately 6 miles upstream of the Braga Bridge (known as site MHB-19) as the target location to assess loads from the Taunton River watershed and necessary reductions to achieve water quality standards throughout the Taunton River estuary. In those prior analyses, EPA did not have information regarding how far upstream the Fall River discharge impacted the Taunton River. Based on this dye study, EPA has determined that the Fall River discharge does not have any impact on MHB-19 (because effectively none of the discharge reaches that upstream location) and it would not be appropriate to assess water quality impacts for this permit at a location significantly upstream of the influence of this discharge.

[23] https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data

[24] https://www.mass.gov/doc/technical-memorandum-cn-5300-mount-hope-bay-buoy-data-report/download

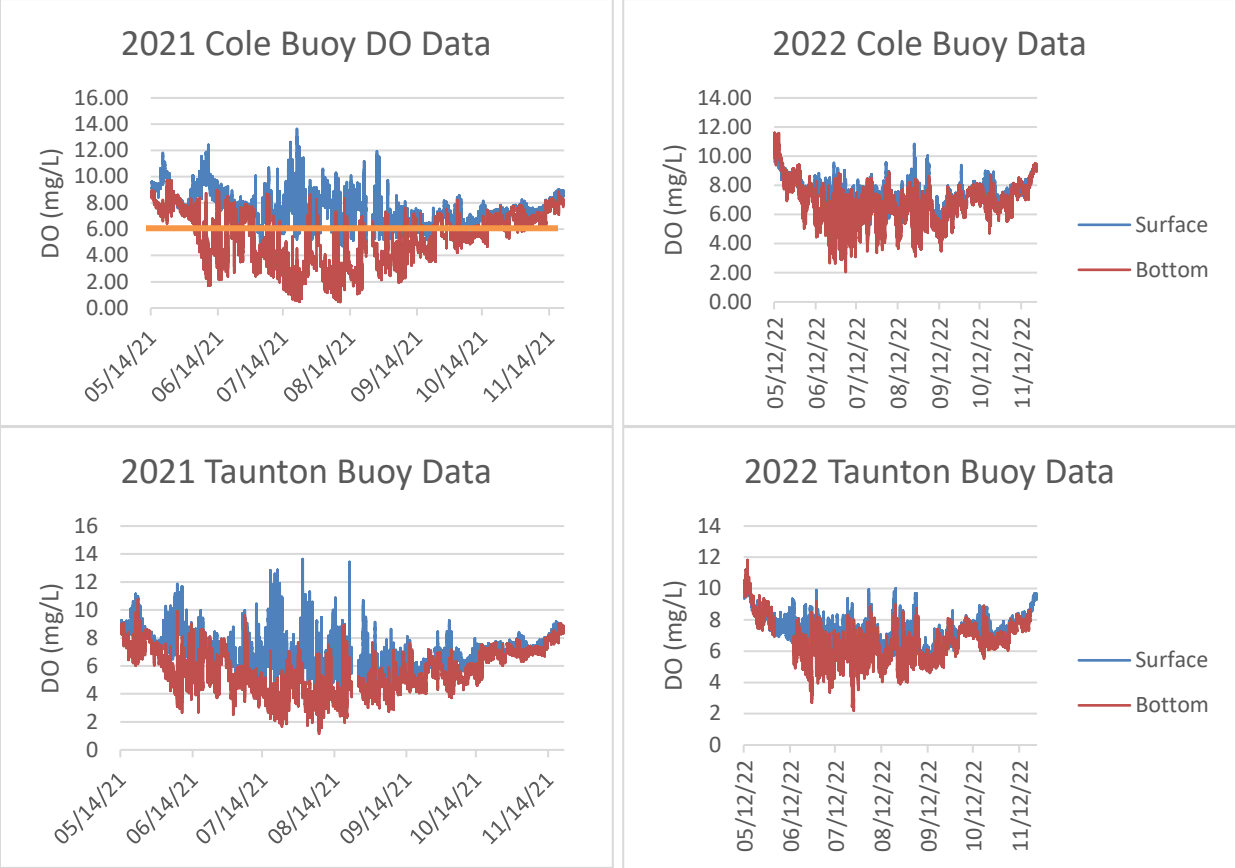
quality impacts are in Mount Hope Bay, and the total nitrogen load from the Fall River WWTP contributes to these impairments.

Figure 4. 2017 and 2018 Dissolved Oxygen Data at Cole and Taunton Buoys



These buoys continue to be deployed in Mount Hope Bay and the most recently available data are from 2021 and 2022. While these data have not been validated or published by MassDEP, EPA considers it valuable to compare these more recent DO data (measured once every 15 minutes) with the data from 2017 and 2018 to determine whether significant improvements in water quality have already been achieved based on recent TN reductions in the watershed.

Figure 5. 2021 and 2022 Dissolved Oxygen Data at Cole and Taunton Buoys



As shown, Figure 5 above confirms (albeit based on draft data[25]) that these locations continue to exhibit long periods of DO well below the respective DO criteria (*i.e.*, 6 mg/L at the Cole Buoy [Class SA] and 5 mg/L at the Taunton Buoy [Class SB], indicated by the orange line). EPA also evaluated the draft DO data (based on instantaneous measurements taken once every 15 minutes from May to October of each year) in comparison to MassDEP's Consolidated Assessment Listing Methodology (CALM)[26] which indicates that the 7-day average should not exceed the criterion more than 10% of the time and the instantaneous minimum should not be greater than 1.0 mg/L below the criterion. This comparison is presented in Table 3 below.

[25] EPA is not relying solely on these draft data to make a permitting decision. Rather, these data are presented here because they demonstrate ongoing DO problems and, therefore, support the same decision that would have been made without using these data but using all other information. Importantly, these draft data do not provide any support that water quality standards are being achieved and further nitrogen reductions are not necessary.
[26] See page 33 of CALM available online at: https://www.mass.gov/doc/2018-consolidated-assessment-and-listing-methodology-guidance/download.

Table 3. 2021 and 2022 Dissolved Oxygen Percent of Measurements Below MassDEP CALM Threshold

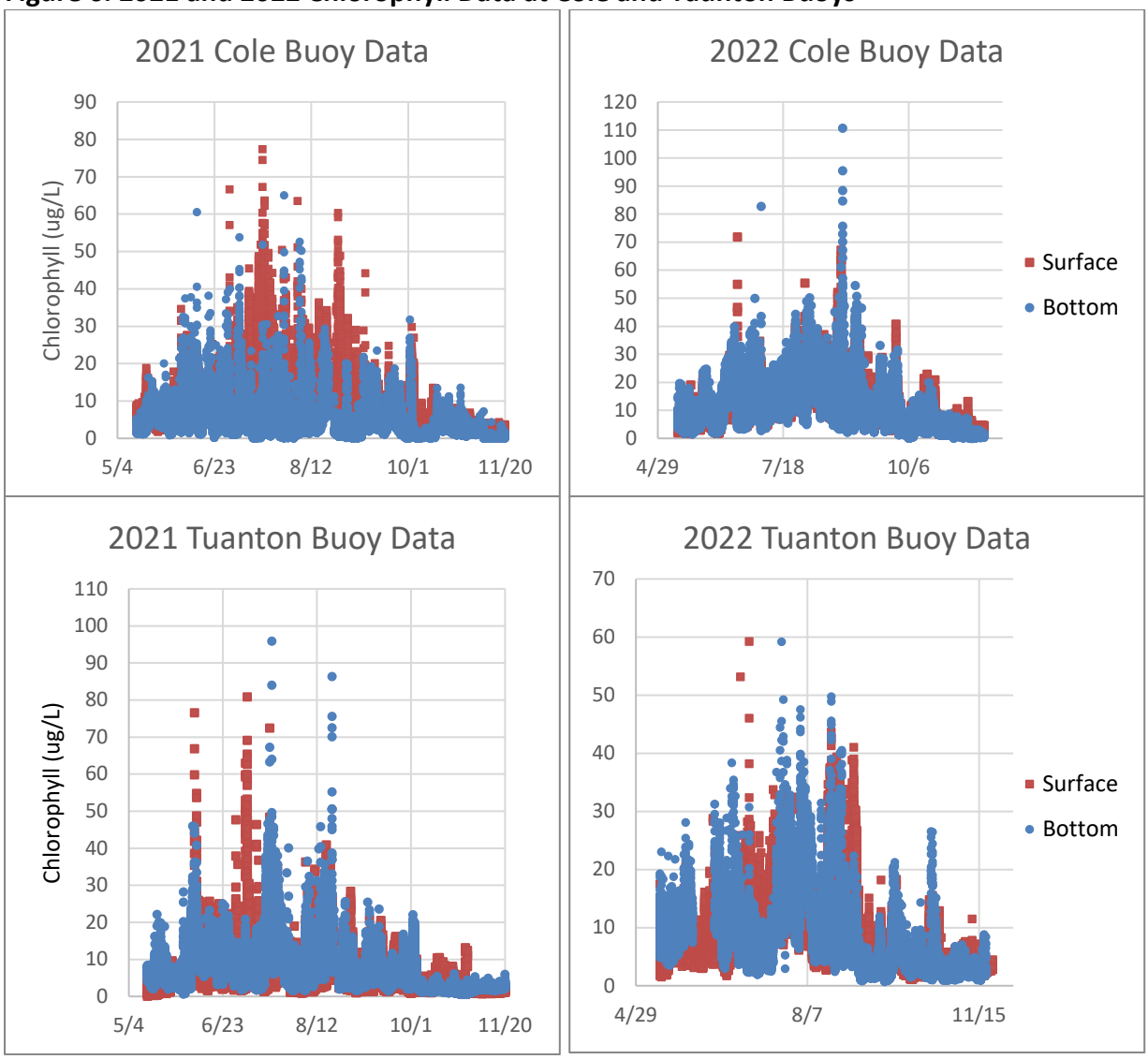
	2021		2022	
	Bottom	Surface	Bottom	Surface
Cole Buoy Measurements Below 6 mg/L (7-day average)	73%	2%	30%	4%
Cole Buoy Measurements Below 5 mg/L (Instantaneous Min)	45%	0.1%	10%	0.1%
Taunton Buoy Measurements Below 5 mg/L (7-day average)	45%	0%	6%	0%
Taunton Buoy Measurements Below 4 mg/L (Instantaneous Min)	17%	0.3%	0.9%	0%

As shown, the results in red text highlight strong evidence of ongoing impairments in Mount Hope Bay. These ongoing DO problems suggest the need for further nitrogen reductions to achieve water quality standards.

Additionally, EPA evaluated the most recent chlorophyll data from these buoys in 2021 and 2022.[27] EPA notes that both Mount Hope Bay segments in Massachusetts identified in Table 2 above are listed as impaired for chlorophyll-a based on concentrations above 10 µg/L. EPA evaluated the most recent draft chlorophyll data (measured once every 15 minutes) presented below to determine whether significant improvements in water quality have already been achieved based on recent nitrogen reductions in the watershed.

[27] Draft chlorophyll data (in µg/L) are presented from an *in-situ* probe measuring once every 15 minutes and calibrated using two points with DI water as a blank and fluorescent rhodamine dye.

Figure 6. 2021 and 2022 Chlorophyll Data at Cole and Taunton Buoys



As shown, Figure 6 above confirms (albeit based on draft data[28]) that these locations continue to exhibit long periods of elevated chlorophyll well above the MA impairment threshold of 10 µg/L identified in MassDEP's Consolidated Assessment Listing Methodology (CALM)[29]. EPA also evaluated the percentage of time (based on instantaneous measurements taken every 15 minutes from May to October of each year) that the draft chlorophyll data exceeded this threshold, as presented in Table 4 below.

[28] EPA is not relying solely on these draft data to make a permitting decision. Rather, these data are presented here because they demonstrate ongoing chlorophyll problems and, therefore, support the same decision that would have been made without using these data but using all other information. Importantly, these draft data do not provide any support that water quality standards are being achieved and further nitrogen reductions are not necessary.

[29] See page 22 of CALM available online at: https://www.mass.gov/doc/2018-consolidated-assessment-and-listing-methodology-guidance/download.

Table 4. 2021 and 2022 Chlorophyll Percent of Measurements Above MassDEP CALM Threshold

	2021		2022	
	Bottom	Surface	Bottom	Surface
Cole Buoy % of Measurements Above 10 µg/L	13%	43%	46%	50%
Taunton Buoy % of Measurements Above 10 µg/L	14%	24%	29%	32%

As shown, this level of chlorophyll is strong evidence of ongoing impairment in Mount Hope Bay. These ongoing chlorophyll problems suggest the need for further nitrogen reductions to achieve water quality standards.

Finally, EPA evaluated the available total nitrogen (TN) data from these two sites taken as grab samples by MassDEP from May to October of 2017 through 2021. The surface samples at the Cole buoy site had a median TN of 0.37 mg/L, a maximum TN of 0.65 mg/L and a 90th percentile TN of 0.5 mg/L; the surface samples at the Taunton buoy site had a median TN of 0.38 mg/L, a maximum TN of 0.73 mg/L and a 90th percentile TN of 0.53 mg/L. While these TN data do not indicate any significant trend in TN over these 5 years, they are referenced here to show that at least 10% of the nitrogen samples demonstrate levels in Mount Hope Bay above the impairment listing target of 0.5 mg/L (discussed in more detail below). EPA also notes that most of the nitrogen concentrations measured during these recent years were within the range of potential total nitrogen thresholds, discussed further below.

These DO, chlorophyll, and TN data, along with the continued impairments discussed above, indicate that a greater reduction in nitrogen loadings is necessary for water quality standards to be achieved. Therefore, EPA has concluded that Mount Hope Bay remains in non-attainment for nutrients due to cultural eutrophication/nitrogen over-enrichment, consistent with RIDEM's and MassDEP's prior assessments.

e. Reasonable Potential Analysis

Pursuant to 40 CFR § 122.44(d)(1), NPDES permits must contain any requirements in addition to technology-based limits necessary to achieve water quality standards established under Section 303 of the CWA, including state narrative criteria for water quality. In addition, limitations "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) that the Director has determined are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality" (40 C.F.R. § 122.44(d)(1)(i)). An excursion occurs if the actual or projected instream data exceeds any numeric or narrative water quality criterion.

To determine the extent of the facility's contribution to the violation of the MA WQS, EPA referred to the 2017 SOE Report to determine the most recent comprehensive estimate of total

nitrogen loading to Mount Hope Bay. EPA considers that the primary watershed nitrogen loads to Mount Hope Bay (Segment MA61-06) are from the Taunton River Basin and from Fall River. Table 8 of Chapter 8 of the 2017 SOE Report indicates 1,925,000 lb/year (5,274 lb/day) were estimated from the Taunton River Basin during 2013-2015 from both point and non-point sources. Table 3 in Chapter 8 of the 2017 SOE Report indicates the WWTF Total Nitrogen Loading was 1,076,000 lb/year (2,948 lb/day) during 2013-2015. The difference between these two estimates of 849,000 lb/year (2,326 lb/day), represents loadings from all other sources (*i.e.*, non-point sources and stormwater point sources) throughout the Taunton River watershed.

EPA notes that the WWTF load described above is the actual load from 2013 to 2015 from these facilities. For comparison, EPA calculated the WWTF loads to the Taunton River Estuary using either the load limits in each facility's individual permit or recent DMR data if they do not have a limit. EPA notes that these loads do not represent the current discharged load but rather the expected discharged load after all facilities are brought into compliance with their current permit limits.[30] These facilities include direct discharges to the Taunton River Estuary (Taunton WWTP and Somerset WPCF), and discharges to the tributaries from other POTWs. For POTWs discharging to tributaries to the Taunton River, an attenuation factor was applied to account for instream uptake of nitrogen, ranging from four to seventeen percent.[31]

As noted above, the Fall River WWTP, which is not in the Taunton River watershed, is also a major contributor of nitrogen to Mount Hope Bay. Therefore, EPA calculated the total nitrogen loading from this facility using DMR data from May to October of the most recent 5-year period and determined the average load to be 3,655 lb/day. See data in Appendix A.

Table 5 below shows the WWTFs, the receiving water, their nitrogen discharges, attenuation factors and the delivered loads to Mount Hope Bay.

[30] The current compliance status for each WWTF is as follows: Brockton, Middleborough and MFN Regional WWTF have already upgraded and are meeting their permit limit, the upgrades at Taunton and Bridgewater are currently under construction, and the two facilities under 1 MGD (*i.e.*, MCI Bridgewater and Oak Point) currently do not have a limit but are required to optimize for TN removal given the relatively small load from these two facilities. Fall River and Somerset do not have any nitrogen limits or optimization requirements in their current permits.

[31] Attachment B of the 2015 Taunton WWTP Fact Sheet (MA0100897) includes more information regarding the derivation of these attenuation factors. These attenuation estimates have not changed in this permit analysis given that the location of each discharge in the watershed has not changed and these estimates are considered the best available information to quantify the delivered load from each facility. This attachment is available at: https://www3.epa.gov/region1/npdes/permits/2015/finalma0100897permit.pdf.

Table 5. WWTF Discharges and Delivered Loads (May to October)

WWTF	Design Flow (MGD)	Receiving water	Permit Limit Basis (mg/L)	TN load limit -or- actual discharge (lb/d)	Attenuation Factor	TN delivered to MHB (lb/d)
Direct discharges to Taunton River Estuary or MHB						
Fall River	30.9	Mount Hope Bay	None	3,655[1,2]	1.0	3,655
Taunton	8.4	Taunton River Est.	3	210	1.0	210
Somerset	4.2	Taunton River Est.	None	355[1,2]	1.0	355
					Total direct point source load:	**4,220**
Upstream discharges						
Brockton	18	Salisbury Plain R.	3	450	0.89	401
MFN Regional	3.14	Three Mile River	5	131	0.83	109
Middleborough	2.16	Nemasket River	5	90	0.92	83
Bridgewater	1.44	Town River	5	60	0.96	58
MCI Bridgewater	0.55	Taunton River	None	27[1]	0.90	24
Oak Point	0.18	Bartlett Brook	None	18[1]	0.88	16
					Total upstream WWTF delivered load:	**691**
					Total WWTF delivered load:	**4,911**

[1] Fall River, Somerset, MCI Bridgewater, and Oak Point do not have TN limits in their current permits. For these facilities, the load was calculated using DMR data from May through October during the most recent 5-year period.
[2] DMR data for Fall River and Somerset did not include monthly average flows needed to calculate TN in lb/day, therefore, this is an approximation using the available rolling annual average flow data and once per month nitrate, nitrite and TKN concentration data.

Based on the WWTF loads above, Table 6 below shows the total watershed nitrogen loads to Mount Hope Bay from the Taunton River Estuary and Fall River once all facilities achieve their current load limit (assuming no change in non-point source and stormwater point source loads from the 2013-2015 estimate).

Table 6. Taunton River Estuary Watershed Loads by Category

TN Sources	Total Delivered TN Loads (lb/d)
Fall River WWTP	3,655
Taunton WWTP	210
Somerset WPCF	355
Upstream WWTF delivered loads	691
Non-point source and stormwater point source loads	2,326
Total	7,237

The Fall River WWTP contributes a significant load of nitrogen to Mount Hope Bay. EPA notes that the Fall River WWTP is the largest POTW (based on design flow) and the only major POTW, other than Somerset, that has not yet received a TN limit. Based on Table 6, the Fall River WWTP load of 3,655 lb/day is approximately 51% of the total nitrogen watershed load delivered to Mount Hope Bay. Given the size of the nitrogen load from the Fall River WWTP and the ongoing nutrient-related impairments in Mount Hope Bay, EPA concludes that the discharge has the reasonable potential to cause or contribute to excursions of Massachusetts' narrative nutrient criteria.

f. Effluent limitation calculation

EPA's calculation of an effluent limitation for nitrogen typically consists of two parts. First, EPA determines a threshold nitrogen concentration for the waterbody. Second, EPA determines the allowable load from watershed sources generally, and this facility specifically, that will result in receiving water concentrations at or below the allowable threshold.

i. Threshold Nitrogen Concentration

If a discharge is found to cause, have the reasonable potential to cause, or contribute to an exceedance of a numeric or narrative state water quality criterion, NPDES regulations implementing section 301(b)(1)(C) provide that a permit must contain effluent limits as necessary to achieve state water quality standards. See 40 CFR §§ 122.44(d)(1), 122.44(d)(5) (providing in part that a permit must incorporate any more stringent limits required by CWA § 301(b)(1)(C)).

The regulatory mechanism used by permit writers to interpret narrative water quality criteria and establish numeric water quality-based effluent limits is set forth at 40 CFR § 122.44(d)(1)(vi). Where a state has not established a numeric water quality criterion for a specific chemical pollutant that is present in the effluent at a level that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: (i) based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use"; (ii) on a "case-by-case basis" using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or (iii) in certain circumstances, based on an "indicator parameter." 40 CFR § 122.44(d)(1)(vi)(A)-(C). EPA in this case relied upon subsection (A) to translate the relevant narrative criterion into a numeric limit.

When establishing water quality-based effluent limitations in the absence of numeric criteria EPA looks to a range of materials, including nationally recommended criteria, supplemented by other relevant materials, such as EPA technical guidance and information published under Section 304(a) of the CWA, peer-reviewed scientific literature, and site-specific surveys and data. 40 CFR § 122.44(d)(1)(vi)(A).

EPA determined that, in this case, the most relevant available material included the *FINAL West Falmouth Harbor Embayment System Total Maximum Daily Loads for Total Nitrogen* (2007) and the *Oyster Pond Embayment System Total Maximum Daily Loads For Total Nitrogen* (2008). These TMDLs evaluated nitrogen loading rates necessary to protect DO in estuarine environments in Class SA waters in Massachusetts and form the basis for demonstrating what level of nitrogen will "attain and maintain applicable narrative water quality criteria and will fully protect the designated use." 40 CFR § 122.44(d)(1)(vi)(A). The concentrations in these TMDLs found to be protective of DO in southeastern Massachusetts estuaries ranged between 0.35 and 0.55 mg/L.

EPA also recognizes that MassDEP has listed Mount Hope Bay as impaired for total nitrogen using a threshold concentration of 0.5 mg/L in the Consolidated Assessment Listing Methodology (CALM).[32] MassDEP chose 0.5 mg/L as the target given that "[h]igher concentrations (>0.5 mg/l) are typically associated with systems experiencing degraded overall health" based on the MEP threshold discussed above.

Given the TN levels found in Mount Hope Bay (discussed above) are already within the range of potential concentration thresholds set forth in the TMDLs (0.35 to 0.55 mg/L), EPA has chosen to adopt an adaptive management approach to further reduce nitrogen loads incrementally within this zone of reasonable values until water quality indicators (specifically for DO and chlorophyll) are fully restored. The details of this adaptive management approach are discussed below.

ii. Allowable TN load

EPA acknowledges the complexity of the Mount Hope Bay system given the wide variety and variability of nitrogen sources that must be controlled and the related difficulty in establishing a precise level of nitrogen reduction necessary to achieve water quality standards. While there will always be an amount of inherent uncertainty and new data that could be collected, EPA is nevertheless obligated to exercise its scientific expertise and apply its technical judgment based on the information it has at the time of permit issuance. See Upper Blackstone, 690 F.3d at 22 ("[N]either the CWA nor EPA regulations permit the EPA to delay issuance of a new permit indefinitely until better science can be developed, even where there is some uncertainty in the existing data.").

When faced with inherent uncertainty, one permitting approach would be to establish a total nitrogen limit at the limit of technology (*i.e.*, 3 mg/L) to ensure that the discharge does not cause or contribute to an excursion of water quality standards. However, in the absence of detailed water quality modeling of this system and based on other ongoing nitrogen reduction efforts in the watershed, EPA has determined that such an approach may be overly stringent, and an adaptive management approach would be more appropriate. EPA highlights that

[32] See page 39 of CALM available online at: https://www.mass.gov/doc/2018-consolidated-assessment-and-listing-methodology-guidance/download.

adaptive management is beneficial because it allows for expeditious application of nitrogen reductions in the short-term (in this case, down to 5 mg/L) and the potential for further reductions in the long-term (down to 3 mg/L) as necessary based on observed water quality impacts.

EPA views adaptive management as an approach to natural resource management that emphasizes learning through management where knowledge is incomplete, and when, despite inherent uncertainty, managers and policymakers must act. Unlike a traditional trial and error approach, adaptive management has explicit structure, including a careful elucidation of goals, identification of alternative management objectives, and procedures for the collection of data followed by evaluation and reiteration.[33] The process is iterative, and serves to reduce uncertainty, build knowledge and improve management over time in a goal-oriented and structured process.

Currently, EPA's efforts to reduce the nitrogen load throughout the watershed are at various stages. While several WWTFs have upgraded to achieve their permit limit, other WWTFs such as Taunton and Bridgewater are currently under construction and their upgrades should result in significant load reductions in the short term. Further, controls put in place in this permit will result in a significant load reduction from the Fall River WWTP. Finally, EPA anticipates another significant load reduction from the Somerset WPCF once its permit is renewed in the near future. EPA considers that the result of these four major treatment facility upgrades may be sufficient to bring Mount Hope Bay into compliance with water quality standards. As many of these reductions are realized, ongoing monitoring by environmental stakeholders in the region will track water quality improvements. If water quality standards are not achieved once these load reductions are realized, further reductions may be required from the WWTFs and/or stormwater point sources and non-point sources. EPA considers these ongoing and anticipated events to be conducive to an adaptive management permitting approach.

Given that Mount Hope Bay is impaired for TN, DO and chlorophyll and continues to exhibit water quality impacts from nutrient over-enrichment, significant reductions are necessary to achieve water quality standards. Therefore, EPA has chosen to apply a mass-based limit of 1,289 lb/day (based on 5 mg/L and the design flow of 30.9 MGD) applicable from May to October[34]. This level of treatment corresponds to what is typically achievable through a major facility upgrade to incorporate nitrification and denitrification without requiring TN reductions to the limit of technology (*i.e.*, 3 mg/L).[35] EPA acknowledges that this limit is not based on a

[33] EPA expects that the collection of ambient data and iterative assessments of the waterbody will continue to be undertaken outside the scope of this permit by MassDEP, Narragansett Bay Estuary Program, SMAST, and perhaps other environmental stakeholders in the region.
[34] The May to October seasonal period is consistent with other nitrogen limits in the Mount Hope Bay and Narragansett Bay watershed to reduce the nitrogen load in the season when nitrogen discharges are most likely to result in violations of water quality standards.
[35] See Section 8.4 of EPA's Nutrient Control Design Manual, available at: https://www.epa.gov/sustainable-water-infrastructure/nutrient-control-design-manual. Typically, a facility upgrade to achieve 5 mg/L is compatible with

precise calculation of necessary reductions throughout the watershed but is intended to significantly reduce nitrogen loads to Mount Hope Bay, representing approximately 65% reduction from Fall River's current load of 3,655 lb/day, a major step forward in achieving water quality standards in Mount Hope Bay. EPA notes that this limit is subject to reevaluation under an adaptive management paradigm with the goal of full attainment of water quality standards.

As the water quality analysis is based on total loads to the estuary and is not affected by variations in the amount of flow from the point sources, EPA has determined that a mass load-only limit is appropriate, protective of water quality and consistent with 40 CFR § 122.45(f). The Permittee must also report total nitrogen concentration as well as concentration and load for the nitrogen parameters nitrate, nitrite and TKN. The sampling frequency is once per week.

Consistent with the seasonal analysis, EPA has not included nitrogen limits for the timeframe of November through April because these months are not the most critical period for phytoplankton growth. However, EPA is imposing a condition requiring the Permittee to optimize nitrogen removal during these winter months. The summer limits and the winter optimization requirements will significantly reduce effluent nitrogen discharges year-round. In combination, the numeric limitations and the optimization requirements are designed to ensure that the discharge does not cause or contribute to violations of applicable water quality standards, including narrative water quality criterion for nutrients, in accordance with Section 301(b)(1)(C) of the CWA.

EPA also notes that while the permit limit was based on achieving standards in the Massachusetts portion of Mount Hope Bay, this adaptive management approach to controlling nitrogen loads throughout the watershed will also ensure that the Fall River WWTP does not cause or contribute to a violation of Rhode Island water quality standards in Mount Hope Bay.

iii. Compliance Schedule

Finally, EPA notes that the Fall River WWTP will be unable to comply with the newly established total nitrogen effluent limit upon the effective date of the permit. Rather, EPA has determined that a major facility upgrade will be necessary and that a compliance schedule is warranted to allow adequate time for this upgrade to occur. Therefore, the Draft Permit proposes the following compliance schedule:

1. Within one year of the effective date of the permit, the Permittee shall investigate alternative operational approaches to reduce year-round nitrogen discharges using its existing equipment and implement operational changes as appropriate to optimize nitrogen removal at the existing facility until the facility upgrade is completed. A report describing the optimization investigation and including a schedule for implementing any recommended actions shall be submitted with the first annual report.

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further optimization (such as the addition of a carbon source) to achieve TN reductions down to the limit of technology and is, therefore, consistent with an adaptive management approach.

2. Within one year of the effective date of the permit, the Permittee shall evaluate and identify appropriate treatment process upgrades necessary to meet the new total nitrogen permit limit.

3. Within two years of the effective date of the permit, the Permittee shall complete design of the facility improvements required to achieve the new total nitrogen permit limit.

4. Within three years of the effective date of the permit, the Permittee shall initiate construction of the facility improvements required to achieve the new total nitrogen permit limit.

5. Within four years of the effective date of the permit, the Permittee shall substantially complete construction of the facility improvements required to achieve the new total nitrogen permit limit.

6. Within five years of the effective date of the permit, the Permittee shall optimize nitrogen removal of the upgraded facility to achieve the new total nitrogen permit limit.[36] The new permit limit for total nitrogen shall go into effect five years from the effective date of the permit.

The Permittee shall provide an annual report to EPA and MassDEP regarding the status of the facility upgrade and compliance with this schedule, to be submitted as an electronic attachment to the DMR immediately following each deadline described above.

5.1.10 Metals

5.1.10.1 Applicable Metals Criteria

State water quality criteria for cadmium, copper, lead, nickel and zinc are established in terms of dissolved metals. However, many inorganic components of domestic wastewater, including metals, are in particulate form, and differences in the chemical composition between the effluent and the receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]). Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR § 122.45(c) require, with limited exceptions, that effluent limits for metals in NPDES permits be expressed as total recoverable metals.

[36] During this 5th year, the Permittee shall complete an evaluation of alternative methods of operating the wastewater treatment facility to optimize the removal of nitrogen in order to minimize the annual average mass discharge of total nitrogen.

Effluent data[37] are presented in Appendix A. The marine criteria for cadmium, copper, lead, nickel and zinc are found in the MA SWQS at 314 CMR 4.06(6)(d) Table 29 and are also presented in Appendix B along with the mass balance equation.

5.1.10.2 Reasonable Potential Analysis and Limit Derivation

To determine whether the effluent has the reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for each metal, EPA uses the mass balance equation presented in Appendix B to project the concentration downstream of the discharge and, if applicable, to determine the limit required in the permit.

For any metal with an existing limit in the 2000 Permit, the same mass balance equation is used to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (C_e) allowable to meet WQS based on current conditions.

Based on the information described above, the results of this analysis for each metal are presented in Appendix B.

As shown, there is no reasonable potential to cause or contribute to an excursion of WQS for cadmium, nickel, and zinc, so the Draft Permit does not propose any new limits for these metals. Additionally, there is no need for a more stringent copper or lead limit to continue to protect WQS, so the existing limits are being carried forward for the reasons specified in Appendix B.

Effluent and ambient monitoring for each of these metals will continue to be required in the WET tests.

5.1.11 Whole Effluent Toxicity

CWA §§ 402(a)(2) and 308(a) provide EPA and States with the authority to require toxicity testing. Section 308 specifically describes biological monitoring methods as techniques that may be used to carry out objectives of the CWA. Whole effluent toxicity (WET) testing is conducted to ensure that the additivity, antagonism, synergism and persistence of the pollutants in the discharge do not cause toxicity, even when the pollutants are present at low concentrations in the effluent. The inclusion of WET requirements in the Draft Permit will assure that the Facility does not discharge combinations of pollutants into the receiving water in amounts that would be toxic to aquatic life or human health.

[37] The Whole Effluent Toxicity (WET) test reports did not include ambient metals data. The Draft Permit requires ambient data from outside of the zone of influence of the discharge to be monitored and reported each quarter. In the next permit reissuance, EPA will use these data (along with all other updated information) to reevaluate reasonable potential to ensure that the discharge continues to comply with WQS for each metal.

In addition, under CWA § 301(b)(1)(C), discharges are subject to effluent limitations based on WQSs. Under CWA §§ 301, 303 and 402, EPA and the States may establish toxicity-based limitations to implement the narrative water quality criteria calling for "no toxics in toxic amounts". *See also* 40 CFR § 122.44(d)(1). The Massachusetts WQSs at 314 CMR 4.05(5)(e) state, "All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife."

National studies conducted by EPA have demonstrated that domestic sources, as well as industrial sources, contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Some of these constituents may cause synergistic effects, even if they are present in low concentrations. Because of the source variability and contribution of toxic constituents in domestic and industrial sources, reasonable potential may exist for this discharge to cause or contribute to an exceedance of the "no toxics in toxic amounts" narrative water quality standard.

In accordance with current EPA guidance and State policy[38], whole effluent chronic effects are regulated by limiting the highest measured continuous concentration of an effluent that causes no observed chronic effect on a representative standard test organism, known as the chronic No Observed Effect Concentration (C-NOEC). Whole effluent acute effects are regulated by limiting the concentration that is lethal to 50% of the test organisms, known as the $LC_{50.}$ This policy recommends that permits for discharges having a dilution factor between 10 and 20 require acute (LC_{50}) and chronic (C-NOEC) toxicity testing four times per year for two species. The LC_{50} limit should be equal to 100%.

The chronic and acute WET limits in the 2000 Permit are C-NOEC greater than or equal to 18% and LC_{50} greater than or equal to 100%, respectively, using the Inland Silverside (*Menidia beryllina*) and the Sea Urchin (*Arbacia punctulata*) as the test species. The Facility has consistently met these limits (Appendix A).

Based on the potential for toxicity from domestic and industrial contributions, the state narrative water quality criterion, the dilution factor of 12.63, and in accordance with EPA national and regional policy and 40 CFR § 122.44(d), the Draft Permit continues the effluent limits from the 2000 Permit including the test organism and the testing frequency.[39] Toxicity testing must be performed in accordance with the updated EPA Region 1 WET test procedures and protocols specified in Attachment A (*Marine Acute Toxicity Test Procedure and Protocol,* July 2012) and Attachment B (*Marine Chronic Toxicity Test Procedure and Protocol*, November 2013) of the Draft Permit.

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[38] *Massachusetts Water Quality Standards Implementation Policy for the Control of Toxic Pollutants in Surface Waters.* February 23, 1990.

[39] EPA notes that the C-NOEC limit is not required by the MA Toxics Policy based on the revised dilution factor above 10, but the existing C-NOEC limit of 18% is carried forward based on anti-backsliding regulations discussed in Section 2.6 above.

5.1.12 Per- and polyfluoroalkyl substances (PFAS)

As explained at https://www.epa.gov/pfas, PFAS are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products. PFAS manufacturing and processing facilities, facilities using PFAS in production of other products, airports, and military installations can be contributors of PFAS releases into the air, soil, and water. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. Exposure to some PFAS above certain levels may increase risk of adverse health effects.[40] EPA is collecting information to evaluate the potential impacts that discharges of PFAS from wastewater treatment plants may have on downstream drinking water, recreational and aquatic life uses.

On October 20, 2020, MassDEP published final regulations establishing a drinking water standard, or a Maximum Contaminant Level (MCL) of 20 parts per trillion (ppt) for the sum of the following six PFAS. *See* 310 CMR 22.00.

- Perfluorohexanesulfonic acid (PFHxS)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorononanoic acid (PFNA)
- Perfluorooctanesulfonic acid (PFOS)
- Perfluorooctanoic acid (PFOA)
- Perfluorodecanoic acid (PFDA)

Although the Massachusetts water quality standards do not include numeric criteria for PFAS, the Massachusetts narrative criterion for toxic substances at 314 CMR 4.05(5)(e) states:

> All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

The narrative criterion is further elaborated at 314 CMR 4.05(5)(e)2 which states:

> Human Health Risk Levels. Where EPA has not set human health risk levels for a toxic pollutant, the human health-based regulation of the toxic pollutant shall be in accordance with guidance issued by the Department of Environmental Protection's Office of Research and Standards. The Department's goal is to prevent all adverse health effects which may result from the ingestion, inhalation or dermal absorption of toxins attributable to waters during their reasonable use as designated in 314 CMR 4.00.

[40] EPA, *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan,* EPA 823R18004, February 2019. Available at: https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf

Since PFAS chemicals are persistent in the environment and may lead to adverse human health and environmental effects, and consistent with recent EPA guidance,[41] the Draft Permit requires that the Facility conduct quarterly influent, effluent and sludge sampling for PFAS chemicals and annual sampling of certain industrial users. The quarterly monitoring shall begin the first full calendar quarter beginning six months after the effective date of the permit. The annual monitoring for certain industrial users shall begin the first full calendar year following the effective date of the permit.

The purpose of this monitoring and reporting requirement is to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits on a facility specific basis. EPA is authorized to require this monitoring and reporting by CWA § 308(a), which states:

> "SEC. 308. (a) Whenever required to carry out the objective of this Act, including but not limited to (1) developing or assisting in the development of any effluent limitation, or other limitation, prohibition, or effluent standard, pretreatment standard, or standard of performance under this Act; (2) determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance; (3) any requirement established under this section; or (4) carrying out sections 305, 311, 402, 404 (relating to State permit programs), 405, and 504 of this Act—
>
> (A) the Administrator shall require the owner or operator of any point source to (i) establish and maintain such records, (ii) make such reports, (iii) install, use, and maintain such monitoring equipment or methods (including where appropriate, biological monitoring methods), (iv) sample such effluents (in accordance with such methods, at such locations, at such intervals, and in such manner as the Administrator shall prescribe), and (v) provide such other information as he may reasonably require;".

(See 40 CFR § 122.21(e)(3)(ii) and 40 CFR § 122.44(i)(1)(iv)(B)).

In the absence of a final 40 CFR § 136 method for measuring PFAS in wastewater and sludge, the Draft Permit requires the use Draft Method 1633 or, when it becomes available, the multi-lab validated Method 1633. Monitoring should include each of the 40 PFAS parameters detectable by Method 1633 (see Draft Permit Attachment B for list of PFAS parameters) and the monitoring frequency is quarterly. Reporting of all 40 PFAS analytes is necessary to address the emerging understanding and remaining uncertainties regarding sources and types of analytes of PFAS in wastewater and their impacts. While MassDEP has currently adopted MCLs for only 6 of

[41] Radhika Fox, Assistant Administrator, EPA to Water Division Directors, EPA Regions 1-10, December 5, 2022, Subject: "Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs." Available at: https://www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf

these analytes as described above, it is possible that MCLs, water quality criteria and/or effluent limitation guidelines could be adopted for many of the other 34 analytes measured by Method 1633 during the life of the permit. Therefore, EPA considers it prudent to require reporting for all 40 analytes that are measured using Method 1633 to ensure EPA has sufficient data to address each of these PFAS analytes in the future. This level of monitoring is recommended in EPA's *October 2021 PFAS Strategic Roadmap*[42] and in an EPA memo dated April 28, 2022, called *Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority*[43].

All PFAS results must be reported on DMRs (see 40 CFR § 122.41)(l)(4)(i)). This approach is consistent with 40 CFR § 122.44(i)(1)(iv)(B) which states that in the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR Part 136 or methods are not otherwise required under 40 CFR chapter I, subchapter N or O, monitoring shall be conducted according to a test procedure specified in the permit for such pollutants or pollutant parameters.

Additionally, EPA has recently published Method 1621 to screen for organofluorines in wastewater. Organofluorines (molecules with a carbon-fluorine bond) are rarely naturally occuring and the most common source of organofluorines are PFAS and non-PFAS fluorinated compounds such as pesticides and pharmaceuticals. The Permittee shall monitor Adsorbable Organic Fluorine using Method 1621 once per quarter concurrently with PFAS monitoring to screen for a broader range of these types of emerging contaminants. This requirement also takes effect the first full calendar quarter following six months after the effective date of the permit.

All monitoring results may be used by EPA in the next permit reissuance to ensure the discharge continues to protect designated uses.

5.2 Industrial Pretreatment Program

The Permittee is required to administer a pretreatment program under 40 CFR Part 403. *See also* CWA § 307; 40 CFR § 122.44(j). The Permittee's pretreatment program received EPA approval on September 28, 1983 and, as a result, appropriate pretreatment program requirements were incorporated into the previous permit, which were consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

The Federal Pretreatment Regulations in 40 CFR part 403 were amended in October 1988, in July 1990, and again in October 2005. Those amendments established new requirements for implementation of pretreatment programs. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with current Federal Regulations. The activities that the permittee must address include, but are not limited

[42] https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf
[43] https://www.epa.gov/system/files/documents/2022-04/npdes_pfas-memo.pdf

to, the following: 1) develop and enforce EPA-approved specific effluent limits (technically-based local limits); 2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; 3) develop an enforcement response plan; 4) implement a slug control evaluation program; 5) track significant noncompliance for industrial users; and 6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

In addition to the requirements described above, the Draft Permit requires the Permittee to submit to EPA in writing, within 180 days of the permit's effective date, a description of proposed changes to permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the Draft Permit to ensure that the pretreatment program is consistent and up-to-date with all pretreatment requirements in effect. Lastly, the Permittee must continue to submit, annually by October 31, a pretreatment report detailing the activities of the program for the twelve-month period ending 60 days prior to the due date.

5.3 Sludge Conditions

Section 405(d) of the Clean Water Act requires that EPA develop technical standards regarding the use and disposal of sewage sludge. On February 19, 1993, EPA promulgated technical standards. These standards are required to be implemented through permits. The conditions in the permit satisfy this requirement.

Requirements related to the incinerator have not been carried forward from the 2000 Permit given that the incinerator was completely shut down in March 2016.

5.4 Infiltration/Inflow (I/I)

Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems, and combined sewer overflows (CSOs) in combined systems.

The Draft Permit includes a requirement for the permittee to control infiltration and inflow (I/I) within the sewer collections system it owns and operates. The permittee shall develop an I/I removal program commensurate with the severity of I/I in the collection system. This program may be scaled down in sections of the collection system that have minimal I/I.

5.5 Operation and Maintenance

5.5.1 Adaptation Planning for the Wastewater Treatment System (WWTS) and/or Sewer System

The Draft Permit, in Part I.C.1. requires the Permittee and Co-permittee(s) to develop an Adaptation Plan to address major storm and flood events as part of their operation and maintenance planning for the part of the WWTS and/or sewer systems that they each own and operate. These requirements are new. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of the WWTS and/or sewer system and has included a schedule in the Draft Permit for completing these requirements.

See Appendix D for a further rationale regarding this Adaptation Plan.

5.5.2 Operation and Maintenance of the Sewer System

The standard permit conditions for 'Proper Operation and Maintenance', found at 40 CFR § 122.41(e), require the proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. The requirements at 40 CFR § 122.41(d) impose a 'duty to mitigate' upon the permittee, which requires that "all reasonable steps be taken to minimize or prevent any discharge violation of the permit that has a reasonable likelihood of adversity affecting human health or the environment. EPA and MassDEP maintain that an I/I removal program is an integral component of ensuring permit compliance with the requirements of the permit under the provisions at 40 CFR § 122.41(d) and (e).

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.C. and I.D. of the Draft Permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to separate sewer collection systems (combined systems are not subject to I/I requirements) to the extent necessary to prevent SSOs and I/I related effluent violations at the Wastewater Treatment Facility and maintaining alternate power where necessary. These requirements are included to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment.

Although these requirements in the Draft Permit were not included in the 2000 Permit, the Permittee has already developed and submitted an Operation and Maintenance Plan as well as a map of the collection system. Therefore, the Draft Permit requires that the Permittee and Co-permittee(s) submit O&M annual reports as well as maintain an updated collection system map. EPA has determined that these requirements are necessary to ensure the proper operation and maintenance of the collection system.

Because the Towns of Freetown and Westport, Massachusetts and Tiverton, Rhode Island own and operate a collection system that discharges to the Fall River WWTP, they have been included as co-permittee for the specific permit requirements discussed in the paragraphs above. The historical background and legal framework underlying this co-permittee approach is set forth in Appendix E to this Fact Sheet, *EPA Region 1 NPDES Permitting Approach for Publicly Owned Treatment Works that Include Municipal Satellite Sewage Collection Systems*.

5.6 Combined Sewer Overflows

Description and History

The wastewater collection system that conveys flow to the Fall River WWTP consists partially of combined sewers that convey both sanitary sewage and stormwater runoff during rain events. During wet weather, the combined flow exceeds the capacity of the interceptor sewers and the wastewater treatment plant, and a portion of the combined flow is discharged to the Mount Hope Bay, Taunton River and Quequechan River through combined sewer overflows (CSOs). CSOs have been identified as a source of impairment of designated uses in the Mount Hope Bay. See the *Massachusetts Integrated List of Waters for the Clean Water Act 2018-2020 Reporting Cycle* ("303(d) List") and the partially-approved *Massachusetts 2022 Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle,* MassDEP Division of Watershed Management Watershed Planning Program, Worcester, Massachusetts, May 2023 (Partially approved list).

The system currently has 18 CSO outfalls which discharge to the Mount Hope Bay, Taunton River and Quequechan River, as listed in Table 7 below and shown on the map in Figure 1 at the end of this Fact Sheet. The 2000 Permit included 19 CSO outfalls, but the South Plymouth Avenue CSO outfall was closed permanently many years ago.

Table 7. Description of CSO Outfalls

Outfall	Latitude	Longitude	Location	Receiving Water
002	41° 40’ 48” N	71° 11’ 41” W	Mount Hope Avenue	Mount Hope Bay
003	41° 41’ 06” N	71° 11’ 24” W	Charles Street	Mount Hope Bay
004	41° 41’ 11” N	71° 11’ 17” W	Birch Street	Mount Hope Bay
005	41° 41’ 25” N	71° 11’ 07” W	Riverview Street	Mount Hope Bay
006	41° 41’ 48” N	71° 10’ 42” W	Middle Street	Mount Hope Bay
007	41° 41’ 58” N	71° 10’ 22” W	William Street	Mount Hope Bay
008	41° 42’ 05” N	71° 10’ 14” W	Ferry Street	Mount Hope Bay
009	41° 42’ 14” N	71° 09’ 36” W	Central Street	Quequechan River
010	41° 42’ 43” N	71° 09’ 21” W	City Pier	Taunton River
011	41° 43’ 02” N	71° 09’ 31” W	President Avenue	Taunton River
013	41° 43’ 35” N	71° 08’ 56” W	Cove Street	Taunton River
014	41° 43’ 60” N	71° 08’ 26” W	Alton Street	Taunton River
015	41° 41’ 49” N	71° 08’ 59” W	Plymouth Ave. – North	Quequechan River
016	41° 41’ 47” N	71° 08’ 56” W	Lowell Street	Quequechan River
017	41° 41’ 19” N	71° 08’ 22” W	Quequechan Street	Quequechan River
018	41° 42’ 15” N	71° 09’ 37” W	Heritage Park	Quequechan River
019	41° 42’ 06” N	71° 09’ 46” W	Canal Street	Quequechan R./Crab Pond
020	41° 42’ 01” N	71° 09’ 15” W	Third Street	Quequechan River

In 1987, the Conservation Law Foundation (CLF) filed suit against the City of Fall River (Civil Action No. 87-3067-RWZ) to control its CSO discharges. Similarly, in 1989, the United States Environmental Protection Agency (EPA) issued an administrative order requiring the City to abate its CSO discharges and bring the system into compliance with the federal Clean Water Act and the City’s NPDES permit. As a result of the CLF’s lawsuit and the EPA’s 1989 Administrative Order, a federal court order was issued in 1992 which mandated the Fall River CSO Abatement Program.

In 2016, the City submitted to EPA a *Draft Integrated Wastewater and Stormwater Master Plan* (“Integrated Plan”). This Integrated Plan is intended to provide perspective to CSO control needs, in relation to needs associated with all other Clean Water Act initiatives (including upgrades at the WWTP) and incorporates overall affordability of the City and its ratepayers. At the City’s request, the Integrated Plan was added as a requirement through an amendment of the federal court order.

The executive summary of the Integrated Plan indicated that, as part of the CSO Abatement Program, the City has implemented the following CSO controls to mitigate the impact of its CSOs on Mount Hope Bay, the Taunton River and the Quequechan River:

- Wet-weather expansion of the WWTF to treat up to 106 MGD,

- A 3-mile, 20-foot diameter, 38-million gallon CSO storage tunnel system that diverts, stores, and conveys storm flows directly to the WWTF, and
- CSO screening and disinfection facilities constructed at the Cove Street and President Avenue outfalls to treat their flows.[44]

In January 2019, the City submitted a CSO Control Plan Program Update Report based on its CSO Abatement Program. While actual measurements of CSO flow is not available at each CSO outfall, this report included a comparison of average annual CSO overflows in 1994 and 2018 showing that typical annual discharges have been reduced by 89 percent (by volume) and the number of events has been reduced by 51 percent. This comparison is presented in Table 8 below and highlights the effectiveness of the CSO Abatement Program over these years.

Table 8. Average Annual Combined Sewer Overflows (1994 vs. 2018)

CSO Outfall	1994		Existing Baseline Conditions (2018)	
	Number of Events	CSO Volume (Million Gallons)	Number of Events	CSO Volume (Million Gallons)
North System (Taunton River)				
Alton Street	39	118	47	27
Cove Street	43	136	4	1
President Avenue	51	87	4	1
City Pier	53	93	56	94
Central Street	32	24	0	0
Central System (Quequechan River)				
Quequechan Street	6	2	0	0
Lowell Street	28	29	3	<1
Plymouth Avenue North	43	59	0	0
Plymouth Avenue South	0	0	Closed	0
Third Street	58	95	0	0
Heritage Park	Blocked	0	Blocked	0
South System (Mt. Hope Bay)				
Canal Street	48	67	7	<1
Ferry Street	84	261	25	9
William Street	4	1	0	0
Middle Street	67	53	11	2
Friendship Street	Closed	0	Closed	0
Riverview Street	38	155	13	1
Birch Street	25	62	46	8
Charles Street	20	9	2	<1
Mt. Hope Avenue	23	44	12	2
Total	662	1,294	315	145

Closed = Permanently sealed. Blocked = Can be reopened, if warranted (e.g., extreme weather)

[44] These CSO Treatment Facilities will be added to the NPDES Permit through this permit reissuance, as discussed further below.

In December 2021, EPA issued an updated Order to the City, incorporating a number of projects identified in the Integrated Plan (e.g., improved sludge handling capabilities at the WWTP and pump station upgrades) and establishing a schedule for the completion of projects through the end of 2024. EPA is currently working with the City to prioritize and schedule projects for the subsequent 5 years which will be included in an updated Order that is expected to be issued by the end of 2024. EPA expects that some of the requirements set forth in this NPDES permit reissuance will be major items incorporated into that updated Order.

Regulatory Framework

CSOs are point sources subject to NPDES permit requirements for both water-quality based and technology-based requirements but are not subject to the secondary treatment regulations applicable to publicly owned treatment works in accordance with 40 CFR §133.103(a). Section 301(b)(1)(C) of the Clean Water Act of 1977 mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Water Quality Act Amendments of 1987 (WQA). The framework for compliance with Clean Water Act requirements for CSOs is set forth in EPA's National CSO Control Policy, 59 Fed. Reg. 18688 (1994). It sets the following objectives:

1) To ensure that if the CSO discharges occur, they are only as a result of wet weather;

2) To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the CWA and applicable federal and state water quality standards;

and

3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

Among the elements established to achieve these objectives, the CSO Policy set forth the minimum BCT/BAT controls (i.e., technology-based limits) that represent the BPJ of the Agency on a consistent, national basis. These are the Nine Minimum Controls ("NMCs") defined in the CSO Policy and set forth in Part I.H of the Draft Permit: 1) proper operation and regular maintenance programs for the sewer system and the combined sewer overflows; 2) maximum use of the collection system for storage; 3) review and modification of the pretreatment programs to assure CSO impacts are minimized; 4) maximization of flow to the POTW for treatment; 5) prohibition of dry weather overflows; 6) control of solid and floatable materials in CSOs; 7) pollution prevention programs which focus on contaminant reduction activities; 8) public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and 9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

To reflect advances in technologies, the Draft Permit includes more specific public notification implementation level requirements to ensure that the public receives adequate notification of CSO occurrences and CSO impacts. The Draft Permit requires the permittee to develop a public notification plan to fulfill NMC #8. As part of this plan, notification shall be provided electronically to any interested party, and a posting made on the Permittee's website, of a probable CSO activation within two (2) hours of becoming aware that the initiation of a CSO discharge may have occurred. Subsequently, within 24 hours of the termination of any CSO discharges(s), the Permittee shall provide follow-up information on their website and in a follow-up electronic communication to any interested party. EPA invites comment on this new requirement during the public comment period with a goal of a workable public notification plan.

In January 2021, Massachusetts enacted a law, *An Act Promoting Awareness of Sewage in Public Waters*. The law requires that the public be aware when untreated sewage flows into Massachusetts waters. This includes CSO outfall discharges and certain Sanitary Sewer Overflows (SSOs). Per 314 CMR 16.06(1), a Permittee with a combined sewer system shall submit to MassDEP for review and approval a preliminary CSO Notification Plan. The Permittee submitted a final CSO notification plan to MassDEP for review and approval on January 12, 2023, consistent with the requirements of 314 CMR 16.00. EPA notes that the Permittee must ensure that CSO public notifications comply with all requirements in this permit as well as in their final CSO notification plan approved by MassDEP. The CSO Policy also recommended that each community that has a combined sewer system develop and implement a long-term CSO control plan ("LTCP") that will ultimately result in compliance with the requirements of the CWA. Most recently, the City submitted a CSO Control Plan and Program Update Report in January 2019.

In accordance with the Clean Water Act and the CSO Policy, the untreated CSOs, and the CSOs from the CSO Treatment Facilities are not subject to the secondary treatment standards that apply to the POTW treatment plant but are required to achieve technology-based requirements as defined in the CSO policy (the nine minimum controls at a minimum) and limitations necessary to achieve water quality standards. Therefore, the Draft Permit includes applicable technology and water quality-based limitations on discharges from the CSO Treatment Facilities: Outfalls 011 and 013. In addition, the Draft Permit includes monitoring requirements which will provide information necessary for evaluating the effectiveness of the CSO Treatment Facilities use as CSO control measures.

Permit Requirements

In accordance with the National CSO Policy, the Draft Permit contains the following conditions for the CSO discharges:

(i) Dry weather discharges from CSO outfalls are prohibited. Dry weather discharges must be immediately reported to EPA and MassDEP.

