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"),

Town of Somerset, Massachusetts

is authorized to discharge from the facility located at

Town of Somerset
Water Pollution Control Facility
116 Walker Street
Somerset, MA 02725

to receiving water named

Taunton River

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

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 May 14, 2004.

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** (PFAS Analyte List) and **Part II (**NPDES Part II Standard Conditions, April 2018).

Signed this day of

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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 Taunton River. 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]	4.2 MGD[5]	---	---	Continuous	Recorder
Effluent Flow[5]	Report MGD	---	Report MGD	Continuous	Recorder
BOD_5	30 mg/L 1,051 lb/day	45 mg/L 1,576 lb/day	Report mg/L	1/Week	Composite
BOD_5 Removal	≥ 85 %	---	---	1/Month	Calculation
TSS	30 mg/L 1,051 lb/day	45 mg/L 1,576 lb/day	Report mg/L	1/Week	Composite
TSS Removal	≥ 85 %	---	---	1/Month	Calculation
pH Range[6]	6.5 - 8.5 S.U.			1/Day	Grab
Total Residual Chlorine[7,8]	0.12 mg/L	---	0.21 mg/L	3/Day	Grab
Fecal coliform [7,8]	88 MPN/100 mL	---	260 MPN/100 mL	1/Week	Grab
Enterococci [7,8]	35 cfu/100 mL	---	104 cfu/100 mL	1/Week	Grab
Total Kjeldahl Nitrogen[9] (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
Nitrate + Nitrite[9] (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[9] (May 1 – October 31) (November 1 – April 30)	 Report mg/L Report mg/L	---	 Report mg/L Report mg/L	 1/Month 1/Month	 Calculation Calculation

Effluent Characteristic	Effluent Limitation			Monitoring Requirements[1,2,3]	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type[4]
Rolling Seasonal Average Total Nitrogen[9,10] (May 1 – October 31)	175 lb/day	---	---	1/Month	Calculation
PFAS Analytes[11]	---	---	Report ng/L	1/Quarter	Grab
Adsorbable Organic Fluorine[12]	---	---	Report ng/L	1/Quarter	Grab
Whole Effluent Toxicity (WET) Testing[13,14]					
LC_{50}	---	---	≥ 100 %	1/Quarter	Composite
C-NOEC	---	---	≥ 6 %	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[15]	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[16]	---	---	Report S.U.	1/Quarter	Grab

Temperature[16]	---	---	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[11]	---	---	Report ng/L	1/Quarter	Grab
Adsorbable Organic Fluorine[12]	---	---	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[11]	---	---	Report ng/g	1/Quarter	Grab[17]

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.

6. 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.). For NH: See Part I.G.1 below for a provision to modify the pH range.

7. 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.

8. 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.

9. 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

10. 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 average and the monthly average each month.

    See Part I.G for compliance schedule and optimization conditions related to nitrogen.

11. 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 C. 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.

12. 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.

13. 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*. 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.

14. 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.

15. 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.

16. 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.

17. 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 the outfall listed in Part I.A.1, 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.H 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 shall develop an Adaptation Plan for the Wastewater Treatment System (WWTS) [2] and/or sewer

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.

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

Component 2: Adaptative Measures Assessment.[10] Within 36 months of the

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 a 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.
10 The Permittee 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.

effective date of the permit, the Permittee 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 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 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.* If the Permittee has undertaken assessment(s) that were 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 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 explains how its prior assessments specifically meet the requirements set forth in this permit and how the Permittee will address any permit requirements that have not been addressed in its prior or ongoing assessment(s).

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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.

c. *Adaptation Plan Progress Report*. The Permittee 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 shall complete the following activities for the collection system which it owns:

a. Maintenance Staff

The Permittee 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 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 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

Within 30 months of the effective date of this permit, the Permittee 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. If any items listed below, such as the location of all outfalls, are not fully documented, the Permittee 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) The scale and a north arrow; and

(11) 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 develop and implement a *Sewer System Operation and Maintenance Plan* for the portion of the system it owns.

(1) Within six (6) months of the effective date of the permit, the Permittee shall submit to EPA and the State:

i. A description of the collection system management goals, staffing, information management, and legal authorities;

ii. 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

iii. A schedule for the development and implementation of the full *Sewer System Operation and Maintenance Plan* consistent with the schedule and elements in Parts I.C.2.e.(2)(i) through (2)(viii), below.

(2) The full Sewer System O&M Plan shall be completed, implemented and submitted to EPA and the State within twenty-four (24) months from the effective date of this permit. The Plan shall include:

i. The required submittal from Part I.C.2.e.(1) above, updated to reflect current information;

ii. A preventive maintenance and monitoring program for the collection system;

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

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

v. Identification of known and suspected overflows and back-up locations, including manholes, in table and map formats. 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;

vi. 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;

vii. An educational public outreach program for all aspects of I/I control, particularly private inflow; and

viii. 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 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. The first annual report is due the first March 31 following submittal of the Sewer System O&M Plan required by Part I.C.2.e.(2) of this 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 4.2 MGD design flow (3.36 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.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the Permittee 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

1. The Permittee shall submit to EPA and the State the name of any Industrial User (IU) subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR chapter I, subchapter N (Parts 405-415, 417-430, 432, 447, 449-451, 454, 455, 457-461, 463-469, and 471 as amended) who commences discharge to the facility after the effective date of this permit.

   This reporting requirement also applies to any other IU who is classified as a Significant Industrial User that discharges an average of 25,000 gallons per day or more of process wastewater into the facility (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater that makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the facility; or is designated as such by the Control Authority as defined in 40 CFR § 403.3(f) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 CFR § 403.8(f)(6)).

2. In the event that the Permittee receives originals of reports (baseline monitoring reports, 90-day compliance reports, periodic reports on continued compliance, etc.) from industrial users subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR chapter I, subchapter N (Parts 405-415, 417-430, 432-447, 449-451, 454, 455, 457-461, 463-469, and 471 as amended), or from a Significant Industrial User, the Permittee shall forward the originals of these reports within ninety (90) days of their receipt to EPA, and copy the State.

3. In accordance with 40 CFR § 122.44(j)(1) the Permittee must identify, in terms of character and volume, any SIUs discharging into the POTW or facility 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.

4. 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 (i.e. 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 C. The industrial discharges sampled and the sampling results shall be summarized and submitted to EPA and copy the state as an electronic attachment to the March discharge monitoring report due April 15 of the calendar year following the testing.

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 175 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 total nitrogen permit limit. 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 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.

H. 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 shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. See Part I.H.6. 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 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/.

4. 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;

      (5) Report of new industrial user commencing discharge; and

      (6) Report received from existing industrial user.

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

5. Submittal of Sewer Overflow and Bypass Reports and Notifications

   The Permittee 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/.

6. 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

7. 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

I. STATE 401 CERTIFICATION CONDITIONS

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: 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

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: MA0100676

PUBLIC NOTICE START AND END DATES: December 22, 2023 to February 5, 2024

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Somerset Board of Water & Sewer Commissioners
116 Walker Street
Somerset, MA 02725

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Town of Somerset
Water Pollution Control Facility
116 Walker Street
Somerset, MA 02725

RECEIVING WATER AND CLASSIFICATION:

Taunton River (MA62-04)
Class SB – Shellfishing and CSO

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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 Somerset Water Pollution Control Facility (the Facility) into the Taunton River.

The permit currently in effect was issued and became effective on May 14, 2004, and expired on September 30, 2008 ("the 2004 Permit"). The Permittee filed an application for permit reissuance with EPA dated March 20, 2008, as required by 40 Code of Federal Regulations (CFR) § 122.6. Since the permit application was deemed timely and complete by EPA on May 8, 2008, the Facility's 2004 Permit has been administratively continued pursuant to 40 CFR § 122.6 and § 122.21(d). EPA and the State conducted a site visit on September 26, 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 numeric and narrative water quality criteria. 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 Procedure for the Anti-Degradation Provisions of the State Water Quality Standards," 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) 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. *See also* 33 U.S.C. § 1311(b)(1)(C). In addition, limitations "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, 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 effluent flow 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 EPA's reasonable potential and WQBEL calculations to ensure compliance with WQSs under § 301(b)(1)(C). Should the effluent flow exceed the flow assumed in these calculations, the in-stream dilution would be reduced, and the calculated effluent limitations may not be sufficiently protective (i.e. might not meet WQSs). Further, pollutants that do not have the reasonable potential to exceed WQSs at the lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. In order to ensure that the assumptions underlying 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" wastewater effluent flow assumptions through imposition of permit conditions for effluent flow.[1] In this regard, the effluent flow limitation is a component of WQBELs because the WQBELs are premised on a maximum level flow. The effluent flow limit is also necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs.

[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)*

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.

In addition, as provided in Part II.B.1 of this permit and 40 CFR § 122.41(e), the Permittee is required to properly operate and maintain all facilities and systems of treatment and control. Operating the facilities wastewater treatment systems as designed includes operating within the facility's design wastewater effluent flow.

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(j), 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. 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.

[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).

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 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 Draft 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 Code of Federal Regulations. *See 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 2004 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 treatment plant and Outfall 001 to the Taunton River are shown in Figure 1. The longitude and latitude of the outfall is 41°42'59" N, 71°09'57" W.

The Somerset Water Pollution Control Facility (WPCF) is a secondary treatment plant with a chlorination/dechlorination system for disinfection. The collection system is a separate sanitary system and serves a population of approximately 17,600. Outfall 001 discharges treated wastewater to the Taunton River through a 540-foot outfall pipe.

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

The Facility has a design flow of 4.2 MGD, the annual average daily flow reported in the 2008 application was 2.7 MGD and the median rolling annual average flow for the most recent 5-year review period was 3.5 MGD. The system is a separate system with no combined sewers. Wastewater is comprised of mostly domestic sewage with some commercial sewage and some septage.

The Permittee does not have any major industries contributing industrial wastewater to the WWTP, and thus is not required to have a pretreatment program.

A quantitative description of the discharge in terms of effluent parameters, based on monitoring data submitted by the permittee from August 2018 through July 2023 is provided in Appendix A of this Fact Sheet.

3.1.1 Treatment Process Description

The Somerset WPCF (WPCF) is an activated sludge treatment facility. Raw wastewater is pumped 22 feet to provide gravity flow through the treatment plant. Mechanically cleaned bar screens remove floating and/or large objects that could either clog or damage downstream pumps and equipment. Grit removal tanks remove heavier inorganic solids. Primary settling tanks remove approximately 60% of the suspended solids, grease and oil. Aeration tanks are supplied by a fine bubble diffused aeration system. Final settling tanks separate the activated solids from the liquid for recirculation or sludge handling. Sodium hypochlorite is mixed with plant water and injected into the final settling tank discharge before it enters the chlorine contact tanks for disinfection. Sodium bisulfite is used to dechlorinate before discharging into the Taunton River. A flow diagram of the Treatment Facility is shown in Figure 2.

Waste sludge is pumped to gravity belt thickeners and thickened to about 4% solids. Thickened waste and primary sludge are combined in the blend well and then pumped into a tanker truck and brought to Synagro in Woonsocket, RI, where is it dewatered and incinerated. The mass of sludge shipped for incineration in 2022 was 385 dry metric tons.

3.1.2 Collection System Description

The Somerset WPCF is served by a separate sewer system. 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 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 Somerset WPCF discharges through Outfall 001 into the Taunton River (within Segment MA62-04). This segment is 2.6 square miles from the confluence with the Assonet River at a line

from Sandy Point, Somerset northeasterly to the southwestern tip of Assonet Neck, Berkley to the mouth of Mount Hope Bay just upstream of the Braga Bridge, Somerset/Fall River.

The Taunton River is classified as a Class SB water in the Massachusetts WQSs, 314 Code of Massachusetts Regulations ("CMR") 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 to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas). The waters should have consistently good aesthetic value.

The Taunton River at Segment MA62-04 is listed in the final *Massachusetts Integrated List of Waters for the Clean Water Act 2018-2020 Reporting Cycle*[5] as well as in the *Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle*[6] as a Category 5 "Waters Requiring a TMDL" ("303(d) List"). The listed impairments are for 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.[7] 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 (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
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).

Approximately one-half mile downstream of the Somerset WPCF discharge, the Taunton River flows 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. This segment is also impacted by the Somerset discharge and

[5] *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.
[6] *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).
[7] The *Final Pathogen TMDL for the Taunton River Watershed* (June 2011) is available at: https://attains.epa.gov/attains-public/api/documents/actions/MA_DEP/40307/107198

is listed on the Massachusetts 303(d) List for chlorophyll-a, dissolved oxygen, enterococcus, fecal coliform, fish bioassessments and total nitrogen.

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[8]. 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 2004 Permit, the 7Q10 flow for the Taunton River in the vicinity of the Somerset WPCF was determined to be 142.1 cfs (91.8 MGD) based on previous MassDEP studies available at that time. The dilution factor (DF) was calculated using the design flow (Q_d) and the critical 7Q10 flow in the receiving water upstream of the discharge (Q_s) to be 22.9. EPA notes that the Taunton River is tidal in the vicinity of the Somerset WPCF discharge and a 7Q10 flow, especially based on studies conducted approximately 20 years ago, may not be adequately protective of water quality under current hydrologic conditions. Therefore, in September 2014 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 8 of the report says the following:

> "The minimum dilution found via the boat tracking fluorometers on September 9th was 15:1, equivalent to a 5-point moving average concentration of 153.39 ppb. This level was found less than 100 meters north of the outfall pipe and the minimum dilution found in the WWTP near-field mixing zone (Figure 4)."

Based on this finding, EPA has updated the available dilution ratio to 15:1 (equivalent to a dilution factor of 16). This updated dilution factor (which is lower than 22.9 used in the 2004 Permit) 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.

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

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 August 2018 to July 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 2004 Permit is 4.2 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 4.0 MGD. There have been no exceedances of the flow limit during the review period.

The Draft Permit continues the 4.2 MGD flow limit from the 2004 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

The BOD_5 limits in the 2004 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 2004 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains once per week.

5.1.2.2 BOD_5 Mass Limits

The mass-based BOD_5 limits in the 2004 Permit of 1,051 lb/day (average monthly) and 1,576 lb/day (average weekly) were based on the 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.

The 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 conc. in mg/L and design flow in MGD to lb/day

Average Monthly: 30 mg/L * 4.2 MGD * 8.34 = 1,051 lb/day
Average Weekly: 45 mg/L * 4.2 MGD * 8.34 = 1,576 lb/day

Therefore, the Draft Permit proposes the same mass-based BOD_5 limits as in the 2004 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains once per week.

5.1.3 Total Suspended Solids (TSS)

5.1.3.1 TSS Concentration Limits

The TSS limits in the 2004 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 exceedances of TSS concentration limits.

The Draft Permit proposes the same TSS concentration limits as in the 2004 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains once per week.

5.1.3.2 TSS Mass Limits

The mass-based TSS limits in the 2004 Permit of 1,051 lb/day (average monthly) and 1,576 lb/day (average weekly) were based on the 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 TSS mass limits.

The calculations of maximum allowable loads for average monthly and average weekly TSS 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 conc. in mg/L and design flow in MGD to lb/day

Average Monthly: 30 mg/L * 4.2 MGD * 8.34 = 1,051 lb/day
Average Weekly: 45 mg/L * 4.2 MGD * 8.34 = 1,576 lb/day

Therefore, the Draft Permit proposes the same mass-based TSS limits as in the 2004 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency remains once per week.

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

In accordance with the provisions of 40 CFR § 133.102(a)(3) and (b)(3), the 2004 Permit requires that the 30-day average percent removal for BOD_5 and TSS be not less than 85%. The DMR data during the review period shows that the median BOD_5 and TSS removal percentages are 93% and 95%, respectively. There were two violations of the 85% removal requirement for BOD_5 and one violation for TSS during the review period.

The requirement to achieve 85% BOD_5 and TSS removal has been carried forward into the Draft Permit.

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 29 violations of the minimum pH limit and no exceedances of the maximum pH limit.

The pH requirements in the 2004 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).

5.1.6 Bacteria

The 2004 Permit includes effluent limitations for bacteria using fecal coliform bacteria as the indicator bacteria to protect shellfishing uses for Class SB waters. These limits are 200 organisms per 100 ml (monthly average) and 400 organisms per 100 ml (maximum daily). The DMR data during the review period shows that there have been no violations of the fecal coliform limitations.

The 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 2004 Permit based on the updated water quality standards. The monitoring frequency shall remain the same at once per week.

Given that the maximum fecal coliform results during the review period were 54 organisms per 100 ml (average monthly) and 260 organisms per 100 ml (daily maximum), 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 it not necessary or warranted. EPA notes that the shellfishing uses of certain segments of Mount Hope Bay downstream of this discharge 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 Taunton River Watershed* (June 2011)[9] 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.

5.1.7 Total Residual Chlorine

The Permittee uses chlorine disinfection. The 2004 Permit includes effluent limitations for total residual chlorine (TRC) of 0.2 mg/L (average monthly) and 0.3 mg/L (maximum daily). The DMR data during the review period show that there have been no exceedances of the monthly average TRC limitation and one exceedance of the daily maximum limitation.

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 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 µg/L * 16 = 120 µg/L = 0.12 mg/L (average monthly)

Acute criteria * dilution factor = Acute limit
13 µg/L * 16 = 208 µg/L = 0.21 mg/L (maximum daily)

Therefore, the average monthly limit is revised from 0.2 mg/L to 0.12 mg/L and the maximum daily limit is revised from 0.3 mg/L to 0.21 mg/L. The sampling frequency shall remain as three per day.

[9] Available at page 47 of: https://attains.epa.gov/attains-public/api/documents/actions/MA_DEP/40307/107198

5.1.8 Ammonia

The 2004 Permit does not include ammonia limits, but the Permittee was required to monitor and report effluent ammonia concentrations each month as well as ambient ammonia on a quarterly basis as part of the Whole Effluent Toxicity (WET) testing.

Ambient data, taken upstream of the Somerset outfall in the Taunton River, is presented in Appendix A. The median concentration for the warm weather period (April 1 through October 31) is 0.1 mg/L and for the cold weather period (November 1 through March 31) is 0.05 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 7.4 S.U. and the median salinity is 23 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, there is no reasonable potential to cause or contribute to an excursion of WQS, so the Draft Permit does not propose ammonia limits.

Effluent and ambient monitoring for ammonia will continue to be required in the quarterly WET tests. Based on this analysis, the monthly ammonia requirement is no longer necessary and has not been included in the Draft Permit.

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 monthly average total nitrogen limit of 175 lb/day for the Somerset WPCF, in effect for the months of May through October, in order to address cultural eutrophication in the Taunton River Estuary and Mount Hope Bay. In addition to this May to October numeric limit, the permit requires the Somerset WPCF 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)[10]. 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

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

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 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.

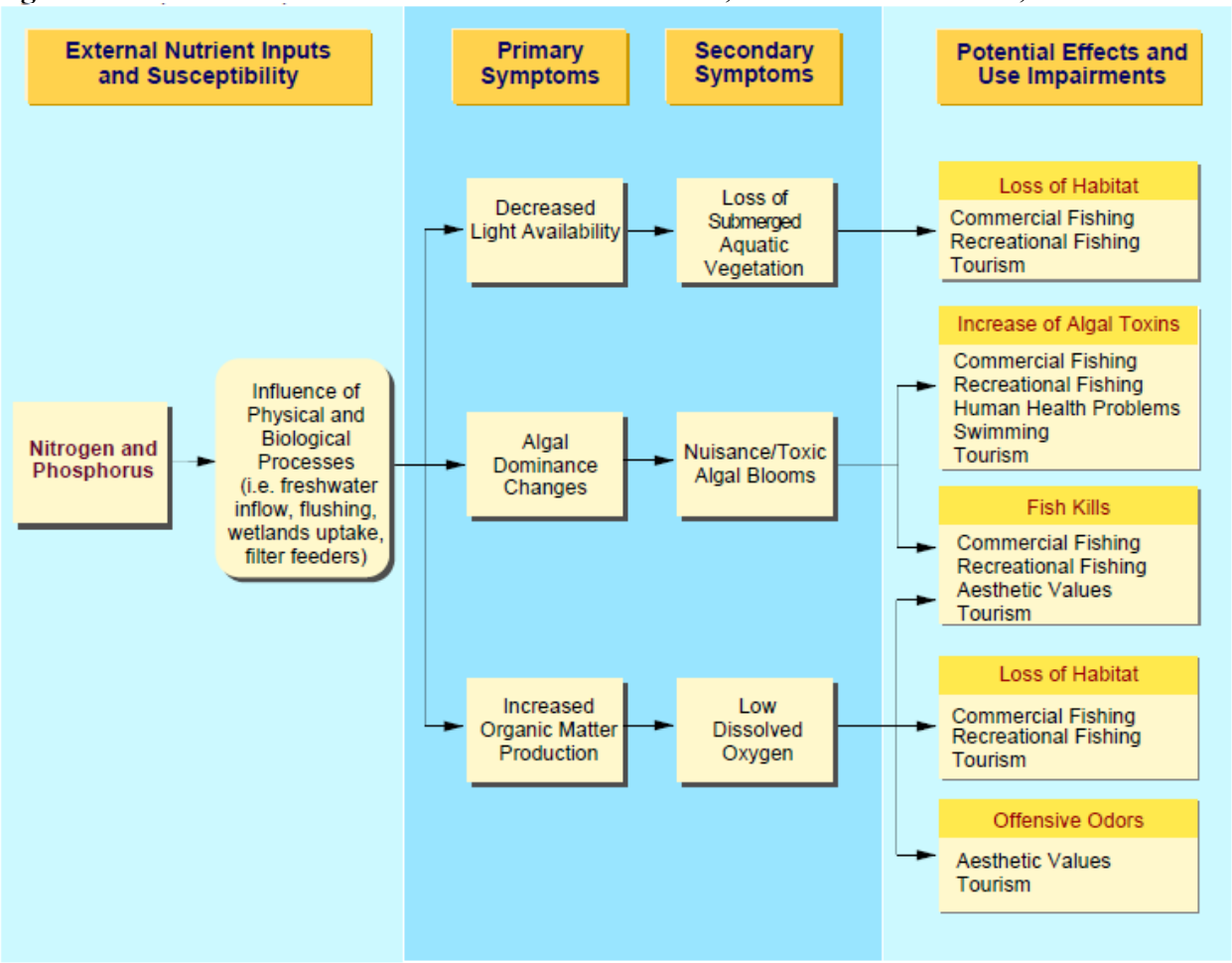
b. Effects of Nutrients on Estuarine Water Quality

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 Taunton River Estuary and the eastern portion of Mount Hope Bay are classified as SB waters, 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 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[11], and narrative criteria for nutrients[12] and aesthetics.[13] 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 Taunton River Estuary and the Massachusetts portions of Mount Hope Bay are expected to achieve water quality standards in Rhode Island as well.

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[11] 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.

[12] § 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.

[13] § 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.

d. Receiving Water Quality Violations

The Taunton River Estuary and Mount Hope Bay have reached their assimilative capacity for nitrogen and are suffering from the adverse water quality impacts of nutrient over-enrichment, including cultural eutrophication. They are, consequently, failing to attain the water quality standards described above. The impacts of excessive nutrients are evident throughout the Taunton River Estuary and 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[14], and ongoing monitoring conducted as part of the larger Narragansett Bay monitoring program[15].

Both Massachusetts[16] and Rhode Island[17] 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.[18] The State of Massachusetts has identified the aquatic life designated use in the lower reaches of the Taunton River Estuary as impaired due to low dissolved oxygen and total nitrogen, as well as Mount Hope Bay as impaired for total nitrogen, low 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
Taunton River	MA62-04	x	x	
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	

MassDEP based the impairments in segment MA62-04 of the Taunton River (into which the Somerset WPCF discharges) primarily on water quality monitoring conducted in June through September of 2018 by the UMass Dartmouth School for Marine Science and Technology (SMAST) and published in 2019 (referred to herein as the "2019 SMAST Report").[19] EPA

[14] 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
[15] Available at: http://www.dem.ri.gov/programs/emergencyresponse/bart/stations.php
[16] Available at: https://www.mass.gov/doc/final-massachusetts-integrated-list-of-waters-for-the-clean-water-act-2022-reporting-cycle/download
[17] Available at: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/iwr22.pdf
[18] There are no technology standards for nitrogen for POTWs.
[19] The results of this monitoring were published on August 2, 2019, in a document entitled *Technical Memorandum*

highlights that the average TN concentration found in the upper portion of segment MA62-04 was 0.672 mg/L and the lower potion in the vicinity of Somerset's discharge was 0.51 mg/L. As described in the Critical Indicators Report above, this level of nitrogen indicates moderate to significant impairment.

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 Somerset discharge (known as site MHB-19) as the target location to assess loads from the 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 Somerset discharge impacted the Taunton River, so EPA made a conservative assumption that 100% of the Somerset discharge reached the MHB-19 location and needed to be reduced significantly to meet the nitrogen target at that location.

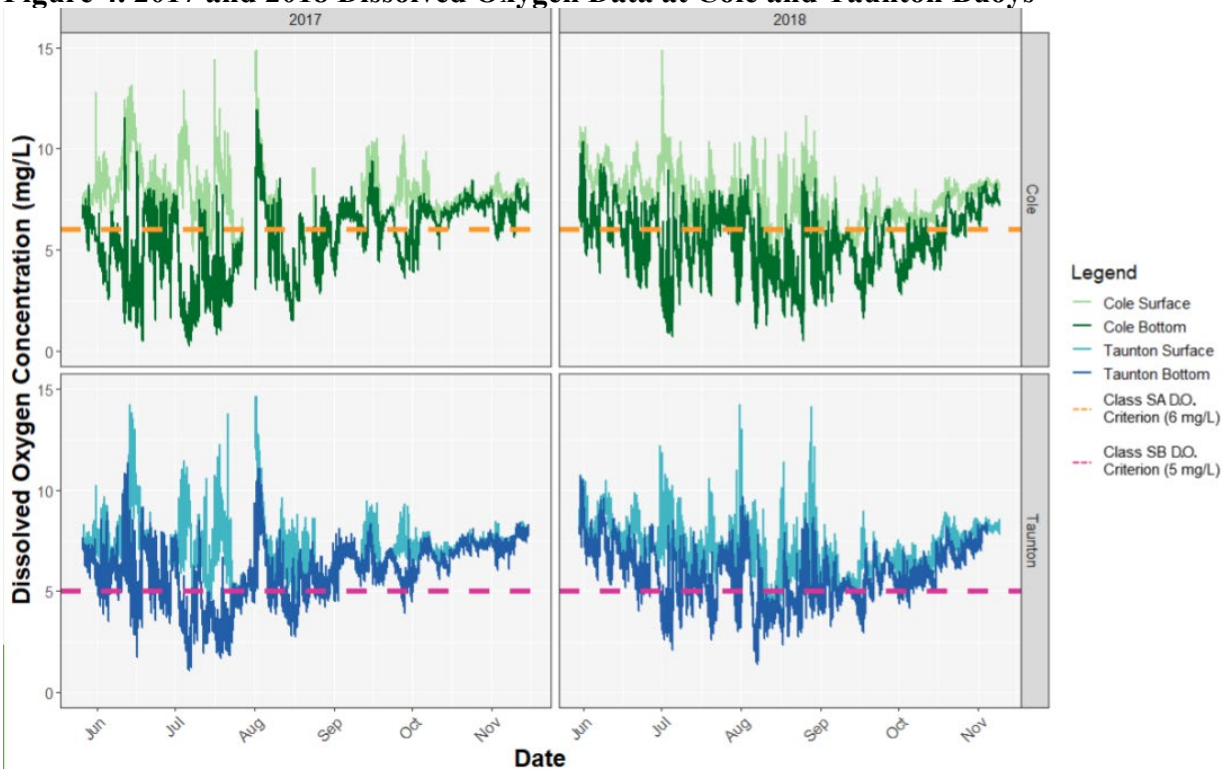
In this permit reissuance for Somerset, however, EPA has incorporated the findings of a dye study conducted in 2014 and published in 2017 for the Somerset WPCF discharge. The complete dye study is attached to this Fact Sheet as Appendix C. As shown in Figure 3 of the dye study, the Somerset discharge is significantly diluted (at least 4,610:1) even by the time it reaches MHB-1, which is approximately 1 mile upstream of the discharge. Based on this finding, EPA has determined that the Somerset 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. EPA notes that the prior analysis is still valid with respect to all other WWTFs upstream of Somerset in the watershed, except that the entire load from Somerset should be removed from that analysis. Given that the load reductions from the other WWTFs in the watershed are still expected to restore water quality in the Taunton River (especially without any contribution from Somerset at MHB-19) once all their limits are achieved, EPA has focused this analysis for the Somerset discharge on the impacts downstream in Mount Hope Bay because EPA considers Mount Hope Bay (Segment MA61-06) to be the most sensitive location impacted by the Somerset discharge of nitrogen.

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)

– *Nutrient Water Quality Monitoring in the Taunton River June-September 2018* and in an *Addendum* to this report dated July 31, 2019. In this Fact Sheet, these two documents are referred to collectively as the "2019 SMAST Report." These results were used by MassDEP as the primary basis for the 2018/2020 TN impairment listing for segment MA62-04 and carried forward in the 2022 TN impairment listing of segment MA62-04.

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[20,21] 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 quality impacts are in Mount Hope Bay, which is downstream of the Somerset discharge, and the total nitrogen load from the Taunton River (including Somerset as a significant portion of that load) contributes to these impairments.