(ii) During wet weather, the discharges must not cause any exceedance of water quality standards.
(iii) The Permittee shall meet the technology-based Nine Minimum Controls described above and shall comply with the implementation levels as set forth in Part I.H of the Draft Permit.
(iv) The Permittee shall review its entire NMC program and revise it as necessary. Documentation of this review and any resultant revisions made to the NMC program shall be submitted to EPA and MassDEP within 6 months of the effective date of the permit. An annual report shall be provided by April 30th of each year which describes any subsequent revisions made to the NMC program and shall also include monitoring results from CSO discharges, and the status of CSO abatement projects.

5.6.1 Numerical Effluent Limitations and Reporting Requirements for Fall River CSO Treatment Facilities, Outfalls 011 and 013

In addition to the requirements described above, the operation of the CSO Treatment Facilities (Outfalls 011 and 013) are subject to additional technology-based effluent limitations, water-quality based effluent limitations, and monitoring requirements. These CSO Treatment Facilities represent enhancements of the Nine Minimum Controls, allowing for removal of floatable and solid materials (NMC #6) and reduction of pathogenic bacteria through disinfection (NMC #7).

The CSO Treatment Facility at Presidents Avenue (Outfall 011) has the capacity to screen and disinfect (including chlorination and dechlorination) up to 36 MGD. The CSO Treatment Facility at Cove Street (Outfall 013) has the capacity to screen and disinfect (including chlorination only) up to 54 MGD.

The Draft Permit contains monitoring requirements and numeric effluent limitations for the CSO Treatment Facilities (Outfalls 011 and 013), including monitoring requirements for flow, TSS, BOD_5, pH, whole effluent toxicity, and total nitrogen as well as limitations on bacteria (both fecal coliform and *enterococci*) and total residual chlorine. The basis for these monitoring requirements and limitations are discussed below.

5.6.1.1 Flow

The Draft Permit requires the Permittee to report specific characteristics about the flow and duration of each discharge event for each of the CSO treatment facilities. The Permittee shall report the duration of each event, the total volume for each discharge event and the number of events each month. This flow data will be used to characterize the discharge from each CSO treatment facility to understand the frequency and magnitude of these discharges.

5.6.1.2 TSS, BOD_5 and pH

The Draft Permit requires the Permittee to report the results of TSS, BOD_5 and pH sampling at each of the CSO Treatment Facilities two (2) times per year for each CSO Treatment Facility outfall (011 and 013). This monitoring is required to characterize these CSO discharges with respect to these parameters to better understand potential impacts to water quality (*e.g.*, water clarity, dissolved oxygen and pH) in the vicinity of the discharges.

5.6.1.3 Whole Effluent Toxicity

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts WQS include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

> All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. The Region's current policy is to include toxicity testing requirements in all municipal permits, while Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

The Draft Permit requires the Permittee to conduct acute toxicity testing (LC50), twice per year, using Inland Silverside (*Menidia beryllina*) and Mysid Shrimp (*Mysidopsis beryllina*) in accordance with the test procedures and protocols specified in **Attachment A** of the Draft Permit. Samples shall be collected during the first flush or as a composite over the duration of the overflow, not to exceed 24 hours.

5.6.1.4 Total Nitrogen

As discussed in Section 5.1.9.1 above, the receiving water is impaired for total nitrogen and this permit is establishing an effluent limit at Outfall 001 to significantly reduce the overall total nitrogen load from Fall River. Additionally, total nitrogen monitoring of each CSO Treatment Facility is required to characterize these CSO discharges with respect to the overall load of nitrogen into the Taunton River and Mount Hope Bay. Although these discharges are intermittent and only occur during periods of wet weather, EPA considers that this data will assist in quantifying the level of nitrogen from these outfalls and may inform future permitting decisions related to nitrogen reductions throughout the watershed.

5.6.1.5 Bacteria

The Draft Permit includes limitations for fecal coliform and *Enterococci* which are based upon the criteria in the MA SWQS for Class SB waters.

Regarding fecal coliform, the current MA SWQS at 314 CMR 4.05(4)(b)4.a state "Waters designated for shellfishing shall not exceed a fecal coliform median or geometric mean MPN of 88 organisms per 100 ml, nor shall more than 10% of the samples exceed an MPN of 260 per 100 ml…" Hence, the Draft Permit contains fecal coliform limits of 88 organisms per 100 ml (average monthly) and 260 organisms per 100 ml (maximum daily). EPA notes that the shellfishing uses of certain segments of Mount Hope Bay are not supported due to fecal coliform impairments, which further supports the need for these limits.

Regarding *Enterococci*, the Draft Permit includes a monthly average limit of 35 *enterococci* cfu/100 ml and a maximum daily limit of 104 *enterococci* cfu/100 ml, consistent with the MA SWQS at 4.05(4)(b)4.b and the *Final Pathogen TMDL for the Narragansett/Mt. Hope Bay Watershed* (July 2010)[45] for the protection of recreational uses in Class SB waters.

These limits shall be effective year-round and the monitoring frequency shall be twice per year.

5.6.1.6 Total Residual Chlorine (TRC)

Chlorine is used to disinfect the effluent at each of the CSO Treatment Facilities, but it is a toxic chemical. The applicable total residual chlorine criteria are found in the MA WQS at 314 CMR 4.06, Table 29. The criteria for marine waters are 13 µg/L for acute effects and 7.5 µg/L for chronic effects. Both of the CSO Treatment Facilities discharge to the Taunton River, which is a marine water (Class SB).

The Draft Permit establishes limits for both CSO Treatment Facilities based on an estimate of the available dilution at each outfall location. Given that there is limited information available regarding the physical characteristics of the outfall, EPA notes that both outfalls discharge into the tidal portion of the Taunton River which provides substantial tidal flushing. Based on the information from this limited information, EPA assumes a dilution factor of at least 10 applies to each outfall.[46] Based on this assumption, the Draft Permit includes the following limits:

> Chronic criteria * dilution factor = Chronic limit
> 7.5 µg/L * 10 = 75 µg/L = 0.075 mg/L (discharge event average)
>
> Acute criteria * dilution factor = Acute limit
> 13 µg/L * 10 = 130 µg/L = 0.13 mg/L (hourly maximum)

The sampling frequency is two times per year, as follows: a grab sample shall be collected within the first two hours of the start of the discharge, and every hour thereafter for the

[45] See Table ES-2 of the TMDL at: https://attains.epa.gov/attains-public/api/documents/actions/MA_DEP/38904/107197.

[46] EPA notes that this dilution factor is similar to the dilution factor applied to Outfall 001 of 12.63. Given that the capacity of the CSO treatment facilities is similar to the design flow of the WWTP, EPA considers this a reasonable approximation of dilution.

duration of four (4) hours. The chronic limit is applied as a discharge event average. The acute limit is applied as a discharge event maximum.

Given that the Cove Street CSO Treatment Facility (Outfall 013) does not currently have dechlorination, EPA is including a 24-month compliance schedule for the TRC limits at this outfall.

Given the uncertainty regarding the available dilution based on limited information, the Draft Permit also includes a requirement that a dilution model or dye study be conducted by the Permittee during the permit term for each of the two CSO Treatment Facility outfalls. The results of the modeling or dye studies must be submitted by the Permittee at least six months before the end of the permit term (concurrent with the NPDES application). The results will be used to update the available dilution in the next permit reissuance.[47] The conditions for the studies can be found in Section I.H.7 of the Draft Permit.

5.7 Standard Conditions

The standard conditions of the permit are based on 40 CFR §122, Subparts A, C, and D and 40 CFR § 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

6.0 Federal Permitting Requirements

6.1 Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority and imposes requirements on Federal agencies regarding endangered or threatened species of fish, wildlife, or plants (listed species) and habitat of such species that has been designated as critical (a "critical habitat").

Section 7(a)(2) of the ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to ensure that any action it authorizes, funds or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers § 7 consultations for freshwater species. The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) administers Section 7 consultations for marine and anadromous species. The Federal action being considered in this case is EPA's proposed NPDES permit for the Fall River WWTP's discharges of pollutants. The Draft Permit is intended to replace the 2000 Permit in governing the Facility. As the federal agency charged with authorizing the discharge from this

[47] If the results of the modeling or dye study result in a larger dilution than assumed at this time, EPA confirms that such results could be used to allow backsliding of the TRC limits based on the anti-backsliding exception regarding "new information" found at CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l).

Facility, EPA determines potential impacts to federally listed species and initiates consultation with the Services when required under § 7(a)(2) of the ESA.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, and plants in the expected action area of the outfall to determine if EPA's proposed NPDES permit could potentially impact any such listed species in this section of Mount Hope Bay.

Two terrestrial listed endangered species, the northern long-eared bat (*Myotis septentrionalis*) and the Roseate Tern (*Sterna dougalli dougalli*) were identified as potentially occurring in the action area of the Fall River WWTF discharge. [48]

According to the USFWS, the endangered northern long-eared bat is found in the following habitats based on seasons, "winter – mines and caves; summer – wide variety of forested habitats." This species is not considered aquatic. However, because the Facility's projected action area overlaps with the general statewide range of the northern long-eared bat, EPA submitted an evaluation on potential effects of the project to the Information for Planning and Consultation (IPaC) system provided by the USFWS. The USFWS system confirmed by letter that, based on the specific project information submitted, the project would have "no effect" on the northern long-eared bat[49]. This concluded EPA's consultation responsibilities for the Fall River WWTP NPDES permitting action under ESA section 7(a)(2) with respect to the northern long-eared bat. No ESA section 7 consultation is required with USFWS for this species.
The roseate tern can be found on small barrier islands in the northeast North America, often at ends or breaks along a beach and almost always nest in colonies with common terns. Roseate terns are found in coastal New Hampshire and Massachusetts from the end of April until late August to early September. The bird eats small fish, primarily the American sand lance. The population has been greatly reduced by human activity and development on barrier islands, predation, and competition from expanding numbers of large gulls.

Because the Facility's projected action area overlaps with the general coastal range of the roseate tern, EPA submitted an evaluation on potential effects of the project to the Information for Planning and Consultation (IPaC) system provided by the USFWS. The USFWS system confirmed by letter that, based on the specific project information submitted, the project would have "no effect" on the roseate tern[50]. This concluded EPA's consultation responsibilities for the Fall River WWTP NPDES permitting action under ESA section 7(a)(2) with respect to the roseate tern. No ESA section 7 consultation is required with USFWS for this species.

<u>NOAA Anadromous and Marine Species</u>
The Facility's discharges are into the Taunton River, which drains into Mt. Hope Bay. The outfall and action area overlap with coastal waters where several protected marine species are found. Two species of anadromous fish, the shortnose sturgeon (*Acipenser brevirostrom)* and the

[48] See §7 resources for USFWS at https://ecos.fws.gov/ipac/.
[49] USFWS Project Code: Project Code 2024-0023269, December 5, 2023
[50] USFWS Project Code: Project Code 2024-0023269, December 5, 2023

Atlantic sturgeon (*Acipenser oxyrhynchus*), are potentially present in the vicinity of the discharge. In general, adult shortnose sturgeon and adult Atlantic sturgeon (ATS) are present in coastal waters. Mt. Hope Bay is possibly home for multiple lifestages, including adult and juvenile sturgeon that are expected to migrate and forage in the area. Also present in the action area are four species of sea turtle, including: the leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), kemp's ridley sea turtle (*Lepidochelys kempii*), and the loggerhead sea turtle (*Caretta caretta*).

According to NOAA Fisheries, adult and juvenile life stages of leatherback, loggerhead, Kemp's ridley and green sea turtles are expected in coastal Massachusetts waters from June 1 through November 30 while migrating and foraging. Also, adult shortnose sturgeon and adult and subadult Atlantic sturgeon are likely present in the action area.

Because these species may be affected by the discharges authorized by the proposed permit, EPA has thoroughly evaluated the potential impacts of the permit action on these anadromous species. Based on that evaluation, EPA's preliminary determination is that this action may affect, but is not likely to adversely affect, the protect species that are expected in the vicinity of the action area of the discharge. Therefore, EPA has judged that a formal consultation pursuant to Section 7 of the ESA is not required. EPA is seeking concurrence from NOAA Fisheries regarding this determination during the Draft Permit's public comment period.

6.2 Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (*see* 16 U.S.C. § 1801 *et seq.*, 1998), EPA is required to consult with the NOAA Fisheries if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b).

The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 U.S.C. § 1802(10). "Adverse impact" means any impact that reduces the quality and/or quantity of EFH 50 CFR § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), or site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.
EFH is only designated for fish species for which federal Fisheries Management Plans exist. *See* 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

Based on available EFH information, including the NOAA Fisheries EFH Mapper,[51] EPA has determined that the receiving water in the vicinity of the discharge is designated as EFH for the species shown in Table 7.

[51] https://www.habitat.noaa.gov/apps/efhmapper/

Table 7. EFH Designated Species

Species/Management Unit	Lifestage(s) Found at Location
Atlantic Butterfish	Adults, Eggs, Juvenile, Larvae
Atlantic Cod	Eggs, Juvenile, Larvae
Atlantic Herring	Adult, Juvenile, Larvae
Atlantic Mackerel	Adult, Eggs, Juvenile, Larvae
Black Sea Bass	Adult, Juvenile
Bluefish	Adult, Juvenile
Little Skate	Adult, Juvenile
Longfin Inshore Squid	Adult, Juvenile
Pollock	Juvenile
Red Hake	Adult, Eggs/Larvae/Juvenile
Sand Tiger Shark	Neonate/Juvenile
Scup	Adult, Eggs, Juvenile, Larvae
Silver Hake	Eggs/Larvae
Summer Flounder	Adult, Juvenile, Larvae
White Shark	Neonate
Windowpane Flounder	Adult, Eggs, Juvenile, Larvae
Winter Flounder	Eggs, Juvenile, Larvae/Adult
Winter Skate	Adult, Juvenile
Yellowfin Tuna	Juvenile
Habitat Area of Particular Concern	
Summer Flounder submerged aquatic vegetation	
Inshore 20m Juvenile Cod	

Therefore, consultation with NOAA Fisheries under the Magnuson-Stevens Fishery Conservation and Management Act is required. EPA has determined that the operation of this Facility, as governed by this permit action, may adversely affect the EFH of the species listed above. The Draft Permit has been conditioned in the following ways to minimize any impacts that reduce the quality and/or quantity of EFH:

- This Draft Permit action does not constitute a new source of pollutants. It is the reissuance of an existing NPDES permit;

- The facility does not withdraw from the receiving water, so there will be no impact that reduces the quality and/or quantity of EFH from impingement and entrainment of organisms;

- Toxicity tests will be conducted each year to ensure that the discharge does not present toxicity problems;

- Total suspended solids, biochemical oxygen demand, fecal coliform, *Enterococci*, total residual chlorine, pH, and total nitrogen are regulated by the Draft Permit to meet water

quality standards;

- The Draft Permit prohibits the discharge of pollutants or combination of pollutants in toxic amounts;

- The Draft Permit prohibits violations of the state water quality standards; and

EPA finds that the conditions and limitations contained within the Draft Permit adequately protect EFH designated for the species listed above. Further mitigation is not warranted. Should adverse impacts to EFH be detected as a result of this permit action, or if new information is received that changes the basis for EPA's conclusions, NOAA Fisheries Habitat and Ecosystem Services Division will be contacted and an EFH consultation will be re-initiated.

At the beginning of the public comment period, EPA notified NOAA Fisheries Habitat and Ecosystem Services Division that the Draft Permit and Fact Sheet were available for review and provided a link to the EPA NPDES Permit website to allow direct access to the documents.

In addition to this Fact Sheet and the Draft Permit, information to support EPA's finding will be included in a letter under separate cover sent to the NOAA Fisheries Habitat and Ecosystem Services Division during the public comment period.

6.3 Coastal Zone Management (CZM) Consistency Review

The Coastal Zone Management Act (CZMA), 16 U.S.C. 1451 et seq., and its implementing regulations (15 CFR Part 930) require a determination that any federally licensed or permitted activity affecting the coastal zone with an approved Coastal Zone Management Program (CZMP) is consistent with the enforceable policies of the CZMP. EPA is prohibited from issuing a NPDES permit for any activity affecting any land or water use or natural resource of the coastal zone until the applicant certifies that the proposed activity complies with the State Coastal Zone Management program, and the State or its designated agency concurs with the certification, or the Secretary of Commerce overrides the State's nonconcurrence. *See* 40 CFR § 122.49(d).

The discharge is within the defined CZM boundaries. During the public notice period, EPA will request that the Permittee submit a letter to the Massachusetts Coastal Zone Management Program stating their intention to abide by the CZM water quality and habitat policies. EPA expects that CZM will find the discharge consistent with its policies.

7.0 Public Comments, Hearing Requests and Permit Appeals

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the permit writer, Michael Cobb at the following email address: Cobb.Michael@epa.gov.

In this case, the public comment period has been set at 60 days rather than the typical 30-day period required by 40 CFR 124.10(b)(1). This extended timeframe is in response to a request by the Permittee for a 60-day comment period on a phone call with EPA on January 19, 2024. The Permittee cited the complex nature of this permit which covers a large POTW, 2 CSO Treatment Facilities and 18 CSO outfalls as well as a major facility upgrade that will likely result from the proposed TN limit. Therefore, EPA is accommodating this request and considers that 60 days will provide sufficient time for all stakeholders to review and comment on the Draft Permit.

Prior to the close of the public comment period, any person may submit a written request to EPA for a public hearing to consider the Draft Permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held if the criteria stated in 40 CFR § 124.12 are satisfied. In reaching a final decision on the Draft Permit, EPA will respond to all significant comments in a Response to Comments document attached to the Final Permit and make these responses available to the public on EPA's website.

Following the close of the comment period, and after any public hearings, if such hearings are held, EPA will issue a Final Permit decision, forward a copy of the final decision to the applicant, and provide a copy or notice of availability of the final decision to each person who submitted written comments or requested notice. Within 30 days after EPA serves notice of the issuance of the Final Permit decision, an appeal of the federal NPDES permit may be commenced by filing a petition for review of the permit with the Clerk of EPA's Environmental Appeals Board in accordance with the procedures at 40 CFR § 124.19.

If for any reason, comments on the Draft Permit and/or a request for a public hearing cannot be emailed to the permit writer specified above, please contact them at telephone number: (617) 918-1369.

8.0 Administrative Record

The administrative record on which this Draft Permit is based may be accessed by contacting Michael Cobb at 617-918-1369 or via email at Cobb.Michael@epa.gov.

February 2024
Date

Ken Moraff, Director
Water Division
U.S. Environmental Protection Agency

Figure 1: Fall River WWTF and CSO Location Map

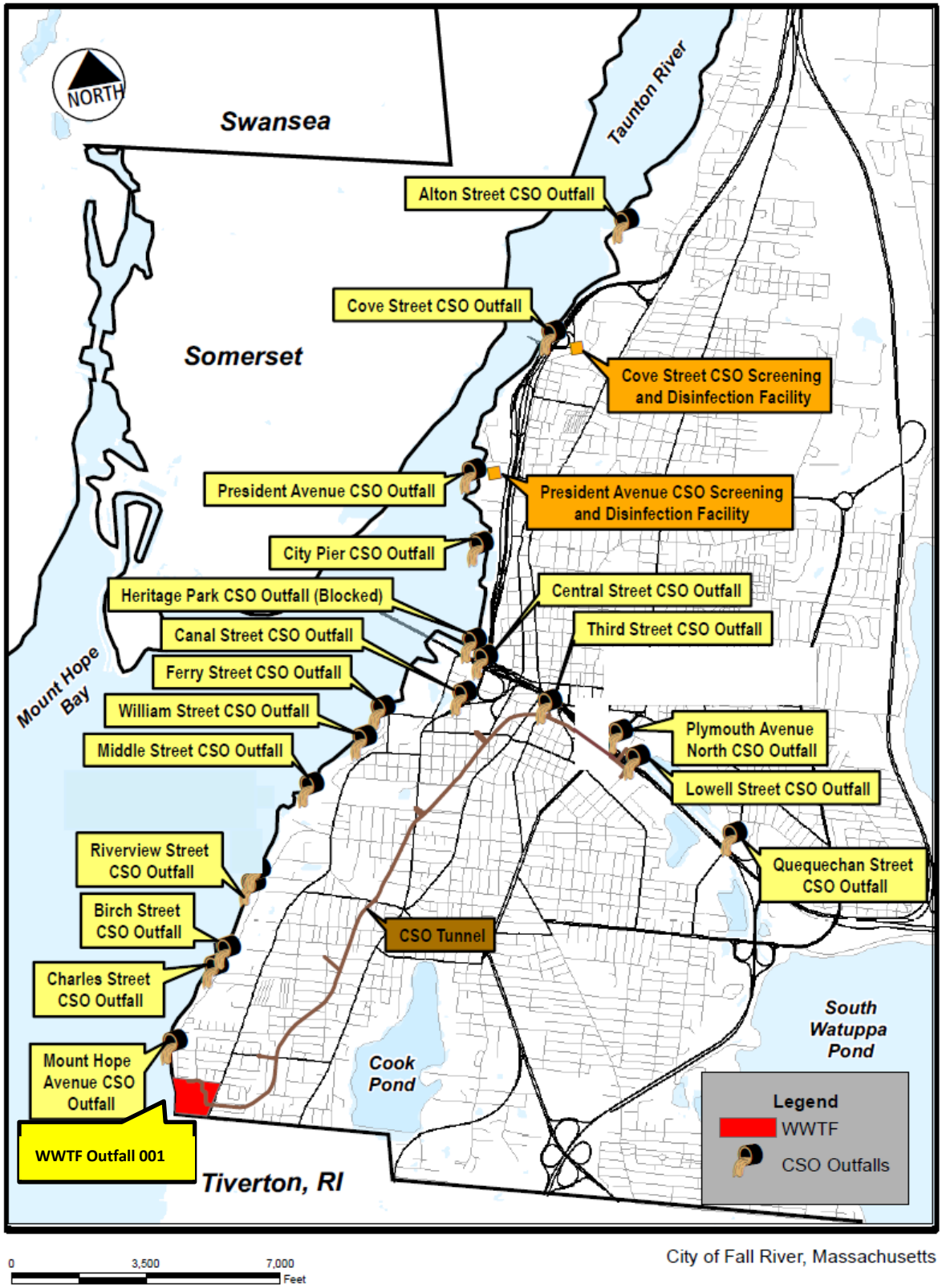
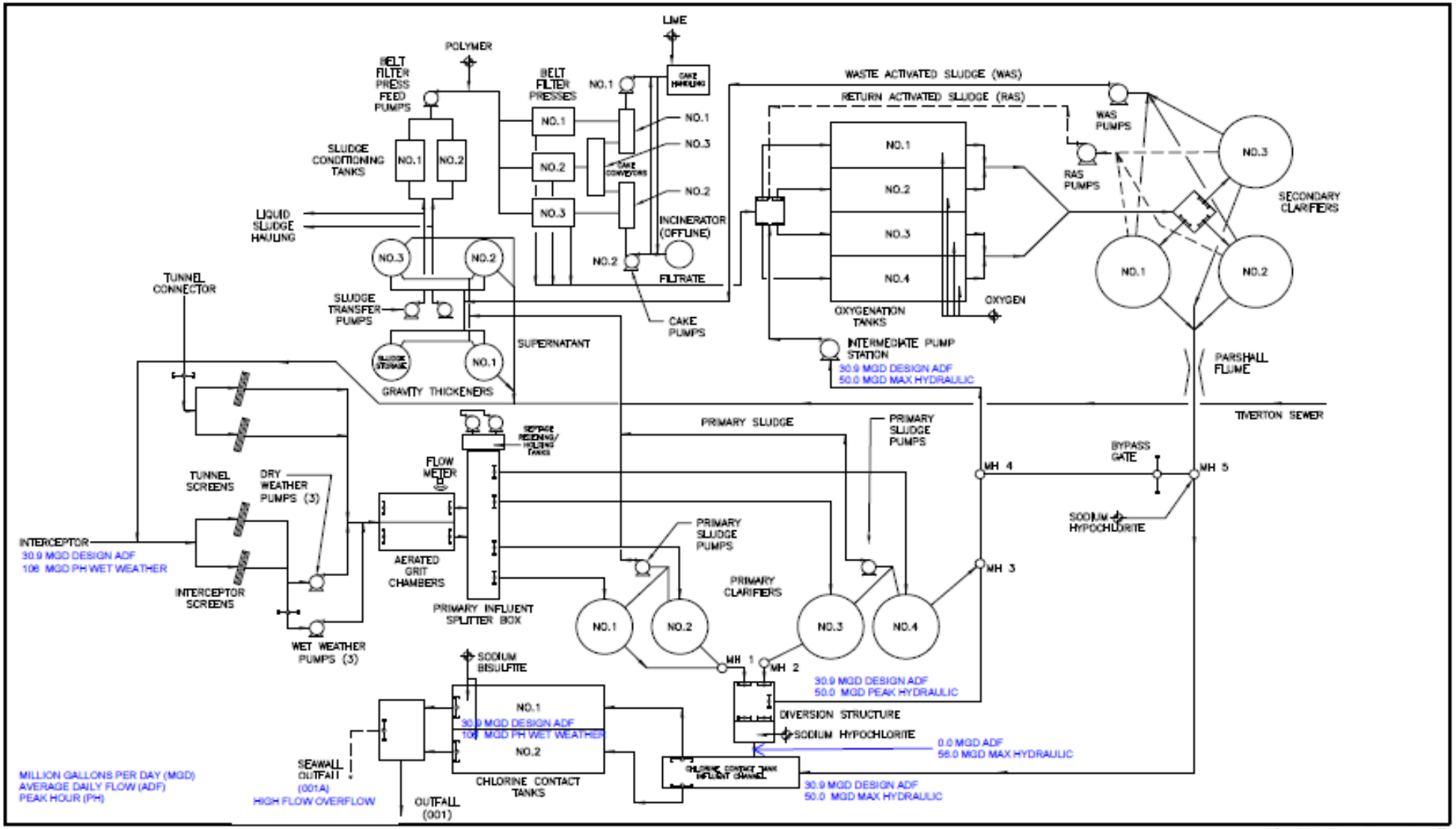


Figure 2: Flow diagram



City of Fall River, Massachusetts
Wastewater Treatment Facilities Plan

Outfall 001

Parameter	Flow	Flow	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5
	Annual Rolling Ave	Daily Max	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Daily Max	Daily Max
Units	MGD	MGD	lb/d	mg/L	lb/d	mg/L	lb/d	mg/L
Effluent Limit	30.9	Report	7730	30	11600	45	Report	Report
Minimum	23.4	19.4	638	4	1032	6	1022	7
Maximum	28.5	94.6	4415	14	10993	21	47123	73
Median	25.75	54.6	1782.5	7.5	2577	10	6474	17.5
No. of Violations	0	N/A	0	0	0	0	N/A	N/A
10/31/2018	26.5	57.6	2570	11	4023	14	9127	24
11/30/2018	27.7	81.3	3679	11	5595	17	11527	18
12/31/2018	28	45.5	2203	10	3644	11	6936	21
1/31/2019	27.9	71.5	2831	11	3940	12	7606	17
2/28/2019	27.2	57.2	3162	13	4411	20	7633	23
3/31/2019	26.5	48.6	1949	8	2637	12	7589	20
4/30/2019	26.3	52.5	1785	7	2033	8	4250	13
5/31/2019	26.7	42.1	1856	8	2320	10	3258	14
6/30/2019	27.1	65.4	2093	8	3150	11	5980	15
7/31/2019	27.8	65.1	2179	9	3181	10	9816	22
8/31/2019	27.8	29.7	1242	7	2237	11	5945	24
9/30/2019	27.4	29	1139	7	1781	9	3870	16
10/31/2019	27.2	64.1	2032	10	2574	12	7152	32
11/30/2019	25.9	54.2	1357	7	1841	8	4684	13
12/31/2019	26.8	86.1	2451	7	3799	10	7951	14
1/31/2020	26.2	32.4	1142	6	2740	7	1705	9
2/29/2020	26	48.7	1584	7	2219	8	4874	12
3/31/2020	25.7	44.6	1578	7	1928	8	4760	13
4/30/2020	25.8	53.8	1976	8	1906	7	5192	22
5/31/2020	25.6	60.8	1720	8	3803	14	5578	11
6/30/2020	25.1	38.7	1671	9	2515	13	4519	25
7/31/2020	24.5	25	1090	7	1786	8	2294	11
8/31/2020	24.2	31.8	1006	7	1319	9	1945	11
9/30/2020	24	24.2	1001	7	1032	7	2422	12
10/31/2020	23.8	62.3	1458	7	2076	8	6862	17
11/30/2020	23.9	43.5	1320	6	2391	9	5969	17
12/31/2020	23.7	82.1	1765	7	2894	8	7092	12
1/31/2021	23.7	57.9	1103	6	1484	7	1568	8

Outfall 001

Parameter	Flow	Flow	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5
	Annual Rolling Ave	Daily Max	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Daily Max	Daily Max
Units	MGD	MGD	lb/d	mg/L	lb/d	mg/L	lb/d	mg/L
Effluent Limit	30.9	Report	7730	30	11600	45	Report	Report
2/28/2021	23.8	55.2	1898	8	2480	10	6906	17
3/31/2021	23.8	42	1780	8	2720	11	6655	19
4/30/2021	23.4	61	1993	9	2812	10	7631	32
5/31/2021	23.5	67.7	2055	9	2553	12	8034	30
6/30/2021	23.6	28.5	1342	7	2006	10	4754	20
7/31/2021	24.2	61.9	2003	9	2427	11	7227	26
8/31/2021	25	88.5	2378	8	4489	10	15500	21
9/30/2021	26.1	83.6	2185	7	4418	10	14642	30
10/31/2021	26.5	53.9	1732	7	2454	8	6293	14
11/30/2021	26.3	34.1	794	5	1092	7	1234	8
12/31/2021	25.1	25.9	1083	6	1314	8	1776	10
1/31/2022	25.1	54.9	1435	6	2375	8	7326	16
2/28/2022	25.8	81.2	2816	8	4736	13	15576	27
3/31/2022	26.1	43.8	1106	5	1436	6	1997	8
4/30/2022	26.2	56.7	1976	8	3323	10	10876	23
5/31/2022	25.7	26.4	1278	7	1454	8	2767	14
6/30/2022	25.6	34.8	2003	10	2481	12	9247	33
7/31/2022	24.9	19.4	638	4	2580	10	1022	7
8/31/2022	24.2	28.8	1090	6	1415	8	3101	15
9/30/2022	23.6	67.2	2640	9	4598	13	14915	34
10/31/2022	23.6	86.6	2142	8	4671	13	10266	33
11/30/2022	23.9	43.1	1655	8	1964	9	5392	15
12/31/2022	24.8	79.3	2401	8	3418	10	8598	22
1/31/2023	25.8	89.5	3507	9	7966	13	26125	35
2/28/2023	25	34.1	1823	8	2857	13	5688	20
3/31/2023	25.1	94.6	3324	9	10661	21	34714	44
4/30/2023	25	77.4	4415	14	3635	14	47123	73
5/31/2023	25.8	66.5	1562	6	10993	19	6655	12
6/30/2023	26	50.3	1590	7	1763	10	6152	22
7/31/2023	27.2	58	1722	6	2635	8	6092	22
8/31/2023	27.9	54.3	2029	7	3644	12	12746	31
9/30/2023	28.5	58.4	1590	6	2607	8	4871	14

Outfall 001

Parameter	BOD5	TSS	TSS	TSS	TSS	TSS	TSS	TSS
	Monthly Ave Min	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Daily Max	Daily Max	Monthly Ave Min
Units	% Removal	lb/d	mg/L	lb/d	mg/L	lb/d	mg/L	% Removal
Effluent Limit	N/A	7730	30	11600	45	Report	Report	N/A
Minimum	83%	540	3	675	4	880	5	68%
Maximum	97%	4348	13	13016	24	51504	69	97%
Median	92%	1188.5	6	1914	8	6318.5	17	93%
No. of Violations	N/A	0	0	1	0	N/A	N/A	N/A
10/31/2018	92%	1485	6	3217	10	7686	24	91%
11/30/2018	91%	2291	7	4289	10	8447	19	89%
12/31/2018	94%	975	4	1945	6	5614	17	94%
1/31/2019	91%	880	3	1737	5	3803	8	93%
2/28/2019	90%	1113	5	1285	5	3526	16	92%
3/31/2019	93%	964	4	1547	7	5313	14	92%
4/30/2019	93%	998	4	1599	6	4904	15	93%
5/31/2019	91%	1115	5	1400	6	3258	14	92%
6/30/2019	90%	2555	8	6713	15	26181	48	80%
7/31/2019	90%	2032	8	3281	10	12047	27	88%
8/31/2019	94%	868	5	1731	8	3963	16	94%
9/30/2019	95%	1109	6	1427	7	4120	19	92%
10/31/2019	91%	2142	10	3558	17	12070	54	85%
11/30/2019	94%	989	5	1149	7	2882	8	92%
12/31/2019	89%	1786	5	3621	9	7206	15	87%
1/31/2020	94%	624	3	1655	4	880	5	95%
2/29/2020	94%	781	3	1111	4	3310	9	96%
3/31/2020	93%	690	3	950	4	2929	8	96%
4/30/2020	90%	1190	4	1241	5	2767	7	92%
5/31/2020	92%	932	4	1661	6	3042	6	95%
6/30/2020	92%	1168	6	1620	10	3690	15	93%
7/31/2020	96%	777	5	1101	6	1321	8	96%
8/31/2020	96%	848	6	1111	7	1768	10	95%
9/30/2020	96%	882	6	1096	7	2212	13	96%
10/31/2020	94%	998	5	1377	6	3633	9	95%
11/30/2020	95%	1152	5	2338	8	7373	21	95%
12/31/2020	92%	1124	4	1737	5	5802	9	95%
1/31/2021	95%	540	3	675	4	1214	7	97%

Outfall 001

Parameter	BOD5	TSS	TSS	TSS	TSS	TSS	TSS	TSS
	Monthly Ave Min	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Daily Max	Daily Max	Monthly Ave Min
Units	% Removal	lb/d	mg/L	lb/d	mg/L	lb/d	mg/L	% Removal
Effluent Limit	N/A	7730	30	11600	45	Report	Report	N/A
2/28/2021	92%	837	3	1234	4	3223	8	96%
3/31/2021	92%	939	4	2182	8	7006	20	95%
4/30/2021	93%	1328	5	2433	7	8649	17	94%
5/31/2021	92%	2134	9	3310	15	11729	48	90%
6/30/2021	94%	862	5	1437	7	4041	17	96%
7/31/2021	91%	1827	8	2218	10	7227	28	91%
8/31/2021	89%	3100	9	7796	15	31728	43	87%
9/30/2021	89%	3460	10	11124	24	36953	56	86%
10/31/2021	95%	2918	11	4997	16	12318	35	89%
11/30/2021	95%	1060	6	2025	10	6685	35	94%
12/31/2021	96%	923	5	1096	6	2382	14	95%
1/31/2022	95%	1187	5	1771	7	5952	14	94%
2/28/2022	90%	1969	6	3140	9	10158	30	92%
3/31/2022	96%	762	3	889	4	1899	9	96%
4/30/2022	93%	1632	6	3678	10	13713	29	93%
5/31/2022	95%	792	5	1006	5	2372	12	96%
6/30/2022	93%	1533	7	2004	9	8967	32	93%
7/31/2022	97%	905	6	2397	9	1541	11	95%
8/31/2022	95%	1289	8	1878	10	3998	17	94%
9/30/2022	91%	3926	13	6023	18	26321	60	**83%**
10/31/2022	89%	2701	9	7436	22	18665	60	86%
11/30/2022	93%	1439	7	1883	7	6778	21	94%
12/31/2022	89%	2136	7	3256	10	8420	27	90%
1/31/2023	**83%**	4348	9	**13016**	20	51504	69	**80%**
2/28/2023	91%	1218	6	1475	7	2982	11	94%
3/31/2023	**84%**	2538	8	7571	19	15779	29	87%
4/30/2023	**84%**	2523	9	2888	11	21948	34	88%
5/31/2023	92%	1474	5	6162	12	7210	13	92%
6/30/2023	91%	2413	10	1737	10	17686	46	**81%**
7/31/2023	90%	2429	8	5243	15	13184	32	**82%**
8/31/2023	86%	2363	9	5001	16	18913	46	**79%**
9/30/2023	87%	3083	9	5926	17	16560	35	**68%**

Outfall 001

Parameter	pH	pH	Fecal Coliform	Fecal Coliform	TRC	TRC	Ammonia
	Minimum	Maximum	Monthly Geometric Mean	Daily Max	Monthly Ave	Daily Max	Monthly Ave
Units	SU	SU	#/100mL	#/100mL	ug/L	ug/L	mg/L
Effluent Limit	6.5	8.5	200	400	42.5	73.7	Report
Minimum	6.2	6.7	1	2	0	0	6.23
Maximum	6.7	7.2	15	870	0	0.1	19.64
Median	6.45	6.8	2	13	0	0	13.295
No. of Violations	30	0	0	2	0	0	N/A
10/31/2018	6.5	6.8	3	25	0	0	10.35
11/30/2018	6.4	6.9	3	20	0	0	6.76
12/31/2018	6.6	6.9	2	4	0	0	11.5
1/31/2019	6.6	6.9	1	4	0	0	11.9
2/28/2019	6.6	7	2	47	0	0	14.3
3/31/2019	6.7	6.9	1	4	0	0	9.48
4/30/2019	6.5	6.8	3	17	0	0	10.82
5/31/2019	6.5	6.8	2	4	0	0	10.61
6/30/2019	6.5	6.8	4	111	0	0	14.1
7/31/2019	6.4	6.7	4	13	0	0	14.22
8/31/2019	6.3	6.7	4	11	0	0	14.3
9/30/2019	6.4	6.8	5	95	0	0	17.98
10/31/2019	6.4	6.8	4	35	0	0	11.48
11/30/2019	6.4	6.9	3	14	0	0	9.88
12/31/2019	6.4	6.9	2	13	0	0	15.8
1/31/2020	6.6	6.9	1	4	0	0	15.5
2/29/2020	6.5	6.8	1	3	0	0	14.9
3/31/2020	6.5	6.8	1	4	0	0	14.4
4/30/2020	6.5	6.8	2	4	0	0	10.51
5/31/2020	6.5	6.8	1	4	0	0	13.18
6/30/2020	6.3	6.9	2	6	0	0	16.38
7/31/2020	6.5	6.8	2	7	0	0	18.28
8/31/2020	6.5	6.8	5	30	0	0	18.43
9/30/2020	6.4	6.8	4	33	0	0	19.64
10/31/2020	6.2	6.8	3	142	0	0	17.83
11/30/2020	6.5	6.9	1	3	0	0	11.3
12/31/2020	6.4	6.9	2	8	0	0	7.8
1/31/2021	6.6	7.2	1	3	0	0	15

Outfall 001

Parameter	pH	pH	Fecal Coliform	Fecal Coliform	TRC	TRC	Ammonia
	Minimum	Maximum	Monthly Geometric Mean	Daily Max	Monthly Ave	Daily Max	Monthly Ave
Units	SU	SU	#/100mL	#/100mL	ug/L	ug/L	mg/L
Effluent Limit	6.5	8.5	200	400	42.5	73.7	Report
2/28/2021	6.5	6.9	1	4	0	0	10.3
3/31/2021	6.3	6.9	2	4	0	0	16.4
4/30/2021	6.5	7.1	1	4	0	0	13.67
5/31/2021	6.3	6.8	1	4	0	0	10.47
6/30/2021	6.5	6.8	2	8	0	0	14.68
7/31/2021	6.3	6.8	2	10	0	0.06	14.7
8/31/2021	6.3	6.9	3	66	0	0	12.96
9/30/2021	6.4	6.9	9	490	0	0	8.83
10/31/2021	6.4	6.7	8	100	0	0	10.7
11/30/2021	6.5	6.7	5	100	0	0	13.7
12/31/2021	6.5	6.8	2	7	0	0	11.8
1/31/2022	6.5	6.9	2	6	0	0	15
2/28/2022	6.4	6.8	3	33	0	0	10.2
3/31/2022	6.5	6.9	1	6	0	0	7.8
4/30/2022	6.6	6.9	2	68	0	0	11.65
5/31/2022	6.7	7	1	4	0	0	13.06
6/30/2022	6.3	6.8	3	69	0	0	13.29
7/31/2022	6.5	6.8	5	19	0	0	16.25
8/31/2022	6.3	6.7	11	870	0	0	17.46
9/30/2022	6.4	6.8	15	240	0	0	11.73
10/31/2022	6.4	6.7	3	26	0	0	11.92
11/30/2022	6.5	6.8	3	22	0	0	17.9
12/31/2022	6.4	6.8	2	35	0	0	13.3
1/31/2023	6.4	7	2	36	0	0	6.23
2/28/2023	6.6	7.1	1	2	0	0	14.2
3/31/2023	6.5	6.9	3	10	0	0.1	14.2
4/30/2023	6.4	6.9	2	8	0	0.1	13.75
5/31/2023	6.3	6.8	2	8	0	0.1	13
6/30/2023	6.2	6.7	5	132	0	0.1	17.07
7/31/2023	6.4	6.9	3	22	0	0	9.22
8/31/2023	6.4	6.8	3	99	0	0	15.24
9/30/2023	6.4	7	3	16	0	0	13.19

Outfall 001

Parameter	TKN	Nitrate	Nitrite	Total Nitrogen	Copper	Copper	Lead	Lead
	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Daily Max	Monthly Ave	Daily Max
Units	mg/L	mg/L	mg/L	lb/day	ug/L	ug/L	ug/L	ug/L
Effluent Limit	Report	Report	Report	Calculated	22	33	48.3	Report
Minimum	7.73	0.11	0.05	2520.0	5	6	0	0
Maximum	22.12	2.78	1.52	5158.4	32	203	3	3
Median	15.37	0.56	0.15	3428.1	6	10	Non-Detect	Non-Detect
No. of Violations	N/A	N/A	N/A	N/A	1	2	0	N/A
10/31/2018	12.68	0.99	1.52	3359.2	7	11	< 1	< 1
11/30/2018	8.71	0.73	0.7		6	10	< 1	< 1
12/31/2018	13	0.57	0.35		6	9	< 1	< 1
1/31/2019	13.6	0.92	0.21		7	9	< 1	< 1
2/28/2019	15.6	0.89	0.14		6	8	< 1	< 1
3/31/2019	11.7	0.87	0.11		7	9	< 1	< 1
4/30/2019	12.55	0.76	0.17		7	11	< 1	< 1
5/31/2019	12.37	0.69	0.17	2947.8	8	13	< 1	< 1
6/30/2019	15.6	0.49	0.48	3747.3	7	10	< 1	< 1
7/31/2019	16.24	1.37	1.16	4354.5	5	7	< 1	< 1
8/31/2019	16.3	2.78	1.26	4718.7	5	7	< 1	< 1
9/30/2019	20.33	1.15	1.08	5158.4	7	7	< 1	< 1
10/31/2019	14.51	0.42	0.24	3443.3	12	27	< 1	< 1
11/30/2019	12	0.39	0.23		32	203	< 1	< 1
12/31/2019	17.5	0.67	0.37		6	9	< 1	< 1
1/31/2020	17.8	0.66	0.13		7	10	< 1	< 1
2/29/2020	16.4	0.57	0.12		7	8	< 1	< 1
3/31/2020	16	0.68	0.11		6	7	1	1
4/30/2020	12.12	0.78	0.13		5	6	1	1
5/31/2020	15.05	0.48	0.17	3354.0	7	10	< 1	< 1
6/30/2020	19.18	0.22	0.16	4097.0	7	14	< 1	< 1
7/31/2020	20.24	0.19	0.19	4215.8	7	9	< 1	< 1
8/31/2020	20.95	0.55	0.7	4483.3	6	9	< 1	< 1
9/30/2020	22.12	0.4	0.46	4602.4	8	10	< 1	< 1
10/31/2020	19.8	0.2	0.13	3998.0	7	10	< 1	< 1
11/30/2020	14	0.21	0.08		6	10	1	1
12/31/2020	9.67	0.86	0.18		7	8	1	1
1/31/2021	16.5	0.29	0.12		7	8	< 1	< 1

Outfall 001

Parameter	TKN	Nitrate	Nitrite	Total Nitrogen	Copper	Copper	Lead	Lead
	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Monthly Ave	Daily Max	Monthly Ave	Daily Max
Units	mg/L	mg/L	mg/L	lb/day	ug/L	ug/L	ug/L	ug/L
Effluent Limit	Report	Report	Report	Calculated	22	33	48.3	Report
2/28/2021	11.7	0.81	0.08		6	7	< 1	< 1
3/31/2021	18.3	0.47	0.13		6	7	< 1	< 1
4/30/2021	15.73	0.56	0.11		8	13	1	1
5/31/2021	12.75	0.32	0.1	2582.7	5	9	1	1
6/30/2021	16.66	0.13	0.09	3324.4	6	11	< 1	< 1
7/31/2021	16.55	0.18	0.16	3410.9	5	6	< 1	< 1
8/31/2021	15.4	0.2	0.11	3277.5	6	12	3	3
9/30/2021	10.74	0.51	0.32	2520.0	8	21	< 1	1
10/31/2021	12.73	0.26	0.23	2923.5	8	14	1	1
11/30/2021	15.5	0.44	0.36		6	7	1	1
12/31/2021	13.6	0.76	0.32		6	8	< 1	< 1
1/31/2022	16.6	0.51	0.113		7	13	1	1
2/28/2022	11.7	1.31	0.07		5	9	< 1	< 1
3/31/2022	9.36	0.96	0.08		6	12	< 1	< 1
4/30/2022	13.38	1.03	0.07		6	8	< 1	< 1
5/31/2022	14.85	0.82	0.09	3380.0	6	9	< 1	< 1
6/30/2022	15.34	1.53	0.46	3702.2	8	18	1	1
7/31/2022	18.2	2.37	0.31	4338.7	6	7	1	1
8/31/2022	19.84	0.9	0.36	4261.1	6	17	1	1
9/30/2022	14.36	1.03	0.28	3086.1	14	39	< 1	< 1
10/31/2022	13.54	0.83	0.37	2902.9	7	11	1	1
11/30/2022	19.7	0.16	0.17		7	16	1	1
12/31/2022	15	0.41	0.08		5	12	< 1	< 1
1/31/2023	7.73	1.15	0.08		6	10	< 1	< 1
2/28/2023	16.7	0.25	0.07		8	11	< 1	< 1
3/31/2023	16.5	0.4	0.07		6	14	< 2	< 2
4/30/2023	16.28	0.23	0.05		8	19	< 2	< 2
5/31/2023	14.64	0.56	0.06	3285.5	5	7	< 1	< 1
6/30/2023	18.57	0.39	0.05	4124.6	5	7	< 2	< 2
7/31/2023	10.5	0.55	0.08	2526.3	6	12	2	2
8/31/2023	17.46	0.11	0.08	4109.4	6	19	2	2
9/30/2023	14.06	0.17	0.12	3412.9	6	14	< 1	< 1

WET - Effluent

Parameter	LC50 Acute Menidia	C-NOEC Chronic Menidia	Noel Static 1Hr Fert. Chronic Arbacia	Cadmium	Copper	Lead	Nickel	Zinc
	Daily Min	Daily Min	Monthly Ave Min	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max
Units	%	%	%	mg/L	mg/L	mg/L	mg/L	mg/L
Effluent Limit	100	18	18	Report	Report	Report	Report	Report
Minimum	100	50	50	0.0003	0.0037	0.0003	0.002	0.008
Maximum	100	100	100	0.0003	0.0076	0.001	0.025	0.055
No. of Violations	0	0	0	N/A	N/A	N/A	N/A	N/A
12/31/2018	100	100	100	<0.0001	0.0054	<0.0003	0.003	0.025
3/31/2019	100	100	100	<0.0001	0.0067	<0.0003	0.002	0.03
6/30/2019	100	100	50	<0.0001	0.0065	<0.0003	0.002	0.028
9/30/2019	100	100	100	<0.0001	0.0066	<0.0003	0.003	0.055
12/31/2019	100	100	100	<0.0001	0.0052	<0.0003	0.002	0.022
3/31/2020	100	100	50	<0.0001	0.0041	0.0004	<0.001	0.025
6/30/2020	100	100	50	<0.0001	0.0043	0.0003	0.002	0.022
9/30/2020	100	100	100	<0.0001	0.0076	0.001	0.002	0.02
12/31/2020	100	100	100	<0.0001	0.0073	0.0003	0.005	0.033
3/31/2021	100	50	100	<0.0001	0.0055	<0.0003	0.002	0.028
6/30/2021	100	50	100	<0.0001	0.0042	<0.0003	0.002	0.012
9/30/2021	100	100	100	0.0003	0.0037	0.0009	0.025	0.022
12/31/2021	100	100	100	<0.0001	0.0066	0.0007	0.003	0.019
3/31/2022	100	100	100	<0.0001	0.0049	0.0004	0.003	0.035
6/30/2022	100	100	100	<0.0001	0.0058	0.0006	0.003	0.022
9/30/2022	100	100	50	<0.0001	0.0056	0.0005	0.003	0.016
12/31/2022	100	100	100	<0.0001	0.0044	<0.0005	0.003	0.015
3/31/2023	100	100	100	<0.0001	0.0051	<0.0005	0.002	0.021
6/30/2023	100	50	100	<0.0001	0.0042	<0.0003	0.002	0.008

WET - Ambient

Parameter	Ammonia	pH	Salinity
	Daily Max	Daily Max	Daily Max
Units	mg/L	S.U.	ppt
Minimum	**0.05**	**7.58**	**23.5**
Maximum	**0.52**	**8.07**	**30.2**
Median	**0.19**	**7.74**	**27.8**
12/31/2018	0.13	7.58	24.3
3/31/2019	0.28	7.63	24.5
6/30/2019	<0.1	7.71	26.7
9/30/2019	0.18	7.73	30.2
12/31/2019	0.52	7.71	27.5
3/31/2020	0.05	8.07	27.8
6/30/2020	0.11	7.74	29.5
9/30/2020			
12/31/2020	0.18	7.81	27.5
3/31/2021	0.42	7.99	25.2
6/30/2021	0.11	7.71	28
9/30/2021	0.21	7.6	23.5
12/31/2021	0.31	7.74	29.5
3/31/2022	<0.1	7.97	25.8
6/30/2022	<0.1	7.66	28.5
9/30/2022	0.2	7.72	27.8
12/31/2022	0.38	7.78	27.9
3/31/2023	0.14	7.77	28.7
6/30/2023	<0.1	7.81	28.1

A reasonable potential analysis is completed using a single set of critical conditions for flow and pollutant concentration that will ensure the protection of water quality standards. To determine the critical condition of the effluent, EPA projects an upper bound of the effluent concentration based on the observed monitoring data and a selected probability basis. EPA generally applies the quantitative approach found in Appendix E of EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD)[1] to determine the upper bound of the effluent data. This methodology accounts for effluent variability based on the size of the dataset and the occurrence of non-detects (i.e., samples results in which a parameter is not detected above laboratory detection limits). For datasets of 10 or more samples, EPA uses the upper bound effluent concentration at the 95th percentile of the dataset. For datasets of less than 10 samples, EPA uses the maximum value of the dataset.

For marine discharges, EPA uses the dilution factor, the calculated upper bound of the effluent data and a concentration representative of the parameter in the receiving water outside of the zone of influence of the discharge to project the downstream concentration after complete mixing using the following simple mass-balance equation:

$$C_s(DF - 1) + C_e = C_d(DF)$$

Where:

C_s = upstream concentration (median value of available ambient data)
C_e = effluent concentration (95th percentile or maximum of effluent concentration)
C_d = downstream concentration
DF = dilution factor (See Dilution Factor section of Fact Sheet)

Solving for the downstream concentration results in:

$$C_d = \frac{C_s(DF - 1) + C_e}{DF}$$

When both the downstream concentration (C_d) and the effluent concentration (C_e) exceed the applicable criterion, there is reasonable potential for the discharge to cause, or contribute to an excursion above the water quality standard. *See* 40 C.F.R. § 122.44(d). When EPA determines that a discharge causes, has the reasonable potential to cause, or contribute to such an excursion, the permit must contain WQBELs for the parameter. *See* 40 C.F.R. § 122.44(d)(1)(iii). Limits are calculated by using the criterion as the downstream concentration

(C_d) and rearranging the mass balance equation to solve for the effluent concentration (C_e). Refer to the pollutant-specific section of the Fact Sheet for a discussion of these calculations, any assumptions that must be made and other relevant permit requirements.

For any pollutant(s) with an existing WQBEL, EPA notes that the analysis described in 40 CFR § 122.44(d)(1)(i) has already been conducted in a previous permitting action demonstrating that there is reasonable potential to cause or contribute to an excursion of WQS. Given that the permit already contains a WQBEL based on the prior analysis and the pollutant(s) continue to be discharged from the facility, EPA has determined that there is still reasonable potential for the discharge of this pollutant(s) to cause or contribute to an excursion of WQS. Therefore, the WQBEL will be carried forward unless it is determined that a more stringent WQBEL is necessary to continue to protect WQS or that a less stringent WQBEL is allowable based on anti-backsliding regulations at CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l). For these pollutant(s), if any, the mass balance calculation is not used to determine whether there is reasonable potential to cause or contribute to an excursion of WQS, but rather is used to determine whether the existing limit needs to be more stringent in order to continue to protect WQS.

From a technical standpoint, when a pollutant is already being controlled as a result of a previously established WQBEL, EPA has determined that it is not appropriate to use new effluent data to reevaluate the need for the existing limit because the reasonable potential to cause or contribute to an excursion of WQS for the uncontrolled discharge was already established in a previous permit. If EPA were to conduct such an evaluation and find no reasonable potential for the controlled discharge to cause or contribute to an excursion of WQS, that finding could be interpreted to suggest that the effluent limit should be removed. However, the new permit without the effluent limit would imply that existing controls are unnecessary, that controls could be removed and then the pollutant concentration could rise to a level where there is, once again, reasonable potential for the discharge to cause or contribute to an excursion of WQS. This could result in an illogical cycle of applying and removing pollutant controls with each permit reissuance. EPA's technical approach on this issue is in keeping with the Act generally and the NPDES regulations specifically, which reflect a precautionary approach to controlling pollutant discharges.

The table below presents the reasonable potential calculations and, if applicable, the calculation of the limits required in the permit. Refer to the pollutant-specific section of the Fact Sheet for a detailed discussion of these calculations, any assumptions that were made and the resulting permit requirements.

Pollutant	Conc. Units	DF	C_s [1]	C_e [2]		C_d		Criteria		Reasonable Potential		Limits	
				Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic
Cadmium	µg/L	12.6	0	0.0	0.0	0.0	0.0	33.2	7.9	N	N	N/A	N/A
Copper	µg/L	12.6	0	33.0	22.0	2.6	1.7	5.8	3.7	**Y**	**Y**	**33**	**22**
Lead	µg/L	12.6	0	1581.1	48.3	125.2	3.8	220.8	8.5	N	**Y**	N/A	**48.3**
Nickel	µg/L	12.6	0	7.6	7.6	0.6	0.6	74.7	8.3	N	N	N/A	N/A
Zinc	µg/L	12.6	0	44.2	44.2	3.5	3.5	95.1	85.6	N	N	N/A	N/A
Ammonia (Warm)	mg/L	12.6	0.11	19.0	19.0	1.6	1.6	9.8	1.5	N	**Y**	N/A	**17.4**
Ammonia (Cold)	mg/L	12.6	0.23	19.1	19.1	1.7	1.7	42.8	6.5	N	N	N/A	N/A

[1]Median conc. for the receiving water outside of the zone of influence of the facility's discharge taken from the WET testing data during the review period (see Appendix A).

[2]Values represent the 95th percentile (for n ≥ 10) or maximum (for n < 10) concentrations from the DMR data and/or WET testing data during the review period (see Appendix A). If the pollutant already has a limit (for either acute or chronic conditions), the value represents the existing limit.

Evaluating the Dilution of Fall River Wastewater Treatment Plant Effluent, Treatment Efficiency, and Potential Microbial Impacts on Shellfish Growing Areas in Mount Hope Bay, Massachusetts and Rhode Island

Report of Findings from the December 3 – 10, 2013 Study Period

FDA Technical Assistance and Training Project

Reported by:
U.S. Food and Drug Administration
Center for Food Safety and Applied Nutrition
Office of Food Safety
Shellfish and Aquaculture Policy Branch
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1.0 INTRODUCTION

1.1 Executive Summary

The U.S. Food and Drug Administration (FDA), Massachusetts Division of Marine Fisheries (MADMF), and the Rhode Island Department of Environmental Management (RIDEM) conducted a comprehensive study in Mount Hope Bay (MHB), covering waters both in Massachusetts and Rhode Island, during December 3 – 6, 2013. Six (6) cages with attached fluorometers and filled with hard shell clams and oysters were deployed at various locations (stations) along the anticipated path of the Fall River wastewater treatment plant (WWTP) effluent discharge to assess dilution of dye-tagged effluent with the indicator bacteria and virus levels in shellfish. Rhodamine WT tracer dye was injected into the Fall River WWTP, located in Massachusetts, for 12.4 hours during a half tidal cycle and was tracked in the growing areas on three (3) consecutive days. Boat-towed tracking fluorometers were used to measure the dye-tagged effluent throughout Mount Hope Bay and the lower -Taunton River, the Lee, Cole, Kickemuit, and upper Sakonnet Rivers. Microbiological analyses of fecal coliforms (FC), male-specific coliphage (MSC), norovirus (NoV) genogroup I (GI) and genogroup II (GII), and adenovirus (AdV) were conducted on sentinel shellfish from each cage as well as influent and effluent samples collected from the Fall River WWTP. The results of the effluent dye-dilution study and microbiological analyses of shellfish and WWTP samples are presented in this report.

1.2 Study Objectives

The study objectives were to:

(1) Assess the dilution, time of travel, and dispersion of effluent discharged from the Fall River WWTP in Mount Hope Bay and the lower -Taunton River, the Lee, Cole, Kickemuit, and upper Sakonnet Rivers;

(2) Determine the bacterial and viral loads in raw, untreated wastewater and in pre-disinfected effluent and the efficiency of the WWTP, which uses a conventional secondary treatment process and chlorine disinfection to reduce these loads before discharge;

(3) Analyze the findings from the microbial testing on the shellfish that were deployed in Mount Hope Bay for approximately one month; and

(3) Provide guidance to MADMF and RIDEM regarding the sizing of the prohibited area around the WWTP outfall based on dilution of effluent and conditional management of the growing areas.

1.3 Study Area Background

In 1987, a study conducted by the FDA concluded that the combined sewer overflows (CSOs) discharging into the Taunton River contributed the highest loadings of fecal contaminants to Mount Hope Bay masking all other fecal sources. Prior to the extensive infrastructure projects undertaken by the City of Fall River, CSO discharges occurred during both dry and wet weather contributing up to 98% of dry-weather coliform loading and 96% of wet-weather coliform loading to Mount Hope Bay (Rippey and Watkins, 1987; Dixon *et al.*1990). A CSO Abatement Plan was established through a Federal Court Order that included the expansion of the Regional Wastewater Treatment Plant primary treatment capacity to 106-million gallons per day,

construction of an 85-million gallon 4.8 km underground rock tunnel with surface piping, and partial sewer separation of selected CSO areas along the waterfront. These improvements have significantly reduced the volume of CSO discharge into the rivers and the bay; since 1989 dry weather discharges have been completely eliminated. Although the tunnel receives flow from six (6) of the CSOs located in the southern portion of the city, wet-weather CSO discharges have not been completely eliminated. A more complete description of the Fall River WWTP and collection system, including CSOs, is provided in Section 1.4-1.5 (below).

The bay and rivers have several different classification zones in Rhode Island and Massachusetts, as shown in Appendix 2, Figure 1. A prohibited zone is currently established around the Fall River WWTP, both in RI and MA waters and also shown in Figure 1. There are no areas designated as approved (permitted to harvest shellfish for direct market distribution year-round) in Mount Hope Bay in RI or MA waters. Temporary closures for conditionally approved harvest areas are based on closure triggers (rainfall amount in a specified time period) which reflect conditions that exist when shellstock are likely unsafe for human consumption. A timeline of the complete history (1946-present) of the growing area status for the Kickemuit River and Mount Hope Bay is provided in the Total Maximum Daily Load report for Mount Hope Bay and Kickemuit River (RIDEM, 2010).

Currently, the RIDEM manages Shellfish Growing Area 17 (GA17), which encompasses the entire Rhode Island portion of Mount Hope Bay, as well as the majority of the saltwater portion of the Kickemuit River that is considered Growing Area 5 (GA5) as shown on Figure 1. Both GA17 and GA5 are managed as conditionally approved; these areas are closed for a period of seven (7) days following a wet weather event (rainfall and/or equivalent snow melt) totaling 0.5" or greater in a 24 hour period. Water samples are collected monthly when the conditional areas are in the open status at the ten (10) stations in the Kickemuit River (GA5), and sixteen (16) stations in Mt. Hope Bay (GA17).

The present management plan for the conditionally approved growing areas in Mount Hope Bay in Massachusetts waters (referred by MADMF as MHB:1) is a closure of the MHB:1 area once a level of 0.75 inches of precipitation is reached in a 24-hour period. The closure is for five (5) days, with shellfish harvesting allowed on the sixth day (unless another event and occurs within the five (5) day time period). If two (2) inches or greater of precipitation occurs within a 24-hour period the growing area is closed and reopens based on water monitoring sample results that meet NSSP criteria. Growing Area MHB:1 is open February 1st through the end of November and is closed during December and January annually.

The rainfall closure trigger for the Lees River (MHB:3) and Coles River (MHB:4) is 0.3" of rainfall in a 24-hour period. Consistent with the Mount Hope Bay closure the Coles and Lee Rivers both close for five (5) days with shellfish harvesting allowed on the sixth day (unless another event and occurs within the five (5) day time period). Likewise, if two (2) inches or greater precipitation occurs within a 24-hour period, the MHB:3 and MHB:4 growing areas are closed and reopen based on water monitoring sample results that meet NSSP criteria. The MHB:3 and MHB:4 growing areas are open February 1st through the end of November and are closed during December and January annually.

The MADMF has an established memorandum of understanding (MOU) with both the Fall River and the Somerset WWTPs in which the MADMF will be notified by the WWTPs during upset conditions (Appendix 3). As stated in the MOU, "Marine Fisheries and the operators of the City of Fall River Wastewater Treatment Plant and collection system agree to cooperate in protecting the quality of shellfish growing waters in Mount Hope Bay that may potentially be adversely impacted by the City of Fall River Wastewater Treatment Facility and combined sewer outfalls (CSO's) sanitary wastewater discharges or bypasses."

The "Restricted" areas in the Taunton River are used exclusively for contaminated shellfish relays (transplants). They are classified "Restricted" because they do not meet "Approved" or "Conditionally Approved" classification standards. The Taunton River has been a source of shellfish for the contaminated relay program that benefits many coastal communities. Over the last three (3) or four (4) years, 13-16 communities have relayed as much as 15,000 bushels of quahogs from the Taunton River to municipally controlled shellfish beds. Most of the relay harvesting occurs north of the Braga Bridge and occurs from approximately April 15th through June 30th. It is expected that approximately 6,600 bushels of quahogs annually will be relayed into nine (9) Buzzards Bay communities.

Prior to the study, a bypass in secondary treatment occurred on November 27, 2013 with a total secondary bypass amount of 27.1 million gallons (MG) over a duration of 19 hours. Secondary bypasses typically receive disinfection, but as previously noted, the effectiveness on reducing viruses may be low. The Mount Hope Bay growing areas in Massachusetts closed on November 27, 2013 and re-opened December 1, 2013. During the study period (December 3-10, 2013) a secondary bypass of 0.74 MG occurred approximately three (3) hours on December 7, 2013. The Massachusetts growing areas were open during the study period. The Mount Hope Bay and Kickemuit growing areas were closed in Rhode Island December 1-3, 2013 and were open December 4-7, 2013 but were closed December 8, 2013 – January 13, 2014. A detailed analysis to determine a volume level of bypass that could result in an impact to the MA and RI growing areas is presented in Section 3.9.

1.4 Description of the Fall River WWTP

The Fall River WWTP is located at 1979 Bay Street in Fall River, MA. The plant was commissioned in 1948 and completed upgrades to the plant in the 1980's. The upgrades included updating the plant with secondary treatment capabilities (Force, 2013). The major pump stations were also updated (Force, 2013). The treatment plant expanded its flow capacity from 50 MGD to 106 MGD between 1997 and 2000. The average daily flow at the plant is 24.8 million gallons per day (MGD). The peak hourly flow under normal conditions is 27 MGD, while under peak wet weather flow the facility is capable of handling 106 MGD. It should be noted that the design capacity of secondary treatment is 50 MGD, at which point, when flows exceed 50 MGD the plant will initiate a bypass in secondary treatment. The design capacity of primary treatment is 56 MGD, at which point, when flows exceed 56 MGD the plant will initiate a bypass in primary treatment. In both cases, bypasses receive chlorination.

The permitted flow is 30.9 MGD per the National Pollution Discharge Elimination System (NPDES) permit No. MA0100382. The treatment processes at the facility include several

phases. The first phase is preliminary and primary treatment by way of influent bar screening, removal of grit, and settlement of suspended solids. The second phase is the transportation to secondary treatment in which the primary effluent flows by way of gravity to a wet well. The third phase is secondary treatment where oxygenation of the flow occurs, leading to secondary clarifiers settling the sludge from the mixed liquor; finally, the effluent is returned to the chlorine tanks for chlorination and dechlorination. The fourth phase involves sludge dewatering and incineration of the sludge. The last phase includes chlorination and dechlorination of the secondary effluent, which is then discharge into Mount Hope Bay via the main outfall pipe which is 66" in diameter and located 600' offshore. During extreme peak flows, there is a second outfall that discharges at the shoreline after receiving primary treatment and disinfection, which helps assure that the WWTP will not flood. There are also several alarms at the plant for high water level, clarifier overflow, and loss of power, along with at least three (3) employees working at the facility 24/7.

1.5 Description of Fall River Combined Sewer Overflows (CSOs)

The Fall River area contains over 200 miles of sewers which date back to the mid 1800's. For many years, wastewater and storm water were diverted into Mount Hope Bay through many different outfalls near the shore. A CSO abatement program was developed to minimize the amount of untreated water discharging into the bay. The first phase of development included the majority of the sewer outfalls being converted to CSO outfalls with construction of the Fall River WWTP between the years of 1948-1952 (Otoski and Beaton, 2012). Upgrades and construction continued throughout the late 1900's. The next phase included a 3-mile long 20' diameter storage tunnel up to 100' deep with 9 drop shaft diversion structures to convey the combined sewage to be directed to the tunnel and sent to the WWTP for treatment. The tunnel has a 38-million-gallon storage capacity. Some areas will still experience wet weather overflows and to address this, some pumping stations have been upgraded to add screening and disinfection facilities to accommodate wet weather flows. Construction and upgrades are planned through 2018.

1.6 General Description of Study Design

Prior to the main dye study at the Fall River WWTP from December 4 – 6, 2013, a preliminary study was conducted on December 3, 2013 to gather background fluorescence data in Mount Hope Bay before the dye injection. Drogues were deployed on December 3, 2013 to determine the timing of the turning of the tides and current movement, as well as the velocity of flow near a few CSO outfalls to determine the time of travel to conditionally approved areas in the event of an overflow during the study period and for management considerations during future events.

Eight (8) stations equipped with WET Labs fluorometers (WET Labs, Inc., Philomath, OR) to measure dye concentrations and Star-Oddi CTDs (Star-Oddi, Ltd, Iceland) to monitor conductivity, temperature, and depth were deployed at strategic locations in the bay. CTDs were deployed with stations 2 – 5. Of the eight (8) stations, one (1) station (station 4) was unable to collect any data during the study period due to a fluorometer malfunction. Figure 1 shows a map of the study area with the eight (8) station locations, the Fall River and Somerset WWTPs, important profile locations, as well as the shellfish growing area classifications for MA and RI.

The equipment remained at the stations until December 10, 2013 to determine the build-up and residence time of dye tagged effluent within Mount Hope Bay

The dye injection occurred over a half tidal cycle from 1:30 AM on December 4, 2013 to 2:25 PM on December 4, 2013 and was tracked during daylight hours via boat for three (3) days. Boat tracking was conducted find peak dye concentrations as well as to determine the spatial extent of dye dispersion throughout the study area. On the third day (December 6, 2013) of boat tracking, a remaining mass of dye tagged effluent was observed along the shoreline and near station 1, though most of the dye was measured at very low levels. It was determined that further tracking was unnecessary as dye levels were low; however, the deployed fluorometers were not retrieved allowing data to be collected for an additional four (4) days.

During the study period, the FDA collected samples of influent, and post-chlorination treated effluent from the WWTP. Samples were analyzed for FC, MSC, AdV, and NoV GI and GII. These analyses were performed to assess the efficiency of the WWTP's treatment process at removing viruses and to better inform the FDA's recommendations for sizing a prohibited area around the WWTP outfall.

2.0 METHODS -

See **Appendix 1** for detailed methods used in the study.

3.0 RESULTS

3.1 Drogue Study and Preliminary Dye Study

Four (4) drogues were released shortly after the turning of the tide from flood to ebb on December 3, 2013. Two (2) drogues were released approximately 0.6 miles north of the Cove Street CSO outfall and the two (2) drogues were released just north of the Somerset WWTP near the mouth of the Taunton River and in proximity to the City Pier CSO outfall. The drogues were pushed by the tide and currents and moved south with the ebbing tide toward the mouth of the river. The results of the drogue study indicated that tidal influence was the predominant factor and that the effluent could travel a good distance in a short amount of time. The drogue information, in conjunction with the time of the tide, was helpful in determining the timing of the dye injection.

3.2 Weather Conditions

According to rainfall data used by the MADMF for classification purposes, a total of 0.03 inches of rain was recorded from December 4 – 6, 2013 during the Fall River comprehensive study period. On December 2, 2013, 0.62 inches of rain were recorded approximately two (2) days prior to the dye injection; however, plant flows were below average during the dye injection period. A rainfall of .48 inches was recorded one day after the last day of dye tracking on December 7, 2013. Wind was not a significant factor as wind speeds were relatively low during the dye injection period and boat tracking days. Therefore, the dye was not influenced by the wind, but was influenced by the high tidal range (approximately 6 – 7 feet) in the area and strong currents. Maximum wind speeds

and directions were as follows: 8 mph WNW on December 4th, 15 mph ESE on December 5th, and 12 mph NNW on December 6th. Wind speeds remained relatively stable during the study period.

3.3 Dye Injection

An 80-gallon dye mixture was prepared at a 1:1 ratio of Rhodamine WT dye to de-ionized water to facilitate the pumping of dye. A Masterflex model 7553-20 variable speed peristaltic pump (Cole-Palmer Instrument Co.) with Masterflex Tygon L/S-15 tubing was used to withdraw the tracer dye solution from a large plastic container. A pump head size 7015 was used with a constant pumping rate of 385 ml/min which was maintained at about 223 revolutions/minute (rpm) head speed. The dye mixture was fed continuously into the final effluent following the chlorine treatment for approximately a 12.9-hour injection period. The initial concentration of the dye in the effluent (936 ppb) was determined using the WWTP's flow average over the course of the dye injection period (14.70 MGD).

3.4 Travel Time

As previously described in section 3.1 of this report, a preliminary drogue study was conducted to determine tidal movement and to estimate the travel time from the CSOs located in the Taunton River to the shellfish growing areas. Drogues were deployed adjacent to several CSOs as seen in the table in Figure 2. Drogues locations were recorded with the FDA's mobile GIS system (RAFT-MAP), which plotted the GPS positions of the drogues over time. Based on the drogue distance and time of travel, calculated velocities for the drogues were determined. The maximum velocities of the drogues were used for each specified CSO station as a worst-case scenario. These numbers were used to calculate an average velocity of 0.62 mph for the drogues in the study area. The RIDEM was particularly interested in finding out how long it would take for a CSO discharge to reach the nearest growing area in RI. To determine this, the FDA used the Mt. Hope CSO outfall as it is the closest outfall to the RI conditional area located approximately 1.75 miles away. It was determined that it would take 2 hours and 48 minutes for the discharge to reach the growing area from the Mt. Hope CSO outfall. It was determined that this would be a worst-case scenario; for a CSO to overflow during an ebb tide, indicating that the response time to such an event would be less than 3 hours.

The time of travel from the WWTP to the conditional areas was also determined using the dye tracking results from the December 4, 2013 study. The time of travel was calculated using the mobile cache results for boat tracking that were then synched with ArcGIS desktop to analyze the data further and create time of travel maps as shown in Figures 3. The earliest time that dye was detected in the MA conditionally approved area was 2:00 PM, approximately 13 hours after the start of the injection and six (6) hours after the beginning of ebb tide. Tracking results show that in the MA conditional area, the minimum dilution detected was 1,254:1, which occurred at 2:14 PM approximately 6 hours and 14 minutes after the start of ebb tide and resulted in a maximum concentration of 0.75 ppb. The earliest any dilutions <1,000:1 were detected in RI waters was at 2:21 PM, or approximately 6 hours and 21 minutes after the start of ebb tide, in surface waters encroaching on a portion of the eastern corner of the conditional area. It should be noted that a shorter time of travel to the conditional areas would likely occur relative to

tracking starting later in the ebb tide when current velocities are highest and overall time of travel may be more in-line with drogue study results.

3.5 Dye Readings by Tracking Fluorometers

Figure 4 represents the accumulated 5-point moving average concentration values and the corresponding dilution levels for the three (3) days of tracking during the study period (December 4 – 6, 2013) as determined by the WET Labs boat tracking fluorometer. The raw data used to create these figures can be provided in Excel worksheets upon request.

On the first day of tracking (December 4th), the leading edge of dye to the north was detected approximately four (4) miles from the Fall River WWTP, in the vicinity of the Somerset WWTP. Dye was also detected as far west as Spar Island and approximately five (5) miles south, near the Route 114 Bridge. Dye was detected around each station except station 7 - RI West, which is west of Spar Island (Figure 5). The minimum dilution found via the boat tracking fluorometer on December 4th was 11.63:1, equivalent to a 5-point moving average concentration of 80.51 ppb. This level was found within several feet of the Fall River WWTP outfall pipe location. Several distinct dye plumes were observed along the length of the outfall pipe indicating that the outfall pipe has several ruptures. Tracking on December 4, 2013 shows that in the RI conditional area, maximum concentrations of 5.28 ppb (177:1 dilution) were found in surface waters in a localized area around station 3. The overall average concentration found in the RI conditional area during the first day of tracking was 0.16 ppb (5,580:1 dilution). In the MA conditional area, a maximum concentration of 0.75 ppb (1,254:1 dilution) was found in the southern corner of the MA conditional area closest to the outfall. The average concentration in the MA conditional area was approximately 0.01 ppb (near the limit of detectability by the tracking fluorometers) representing >93,600:1 dilution. There were no dilution values found that were <1,000:1 during the first day of tracking in the MA conditional area, however, it should be noted that tracking on the flood tide just after end of the dye injection had to be cut short due to loss of daylight. As dilution less than a 1,000:1 occurred on the ebb tide from Station 4 and extending over a half mile west of Station 4 (refer to Figure 5) during ebb tide, it is conceivable that dilutions less than 1,000:1 could have occurred in the conditional area closest to Station 4 during flood tide when tidal currents could push the dye tagged effluent towards the conditional area Figures 5-7 show the dilution levels for the three days of tracking the dye tagged effluent plume.

For December 5, 2013, dye tracking results show that in the RI conditional area a maximum concentration of 0.78 ppb was found representing a dilution of 1,204:1 (Figure 6). The average concentration in the RI conditional area was 0.09 ppb representing an average dilution of 10,400:1. There were also no dilutions found that were <1,000:1 in the RI growing area. For the MA conditional area, the maximum concentration of 0.98 ppb was found representing a dilution of 959:1. The average concentration in the growing area was 0.08 ppb representing an average dilution of 11,700:1. Only a few <1,000:1 dilution points were found, with the earliest reaching the growing area at 11:14 AM on December 5th, which is approximately 21 hours after the dye injection into the bay ended. Compared to the first day of tracking, the MA conditional area showed higher concentrations and a larger extent of dye in the growing area. Much of the dye did not reach the MA growing areas on the initial ebb tide tracking, but had reached the growing area on subsequent flood tides. However, it should be noted that the second day of tracking

occurred on the second flood tide after the termination of the dye injection, had tracking been performed on the first flood tide after the injection (during the night), higher concentrations similar to the concentrations found in the RI growing area on the first day would be expected in the MA growing area. Overall, dye levels generally decreased in most areas during the second day of tracking. The minimum dilution value detected was 428:1, equivalent to a 5-point moving average concentration of 2.18 ppb, which was located approximately 0.4 miles south of the Fall River WWTP in the prohibited area. Dye was found just north of the Somerset WWTP and some dye did reach the Route 114 Bridge. Dye was detected at all stations and even trace amounts of dye were found west of station 7 - RI West heading toward the Kickemuit River. Some dye was detected in the conditionally approved growing area in MA waters just northwest of station 4. Due to the extent of remaining dye, further tracking was needed the following day.

Dye concentration levels decreased significantly the third day of boat tracking on December 6, 2013 (Figure 7). The minimum dilution value detected was 1,023:1, equivalent to a 5-point moving average concentration of 0.91 ppb, which was located in the vicinity of Station 1. Low levels of dye still reached as far north as the Somerset WWTP, but did not reach as far south as the previous day. Little to no dye was detected at stations 2, 3, and Station 8 - Middle. Low levels of dye were detected in the conditionally approved area in MA waters, with the lowest level of dilution in this area being 4,434:1. It was determined that the dye tagged effluent in surface waters had dispersed and diluted significantly and therefore further tracking was not needed; however, the moored fluorometers were left in the growing area to determine the overall residence time within Mount Hope Bay and to determine when the dye tagged effluent was completely flushed out of the bay.

Figure 8 shows the accumulated dilutions and shellfish classification areas for the MA portion of the study area. Figure 9 shows the accumulated dilutions and shellfish classification areas for the RI study area. Figure 10 shows the accumulated concentration and dilution contours. Accumulated dye values from the three (3) study days tracking data show that only a few dilution values were found that were less than 1,000:1 in the conditionally approved growing areas as seen in Figures 8-10, or the value the FDA recommends in an effort to mitigate the risk of contaminating shellfish with viruses as described in Section 2.1 of Appendix 1 and as recommended in the NSSP MO Dilution Guidance. However, in the event of a CSO discharge or bypass event from the WWTP, a 1,000:1 dilution is not adequate and a closure would need to be implemented soon after the event given the short time of travel.

3.6 Dye Readings at Stations

Dye readings recorded by the station WET Labs fluorometers and boat tracking fluorometers within a 200-meter radius of each station are shown in Figures 11 - 17. The maximum dye concentration values are plotted for both the submersible readings and the boat tracking readings. Along with the dye concentrations in each figure are the associated dilution levels for the Fall River study. The WET Labs fluorometer at Station 4 malfunctioned and did not collect any dye data, so no results are shown for that station. Tidal height in feet is plotted based on the Fall River NOAA buoy that is located in the study area. The CTDs at most of the stations malfunctioned and did not record depth data, therefore, for consistency, we determined that the NOAA buoy nearby represented the tidal height data for each station.

Continual dye readings from the submersible fluorometers are plotted in Figures 11 – 17 showing the data throughout the entire study period. Accumulated peak one (1) hour average concentrations for each 12-hour period of the study are also plotted in Figures 11 – 17. All stations, except for station 6 – Outfall, represented accurate steady state dilution levels via the superposition method. Station 6 - Outfall was influenced on December 6, 2013 at approximately 2:00 AM when an accidental release of ~1 gallon of dye which was reflected on the Outfall station for a relatively short amount of time. All other stations did not reflect this dye release. Maximum and average steady state concentrations were plotted for each 12-hour period for comparison. However, the FDA has determined the peak one (1) hour average concentrations are more useful in determining the steady state values as they more accurately reflect the time frame needed for shellfish to accumulate pathogens when exposed to effluent.

The dye readings recorded by the boat tracking fluorometers at the surface within a 200-meter radius of each station, along with the maximum concentrations for boat tracking, are also shown in the Figures 11-1. All stations, except for station 8 – Middle, detected higher maximum concentration values with the boat tracking fluorometer as opposed to the submersible fluorometer. The Fall River WWTP outfall is in waters approximately fifteen (15) feet deep at Mean Low Low Water. Due to a shallow depth and the absence of significant density stratification produces a high buoyant effluent plume that reaches the surface quickly. The lighter density effluent reaching the surfaced produce higher concentrations in surface waters throughout the bay compared to fluorometers located at Stations at a lower depth. Stations 1 – 5 were in depths of greater than 20 feet and station 7 -RI West was approximately 13 – 15 feet.

3.7 Profiles of Dye at Depth

Many profiles were conducted during the Fall River study using the SeaBird CTD interfaced with a WET Labs tracking fluorometer (WET Labs FLRHRT 2487). Figures 18 – 21 show dye data from the profile fluorometer at stations 1-3, 5, 6, and two (2) in the Taunton River where profiles were recorded in the plume of dye along with the salinity, temperature, and depth for that given profile. The depths at each station varied as well as the dye concentrations at the surface and bottom depths. Dye concentrations at station 1 were as high as 10 ppb at the surface and at a depth of 4.5 feet dropped to zero down to the total depth of 23 feet (Figure 18). Dye concentrations at station 2 were as high as 4.2 ppb at the surface and at a depth of 4 feet dropped to zero down to the total depth of 22 feet (Figure 18). Salinity and temperature generally increased slightly with depth at stations 1 and 2 and are also shown in Figure 18.

Bottom depths at station 3 reached up to 25 feet. Two (2) profiles were taken near station 3, of which, one (1) did not record any dye and the other recorded low levels of dye (0.3 ppb) for only two (2) seconds, which was near the surface (Figure 19). This could have been due to the fluorometer being above the water, so station 3 results are inconclusive. Station 4 profiling recorded depths up to 25 feet. Station 4 was the closest station to the outfall and showed dye concentrations at the surface as high as 5 ppb and at 3 feet in depth concentrations dropped to zero (Figure 19). Salinity and temperature generally increased slightly with depth at stations 3 and 4 and are also shown in Figure 19.

Station 5 had profiles as deep as 28 feet which were the deepest of any station. Comparable with the other stations, no dye was found near the bottom while dye readings were almost 19 ppb at the surface (Figure 20). Bottom depths near the outfall (station 6) ranged from 6 – 10 feet, which was the shallowest of any stations. Dye recordings at the very bottom were as high as 13 ppb while dye near the surface was as high as 32 ppb (Figure 20). Salinity and temperature generally increased slightly with depth at stations 5 and 6 and are also shown in Figure 20. No profiles were taken at stations 7 & 8.

Several profiles were taken in the Taunton River near the Somerset WWTP, consistent with the other stations; dye concentrations were higher near the surface than at depth (Figure 21). Dye was not detected by the profiling fluorometer at depths greater than fifteen (15) feet at any of the stations although low levels of dye were detected by the submersible fluorometers at the bottom depths at most stations. This is likely because dye being slightly heavier than seawater may have settled to lower depths in the water column during periods of slack tides as the study progressed over several tidal cycles.

3.8 Projections for Different Wastewater Treatment Plant Flows

The dye injection was conducted on December 4, 2013 during a low wastewater treatment plant flow period. The average flow recorded during the dye injection period was 14.70 MGD, compared to a normal average daily flow of 24.8 MGD. The low flows are likely due to the lack of significant rain during the week leading up to the dye injection as outlined in section 3.2. Therefore, the calculated dilution values were higher than if the plant were operating under higher flows. As indicated in section 1.5 above, the peak hourly flow under normal conditions is 27 MGD, while under peak wet weather flow the facility is capable of handling 106 MGD. The design capacity of secondary treatment is 50 MGD, at which point, when flows exceed 50 MGD, the plant will initiate a bypass in secondary treatment. The design capacity of primary treatment is 56 MGD, at which point, when flows exceed 56 MGD, the plant will initiate a bypass in primary treatment. In both cases, the bypasses receive chlorination. Thus, in consideration of the necessary changes in treatment that occurs when the plant reaches 50 MGD, that may degrade the effluent quality with respect to the reduction of enteric pathogens (viruses), 50 MGD flow projections were modeled empirically and displayed spatially in ArcGIS and are presented in Figures 23 – 25. Figure 22 shows the initial dilution (minimum dilution 11.63) within 100 meters of the outfall during the 14.70 MGD flow. It should be noted that minimum dilution within 100 meters of the outfall may be lower at higher WWTP flows. The low dilution may be a result of the fragmented outfall pipe in which multiple boils were observed.

Figure 23 shows the accumulated dye levels for a projected flow of 50 MGD. The 50 MGD projection is approximately twice the flow of the average daily flow at the plant and is capable of reaching these flows during a significant wet weather event. The less than 1,000:1 dilution values for the 14.70 MGD are shown in Figure 23 as well as the projected less than 1,000:1 for the 50 MGD flow. With the 14.70 MGD plant flows only a few less than 1,000:1 points are shown in both the RI and MA conditionally approved areas, whereas with the 50 MGD projected flow there could be many less than 1,000:1 points in both areas, especially in the southeastern portion of the growing areas as is shown in Figures 24-25. The findings support the need for

conditionally approved classifications – not only for rainfall conditions but also WWTP operating conditions.

3.9 Short Term Failure/Bypasses at the Fall River WWTP

As shown in Figure 26, daily fluctuations in flow can be large. During 2013, there were 58 days in which the WWTP experienced a bypass (secondary or both primary and secondary) as shown in Table 1. In 2013, the maximum bypass recorded was 33.7 MG and the longest duration was >24 hours (Table 1). The total accumulated bypass amount in 2013 was 307 MG and the total accumulated hours of bypass was 418 hours (Table 1). During 2014, there were 50 days in which the WWTP experienced a bypass (secondary or both primary and secondary) as shown in Table 2. In 2014, the maximum bypass recorded was 50.3 MG and the longest duration was >24 hours (Table 2). The total accumulated bypass amount in 2014 was 295 MG and the total accumulated hours of bypass was 385 hours (Table 2).

Figure 27 shows the relationship between bypass volume and duration. There is a strong correlation indicating that higher bypass volumes are associated with a longer duration of bypass. For example, on average, it would take approximately ten (10) hours to reach a total bypass of up to 6 million gallons (MG). Figure 28 shows the relationship between bypass volume and the average flow rate attributed to the bypass volume discharged, which was determined as the volume of bypass divided by the duration of the bypass event. The relationship was used to empirically model the impact of the volume bypassed on the growing area. Dye-dilution study results were scaled to reflect the impact of various bypass volumes on the growing area and the resulting level of dilution achieved. Figure 29 shows the potential impact of bypass events on MA conditional growing areas. A bypass event of 3.5 MG (shown as the red data points) heavily impacts the southernmost area MHB1.2 (MADMF classifications are shown in Appendix 4). However, a bypass volume of 6 MG (shown as yellow data points) does not extend much beyond the areas impacted by the 3.5 MG event. A bypass event of 12 MG (shown as the blue data points) extends much further into the growing area impacting the adjacent area referred to as MHB1.2 which is classified as conditionally approved (also shown in Appendix 4). A similar analysis was done to assess growing areas in RI (Figure 30). A similar bypass event of 6 MG (shown as the red data points) shows the majority of the growing area also impacted under this event. A bypass event of 12 MG (shown as the purple data points) extends much further into the growing area in Mount Hope Bay.

In order to determine if the growing areas in RI and MA are placed in the closed status (due to rainfall trigger) during bypass events of 6 MG or greater, an analysis was done to compare the status of the growing area (open or closed), bypass volumes (6 MG or greater), and rainfall amount. Figure 31 shows a comparison of volume of bypass and rainfall with closure period of growing areas in MA for 2013. In 2013, rainfall exceeding 0.75 inches resulted in the growing areas in MA to be closed for a total of 32 days. In 2013, bypass volumes 6 MG or greater occurred 15 times. However, as shown in Figure 31, the rainfall closures did not coincide well with periods of bypass volumes 6 MG or greater which have an impact to the growing areas. In 2013, 9 out of 15 times when the bypass volumes exceeded 6 MG, the growing area was already in the closed status. However, the other 6 times, when bypass volumes exceeded 6 MG, the growing area was in the open status. In 2014, rainfall exceeding 0.75 inches resulted in the

growing areas in MA to be closed for a total of 51 days (Figure 32). In 2014, bypass volumes 6 MG or greater occurred 14 times; 9 out of 14 times when the bypass volumes exceeded 6 MG, the growing area was already in the closed status. However, the other five (5) times when bypass volumes exceeded 6 MG, the growing area was in the open status. A similar analysis was done for shellfish growing areas in RI for 2013. In 2013, rainfall exceeding 0.50 inches resulted in the growing areas in RI to be closed for a total of 175.5 days. In 2013, 14 out of 15 times when the bypass volumes exceeded 6 MG, the growing area was already in the closed status. The growing area was in the open status one (1) time when bypass volumes exceeded 6 MG (Figure 33). In 2014, rainfall exceeding 0.50 inches resulted in the growing areas in RI to be closed for a total of 181 days (Figure 34). In 2014, bypass volumes 6 MG or greater occurred 14 times; 14 out of 14 times when the bypass volumes exceeded 6 MG, the growing area was already in the closed status. Thus, the 0.5 rainfall trigger for RI waters appears to coincide well with periods of bypass that otherwise impact the growing areas. The 0.75 rainfall trigger for MA waters does not coincide well with periods of bypass that impact the growing areas.

3.10 Recommendations for MA and RI Growing Areas and other Considerations

Regarding shellfish growing areas in MA, due to the close proximity of conditional area MHB1.2 to the outfall, the FDA recommends that the area impacted by a ≥6 MG bypass be downgraded either to conditionally restricted (with long term relay to address viral concerns) or to prohibited as shown in Figure 35. The recommendation is due to short time of travel and inadequate dilution during the bypass events. In addition, as previously discussed, the current 0.75-inch rainfall is not adequate to effectively close this area during these events. Thus, a bypass trigger must be used to close the area during these events; it is recommended that ≥6 MG level of bypass be used in addition to the rainfall trigger to close the adjacent conditionally approved area (MHB1.2) during these bypass events. Based on the 2013-2014 data bypasses of 6 MG or higher occurred 15 and 14 times, respectively, and did not correspond well with rainfall closures 6 and 5 times, respectively. Thus, an additional bypass trigger added to the conditional area management plan (CAMP) would likely account for an average 5-6 additional closures a year.

Regarding shellfish growing areas in RI, although the rainfall trigger of 0.5 inches corresponded well with periods of bypass events of 6 MG or greater, a bypass trigger must be added to the RI CAMP and it is also recommended that trigger of 6 MG bypass be used. The bypass trigger would address the potential for times where the rainfall trigger is not met, but flows are high enough at the WWTP to cause a bypass of 6 MG or higher (e.g. snowmelt or high intensity but short duration rain event during summer). The addition of a bypass trigger would likely not cause additional closures to the RI management of the conditional areas, but would add an additional level of safety specifically addressing WWTP bypasses. In fact, if the RI CAMP included the 6 MG or higher bypass trigger it may be possible to lower the rainfall trigger to 0.5 inches – consistent with MA.

Figure 36 shows a comparison of concentration and dilutions at the fixed station locations comparing concentrations and dilutions at the surface (collected by towed fluorometer), and at depth (collected by moored fluorometer) – both the average concentration and the steady state peak 1-hr concentration. As shown in Figure 36, for most stations higher dye concentrations

were observed at the surface than in lower depths when comparing the surface concentrations to the average concentrations at the lower depths. This implies that for a short duration bypass event <12 hours, concentrations at the surface, during similar conditions encountered during the study, would likely be significantly higher than at lower depths. However, the build-up to steady state analysis, which is shown in the peak 1 hour concentration values, reflects that the concentrations at lower depths could build to much higher levels if the pollution event is longer in duration >12 hours.

Figures 37 and 38 show Male-Specific Coliphage (MSC) levels in shellfish versus dilution in receiving waters based on data collected in 2013 from the Fall River WWTP study and in 2014 data from the Somerset WWTP study. In general, the data shows the relationship between MSC levels and dilution – as dilution in receiving water increases levels of MSC in shellfish decrease. MSC levels in shellfish for all samples but one are below 50 PFU/100 gram when dilution in the receiving water is greater than 1,000:1. MSC levels in shellfish below 50 PFU/100 gram was first established in the NSSP MO as a standard for use following sewage spills or malfunctions at WWTPs. In such situations, it is considered that bivalve molluscs may be safely harvested for food consumption once the WWTP problems have been fully mitigated and there is evidence that the MSC level in bivalve molluscs has reduced to <50pfu/100 grams. Figure 39 show a comparison of MSC in shellfish at the five (5) shellfish stations for the Fall River WWTP study conducted in 2013. An initial baseline hard shell clam samples collected on 11/4/13 prior to the study show low levels of MSC. With the exception of Station 5 located within the prohibited zone closest to the Fall River WWTP outfall, levels of MSC in both the hard shell clams and oysters are more elevated in the 12/10/13 samples. During this period a rain event of 0.72 inches occurred on 11/27/13 which was not enough to close the Massachusetts growing areas (less than the 0.75 inch closure trigger). However, the rainfall was enough to trigger a 27.1 MG bypass at the Fall River WWTP. Station 4, located closest to the Massachusetts conditionally approved growing area showed the largest impact which reinforces the need to change the classification of the adjacent area (MHB1.2) to conditionally restricted with long term relay (>21 days) or to prohibited. Station 3, located closest to the Rhode Island conditionally approved growing area showed the second largest impact, however, the Rhode Island area closed when the rainfall levels reached 0.5 inches. As previously mentioned, although the 0.5 inch rainfall trigger in RI matched up well with most bypass events the ≥ 6 MG bypass trigger should be added to both the MA and RI CAMPs.

During the Somerset WWTP study conducted in 2014, one (1) sample station located in the conditionally approved area closet to Brayton Point (Station 2) showed elevated levels of MSC in oysters above 50 PFU/100 grams although MSC levels in clams were below 50 PFU/100 grams (Figure 40). It is recommended that more intensive shoreline survey in the vicinity of the high sample be conducted to determine if another source of pollution in this vicinity caused the elevated sample result. As there were no reported bypass events from either the Fall River or Somerset WWTPs during the study timeframe and both WWTPs were confirmed to be operating normally, and given dilution at the Station 2 was greater than 1000:1, the elevated MSC sample appears more likely to be attributed to a source other than the WWTPs.

4.0 CONCLUSIONS

When considered collectively, the data from the hydrographic dye study at the Fall River WWTP and the microbiological assessment of the influent and effluent and shellfish in the growing area support the following conclusions and recommendations:

- The WWTP is efficient at removing FC indicator bacteria when flows are within design flow (as assessed during this study) and in meeting its permitted requirements for FC.
- The WWTP performance in reducing MSC, AdV, and NoV GI is consistent with similar conventional secondary treatment WWTPs with chlorination.
- For the WWTP flow rate that occurred during the study period (14.70 MGD), the 1,000:1 in surface waters was achieved largely within the prohibited buffer zones established adjacent to conditionally approved areas in both MA and RI.
- However, for a projected flow of 50 MGD, the point at which the WWTP bypasses secondary treatment, the prohibited buffer zone is not adequate under higher flow rates and dilutions less than 1,000:1 encroach upon the conditional areas in both MA and RI. Additionally, under this condition of potentially degraded treatment, a higher level of dilution would need to be achieved.
- Analysis showed the current 0.75-inch rainfall trigger used in MA to close the Mount Hope Bay growing area is not adequate to effectively close the area during bypass events of 6 MG or higher which are shown to impact the growing area.
- The area in MA closest to the outfall (MHB1.2) is most heavily impacted under bypass events. Due to proximity, leading to short time of travel and low dilution, growing area MHB1.2 is impacted by the ≥6 MG level and must be reclassified from conditionally approved to conditionally restricted (with long term relay ≥21 days to address viral concerns) or prohibited.
- The ≥6 MG level of bypass must be added as a condition in the MA conditional area management plan (CAMP), in conjunction with the rainfall trigger to close the adjacent polygon during these bypass events as required under 2015 NSSP MO Chapter IV @.03(C.)(2.)(a.)(i.-viii). Based on data from 2013-2014, bypasses of 6 MG or higher occurred 15 and 14 times, respectively, and did not correspond well with rainfall closures 6 and 5 times, respectively. Thus, an additional bypass trigger added to the MA CAMP would account for an average 5-6 additional closures a year.
- Analysis showed the current 0.5-inch rainfall trigger used in RI corresponded well with periods of bypass events of 6 MG or greater. In order to meet the requirements of 2015 NSSP MO Chapter IV@.03(C.)(2.)(a.)(i.-viii), a bypass trigger of (6 MG level) needs to be added to the RI CAMP for Mount Hope Bay. This would address the potential for times where the rainfall trigger is not met but flows are high enough at the WWTP to cause a bypass of 6 MG or higher (e.g. snowmelt or high intensity but short duration rain event during summer). The addition of a bypass trigger would likely not cause additional closures to the RI management of the conditional areas but would add an additional level of safety specifically addressing WWTP bypasses and increase the length of time the area is closed.
- If the RI CAMP included the 6 MG or higher bypass trigger, it may be possible to lower the rainfall trigger to 0.5 inches with data to support the performance standard (2015 NSSP MO Chapter IV @.03(C.)(2.)(b.)).

The re-opening criteria for both RI and MA CAMPs must include the criteria in the 2015 NSSP MO Chapter IV @.03(C.)(2.)(c.)(i-iv.) including; (i) Performance standards of the plan are fully met; (ii) Sufficient time has elapsed to allow the water quality in the growing area to return to acceptable levels; (iii) Sufficient time has elapsed to allow the shellstock to reduce pathogens that might be present to acceptable levels. Studies establishing sufficient elapsed time shall document the interval necessary for reduction of coliform levels in the shellstock to pre-closure levels. The study may establish criteria for reopening based on coliform levels in the water. The SSCA may utilize MSC in growing areas adjacent to waste water system discharge. Studies establishing sufficient elapsed time shall document the interval necessary for reduction of viral levels in the shellstock. Analytical sample results shall not exceed a level of 50 MSC per 100 grams or pre-determined levels established by the Authority based on studies conducted on regional species under regional conditions. These studies may establish criteria for reopening based on viral levels in the shellfish meats or the area must be in the closed status until the event is over and twenty-one (21) days have passed; and (iv) Shellstock feeding activity is sufficient to achieve microbial reduction.

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APPENDIX 1 – METHODS (Section 2.0)

2.1 FDA Guidance on Establishing Closure Zones for WWTP Discharges

In consideration of Section II, Chapter IV @.03 E(5) (Prohibited Classification – Wastewater Discharges) of the National Shellfish Sanitation Program Model Ordinance, which notes that the determination of the size of a prohibited zone around a WWTP outfall shall include "the wastewater's dispersion and dilution, and the time of waste transport to the growing area where shellstock may be harvested" (iii), FDA has provided guidance to state shellfish control authorities to size prohibited zones around WWTP outfalls according to the following scenarios:

Scenario 1: In consideration of effluent discharged from a WWTP under **failure conditions** (such as a loss of disinfection), the prohibited zone should provide a sufficient amount of dilution to dilute the effluent discharged under failure conditions to the fecal coliform standard of 14 FC/100 ml within the boundaries of the prohibited zone.

OR

Scenario 2: In order to reduce the size of the prohibited zone, a conditionally approved zone may be operated if a factor of at least a 1000:1 dilution of effluent is achieved within the prohibited area to mitigate the impact of viruses, and there is a sufficient amount of time to close the conditional area to the harvesting of shellfish before the effluent discharged at the onset of a failure can travel to the boundaries of the prohibited zone

Note: the additional area beyond the prohibited zone to be closed under WWTP failure conditions should provide a sufficient amount of dilution to dilute the effluent discharged under failure conditions to the fecal coliform standard of 14 MPN/100 ml within the closed (due to failure) zone (consistent with Scenario 1).

Wastewater treatment technologies have drastically improved throughout the past few decades. During this time FDA has maintained a conservative position recognizing that any WWTP may remain subject to failure. FDA recognizes that with advancements in technologies, including improved monitoring and alarm systems for a treatment bypass or loss of disinfection, it may be possible to operate a conditional area as outlined in Scenario 2 above. This allows additional shellfish growing areas to be harvested under certain conditions.

When a WWTP is operating normally, disinfection has been shown to be effective in reducing the coliform bacteria group (fecal coliform and total coliform) to levels below shellfish harvesting standards as can be seen in WWTP permit records kept in accordance with the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Program. However, human enteric viruses such as noroviruses and hepatitis A virus are more resistant to disinfection and thus are not reduced to the same degree as the coliform bacteria group. In an effort to mitigate the risk of contaminating shellfish with viruses, FDA has recommended a 1000:1 dilution as described in Scenario 2 as the minimum zone of dilution needed when the WWTP is operating under normal conditions, unless an alternative approach is well supported by data. One of the alternative approaches recommended by FDA is to use 400:1

dilution for plants with UV disinfection that demonstrate exceptional treatment capabilities and the absence of significant levels of viruses and viral indicators in treated effluent. In the case of the Fall River WWTP, the use of a 400:1 dilution zone was not supported by the data presented in this report.

2.2 Dye Standard Preparation and Fluorometer Calibration

The dye tracer used in this study was Rhodamine WT, purchased from the Keystone Aniline Corporation, with a specific gravity of approximately 1.12 (20% as dry dye). Ten (10) standards were prepared from the stock solution of Rhodamine WT dye and distilled water by serial dilution, ranging from 100,000 parts per million (ppm) to 0.1 parts per billion (ppb).

The Rhodamine WT dye was detected and its concentrations in Mount Hope Bay were obtained using a combined total of 10 fluorometers. Eight of these were WET Labs FLRHB submersible fluorometers (WET Labs, Inc., Philomath, OR) that were attached to the eight stations in the bay. One was a WET Labs FLRHRT fluorometer that was pulled behind a boat and used for tracking the dye on each day of the study. The final was a WET Labs FLRHRT fluorometer interfaced with a SeaBird SBE19-plusV2 CTD used for conducting profiles of the dye at depth while at the same time capturing conductivity, temperature, and depth data within the water column.

The dye standards were used to develop calibration curves for FDA's WET Labs FLRHRT 2487 and 586 tracking and profiling fluorometers and the eight station fluorometers – WET Labs FLRHB units 585, 913, 915, 1730, 2032, 2219, 2416 and 3007. With the subtraction of background fluorescence levels in the bay, these curves were used to calculate part per billion (ppb) levels of dye based on the WET Labs' measured fluorescence units (FUs).

The y-intercept of the calibration curve was adjusted so that a "0.1 ppb" result read as a perfect "0.1" on the curve. The slope and x-axis values for the curve remained the same, but this adjustment caused a slight addition of error (5-10% error) to the higher concentrations on the curve, such as 10 ppb. However, higher accuracy at the lower end of the curve, 0.1 ppb, is more vital in order to optimize sensitivity in detecting the dye at low concentrations, as important data tends to fall within the 0.1-1 ppb range during FDA dye studies. Using a calibration curve adjusted in this manner is necessary when converting raw FU readings to ppb values if sensitivity in the 0.1-1 ppb range is critical for the study. The WET Labs limit of detection in distilled water is 0.01 ppb, with a limit of detection in estuary water of approximately 0.01 – 0.03 ppb dependent on the specific fluorometer.

Background readings were captured on December 3, 2013 for the study with the 586 tracking fluorometer. For the interfaced SeaBird CTD and WET Labs FLRHRT 2487 fluorometer (a.k.a., the "profiler"), background levels were recorded in terms of voltage readings and were converted to ppb units by applying a conversion factor and calibration curve data. However, the average of the raw voltage readings was used to program the background level for the profiler in RAFT-MAP. Background levels for the station fluorometers were determined by plotting all of the data collected by the fluorometers and finding the baseline FU level for readings taken prior to the dye injection in comparison with those recorded after the dye injection at each station. Background levels for the tracking fluorometers were based on maximum FU readings in the growing area, excluding

outliers, detected prior to the dye injection. These background levels were programmed into RAFT-MAP and automatically subtracted from the fluorescence readings recorded in the bay after the dye injection.

2.3 Drogue Study and Preliminary Dye Injection

Orange and wing drogues were used on December 3, 2013 for the Fall River study to assess the timing of tidal cycles (i.e., slack high/start of ebb tide) and to assess the impact of winds vs. tides on drogue movement. Some drogues were released just north of the Somerset WWTP in the Taunton River, a few were released in Battleship Cove to determine any eddying occurring, and a few were released at the Fall River WWTP. Drogue locations were recorded by GPS with RAFT-MAP to help determine the timing of the turning of the tides and the current movement and tidal influence in the area.

The velocity of dye movement was determined by using drogue location points for the Fall River dye study. On December 3, 2013 a drogue study was conducted around 7:30 AM during an ebb tide. In some cases performing a drogue study during an ebb tide would allow us to calculate the drogue velocity, in turn helping us estimate the travel time of wastewater from a WWTP to a shellfish growing area. In this case drogues were released near some of Fall River combined sewer overflow (CSO) outfalls. Although the drogue study could not be used to determine time of travel from the Fall River WWTP to the approved growing areas, but it could be used to determine the approximate velocity of wastewater/storm water coming from a CSO if the outfall were to discharge. At the Alton/Weir outfall Drogue Unit 3 was released at 7:36 AM and traveled at a speed of 0.21 mph until 9:14 AM. This drogue was again released near the Alton/Weir outfall at 12:59 PM and traveled at a speed of 0.44 mph until 2:51 PM. In a worst case scenario it would be safe to say that the velocity of discharge from this outfall would be around 0.5 mph. Drogue Unit 6 was released at 9:30 AM at the City Pier CSO outfall and traveled until 10:49 AM at a speed of 0.85 mph. Several different velocities were seen with the different drogues, an overall average was determined by taking maximum velocities at several outfalls and dividing by the number of outfalls. The average velocity was calculated to be 0.62 mph if there were to be an overflow at one of the outfalls. The maximum velocity from the drogue results was 1.13 mph.

A map was created in ArcGIS Desktop for the study of estimated velocities for each of the different drogues deployed during the drogue study on December 3, 2013.

2.4 Dye Injection

For the Fall River dye injection, a total of approximately 79 gallons of dye mixture was injected at a constant rate into the WWTP effluent over a 12.9 hour period from 1:30 AM to 2:25 PM December 4, 2013. To facilitate the pumping of dye, 40 gallons of deionized water was added to 40 gallons of dye creating a 50:50 water/dye dilution mixture (80 gallons total, of which 79 gallons was injected resulting in approximately 39.5 gallons of raw dye). A Masterflex model 7553-20 variable speed peristaltic pump (Cole-Palmer Instrument Co.) was used to withdraw the tracer dye solution from a large plastic holding bin, using Masterflex Tygon L/S-14 tubing. A pump head size 7015 was used with a constant pumping rate of 408 ml/min which was maintained at 244 revolutions/minute (rpm) head speed. Approximately one gallon of dye

mixture remained and was accidently dumped into the bay on December 6, 2013 around 1:30 AM. The tracer dye mixture was fed continuously into the final effluent over the 12.4 hour injection period. The dye was injected just after dechlorination, which then traveled a short distance to the outfall in the bay. The initial concentration of the dye in the effluent was determined using the WWTP's flow average over the period of the dye injection (14.70 MGD). Flow rates out of the WWTP were based on SCADA readings.

2.5 Dye Tracking

Boat tracking was conducted on each day of the study with one boat-towed fluorometer, the WET Labs FLRHRT-586, to track the dye past the cages; to determine the shape and edges of the dye plume; and to assess the dye concentrations and dilutions in the surface waters. The fluorometers were linked to Panasonic Toughbook C-19 field computers operating FDA's custom-made mobile GIS software, RAFT-MAP (Real-Time Application for Tracking and Mapping).

One boat was used for dye tracking. Dye readings were taken on successive days (December 4 – 6) for high and low tides. Traverses were done on all the days of the study from north to south and east to west and vice versa, and dye readings were also recorded at each of the fixed station locations to show changes in dye concentration and build-up with time.

While traverses of the dye were being done with the WET Labs FLRHRT-586 fluorometer, the other FLRHRT fluorometer-2487 was interfaced with a SeaBird SBE19-plusV2 CTD used for conducting profiles of the dye at depth at various locations along the path of the dye plume, particularly near the WWTP outfalls and each of the station locations. Fluorescence data from the SeaBird interfaced with the WET Labs was transmitted in voltage readings, but these were later converted to ppb readings using the dye calibration data.

A five-point moving average was applied to the dye concentration data to smooth out any false high or low readings. Dilution was calculated by dividing the initial concentration of dye injected at the WWTP by the final (five-point moving average) concentrations in the bay.

Using RAFT-MAP, the fluorometer dye concentration readings (in FUs) with the associated GPS readings were converted into ppb units and automatically plotted on a field GIS map in real-time on the boat. The GIS caches were later synchronized into ArcGIS Desktop to post-process the data (e.g., remove false positive readings); add scales, legends, station locations, growing area classification lines, and other map features; and provide additional information, such as the accumulated dye concentrations and locations of dye readings with $\leq$ 1000:1 dilution.