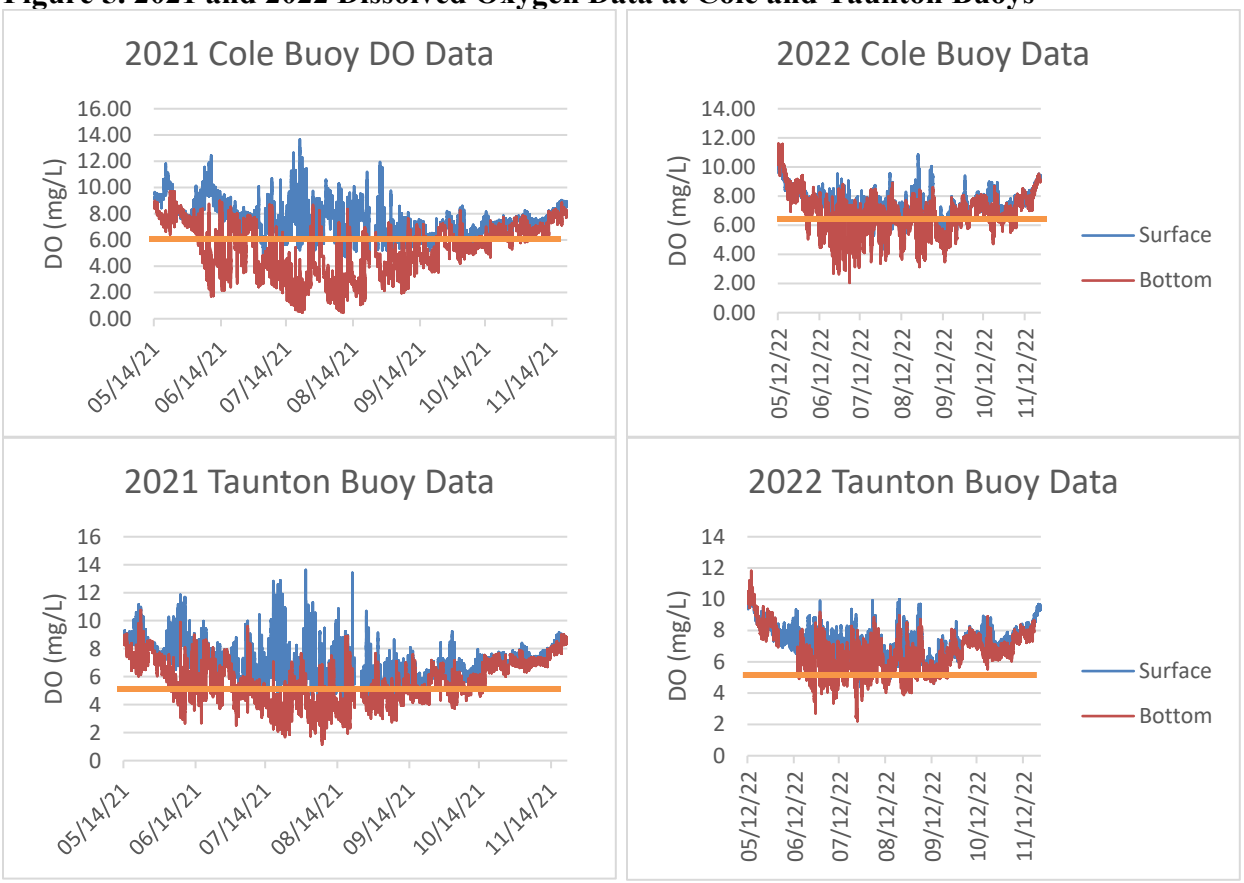
Figure 4. 2017 and 2018 Dissolved Oxygen Data at Cole and Taunton Buoys



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.

[20] https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data
[21] https://www.mass.gov/doc/technical-memorandum-cn-5300-mount-hope-bay-buoy-data-report/download

Figure 5. 2021 and 2022 Dissolved Oxygen Data at Cole and Taunton Buoys



As shown, Figure 5 above confirms (albeit based on draft data[22]) 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)[23] 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.

[22] 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.

[23] 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

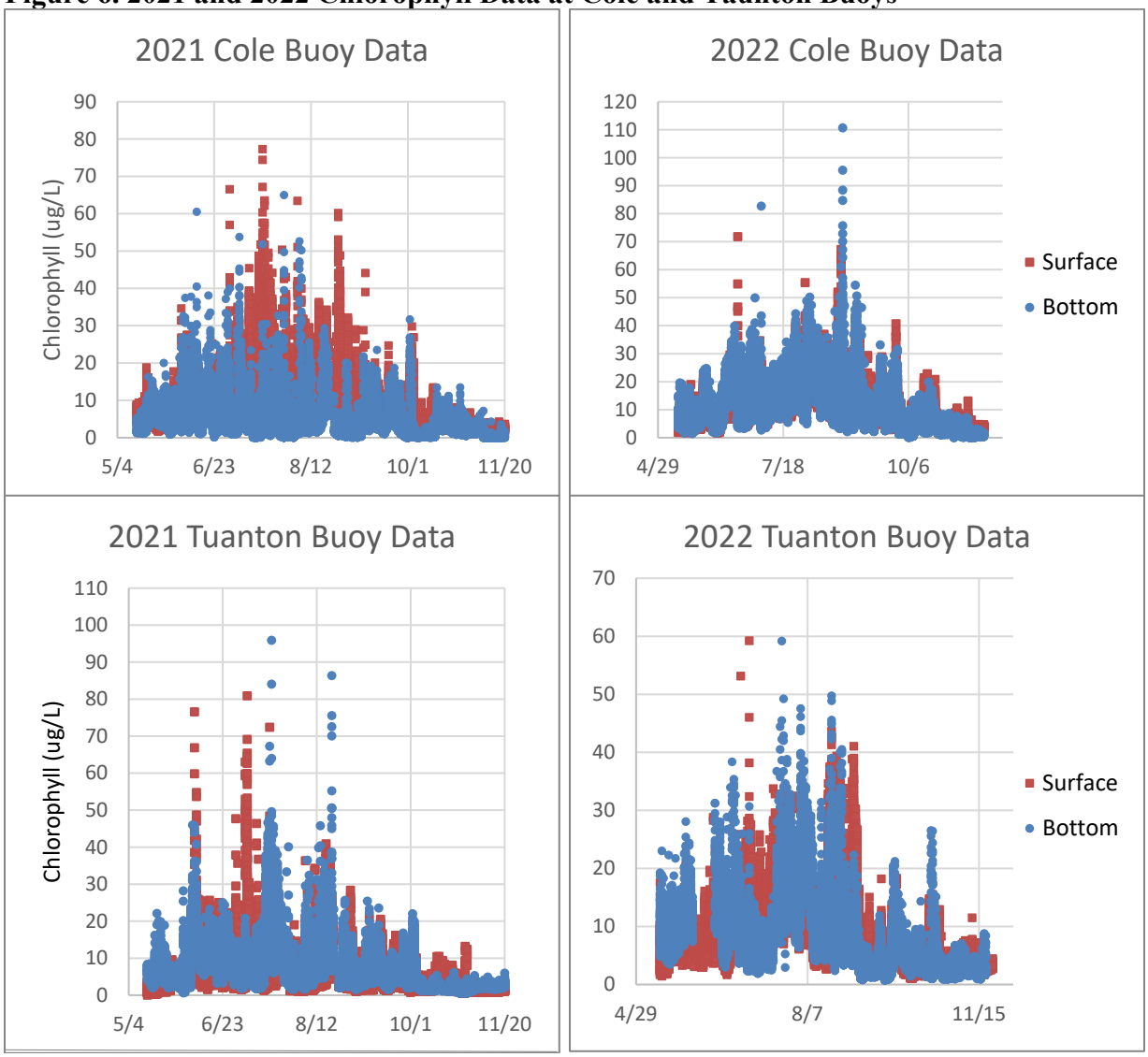
	2021		2022	
	Bottom	Surface	Bottom	Surface
Cole Buoy Measurements Below 6 mg/L (7-day average)	73%	2%	30%	4%
Cole Buoy Measurements Below 5 mg/L (Instantaneous Min)	45%	0.1%	10%	0.1%
Taunton Buoy Measurements Below 5 mg/L (7-day average)	45%	0%	6%	0%
Taunton Buoy Measurements Below 4 mg/L (Instantaneous 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.[24] 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.

[24] 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[25]) 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)[26]. 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.

[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 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.

[26] 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 the Taunton River Estuary and Mount Hope Bay remain 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.[27] 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.[28]

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.

Table 5 below shows the WWTFs, the receiving streams, their nitrogen discharges, attenuation factors and the delivered loads to Mount Hope Bay.

[27] 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.

[28] 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 stream	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 Somerset WPCF contributes a significant load of nitrogen to Mount Hope Bay. EPA notes that the Somerset WPCF is the fourth largest WWTF (based on design flow) and the only major WWTF, other than Fall River, that has not yet received a TN limit. Based on Table 6, the Somerset WPCF load of 355 lb/day is approximately 5% of the total nitrogen watershed load delivered to Mount Hope Bay. Given the size of the nitrogen load from the Somerset WPCF and the ongoing nutrient-related impairments in the Taunton River Estuary and 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 C.F.R. §§ 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 the Taunton River and Mount Hope Bay as impaired for total nitrogen using a threshold concentration of 0.5 mg/L in the Consolidated Assessment Listing Methodology (CALM).[29] 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 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

[29] See page 39 of CALM available online at: https://www.mass.gov/doc/2018-consolidated-assessment-and-listing-methodology-guidance/download.

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.[30] 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 Somerset WPCF. Finally, EPA anticipates another significant load reduction from the Fall River WWTF when 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 175 lb/day (based on 5 mg/L and the design flow of 4.2 MGD) applicable from May to October[31]. 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).[32] Further, EPA notes that this limit is equitable with all other WWTFs in the watershed that have a design flow between 1 MGD and 5 MGD, given that they all have already received a limit based on 5 mg/L. EPA acknowledges that this is limit is not based on a precise calculation of necessary reductions throughout the watershed but is intended to significantly reduce nitrogen loads to Mount Hope Bay, representing approximately 51% reduction from Somerset's current load of 355 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-

[30] 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.
[31] 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.
[32] 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 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.

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 Somerset WPCF does not cause or contribute to a violation of Rhode Island water quality standards in Mount Hope Bay.[33] While other loads to Mount Hope Bay (particularly the Fall River WWTP) will need to be addressed as well, the reduction in nitrogen loadings from Somerset required by this permit will ensure that this discharge does not cause or contribute to nitrogen-related impairments in the Taunton River or in Mount Hope Bay.

iii. Compliance Schedule

Finally, EPA notes that the Somerset WPCF 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.

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.

[33] EPA considers the impact to the Rhode Island portion of Mount Hope Bay to be minimal given that the Somerset discharge is significantly diluted (at least 4,610:1) by the time it reaches the state line. See Figure 3 of Appendix C for relevant dye study results.

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.[34] 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.

Effluent and receiving water data 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

[34] 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.

equation presented in Appendix B to project the concentration downstream of the discharge and, if applicable, to determine the limit required in the permit.

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, copper, lead, nickel, or zinc, so the Draft Permit does not propose any new limits for these metals.

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.

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[35], 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 below 20 require acute and

[35] *Massachusetts Water Quality Standards Implementation Policy for the Control of Toxic Pollutants in Surface Waters*. February 23, 1990.

chronic toxicity testing four times per year for two species with an LC_{50} limit of greater than or equal to 100% and a C-NOEC limit of 1/DF x 100%.

The acute WET limit in the 2004 Permit is LC_{50} greater than or equal to 100%, using the Inland Silverside (*Menidia beryllina*) as the test species. Under a previous permit the Facility received a reduction from the two monitoring species testing requirement to only the *menidia*. 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 16, and in accordance with EPA national and regional policy and 40 CFR § 122.44(d), the Draft Permit continues the acute effluent limit from the 2004 Permit (including the test organism and the testing frequency) and proposes a new chronic (C-NOEC) limit of 6% (*i.e.*, 1/16 x 100%) with the same test organism and frequency. 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.

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.[36] 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.

Background Information

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)

[36] 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

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.

Since PFAS chemicals are persistent in the environment and may lead to adverse human health and environmental effects, and consistent with recent EPA guidance,[37] 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

[37] 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

> 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 C 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 NHDES has currently adopted MCLs for only 4 of 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 36 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*[38] 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*[39].

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. EPA issued a memo on December 6, 2022 related to *Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs*. That memo indicates that "The draft Adsorbable Organic Fluorine CWA wastewater method 1621 can be used in conjunction with draft method 1633, if appropriate." Given that AOF monitoring will screen for a broader range of organofluorines, such as PFAS and other emerging contaminants, EPA considers it appropriate to monitoring for AOF (Method 1621) as well as PFAS (Method 1633) to ensure the discharge is fully characterized with respect to these pollutants in the next permit reissuance. The Permittee shall monitor Adsorbable Organic Fluorine using Method 1621 once per quarter concurrently with PFAS monitoring. This requirement also takes effect the first full calendar quarter following six months after the effective date of the permit.

[38] https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf
[39] https://www.epa.gov/system/files/documents/2022-04/npdes_pfas-memo.pdf

All monitoring results may be used by EPA in the next permit reissuance to ensure the discharge continues to protect all designated uses of the receiving water.

5.2 Industrial Users and Pretreatment

The Permittee is not required to develop an industrial pretreatment program. There are no significant industrial users in the collection system. However, Part I.E of the Draft Permit includes conditions that are necessary to allow EPA and MassDEP to ensure that pollutants discharged to a facility by an industrial user will not pass through the facility and cause violations of water quality standards and/or sludge use and disposal difficulties, or cause interference with the operation of the treatment works. The Draft Permit requires Permittees to notify EPA and MassDEP whenever a process wastewater discharge to a facility from an industrial user within a primary industry category is planned or if there is any substantial change in the volume or character of pollutants being discharged into the facility by a source that was discharging at the time of the effective date of permit coverage. The Draft Permit requires Permittees to report to EPA and MassDEP the name(s) of all industrial users subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR Chapter I, Subchapter N (Parts 405-415, 417-430, 432-447, 454, 455, 457-461, 463-469, and 471 as amended) who commence discharge to the facility after the effective date of permit coverage, and to forward any original pretreatment reports submitted by industrial users within ninety (90) days of their receipt to EPA and copy MassDEP in accordance with Part I.H.4 of the Draft Permit.

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.

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 to develop Adaptation Plans 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.

Some of the requirements in the Draft Permit are not included in the 2004 Permit, including collection system mapping. EPA has determined that this additional requirement is necessary to ensure the proper operation and maintenance of the collection system and has included schedules for completing these requirements in the Draft Permit.

5.6 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 Somerset WPCF's discharges of pollutants. The Draft Permit is intended to replace the 2004 Permit in governing the Facility. As the federal agency charged with authorizing the discharge from this 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 the Taunton River.

One terrestrial listed threatened species, the northern long-eared bat (*Myotis septentrionalis*) was identified as potentially occurring in the action area of the Somerset WPCF discharge. [40]

According to the USFWS, the threatened 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 confirm by letter that, based on the specific project information submitted, the project would have "no effect" on the northern long-eared bat[41]. This concluded EPA's consultation responsibilities for the Somerset WPCF 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.