The Geostatistical Tool in ArcGIS Desktop was used to interpolate the data and estimate dye concentrations in areas where no dye tracking was conducted based on the surrounding areas where dye tracking was conducted. This tool was also used to add the actual and interpolated dye concentrations for each day of the dye study, to achieve accumulated total dye concentrations throughout the growing area for the three days during the study. The results were mapped in ArcGIS as the total dye mass for a 14.70 MGD flow (the flow rate during the Fall River dye injection) over the December 4 – 6, 2013 study period. A projection of what the dye mass would

look like if the flow rate at the WWTP was increased to 50 MGD (which could occur during a strong storm) was also performed. Typically, dye dilutes to very low or non-detectable levels in less than 6 days, as this was the case for this study. The dye diluted to relatively low levels after three days in the system.

2.6 Dilution Analysis - Dye Readings from Station Fluorometers

One of the advantages of the station fluorometers over the boat-towed fluorometers is that they can detect dye every ten minutes for thirty second intervals over the entire study period and can therefore pick up dye readings at depth during hours in which boat tracking was not possible. The fluorescence readings recorded by the submersible fluorometers at each of the six stations were downloaded, converted to ppb using each fluorometer's calibration curve chart, and plotted in SigmaPlot alongside the Star-Oddi CTD tidal depth curves for the study period. The recorded boat-towed fluorometer readings at the surface within a 200 meter radius of each station were included on the charts as well.

A five-point moving average was applied to the dye concentration data to normalize high or low readings in the data. Dilution was calculated by dividing the initial concentration of dye injected at the WWTP by the final (five-point moving average) concentrations detected in the bay.

Since only a 12.4 hour dye injection was conducted, FDA used the superposition method (first presented in Kirkpatrick, 1993 and modified by Goblick et. al., 2015) to estimate the steady state condition for dye at each of the stations using data collected from December 4 – 10, 2013 to allow an adequate amount of time for the dye to be flushed out of the system. FDA has successfully employed the superposition method in a number of recent studies and uses this method to save time and resources. By adding the dye levels for each 6 hour period of the study together, the accumulated dye concentration value and associated dilution value provides a good reference point for how much dye was reaching the station over the entire study period.

Peak 1 hour average concentrations of dye at each station were determined. Maximum and average concentrations were also determined but were not the main driving factor because FDA has found that these values are overly conservative or not conservative enough in representing the higher dye levels reaching the station. Peak 1 hour average values were determined by plotting the dye data for each 12.4 hour period (ebb tide or flood tide) at each station and finding the 1 hour period with the highest average dye concentration value within that period. FDA found in past studies and in this study that in some cases the maximum dye concentrations were overly conservative because they included outlier values, so the peak 1 hour average concentrations and dilutions are given more weight than the maximum concentrations and dilutions. Finding the hour during each tidal cycle in which the station received the highest amount of dye and averaging the dye concentration readings over that 1 hour period gives dye concentration values and steady state dilution estimates that are both realistic and conservative.

First the peak 1 hour average values for the two 12.4 hour tide periods on the day of the dye injection, December 4, 2013, were plotted. For the second day of the study, December 5, 2013, dye still remained in the system, so the peak 1 hour average values for this remaining dye level were added to the values detected on day 1 and plotted. Remaining dye levels on successive

tides from December 6 - 9, 2013 were also added. With the use of the superposition principled, a steady state condition was achieved on December 10, 2013 where little to no dye occurred anymore near the stations. Therefore, all dye levels were added together from December 4 – 10, 2013. If the superposition principle were used, a steady state condition would be achieved when all the dye levels were added together and no dye remained detectable near the stations. However, some dye still remained in the system at stations 7 & 8 at the time they were pulled on December 10, 2013.

For each station, the minimum dilution was based on either the maximum concentration from the station fluorometer or the maximum concentration detected by the boat-tracking fluorometer within a 200 meter radius of that station (excluding outliers). FDA's analyses and conclusions were based upon the lower of these dilution values in a conservative approach.

2.7 Microbiological Analysis of Wastewater

Indicator Microorganisms

FC densities in the WWTP influent and effluent were determined using a conventional five-tube, three-dilution MPN procedure.

MSC densities were determined by using a modified double-agar-overlay method initially described by Cabelli (1988); the *E. coli* strain HS(pFamp)R (ATCC 700891) was utilized as the bacterial host strain.

Virus concentration and RNA extraction

Viral analysis for the sewage utilizes elution with an alkaline buffer followed by ultracentrifugation (Williams-Woods, et al., 2011). Concentrates were extracted for RNA with RNeasy Mini Kit (Qiagen, Valencia, CA) utilizing 6M guanidium isothiocyanate as a lysis solution. Extracted RNA and DNA was tested by real-time reverse transcription (RT)-qPCR and qPCR respectively.

RT-qPCR

Positive controls used for NoV GI and GII were *in vitro* RNA transcripts of sequences cloned from positive clinical samples previously identified as NoV (Burkhardt, et al., 2006). Primers and probes for NoV GI and GII targeted the most conserved region of the open reading frame 1 (ORF1)-ORF2 junction. Real-time RT-qPCR for detection of NoV GI and NoV GII with an RNA IAC was performed in a 25-µl reaction volume by using a one-step RT-PCR kit (Qiagen). The primer concentrations for the NoV targets were 300 nM each, and the concentrations for the IAC primers (46F and 194R) were 75 nM each. The 5' nuclease probe concentrations for NoV and the IAC target were 100 and 150 nM each, respectively. The final concentration of $MgCl_2$ in the real-time RT-qPCR was 4 mM. Thermal cycling was run using the SmartCycler II system with the following conditions: 50°C for 3,000 s and 95°C for 900 s followed by 50 cycles of 95°C for 10 s, 53°C for 25 s, and 62°C for 70 s. Fluorescence was read at the end of the 62°C elongation step. Default analysis parameters were used, except that the manual threshold fluorescence units were set to 10. Samples positive with the initial primer and probe sets for NoV

GI and/or NoV GII were subjected to a secondary detection assay. Amplification of the original RNA extract was performed with primers from the B region by conventional RT-PCR (see Table 1 in DePaola, et al., 2010). Amplification of a second region of the genome is non-contiguous to the first and serves as an indication that the RNA was not degraded.

Adenovirus

The positive control used for Adenovirus (AdV) was serotype 41 isolated from a clinical stool sample, propagated in-house by utilizing the A-549 cell line. Real-time PCR for the detection of AdV was performed in a 25-mL reaction volume by using Platinum TAQ DNA Polymerase (Life Technologies, Grand Island, NY) as previously described with slight modifications (Williams-Woods, et al., 2011). A DNA IAC utilizing the 46F and 194R primers and the TxRed-labeled probe as previously described was added with final primer and probe concentrations of 0.75 mM and 1.5 mM, respectively (DePaola et al., 2010). Cycle parameters were slightly adjusted as follows: 95°C for 120 s followed by 50 cycles of 95°C for 3 s, 53°C for 10 s, and 65°C for 70 s. AdV primers and probe were previously described with slight modifications to the probe (Heim, 2003) whereby probe was FAM-ZEN labeled as a fluorescent dye on the 5' end and an Iowa Black quencher dye labeled on the 3'end. Fluorescence was read at the end of the 72°C elongation step. Default analysis parameters were used except that the manual threshold fluorescence units were set to 10.

Murine norovirus

The extraction control used for murine norovirus was purchased from ATCC PTA-5935 and propagated using the RAW264.7 cell line. Real-time RT-qPCR was utilized for the detection of murine norovirus (the extraction control virus) with an RNA IAC in a 25-µl reaction volume by using a one-step RT-PCR kit (Qiagen). Primers and probes were utilized as described in Hewitt, et al., 2009. Thermal cycling was run using the SmartCycler II system. Fluorescence was read at the end of the elongation step and the default analysis parameters were used except that the manual threshold fluorescence units were set to 10.

APPENDIX 2 – Figures and Tables

Figure 1: Map of Station Locations, Outfalls, Profile Locations, and Classified Growing Areas

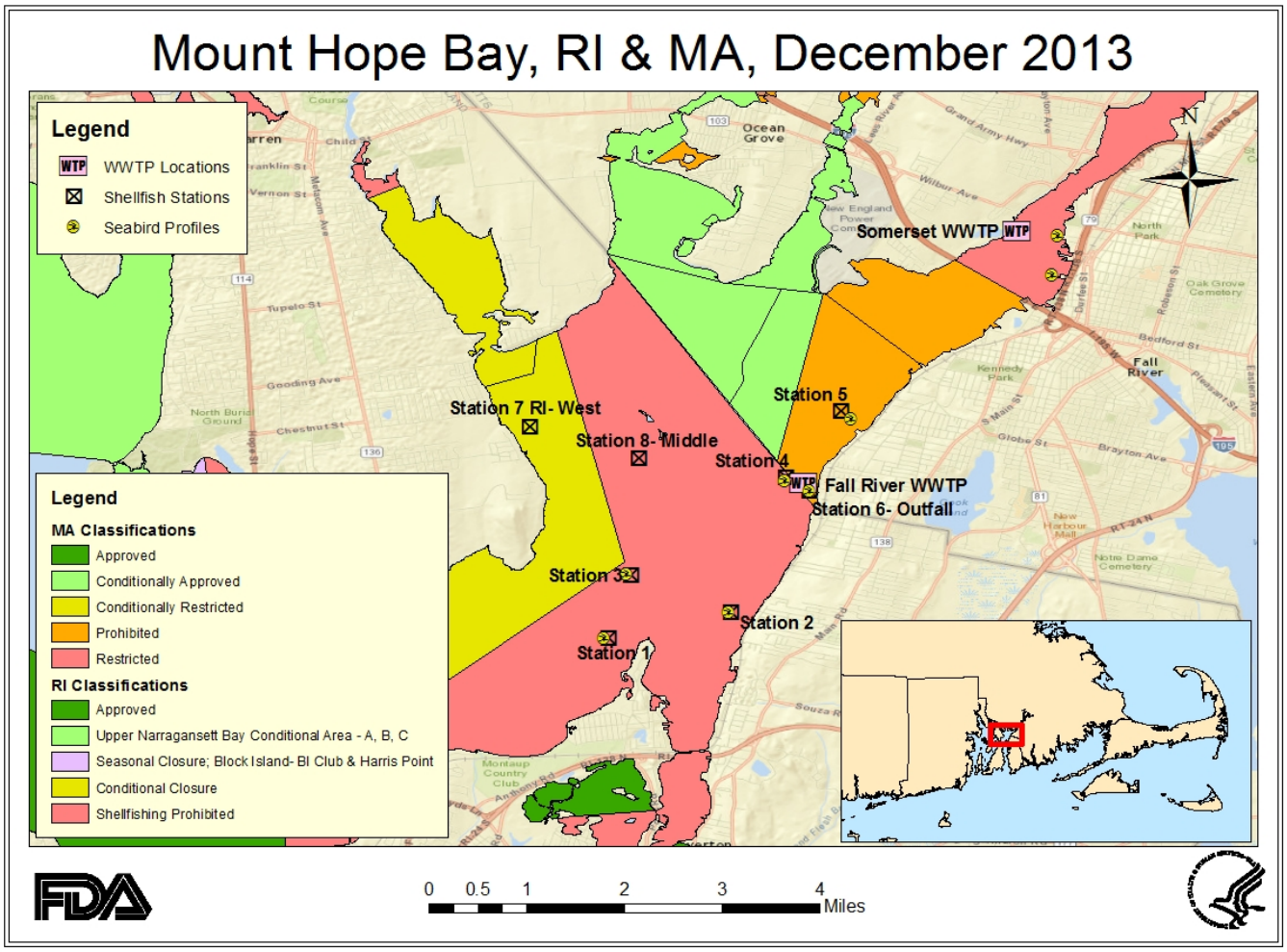


Figure 2: Velocity and Travel Time Estimates Based on Drogue Data from CSO Outfalls

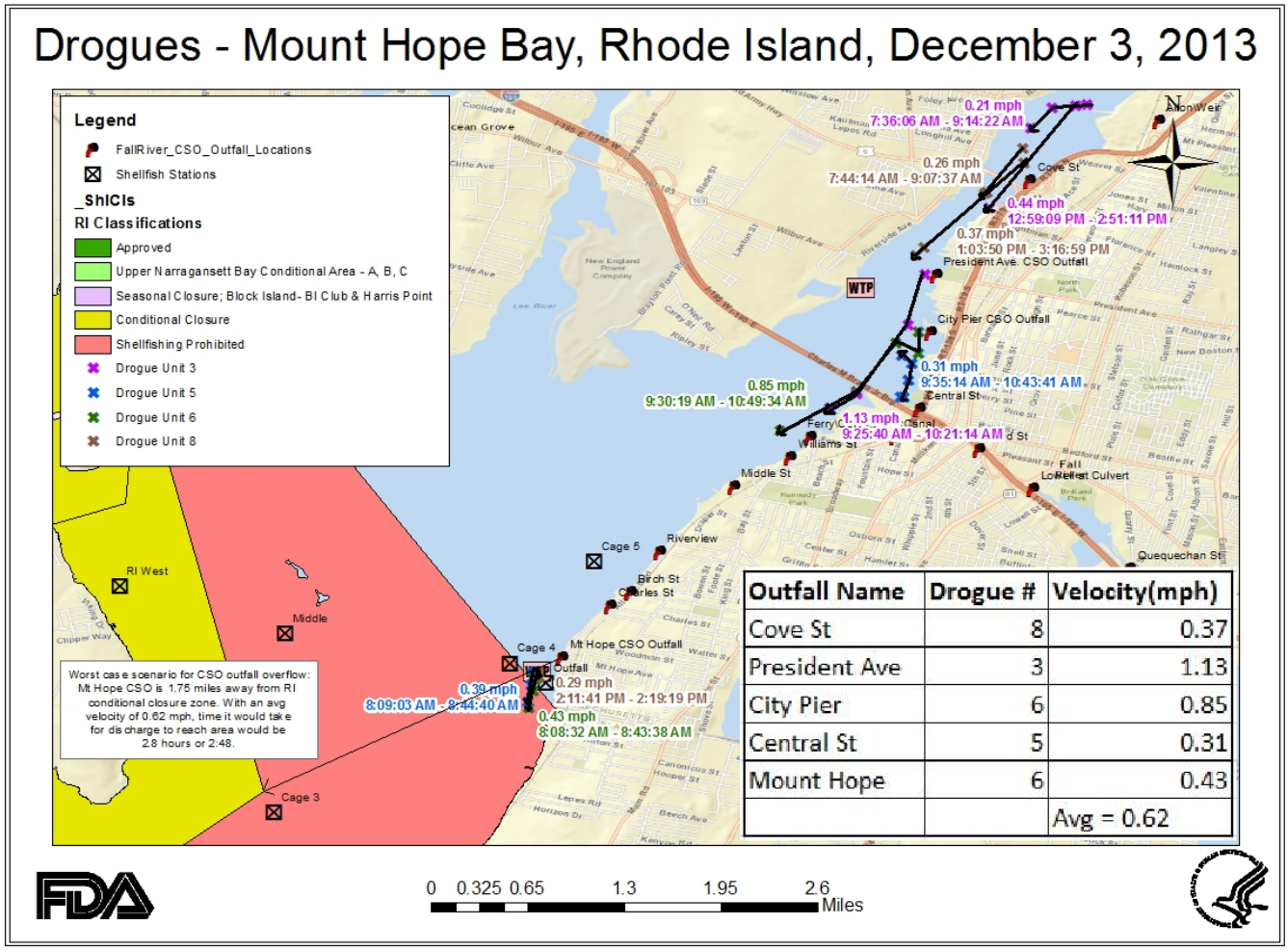


Figure 3: Time of Travel Estimates Based on Boat Tracking Fluorometer Data - December 4, 2013

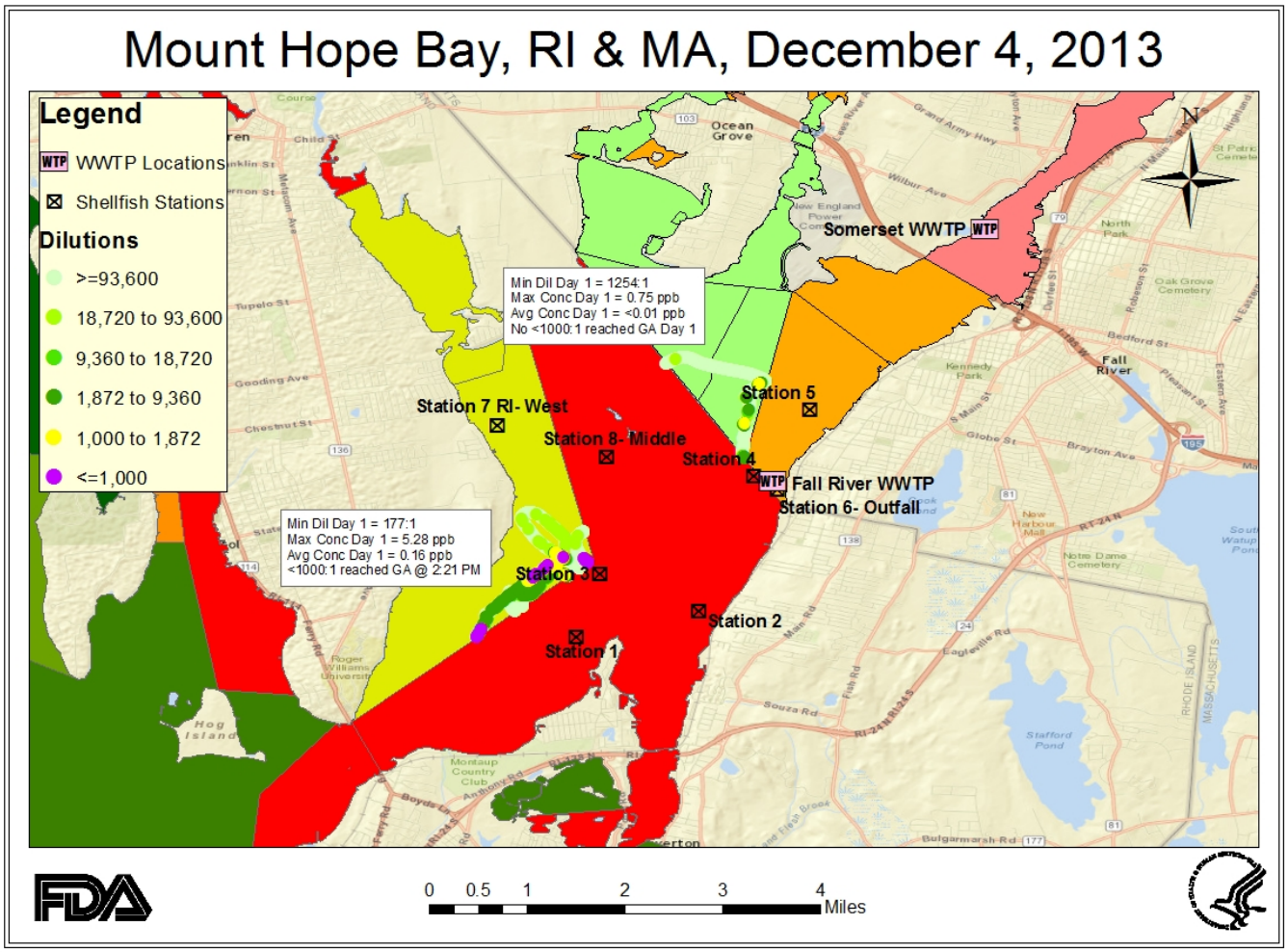


Figure 4: Accumulated 5-Point Moving Average Concentration Values and Associated Dilutions

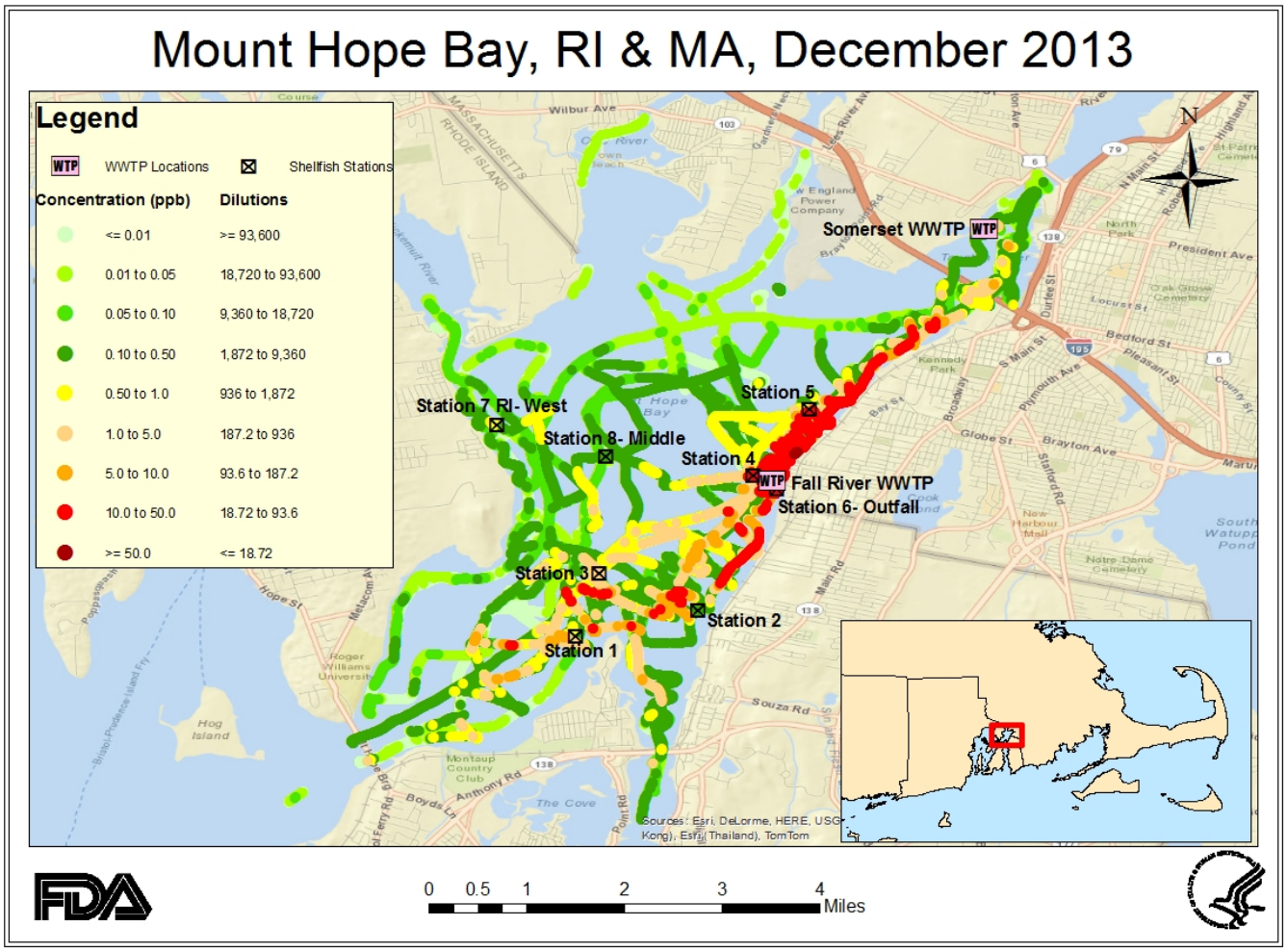


Figure 5: Dilution Levels for Day 1 Boat Tracking

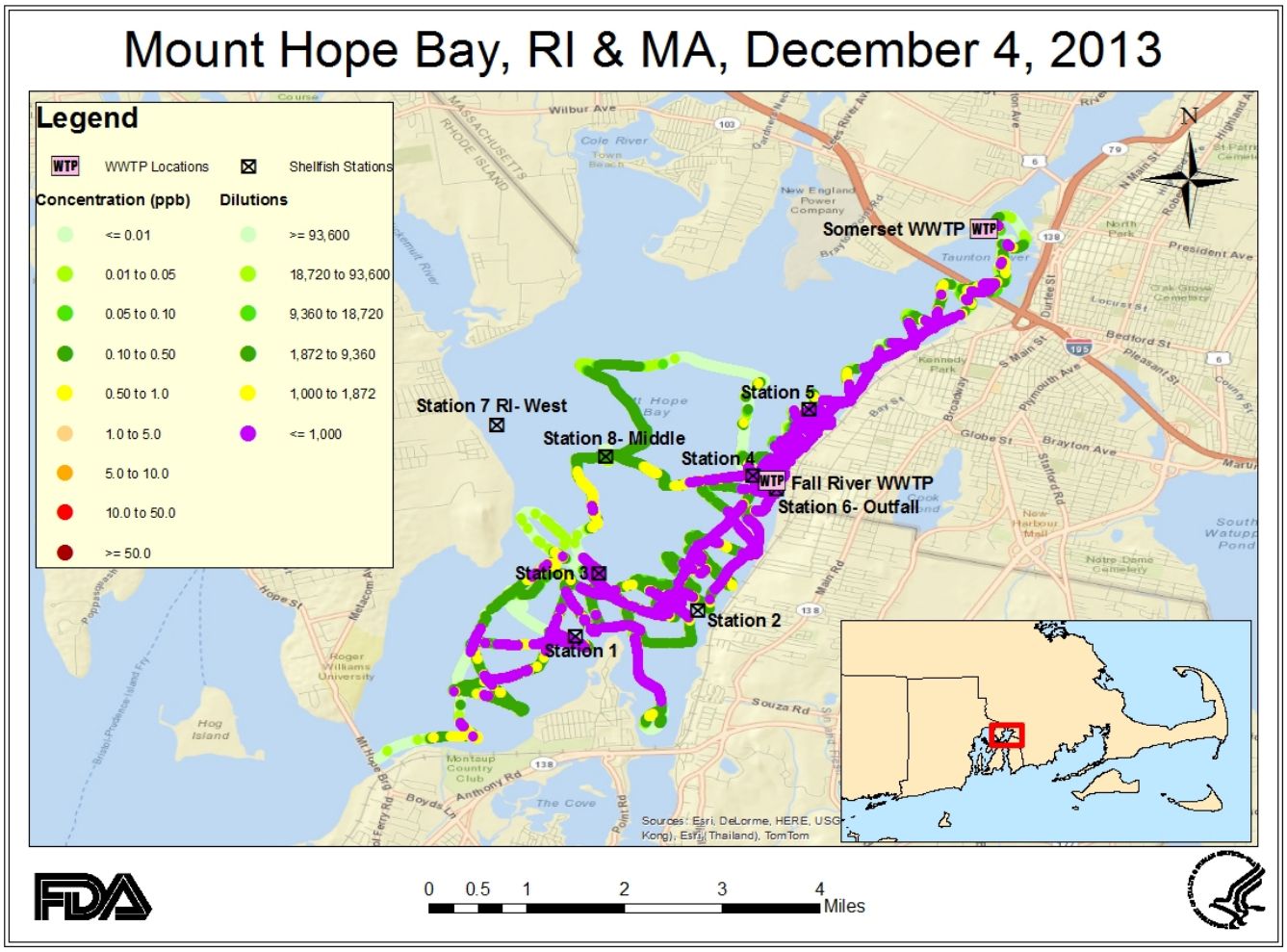


Figure 6: Dilution Levels for Day 2 Boat Tracking

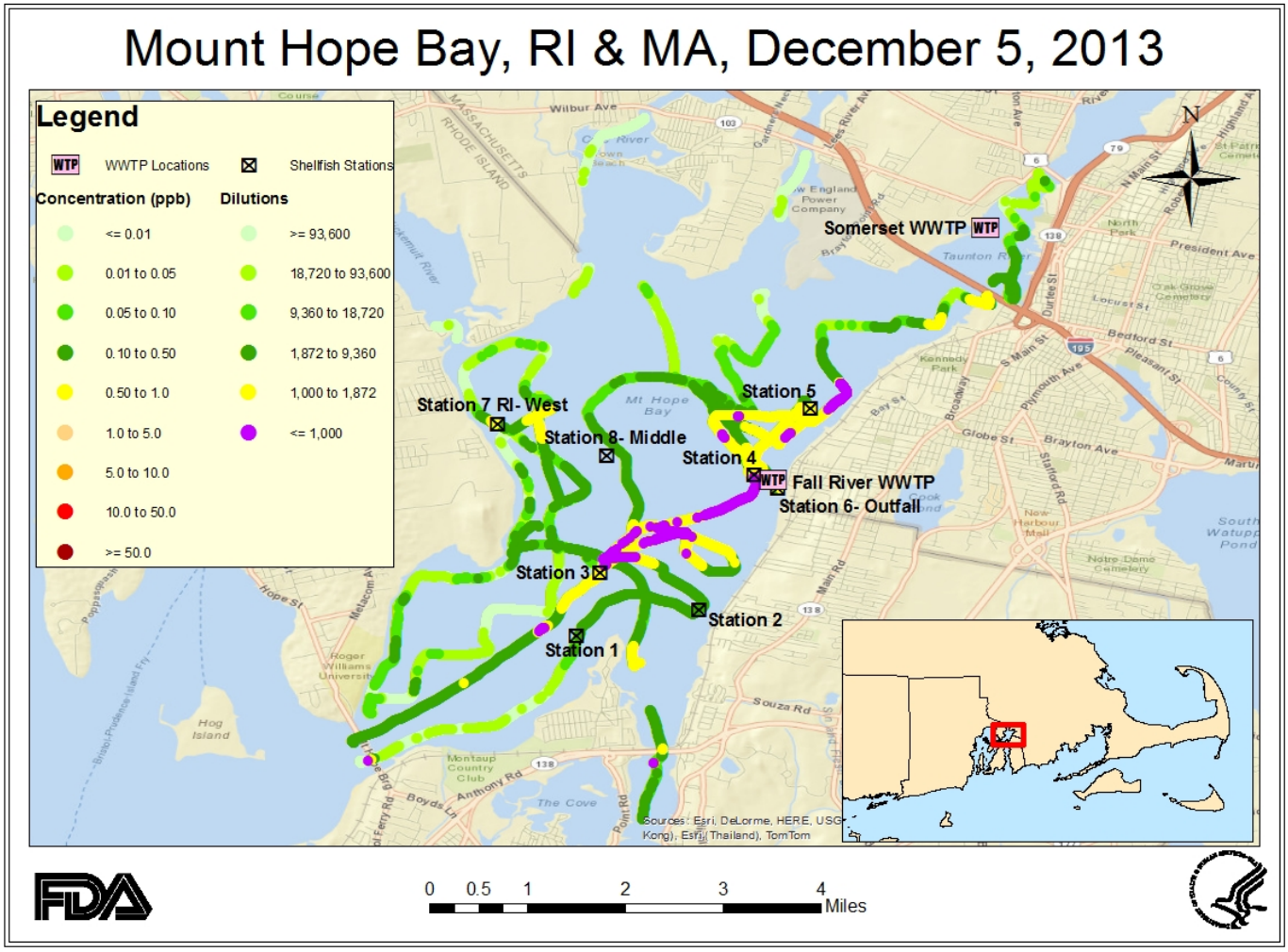


Figure 7: Dilution Levels for Day 3 Boat Tracking

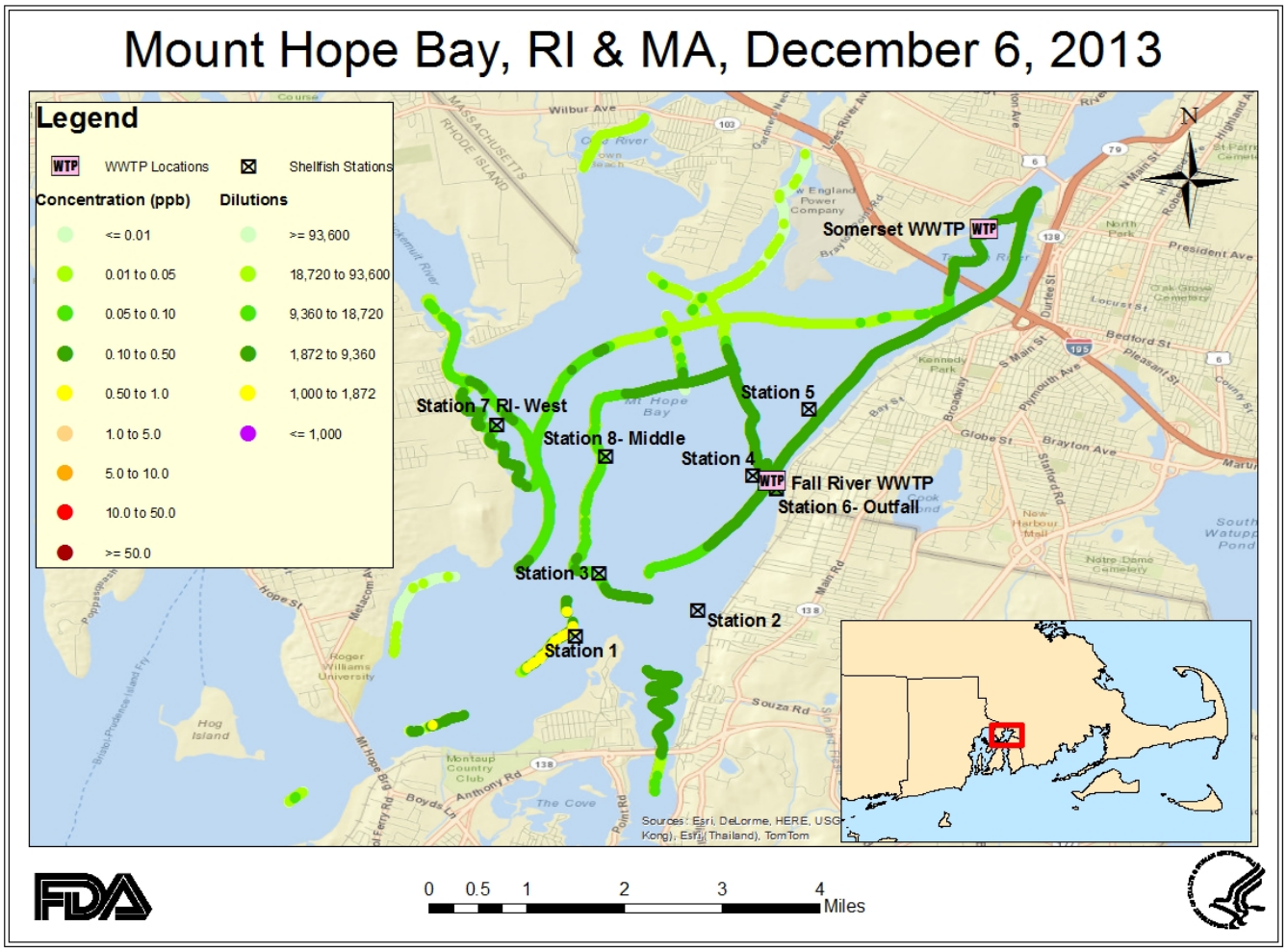


Figure 8: Accumulated Dilutions and Shellfish Classification Areas for MA

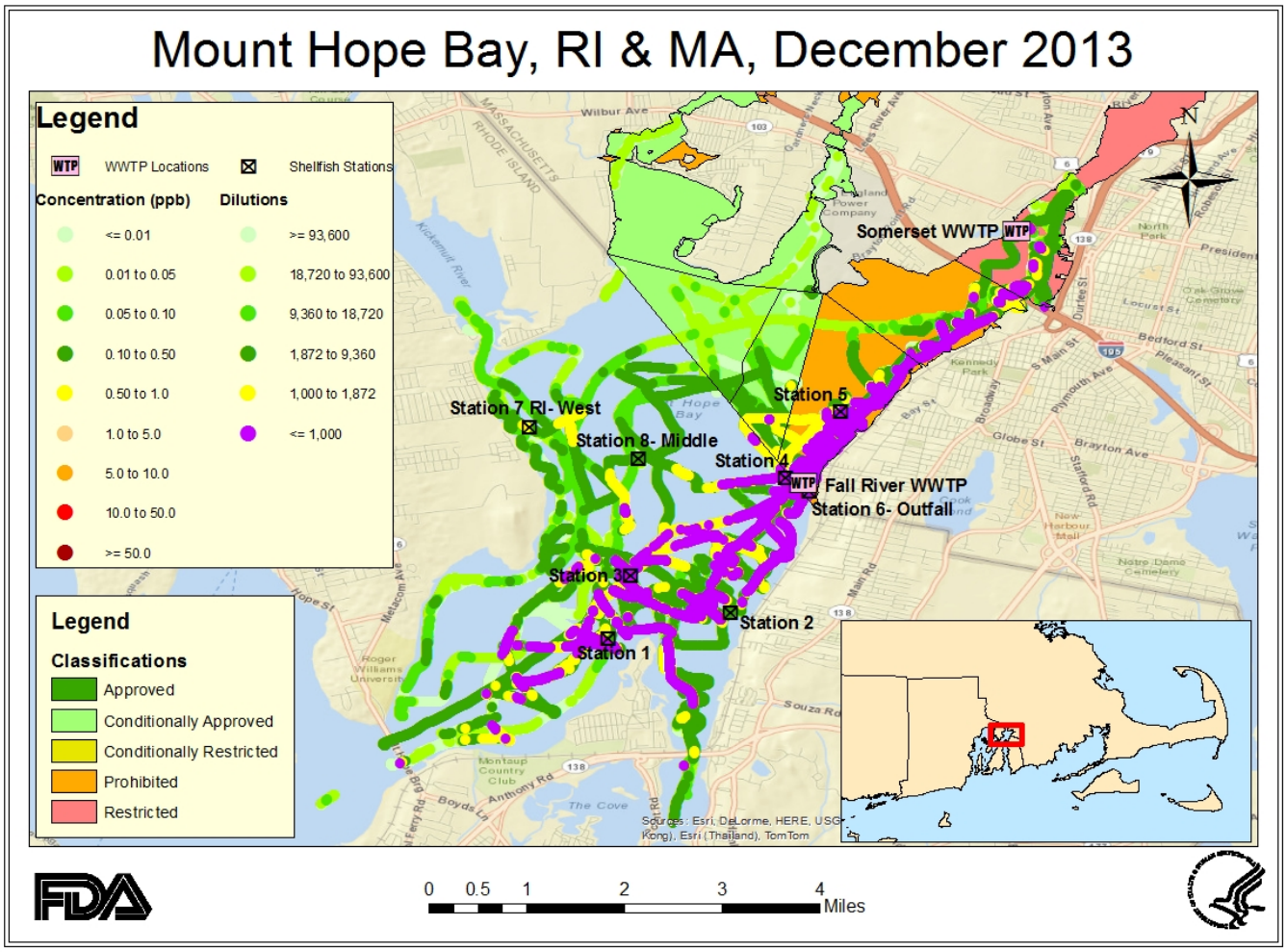


Figure 9: Accumulated Dilutions and Shellfish Classification Areas for RI

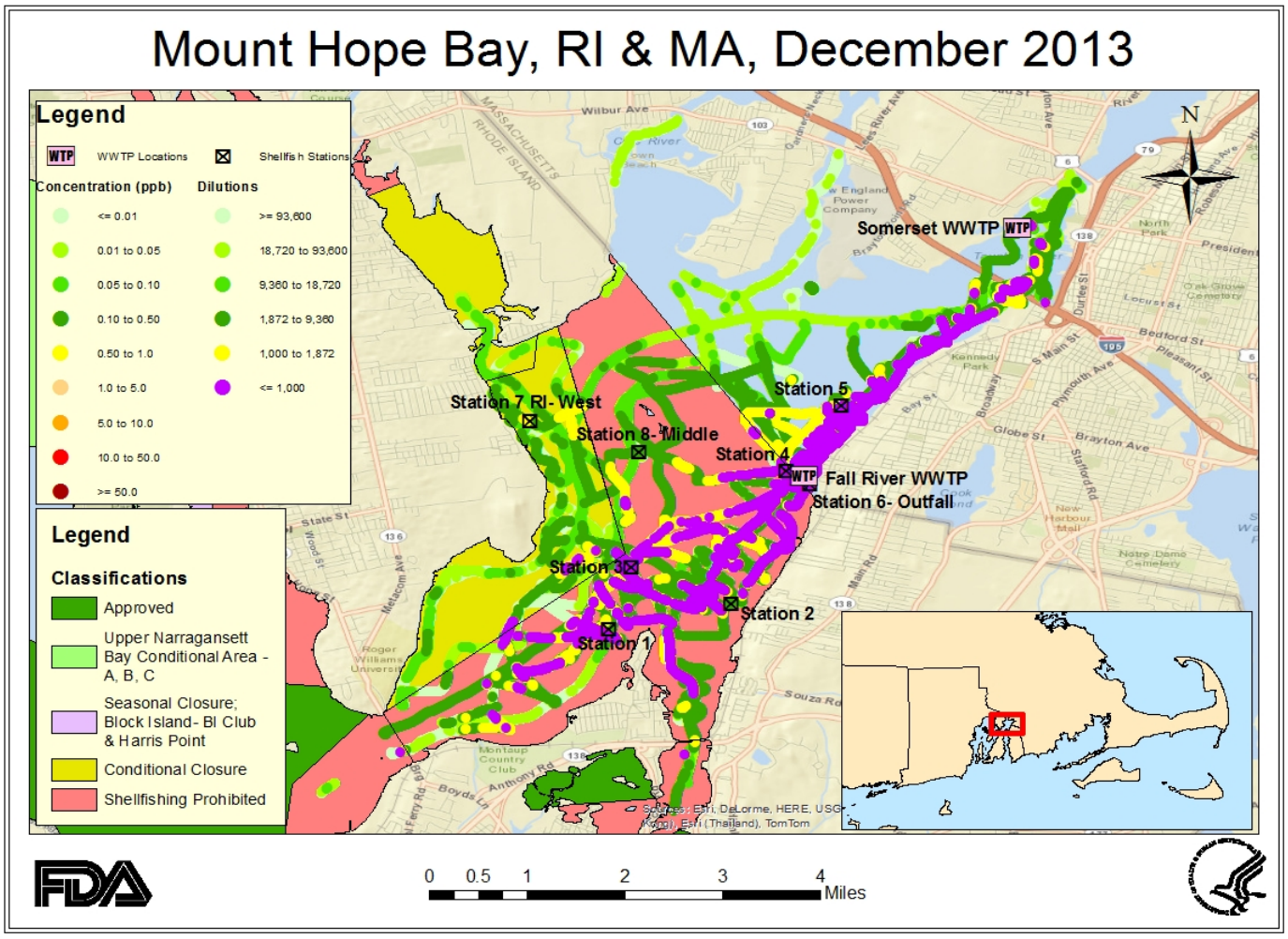


Figure 10: Dilution of 5-Point Moving Average Dec 4 – 6, 2013 (Accumulated)

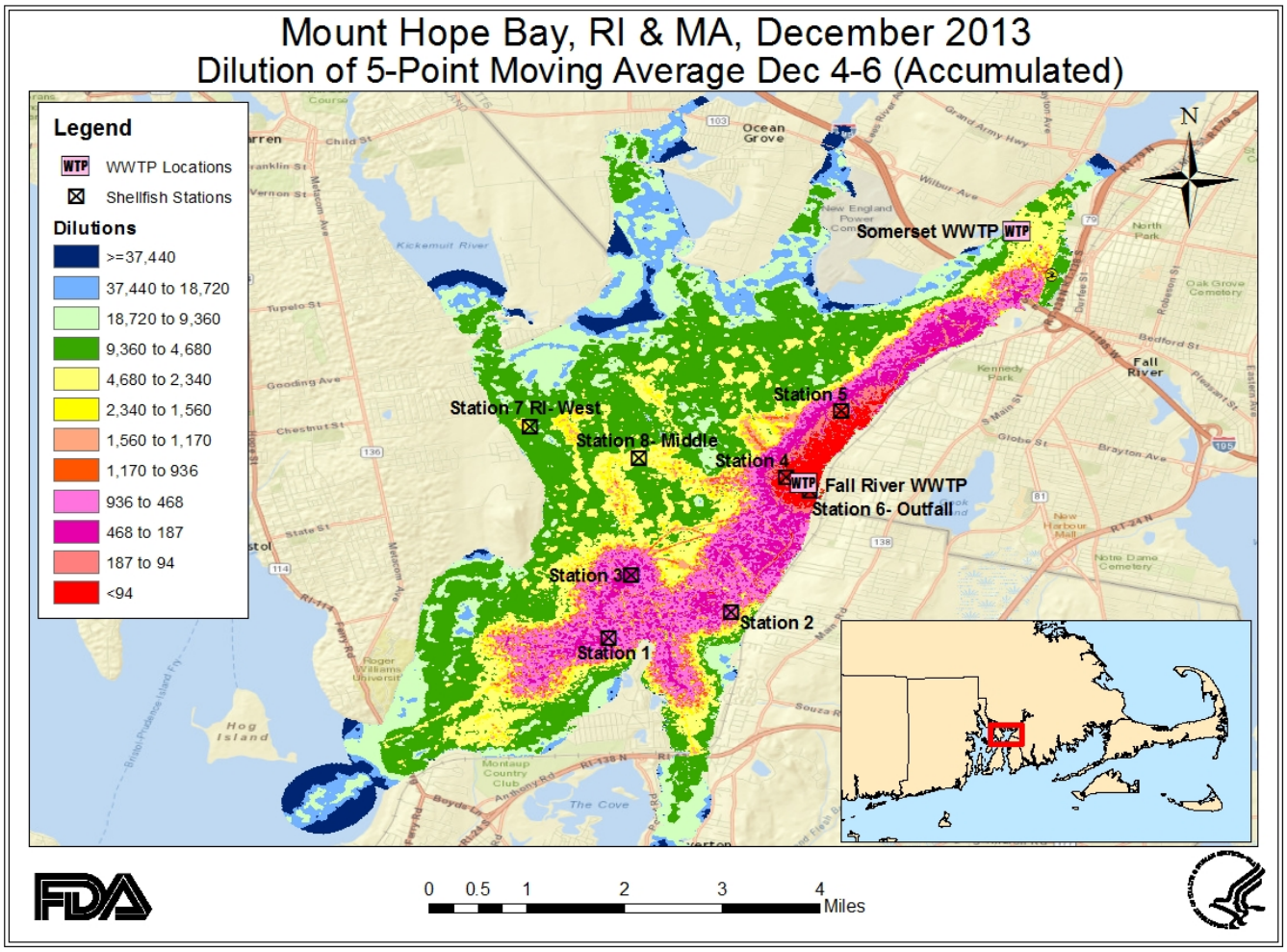


Figure 11: Station 1 Wet Labs 2032 Data

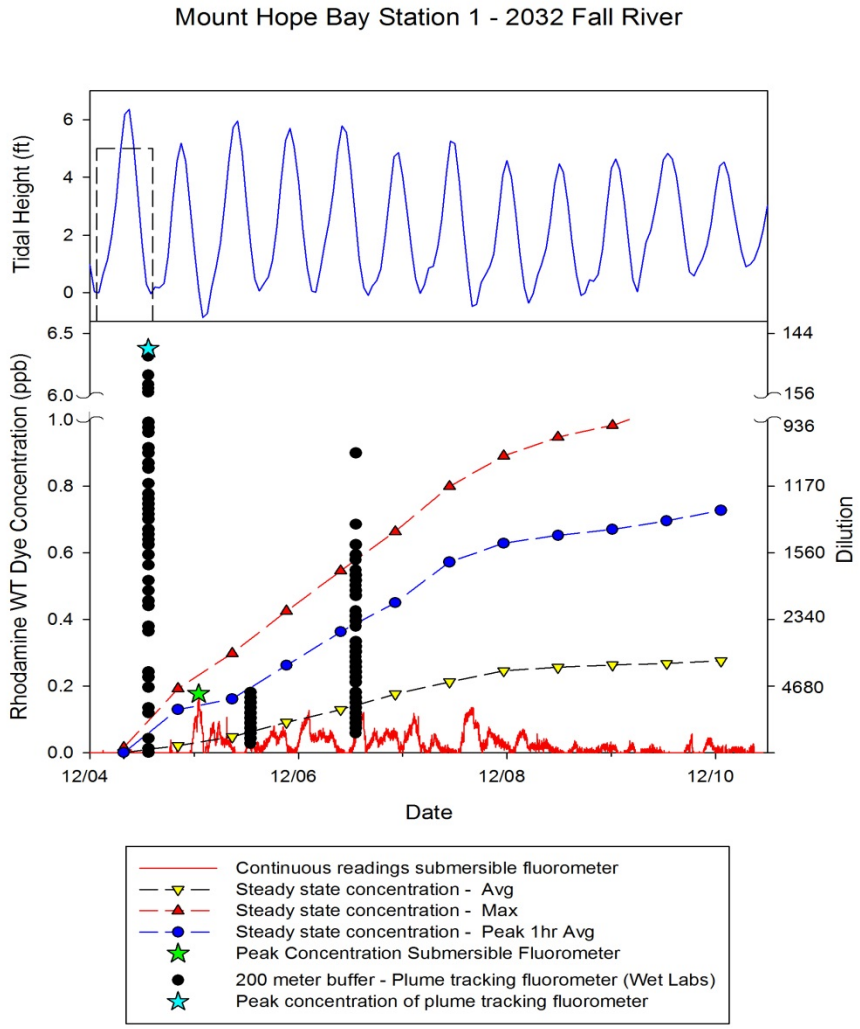


Figure 12: Station 2 Wet Labs 913 Data

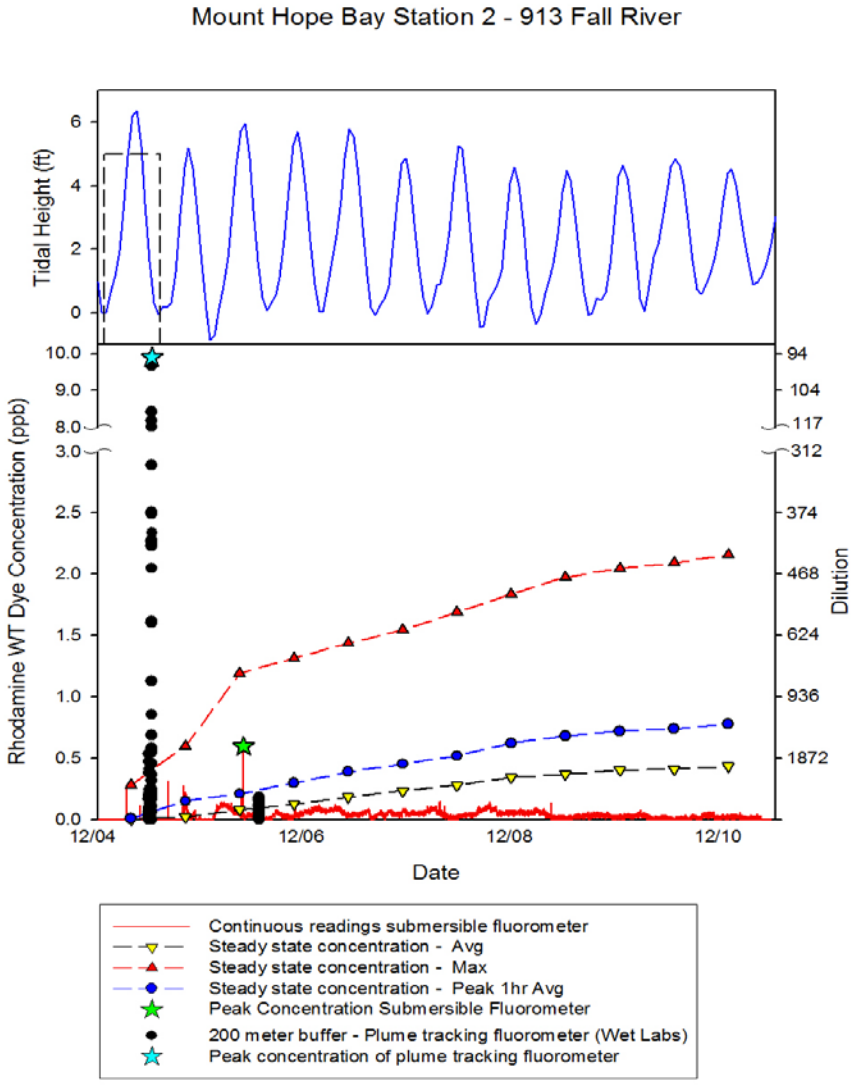


Figure 13: Station 3 Wet Labs 585 Data

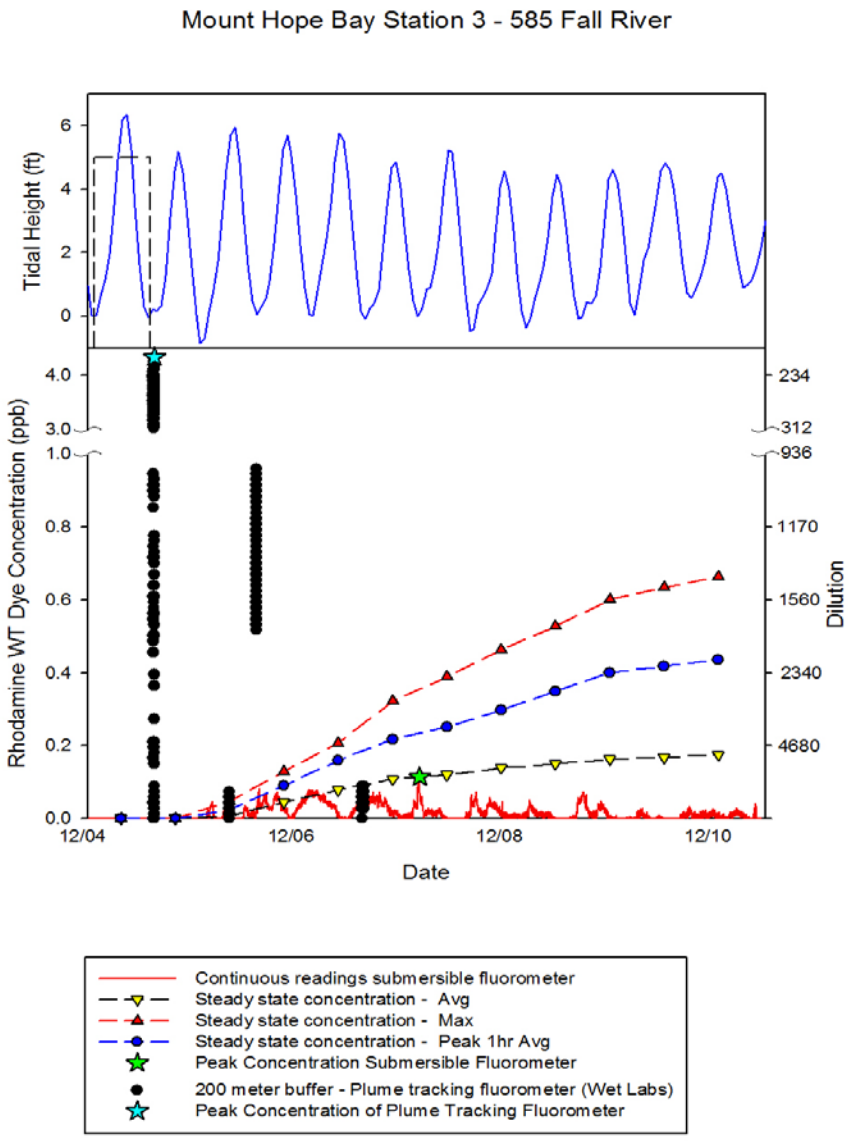


Figure 14: Station 5 Wet Labs 2219 Data

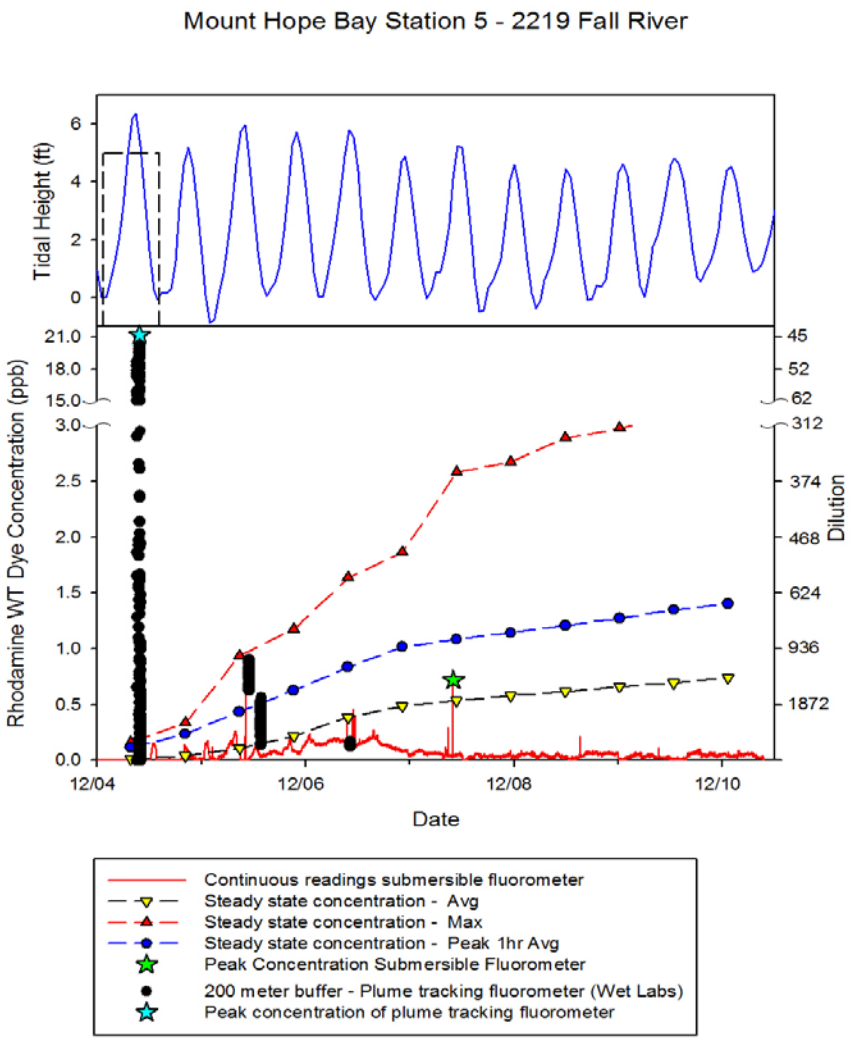


Figure 15: Station 6 - Outfall Wet Labs 3007 Data

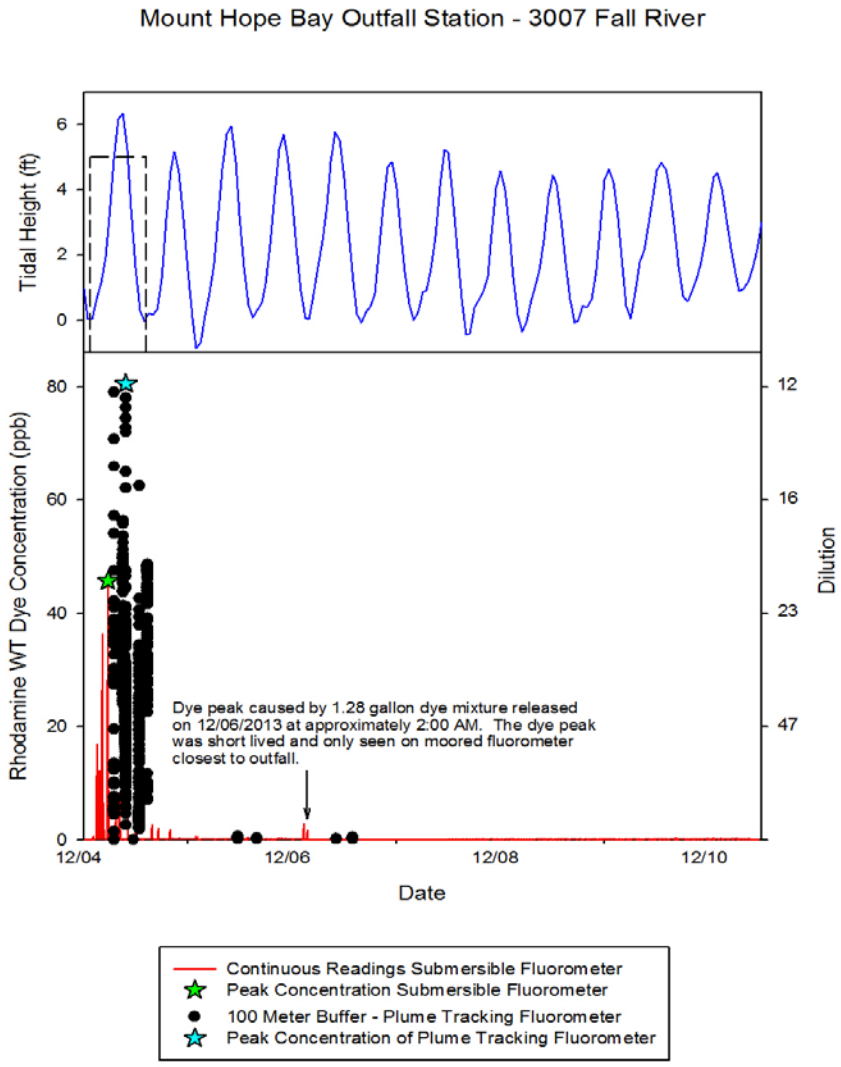


Figure 16: Station 7 - RI West Wet Labs 2416 Data

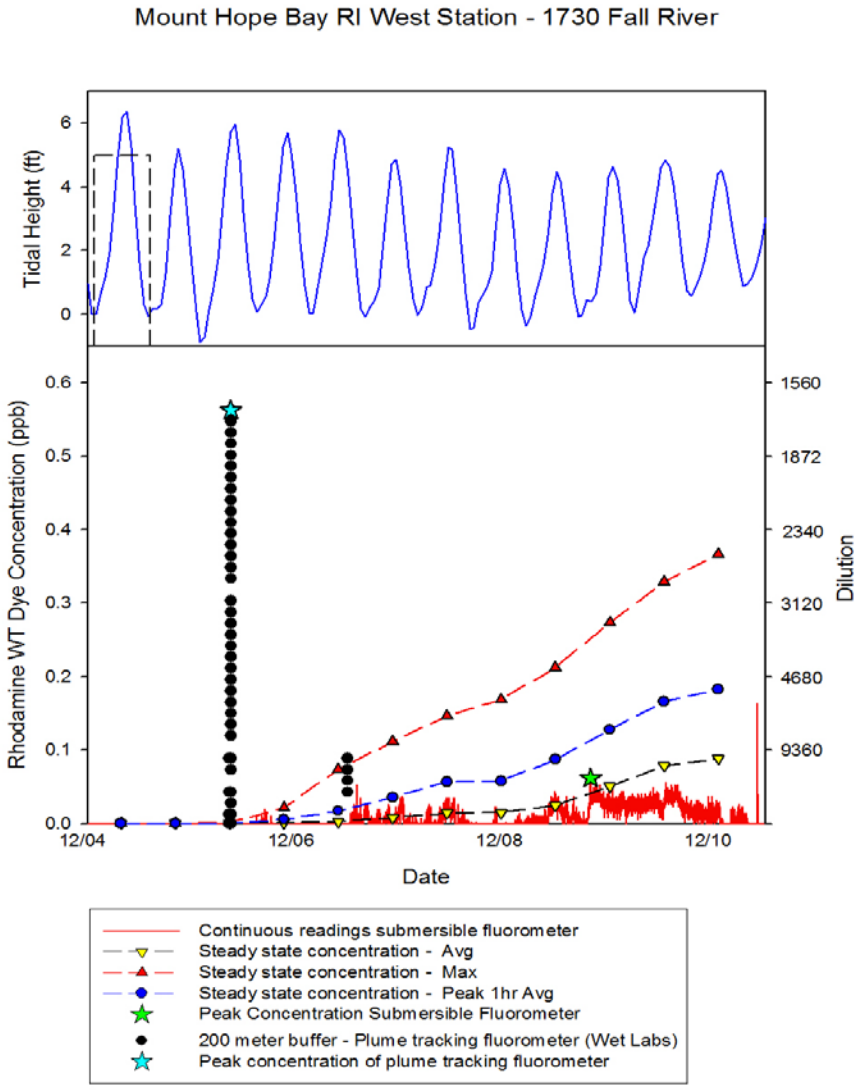


Figure 17: Station 8 - Middle Wet Labs 1730 Data

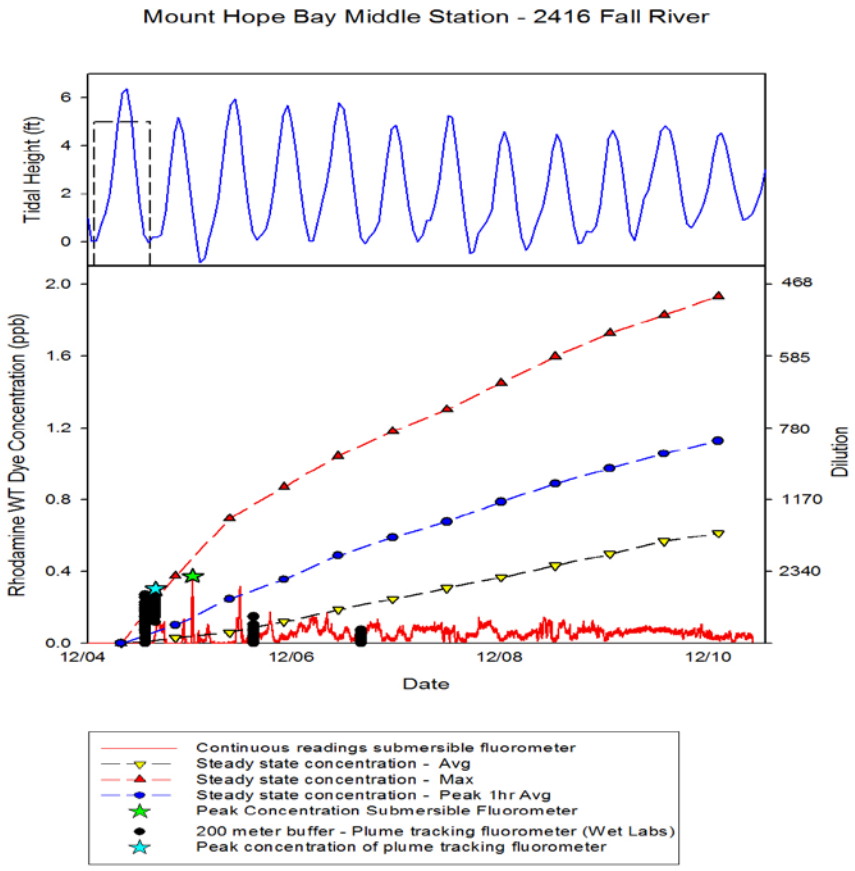


Figure 18: Seabird CTD with Wet Labs 2487 Profile Fluorometer – Stations 1 & 2

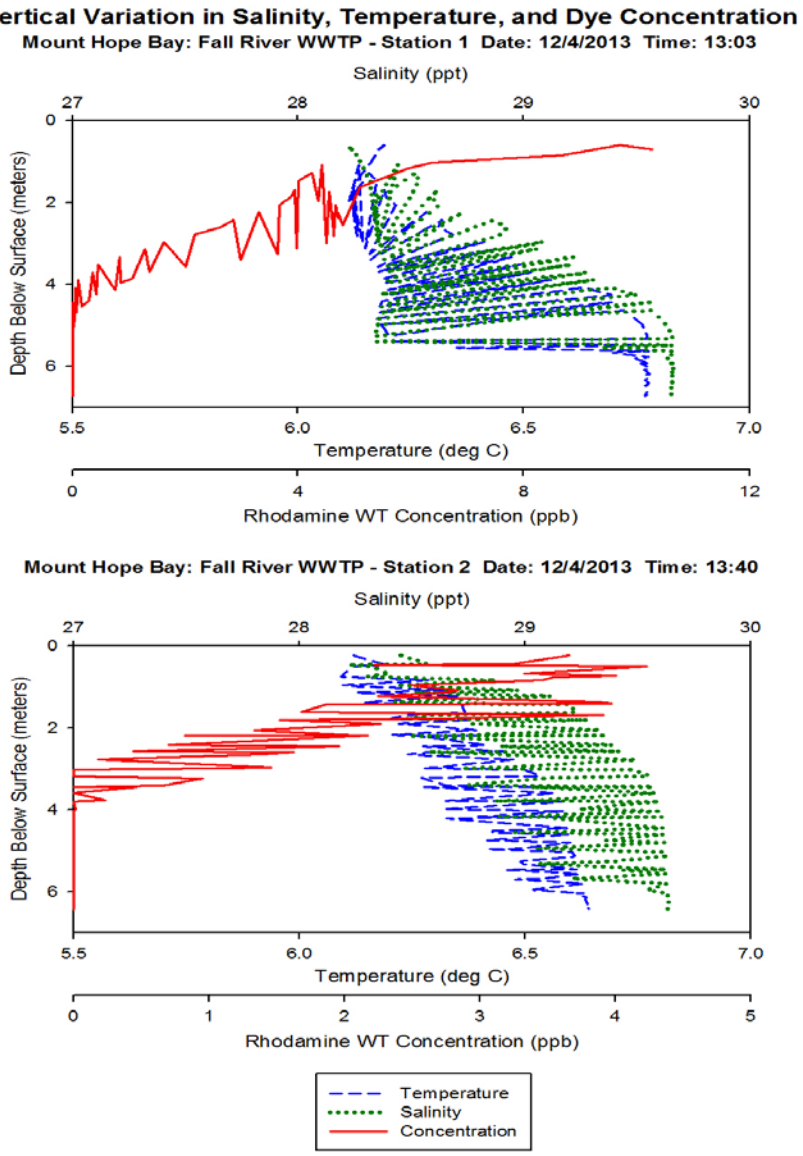


Figure 19: Seabird CTD with Wet Labs 2487 Profile Fluorometer – Stations 3 & 4

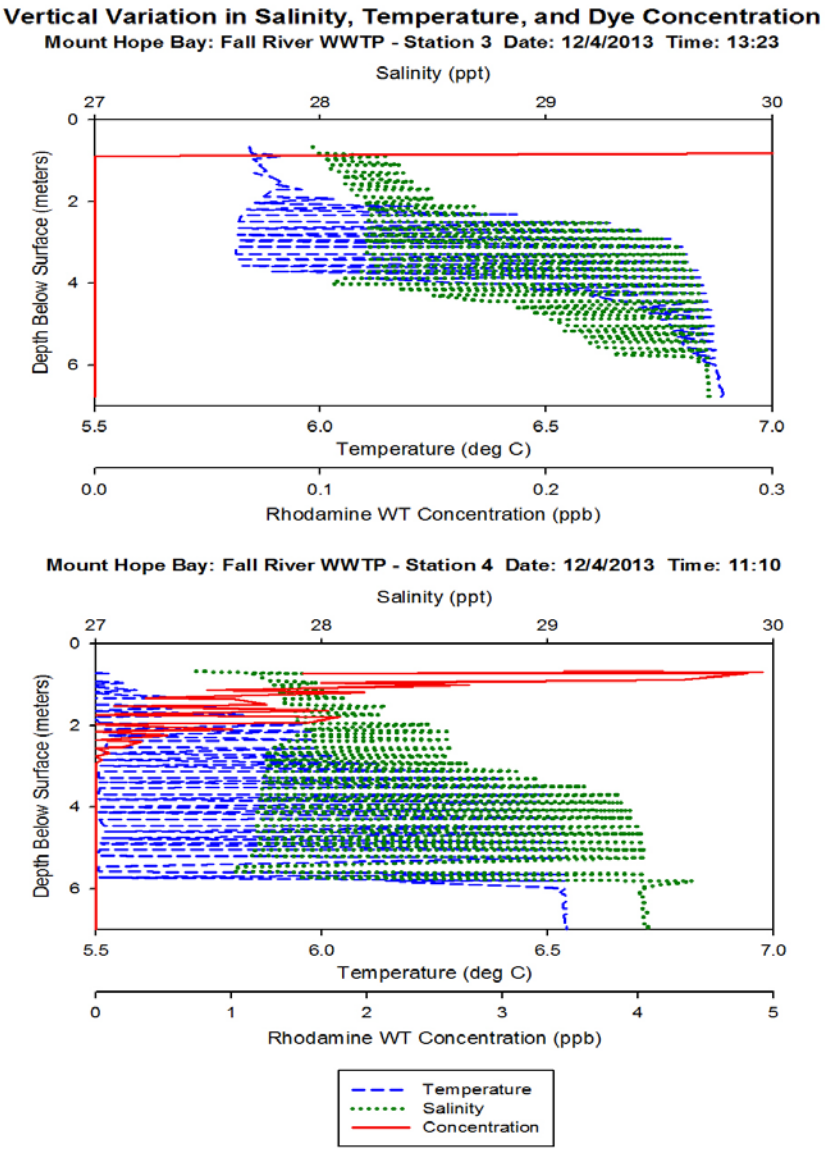


Figure 20: Seabird CTD with Wet Labs 2487 Profile Fluorometer Stations 5 & 6

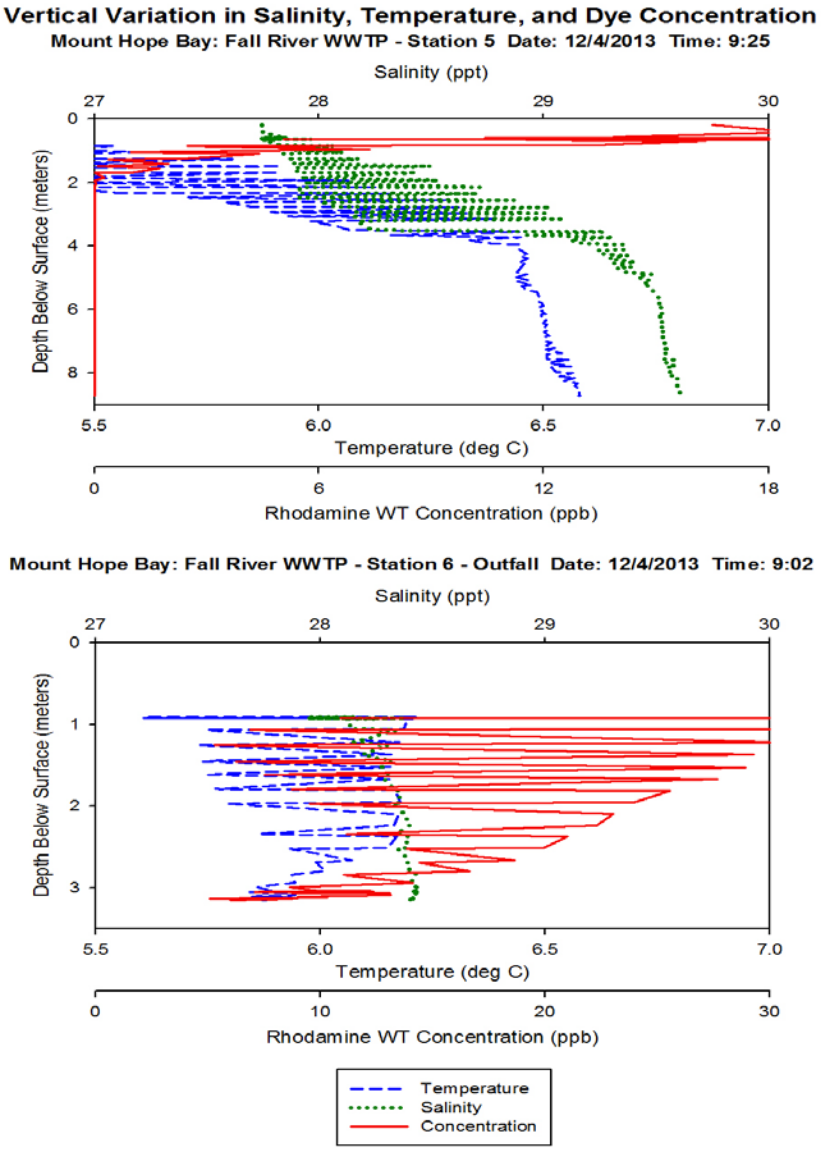


Figure 21: Seabird CTD with Wet Labs 2487 Profile Fluorometer – Taunton River

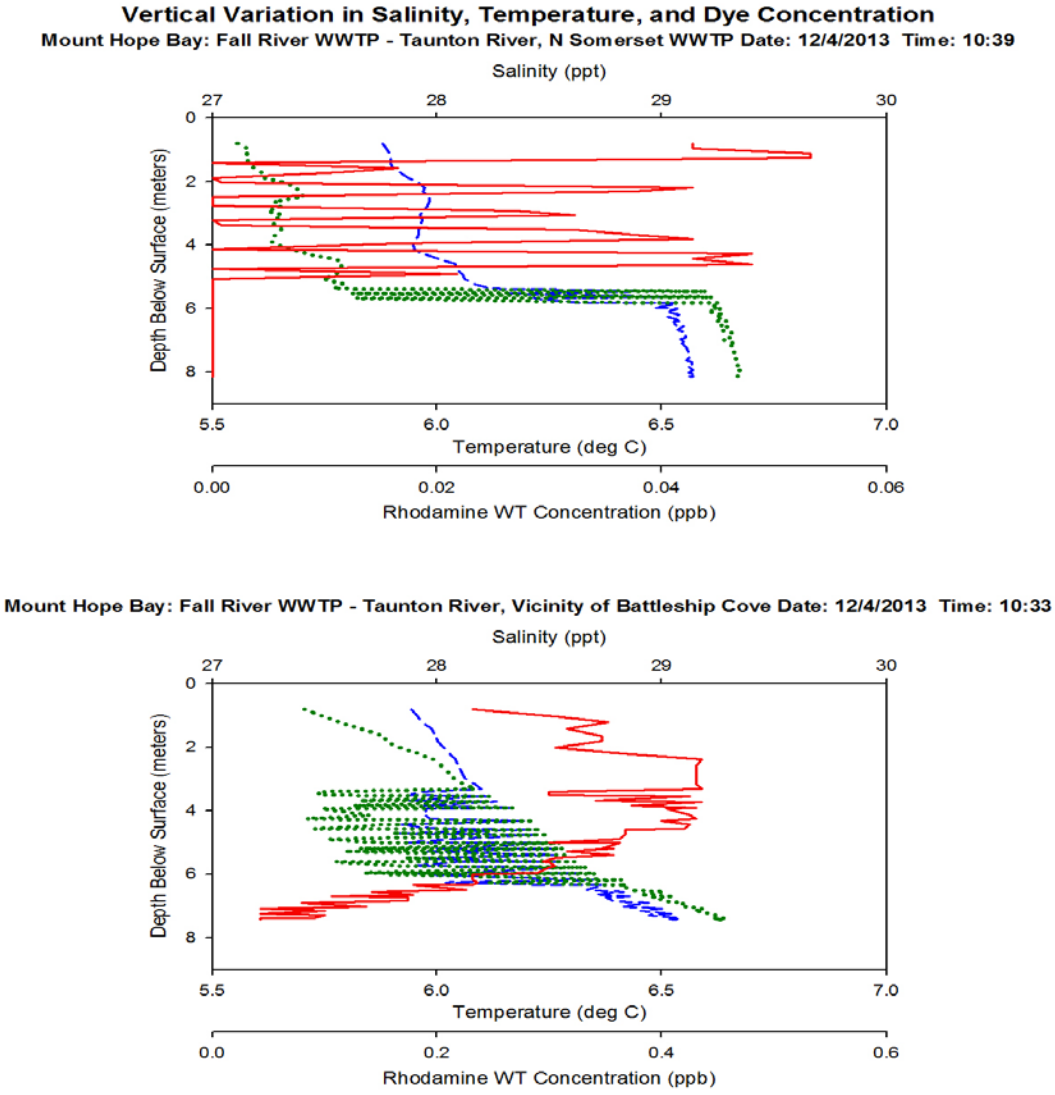


Figure 22: Fall River WWTP 100 Meter Buffer Frequency

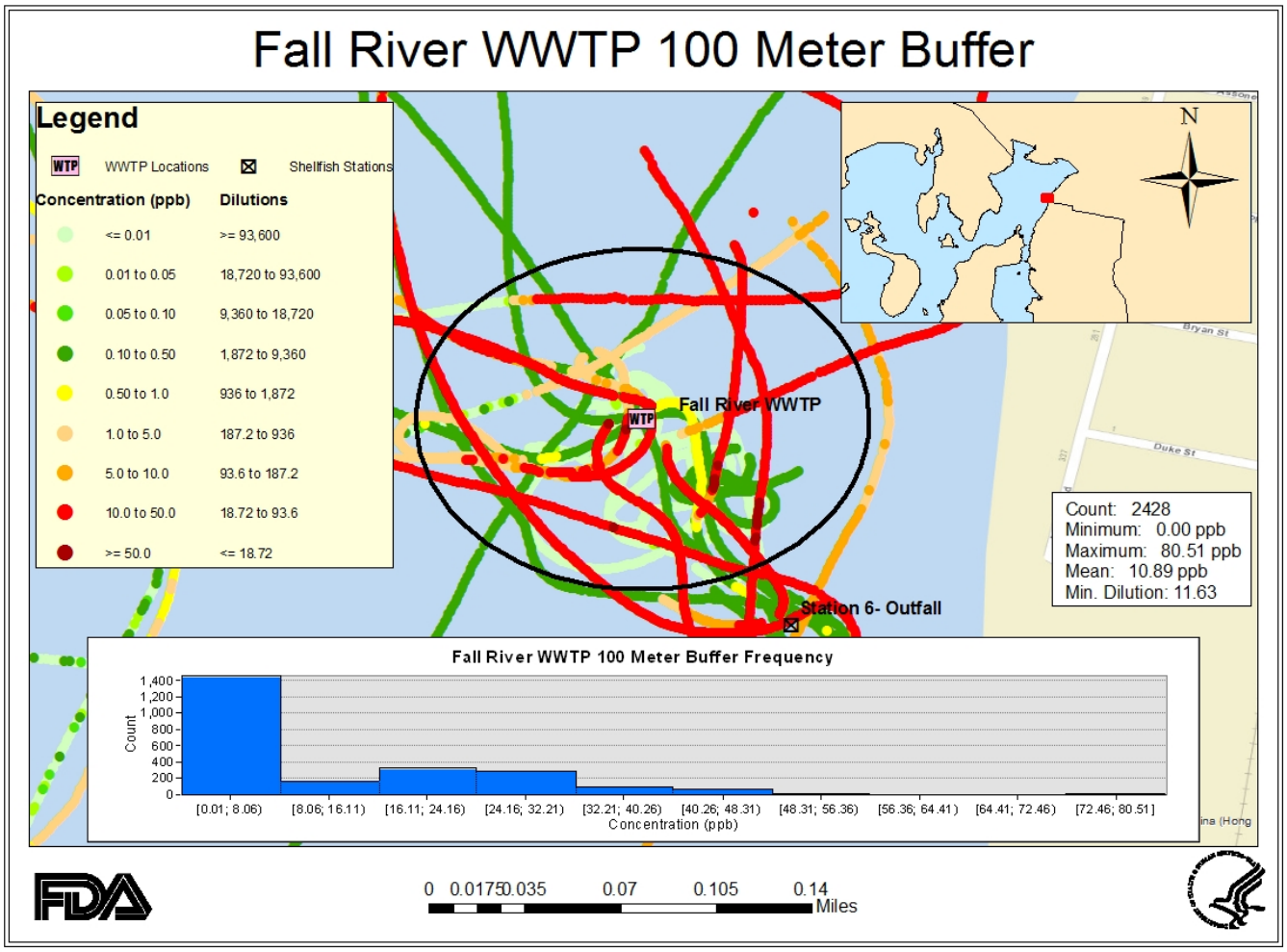


Figure 23: Results Projected for a 50 MGD Flow

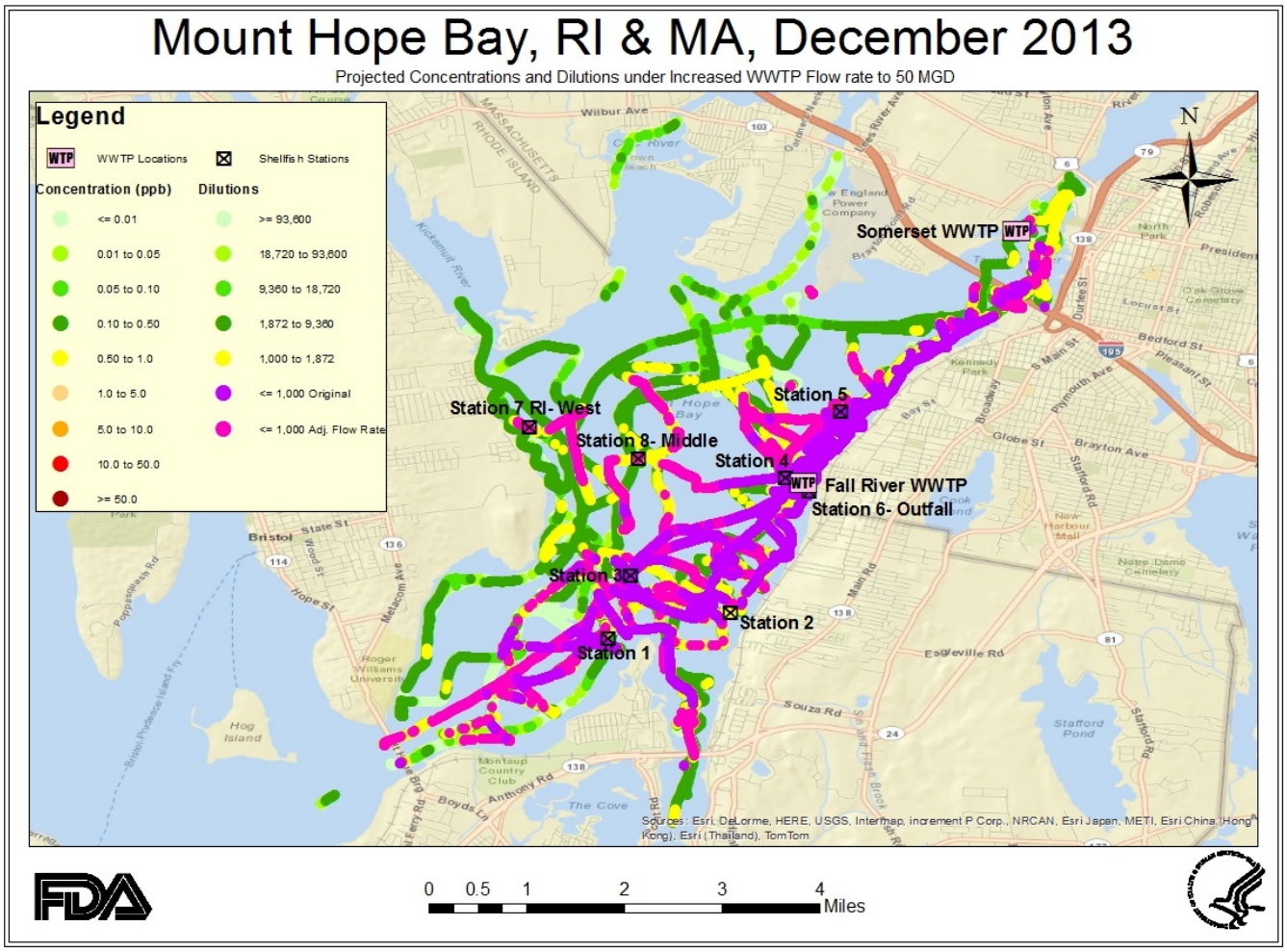


Figure 24: Accumulated Dilution Results Projected for a 50 MGD Flow – MA Shellfish Classifications

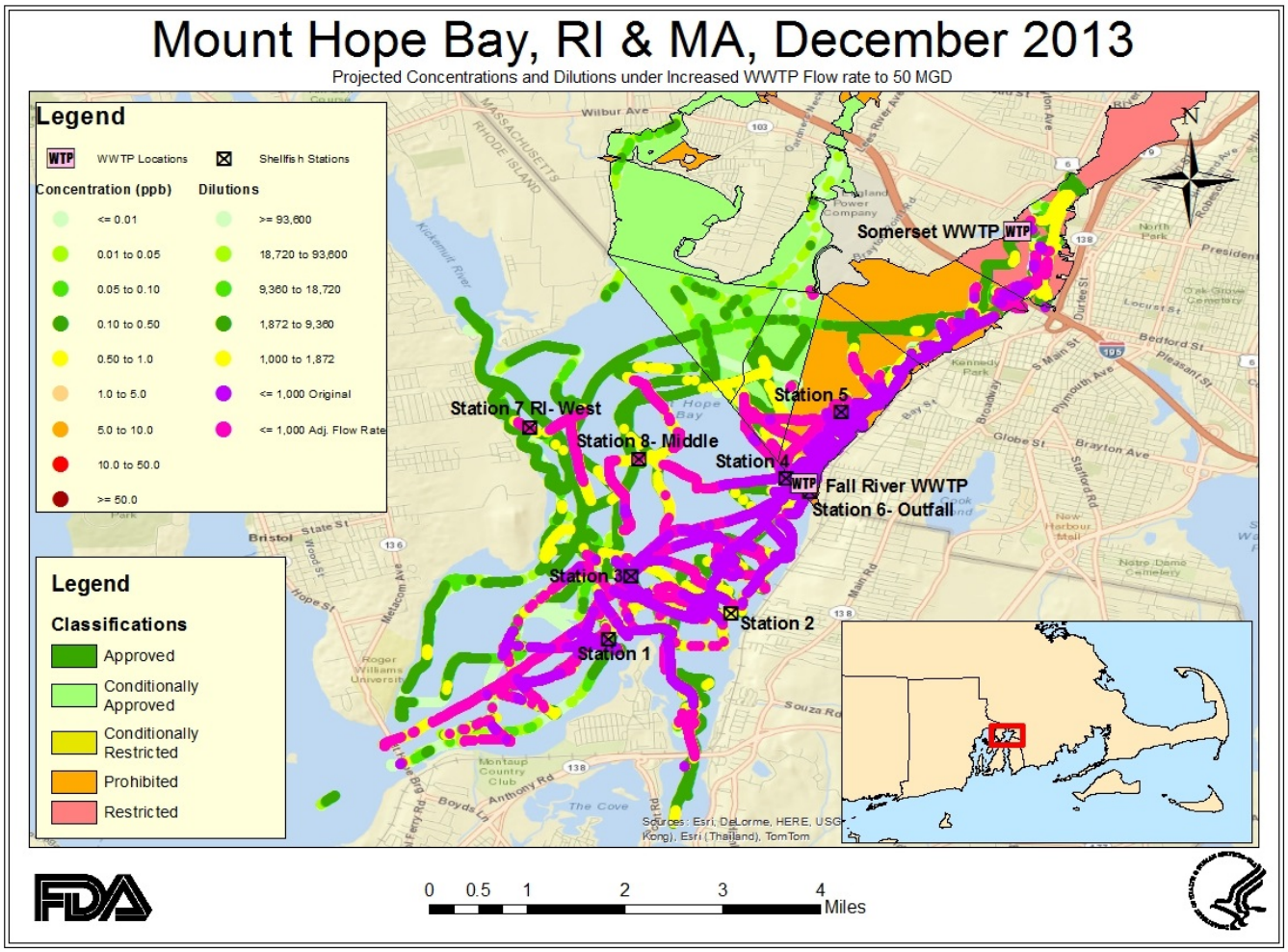


Figure 25: Accumulated Dilution Results Projected for a 50 MGD Flow – RI Classification Areas

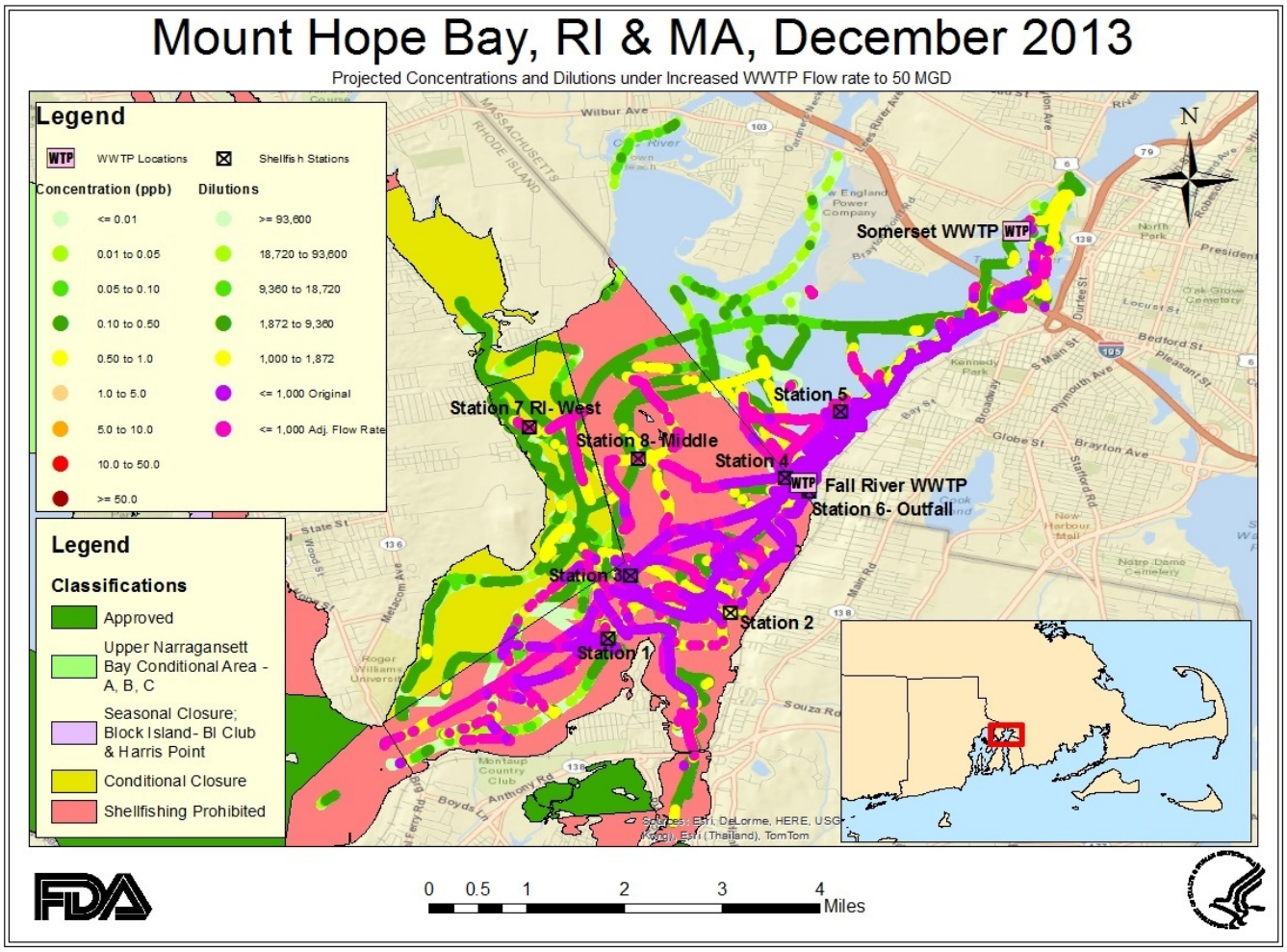


Figure 26: Comparison of Daily Average and Maximum Flows and Bypass Volume – Fall River WWTP

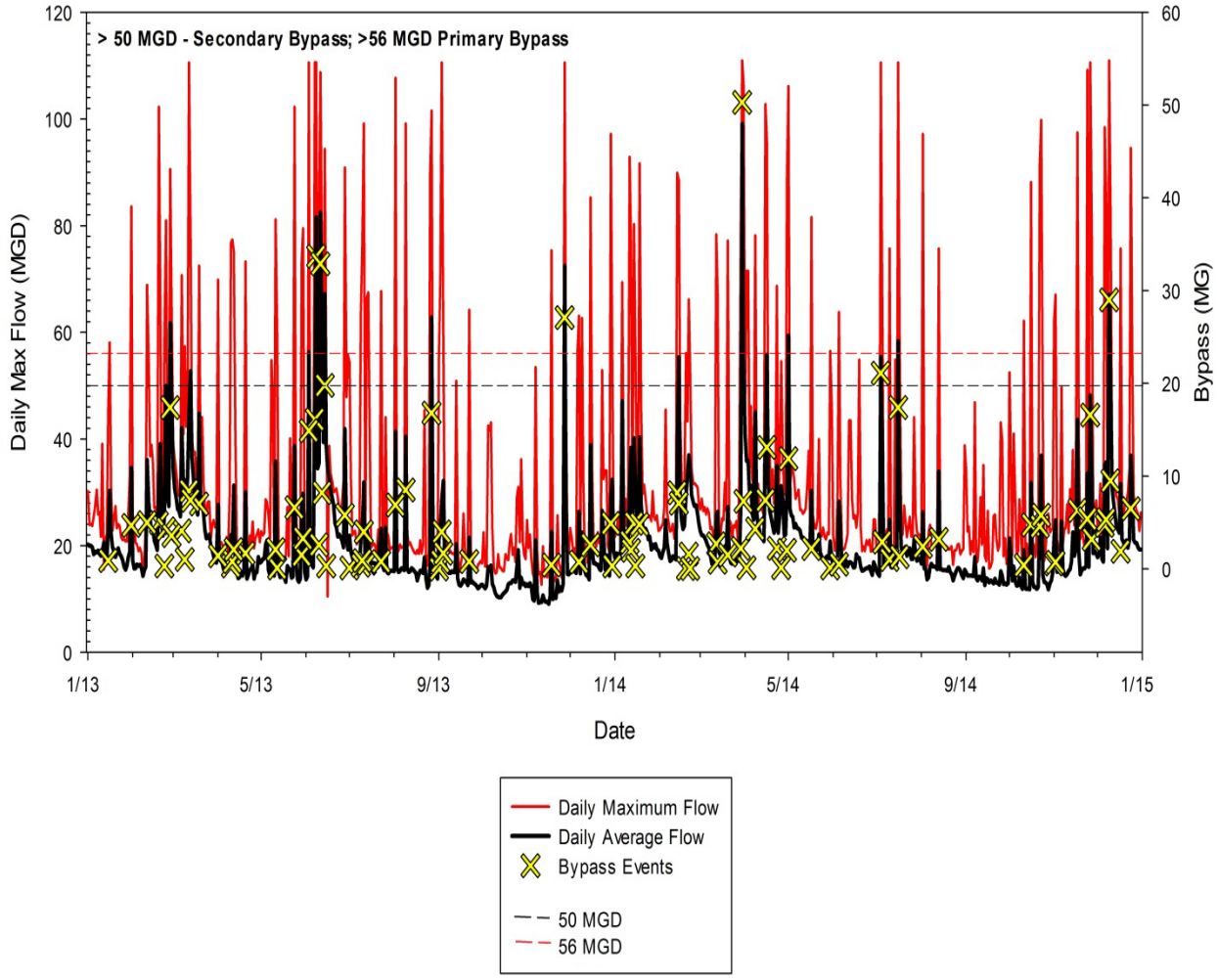
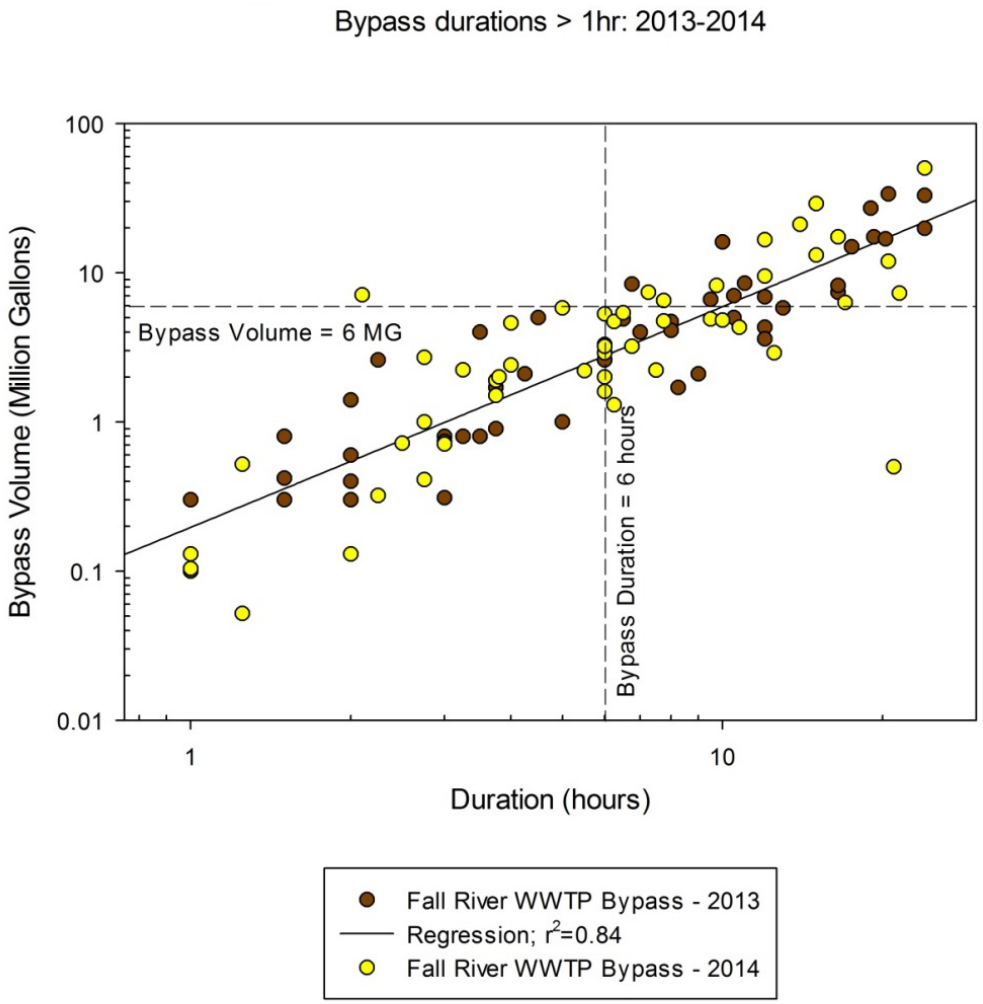


Figure 27: Bypass Volume vs Duration – Fall River WWTP



Note: Bypass volumes do not typically exceed 6 MG in 6 hour timeframe.