[40] See §7 resources for USFWS at https://ecos.fws.gov/ipac/.
[41] USFWS Project Code: 2024-0006892, October 19, 2023

NOAA Anadromous and Marine Species
For protected species under the jurisdiction of NOAA Fisheries, the following life stages of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) are likely present in the action area: adult (migrating and foraging) and subadult (migrating and foraging).

Because this 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. On the basis of the evaluation, EPA's preliminary determination is that this action may affect, but is not likely to adversely affect, the life stages of Atlantic sturgeon 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,[42] EPA has determined that the receiving water in the vicinity of the discharge is designated as EFH for the species shown in Table 7.

[42] https://www.habitat.noaa.gov/apps/efhmapper/

Table 7. EFH Designated Species

Species/Management Unit	Lifestage(s) Found at Location
Atlantic Butterfish	Adults, Eggs, Larvae
Atlantic Cod	Eggs, Juvenile, Larvae
Atlantic Herring	Eggs, 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
Scup	Adult, Eggs, Juvenile, Larvae
Silver Hake	Eggs/Larvae
Summer Flounder	Adult, Juvenile, Larvae
Windowpane Flounder	Adult, Eggs, Juvenile, Larvae
Winter Flounder	Eggs, Juvenile, Larvae/Adult
Winter Skate	Adult, Juvenile
Habitat Area of Particular Concern	
Summer Flounder submerged aquatic vegetation	

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 regulation at 40 CFR § 122.49(d) states "The Coastal Zone Management Act, 16 U.S.C. 1451 et seq. section 307(c) of the Act and implementing regulations (15 CFR part 930) prohibit EPA from issuing a permit for an activity affecting land or water in 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.

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.

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.

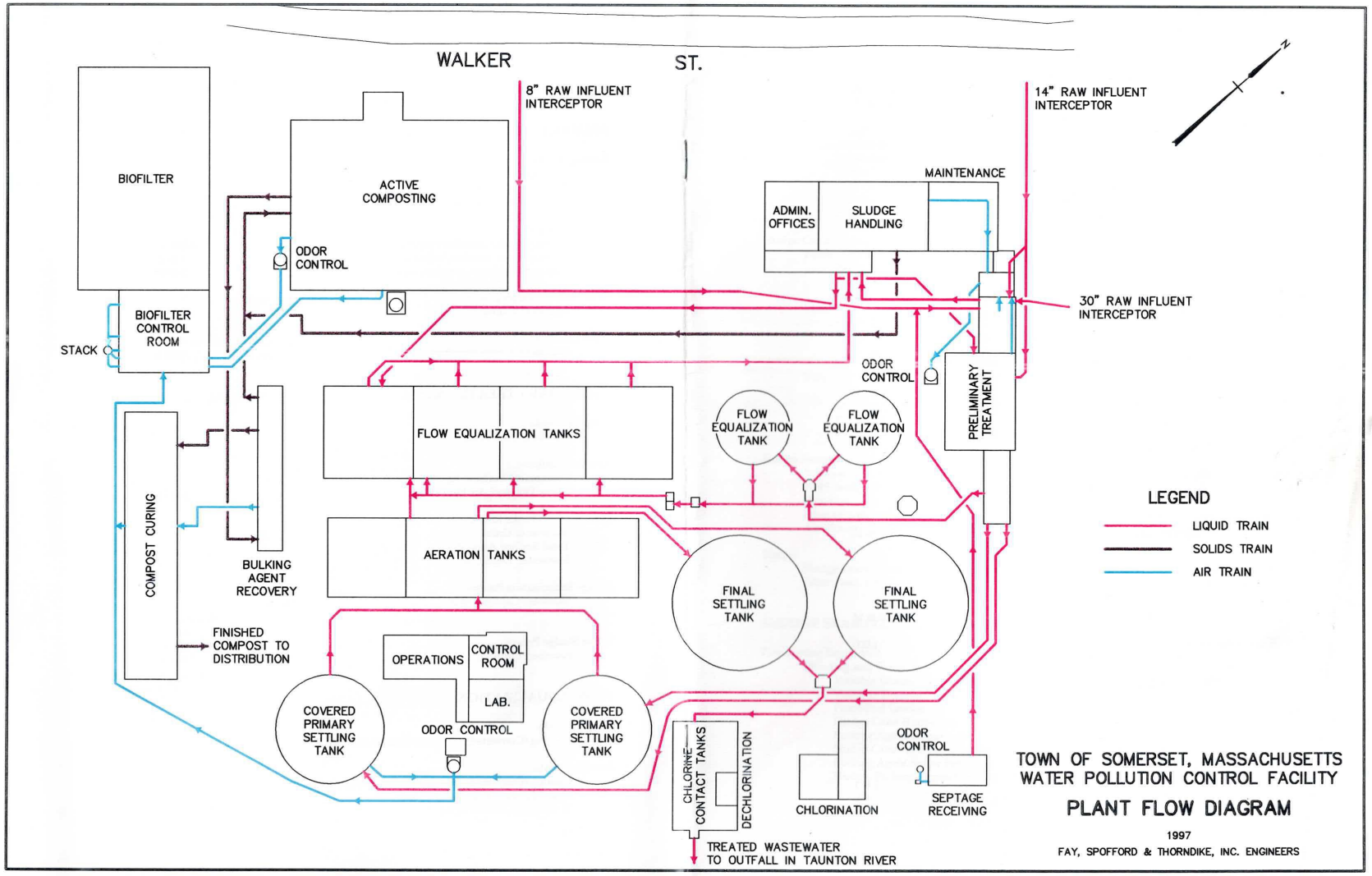
December 2023
Date

Ken Moraff, Director
Water Division
U.S. Environmental Protection Agency

Figure 1: Location of the Somerset WPCF

Image obtained from maps.google.com

Figure 2: Flow diagram



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	Monthly Ave Min
Units	MGD	MGD	lb/d	mg/L	lb/d	mg/L	mg/L	%
Effluent Limit	4.2	Report	1051	30	1576	45	Report	85
Minimum	1.8	1.95	133	5.6	186.3	6	7	83
Maximum	4	14.9	569	25.3	889	43	74.4	97.2
Median	3.45	4.45	280.5	9.75	400.25	13.6	17.9	92.6
No. of Violations	0	N/A	0	0	0	0	N/A	2
8/31/2018	3.5	2.6	226	12.1	318	16.5	19.6	92.7
9/30/2018	3.5	2.9	300	15.6	525	25.5	49	90.2
10/31/2018	3.6	4.22	212	7.5	330	10.4	14.4	93.4
11/30/2018	`	8.3	459	9.3	655	12.4	17.8	84.7
12/31/2018	3.9	6	278	7.9	348	9	11.7	90.7
1/31/2019	4	6.8	515	12	889	19.3	24	88.6
2/28/2019	3.9	5.3	314	8.1	397	9.8	12.3	92.7
3/31/2019	3.7	5.9	364	8.9	538	13.8	19.1	88.1
4/30/2019	3.8	6.6	357	9.3	478	11.6	20.9	90.6
5/31/2019	3.7	4.8	338	9.6	757	20	20	91.9
6/30/2019	3.9	4.3	380	12.5	524	15.8	16.6	90.3
7/31/2019	4	3.6	352	13.8	576	19.7	26	91.2
8/31/2019	4	2.9	319	15.8	402	18.9	20.9	90.8
9/30/2019	4	2.2	169	10.1	226	13.7	17.5	95.3
10/31/2019	3.9	2.7	462	25.3	795	43	74.4	85.9
11/30/2019	3.6	3.5	278	11.7	558	25.5	16.8	90.7
12/31/2019	3.7	8.5	466	10.3	547	13.5	14.5	86
1/31/2020	3.6	5.3	277	8.7	516	11.6	16.2	90.9
2/29/2020	3.5	4.2	285	9.5	326	10.2	12.3	91.1
3/31/2020	3.4	5	252	8.2	400	9.7	13.4	93.4
4/30/2020	3.4	5.3	419	11	605	15.2	19.5	88.8
5/31/2020	3.4	5.8	167	5.8	198	6	7.5	95.9
6/30/2020	3.3	2.9	267	12.3	400.5	17.7	27.3	93.4
7/31/2020	3.2	2.61	148	8.5	212	11.5	13.5	96.3
8/31/2020	3.2	2.06	217	13.9	261	19.5	27	94
9/30/2020	3.2	1.95	133	9	203.5	13.7	14.4	97
10/31/2020	1.8	2.3	179	11.5	261.3	15.8	21	96
11/30/2020	3.1	4.25	248	11.5	440.5	17.6	20.2	94.2
12/31/2020	3.1	8.31	278	7.1	400	11.4	12	93.4
1/31/2021	3.1	5.1	220	7	340	8.7	13.6	94.8
2/28/2021	3.2	4.8	224	6.5	263.3	7.7	9.5	95.1

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Parameter	Flow	Flow	BOD5	BOD5	BOD5	BOD5	BOD5	BOD5
	Annual Rolling Ave	Daily Max	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Daily Max	Monthly Ave Min
Units	MGD	MGD	lb/d	mg/L	lb/d	mg/L	mg/L	%
Effluent Limit	4.2	Report	1051	30	1576	45	Report	85
3/31/2021	3.2	4.7	178	5.6	200.3	6.6	7	95.4
4/30/2021	3.1	4.85	197	6.2	215.7	6.3	12.9	95.5
5/31/2021	3.1	3.9	199	6.7	262	8.3	8.5	96.1
6/30/2021	3.1	4	175	6.9	246	8.4	11	97.2
7/31/2021	3.3	5.1	183	6.4	236	9.6	12	96.2
8/31/2021	3.4	5.3	352	11.4	369	12.2	18	90.8
9/30/2021	3.7	14.9	305	9	512	18	13.6	91.3
10/31/2021	3.7	5.1	450	15.6	504.5	18.6	27.2	88.7
11/30/2021	3.8	5.5	569	18	699	21.8	27.5	83
12/31/2021	3.9	3.1	305	13.4	437	20	20	91
1/31/2022	3.7	4	405	14.5	513.7	20.8	23	87.8
2/28/2022	3.8	7.5	374	9	550.5	9.7	11.1	89.8
3/31/2022	3.8	5.4	444	12.5	527.7	15.2	20.8	85.2
4/30/2022	3.8	4.5	283	9	425	12.5	12	92.6
5/31/2022	3.7	3.3	331	14.6	423	15.5	26	92.6
6/30/2022	3.7	2.5	221	11.9	321.5	17.4	24	94.6
7/31/2022	3.6	2.3	166.6	9.9	203.5	11.2	14.3	96.1
8/31/2022	3.5	2.1	134.5	8.6	263	15.5	20	96.8
9/30/2022	3.3	2.5	164.9	9.7	186.3	11.2	20	95.8
10/31/2022	3.1	4	361.3	15	506	21.9	32	90.5
11/30/2022	3.1	3.2	266	11.2	269.7	11.3	18.1	93
12/31/2022	3.1	7.1	504.7	14.2	661	19.3	24	87.2
1/31/2023	3.3	9.2	479	10.1	756.7	12.1	15.4	87.5
2/28/2023	3.2	5.3	215.6	6.9	390	8.6	8.3	94.4
3/31/2023	3.2	6.9	389.4	9.8	734.7	13.3	20	89.2
4/30/2023	3.1	4.4	306.7	12.7	371	16.4	22.4	91.1
5/31/2023	3.2	4.4	301.8	9.7	585.7	16	19.1	92.8
6/30/2023	3.2	2.9	194.7	9.4	244.7	12.9	14	94.8
7/31/2023	3.4	7.8	251.3	6.9	363	9.5	10	93.5

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Parameter	TSS	TSS	TSS	TSS	TSS	TSS	pH	pH
	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Daily Max	Monthly Ave Min	Minimum	Maximum
Units	lb/d	mg/L	lb/d	mg/L	mg/L	%	SU	SU
Effluent Limit	1051	30	1576	45	Report	85	6.5	8.5
Minimum	55	2.3	120	3.5	4	81	5.8	6.8
Maximum	828	25.8	1256	43.5	63	98.4	6.9	8.4
Median	251.5	8.6	389.5	13	17.5	94.7	6.5	7.3
No. of Violations	0	0	0	0	N/A	1	29	0
8/31/2018	154	8.1	227	12	12	96	6.1	7
9/30/2018	55	3	120	6.5	10	98.4	6.4	7
10/31/2018	97	3.5	230	9	9	96.8	6.4	7.1
11/30/2018	149	3.1	202	4	4	94.7	6.5	6.9
12/31/2018	243	7	380	12	15	92.3	6.5	7.4
1/31/2019	250	5.7	498	11	18	94.7	6.5	7.4
2/28/2019	127	3.1	236	5.5	10	96.9	6.4	7.1
3/31/2019	94	2.3	165	3.5	4	97.3	6.4	7
4/30/2019	150	3.8	325	7.5	14	95.7	6.2	7
5/31/2019	90	2.7	164	4.5	8	97.1	5.9	6.8
6/30/2019	238	8.3	418	13.5	14	93.7	5.9	6.9
7/31/2019	401	16.6	506	19.5	23	91.1	6.2	7
8/31/2019	311	15.6	432	21.5	26	91.8	6.4	7
9/30/2019	170	10.4	249	15.5	22	95.4	6.1	7.3
10/31/2019	421	23.8	718	43.5	63	88.4	6.4	7.3
11/30/2019	287	12.6	387	18.5	21	91.3	6.5	7.6
12/31/2019	271	6.2	501	12	13	91.8	6	7.2
1/31/2020	270	8	471	11	15	92	5.9	6.8
2/29/2020	253	8.3	557	17	19	92	6.5	7.1
3/31/2020	261	8.7	427	15	18	93.2	6.5	7.4
4/30/2020	285	7.3	396	10	11	93.1	5.8	7.1
5/31/2020	179	5.4	309.5	7.5	13	96.3	6.6	7.4
6/30/2020	243	11.1	392	16.5	28	95.2	6.5	7.2
7/31/2020	185	10.5	207.5	12.5	19	96.6	6.6	7.4
8/31/2020	260	16.3	422	26.5	30	94.9	6.6	7.4
9/30/2020	240	16.3	312	21	29	95.5	6.5	7.5
10/31/2020	327	21.4	496	32.5	36	94.2	6.4	7.5
11/30/2020	422	18.1	451.5	21	28	91.6	6.6	7.2
12/31/2020	539	12.6	773	22	24	89	6.4	7
1/31/2021	308	9.8	745	15	16	92.9	6.5	7.3
2/28/2021	277	8.5	335	11	16	94.5	6.5	7.3