Figure 28: Bypass Volume vs Flow Rate – Fall River WWTP

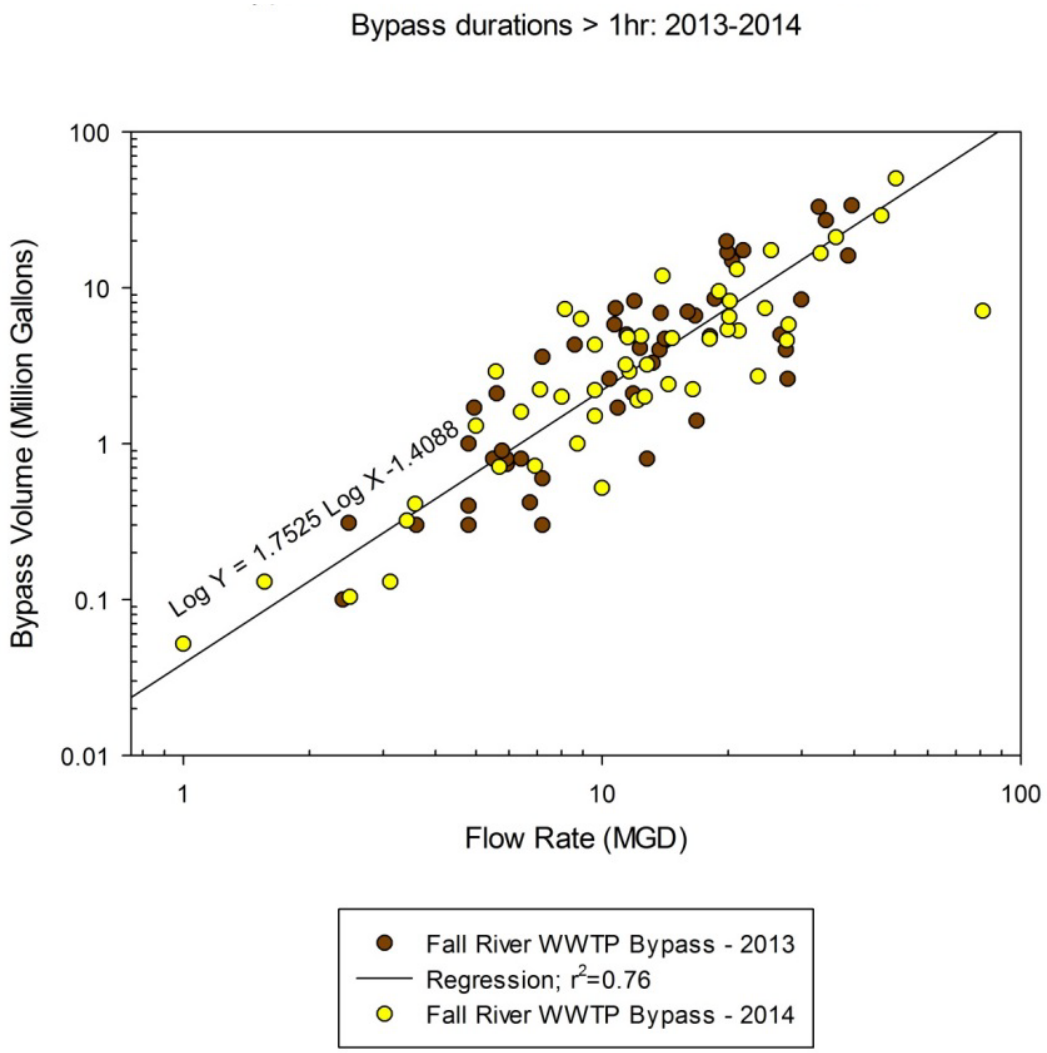


Figure 29: Potential Impact of Bypass Events on MA Conditional Growing Areas

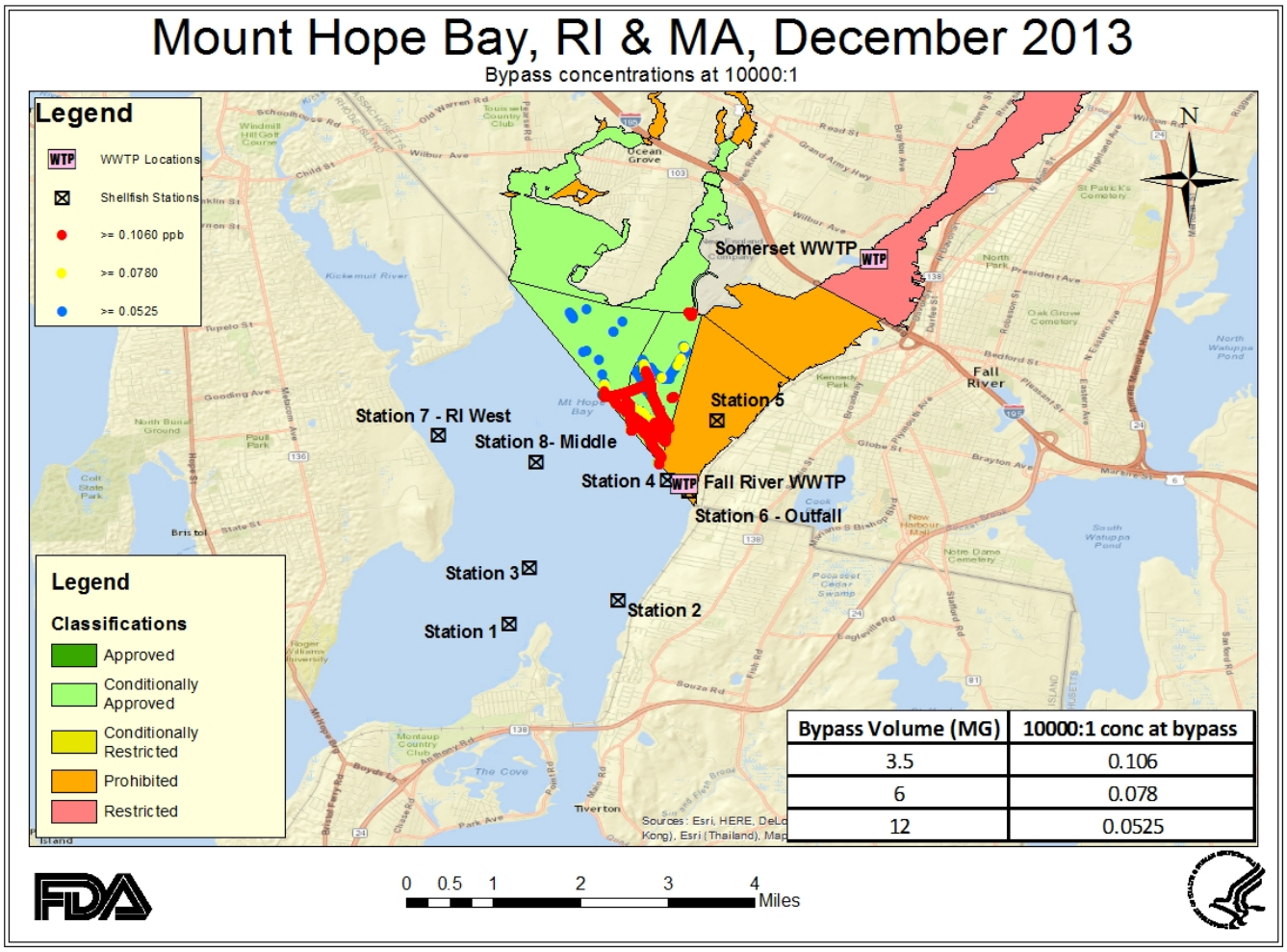


Figure 30: Dilution in Surface Waters During Bypass Events – RI Growing Area

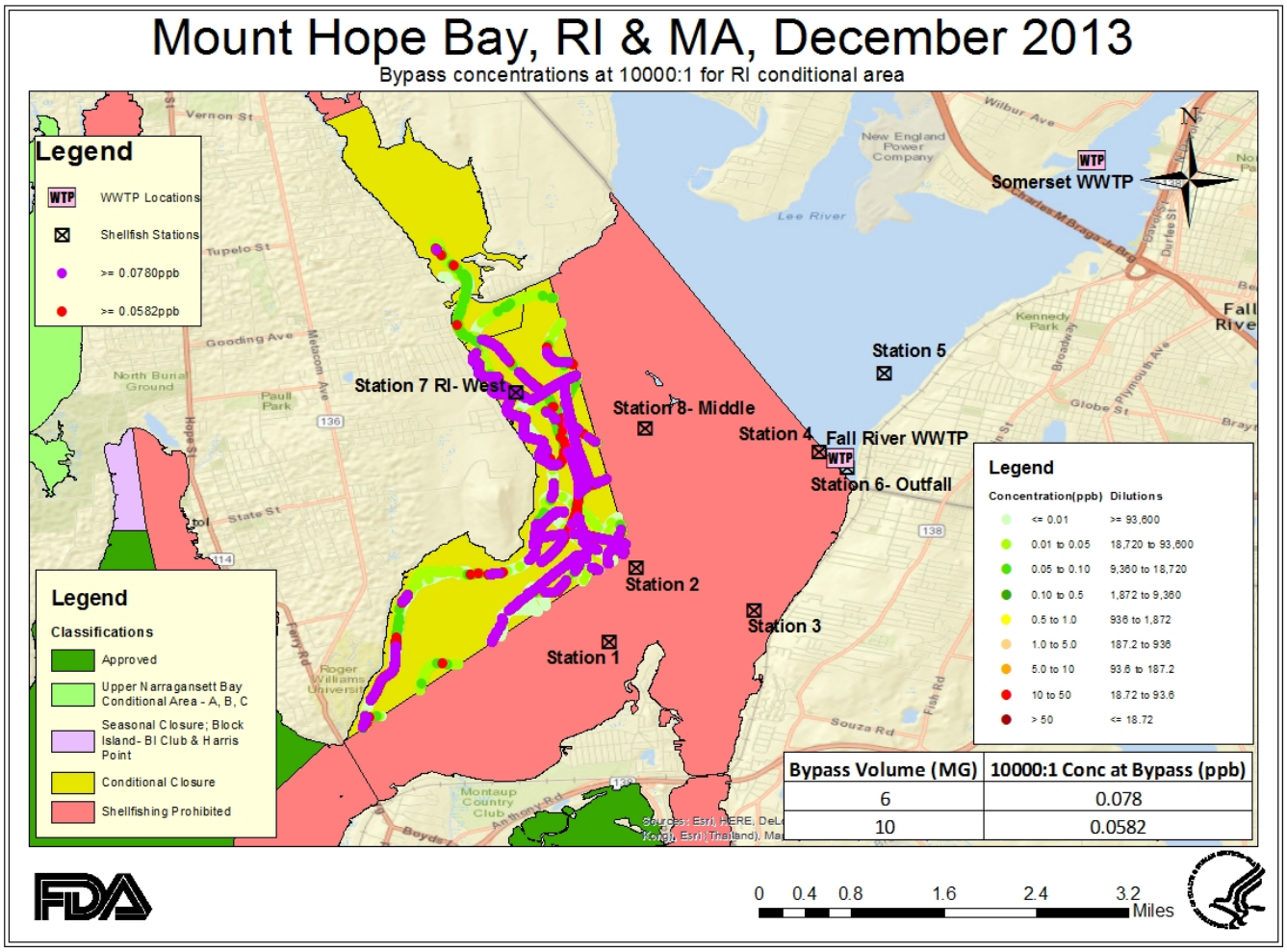


Figure 31: Comparison of Volume of Bypass and Rainfall with Closure Period – MA 2013

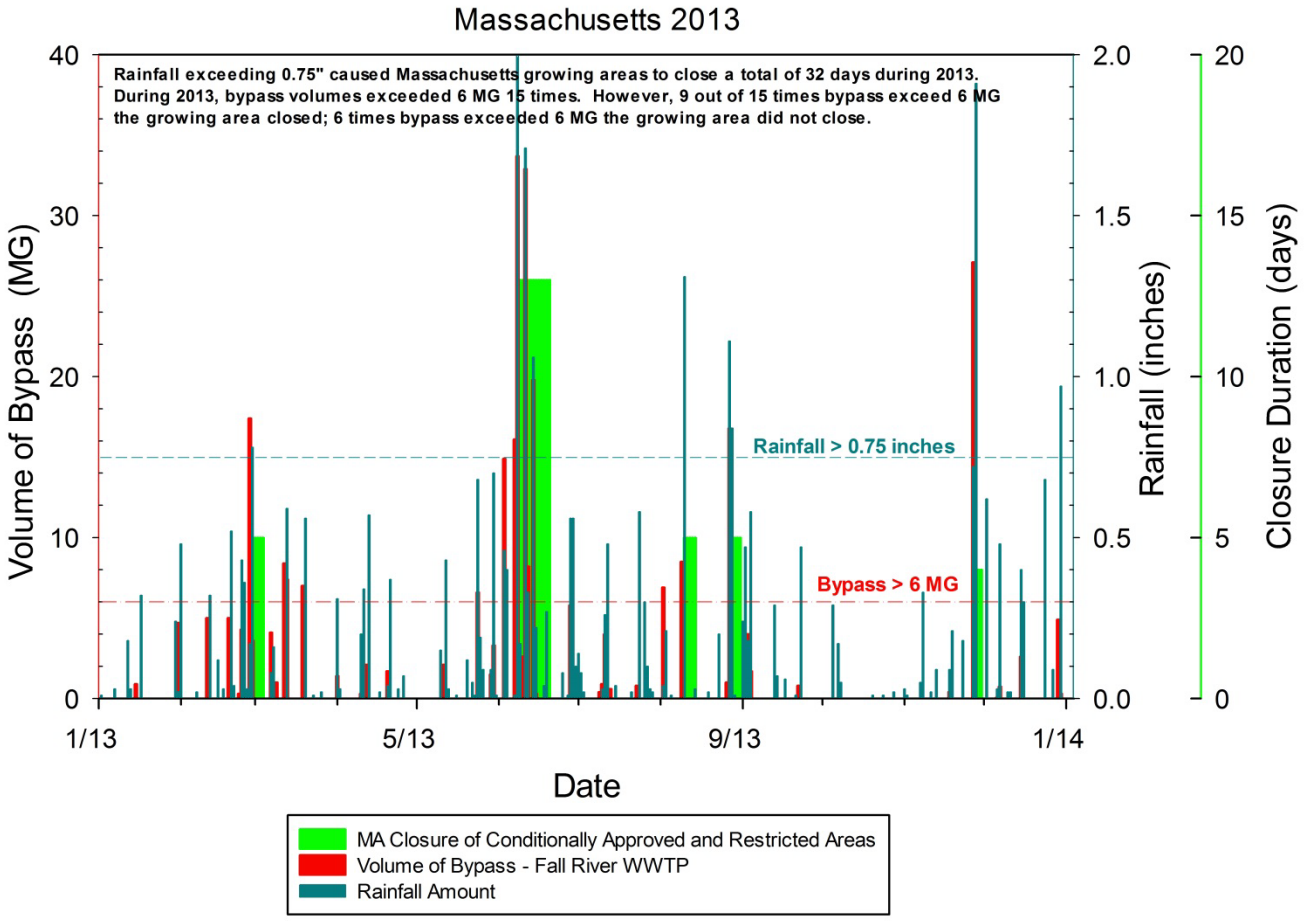


Figure 32: Comparison of Volume of Bypass and Rainfall with Closure Period – MA 2014

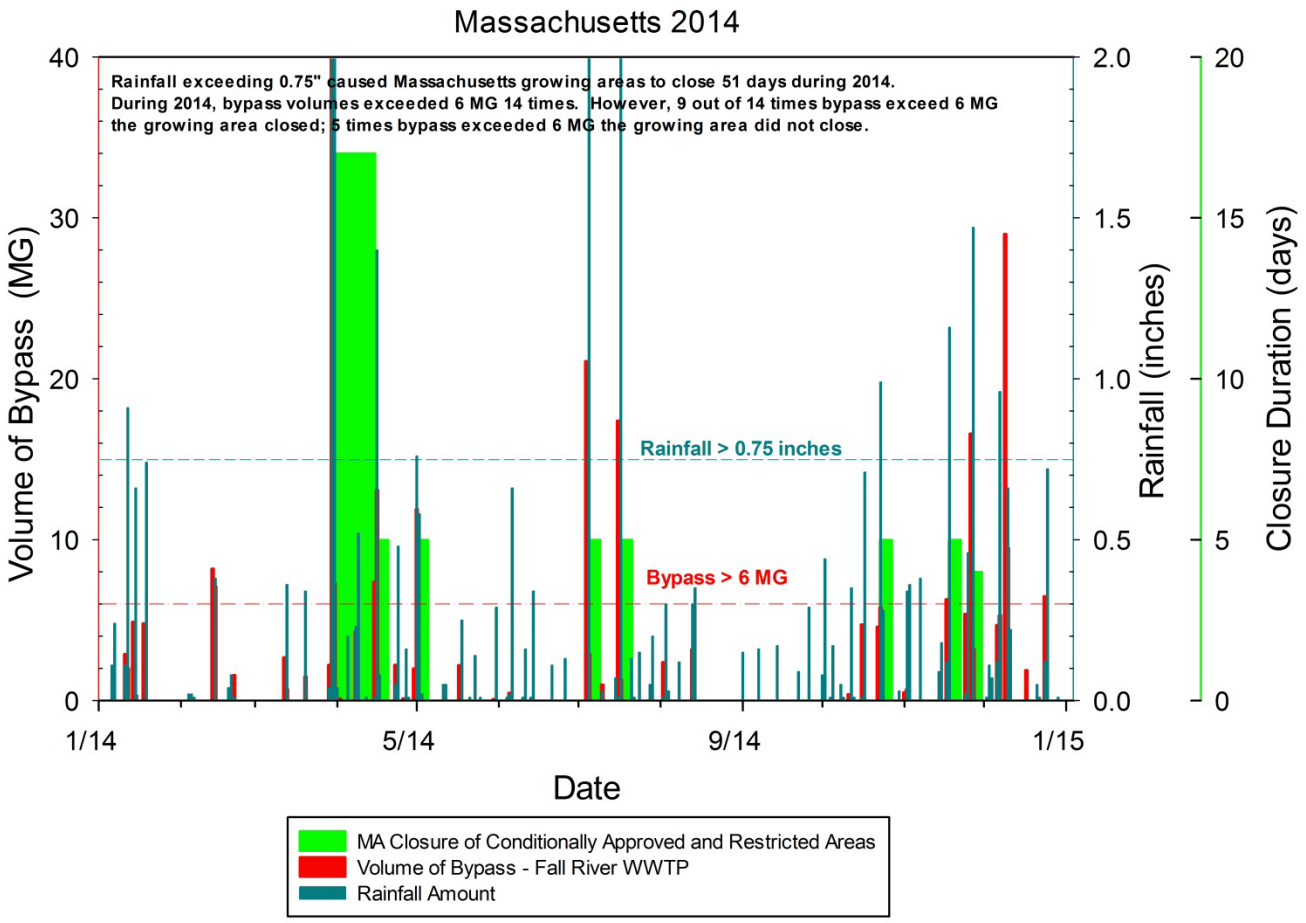


Figure 33: Comparison of Volume of Bypass and Rainfall with Closure Period – RI 2013

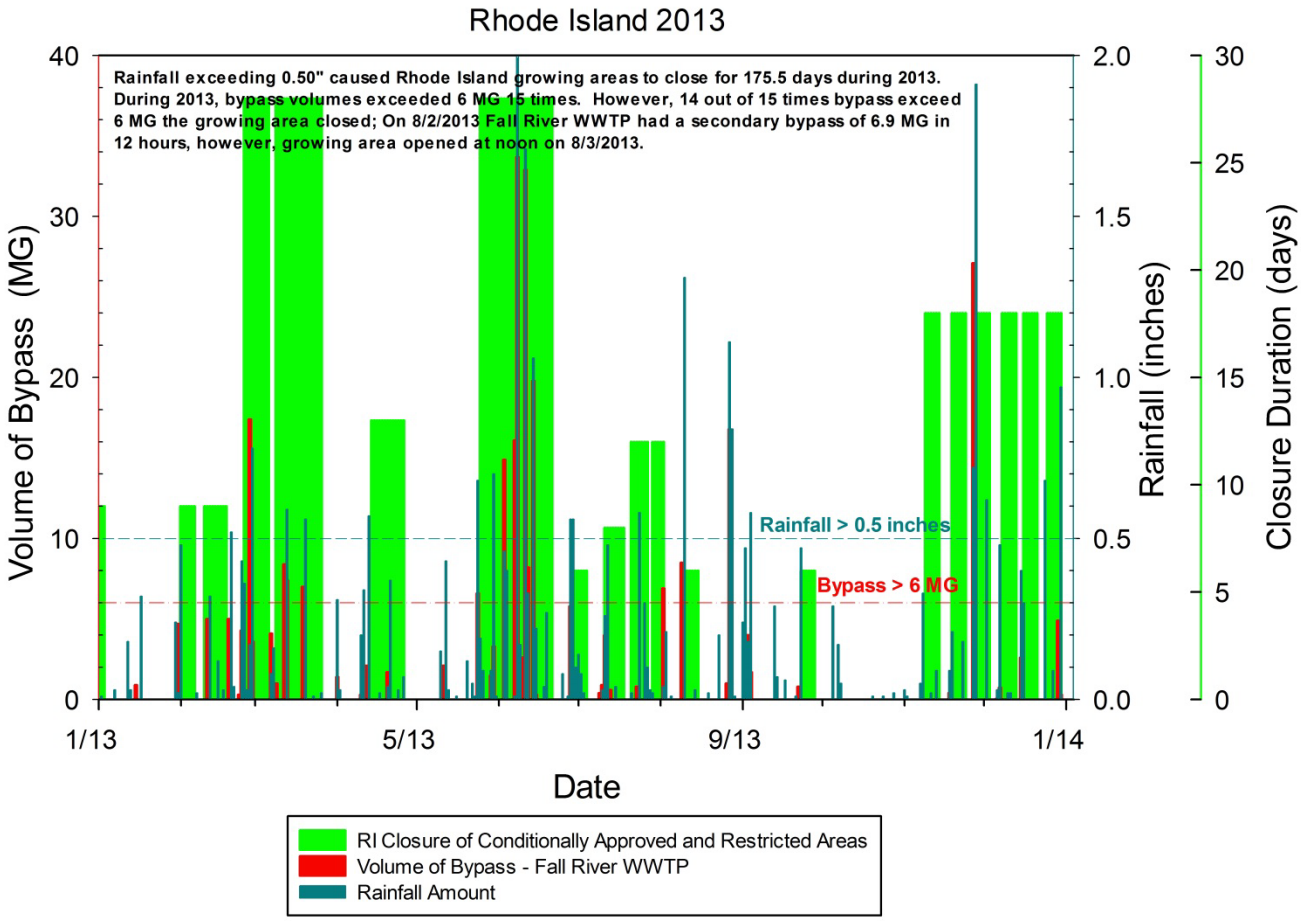


Figure 34: Comparison of Volume of Bypass and Rainfall with Closure Period – RI 2014

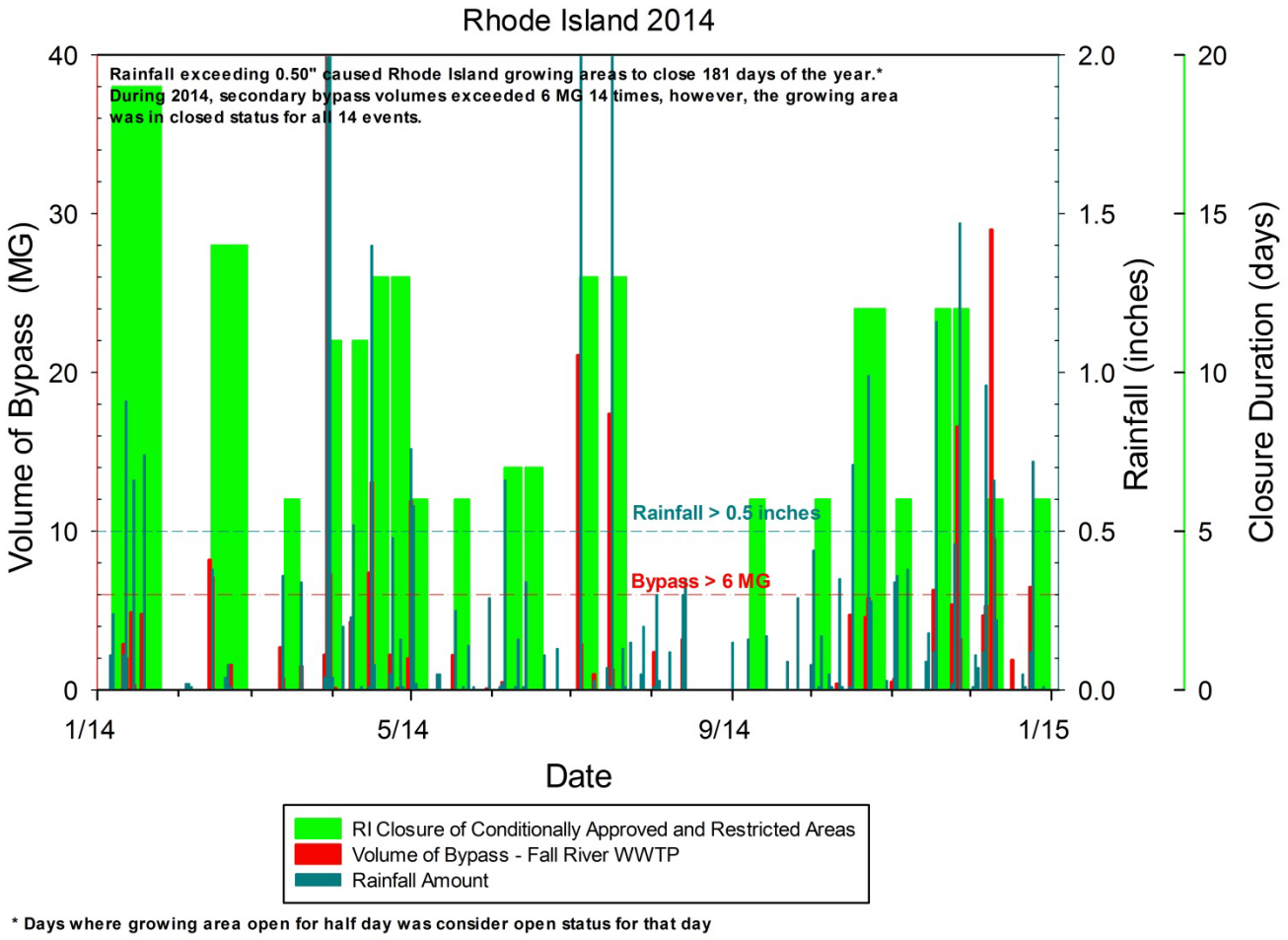


Figure 35: Recommended Classification Change – MA Growing Area

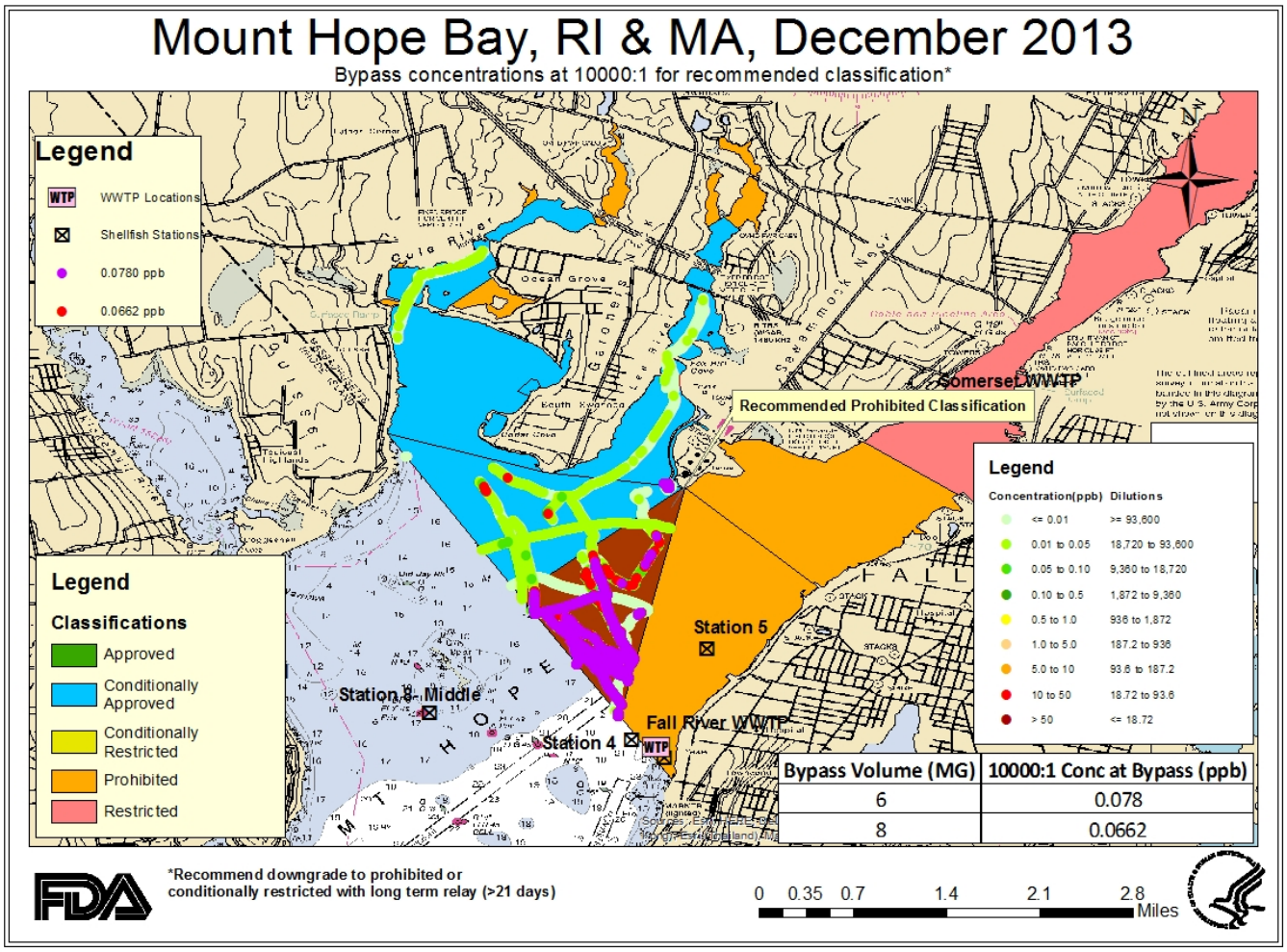
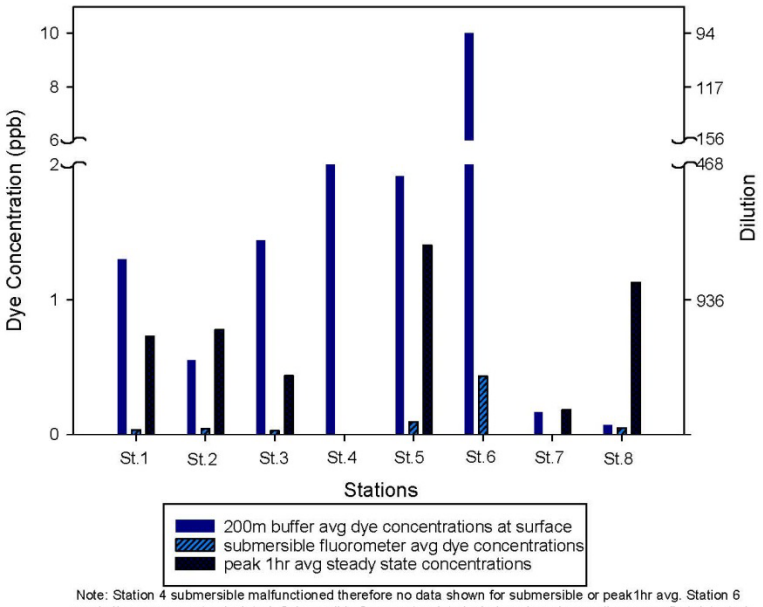


Figure 36: Comparison of Concentration and Dilutions – Surface, Depth, and Steady State Averages



Note: Station 4 submersible malfunctioned therefore no data shown for submersible or peak1hr avg. Station 6 peak 1hr avg was not calculated. Submersible fluorometer data includes when dye readings were first detected until the end of tracking on 12/6 at approximately 5:00pm.

Station locations:

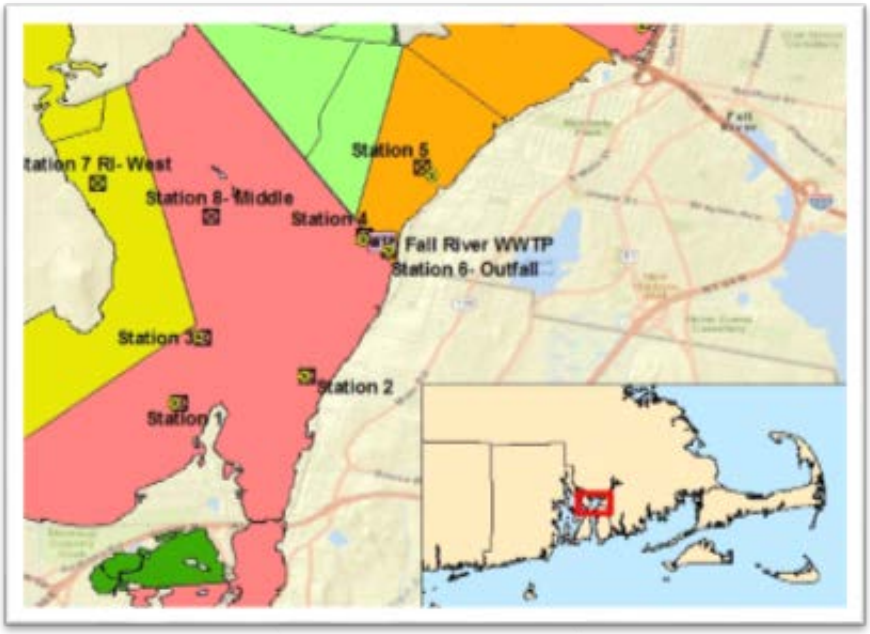
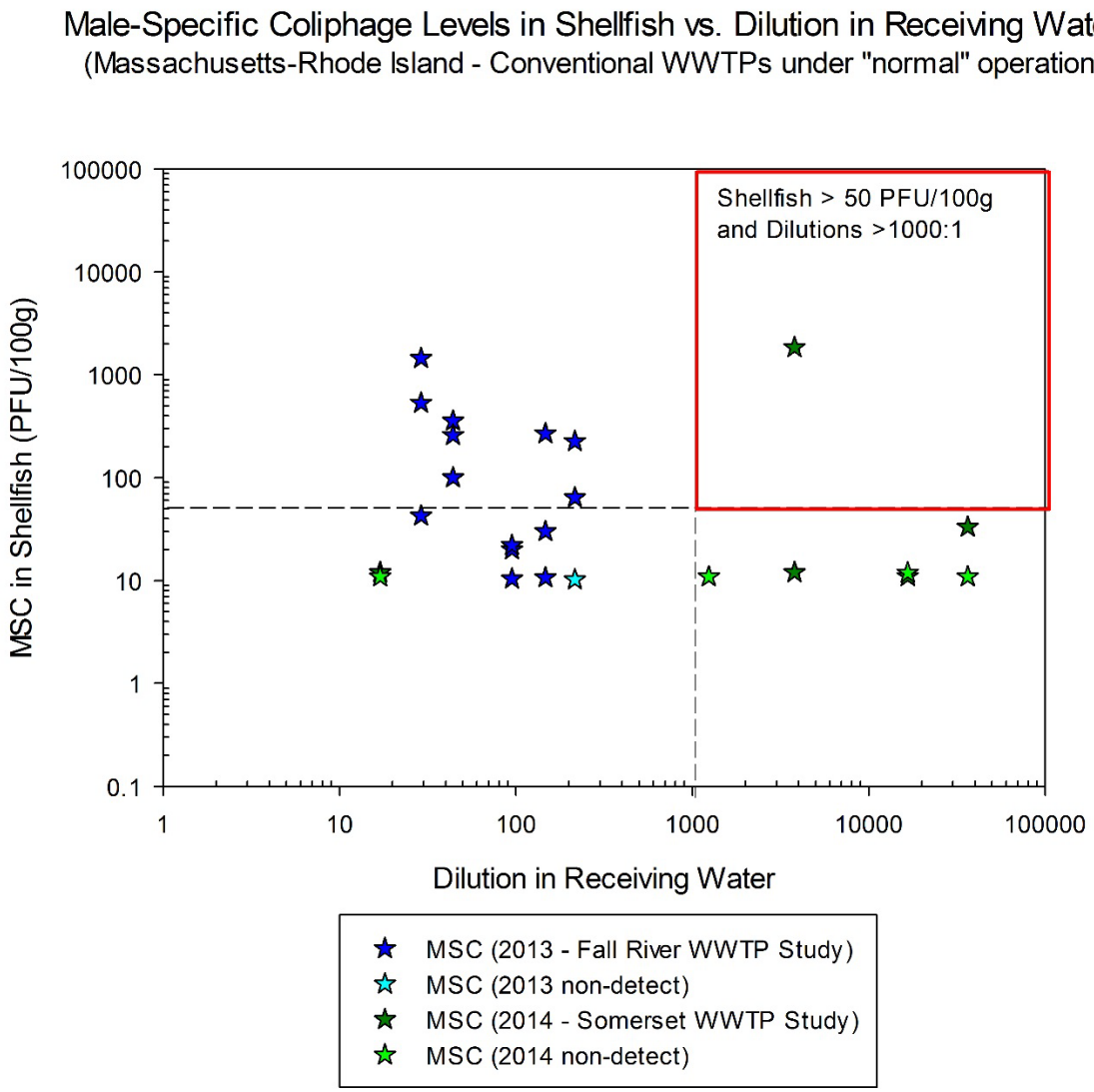


Figure 37: Male-Specific Coliphage Levels in Shellfish vs. Dilution in Receiving Waters - 2013 data from Fall River WWTP and 2014 data from Somerset WWTP studies – all data



* Unusal to find highest MSC level at a high dilution - even higher than levels found closer to outfall. This may potentially be attributed to another source of MSC closer to the sample site. Further field studies and shoreline survey in this area recommended.

Figure 38: Male-Specific Coliphage Levels in Shellfish vs. Dilution in Receiving Waters - 2013 data from Fall River WWTP and 2014 data from Somerset WWTP studies – species comparison

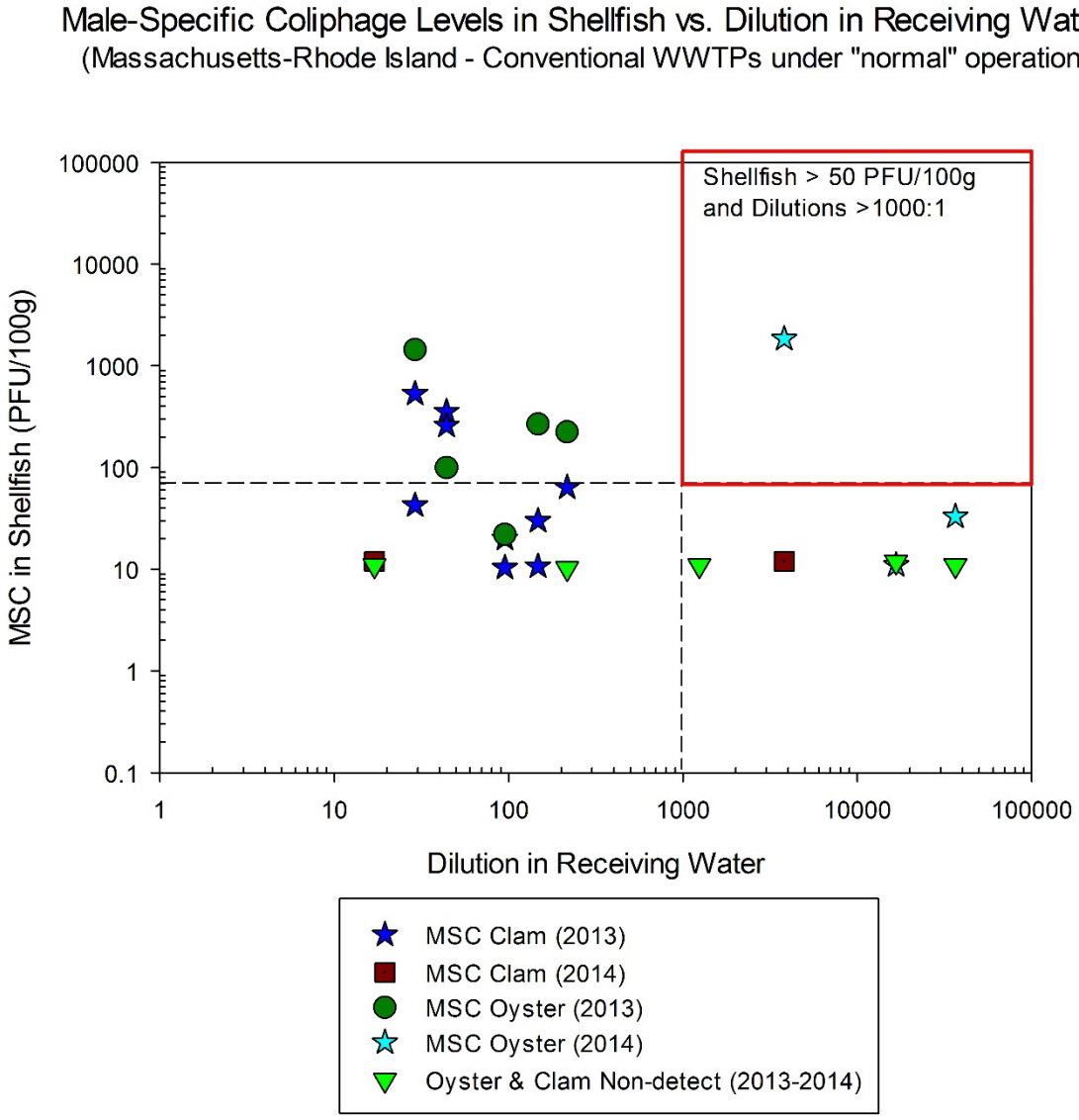
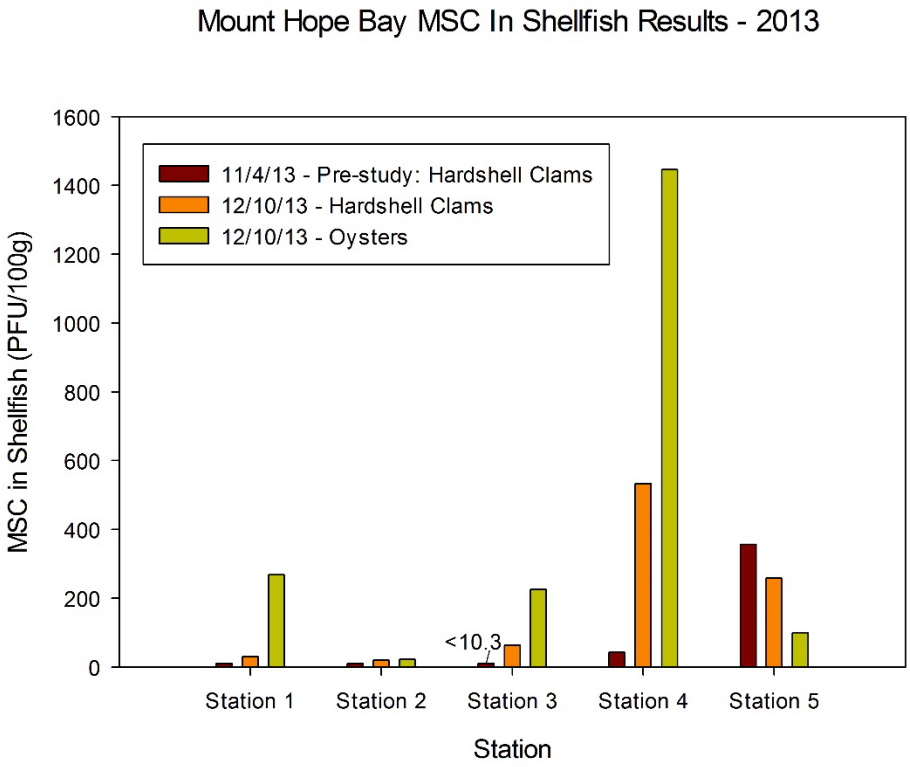


Figure 39: Comparison of Male-Specific Coliphage Results at Stations - 2013



Date	Rainfall (in)	Volume of Bypass (MG)	Duration
11/27/2013	0.72	27.1	19
12/6/2013	0.03	0.08	0.01
12/7/2013	0.48	0.74	3

Station Locations:

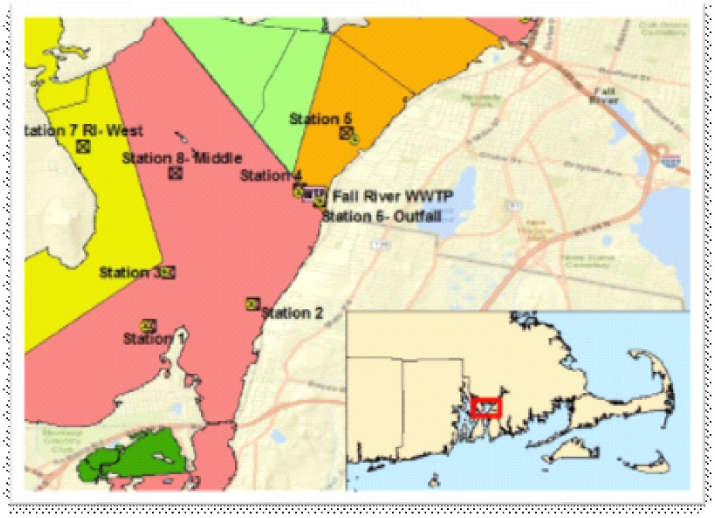
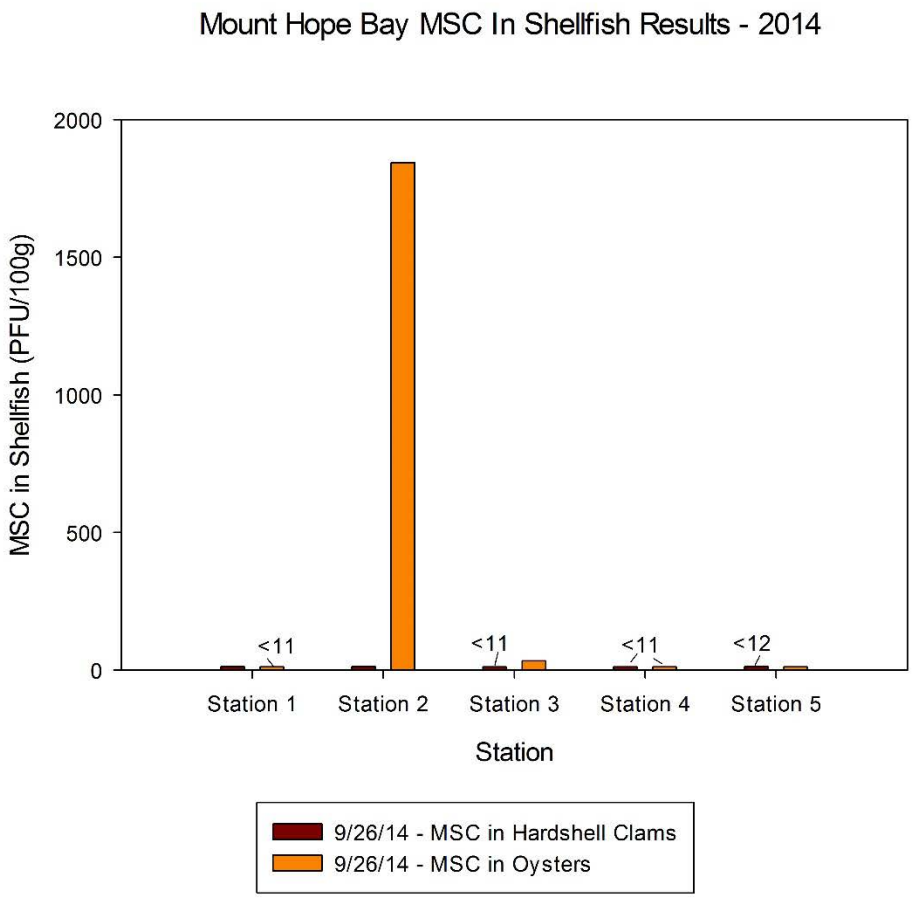


Figure 40: Comparison of Male-Specific Coliphage Results at Stations - 2014



Station Locations:

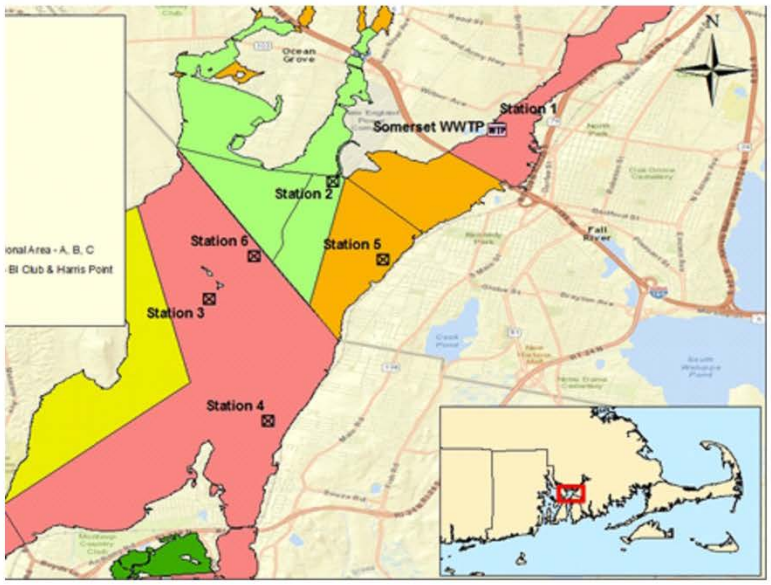


Table 1: Recorded Bypass Events – Fall River WWTP 2013

Date	Volume (MG)	Duration (hours)
1/15/2013	0.9	3.75
1/31/2013	4.7	8
2/11/2013	5	10.5
2/19/2013	5	4.5
2/20/2013		5.5
2/23/2013	0.3	2
2/24/2013	4.3	12
2/27/2013	17.4	19.25
2/28/2013	3.6	12
3/7/2013	4.1	8
3/9/2013	1	5
3/12/2013	8.4	6.75
3/13/2013	7.4	16.5
3/19/2013	7	10.5
4/1/2013	1.4	2
4/10/2013	0.3	1.5
4/11/2013	0.8	1.5
4/12/2013	2.1	9
4/20/2013	1.7	3.75
5/11/2013	2.1	4.25
5/12/2013	0.1	1
5/24/2013	6.6	9.5
5/29/2013	1.5	3.75
5/30/2013	3.3	6
6/3/2013	14.9	17.5
6/7/2013	16.1	10
6/8/2013	33.7	20.5
6/10/2013	2.6	2.25
6/11/2013	32.9	24
6/12/2013	8.2	16.5
6/14/2013	19.8	24
6/15/2013	0.3	1
6/28/2013	5.8	13
6/30/2013	0.1	0.5
7/1/2013	0.1	1
7/9/2013	0.4	2
7/10/2013	0.9	3.75
7/11/2013	4	7
7/13/2013	0.6	2
7/14/2013	0	0.75
7/23/2013	0.8	3
8/2/2013	6.9	12
8/9/2013	8.5	11

Table 1 (Continued): Recorded Bypass Events – Fall River WWTP 2013

8/26/2013	1	0.5
8/27/2013	16.8	20.25
9/1/2013	0	1
9/2/2013	0.8	3.25
9/3/2013	4	3.5
9/4/2013	1.7	8.25
9/22/2013	0.8	3.5
11/18/2013	0.42	1.5
11/27/2013	27.1	19
12/6/2013	0.08	0.01
12/7/2013	0.74	3
12/15/2013	2.6	6
12/23/2013	0.04	0.75
12/29/2013	4.9	6.5
12/30/2013	0.31	3
Sum:	307	418
Max:	33.7	24
Min:	0	0.01
Count (days with bypass):	58	58

Table 2: Recorded Bypass Events – Fall River WWTP 2014

Date	Bypass Volume (MG)	Duration (hours)
1/11/2014	2.9	6
1/12/2014	2	6
1/14/2014	4.9	9.5
1/15/2014	0.32	2.25
1/18/2014	4.8	10
2/13/2014	8.2	9.75
2/14/2014	7.1	2.1
2/19/2014	0.052	1.25
2/21/2014	1.6	6
2/22/2014	0.045	0.75
3/12/2014	2.7	2.75
3/13/2014	0.72	2.5
3/20/2014	1.5	3.75
3/29/2014	2.23	3.25
3/30/2014	50.3	24
3/31/2014	7.3	21.5
4/2/2014	0.13	1
4/8/2014	4.3	10.75
4/15/2014	7.4	7.25
4/16/2014	13.1	15
4/23/2014	2.22	7.5
4/26/2014	0.13	2
4/30/2014	2	3.8
5/1/2014	11.9	20.5
5/17/2014	2.2	5.5
5/30/2014	0.104	1
6/5/2014	0.5	21
7/4/2014	21.1	14
7/5/2014	2.9	12.5
7/10/2014	1	2.75
7/16/2014	17.4	16.5
7/17/2014	1.3	6.25
8/2/2014	2.4	4
8/13/2014	3.2	6.75
10/11/2014	0.41	2.75
10/16/2014	4.74	7.75
10/22/2014	4.6	4
10/23/2014	5.8	5
11/1/2014	0.52	1.25
11/2/2014	0.71	3
11/17/2014	6.3	17
11/24/2014	5.4	6.5
11/26/2014	16.6	12

Table 2 (Continued): Recorded Bypass Events – Fall River WWTP 2014

Date	Volume (MG)	Duration (hours)
11/27/2014	3.2	6
12/6/2014	4.7	6.25
12/7/2014	5.3	6
12/9/2014	29	15
12/10/2014	9.5	12
12/17/2014	1.9	3.75
12/24/2014	6.5	7.75
Sum:	295	385
Max:	50.3	24
Min:	0.045	0.75
Count (days with bypass):	50	50

Table 3: Summery of Male-Specific Coliphage Results in Shellfish 2013-2014

Station	Date of collection	Classification	Shellfish	MSC - PFU/100g	Dilution	Method
Station 1 - Common Fence Point	11/4/2013	Prohibited	Clam	10.7	147	Tracking
Station 2 - East Entrance to Sakonnet	11/4/2013	Prohibited	Clam	10.4	95	Tracking
Station 3 - RI Cond Area East Corner	11/4/2013	Prohibited	Clam	<10.3	216	Tracking
Station 4 - MA Cond Area South Corner	11/4/2013	Prohibited	Clam	42.5	29	Tracking
Station 5 - North of Fall River Outfall	11/4/2013	Prohibited	Clam	356.4	44	Tracking
Station 1 - Common Fence Point	12/10/2013	Prohibited	Clam	30	147	Tracking
Station 2 - East Entrance to Sakonnet	12/10/2013	Prohibited	Clam	20	95	Tracking
Station 3 - RI Cond Area East Corner	12/10/2013	Prohibited	Clam	64	216	Tracking
Station 4 - MA Cond Area South Corner	12/10/2013	Prohibited	Clam	533	29	Tracking
Station 5 - North of Fall River Outfall	12/10/2013	Prohibited	Clam	258	44	Tracking
Station 1 - Common Fence Point	12/10/2013	Prohibited	Oyster	268	147	Tracking
Station 2 - East Entrance to Sakonnet	12/10/2013	Prohibited	Oyster	22	95	Tracking
Station 3 - RI Cond Area East Corner	12/10/2013	Prohibited	Oyster	225	216	Tracking
Station 4 - MA Cond Area South Corner	12/10/2013	Prohibited	Oyster	1446	29	Tracking
Station 5 - North of Fall River Outfall	12/10/2013	Prohibited	Oyster	100	44	Tracking
Station 1 - Somerset WWTP	9/26/2014	Restricted	Oyster	<11	17	Tracking
Station 2 - Brayton Point	9/26/2014	Conditionally Approved	Oyster	1844	3800	Tracking
Station 3 - RI Cond Area East Corner	9/26/2014	Prohibited	Oyster	33	36472	Tracking
Station 4 - East Entrance to Sakonnet	9/26/2014	Prohibited	Oyster	<11	1239	Station
Station 5 - North of Fall River Outfall	9/26/2014	Prohibited	Oyster	11	16655	Tracking
Station 1 - Somerset WWTP	9/26/2014	Restricted	Clam	12	17	Tracking
Station 2 - Brayton Point	9/26/2014	Conditionally Approved	Clam	12	3800	Tracking
Station 3 - RI Cond Area East Corner	9/26/2014	Prohibited	Clam	<11	36472	Tracking
Station 4 - East Entrance to Sakonnet	9/26/2014	Prohibited	Clam	<11	1239	Station
Station 5 - North of Fall River Outfall	9/26/2014	Prohibited	Clam	<12	16655	Tracking

APPENDIX 3 – Fall River MOU

June 27, 2011

MEMORANDUM OF UNDERSTANDING

To classify and manage Massachusetts coastal waters, the Commonwealth of Massachusetts, Division of Marine Fisheries (*MarineFisheries*) must determine that shellfish growing areas maintain National Shellfish Sanitation Program (NSSP) criteria for any given classification. For a shellfish growing area to be managed under a conditional classification, the NSSP requires an area meet conditionally approved criteria under certain predictable conditions and performance standards be established be the shellfish control agency (*MarineFisheries*).

The NSSP requires a plan to exist between the shellfish control agency (*MarineFisheries*) and the owner/operators of any wastewater treatment plant which may potentially adversely impact shellfish growing areas. This document includes notification procedures and commitments in accordance with the NSSP.

MarineFisheries and the operators of the City of Fall River Wastewater Treatment Plant and collection system agree to cooperate in protecting the quality of shellfish growing waters in Mount Hope Bay that may potentially be adversely impacted by the City of Fall River Wastewater Treatment Facility and combined sewer outfalls (CSO's) sanitary wastewater discharges or bypasses. This Memorandum of Understanding is designed to assure continued adequate communication between the City of Fall River Wastewater Treatment Facility and *MarineFisheries*, and should allow both the City of Fall River and *MarineFisheries* to work efficiently toward the shared goal of protecting public health. Under NSSP requirements, adherence to this agreement is necessary to ensure waters of Mount Hope Bay can be reclassified/opened and can remain open to the harvest of shellfish.

Failure to adhere to the conditions of this Memorandum of Understanding will cause *MarineFisheries* to change the status of the growing area to "CLOSED TO SHELLFISHING". If failure to adhere to the Memorandum of Understanding is determined to be persistent and irreconcilable *MarineFisheries* will change the classification of the potentially effected portion of Mount Hope Bay to "PROHIBITED" to shellfishing.

This Memorandum of Understanding may be modified at any time by mutual consent, upon thirty days written notice, due to changes in circumstances effecting the classification of the growing area or general operation of this Memorandum of Understanding.

MarineFisheries may change, at any time, the status of the conditional area to "CLOSED TO SHELLFISHING" to ensure public health and safety.

Notification Procedures for the Wastewater Treatment Facility and Collection System

Whereas the City of Fall River subcontracts work at the Fall River Wastewater Treatment Facility and the associated sewage collection system, and whereas there exists CSO's and the potential of an adverse discharge or bypass, the City of Fall River agrees to notify the Massachusetts Division of Marine Fisheries in the event of the following:

1. Discharge under the following conditions:

   Fall River Wastewater Treatment Facility

   Any discharge through the outfall in violation of the NPDES permit limits for fecal coliform.

2. Discharge from the following area:

   Combined Sewer Outfalls

   Any unauthorized release through the City of Fall River combined sewer outfalls (CSO's) that are observed and/or recorded by the City of Fall River Wastewater personnel; this is intended to mean dry weather discharges from CSO's to the receiving waters due to malfunctions or failures of the CSO control systems. This is not intended to include wet weather overflows that normally occur in the system; nor is intended to include groundwater infiltration to the CSO outfall pipes.

3. Foreseeable events that have the potential to affect the performance of the treatment facility to the extent that the shellfish growing area may be adversely affected. These events may include, but are not necessarily limited to, any malfunction; planned or unplanned maintenance, reductions in chlorination levels or abnormal chlorine residuals.

MarineFisheries will be notified by phone at one or both of the below numbers as soon as possible following detection of a problem or potential problem.