Outfall 001

Parameter	TSS	TSS	TSS	TSS	TSS	TSS	pH	pH
	Monthly Ave	Monthly Ave	Weekly Ave	Weekly Ave	Daily Max	Monthly Ave Min	Minimum	Maximum
Units	lb/d	mg/L	lb/d	mg/L	mg/L	%	SU	SU
Effluent Limit	1051	30	1576	45	Report	85	6.5	8.5
3/31/2021	218	7	366.5	11	17	95.1	6.1	7.2
4/30/2021	143	4.8	362	12.5	18	97	6.4	7.6
5/31/2021	215	7.6	301.5	11.5	13	96	6.2	7
6/30/2021	281	11.2	384	16.5	18	97.5	6.5	7.6
7/31/2021	288	10	441	15	18	94.8	6.5	7.1
8/31/2021	147	4.9	192.5	7.5	8	97.4	6.2	7.2
9/30/2021	316	7.8	745.5	14.5	21	93.9	6.5	7.3
10/31/2021	487	17.4	745	27.8	41.5	90.2	6.5	7.2
11/30/2021	828	25.8	1256	40.5	58	81	6.7	7.4
12/31/2021	475	20.3	536	24	27	90.3	6.6	7.2
1/31/2022	586	21.2	777	32	34	85.9	6.5	7.4
2/28/2022	402	9.5	472	13	12	89.9	6.5	7.7
3/31/2022	213	5.9	375	9	10	94	6.5	8.4
4/30/2022	91	2.9	260	7.5	6	97.5	6.4	7.4
5/31/2022	191	8.4	227	10	14	95.9	6.3	7.3
6/30/2022	235	12.7	324.5	18	20	95.4	6.6	7.2
7/31/2022	170.6	10.1	231.5	13	15	97.4	6.3	7.4
8/31/2022	145.2	9.7	199	12	17	97.4	6	7.1
9/30/2022	139	8.1	167.5	10	12	97.9	6	7.4
10/31/2022	271.2	11	526	18	24	96.1	6.5	7.3
11/30/2022	425	17.9	489.5	20.5	31	91.5	6.8	7.5
12/31/2022	626.7	17	740.5	21.5	24	85.1	6.5	7.3
1/31/2023	314.1	7	465.5	12	14	92	6.3	7.3
2/28/2023	149.1	4.6	303.5	6.5	9	96.2	6.9	7.3
3/31/2023	316.8	8.3	616	14	16	92.6	6.7	7.2
4/30/2023	173.5	6.6	332	12.5	20	96.6	6.8	7.4
5/31/2023	391.5	12.1	1086.5	29.5	35	93.6	6.7	7.3
6/30/2023	203.5	9.9	279	13.5	14	95.8	6.3	7.2
7/31/2023	334	8.9	585	12.5	18	93.1	6.2	6.9

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Parameter	Fecal Coliform	Fecal Coliform	Fecal Coliform	TRC	TRC	Ammonia	TKN
	Monthly Geometric Mean	Daily Max	AVERAGE	Monthly Ave	Daily Max	Daily Max	Daily Max
Units	#/100mL	#/100mL	#/100mL	mg/L	mg/L	mg/L	mg/L
Effluent Limit	200	400	Report	0.2	0.3	Report	Report
Minimum	1	0	1	0.02	0.04	0.2	0.1
Maximum	54	260	260	0.07	0.32	25.5	21
Median	5	15	14.5	0.03	0.165	4.55	7
No. of Violations	0	0	N/A	0	1	N/A	N/A
8/31/2018	12	167	167	0.03	0.23	0.8	1.6
9/30/2018	2	7	7	0.04	0.26	18.6	17.8
10/31/2018	7	13	13	0.07	0.26	1.2	1.5
11/30/2018	2	4	4	0.04	0.24	1	1.7
12/31/2018	2	3	3	0.02	0.1	1.4	1.6
1/31/2019	2	5	5	0.05	0.17	3.2	4
2/28/2019	1	2	2	0.02	0.09	3.1	3.1
3/31/2019	3	5	5	0.02	0.08	2.8	3
4/30/2019	10	21	21	0.02	0.04	0.8	2
5/31/2019	4	15	15	0.03	0.11	0.8	1.3
6/30/2019	3	10	10	0.02	0.08	0.6	1.4
7/31/2019	9	65	65	0.03	0.19	2.3	1.3
8/31/2019	6	14	14	0.04	0.19	17.3	10.6
9/30/2019	5	36	36	0.05	0.18	9.1	11.6
10/31/2019	34	80	80	0.04	0.25	5.8	8.2
11/30/2019	5	10	10	0.03	0.13	12.5	13.7
12/31/2019	2	6	6	0.02	0.15	6.6	7.1
1/31/2020	4	14	14	0.02	0.05	0.9	2.3
2/29/2020	6	124	124	0.02	0.05	9.3	6.5
3/31/2020	1	3	3	0.03	0.2	11.9	14.1
4/30/2020	3	24	24	0.03	0.08	2.2	2.5
5/31/2020	1	1	1	0.03	0.16	2.7	3
6/30/2020	2	4	4	0.06	0.24	4.6	8.4
7/31/2020	7	15	15	0.05	**0.32**	1.9	21
8/31/2020	37	165	165	0.04	0.2	25.5	20.7
9/30/2020	17	208	208	0.03	0.09	3.8	11.3
10/31/2020	13	57	13	0.04	0.12	4.8	14.5
11/30/2020	4	29	29	0.03	0.09	4.5	10.9
12/31/2020	8	92	92	0.03	0.1	3.7	9.2
1/31/2021	2	11	11	0.02	0.06	0.7	0.1
2/28/2021	1	0	1	0.02	0.15	3.5	6.1

Outfall 001

Parameter	Fecal Coliform	Fecal Coliform	Fecal Coliform	TRC	TRC	Ammonia	TKN
	Monthly Geometric Mean	Daily Max	AVERAGE	Monthly Ave	Daily Max	Daily Max	Daily Max
Units	#/100mL	#/100mL	#/100mL	mg/L	mg/L	mg/L	mg/L
Effluent Limit	200	400	Report	0.2	0.3	Report	Report
3/31/2021	2	5	5	0.06	0.21	2.9	3.8
4/30/2021	1	1	1	0.06	0.22	4.2	5.6
5/31/2021	3	4	4	0.03	0.11	0.2	1.1
6/30/2021	4	81	81	0.04	0.24	4.2	6
7/31/2021	2	6	6	0.04	0.23	4.8	9.2
8/31/2021	3	8	8	0.03	0.12	7.8	4.8
9/30/2021	4	11	11	0.02	0.1	2.2	4.6
10/31/2021	21	116	116	0.05	0.23	3.5	3.6
11/30/2021	6	32	32	0.07	0.28	2.1	NODI: P
12/31/2021	18	36	36	0.05	0.27	13.9	14.1
1/31/2022	10	40	40	0.05	0.25	6.6	9.6
2/28/2022	7	21	21	0.07	0.26	13.5	14.3
3/31/2022	8	88	88	0.04	0.25	6.1	6.3
4/30/2022	7	73	73	0.03	0.2	8.4	6.5
5/31/2022	9	46	46	0.04	0.24	4	17.9
6/30/2022	13	240	240	0.03	0.2	12	13.5
7/31/2022	4	17	17	0.03	0.05	14	15.4
8/31/2022	5	40	40	0.03	0.12	3.4	6.7
9/30/2022	16	84	84	0.03	0.1	4.6	6.5
10/31/2022	39	260	260	0.03	0.16	21.1	10.8
11/30/2022	4	8	8	0.04	0.21	16.8	9.5
12/31/2022	6	18	18	0.04	0.17	10.9	15.2
1/31/2023	6	14	14	0.03	0.05	8.1	6.9
2/28/2023	5	6	6	0.03	0.08	4.6	7.2
3/31/2023	19	52	52	0.04	0.1	7.6	8.9
4/30/2023	2	7	7	0.03	0.06	9.9	11
5/31/2023	3	14	14	0.03	0.19	6.9	7.4
6/30/2023	54	163	163	0.04	0.29	8.6	12.1
7/31/2023	4	9	9	0.04	0.13	3	18.5

Outfall 001

Parameter	Nitrite+Nitrate	TN	Solids, settleable	Solids, settleable	Solids, settleable
	Daily Max	Calculated	Monthly Ave	Weekly Ave	Daily Max
Units	mg/L	mg/L	mL/L	mL/L	mL/L
Effluent Limit	Report	Calculated	0.1	0.1	0.3
Minimum	0.04	59.6	0	0	0
Maximum	11.6	660.4	0.08	0.2	1.1
Median	2.335	355.1	Non-Detect	Non-Detect	Non-Detect
No. of Violations	N/A	N/A	0	1	1
8/31/2018	9.4	321.1	<= .1	<= .1	0.1
9/30/2018	2.22	584.4	<= .1	<= .1	<= .1
10/31/2018	6.22	231.8	<= .1	<= .1	0.3
11/30/2018	6.92		<= .1	<= .1	<= .1
12/31/2018	6.78		<= .1	<= .1	<= .1
1/31/2019	3.7		<= .1	<= .1	<= .1
2/28/2019	4.68		<= .1	<= .1	<= .1
3/31/2019	5.86		<= .1	<= .1	<= .1
4/30/2019	5.91		<= .1	<= .1	<= .1
5/31/2019	0.63	59.6	<= .1	<= .1	<= .1
6/30/2019	8.18	311.6	<= .1	<= .1	<= .1
7/31/2019	5.69	233.2	<= .1	<= .1	0.3
8/31/2019	0.66	375.6	<= .1	<= .1	0.25
9/30/2019	1.45	435.3	<= .1	<= .1	<= .1
10/31/2019	0.04	268.0	<= .1	<= .1	0.1
11/30/2019	1.78		<= .1	<= .1	<= .1
12/31/2019	1.92		<= .1	<= .1	0.1
1/31/2020	5.35		<= .1	<= .1	<= .1
2/29/2020	0.83		<= .1	<= .1	<= .1
3/31/2020	0.276		<= .1	<= .1	<= .1
4/30/2020	2.6		<= .1	<= .1	<= .1
5/31/2020	1.95	140.4	< .1	< .1	< .1
6/30/2020	1.51	272.7	<= .1	<= .1	<= .1
7/31/2020	0.94	585.5	< .1	< .1	0.1
8/31/2020	0.83	574.6	< .1	< .1	0.1
9/30/2020	6.07	463.6	<= .1	<= .1	0.1
10/31/2020	4.84	290.3	<= .1	<= .1	<= .1
11/30/2020	5.57		<= .1	<= .1	<= .1
12/31/2020	3.5		<= .1	<= .1	<= .1
1/31/2021	4.78		<= .1	<= .1	<= .1
2/28/2021	4.2		0.01	0.04	0.3

Outfall 001

Parameter	Nitrite+Nitrate	TN	Solids, settleable	Solids, settleable	Solids, settleable
	Daily Max	Calculated	Monthly Ave	Weekly Ave	Daily Max
Units	mg/L	mg/L	mL/L	mL/L	mL/L
Effluent Limit	Report	Calculated	0.1	0.1	0.3
3/31/2021	4.65		<= .1	<= .1	<= .1
4/30/2021	1.28		<= .1	<= .1	<= .1
5/31/2021	9.02	261.6	<= .1	<= .1	<= .1
6/30/2021	3.01	232.9	<= .1	<= .1	0.1
7/31/2021	0.91	278.2	<= .1	<= .1	<= .1
8/31/2021	3.46	234.2	<= .1	<= .1	<= .1
9/30/2021	2.75	226.8	<= .1	<= .1	0.1
10/31/2021	5.05	266.9	<= .1	<= .1	0.2
11/30/2021	2.74		0.08	**0.2**	**1.1**
12/31/2021	1.01		< .1	< .1	0.1
1/31/2022	0.09		<= .1	<= .1	0.2
2/28/2022	0.77		<= .1	<= .1	0.1
3/31/2022	1.99		<= .1	<= .1	<= .1
4/30/2022	1.91		<= .1	<= .1	0.1
5/31/2022	3.5	660.4	<= .1	<= .1	0.1
6/30/2022	2.39	490.3	<= .1	<= .1	<= .1
7/31/2022	1.21	498.7	<= .1	<= .1	0.1
8/31/2022	11.6	534.2	<= .1	<= .1	0.1
9/30/2022	0.64	196.5	<= .1	<= .1	<= .1
10/31/2022	2.28	338.2	<= .1	<= .1	0.1
11/30/2022	1.25		<= .1	<= .1	0.1
12/31/2022	0.42		<= .1	<= .1	0.1
1/31/2023	1.94		<= .1	<= .1	<= .1
2/28/2023	1.84		<= .1	<= .1	<= .1
3/31/2023	1.97		<= .1	<= .1	0.1
4/30/2023	1.28		<= .01	<= .01	0.1
5/31/2023	0.47	210.0	<= .1	<= .1	<= .1
6/30/2023	3.53	417.1	<= .1	<= .1	0.1
7/31/2023	4.74	659.0	<= .1	<= .1	<= .1

WET Effluent

Parameter	LC50 Acute Menidia	Cadmium	Copper	Lead	Nickel	Zinc
	Daily 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	Report	Report	Report	Report	Report
Minimum	100	0	0	0	0	0.014
Maximum	100	0.0001	0.015	0.0007	0.003	0.098
Median	100	Non-Detect	0.005	0.0003	0.001	0.0215
No. of Violations	0	N/A	N/A	N/A	N/A	N/A
8/31/2018	100	<0.0001	0.011	0.0003	0	0.036
11/30/2018	100	<0.0001	0.015	0	0.003	0.023
2/28/2019	100	0.0001	0	0.0005	0	0.024
5/31/2019	100	<0.0001	0.007	0.0002	0.002	0.019
8/31/2019	100	<0.0001	0.005	0.0003	0.001	0.015
11/30/2019	100	<0.0001	0.004	0.0007	0.002	0.098
2/29/2020	100	<0.0001	0.006	0.0002	0.001	0.02
5/31/2020	100	<0.0001	0.004	0.0003	0.002	0.022
8/31/2020	100	<0.0001	0.004	0.0005	0.002	0.016
11/30/2020	100	<0.0001	0.007	0.0004	0.002	0.025
2/28/2021	100	<0.0001	0.004	0.0002	0.001	0.025
5/31/2021	100	<0.0001	0.003	0.0003	0.001	0.014
8/31/2021	100	<0.0001	0.002	0.0002	0.002	0.015
11/30/2021	100	<0.0001	0.006	0.0004	0.001	0.023
2/28/2022	100	<0.0001	0.002	0.0001	0.002	0.019
5/31/2022	100	<0.0001	0.005	0.0003	0.001	0.021
8/31/2022	100	<0.0001	0.006	0.0003	0.001	0.021
11/30/2022	100	<0.0001	0.005	0.0002	0.002	0.017
2/28/2023	100	<0.0001	0.006	0.0002	0.001	0.022
5/31/2023	100	<0.0001	0.003	0.0001	0.001	0.023

WET Ambient

Parameter	pH	Salinity	Ammonia	Cadmium	Copper	Lead	Nickel	Zinc
	Daily	Daily	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max
Units	S.U.	ppt	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Effluent Limit	Report	Report	Report	Report	Report	Report	Report	Report
Minimum	**6.4**	**11**	**0**	**0**	**0**	**0**	**0**	**0**
Maximum	**7.9**	**29**	**0.3**	**0.0043**	**0.049**	**0.0169**	**0.016**	**0.127**
Median	**7.4**	**23**	**0.1**	**0**	**0**	**0.0014**	**0**	**0.024**
8/31/2018	7.6	27	0.1	0	0	0	0	0
11/30/2018	7	11	0.1	0	0	0	0	0.017
2/28/2019	7.6	18	0	0	0	0.002	0	0
5/31/2019	7.6	25	0.1	0.0001	0.007	0.0005	0	0.002
8/31/2019	7.3	26	0.1	0	0	0.0012	0	0.022
11/30/2019	7.7	25	0.2	0	0	0.002	0	0.024
2/29/2020	7	23	<0.1	<0.001	<0.01	0.0011	<0.01	0.019
5/31/2020	7.5	15	<0.1	<0.001	<0.01	0.0013	<0.01	0.051
8/31/2020	7.4	28	<0.1	0.0043	<0.01	0.0099	<0.01	0.074
11/30/2020	7.5	25	0.2	<0.001	0.016	0.0169	0.016	0.127
2/28/2021	7.8	25	<0.1	<0.001	<0.01	0.0015	<0.01	0.019
5/31/2021	7.2	23	<0.1	<0.001	<0.01	0.0033	<0.01	0.022
8/31/2021	6.4	15	0.1	<0.001	<0.01	<0.001	<0.01	0.032
11/30/2021	7.4	20	0.1	<0.001	<0.01	<0.001	<0.01	0.024
2/28/2022	6.8	12	0.3	<0.001	<0.01	<0.001	<0.01	<0.01
5/31/2022	7.9	28	<0.1	<0.001	<0.01	<0.001	<0.01	0.031
8/31/2022	7.6	29	0.2	<0.001	<0.01	0.0014	<0.01	0.036
11/30/2022	6.8	15	0.1	<0.001	<0.01	<0.001	<0.01	0.042
2/28/2023	7.4	17	<0.1	<0.001	0.049	0.0023	0.001	0.093
5/31/2023	7.1	21	<0.1	<0.001	<0.01	0.0007	<0.01	0.007

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[1]
C_e = effluent concentration[2] (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:

$$C_d = \frac{C_s(DF - 1) + C_e}{DF}$$

[1] Median concentration for the receiving water outside of the zone of influence of the facility's discharge taken from all available information over the most recent 5-year period, including WET testing data, for each Permittee.
[2] The 95th percentile (for $n \geq 10$) or maximum (for $n < 10$) concentrations from all available date over the most recent 5-year period, including DMR data and/or WET testing data, for each Permittee.

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	16.0	0	0.0	0.0	0.0	0.0	33.2	7.9	N	N	N/A	N/A
Copper	µg/L	16.0	0	11.0	11.0	0.7	0.7	5.8	3.7	N	N	N/A	N/A
Lead	µg/L	16.0	1.15	0.6	0.6	1.1	1.1	220.8	8.5	N	N	N/A	N/A
Nickel	µg/L	16.0	0	2.7	2.7	0.2	0.2	74.7	8.3	N	N	N/A	N/A
Zinc	µg/L	16.0	23	43.8	43.8	24.3	24.3	95.1	85.6	N	N	N/A	N/A
Ammonia (Cold)	mg/L	16.0	0.10	20.2	20.2	1.4	1.4	80.8	12.3	N	N	N/A	N/A
Ammonia (Warm)	mg/L	16.0	0.05	24.2	24.2	1.6	1.6	18.3	2.8	N	N	N/A	N/A

[1]Median concentration for the receiving water upstream 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 $n \geq 10$) 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 Wastewater Treatment Plant Effluent, Treatment Efficiency, and Potential Microbial Impacts on Shellfish Growing Areas in Somerset, MA

Report of Findings from the September 8 – 19, 2014 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
Field Engineering and Data Analysis Team
College Park, MD 20740-3835

September 2017

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1.0 INTRODUCTION

1.1 Executive Summary

The U.S. Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), the Massachusetts Department of Marine Fisheries (MADMF), and the Rhode Island Department of Environmental Management (RIDEM) conducted a study from September 8 – 19, 2014 in Mount Hope Bay to assess the impact from the Somerset wastewater treatment plant (WWTP) discharge on growing areas within Massachusetts (MA) and Rhode Island (RI) waters. Six (6) cages with attached fluorometers filled with hard shell clams and oysters were deployed at various locations (stations) along the anticipated path of effluent to assess dilution of dye-tagged effluent with the indicator bacteria and virus levels in shellfish. Rhodamine WT tracer dye was injected into the Somerset WWTP, located in MA, 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 near stations and throughout Mount Hope Bay and the Taunton River. 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 Somerset WWTP. The results of the effluent dye-dilution study and the 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 Somerset WWTP in Mount Hope Bay and the Taunton River;
(2) Determine the bacterial and viral loads in raw, untreated wastewater and in pre-disinfected effluent and determine the efficiency of the WWTP 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 (1) month; and
(4) Provide guidance to the MADMF and RIDEM regarding the sizing of the prohibited area around the WWTP outfall based on dilution of effluent and conditional management of the adjacent growing areas.

1.3 Study Area Background

The study was performed in Mount Hope Bay and the Taunton River with portions of the study occurring in both MA and RI waters. The growing area classifications for both MA and RI are shown Figure 1. The Somerset WWTP falls within a prohibited zone established for the Taunton River within MA waters. There are no areas designated as approved (permitted to harvest shellfish year-round under any conditions) in either the MA or RI areas. Temporary closures for conditionally approved harvest areas are based on closure triggers (rainfall amount in a specified period), which are intended to reflect conditions that exist when shellstock are likely unsafe for human consumption. A timeline on 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). A comprehensive sanitary survey of the area was conducted by MADMF in 2010 and by RIDEM in 2013 and will be performed again in 2022 and 2025 respectively, with annual and triennial reevaluation reports in the interim.

The present management plan for the conditionally approved growing areas in Mount Hope Bay in MA 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 occurs within the 5-day period). If two (2) inches or greater precipitation occurs within a 24-hour period, the growing area is closed and reopens based on sample results that meet NSSP criteria. The MHB:1 area is also conditional on season and is in the open status from February 1st – November 30th and is in the closed status during December and January.

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" classifications. The Taunton River has been a source of shellfish for the contaminated relay program that benefits many coastal communities. Over the past several years, 13-16 communities have relayed as much as 15,000 bushels of quahogs from the area. Most of the relaying occurs north of the Braga Bridge annually 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.

Currently, the RIDEM manages Shellfish Growing Area 17 (GA17) which encompasses the entire RI portion of Mount Hope Bay, as well as a majority of the saltwater portion of the Kickemuit River, which is considered as 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 totaling 0.5" or greater. Water samples are collected monthly when the conditional areas are in the open status at the 10 stations in the Kickemuit River (GA5), and 16 stations in Mt. Hope Bay (GA17).

At the time of the study, there were no emergency closures in place and the approved and conditionally approved areas were open and actively being harvested. The RIDEM and the MADMF reported to the FDA during the study that the approved areas can be closed within two (2) hours in the event of a failure at the Somerset WWTP.

1.4 Description of the Somerset WWTP

The Somerset WWTP is located at 116 Walker Street in Somerset, MA. The plant was constructed in 1972 and completed major upgrades in 1997. The major upgrades included improving mixing, increasing active composting aeration capacity, temperature control for composting aeration, and providing covered storage facilities for compost curing. Other upgrades included adding an odor management building. The plant was originally designed to serve a population of 12,500 people over a 20-year period, although this number has expanded since the upgrades (the population of Somerset was 18,223 in 2016). The average daily flow at the plant is 3.5 million gallons per day (MGD) with a peak hourly flow of 10.1 MGD. The

permitted average monthly flow is 4.2 MGD according to the plant's National Pollutant Discharge Elimination System (NPDES) permit #: MA0100676. The treatment processes at the facility include preliminary treatment where bar screening, grit removal, and flow equalization occurs, followed by primary settling of the solids during the primary treatment phase. Secondary treatment includes aeration, secondary clarification, and final settling of the sludge. Chlorine gas mixed with plant effluent is injected into the final settling tank before it enters the chlorine contacts tanks to reduce pathogenic organisms before discharging into the Taunton River. The WWTP does not have a SCADA system, but maintains computer systems for monitoring all processes, collecting and storing data and providing alerts. The plant also has four (4) generators on standby at preliminary treatment, operations building, solids handling, and odor control facilities. The effluent discharges into the Taunton River from a 54" diameter reinforced concrete 520' long pipe, located at approximately latitude 41.716 and longitude -71.166. It should be noted that there is no flow meter at the final effluent discharge so accurate measurements of effluent flow cannot be determined. Effluent flow is estimated based on influent flow; flow equalization, buffering, and time of travel through the plant can hinder flow estimates of the final effluent.

1.5 General Description of Study Design

Prior to the dye study on September 9 – 11, 2014, the level of background fluorescence was measured in the Mount Hope Bay and Taunton River with two WET Labs (WET Labs, Inc., Philomath, OR) FL-RHT boat tracking fluorometers at the surface and a Wet Labs FL-RHT fluorometer attached to a Sea-Bird (Sea-Bird Electronics, Bellevue, WA) Seacat CTD used to measure fluorescence, salinity, and temperature in the water column. Six (6) stations were equipped with WET Labs fluorometers (FL-RHB) to measure dye concentrations and were deployed at strategic locations in the study area on September 8, 2014. Three (3) CTDs (Fondriest Environmental, HOBO by Onset, and Schlumberger) were deployed to monitor conductivity, temperature, and depth at Stations 1, 2 and 6. However, Station 6 was lost either due to strong currents or a broken line and therefore no submersible or CTD data at this station could be recovered. Figure 1 shows a map of the study area with the six (6) station locations, the outfall, as well as the shellfish growing area classifications. The Rhodamine WT dye used for the comprehensive study was injected over a half tidal cycle (12.4 hours) from 2:09 AM to 14:33 PM on September 9, 2014. Boat tracking was conducted to find peak dye concentrations and to determine the spatial extent of dye dispersion throughout the study area. The deployed fluorometers remained in the water until September 19, 2014 to determine the residence time of the dye in the conditionally restricted growing areas.

In addition to the hydrographic dye-dilution study, the FDA collected samples of influent, pre-chlorine treated effluent, and post-chlorine 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 secondary treatment process and chlorine disinfection at removing viruses and to inform recommendations for sizing a prohibited area around the WWTP outfall in conjunction with the hydrographic dye-dilution study. The FDA also performed microbiological analysis on both clam and oyster tissue samples; the samples were analyzed for FC, EC, and MSC. Testing of shellfish helped validate the findings of the WWTP microbiological and hydrographic dye study results.

2.0 METHODS -

See **Appendix 1** for detailed methods used in the study.

3.0 RESULTS

3.1 Weather Conditions

According to the National Oceanographic and Atmospheric Association's (NOAA's) National Center for Environmental Information (http://www.ncdc.noaa.gov/cdo-web/), during the Somerset comprehensive study period, the Taunton Municipal Airport weather station recorded a total of 0.00 inches of rain from September 9 – 11, 2014. Winds recorded at the National Weather Service ranged from 3-14 mph in the northeasterly direction on September 8, 2014. Winds increased slightly to 6-13 mph in the northeasterly direction on September 9, and 5-18 mph in the southwesterly direction on September 11, 2016. However, winds were not a significant factor that influenced the direction and dispersion of dye, which moved in a southerly direction and into Mount Hope Bay on an ebb tide. The northerly component in the wind during the first two (2) days of the dye tracking followed the direction of the ebb tide and may have helped push the dye tag effluent further downstream once in Mount Hope Bay; the Taunton River was largely sheltered from the northeasterly winds.

3.2 Dye Injection

A 20-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 pumps (Cole-Palmer Instrument Co.) with Masterflex Tygon L/S-16 tubing was used to withdraw the tracer dye solution from a large plastic container. A pump head size 7016 was used to achieve a combined pumping rate of 97 ml/min which was maintained at 108 revolutions/minute (rpm) constant head speed. The dye mixture injected into the Somerset WWTP began on September 9, 2014 at 2:09 AM and was fed continuously into the final effluent following the chlorine treatment until 14:33 PM, approximately a 12.4-hour injection period. The initial concentration of the dye in the effluent (2305 ppb) was determined using the WWTP's flow average over the course of the dye injection period (1.6 MGD), which was lower than the average daily flow of 3.5 MGD at the plant.

3.3 Travel Time

This study determined the extent of dye travel on the first ebb tide during the dye injection on September 9, 2014. The dye tracking fluorometer data was used to determine the time of travel from the Somerset WWTP to the conditionally approved growing area (located 1.9 miles from the discharge) in MA (Figure 2). The time of travel was determined based on the time it took dye tagged effluent to reach the conditionally approved area from the beginning of the ebb tide (8:49 AM on September 9, 2014). The dye reached the conditionally approved area at 11:44 AM on September 9, 2014, indicating a time of travel of 2 hours and 55 minutes representing an average velocity of 0.65 mph. However, it should be noted that the time of travel could be conceivably shorter if a WWTP failure event occurred during mid-ebb when current velocities are at a maximum. The relatively short time of travel from the Somerset WWTP to the

conditionally approved area in MA (less than 3 hours) necessitates the need for quick notification by the WWTP and response by the MADMF in the event of a WWTP malfunction; this critical and timely communication must be highlighted in the Conditionally Approved Management Plan (CAMP).

3.4 Dye Readings by Tracking Fluorometers

The 12.4-hour dye injection into the Somerset WWTP (on September 9, 2014 from 2:09 AM to 14:33 PM) was tracked in the growing areas for three (3) consecutive days from September 9 to 11, 2014. Figure 3 represents the accumulated 5-point moving average concentration and the corresponding dilution of dye tagged effluent for the three (3) days of tracking during the study period. The minimum dilution found via the boat tracking fluorometers on September 9th was 15:1, equivalent to a 5-point moving average concentration of 153.39 ppb. This level was found less than 100 meters north of the outfall pipe and the minimum dilution found in the WWTP near-field mixing zone (Figure 4). Dye was detected approximately 3 miles north into the Taunton River as shown in Figure 5, which is classified as restricted. Trace dye amounts were also detected more than 5 miles downstream of the outfall past Station 4. Dilution levels during the first day of tracking in the conditionally approved classification area in MA never reached below 2763:1.

On September 10, 2014, dye levels dropped off significantly as shown in Figure 6. The minimum 5-point moving average dilution was 6332:1, equivalent to a 5-point moving average concentration of 0.36 ppb, located within 400 meters of the outfall. The minimum 5-point moving average dilution detected within the MA conditional area was 14663:1, while no dye was detected within the RI conditional area. The 5-point moving average dilution around Station 1 never reached below 14663:1 and 19273:1 for Station 2. The 5-point moving average dilution around Station 5 never reached below 16655:1 and little to no dye was found around Stations 3 and 4.

On September 11, 2014, dye levels continued to drop as shown in Figure 7. The minimum 5-point moving average dilution detected was 21402:1; equivalent to a 5-point moving average concentration of 0.11 ppb, located within the MA conditionally approved area. No dye tracking occurred near station 1, 4 and 5. Surface dye tended to push more toward Station 2 and thus where the majority of the tracking was performed during day 3. The minimum dilution near Station 2 was 21402:1, while the minimum dilution around Station 6 was 30692:1.