Work Hours

Gregory Sawyer: 508-990-2860 x130

Mike Hickey: 508-990-2860 x122

Tom Shields: 508-990-2860 x126

After Hours and Weekends

Mike Hickey: 508-965-2273 (cell)

Terrance Sullivan, Administrator of
Community Utilities

Date

Paul J. Diodati, Director
Massachusetts Division of Marine Fisheries

Date

APPENDIX 4

MADMF SHELLFISH GROWING AREA CLASSIFICATION FOR MOUNT HOPE BAY

MarineFisheries
Commonwealth of Massachusetts

Massachusetts Division of Marine Fisheries

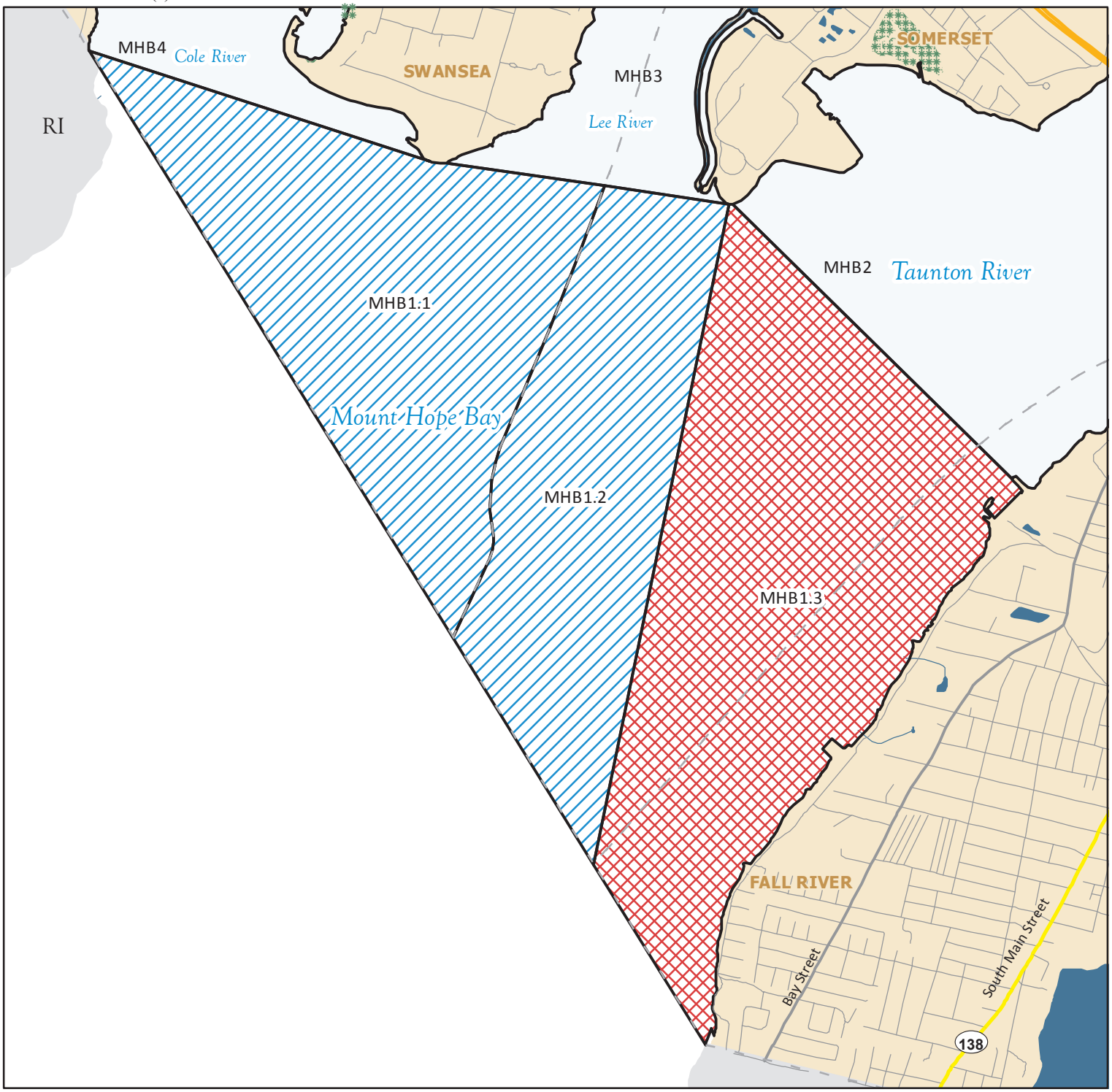
SHELLFISH SANITATION AND MANAGEMENT

Growing Area Code: MHB1
Area Name: MOUNT HOPE BAY
Area Town(s): Fall River, Somerset, Swansea

Shellfish Area Classification

- Approved
- Conditionally Approved
- Restricted
- Conditionally Restricted
- Prohibited

Produced: 6/28/2013



This map depicts the MarineFisheries' sanitary classification of shellfish growing waters in accordance with the National Shellfish Sanitation Program. It does not indicate the current status, either "open" or "closed" to harvesting due to shellfish management or public health reasons. Always confirm the status with local authorities and/or MarineFisheries. Information on this map may be out-dated or otherwise incorrect, and should not be relied upon for legal purposes.

Marsh/Wetland | Saltmarsh | Pond/Lake/Reservoir
Town Boundaries | Stream/Ditch/Canal

NORTH
0 0.5 1 miles

APPENDIX D

I. Rationale on the Appropriateness of, and the Authority for, the Inclusion of the Wastewater Treatment System and Sewer System Adaptation Plan Requirements

The adaptation planning requirements proposed in the Draft Permit are new requirements that build on existing operation and maintenance practices. EPA provides this appendix to further explain the basis for and importance of these provisions.

In Section A below, EPA discusses the necessity for requiring the development of Adaptation Plans at wastewater treatment systems ("WWTS") and sewer systems[1] and provides some examples of how major storm and flood events can impact facility operations. In Section B below, EPA discusses the various components and proper scope of an Adaptation Plan. In Section C below, EPA sets forth the legal basis for its decision to require wastewater treatment systems and sewer systems to develop an Adaptation Plan.

A. Necessity for Wastewater Treatment System and Sewer System Adaptation Planning

Wastewater treatment systems and sewer systems are crucial in helping protect human health and the environment and providing critical services to the communities that they serve. Many wastewater treatment facilities and associated sewer system pump stations are located at low elevations (to maximize flow via gravity) within riverine or coastal floodplains and are at risk of increased flooding and other impacts from major storm events. As noted in a 2016 report by the New England Interstate Water Pollution Control Commission[2] wastewater systems are already facing severe effects due to major storm and flood events and need to better adapt to this new reality:

> In the Northeast and throughout the world, extreme storm events are growing in frequency and force. Hurricanes and blizzards threaten the operation of wastewater infrastructure and in some cases the infrastructure itself. Consequently, wastewater facilities should be made more resilient though preparedness planning and physical upgrades.

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[1] The Clean Water Act authorizes EPA, as permit issuer, to issue permits for "publicly owned treatment works" (POTWs). CWA § 402. POTWs comprise wastewater treatment systems and sewer systems. 40 C.F.R. §§ 122.2, 403.3(q); *In re Charles River Pollution Control District*, 16 EAD 623, 635 (EAB 2015) ("POTW treatment plants, like the satellite sewage collection systems that convey wastewater to the plants, are components of a POTW.") To more precisely and accurately describe the permit requirements, the Permit and this Response to Comments refer to "wastewater treatment system(s)" and "sewer system(s)" or, in some instances, both.

"Wastewater Treatment System" or "WWTS" means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It does not include sewers, pipes and other conveyances to the wastewater treatment facility.

[2] "Preparing for Extreme Weather at Wastewater Utilities: Strategies and Tips, New England Interstate Water Pollution Control Commission" (September 2016) pg. 2, https://www.neiwpcc.org/neiwpcc_docs/9-20-2016%20NEIWPCC%20Extreme%20Weather%20Guide%20for%20web.pdf

> In the Northeast in the last five years Hurricanes Irene (2011) and Sandy (2012), and winter blizzards such as the February 2013 northeaster, produced widespread economic harm. Sandy caused nearly 11 billion gallons of sewage to be released into coastal waters, rivers, and other bodies of water as power outages and storm surge overwhelmed wastewater-treatment plants. 94% of these releases were a result of flooding and storm surge as waters overwhelmed sewage-treatment plants.

As a result, addressing the ongoing challenges and the increasing risks faced by wastewater infrastructure systems nationwide - reduction or failure of system services resulting in discharges of untreated or partially treated sewage, flooding, physical damage to assets, impacts to personnel, to name just some of the possible outcomes - are a priority for EPA and a host of federal and state agencies, as well as regional and local governmental bodies. Addressing these challenges is also a priority for many wastewater treatment managers across the country. As noted in a 2019 study,[3] which surveyed wastewater treatment systems in Connecticut, 78% of wastewater managers had made adaptive changes that ranged from low-cost temporary adaptive changes to a few who described major changes that addressed redesign or the rebuilding of WWTPs; of those who had made changes, half "did so to improve resiliency to withstand the worst storm experienced by the wastewater system to date."[4]

Flooding and other major storm events can lead to a variety of, and more frequent, WWTS and sewer system failures. One recent analysis suggests that one-third of 5,500 wastewater treatment plants analyzed from around the country would be at risk of flooding in the event of a major storm.[5] System failures, such as backups of untreated wastewater into the collection system and potentially into buildings and connections, bypasses of pollution treatment, and/or discharges of raw sewage into the environment are some of the potential impacts that may become more frequent.[6]

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[3] "Kirchhoff, C.J. and P.L. Watson. 2019. "Are Wastewater Systems Adapting to Climate Change?" *Journal of the American Water Resources Association*, 1-12. pg.1. https://doi.org/10.1111/1752-1688.12748. (Citations omitted in quote).

[4] Id. at pgs. 5, 8.

[5] "Rising Flood Risks Threaten Many Water and Sewage Treatment Plants Across the U.S."(August 10, 2023), https://apnews.com/article/climate-change-flood-risks-infrastructure-vermont-7bd953f513035468ee74f8f7c619bb8e

[6] See EPA's Resilient Strategies Guide (noting that "[u]tilities are increasingly recognizing that future extreme weather events, energy prices and ecological conditions may not be predictable based on historical observations. These shifts may require utilities to change how they operate and manage their resources.") https://www.epa.gov/crwu/resilient-strategies-guide-water-utilities#/resources/646; EPA Memorandum, "Re-Instatement of Federal Flood Risk Management Standard for State Revolving Fund Programs," Thompkins, Anita Maria and Stein, Raffael to Water Division Directors (April, 2022) https://www.epa.gov/dwsrf/federal-flood-risk-management-standard-srf-programs (noting that "[f]looding is one of the most common hazards in the United Stated accounting for roughly $17 billion in damage annually between 2010-1018 according to [FEMA], and it will continue to be an ongoing challenge for water infrastructure" with impacts that "can include physical damage to assets, soil and streambank erosion and contamination of water sources, loss of power and communication, loss of access to facilities, saltwater intrusion, and dangerous conditions for personnel."). See also, National Association of Clean Water Agencies ("NACWA"), "NACWA Principles on Climate Adaptation and Resiliency" (noting that "[f]or many clean water agencies, changing weather patterns have become a management reality and responsibility.") https://www.nacwa.org/docs/default-source/conferences-events/2018-ulc/nacwa-statement-of-principles-on-climate_.pdf?sfvrsn=2

In New England, as well as elsewhere throughout the country,[7] storms and flooding have caused damage to, and in some cases total failure of, wastewater treatment systems and sewer systems. Implementing adaptive measures so that a wastewater treatment plant's wastewater infrastructure may withstand increasingly frequent heavy precipitation and major storm and flood events is, therefore, a critical step in a system's maintenance. Additionally, EPA notes that sometimes, mitigation measures based on adaptation/mitigation plans that were at one point sufficient and that were based on historic, local major storm and flood predictions, may now be insufficient given actual experience with major storms and flooding, the emergence of new data that was not previously available, and more recent projections. And while EPA also acknowledges that it may not always be possible to anticipate all future events (i.e., speed or direction of the wind, temperature fluctuations, the uprooting of trees, etc.) that can exacerbate, or alleviate, the outcomes of major storm and flood events, as illustrated in the examples below, it is important to ensure that existing adaptation plans reflect, as best as possible, all relevant data.

Many New England WWTSs have been negatively impacted by major storm and flood events in recent years. In one notable example from Rhode Island in 2010, historically high flood waters (known as "the Great Flood of 2010") severely impacted several wastewater treatment facilities, including the Warwick Rhode Island Wastewater Treatment Facility.[8] After repetitive flood damages to the WWTS, the City of Warwick had constructed a protective berm, or levee, in the mid-1980s to protect the WWTS from future damages. The levee, originally designed for the 100-year flood at that time, plus three feet of freeboard, was breached by repeated heavy rain events in March 2010. The flooding caused catastrophic impacts to the WWTS which led to the "unthinkable" - the decision to evacuate the plant as the Pawtuxet River crested at 20.79 feet.[9] The impact to the treatment plant was extreme:

> While the flood waters caused no structural damages to the facility's tanks or buildings, anything electrical and everything that was not metal or concrete was ruined. It was at least two days before the river had subsided to the point where staff could begin to access the facility.[10]

With a tremendous amount of work and rebuilding, the facility was dewatered, and primary and then secondary treatment were restored. The facility was unable to achieve full compliance with its permit limits for a period of about 80 days.[11] Due to this flooding, the facility updated their flood protection plans based on local storm and flooding data and implemented improvements

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[7] National Association of Clean Water Agencies ("NACWA") Fact Sheet: "10 Extreme Rain and Flood Events in the US – All in 2022" (listing the "top 10 flood events of 2022" and their effects on water infrastructure from across the country, including the devastating impacts that include loss of life, estimated damages in the range of millions to billions of dollars, and extreme impacts to system services.)

[8] Holbrook, Nicolas Q., The Flood Crews of 2010: A History of Rhode Island's 2010 Floods as Told By The State's Wastewater Collection and Treatment Operators, Rhode Island DEM, Office of Water Resources (2017) https://dem.ri.gov/sites/g/files/xkgbur861/files/programs/benviron/water/pdfs/floodcrews2010.pdf

[9] Id. at 13.

[10] Id.

[11] Burke, Janine L., Executive Director, Warwick Sewer Authority, "The Great Flood of 2010: A Municipal Response," pg. 237 Journal NEWEA (September 2012) https://www.warwicksewerauthority.com/pdfs/floodmitgation/NEWWA%20Journal%20Article%20on%20WSA%20Flood%20Response.pdf

for the WWTS, including raising the levee to protect the WWTS from inundation caused by a 500-year flood event.[12]

Figure 1: The flooded Warwick wastewater facility on Wednesday, March 31, 2010. (State of Rhode Island)

More recently, in July 2023, Vermont experienced a major storm and flooding event characterized by the National Weather Service as "catastrophic flash flooding and river flooding" with upwards of three to nine inches of rain falling in 48 hours, an amount that in some places of Vermont, amounted to the "greatest calendar day rainfall "since records began in 1948.[13] According to local reporting, operations at 33 wastewater treatment systems were disrupted, and several facilities, like those in the towns of Ludlow and Johnson, were rendered inoperable and will need significant reconstruction.[14] As one news outlet reported about the conditions in Ludlow:

> [t]he facility that keeps the village's drinking water safe was built at elevation and survived. But its sewage plant fared less well. Flooding tore through it, uprooting chunks of road, damaging buildings and sweeping sewage from treatment tanks into the river.

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[12] Preliminary Design Report, Wastewater Treatment Facility Flood Protection and Mitigation Design, Warwick, Rhode Island (Prepared by AECOM for Warwick Sewer Authority, July 12, 2012) https://www.warwicksewerauthority.com/pdfs/floodmitgation/Warwick%20Flood%20Mitigation%20PDR%207-24-12%20with%20Appendices.pdf,; Warwick Wastewater Treatment Facility – Climate Vulnerability Summary https://dem.ri.gov/sites/g/files/xkgbur861/files/programs/benviron/water/pdfs/cvswarwick.pdf

[13] Banacos, Peter, "The Great Vermont Flood of 10-11 July 2023: Preliminary Meteorological Summary" National Oceanic and Atmospheric Administration, National Weather Service, pg. 2 (August 5, 2023) https://www.weather.gov/btv/The-Great-Vermont-Flood-of-10-11-July-2023-Preliminary-Meteorological-Summary (noting that damage "rivaled and in some areas exceeded – Tropical Storm Irene in 2011")

[14] Robinson, Shaun, "Total Destruction:' Flooding Knocks Out Johnson's Wastewater Plant, Disrupts Operations Elsewhere" (July 18, 2023); https://vtdigger.org/2023/07/18/total-destruction-flooding-knocks-out-johnsons-wastewater-plant-disrupts-operations-elsewhere/ ("Across Vermont, 33 wastewater treatment facilities were impacted by the flooding …according to Michelle Kolb, a supervisor in the state Department of Environmental Conservation's wastewater program.")

Even [over three weeks after the storm event] the plant can only handle half its normal load.[15]

Figure 2: Ludlow Wastewater Treatment Plant (photo August 2, 2023, taken after July storm event) [16]

The wastewater treatment plant in Johnson, Vermont was similarly devastated with the Assistant Plant Manager reporting to a local news outlet, "'Total destruction. The only thing we have left is the shell of a building.'" [17]

According to officials from Vermont DEC, both the Ludlow and Johnson WWTSs had some flood protections in place prior to this event: Ludlow built a new influent pump station designed to withstand a 500-year flood event in 2020-21.[18] While its plant was rendered inoperable immediately after the early July flood, it came back on-line in late July. For the Johnson Wastewater Treatment Plant, this was the 6th flooding event at the plant since it was built in 1995. In the assessment that occurred by state and federal officials after the most recent flood, long-term recommendations ranged from more minor fixes (i.e., replacing the gravity line with a pump station and force main) to undertaking an assessment that would compare the cost of moving the facility against the already-significant cost of just repair and construction, estimated

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[15] Naishadham, Suman, Peterson, Brittany, Fassett, Carnille, "Rising Flood Risks Threaten Many Water and Sewage Treatment Plants Across the US," Vermont Public, https://www.vermontpublic.org/local-news/2023-08-10/ludlow-vermont-rising-flood-risks-threaten-many-water-and-sewage-treatment-plants-across-the-us

[16] https://apnews.com/article/climate-change-flood-risks-infrastructure-vermont-7bd953f513035468ee74f8f7c619bb8e] (picture captions: Joe Gaudiana, the Ludlow, VT. Chief Water and Sewer Operator, left, surveys damage with Elijah Lemieux, of the Vermont Rural Water Association, at the wastewater treatment plant following July flooding, Wednesday, Aug. 2, 2023, in Ludlow. (AP Photo/Charles Krpa))

[17]Robinson, Shaun, "Total Destruction: "Flooding Knocks Out Johnson's Wastewater Plant, Disrupts Operations Elsewhere" (July 18, 2023); https://vtdigger.org/2023/07/18/total-destruction-flooding-knocks-out-johnsons-wastewater-plant-disrupts-operations-elsewhere/

[18] Telephone conversation with Vermont Department of Conservation officials, Heather Collins and Michelle Kolb (September 25, 2023).

to be at least $2 million.[19] As the officials emphasized, short of relocating, or finding significant additional resources, for some of Vermont's impacted facilities, there are no easy fixes and future adaptations might mean preparing "to-go bags," and installing "redundant pipes," submersible pumps, waterproof electrical boxes or, in some cases, possibly building a second story on an existing plant.

Even more recently, in September 2023 the City of Leominster in central Massachusetts experienced a flash flooding event.[20] Previously, the city had identified a riverbank section of the North Nashua River, near the WWTS, that had eroded and was continuing to be eroded and was heading towards a buried sewer main. As detailed in the summary of work report,[21] "[l]eft unabated, the stream would likely carve a new path into the sewer line, potentially causing a break." To mitigate this potential problem, the city completed a riverbank stabilization project under FEMA's Hazard Mitigation Grant Program to protect the main sewer line that was identified as vulnerable to flooding and failure. That line was unimpacted by the recent flash flooding in September and the stabilization work is still intact while other infrastructure in the area suffered significant flood damages. In addition to illustrating the potential impacts of a recent flooding event on a WWTF, this example - of identifying a risk to increased flooding and consequent mitigation measure - exemplifies the process that EPA envisions for the Adaptation Plan.

EPA acknowledges and appreciates that many WWTSs and sewer systems are currently designed with some flood protections to combat the increasing frequency of major storm and flood events and the resulting impacts to wastewater treatment systems and sewer systems. To address the current and future risks associated with these more frequent and intense storms occuring in the region, EPA finds that the development of an Adaptation Plan is necessary in order to ensure the proper operation and maintenance of WWTSs and sewer systems.

B. Requirement to Develop an Adaptation Plan

To support the Permittee's[22] development of an Adaptation Plan, EPA Region 1 has developed a companion document: *Recommended Procedures and Resources for the Development of Adaptation Plans* ("Recommended Procedures")[23] to assist owners and operators of wastewater treatment systems and/or sewer systems to develop adaptation plans that meet the requirements included in Region 1 NPDES permits. The document provides recommendations and procedures for the use of a free EPA tool developed specifically for water utilities. Permittees may use the recommended tool and the associated procedures, or they may use other approaches providing comparable analyses, as discussed in more detail below, to satisfy permit requirements.

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[19] Johnson Village Wastewater Post July 2023 Flood Treatment Plant Assessment Lamoille County, Vermont, NPDES Permit Number Vermont 0100901 (August 9, 2023)

[20] Derrick Bryson Taylor and Johnny Diaz, "Massachusetts Cities Declare Emergency After 'Catastrophic' Flash Flooding" https://www.nytimes.com/2023/09/12/us/leominster-massachusetts-flash-flooding.html

[21] City of Leominster, North Nashua River Riverbank Stabilization Project: Summary of Work (prepared by GZA GeoEnvironmental, Inc.) (February 2023)

[22] For brevity, this document refers to "Permittee" throughout; however, this reference also includes all "Co-Permittee(s)" subject to the applicable permit requirements.

[23] Available at: https://www.epa.gov/npdes-permits/npdes-water-permit-program-new-england

In the permit, the three components of the Adaptation Plan include the following (additional detail, including definitions of certain terms, is included in the permit):

- Component #1: Requires the Permittee to develop and sign, within 24 months of the effective date of the permit, an identification of critical assets and related operations within the WWTS and/or sewer system which they own and/or operate that are most vulnerable to major storm and flood events under baseline and future conditions and to assess the ability of each to function properly in the event of major storm and flood events in terms of effluent flow, sewer flow, and discharges of pollutants;

- Component #2: Requires the Permittee to develop and sign, within 36 months of the effective date of the permit, an assessment of adaptive measures, and/or, if appropriate, the combination of adaptative measures that minimize the impact of future conditions on the critical assets and related operations of the WWTS and/or sewer system(s); and

- Component #3: Requires the Permittee to submit a summary of the work completed in Components #1 and #2 with a proposed schedule for implementation and maintenance of adaptive measures within 48 months of the effective date of the permit.

The rationale for specific revisions and definitions is provided in more detail below.

- The permit requires the Permittee to develop an implementation schedule rather than specify a particular schedule for implementation. EPA notes that the permit also requires that the Permittee report annually on "any progress made toward implementation of adaptive measures." This leaves the Permittee free to evaluate other considerations when determining when and how to implement adaptive measures. EPA encourages Permittees to move forward with implementation actions that address the vulnerabilities identified as part of its Adaptation Plan in as timely a manner as possible and to prioritize addressing the most impactful vulnerabilities.[24]

- Permittees who wish to comply with this permit requirement through prior assessments must explain how its prior assessments specifically meet the requirements of the permit. The permit allows such assessments that were undertaken in the last 5 years to be used, as long as they meet certain conditions specified in the permit.

- EPA uses certain minimum standards (e.g., use of FEMA Flood Standards) and other terminology that is defined in and consistent with the federal flood standards, to ensure

[24] EPA notes that there are many aspects involved in addressing adaptation planning and associated implementation measures, including regional considerations and that region-wide planning is appropriate. Permittees are encouraged to engage in regional planning and EPA understands this may impact proposed schedules for implementation measures. EPA expects, however, that for most Permittees there will be many implementation measures that do not require regional planning or collaboration. To the extent this is not the case, the Permittee may document its analysis supporting such a conclusion and base its implementation schedule accordingly.

eligibility for federal funding as well as SRF funding.[25] The permit requires that the Permittee evaluate asset vulnerability using "baseline conditions" and "future conditions." The permit defines baseline conditions as the 100-year flood based on historical records and future conditions as projected flood elevations using one of two approaches consistent with the federal flood standards.

This clearly defines what minimum conditions must be used to assess vulnerability under the Adaptation Plan, and EPA has provided tools and data references a Permittee may use to evaluate these conditions and meet the permit requirements. The flood elevations specified account for many of the storm and flood conditions; however, EPA notes that these data may not account for all potential instances of extreme precipitation. Currently, data sets or mapping tools that model changes to flood elevations in response to varying storm sizes are not readily available or simple to use. Therefore, EPA is not requiring facilities to identify or use such data in their analysis. However, EPA notes that there may be site-specific data available for use in a given municipality, and EPA encourages facilities to consider impacts from site-specific events for planning purposes if possible. One or more of the resources provided in the Recommended Procedures document, referenced above, may also account for impacts of extreme precipitation to an extent that is useful to facilities.

- The permit requires evaluating the vulnerability of assets once during the permit term (during the development of the Adaptation Plan). Additional revisions of the Adaptation Plan during the permit term would only be required during the permit term if there has been a significant change to the infrastructure of the system to update the description of the assets removed or updated, to incorporate any new assets into the documentation, and describe any effects these changes have on the asset and/or system vulnerability.

- In light of security concerns posed by the public release of information regarding vulnerabilities to wastewater infrastructure, Permittees are not required to submit Component 1 and 2 and instead must keep that documentation on file and available for inspection or review by EPA upon request. In all other submittals (Component 3 and future annual reports), the Permittee shall provide information only at a level of generality that indicates the overall nature of the vulnerability but omitting specific information regarding such vulnerability that could pose a security risk.

- Regarding timing, EPA considers that the permit allows adequate time to initiate the necessary funding and procurement processes (which EPA understands must line-up with local requirements which can take place over many months or even years) in order to develop the plans (either in-house or through professional engineering services) without significantly impacting other ongoing municipal projects.

[25] "Re-Instatement of Federal Flood Risk Management Standard for State Revolving Fund Programs," Thompkins, Anita Maria and Stein, Raffael to Water Division Directors (April, 2022) https://www.epa.gov/dwsrf/federal-flood-risk-management-standard-srf-programs

- Regarding annual reporting, the first report is due on March 31 following the completion of Component 1 of the Adaptation Plan. As described above, flood and major storm events are a significant threat to water quality. An annual reporting requirement is therefore appropriate to facilitate Adaptation Planning and, ideally, the implementation of an Adaptation Plan occurring as promptly and as efficiently as possible.

- Regarding the cost of developing the Adaptation Plan, there are costs and other resources that Permittees must allocate to comply with all permit requirements. EPA considers proper operation and maintenance of the WWTS as well as the collection system to include addressing major storm and flood events that would impair operation of the system. EPA acknowledges that the Permittee will incur costs and other potential resource expenditures to develop a plan related to these events but considers these expenditures to be necessary in order to prevent impacts during such events (e.g., bypass, upset or failure of the WWTS, overflow, or increased inflow and infiltration in the sewer system, and discharges of pollutants that exceed effluent limits), which would adversely affect human health or the environment.

  However, EPA appreciates the regulated community's concerns regarding costs as described below.

  1. In order to minimize costs and provide additional clarity to Permittees, EPA has developed a companion document, *Recommended Procedures and Resources for the Development of Adaptation Plans for Wastewater Treatment Systems and/or Sewer Systems,* ("Recommended Procedures"), which a Permittee could elect to use to guide it through development of the Adaptation Plan. The document instructs Permittees on the use of EPA's CREAT tool, which is free to use by Permittees and will help Permittees navigate through much of the analysis needed to develop an Adaptation Plan. It is EPA's intention that a Permittee could use these tools to develop an Adaptation Plan in an effort to reduce costs and possibly to eliminate or reduce the need to hire external contractors.

  2. As mentioned above, the permit that allows credit for prior work to eliminate potentially costly duplication of efforts.

  3. It is EPA's intention to provide Permittees with technical assistance for the development of the Adaptation Plan. EPA has many on-line training tools, [26] some of which have been utilized by New England WWTSs[27] and also plans (in accordance with available funding and agency priorities) to offer: a New England-based virtual workshop training series for WWTS operators and others on the use of the CREAT tool which EPA expects will commence in early 2024 (which will be recorded to maximize its utility for those who may want to access the information at a later date);

[26] https://www.epa.gov/crwu/training-and-engagement-center; see also, the Resources Section in the Recommended Procedures for additional resources that Permittees might find useful.

[27] See https://toolkit.climate.gov/sites/default/files/Manchester-by-the-Sea_March_2016.pdf;]; see also, the Resources Section of the Recommended Procedures document for more New England case studies and other useful resources.

in-person technical assistance sometime in mid-2024 and telephone assistance on the use of the CREAT tool. In recommending Permittees use this tool and by providing procedures for using it, EPA hopes to both enable Permittees to develop robust Adaptation Plans themselves, but also to reduce the costs, including the costs associated with outside contractors.

4. Additionally, EPA notes that there may be federal, state or local funding sources available to assist entities with adaptation planning.[28]

- With regards to the cost of implementing adaptation measures, the selection and deadlines for implementing specific adaptation measures are not included as requirements in the permit since those will only be known after the completion of the Adaptation Plan. EPA expects that the Permittee will begin implementation of those measures in the coming years. However, since the Permittee will be setting the prioritizations and scheduling for implementing the measures based on their own risks and vulnerabilities to major storm and flood events, they may incorporate affordability and funding availability into their considerations.

  EPA notes, that in developing the Adaptation Plan, the Permittee may, as part of the process, be comparing the potential economic costs of the baseline condition, or "no action alternative," with those of possible adaptation measures, under current and predicted risks of major storm and flood events. This option is available in the use of the adaptation planning approach as outlined in the companion document to this permit entitled *Recommended Procedures and Resources for the Development of Adaptation Plans for Wastewater Treatment Systems and/or Sewer Systems.*[29] Depending on site-specific circumstances, the Permittee may find that the cost of not implementing adaptation measures is greater than the cost of implementing them.

C. Legal Authority

The Adaptation Plan permit conditions are necessary to further the overarching goal of the CWA[30] "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" and derive from the same authorities as all other standard operation and maintenance requirements. CWA § 101(a), 40 C.F.R. §§ 122.41(d), (e), (n). The Adaptation Plan requirements are an iterative update to EPA's standard O&M permit provisions and intend to address serious and increasingly prevalent threats to Permittees' compliance with permit effluent limitations. As illustrated by the recent examples detailed in Section A, major storm and flood events can

[28] See EPA's website for Federal Funding for Water and Wastewater Utilities in National Disasters (Fed FUNDS). https://www.epa.gov/fedfunds. Potential resources may also be available through the State of Massachusetts.
[29] Available at: https://www.epa.gov/npdes-permits/npdes-water-permit-program-new-england
[30] Congress has recently expressly affirmed that natural hazard adaptation measures for POTWs appropriately fall within the scope of the CWA: Congress added section 223 to the CWA via the Infrastructure Investment and Jobs Act, creating a grant program to support, *inter alia*, "the modification or relocation of an existing publicly owned treatment works, conveyance, or discharge system component that is at risk of being significantly impaired or damaged by a natural hazard[ ]." Pub. L. 117-58, 135 Stat. 1162 (codified at 33 U.S.C. § 1302a(c)(4))(2021).

gravely impact discharges from WWTSs and thus water quality. That is, plant and/or sewer system failure due to storms, increased precipitation/floods, storm surge, and sea level rise can and do lead to bypasses, upsets, and violations of some or all of the permit limits, including water quality-based limits and limits based on secondary treatment standards. The Adaptation Plan is designed to reduce and/or eliminate noncompliant discharges that result from impacts of major storm or flood events through advanced planning and adaptation measures and is authorized by both EPA regulations and the CWA.

EPA recognizes that larger scale planning may be necessary to address some issues and that requiring the same would be beyond the scope of this NPDES permit. This NPDES permit does not intend to address all issues caused by major storm and flood events. To the contrary, the Adaptation Plan O&M requirements intend to address one specific issue that EPA has witnessed in New England, as described in Section A: the operability of the WWTS and/or sewer system during and after major storm and flood events. This issue is appropriate for an NPDES permit because it is central to the Permittee's compliance with the Permit's effluent limitations and other Permit conditions, and thus central to EPA's obligation to issue permits that assure compliance with Water Quality Standards and other applicable laws. For the reasons described in this Section, EPA is well within its CWA-based authority to impose the Adaptation Plan requirements.

EPA's O&M regulations authorize EPA to impose the Adaptation Plan requirement. 40 C.F.R. § 122.41(e) ("Proper operation and maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit.") Proper operation and maintenance of the permitted facilities and systems inherently includes adaptation planning. As illustrated in the examples in Section A, if a WWTS is unable to operate properly as designed due to impacts from a major storm or flood event, the discharge of pollutants in violation of both its permit and applicable water quality standards is highly likely to occur and with increasing frequency. In other words, the Permittee cannot satisfy its obligation to operate properly "at all times" if it cannot do so during and after major storms or flooding events. The new Adaptation Plan requirements are an iterative extension of the previous permit's requirements that "The permittee will maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure." Major storm and flood events represent an increasing cause of WWTS malfunctions and failures and thus EPA added the Adaptation Plan requirements to the O&M requirements to more specifically address this issue.

EPA is well within its CWA-based authority to include these permit conditions which are necessary to reduce the frequency or likelihood of bypass or upset and otherwise achieve compliance with the permit's effluent limits, and thus also assure compliance with water quality standards and other CWA requirements. CWA § 402(a)(2) ("[EPA] shall prescribe conditions for [NPDES] permits to assure compliance with the [applicable CWA] requirements…as he deems appropriate."); CWA §§ 301(b)(1)(C), 401(a)(1)-(2); *see also* 40 C.F.R. § 122.4(d) ("No permit may be issued… When the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States"); *See also* 40 C.F.R. § 122.44(d)(1). The provisions are reasonable measures rooted in the permitting requirements to properly operate

and maintain all facilities and the duty to take all reasonable steps to minimize or prevent any discharge in violation of the permit. 40 C.F.R. § 122.41(d), (e).

The Agency relied on the same CWA-based authority when it promulgated the O&M regulations:

> Many commenters expressed doubt whether EPA is legally authorized to require proper operation and maintenance of facilities. This requirement is clearly authorized for NPDES permittees by section 402(a)(2) of CWA which requires the Administrator to prescribe permit conditions which will assure compliance with the requirements of CWA section 402(a)(1).

45 Fed. Reg. 33290, 33303-04 (May 19, 1980). In 1980 and now, the proper operation and maintenance of a facility – including the Adaptation Plan requirements – effectuates the permit limits on all addressed pollutants and protects all applicable water quality standards, as they assure that such limits will be met, even in times of major storms or during flood events. CWA § 402(a)(2). It is well-established that EPA may include specific permit conditions that ensure the preconditions or assumptions underlying EPA's pollutant effluent flow calculations remain constant, thus ensuring the permit, as a whole, assures compliance with WQS and other applicable CWA requirements. *See In re: City of Lowell,* 2020 WL 3629979 at *35,18 E.A.D. 115, 156 (EAB 2020) (affirming effluent flow limit as a proper exercise of the Agency's 40 C.F.R. § 122.41(e) authority in part on the basis that the permit's pollutant effluent limits were calculated based on a presumed maximum wastewater effluent discharge from the facility, and thus "If flow limits exceed the assumed maximum flow, … then the Region may have erroneously concluded that a pollutant did not have a reasonable potential to cause or contribute to an exceedance of water quality standards or that the permit's pollutant effluent limits assure compliance with Massachusetts' water quality standards.") Likewise, the Adaptive Plan O&M requirements ensure the basic, necessary preconditions (i.e., the plant's operability) to compliance with the permit's effluent limits and other requirements of the CWA. Given the importance of WWTS and sewer system operability to compliance with this NPDES permit, it is not unreasonable for EPA to impose the Adaptation Plan O&M requirements. *C.f. In re Avon Custom Mixing Services, Inc.*, 17 E.A.D. 700, 709 (EAB 2002) ("Given the importance of monitoring to the integrity of NPDES permits, and the broad authority the CWA confers on the Region to impose monitoring requirements in NPDES permits, it does not strike us as unreasonable that the Region has decided to include new monitoring requirements in the reissued permit.")

The EAB has affirmed the Agency's authority to require the preparation and submission of a plan as part of the Operation & Maintenance requirements of an NPDES permit. *In Re City of Moscow, Idaho*, 10 E.A.D. 135, 169-172 (EAB 2001) (affirming O&M permit provision that required development and submission of a quality assurance project plan,"[t]he primary purpose of [which] shall be to assist in planning for the collection and analysis of samples in support of the permit…"[31] under the O&M regulations, stating "it seems plain that the CWA and its implementing regulations authorize the Region to include permit requirements like the QAPP here in conjunction with the ultimate goal of assuring compliance with the CWA."). Like the

[31] NPDES Permit issued to City of Moscow, Idaho, Part I.E (March 12, 1999) (available at: https://www2.deq.idaho.gov/admin/LEIA/api/document/download/15509)

O&M planning requirement in *Moscow,* the primary purpose of the Adaptation Plan in this permit is to assist in planning for compliance with the permit – in this instance, by ensuring the facility remains operable even during flooding or other major storm events – and the ultimate goal of the requirement is to assure compliance with the CWA.

40 C.F.R. § 122.41(d) also authorizes EPA to impose the Adaptation Plan requirement. ("Duty to mitigate. The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.") It is a reasonable step for EPA to require a Permittee to create an Adaptation Plan to minimize facility disruptions during major storm and flood events. For example, if a Permittee identifies that an asset critical to its WWTS is extremely vulnerable to a major storm and that loss of the asset would result in the inoperability of the WWTS and thus discharges in violation of permit limits, then mitigating those risks reasonably minimizes or prevents harmful discharges in violation of the permit.

EPA also has broad authority for data and information collection, reporting, and "such other requirements as [the delegated permit authority] deems appropriate" to carry out the objectives of the Act." CWA § 402(a)(2). *See also In re Moscow*, 10 E.A.D. at 171. Components 1 and 2 of the Adaptation Plan require the Permittee to collect and report to EPA data and information that are appropriate to carry out the objectives of the CWA. This information and data will allow the Permittee to identify assets which are vulnerable to flooding and adaptive measures appropriate to address those vulnerabilities. As described elsewhere in this Appendix, facility vulnerabilities threaten compliance with permit requirements and thus CWA objectives. Conversely, information about appropriate adaptive measures will facilitate compliance with both.

EPA notes that although the CWA limits the terms of NPDES permits to five years, CWA § 402(b)(1)(B), such a limitation does not logically constrain the permitting authority from requiring the Permittee to consider future conditions beyond the five-year term. EPA expects Permittees to fully comply with the Adaptation Plan provision within the five-year term of the permit, meaning it does not impose any obligations on the Permittee beyond the five-year permit term. One directly relevant example for WWTSs are Combined Sewer Overflow Long-Term Control Plans (LTCPs). The CSO Policy, 59 Fed. Reg. 18688 (April 19, 1994), which Congress expressly incorporated directly into the CWA at § 402(q), requires the development of LTCPs to ultimately come into compliance with the Act, recognizing that such schedules will (and have) in many instances span multiple permit terms. That Congress directly amended the CWA to require compliance with the CSO Policy, including its long-term permitting approaches, demonstrates that the Act does not constrain permitting authorities from considering timeframes outside of the five-year permit term. Another example of permissible permit timeframes that extend beyond the five-year permit term are compliance schedules, which may go beyond the expiration date of the permit if consistent with applicable state law. *See In Re Moscow,* 10 E.A.D. at 153 ("…a Region's authority to provide for compliance schedules in EPA-issued permits is limited to those circumstances in which the State's water quality standards or its implementing regulations 'can be fairly construed as authorizing a schedule of compliance.'") (citations omitted). The WWTS Adaptation Plan reasonably also requires *consideration* of long-term horizons as the planning and actions needed to address increasing major storms and flood events will be in many instances long-term as well.

Further, EPA does not consider the expected life or design life the appropriate recurrence interval to evaluate future risks. Namely, while a particular facility can be designed initially for an expected period of operation and the design storm at a given point in time, material changes often occur over time to operate and maintain a facility, thus extending its design life, and with the impacts of increased severity and frequency of major storm and flood events, the original design storm may no longer represent likely discharge conditions. EPA asserts that a forward-looking evaluation of the risks to a facility relative to its current operational state is important to selection and implementation of the control measures necessary to minimize discharges that result from impacts of major storm and flood events.

EPA acknowledges that there are many possible approaches and that there are other programs that require resiliency planning. However, because adaptation planning is a critical step in complying with the permit's effluent limitations, EPA has determined that it is appropriate to include the Adaptation Plan requirements in the permit itself even if similar requirements also derive from other obligations. Major storm and flood events are of urgent concern, and EPA does not believe it would be sufficient to rely entirely on non-Permit obligations to address these threats to the proper operation and maintenance of WWTSs and/or sewer systems, especially because not all Permittees may otherwise be obligated to engage in adaptation planning, or may not be required to do so at this time. EPA has determined that planning for major storm and flood events must be done by all facilities now to avoid negative impacts. In recognition of the fact that Permittees may complete similar assessments to satisfy other obligations, the permit allows the Permittee to use qualifying assessments done for other programs or obligations to satisfy some or all of the components of the Adaptation Plan requirements. EPA considers its approach to be appropriate and reasonable to ensure consistent operation and maintenance of permitted facilities. Therefore, EPA will require Adaptation Plans be developed under NPDES permits for all wastewater treatment plants in Massachusetts.

Appendix E

EPA REGION 1 NPDES PERMITTING APPROACH FOR PUBLICLY OWNED TREATMENT WORKS THAT INCLUDE MUNICIPAL SATELLITE SEWAGE COLLECTION SYSTEMS

This regional interpretative statement provides notice to the public of EPA Region 1's interpretation of the Clean Water Act ("CWA" or "Act") and implementing regulations, and advises the public of relevant policy considerations, regarding the applicability of the National Pollutant Discharge Elimination System ("NPDES") program to publicly owned treatment works ("POTWs") that include municipal satellite sewage collection systems ("regionally integrated POTWs"). When issuing NPDES permits to these types of sanitary sewer systems, it is EPA Region 1's practice to include and regulate the owners/operators of the municipal satellite collection systems through a co-permitting structure. This interpretative statement is intended to explain, generally, the basis for this practice. EPA Region 1's decision in any particular case will be made by applying the law and regulations on the basis of specific facts when permits are issued.

EPA has set out a national policy goal for the nation's sanitary sewer systems to adhere to strict design and operational standards:

> "Proper [operation and maintenance] of the nation's sewers is integral to ensuring that wastewater is collected, transported, and treated at POTWs; and to reducing the volume and frequency of …[sanitary sewer overflow] discharges. Municipal owners and operators of sewer systems and wastewater treatment facilities need to manage their assets effectively and implement new controls, where necessary, as this infrastructure continues to age. Innovative responses from all levels of government and consumers are needed to close the gap."[1]

Because ownership/operation of a regionally integrated POTW is divided among multiple parties, the owner/operator of the treatment plant many times lacks the means to implement comprehensive, system-wide operation and maintenance ("O&M") procedures. Failure to properly implement O&M measures in a POTW can cause, among other things, excessive extraneous flow (*i.e.*, inflow and infiltration) to enter, strain and occasionally overload treatment system capacity. This failure not only impedes EPA's national policy goal concerning preservation of the nation's wastewater infrastructure assets, but also frustrates achievement of the water quality- and technology-based requirements of CWA § 301 to the extent it results in sanitary sewer overflows and degraded treatment plant performance, with adverse impacts on human health and the environment.

In light of these policy objectives and legal requirements, it is EPA Region 1's permitting practice to subject all portions of the POTW to NPDES requirements in order to ensure that the treatment system as a whole is properly operated and maintained and that human health and

[1] *See Report to Congress: Impacts and Control of CSOs and SSOs* (EPA 833-R-04-001) (2004), at p. 10-2. *See also* "1989 National CSO Control Strategy," 54 Fed. Reg. 37371 (September 8, 1989).

water quality impacts resulting from excessive extraneous flow are minimized. The approach of addressing O&M concerns in a regionally integrated treatment works by adding municipal satellite collection systems as co-permittees is consistent with the definition of "publicly owned treatment works," which by definition includes sewage collection systems. Under this approach, the POTW in its entirety is subject to NPDES regulation as a point source discharger under the Act. This entails imposition of permitting requirements applicable to the POTW treatment plant along with a more limited set of conditions applicable to the connected municipal satellite collection systems.

The factual and legal basis for the Region's position is set forth in greater detail in *Attachment A*.

Attachment A

ANALYSIS SUPPORTING EPA REGION 1 NPDES PERMITTING APPROACH FOR PUBLICLY OWNED TREATMENT WORKS THAT INCLUDE MUNICIPAL SATELLITE SEWAGE COLLECTION SYSTEMS

Exhibit A	List of regional centralized POTW treatment plants and municipal satellite collection systems subject to the co-permittee policy
Exhibit B	Analysis of extraneous flow trends for representative systems
Exhibit C	Form of Regional Administrator's waiver of permit application requirements for municipal satellite collection systems

Introduction

On May 28, 2010, the U.S. EPA Environmental Appeals Board ("Board") issued a decision remanding to the Region certain NPDES permit provisions that included and regulated satellite collection systems as co-permittees. *See In re Upper Blackstone Water Pollution Abatement District*, NPDES Appeal Nos. 08-11 to 08-18 & 09-06, 14 E.A.D. __ (*Order Denying Review in Part and Remanding in Part*, EAB, May 28, 2010).[2] While the Board "did not pass judgment" on the Region's position that its NPDES jurisdiction encompassed the entire POTW and not only the treatment plant, it held that "where the Region has abandoned its historical practice of limiting the permit only to the legal entity owning and operating the wastewater treatment plant, the Region had not sufficiently articulated in the record of this proceeding the statutory, regulatory, and factual bases for expanding the scope of NPDES authority beyond the treatment plant owner/operator to separately owned/operated collection systems that do not discharge directly to waters of the United States, but instead that discharge to the treatment plant." *Id., slip op.* at 2, 18. In the event the Region decided to include and regulate municipal satellite collection systems as co-permittees in a future permit, the Board posed several questions for the Region to address in the analysis supporting its decision:

(1) Is the scope of NPDES authority limited to owners/operators of the treatment plant, or does the authority extend to owners/operators of the municipal satellite collection systems that comprise the wider POTW?

(2) If the latter, how far up the collection system does NPDES jurisdiction reach, *i.e.*, where does the "collection system" end and the "user" begin?

(3) Do municipal satellite collection systems "discharge [ ] a pollutant" within the meaning of the statute and regulations?

[2] The decision is available on the Board's website via the following link: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/30b93f139d3788908525706c005185b4/34e841c87f346d9485257360068976f!OpenDocument.

(4) Are municipal satellite collection systems "indirect dischargers" and thus excluded from NPDES permitting requirements?

(5) Is the Region's rationale for regulating municipal satellite collection systems as co-permittees consistent with the references to "municipality" in the regulatory definition of POTW, and the definition's statement that "[t]he term also means the municipality…which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works"?

(6) Is the Region's rationale consistent with the permit application and signatory requirements under NPDES regulations?

See *Blackstone, slip op.* at 18, 20, n. 17.

This regional interpretative statement is, in part, a response to the Board's decision. It details the legal and policy bases for regulating as co-permittees publicly owned treatment works ("POTWs") that include municipal satellite collection systems. Region 1's analysis is divided into five sections. First, the Region provides context for the co-permitting approach by briefly describing the health and environmental impacts associated with poorly maintained sanitary sewer systems. Second, the Region outlines its evolving permitting practice regarding regionally integrated POTWs, particularly its attempts to ensure that such entity's municipal satellite collection systems are properly maintained and operated. Third, the Region explains the legal authority to include municipal satellite collection systems as co-permittees when permitting regionally integrated POTWs. In this section, the Region answers the questions posed by the Board in the order presented above. Fourth, the Region sets forth the basis for the specific conditions to which the municipal satellite collection systems are subject as co-permittees. Finally, the Region discusses other considerations informing its decision to employ a co-permittee structure when permitting regionally integrated POTWs.

I. Background

A sanitary sewer system (SSS) is a wastewater collection system owned by a state or municipality that is designed to collect and convey only sanitary wastewater (domestic sewage from homes as well as industrial and commercial wastewater).[3] The purpose of these systems is to transport wastewater uninterrupted from its source to a treatment facility. Developed areas that are served by sanitary sewers often also have a separate storm sewer system (*e.g.*, storm drains) that collects and conveys runoff, street wash waters and drainage and discharges them directly to a receiving water (*i.e.*, without treatment at a POTW). While sanitary sewers are not designed to collect large amounts of runoff from precipitation events or provide widespread drainage, they typically are built with some allowance for higher flows that occur

[3] A combined sewer, on the other hand, is a type of sewer system that collects and conveys sanitary sewage and stormwater runoff in a single-pipe system to a POTW treatment plant. *See generally* Report to Congress: Impacts and Control of CSOs and SSOs (EPA 833-R-04-001) (2004), from which EPA Region 1 has drawn this background material.

during periods of high groundwater and storm events. They are thus able to handle minor and controllable amounts of extraneous flow (*i.e.*, inflow and infiltration, or I/I) that enter the system. Inflow generally refers to water other than wastewater—typically precipitation like rain or snowmelt— that enters a sewer system through a direct connection to the sewer. Infiltration generally refers to other water that enters a sewer system from the ground, for example through defects in the sewer.

Municipal sanitary sewer collection systems can consist of a widespread network of pipes and associated components (*e.g.*, pump stations). These systems provide wastewater collection service to the community in which they are located. In some situations, the municipality that owns the collector sewers may not provide treatment of wastewater, but only conveys its wastewater to a collection system that is owned and operated by a different municipal entity (such as a regional sewer district). This is known as a satellite community. A "satellite" community is a sewage collection system owner/operator that does not have ownership of the treatment facility and a specific or identified point of discharge but rather the responsibility to collect and convey the community's wastewater to a POTW treatment plant for treatment. *See* 75 Fed. Reg. 30395, 30400 (June 1, 2010).

Municipal sanitary sewer collection systems play a critical role in protecting human health and the environment. Proper operation and maintenance of sanitary sewer collection systems is integral to ensuring that wastewater is collected, transported, and treated at POTW treatment plants. Through effective operation and maintenance, collection system operators can maintain the capacity of the collection system; reduce the occurrence of temporary problem situations such as blockages; protect the structural integrity and capacity of the system; anticipate potential problems and take preventive measures; and indirectly improve treatment plant performance by minimizing deterioration due to I/I-related hydraulic overloading.

Despite their critical role in the nation's infrastructure, many collection systems exhibit poor performance and are subjected to flows that exceed system capacity. Untreated or partially treated overflows from a sanitary sewer system are termed "sanitary sewer overflows" (SSOs). SSOs include releases from sanitary sewers that reach waters of the United States as well as those that back up into buildings and flow out of manholes into city streets.

There are many underlying reasons for the poor performance of collection systems. Much of the nation's sanitary sewer infrastructure is old, and aging infrastructure has deteriorated with time. Communities also sometimes fail to provide capacity to accommodate increased sewage delivery and treatment demand from increasing populations. Furthermore, institutional arrangements relating to the operation of sewers can pose barriers to coordinated action, because many municipal sanitary sewer collection systems are not entirely owned or operated by a single municipal entity.

The performance and efficiency of municipal collection systems influence the performance of sewage treatment plants. When the structural integrity of a sanitary sewer collection system deteriorates, large quantities of infiltration (including rainfall-induced infiltration) and inflow can enter the collection system, causing it to overflow. These extraneous flows are among the

most serious and widespread operational challenges confronting treatment works.[4]

Infiltration can be long-term seepage of water into a sewer system from the water table. In some systems, however, the flow characteristics of infiltration can resemble those of inflow, *i.e.*, there is a rapid increase in flow during and immediately after a rainfall event, due, for example, to rapidly rising groundwater. This phenomenon is sometimes referred to as rainfall-induced infiltration.

Sanitary sewer systems can also overflow during periods of normal dry weather flows. Many sewer system failures are attributable to natural aging processes or poor operation and maintenance. Examples include years of wear and tear on system equipment such as pumps, lift stations, check valves, and other moveable parts that can lead to mechanical or electrical failure; freeze/thaw cycles, groundwater flow, and subsurface seismic activity that can result in pipe movement, warping, brittleness, misalignment, and breakage; and deterioration of pipes and joints due to root intrusion or other blockages.

Inflow and infiltration impacts are often regional in nature. Satellite collection systems in the communities farthest from the POTW treatment plant can cause sanitary sewer overflows ("SSOs") in communities between them and the treatment plant by using up capacity in the interceptors. This can cause SSOs in the interceptors themselves or in the municipal sanitary sewers that lead to them. The implication of this is that corrective solutions often must also be regional in scope to be effective.

The health and environmental risks attributed to SSOs vary depending on a number of factors including location and season (potential for public exposure), frequency, volume, the amount and type of pollutants present in the discharge, and the uses, conditions, and characteristics of the receiving waters. The most immediate health risks associated with SSOs to waters and other areas with a potential for human contact are associated with exposure to bacteria, viruses, and other pathogens.

Human health impacts occur when people become ill due to contact with water or ingestion of water or shellfish that have been contaminated by SSO discharges. In addition, sanitary sewer systems can back up into buildings, including private residences. These discharges provide a direct pathway for human contact with untreated wastewater. Exposure to land-based SSOs typically occurs through the skin via direct contact. The resulting diseases are often similar to those associated with exposure through drinking water and swimming (*e.g.*, gastroenteritis), but may also include illness caused by inhaling microbial pathogens. In addition to pathogens, raw sewage may contain metals, synthetic chemicals, nutrients, pesticides, and oils, which also can be detrimental to the health of humans and wildlife.

[4] In a 1989 Water Pollution Control Federation survey, 1,003 POTWs identified facility performance problems. Infiltration and inflow was the most frequently cited problem, with 85 percent of the facilities reporting I/I as a problem. I/I was cited as a major problem by 41 percent of the facilities (32 percent as a periodic problem).

II. EPA Region 1 Past Practice of Permitting POTWs that Include Municipal Satellite Collection Systems

EPA Region 1's practice in permitting regionally integrated POTWs has developed in tandem with its increasing focus on addressing I/I in sewer collection systems, in response to the concerns outlined above. Up to the early 1990s, POTW permits issued by Region 1 generally did not include specific requirements for collection systems. When I/I and the related issue of SSOs became a focus of concern both nationally and within the region in the mid-1990s, Region 1 began adding general requirements to POTW permits that required the permittees to "eliminate excessive infiltration and inflow" and provide an annual "summary report" of activities to reduce I/I. As the Region gathered more information and gained more experience in assessing these reports and activities, it began to include more detailed requirements and reporting provisions in these permits.

MassDEP also engaged in a parallel effort to address I/I, culminating in 2001 with the issuance of MassDEP Policy No. BRP01-1, "Interim Infiltration and Inflow Policy." Among other provisions, this policy established a set of standard NPDES permit conditions for POTWs that included development of an I/I control plan (including funding sources, identification and prioritization of problem areas, and public education programs) and detailed annual reporting requirements (including mapping, reporting of expenditures and I/I flow calculations). Since September 2001, these requirements have been the basis for the standard operation and maintenance conditions related to I/I.