Accumulated dye values from the three (3) study days show that no dilution values less than 1000:1 were found within both the MA (Figure 8) and RI (Figure 9) conditionally approved areas; however, it should be noted that the WWTP flows during the time of the study (1.6 MGD) were less than the average daily flow reported in the permit (3.5 MGD), meaning the dilution would be even higher under higher flows closer to the average daily flow. Utilizing a minimum 1000:1 dilution significantly reduces the risk of impacts from enteric viral pathogens when the WWTP is operating within normal operating conditions (NSSP Section IV: Guidance Document Chapter II 19.). In addition to minimum dilution within the prohibited area, adequate detection and response time is needed when any malfunction occurs to ensure that all harvesting ceases and closures are enforced, so that contaminated product does not reach the market. The FDA

recommends a 1000:1 dilution value in conjunction with conditional management that is described in more detail in Section 2.1 of Appendix 1.

3.5 Dye Readings at Stations

Dye readings recorded by the fluorometers attached to cages and boat tracking fluorometers (within a 100-meter radius of each cage/station) are shown in Figures 11 - 15. The superposition method (Goblick et. al, 2016) was used to estimate the steady state condition for dye over multiple tidal days at Station 2 using data collected over the study period. Superposition determinations are achieved by superimposing, in cumulative fashion, the measurements taken on each tidal day after the dye injection with the measurements recorded on the first tidal day. This process is continued until a stable (peak) concentration dye value is obtained. The peak concentration value represents the buildup of pollutants to a steady state maximum concentration, and the timeframe to reach steady state represents the overall residence time of pollutants within the estuary. Tidal height in feet based on the nearby NOAA buoy in Fall River, MA is also shown.

The superposition method was not used to estimate steady state conditions for the remaining stations. Steady state estimates for Station 1 (located closest to the outfall) within the prohibited area would provide little benefit towards shellfish management. Superposition calculations were not performed at Stations 3, 4, and 5 due to inconsistent and low levels of dye detected at these stations; no results are reported for Station 6 as it was not recovered. Station data was used to supplement the boat tracking data, although the boat tracking data was most useful regarding the overall recommendations for growing area classification. The maximum dye concentration values are plotted for both the stationary and the boat tracking fluorometers. Along with the dye concentrations, each figure shows the associated dilution levels at each station.

For Station 1, the maximum concentration from the boat tracking fluorometer (139.29 ppb) was greater than the maximum value for the submersible fluorometer (1.98 ppb), indicating a buoyant effluent plume that rose quickly to the surface due to the lighter density. At Station 2, the dye levels detected by the boat tracking fluorometer were consistent with the dye levels from the stationary fluorometer attached to the cage at the same relative time indicating that the dye was more evenly mixed throughout the water column at this location. The minimum dilution calculated using the superposition method for the peak 1-hour average at Station 2 was 7528:1 (0.3062 ppb). No dye was detected by the boat tracking fluorometer at Stations 3 and 4, and only sporadic and low levels of dye were detected by the submersible fluorometers at these stations. At Station 5, low levels of dye were detected by the boat tracking fluorometer (0.17 ppb representing a minimum dilution of 13559:1), however, sporadic and low levels of dye were detected by the stationary fluorometer attached to the cage at a lower depth.

3.6 Profiles of Dye at Depth

Profiles were conducted during the Somerset dye study using the SeaBird CTD interfaced with a WET Labs tracking fluorometer (WET Labs FLRHRT 2487). The majority of the profiles were taken within proximity to each station. Minute traces or no dye was detected at Stations 3-6 during the time the profiles were conducted (however, brief and sporadic traces of dye were

picked up on the stationary fluorometers as previously discussed). Thus, Station 2 profile is presented in this report to illustrate the findings regarding the behavior of the dye tagged effluent plume as it transported down the Taunton River and through Mount Hope Bay (Figure 15). The highest concentration near Station 2, recorded by the profiling fluorometer, was 0.36 ppb with an associated dilution 6451:1; the dye levels at the time the profile was conducted were higher below the surface (the highest concentration at the surface was 0.09 ppb). The profile shown in Figure 15 shows little stratification in salinity and temperature, indicating that the dye tagged effluent was well mixed within the water column and observed by the dye readings. This indicates that under these conditions, the effluent discharged from the Somerset WWTP becomes more evenly mixed as it transports downstream and can reach the bottom depths where shellfish are harvested.

3.7 Projections for Different Wastewater Treatment Plant Flows

The dye injection was conducted on September 9, 2014 during a relatively low wastewater treatment plant flow period. The average flow during the dye injection period was 1.6 MGD, compared to the average daily flow of 3.5 MGD and the average monthly flow of 4.2 MGD per NPDES #: MA0100676. The low flow over the period of the dye injection period may, in part, be due to the low flow period that occurred at the beginning of the injection (2:09 AM) until the morning peak (7:30 AM) in conjunction with the lack of rain leading up to and during the dye injection. Therefore, the calculated dilution values were higher than if the plant were operating under higher flows. Projections were modeled for 4.2 MGD flows and are shown in Figures 16 and 17.

Figures 16 and 17 show the accumulated dye levels for a projected flow of 4.2 MGD for the MA and RI growing areas. The 4.2 MGD projection is approximately 2.5 times the flow of the average flow during the dye injection period. The <1000:1 dilution values for the 1.6 MGD are shown in Figures 16 and 17 as well as the projected <1000:1 dilutions for the 4.2 MGD flow. Using original plant flows, there were no <1000:1 points that reached the MA or RI conditionally approved areas. This also holds true with the 4.2 MGD projected flow, but a large cluster of <1000:1 points fell within 100 meters of the MA conditionally approved area. Although no dilutions <1000:1 reached the MA conditionally approved area; with higher flows (>4.2 MGD) from heavy rainfall would result in dilutions <1000:1 within the conditional area and thus conditional management is appropriate to ensure the area closes during these events.

3.8 Short Term Failure - Dilution and Anticipated Fecal Coliform (FC) Concentrations

The Somerset WWTP has flow equalization that is designed to buffer high flows entering the plant and minimizes the risk of a bypass. As recommend in the NSSP Guidance (NSSP Section IV: Guidance Document Chapter II 19.), in the unlikely event of a raw sewage failure, a dilution of 100,000:1 would be needed if it were assumed that the failure concentration was as high as 1.4×10^6 cfu/100 ml. A 100,000:1 dilution line could not be determined based on the results of this study as the dye levels associated with 100,000 were below the limit of detection of the fluorometers (0.01 ppb). Figure 18 shows the minimum dilution of the Somerset discharge versus the distance from the outfall. As shown in Figure 18, a 100,000:1 dilution is not met within the MA waters or the RI prohibited waters (but met within the RI conditional areas), for

either the lower than average flows encountered during the study (1.6 MGD), or for a projected monthly permitted flow (4.2 MGD). These results indicate that the MADMF must ensure that the growing areas close in a timely manner in if a WWTP malfunction occurs. Effective communication between the WWTP personnel and MADMF must be outlined in the CAMP.

3.9 Microbiological Analysis of WWTPs and Shellfish

Appendix 3, Table 1 shows the enteric virus results in shellfish at each cage except for Station 6, which was not recovered. Positive detections of MSC were found at Stations 1, 2, 3, and 5, with Station 2 reaching a level of 1844 PFU/100ml in oysters (Table 1, Figure 19). The level of MSC detected at Station 2 was much higher than the level found closest to the outfall. However, this could be a result of the Station 1 being too close the outfall affecting the pumping rates of shellfish; the salinity at Station 1 was observed to be approximately 10 ppt lower on average than compared with Station 2 with the highest level detected at Station 2. Fecal coliform in shellfish was detected at Stations 1, 2, 3, and ranging from 1.8-41 cfu/100 grams (Figure 20). Due to the high level of dilution at Station 2, the performance of the WWTP which was within normal operating conditions during the study, and no significant rain events that occurred leading up to the study, the FDA recommends follow-up shoreline survey field work near this station to determine if there is another source within the vicinity of the Brayton Point area.

4.0 CONCLUSIONS AND RECOMMENDATIONS

When considered collectively, the data from the hydrographic dye study and the microbiological results of shellfish sampling support the following conclusions and recommendations:

- For the WWTP flow rate that occurred during the study period (1.6 MGD), the 1000:1 dilution of dye tagged effluent was achieved within the prohibited and restricted areas where no direct market shellfish harvesting is allowed in MA waters. Even for a projected flow of 4.2 MGD (the maximum monthly permitted flow rate) no <1000:1 points fell within the approved or conditionally approved areas.
- Based on the results of the boat tracking data, the time of travel from the WWTP outfall to the conditionally approved area MHB 1.2 in MA waters was approximately 3 hours. Time of travel to MHB 1.2 may be less than 3 hours during mid-ebb tide when current velocities are highest.
- During the first ebb tide when the initial dye tracking occurred, the dye tagged WWTP effluent did not reach RI waters. Dye tag effluent reached the RI prohibited waters on the subsequent ebb tide indicating time of travel into RI prohibited waters is >12 hours. However, no dye readings above the instrument limit of detection were recorded in any of the shellfish growing areas in RI waters indicating that a failure in treatment from the Somerset WWTP would not impact these waters (dilution >230,500).
- Although no <1000:1 points fell within the approved or conditionally approved areas in MA waters, if a WWTP malfunction occurs at the Somerset WWTP a closure in MA waters would be still necessary. This is a result of dilution levels that are not sufficient to dilute the microbial loading from the Somerset WWTP when operating outside of "normal" WWTP operations such as a loss of disinfection or a bypass in any stage of treatment. If a failure were to occur at the maximum permitted monthly flow of 4.2

MGD the MHB 1.2 portion of the growing area would be most heavily impacted (dilution 1000-2305:1).

- FDA recommends that the MA growing areas remain closed for 21 days when the WWTP is operating outside of "normal" operation. Or, as indicated in the NSSP MO @.03 C.(2)(c)(iii): "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."
- FDA recommends that MADMF review and update the CAMP as necessary to ensure when any loss of disinfection or bypass in stage of treatment occurs all harvesting ceases and closures are enforced, so that contaminated product does not reach the market. It is also recommended that MADMF review the CAMP with the Somerset WWTP personnel so that they understand the importance of timely and accurate reporting when the WWTP is operating outside of "normal" operation including any loss of disinfection or a bypass in any stage of treatment.
- The data from Station 2 suggests that there may be a possible unidentified source near Brayton Point other than the WWTP that could be impacting Station 2. The FDA suggests a follow up shoreline survey investigation in this area. Additional shellfish deployments in this vicinity may also help to determine if Station 2 is consistently impacted.
- The data from Station 2 also indicates the residence time of pollutants discharged from the Somerset WWTP in this vicinity is at least 4 days. Based on environmental factors such as temperature and sunlight, viruses sequestered by shellfish from the WWTP when operating outside of "normal" operation could remain a considerably longer time.
- FDA also recommends that an effluent flow meter is installed at the WWTP to accurately measure the discharge from the WWTP and assess if the flow equalization is effective at buffering flows such that the WWTP can operate under the design capacity of the WWTP the maximum amount of time. If the WWTP is found to be operating consistently above its design capacity or permitted flow (4.2 MGD), then it is recommended that the efficiency of the WWTP in reducing the viral load is assessed under these circumstances to determine if an additional flow trigger is needed in conjunction with the rainfall trigger for the MA MDF growing areas and flows greater than 4.2 MGD should be assessed to determine if the RI conditional areas are impacted.

5.0 ACKNOWLEDGEMENTS

Special thanks to Mr. Greg Sawyer, MADMF, Mr. Joe Milgiore, RIDEM, Mr. Tim Bridges, EPA, the Rhode Island Coastal Resources Management Council, and the Somerset WWTP for assisting with data collection and field support during this study.

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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 Somerset WWTP (which utilizes conventional chlorination), 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 and Taunton River were obtained using a combined total of 8 fluorometers. Five of these were WET Labs FLRHB submersible fluorometers (WET Labs, Inc., Philomath, OR) that were attached to the eight stations in the bay. Two were 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 2040, 2487 and 586 tracking and profiling fluorometers and the five station fluorometers – WET Labs FLRHB units 915, 1730, 2032, 2153 and 2219. 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 September 8, 2014 for the study with the 2040 and 586 tracking fluorometers. 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 September 8, 2014 for the Somerset 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. The drogues were released just north of the Somerset WWTP in the Taunton River. 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 majority of the drogues was taken by the wind and current onto shore near Brayton Point and therefore was not used for time of travel purposes. However the drogues did help determine the timing of the tidal cycles to help establish an injection time at 2:09 AM on 9/9/2014.

2.4 Dye Injection

For the dye injection, a total of approximately 22 gallons of dye mixture was injected at a constant rate into the WWTP effluent over a 12.4 hour period from 2:09 AM to 2:33 PM on September 9, 2014. To facilitate the pumping of dye, 11 gallons of deionized water was added to 11 gallons of dye creating a 50:50 water/dye dilution mixture (22 gallons total, of which 21 gallons was injected resulting in approximately 10.5 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-15 tubing. A pump head size 7015 was used with a constant pumping rate of 408 ml/min which was maintained at 108 revolutions/minute (rpm) head speed. Approximately one gallon of dye mixture remained. 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 (1.6 MGD). Flow rates out of the WWTP were based on flow meters.

2.5 Dye Tracking

Boat tracking was conducted on each day of the study with two boat-towed fluorometers, the WET Labs FLRHRT-586 and 2040, 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).

Two boats were used for dye tracking. Dye readings were taken on successive days (September 9 –11) 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 tracking fluorometers, 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.

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 attempted to use the superposition method (Kirkpatrick, 1993) to estimate the steady state condition for dye at each of the stations using data collected from December 9 – 15, 2014 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. However for the Somerset study, the build-up of dye at each station was unpredictable and therefore accurate steady state dilution levels could not be determined using the superposition method.

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^{o}C for 120 s followed by 50 cycles of 95^{o}C for 3 s, 53^{o}C for 10 s, and 65^{o}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.

Figure 1: Map of Station Locations, Outfalls, Profile Locations, and Classified Growing Areas

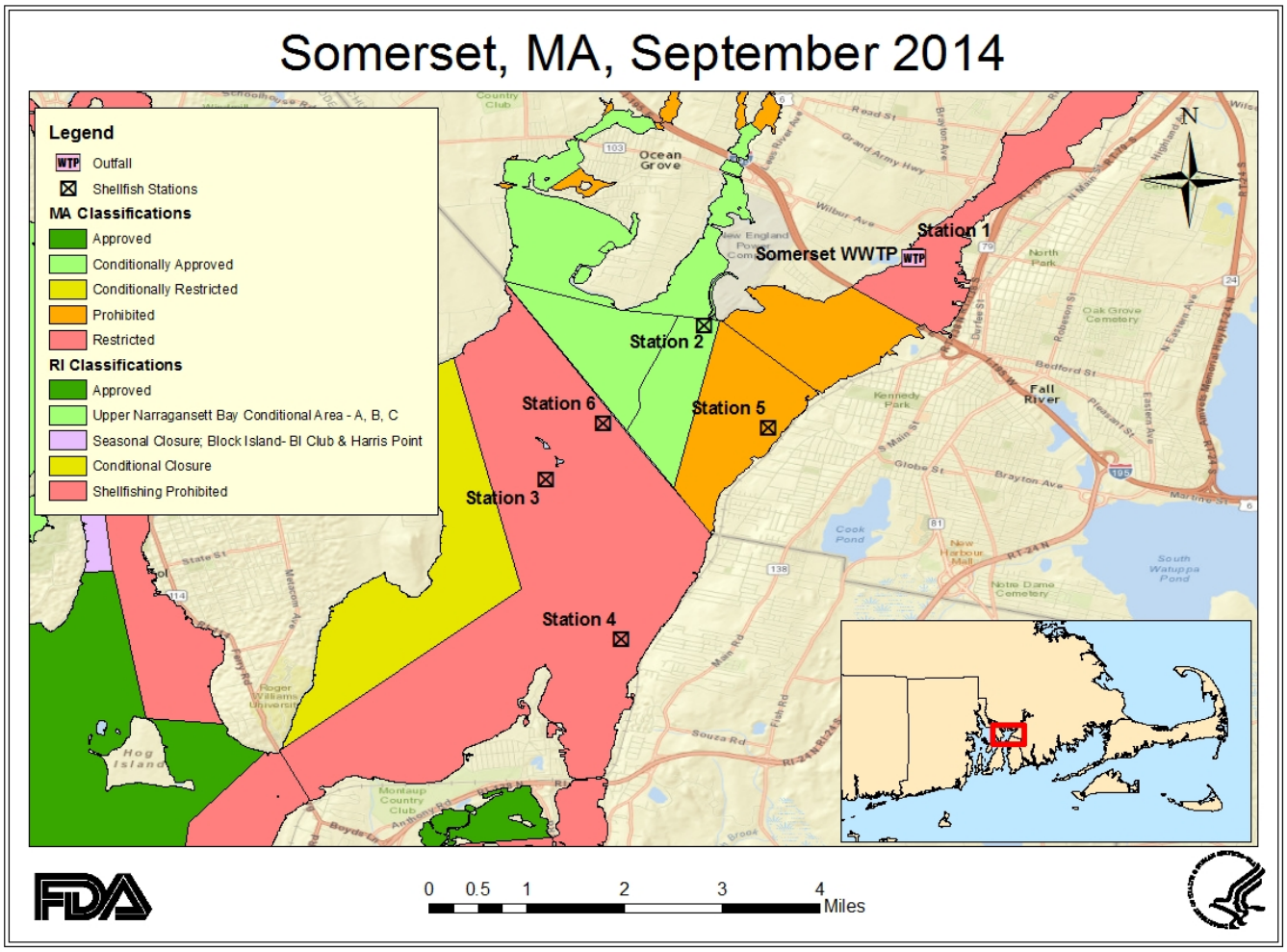
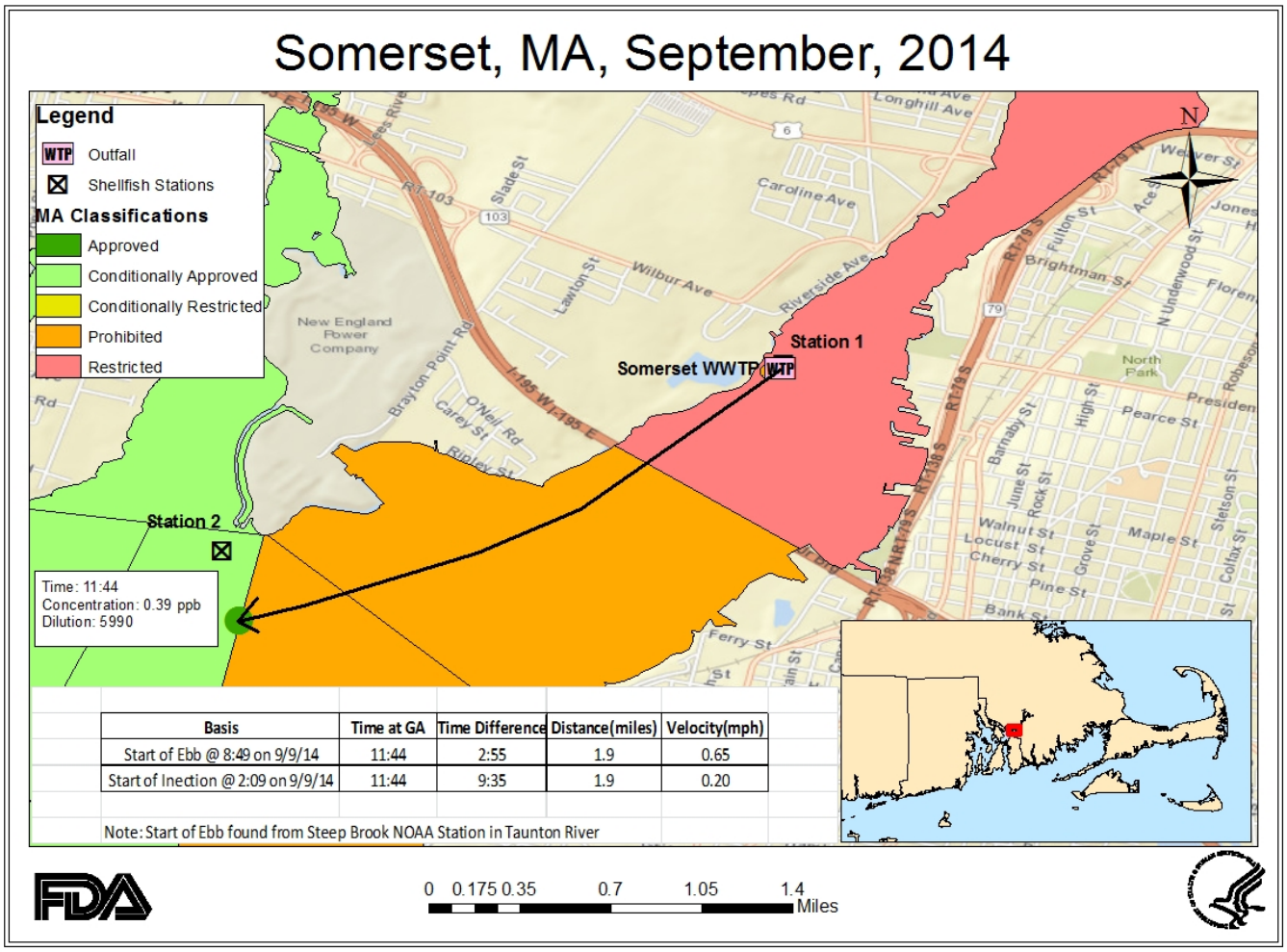


Figure 2: Velocity and Travel Time Estimates Based on Boat Tracking Data



Basis	Time at GA	Time Difference	Distance(miles)	Velocity(mph)
Start of Ebb @ 8:49 on 9/9/14	11:44	2:55	1.9	0.65
Start of Inection @ 2:09 on 9/9/14	11:44	9:35	1.9	0.20

Note: Start of Ebb found from Steep Brook NOAA Station in Taunton River

Figure 3: Accumulated 5-Point Moving Average Concentration Values and Associated Dilutions

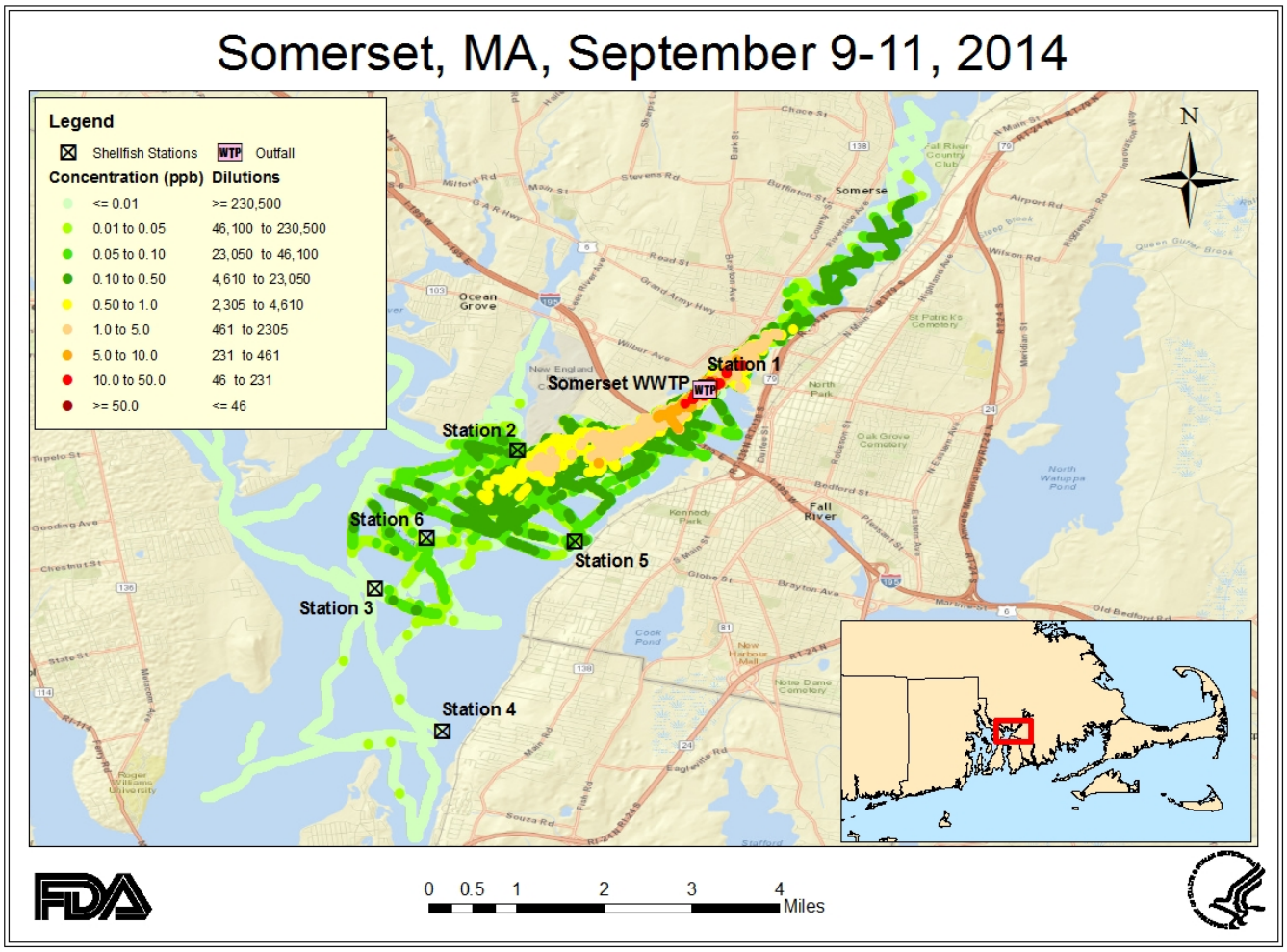


Figure 4: Somerset WWTP 100 Meter Buffer – Initial Dilution in Near-Field

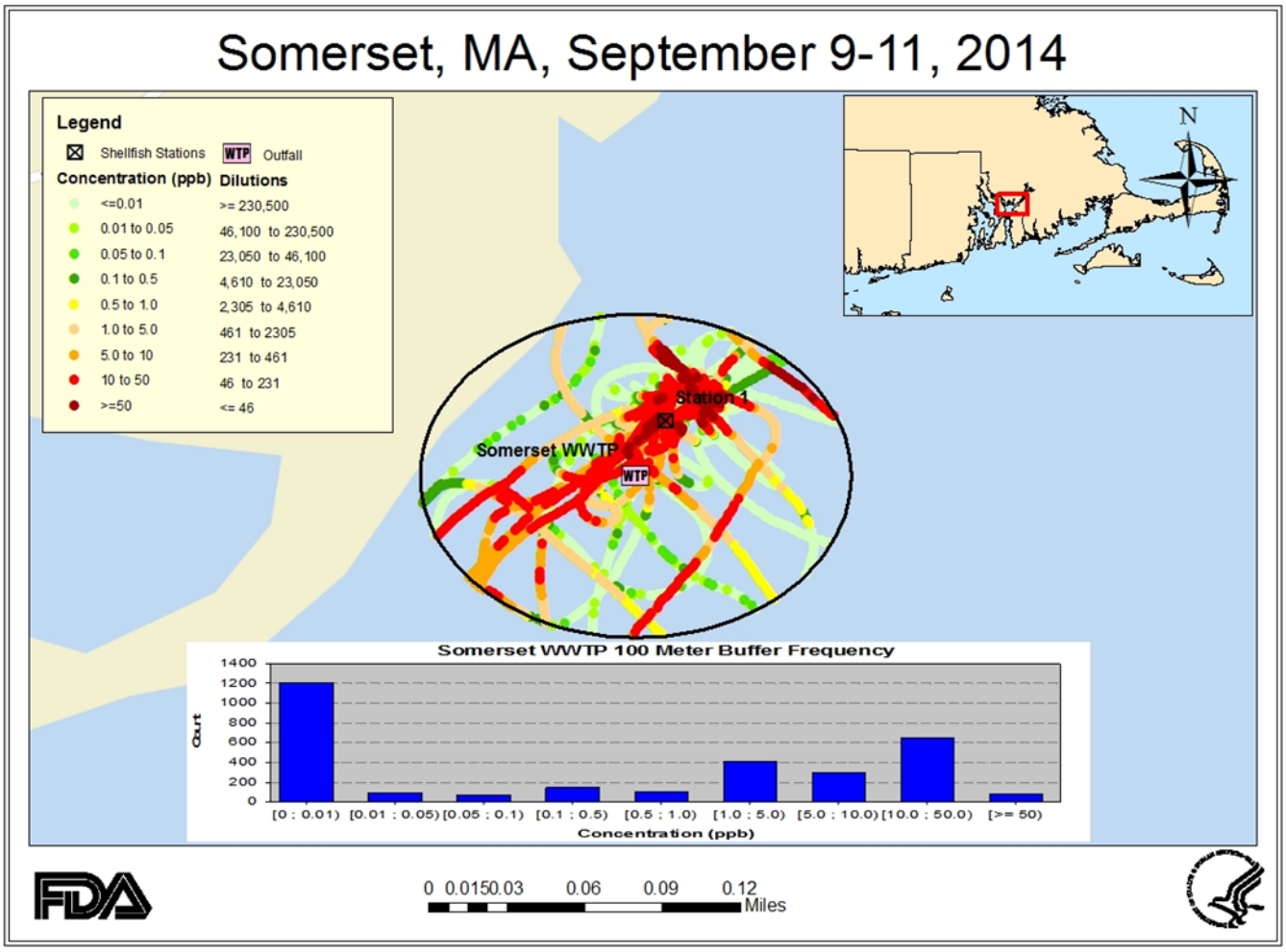


Figure 5: Dilution Levels for Day 1 Boat Tracking