Regional treatment plants presented special issues as I/I requirements became more specific, as it is generally the member communities, rather than the regional sewer district, that own the collection systems that are the primary source of I/I. Before the focus on I/I, POTW permits did not contain specific requirements related to the collection system component of POTWs. Therefore, when issuing NPDES permits to authorize discharges from regionally integrated treatment POTWs, EPA Region 1 had generally only included the legal entity owning and/or operating the regionally centralized wastewater treatment plant. As the permit conditions were focused on the treatment plant itself, this was sufficient to ensure that EPA had authority to enforce the permit requirements.

In implementing the I/I conditions, Region 1 initially sought to maintain the same structure, placing the responsibility on the regional sewer district to require I/I activities by the contributing systems and to collect the necessary information from those systems for submittal to EPA. MassDEP's 2001 Interim I/I Policy reflected this approach, containing a condition for regional systems:

> ((FOR REGIONAL FACILITIES ONLY)) The permittee shall require, through appropriate agreements, that all member communities develop and implement infiltration and inflow control plans sufficient to ensure that high flows do not cause or contribute to a violation of the permittees effluent limitations, or cause overflows from the permittees collection system.

As existing NPDES permittees, the POTW treatment plants were an obvious locus of regulation. The Region assumed the plants would be in a position to leverage preexisting legal and/or contractual relationships with the satellite collection systems they serve to perform a coordinating function, and that utilizing this existing structure would be more efficient than establishing a new system of direct reporting to EPA by the collection system owners. The Region also believed that the owner/operator of the POTW treatment plant would have an incentive to reduce flow from contributing satellite systems because doing so would improve treatment plant performance and reduce operation costs. While relying on this cooperative approach, however, EPA Region 1 also asserted that it had the authority to require that POTW collection systems be included as NPDES permittees and that it would do so if it proved necessary. Indeed, in 2001 Region 1 acceded to Massachusetts Water Resources Authority's ("MWRA") request that the contributing systems to the MWRA Clinton wastewater treatment plant ("WWTP") be included as co-permittees, based on evidence provided by MWRA that its specific relationship with those communities would not permit it to run an effective I/I reduction program for these collection systems. EPA Region 1 also put satellite collection systems on notice that they would be directly regulated through legally enforceable permit requirements if I/I reductions were not pursued or achieved.

In time, the Region realized that its failure to assert direct jurisdiction over municipal satellite dischargers was becoming untenable in the face of mounting evidence that cooperative (or in some cases non-existent) efforts on the part of the POTW treatment plant and associated satellites were failing to comprehensively address the problem of extraneous flow entering the POTW. The ability and/or willingness of regional sewer districts to attain meaningful I/I efforts in their member communities varied widely. The indirect structure of the requirements also tended to make it difficult for EPA to enforce the implementation of meaningful I/I reduction programs.

It became evident to EPA Region 1 that a POTW's ability to comply with CWA requirements depended on successful operation and maintenance of not only the treatment plant but also the collection system. For example, the absence of effective I/I reduction and operation/maintenance programs was impeding the Region's ability to prevent or mitigate the human health and water quality impacts associated with SSOs. Additionally, these excess flows stressed POTW treatment plants from a hydraulic capacity and performance standpoint, adversely impacting effluent quality. *See Exhibit B* (Analysis of extraneous flow trends for representative systems). Addressing these issues in regional systems was essential, as these include most of the largest systems in terms of flow, population served and area covered, and serve the largest population centers.

The Region's practice of imposing NPDES permit conditions on the municipal collection systems in addition to the treatment plant owner/operator represents a necessary and logical progression in its continuing effort to effectively address the serious problem of I/I in sewer collection systems.[5] In light of its past permitting experience and the need to effectively address

[5] Although EPA Region 1 has in the past issued NPDES permits only to the legal entities owning and operating the wastewater

the problem of extraneous flow on a system-wide basis, Region 1 decided that it was necessary to refashion permits issued to regionally integrated POTWs to encompass all owners/operators of the treatment works (*i.e.*, the regional centralized POTW treatment plant and the municipal satellite collection systems.[6] Specifically, Region 1 determined that the satellite systems should be subject as co-permittees to a limited set of O&M-related conditions on permits issued for discharges from regionally integrated treatment works. These conditions pertain only to the portions of the POTW collection system that the satellites own. This ensures maintenance and pollution control programs are implemented with respect to all portions of the POTW. Accordingly, since 2005, Region 1 has generally included municipal satellite collection systems as co-permittees for limited purposes, in addition to the owner/operator of the treatment plant as the main permittee subject to the full array of NPDES requirements, including secondary treatment and water-quality based effluent limitations. The Region has identified 36 permits issued by the Region to POTWs in New Hampshire and Massachusetts that include municipal satellite collection systems as co-permittees. *See Exhibit A*. The 36 permits include a total of 81 satellite collection systems as co-permittees.

III. Legal Authority

The Region's prior and now superseded practice of limiting the permit only to the legal entity owning and/or operating the wastewater treatment plant had never been announced as a regional policy or interpretation. Similarly, the Region's practice of imposing NPDES permit conditions on the municipal collection systems in addition to the treatment plant owner/operator has also never been expressly announced as a uniform, region-wide policy or interpretation. Upon consideration of the Board's decision, described above, EPA Region 1 has decided to supply a clearer, more detailed explanation regarding its use of a co-permittee structure when issuing NPDES permits to regionally integrated POTWs. In this section, the Region addresses the questions posed by the Board in the *Upper Blackstone* decision referenced above.

(1) Is the scope of NPDES authority limited to owners/operators of the treatment plant, or does the authority extend to owners/operators of the municipal satellite collection systems that comprise the wider POTW?

The scope of NPDES authority extends beyond the owners/operators of the treatment plant to include to owners/operators of portions of the wider POTW, for the reasons discussed below.

The CWA prohibits the "discharge of any pollutant by any person" from any point source to

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treatment plant (*i.e.*, only a portion of the "treatment works"), the Region's reframing of permits to include municipal satellite collection systems does not represent a break or reversal from its historical legal position. EPA Region 1 has never taken the legal position that the satellite collection systems are beyond the reach of the CWA and the NPDES permitting program. Rather, the Region as a matter of discretion had merely never determined it necessary to exercise its statutory authority to directly reach these facilities in order to carry out its NPDES permitting obligations under the Act.

[6] EPA has "considerable flexibility in framing the permit to achieve a desired reduction in pollutant discharges." *Natural Resources Defense Council, Inc. v. Costle*, 568 F.2d 1369, 1380 (D.C.Cir.1977). ("[T]his ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all.").

waters of the United States, except, *inter alia,* in compliance with an NPDES permit issued by EPA or an authorized state pursuant to Section 402 of the CWA. CWA § 301, 402(a)(1); 40 C.F.R. § 122.1(b). Where there is a discharge of pollutants, NPDES regulations require the "operator" of the discharging "facility or activity" to obtain a permit in circumstances where the operator is different from the owner. *Id.* § 122.21(b). "Owner or operator" is defined as "the owner or operator of any 'facility or activity' subject to regulation under the NPDES program," and a "facility or activity" is "any NPDES 'point source' or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program." *Id.* § 122.2.

"Publicly owned treatment works" are facilities subject to the NPDES program. Statutorily, POTWs as a class must meet performance-based requirements based on available wastewater treatment technology. *See* CWA § 402(a)(1) ("[t]he Administrator may…issue a permit for the discharge of any pollutant….upon condition that such discharge will meet (A) all applicable requirements under [section 301]…"); § 301(b)(1)(B) ("In order to carry out the objective of this chapter there shall be achieved…for publicly owned treatment works in existence on July 1, 1977...effluent limitations based upon secondary treatment[.]"); *see also* 40 C.F.R. pt 133. In addition to secondary treatment requirements, POTWs are also subject to water quality-based effluent limits if necessary to achieve applicable state water quality standards. *See* CWA § 301(b)(1)(C). *See also* 40 C.F.R. § 122.44(a)(1) ("…each NPDES permit shall include…[t]echnology-based effluent limitations based on: effluent limitations and standards published under section 301 of the Act") and (d)(1) (same for water quality standards and state requirements). NPDES regulations similarly identify the "POTW" as the entity subject to regulation. *See* 40 C.F.R. § 122.21(a), (requiring "new and existing POTWs" to submit information required in 122.21(j)," which in turn requires "all POTWs," among others, to provide permit application information).

A municipal satellite collection system is part of a POTW under applicable law. The CWA and its implementing regulations broadly define "POTW" to include not only wastewater treatment plants but also the sewer systems and associated equipment that collect wastewater and convey it to the plants. Under NPDES regulations at 40 C.F.R. §§ 122.2 and 403.3(q), the term "Publicly Owned Treatment Works" or "POTW" means "a treatment works as defined by section 212 of the Act, which is owned by a State or municipality (as defined by section 502(4) of the Act)." Under section 212 of the Act,

> "(2)(A) The term 'treatment works' means any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature to implement section 1281 of this title, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, outfall sewers, *sewage collection systems* [emphasis added], pumping, power, and other equipment, and their appurtenances; extensions, improvements, remodeling, additions, and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities; and any works, including site acquisition of the land that will be an integral part of the treatment process (including land used for the storage of treated

wastewater in land treatment systems prior to land application) or is used for ultimate disposal of residues resulting from such treatment.

(B) In addition to the definition contained in subparagraph (A) of this paragraph, 'treatment works' means any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including storm water runoff, or industrial waste, including waste in combined storm water and *sanitary sewer systems* [emphasis added]. Any application for construction grants which includes wholly or in part such methods or systems shall, in accordance with guidelines published by the Administrator pursuant to subparagraph (C) of this paragraph, contain adequate data and analysis demonstrating such proposal to be, over the life of such works, the most cost efficient alternative to comply with sections 1311 or 1312 of this title, or the requirements of section 1281 of this title."

Under the NPDES program regulations, this definition has been interpreted as follows:

"The term *Publicly Owned Treatment Works* or *POTW* [emphasis in original]…includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works."

See 40 C.F.R. § 122.2, cross-referencing 403.3(q).

The statutory and regulatory definitions plainly encompass both the POTW treatment plant and municipal satellite collection systems. Municipal satellite collection systems are part of a POTW by definition (*i.e.*, they are "sewage collection systems" under section 212(A) and "sanitary sewer systems" under section 212(B)). They are also conveyances that send wastewater to a POTW treatment plant for treatment under 40 C.F.R. 403.3(q)). The preamble to the rule that created the regulatory definition of POTW supports the reading that the treatment plant comprises only a portion of the POTW. *See* 44 Fed. Reg. 62260, 62261 (Oct. 29, 1979).[7]

Consistent with EPA Region 1's interpretation, courts have similarly taken a broad reading of the terms treatment works and POTW.[8]

[7] "A new provision…defining the term 'POTW Treatment Plant' has been added to avoid an ambiguity that now exists whenever a reference is made to a POTW (publicly owned treatment works). …[T]he existing regulation defines a POTW to include both the treatment plant and the sewer pipes and other conveyances leading to it. As a result, it is unclear whether a particular reference is to the pipes, the treatment plant, or both. The term "POTW treatment plant" will be used to designate that portion of the municipal system which is actually designed to provide treatment to the wastes received by the municipal system."

[8] *See, e.g.*, *United States v. Borowski, 977 F.2d 27, 30 n.5* (1st Cir. 1992) ("We read this language [POTW definition] to refer to such sewers, pipes and other conveyances that are publicly owned. Here, for example, the City of Burlington's sewer is

(2) If the latter, how far up the collection system does NPDES jurisdiction reach, i.e., where does the "collection system" end and the "user" begin?

NPDES jurisdiction extends beyond the treatment plant to the outer boundary of the municipally-owned sewage collection systems, which are defined as sewers whose purpose is to be a common carrier of wastewater for others to a POTW treatment plant for treatment, as explained below.

As discussed in response to Question 1 above, the term "treatment works" is defined to include "sewage collection systems." CWA § 212. In order to define the extent of the sewage collection system for purposes of co-permittee regulation—*i.e.*, to identify the boundary between the portions of the collection system that are subject to NPDES requirements and those that are not—Region 1 is relying on EPA's regulatory interpretation of the term "sewage collection system." In relevant part, EPA regulations define "sewage collection system" at 40 C.F.R. § 35.905 as:

> "…. each, and all, of the common lateral sewers, within a publicly owned treatment system, which are primarily installed to receive waste waters directly from facilities which convey waste water from individual structures or from private property and which include service connection "Y" fittings designed for connection with those facilities. The facilities which convey waste water from individual structures, from private property to the public lateral sewer, or its equivalent, are specifically excluded from the definition…."

Put otherwise, a municipal satellite collection system is subject to NPDES jurisdiction under the Region's approach insofar as its purpose is to be a common carrier of wastewater for others to a POTW treatment plant for treatment. The use of this primary purpose test (i.e., common sewer installed as a recipient and carrier waste water from others) allows Region 1 to draw a principled, predictable and readily ascertainable boundary between the POTW's collection system and user. This test would exclude, for example, branch drainpipes that collect and transport wastewater from fixtures in a commercial building or public school to the common lateral sewer. This type of infrastructure would not be considered part of the collection system, because it is not designed to be a common recipient and carrier of wastewaters from other users. Rather, it is designed to transport its users' wastewater to such a common collection system at a point further down the sanitary sewer system.

EPA's reliance on the definition of "sewage collection system" from outside the NPDES

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included in the definition because it conveys waste water to the Massachusetts Water Resource Authority's treatment works."); *Shanty Town Assoc. v. Envtl. Prot. Agency, 843 F.2d 782, 785* (4th Cir. 1988) ("As defined in the statute, a 'treatment work' need not be a building or facility, but can be any device, system, or other method for treating, recycling, reclaiming, preventing, or reducing liquid municipal sewage and industrial waste, including storm water runoff.") (citation omitted); *Comm. for Consideration Jones Fall Sewage System v. Train,* 375 F. Supp. 1148, 1150-51 (D. Md. 1974) (holding that NPDES wastewater discharge permit coverage for a wastewater treatment plant also encompasses the associated sanitary sewer system and pump stations under § 1292 definition of "treatment work").

regulations for interpretative guidance is reasonable as the construction grants regulations at 40
C.F.R. Part 35, subpart E pertain to grants for POTWs, the entity that is the subject of this NPDES policy. Additionally, the term "sewage collection systems" expressly appears in the definition of treatment works under section 212 of the Act as noted above. Finally, this approach is also consistent with EPA's interpretation in other contexts, such as the SSO listening session notice, published in the Federal Register on June 1, 2010, which describes wastewater collection systems as those that "collect domestic sewage and other wastewater from homes and other buildings and convey it to wastewater sewage treatment plants for proper treatment and disposal." *See* "Municipal Sanitary Sewer Collection Systems, Municipal Satellite Collection Systems, Sanitary Sewer Overflows, and Peak Wet Weather Discharges From Publicly Owned Treatment Works Treatment Plants Serving Separate Sanitary Sewer Collection Systems," 75 Fed. Reg. 30395.[9]

(3) Do municipal satellite collection systems "discharge [] a pollutant" within the meaning of the statute and regulations?

Yes, because they are a part of the POTW, municipal satellite collection systems discharge pollutants to waters of the United States through one or more outfalls (point sources).

The "discharge of a pollutant," triggers the need for a facility to obtain an NPDES permit. A POTW "discharges [ ] pollutant[s]" if it adds pollutants from a point source to waters of the U.S. (See 40 C.F.R. § 122.2, section (a) of the definition of "discharge of a pollutant.") As explained above, municipal satellite collection systems are part of the POTW. The entire POTW is the entity that discharges pollutants to waters of the U.S. through point source outfalls typically located at the treatment plant but also occasionally through other outfalls within the overall system. The fact that a collection system may be located in the upstream portions of the POTW and not necessarily near the ultimate discharge point at the treatment plant is not material to the question of whether it "discharges" a pollutant and consequently may be subject to conditions of an NPDES permit issued for discharges from the POTW.[10]

"Discharge of a pollutant" at 40 C.F.R. § 122.2 is also defined to include "… discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person *which do not lead to a treatment works.*"(emphasis added). Some municipal collection systems have argued that this sentence means that only municipal discharges that do not lead to a "treatment plant" fall within the scope of "discharge of a pollutant." They further argue that because discharges through satellite collection systems do lead to a treatment plant, such systems do not "discharge [] pollutant[s]" and therefore are not subject to the NPDES permit

[9] That EPA has in the past looked for guidance from Part 35 when construing the NPDES permitting program, for instance, in the context of storm water permitting, provides further support to the Region that its practice in this regard is sound. *See, e.g.*, "National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges," 55 Fed. Reg. 47990, 47955 (looking to the definition of "storm sewer" at 40 C.F.R. § 35.2005(b)(47) when defining "storm water" under the NDPES program).

[10] This position differs from that taken by the Region in the *Upper Blackstone* litigation. There, the Region argued that the treatment plant was the sole discharging entity for regulatory purposes. The Region has revised this view upon further consideration of the statute, regulations and case law and determined that the POTW as a whole is the discharging entity.

requirements. This argument is flawed in that it incorrectly equates "treatment works," the term used in the definition above, with "treatment plant." To interpret "treatment works" as it appears in the regulatory definition of "discharge of a pollutant" as consisting of only the POTW treatment plant would be inconsistent with the definition of "treatment works" at 40 C.F.R. § 403.3(q), which expressly includes the collection system. *See also* § 403.3(r) (defining "POTW Treatment Plant" as "*that portion* [emphasis added] of the POTW which is designed to provide treatment (including recycling and reclamation) of municipal sewage and industrial waste").

(4) Are municipal satellite collection systems "indirect dischargers" and thus excluded from NPDES permitting requirements?

No, municipal satellite collection systems are part of the POTW, not "indirect dischargers" to the POTW.

Section 307(b) of the Act requires EPA to establish regulatory pretreatment requirements to prevent the "introduction of pollutants into treatment works" that interfere, pass through or are otherwise incompatible with such works. Section 307 is implemented through the General Pretreatment Regulations for Existing and New Sources of Pollution (40 C.F.R. Part 403) and categorical pretreatment standards (40 C.F.R. Parts 405-471). Section 403.3(i) defines "indirect discharger" as "any non-domestic" source that introduces pollutants into a POTW and is regulated under pretreatment standards pursuant to CWA § 307(b)-(d). The source of an indirect discharge is termed an "industrial user." *Id*. at § 403.3(j). Under regulations governing the NPDES permitting program, the term "indirect discharger" is defined as "a non-domestic discharger introducing 'pollutants' to a 'publicly owned treatment works.'" 40 C.F.R. § 122.2. Indirect dischargers are excluded from NPDES permit requirements by the indirect discharger rule at 40 C.F.R. § 122.3(c), which provides, "The following discharges do not require an NPDES permit: . . . The introduction of sewage, industrial wastes or other pollutants into publicly owned treatment works by indirect dischargers."

Municipal satellite collection satellite systems are not indirect dischargers as that term is defined under part 122 or 403 regulations. Unlike indirect dischargers, municipal satellite collection systems are not "introducing pollutants" to POTWs under 40 C.F.R. § 122.2; they are, instead, part of the POTW by definition. Similarly, they are not a non-domestic *source* that introduces pollutants into a POTW within the meaning of § 403.3(j), but as part of the POTW collect and convey municipal sewage from industrial, commercial and domestic users of the POTW.

The Region's determination that municipal satellite collection systems are not indirect dischargers is, additionally, consistent with the regulatory history of the term indirect discharger.

The 1979 revision of the part 122 regulations defined "indirect discharger" as "a non-municipal, non-domestic discharger introducing pollutants to a publicly owned treatment works, which introduction does not constitute a 'discharge of pollutants'…" *See* National Pollutant Discharge Elimination System, 44 Fed. Reg. 32854, 32901 (June 7, 1979). The term "non-municipal" was removed in the Consolidated Permit Regulations, 45 Fed. Reg. 33290, 33421 (May 19, 1980) (defining "indirect discharger" as "a nondomestic discharger…"). Although the change was not explained in detail, the substantive intent behind this provision remained the same. EPA characterized the revision as "minor wording changes." 45 Fed. Reg. at 33346 (Table VII: "Relationship of June 7[, 1979] Part 122 to Today's Regulations"). The central point again is that under any past or present regulatory incarnation, municipal satellite collection systems, as POTWs, are not within the definition of "indirect discharger," which is limited to dischargers that introduce pollutants to POTWs.

The position that municipal satellite collection systems are part of, rather than discharge to, the POTW also is consistent with EPA guidance. EPA's 1994 Multijurisdictional Pretreatment Programs Guidance Manual, (EPA 833-B94-005) (June 1994), at p. 19, asserts that EPA has the authority to require municipal satellite collection systems to develop pretreatment programs by virtue of their being part of the POTW.

(5) How is the Region's rationale consistent with the references to "municipality" in the regulatory definition of POTW found at 40 C.F.R. § 403.3(q), and the definition's statement that "[t]he term also means the municipality….which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works?"

There is no inconsistency between the Region's view that municipally-owned satellite collection systems are part of a POTW, and the references to municipality in 40 C.F.R. § 403.3(q), including the final sentence of the regulatory definition of POTW in the pretreatment regulations.

The Region's co-permitting rationale is consistent with the first part of the pretreatment program's regulatory definition of POTW, because the Region is only asserting NPDES jurisdiction over satellite collection systems that are owned by a "State or municipality (as defined by section 502(4) of the Act)." The term "municipality" as defined in CWA § 502(4) "means a city, town, borough, county, parish, district, association, or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes…" Thus, in order to qualify under this definition, a wastewater collection system need only be "owned by a State or municipality." There is no requirement that the constituent components of a regionally integrated POTW, *i.e.*, the collection system and regional centralized POTW treatment plant, be owned by the same State or municipal entity.

Furthermore, there is no inconsistency between the Region's view that a satellite collection system is part of a POTW, and the final sentence of the regulatory definition of POTW in the pretreatment regulations. As noted above, the sentence provides that "POTW" may "also" mean a municipality which has jurisdiction over indirect discharges to and discharges from the treatment works. This is not a limitation because of the use of the word "also" (contrast this

with the "only if" language in the preceding sentence of the regulatory definition).

(6) How does the Region's rationale comport with the permit application and signatory requirements under NPDES regulations?

EPA's authority to require municipal satellite collection systems to separately comply with the permit application requirements, or to provide waivers from these requirements where appropriate, is consistent with NPDES regulations, which provide that all POTWs must submit permit application information set forth in 40 C.F.R. § 122.21(j) unless otherwise directed, and municipal satellite collection systems are part of the POTW.

EPA has the authority to require municipal satellite collection systems to submit permit applications. These entities are operators of parts of the POTW. NPDES regulations characterize the operator "of the POTW" (which by definition includes the sewage collection system) as opposed to the operator "of the POTW treatment plant" as an appropriate applicant. *Id.* § 122.21(a), (requiring applicants for "new and existing POTWs" to submit information required in 122.21(j)," which in turn requires "all POTWs," among others, to provide permit application information). This reading of the regulation is in keeping with the statutory text, which subjects the POTW writ large to the secondary treatment and water quality-based requirements. *See* CWA § 301(b)(1)(B), (C). In fact, the NPDES permit application for POTWs solicits information concerning portions of the POTW beyond the treatment plant itself, including the collection system used by the treatment works. *See* 40 C.F.R. 122.21(j)(1).

Notwithstanding that EPA could require applications for all the municipal satellite collection systems, requiring such applications may result in duplicative or immaterial information. The Regional Administrator ("RA") may waive any requirement of this paragraph if he or she has access to substantially identical information. 40 C.F.R. § 122.21(j). *See generally*, 64 Fed. Reg. 42440 (August 4, 1999). The RA may also waive any application requirement that is not of material concern for a specific permit. Region 1 believes that it will typically receive information sufficient for NPDES permitting purposes from the POTW treatment plant operator's application.

In most cases, EPA Region 1 believes that having a single permit application from the POTW treatment plant operator will be more efficient in carrying out the regulation's intent than multiple applications from the satellite systems. (The treatment plant operator would of course be required to coordinate as necessary with the constituent components of the POTW to ensure that the information provided to EPA is accurate and complete). EPA Region 1 therefore intends to issue waivers to exempt municipal satellite collection systems from permit application and signatory requirements in accordance with 40 C.F.R. § 122.21(j). To the extent the Region requires additional information, it intends to use its information collection authority under CWA § 308.

IV. Basis for the Specific Conditions to which the Municipal Satellite Collection Systems are Subject as Co-permittees

The legal authority for extending NPDES conditions to all portions of the municipally-owned treatment works to ensure proper operation and maintenance and to reduce the quantity of extraneous flow into the POTW is Section 402(a) of the CWA. This section of the Act authorizes EPA to issue a permit for the "discharge of pollutants" and to prescribe permit conditions as necessary to carry out the provisions of the CWA, including Section 301 of the Act. Among other things, Section 301 requires POTWs to meet performance-based requirements based on secondary treatment technology, as well as any more stringent requirements of State law or regulation, including water quality standards. *See* CWA § 301(b)(1)(B),(C).

The co-permittee requirements are required to assure continued achievement of secondary treatment requirements and water quality standards in accordance with sections 301 and 402 of the Act and to prevent unauthorized discharges of sewage from collection systems. With respect to secondary treatment, the inclusion of the satellite systems as co-permittees is necessary because high levels of I/I dilute the strength of influent wastewater and increase the hydraulic load on treatment plants, which can reduce treatment efficiency (*e.g.*, result in violations of technology-based percent removal limitations for BOD and TSS due to less concentrated influent, or violation of other technology effluent limitations due to reduction in treatment efficiency), lead to bypassing a portion of the treatment process, or in extreme situations make biological treatment facilities inoperable (*e.g.*, wash out the biological organisms that treat the waste).

As to water quality standards, the addition of the satellite systems as co-permittees is necessary to ensure collection system operation and maintenance, which will reduce extraneous flow entering the system and free up available capacity. This will facilitate compliance with water quality-based effluent limitations—made more difficult by reductions in treatment efficiency and also reduce water quality standard violations that result from the occurrence of SSOs. *See Exhibits B* (Municipal satellite collection systems with SSOs) and *C* (Analysis of extraneous flow trends for representative systems). SSOs that reach waters of the U.S. are discharges in violation of section 301(a) of the CWA to the extent not authorized by an NPDES permit.

Subjecting portions of an NPDES-regulated entity upstream of the ultimate discharge point is consistent with EPA's interpretation of the CWA in other contexts. For example, it is well established that EPA has the ability to apply discharge limitations and monitoring requirements to internal process discharges, rather than to outfalls, on the grounds that compliance with permit limitations "may well involve controls applied at points other than the ultimate point of discharge." *See Decision of the General Counsel No. 27 (In re Inland Steel Company)*, August 4, 1975 ("Limitations upon internal process discharges are proper, if such discharges would ultimately be discharged into waters of the United States, and if such limitations are necessary to carry out the principal regulatory provisions of the Act."). In the case of regionally integrated POTWs, placing conditions on satellite collection systems—though located farther up the

system than the point of discharge—is a logical implication of the regulations and serves to effectuate the statute.

Without imposing conditions on the satellite communities, standard permit conditions applicable to all NPDES permits by regulation cannot be given full effect. To illustrate, there is no dispute that the operator of the POTW treatment plant and outfall is discharging pollutants within the meaning the CWA and, accordingly, is subject to the NPDES permit program. NPDES permitting regulations require standard conditions that "apply to all NPDES permits," pursuant to 40 C.F.R. § 122.41, including a duty to mitigate and to properly operate and maintain "all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit." *Id.* at § 122.41(d), (e). EPA regulations also require additional conditions applicable to specified categories of NPDES permit, including "Publicly owned treatment works." *See id.* at § 122.42(b). A municipal satellite collection system, as demonstrated above, falls within the regulatory definition of a POTW. In light of EPA's authority to require appropriate operation and maintenance of collection systems necessary to achieve compliance with an NPDES permit, and because the operator of the POTW treatment plant may not own or operate a significant portion of the wider treatment works (*i.e.*, the collection systems that send flow to the POTW treatment plant), it is appropriate, and in some cases necessary, to extend pertinent, mandated standard conditions to all portions of the POTW, which is subject to regulation in its entirety.

The alternative of allowing state and local jurisdictional boundaries to place significant portions of the POTW beyond the reach of the NPDES permitting program would not only be inconsistent with the broad statutory and regulatory definition of the term POTW but would impede Region 1 from carrying out the objectives of the CWA. It would also, illogically, preclude the Region from imposing on POTWs standard conditions EPA has by regulation mandated for those entities.

Other Considerations Informing EPA Region 1's Decision to Use a Co-permittee Permitting Structure for Regionally Integrated POTWs

In addition to consulting the relevant statutes, regulations, and preambles, Region 1 also considered other EPA guidance in coming to its determination to employ a co-permittee structure for regionally integrated POTWs. EPA's 1994 Multijurisdictional Pretreatment Programs Guidance Manual, p. 19, asserts that EPA has the authority to include municipal satellite collection systems as co-permittees by virtue of their being part of the POTW:

> If the contributing jurisdiction owns or operates the collection system within its boundaries, then it is a co-owner or operator of the POTW. As such, it can be included on the POTW's NPDES permit and be required to develop a pretreatment program. Contributing jurisdictions should be made co-permittees where circumstances or experience indicate that it is necessary to ensure adequate pretreatment program implementation.

The same logic that led EPA to conclude it had authority to require municipal satellite collection systems to develop a pretreatment program pursuant to an NPDES permit supports EPA Region 1's decision to impose permit conditions on such facilities to undertake proper O & M and to reduce inflow and infiltration.

EPA Region 1 also took notice of federal listening session materials on the June 2010 proposed SSO rule and associated model permits and fact sheet. The position articulated by EPA in these model documents—specifically the application of standard NPDES conditions to municipal satellite collection systems—generally conform to Region 1's co-permitting approach.

Finally, in addition to federal requirements, EPA Region 1 considered the co-permittee approach in light of state regulations and policy pertaining to wastewater treatment works. The Region found its approach to be consistent with such requirements. Under Massachusetts law, "Any person operating treatment works shall maintain the facilities in a manner that will ensure proper operation of the facilities or any part thereof," where "treatment works" is defined as "any and all devices, processes and properties, real or personal, used in the collection, pumping, transmission, storage, treatment, disposal, recycling, reclamation or reuse of waterborne pollutants, but not including any works receiving a hazardous waste from off the site of the works for the purpose of treatment, storage or disposal, or industrial wastewater holding tanks regulated under 314 CMR 18.00" *See* 314 CMR 12.00 ("Operation and Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers"). MassDEP has also prioritized this area, issuing detailed operation and maintenance guidelines entitled "Optimizing Operation, Maintenance and Rehabilitation of Sanitary Sewer Collection Systems."

Exhibit A

Permit Number	Permittee	Co-permittees	Issue Date with Co-permittees
MA0100404	Massachusetts Water Resources Authority – Clinton	Town of Clinton Lancaster Sewer District	September 27, 2000
MA0101010	City of Brockton	Town of Abington Town of Whitman	May 11, 2005
MA0100412	Westborough Wastewater Treatment Plant	Town of Westborough Town of Shrewsbury Town of Hopkinton	May 20, 2005
MA0100480	City of Marlborough	Town of Northborough	May 26, 2005
MA0100447	Greater Lawrence Sanitary District	City of Lawrence, Town of Andover, Town of North Andover, Town of Methuen, Town of Salem, NH	August 11, 2005
MA0100633	Lowell Regional Wastewater Utilities	Town of Chelmsford, Town of Dracut Town of Tewksbury Town of Tyngsborough	September 1, 2005
MA0100064	Pepperell Wastewater Treatment Plant	Town of Groton	December 22, 2005
MA0100439	Town of Webster Sewer Department	Town of Dudley	March 24, 2006
MA0100455	Town of South Hadley, Board of Selectmen	Town of Granby, Town of Chicopee	June 12, 2006
MA0100617	City of Leominster (NPDES Permit No. MA0100617)	Town of Lunenberg Town of Lancaster	September 28, 2006
MA0100510	Hoosac Water Quality District	Town of Williamstown Town of North Adams Town of Clarksburg	September 28, 2006
MA0101036	Board of Public Works, North Attleborough	Town of Plainville	January 4, 2007
NH0100544	Town of Sunapee	New London Sewer Commission	February 21, 2007
MA0100552	Lynn Water and Sewer Commission (NPDES Permit No. MA0100552)	Town of Nahant Town of Swampscott Town of Saugus	March 3, 2007

Permit Number	Permittee	Co-permittees	Issue Date with Co-permittees
NH0100331	City of Concord	Boscawen Board of Selectmen	June 29, 2007
NH0100790	City of Keene (NPDES Permit No. NH0100790)	Town of Marlborough, NH Swanzey Sewer Commission	August 24, 2007
NH0100625	Town of Hampton	Rye Sewer Commission	August 28, 2007
NH0100161	Town of Merrimack, NH	Town of Bedford	September 25, 2007
MA0101621	City of Haverhill	Town of Groveland	December 5, 2007
MA0101681	City of Pittsfield, Department of Public Works	Town of Dalton Town of Lenox Town of Hinsdale Town of Lanesborough Town of Richmond	August 22, 2008
NH0100447	City of Manchester	Town of Goffstown Town of Bedford Town of Londonderry	September 25, 2008
MA0100781	City of New Bedford	Town of Acushnet Town of Dartmouth	September 28, 2008
MA0101818	City of Northhampton	Town of Williamsburg	September 30, 2008
NH0100960	Winnipesaukee River Basin Program Wastewater Treatment Plant	Town of Belmont Town of Center Harbor City of Franklin Town of Gilford City of Laconia Town of Meredith Town of Northfield Town of Tilton	June 19, 2009
MA0101800	City of Westfield	Town of Southwick	September 30, 2009
MA0101231	Hull Permanent Sewer Commission	Cohasset Sewer Commission Hingham Sewer Commission	September 1, 2009
MA0100994	Gardner Department of Public Works	Town of Ashburnham	September 30, 2009
MA0102598	Charles River Pollution Control District	Town of Franklin Town of Medway Town of Millis Town of Bellingham	July 23, 2014

Permit Number	Permittee	Co-permittees	Issue Date with Co-permittees
MA0101702	MFN Region Wastewater District	Town of Mansfield Town of Norton Town of Foxboro	September 11, 2014
MA0100897	Taunton Wastewater Treatment Plant	Town of Raynham Town of Dighton	April 10, 2015
NH0100366	City of Lebanon, NH	Town of Enfield	September 30, 2015
NH0100099	Town of Hanover, NH	City of Lebanon	November 18, 2015
MA0100501	South Essex Sewerage District	City of Beverly, Town of Danvers Town of Marblehead City of Peabody City of Salem	May 5, 2016
NH0100471	Town of Milford, NH	Town of Wilton Sewer Commission	August 31, 2020
MA0101613	Springfield Regional Wastewater Treatment Facility	Town of Agawam Town of East Longmeadow Town of Longmeadow Town of Ludlow Town of West Springfield Town of Wilbraham	September 30, 2020
NH0101390	Town of Allenstown, NH	Town of Pembroke Sewer Commission	November 29, 2021
NH0100901	Town of Concord - Concord Hall Street Wastewater Treatment Facility	Town of Bow	July 1, 2022
MAG590000	2022 Medium Wastewater Treatment Facilities General Permit	(as authorized)	September 28, 2022

Exhibit B

I/I Flow Analysis for Sample Regional Publicly Owned Treatment Works

I. Representative POTWS

The **South Essex Sewer District (SESD)** is a regional POTW with a treatment plant in Salem, Massachusetts. The SESD serves a total population of 174,931 in six communities: Beverly, Danvers, Marblehead, Middleton, Peabody and Salem. The **Charles River Pollution Control District (CRPCD)** is a regional POTW with a treatment plant in Medway, Massachusetts. The CRPCD serves a total population of approximately 28,000 in four communities: Bellingham, Franklin, Medway and Millis. Both of these facilities have been operating since 2001 under permits that place requirements on the treatment plant to implement I/I reduction programs with the satellite collection systems, in contrast to Region 1's current practice of including the satellite collection systems as co-permittees.

II. Comparison of flows to standards for nonexcessive infiltration and I/I

Flow data from the facilities' discharge monitoring reports (DMRs) are shown in comparison to the EPA standard for nonexcessive infiltration/inflow (I/I) of 275 gpcd wet weather flow and the EPA standard for nonexcessive infiltration of 120 gallons per capita per day (gpcd) dry weather flow; the standards are multiplied by population served for comparison with total flow from the facility. See *I/I Analysis and Project Certification*, EPA Ecol. Pub. 97-03 (1985); 40 CFR 35.2005(b)(28) and (29).

Figures 1 and 2 show the Daily Maximum Flows (the highest flow recorded in a particular month) for the CRPCD and SESD, respectively, along with monthly precipitation data from nearby weather stations. Both facilities experience wet weather flows far exceeding the standard for nonexcessive I/I, particularly in wet months, indicating that these facilities are receiving high levels of inflow and wet weather infiltration.

Figure 1. CRPCD Daily Maximum Flow Compared to Nonexcessive I/I Standard

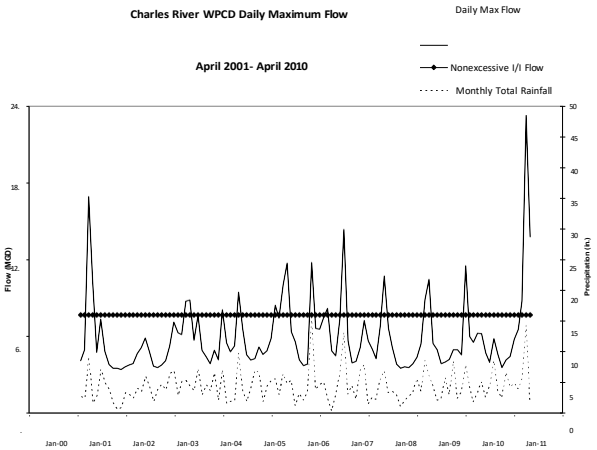
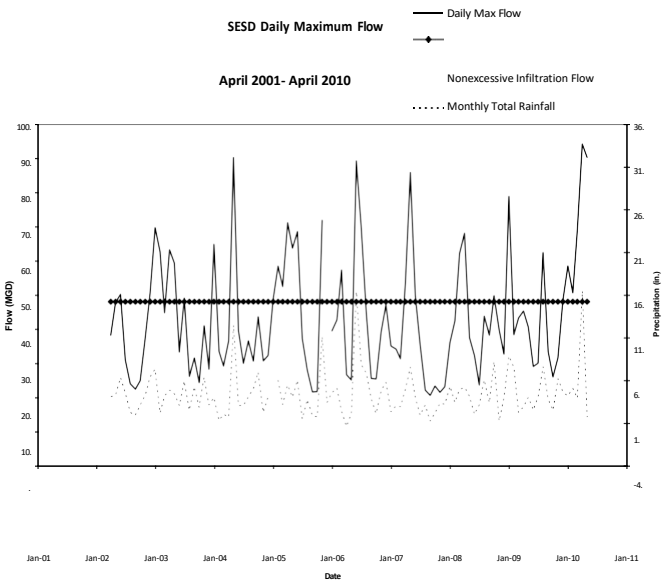


Figure 2. SESD Daily Maximum Flow Compared to Nonexcessive I/I Standard



Figures 3 and 4 shows the Average Monthly Flows for the CRPCD and SESD, which exceed the nonexcessive infiltration standard for all but the driest months. This indicates that these systems experience high levels of groundwater infiltration into the system even during dry weather.

Figure 3. CRPCD Monthly Average Flow Compared to Nonexcessive Infiltration Standard

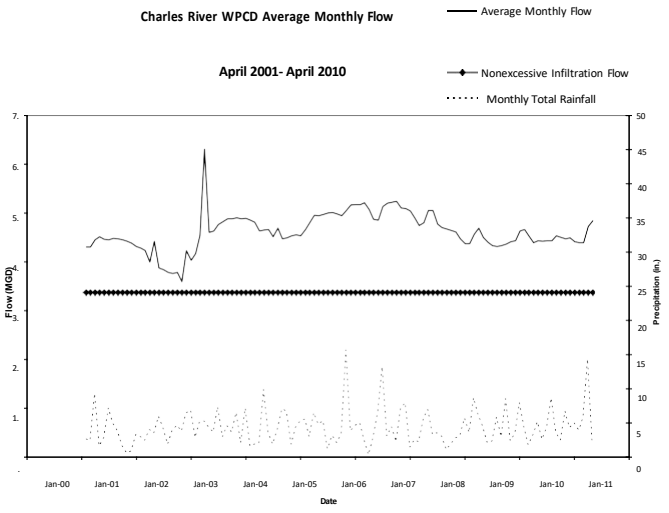
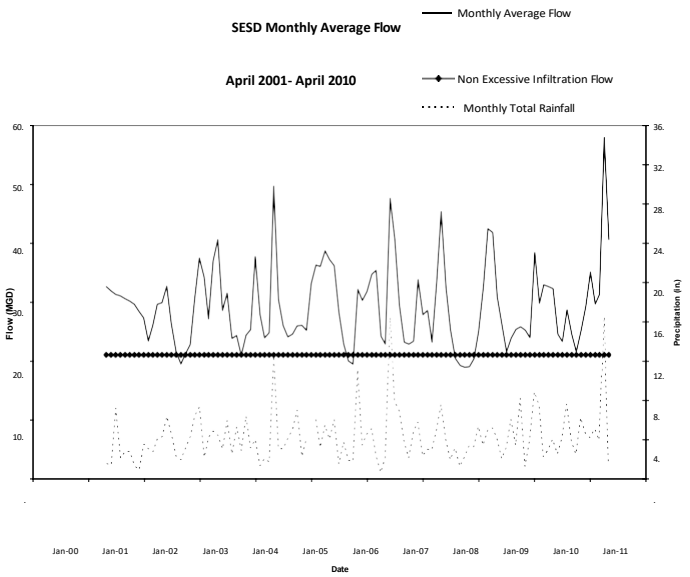


Figure 4. SESD Monthly Average Flow Compared to Nonexcessive Infiltration Standard



II. Flow Trends

Figures 5 and 6 show the trend in Maximum Daily Flows over the period during which these regional facilities have been responsible for implementing cooperative I/I reduction programs with the satellite collection systems. The Maximum Daily Flow reflects the highest wet weather flow for each month. The trend over this time period has been of increasing Maximum Daily Flow, indicating that I/I has not been reduced in either system despite the permit requirements.

Figure 5. CRPCD Daily Maximum Flow Trend

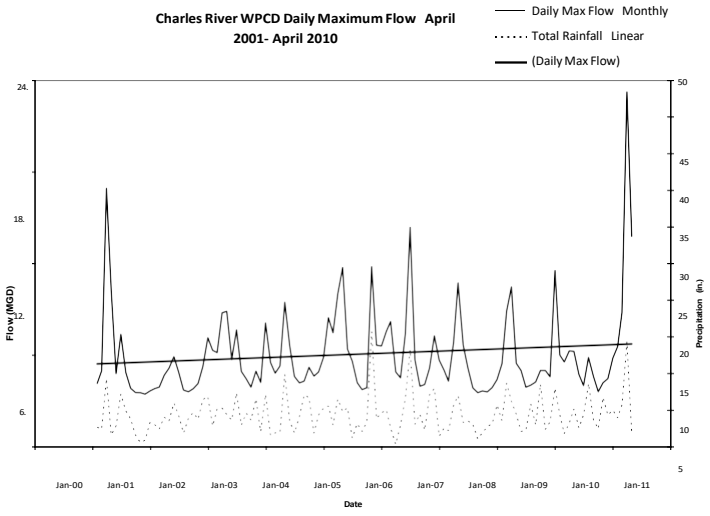
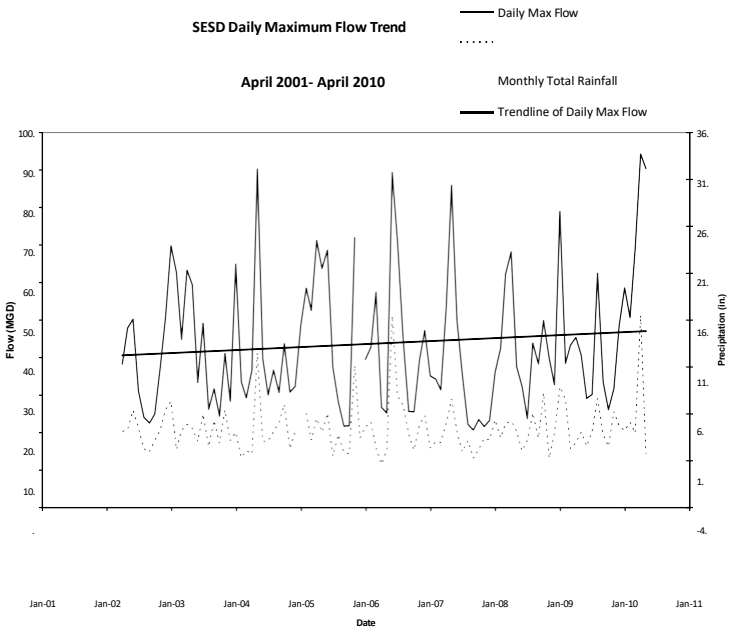


Figure 6. SESD Daily Maximum Flow Trend



III. Violations Associated with Wet Weather Flows

Both the CRPCD and SESD have experienced permit violations that appear to be related to I/I, based on their occurrence during wet weather months when excessive I/I standards are exceeded. Figure 7 shows violations of CRPCD's effluent limits for CBOD (concentration) and TSS (concentration and percent removal). Twelve of the sixteen violations occurred during months when daily maximum flows exceeded the EPA standard.

Figure 7. CRPCD CBOD and TSS Effluent Limit Violations

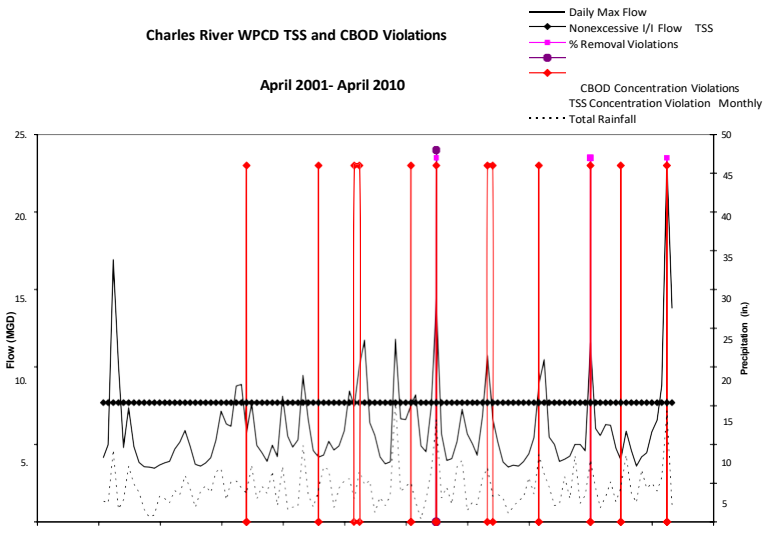
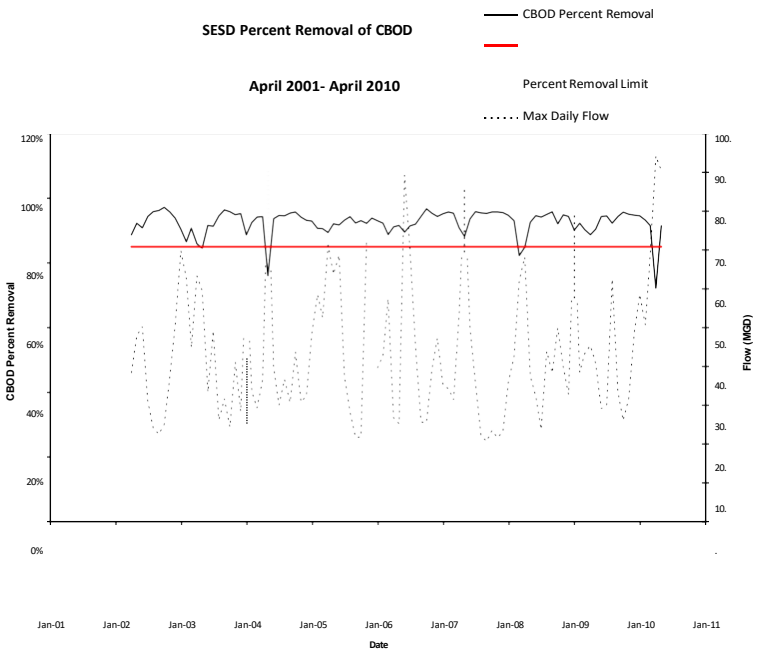


Figure 8 shows SESD's results for removal of CBOD, in percentage, as compared to maximum daily flow. SESD had three permit violations where CBOD removal fell below 85%, all during months with high Maximum Daily Flows.

Figure 8. SESD CBOD Percent Removal



In addition, both of these regional POTWs have experienced SSOs within the municipal satellite collection systems. In the SESD system, Beverly, Danvers, Marblehead and Peabody have reported SSOs between 2006 and 2008, based on data provided by MassDEP. In the CRPCD system, both Franklin and Bellingham have reported SSOs between 2006 and 2009.

Exhibit C

Form of Regional Administrator's waiver of permit application requirements
for municipal satellite collection systems

REGION 1

BOSTON, MA 02109

Re: Waiver of Permit Application and Signatory Requirements for [Municipal Satellite Sewage Collection System]

Dear _____:

Under NPDES regulations, all POTWs must submit permit application information set forth in 40 C.F.R. § 122.21(j) unless otherwise directed. Where the Region has "access to substantially identical information," the Regional Administrator may waive permit application requirements for new and existing POTWs. *Id.* Pursuant to my authority under this regulation, I am waiving NPDES permit application and signatory requirements applicable to the above-named municipal satellite collection systems.

Although EPA has the authority to require municipal satellite collection systems to submit individual permit applications, in this case I find that requiring a single permit application executed by the regional POTW treatment plant owner/operator will deliver "substantially identical information," and will be more efficient, than requiring separate applications from each municipal satellite collection system owner/operator. Municipal satellite collection system owners/operators are expected to consult and coordinate with the regional POTW treatment plant operators to ensure that any information provided to EPA about their respective entities is accurate and complete. In the event that EPA requires additional information, it may use its information collection authority under CWA § 308. 33 U.S.C. § 1318.

This notice reflects my determination based on the specific facts and circumstances in this case. It is not intended to bind the agency in future determinations where a separate permit for municipal satellites would not be duplicative or immaterial.

If you have any questions or would like to discuss this decision, please contact [EPA Permit Contact] at mailto:permit.writer@epa.gov or 617-918-XXXX.

Sincerely,

Regional Administrator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1 (EPA)
WATER DIVISION
5 POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02109

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP)
COMMONWEALTH OF MASSACHUSETTS
100 CAMBRIDGE STREET, SUITE 900
BOSTON, MASSACHUSETTS 02114

EPA PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO WATERS OF THE UNITED STATES UNDER SECTION 402 OF THE CLEAN WATER ACT (CWA), AS AMENDED, AND MASSDEP PUBLIC NOTICE OF EPA REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE CWA.

PUBLIC NOTICE PERIOD: **February 1, 2024 – April 1, 2024**

NAME AND MAILING ADDRESS OF APPLICANT:

City of Fall River Sewer Commission
One Government Center
Fall River, MA 02722

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Fall River Wastewater Treatment Plant
1979 Bay Street
Fall River, MA 02724 and 18 combined sewer overflow (CSO) outfalls

RECEIVING WATER AND CLASSIFICATION:

Mount Hope Bay (MA61-06); Class SB - CSO [Outfall 001 and 7 CSOs]
Taunton River (MA62-04); Class SB - CSO [4 CSOs]
Quequechan River (MA61-05); Class B – Warm Water Fishery and CSO [7 CSOs]

PREPARATION OF THE DRAFT PERMIT AND EPA REQUEST FOR CWA § 401 CERTIFICATION:

EPA is issuing for public notice and comment the Draft NPDES Permit for the Fall River WWTP, which discharges treated domestic and industrial wastewater. Sludge from this facility is transported to Cranston, RI for incineration. The effluent limits and permit conditions have been drafted pursuant to, and assure compliance with, the CWA, including EPA-approved State Surface Water Quality Standards at 314 CMR 4.00. MassDEP cooperated with EPA in the development of the Draft NPDES Permit. MassDEP retains independent authority under State law to publish for public notice and issue a separate Surface Water Discharge Permit for the discharge, not the subject of this notice, under the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53.

In addition, EPA has requested that MassDEP grant or deny certification of this Draft Permit pursuant to Section 401 of the CWA and implementing regulations. Under federal regulations governing the NPDES program at 40 Code of Federal Regulations (CFR) § 124.53(e), state certification shall contain conditions that are necessary to assure compliance with the applicable provisions of CWA sections 208(e), 301, 302, 303, 306, and 307 and with appropriate requirements of State law, including any conditions more stringent than those in the Draft Permit that MassDEP finds necessary to meet these requirements. Furthermore, MassDEP may provide a statement of the extent to which each condition of the Draft Permit can be made less stringent without violating the requirements of State law.

INFORMATION ABOUT THE DRAFT PERMIT:

The Draft Permit and explanatory Fact Sheet may be obtained at no cost at https://www.epa.gov/npdes-permits/massachusetts-draft-individual-npdes-permits or by contacting:

Michael Cobb
U.S. Environmental Protection Agency – Region 1
5 Post Office Square, Suite 100 (06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1369
Email: Cobb.Michael@epa.gov

Any electronically available documents that are part of the administrative record can be requested from the EPA contact above.

PUBLIC COMMENT AND REQUESTS FOR PUBLIC HEARINGS:

All persons, including applicants, who believe any condition of this Draft Permit is inappropriate must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by **April 1, 2024,** which is the close of the public comment period. Comments, including those pertaining to EPA's request for CWA § 401 certification, should be submitted to the EPA contact at the address or email listed above. Upon the close of the public comment period, EPA will make all comments available to MassDEP. All commenters who want MassDEP to consider their comments in the state decision-making processes (i.e., the separate state permit and the CWA § 401 certification) must submit such comments to MassDEP during the state comment period for the state Draft Permit and CWA § 401 certification. For information on submitting such comments to MassDEP, please follow the instructions found in the state public notice at: https://www.mass.gov/service-details/massdep-public-hearings-comment-opportunities.

Any person, prior to the close of the EPA public comment period, may submit a request in writing to EPA for a public hearing on the Draft Permit under 40 CFR § 124.10. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice if the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this Draft Permit, the Regional Administrator will respond to all significant comments and make the responses available to the public.

If comments are submitted in hard copy form, please also email a copy to the EPA contact above.

FINAL PERMIT DECISION:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and notify the applicant and each person who has submitted written comments or requested notice.

KEN MORAFF, DIRECTOR
WATER DIVISION
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY – REGION 1

LEALDON LANGLEY, DIRECTOR
DIVISION OF WATERSHED MGMT
MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION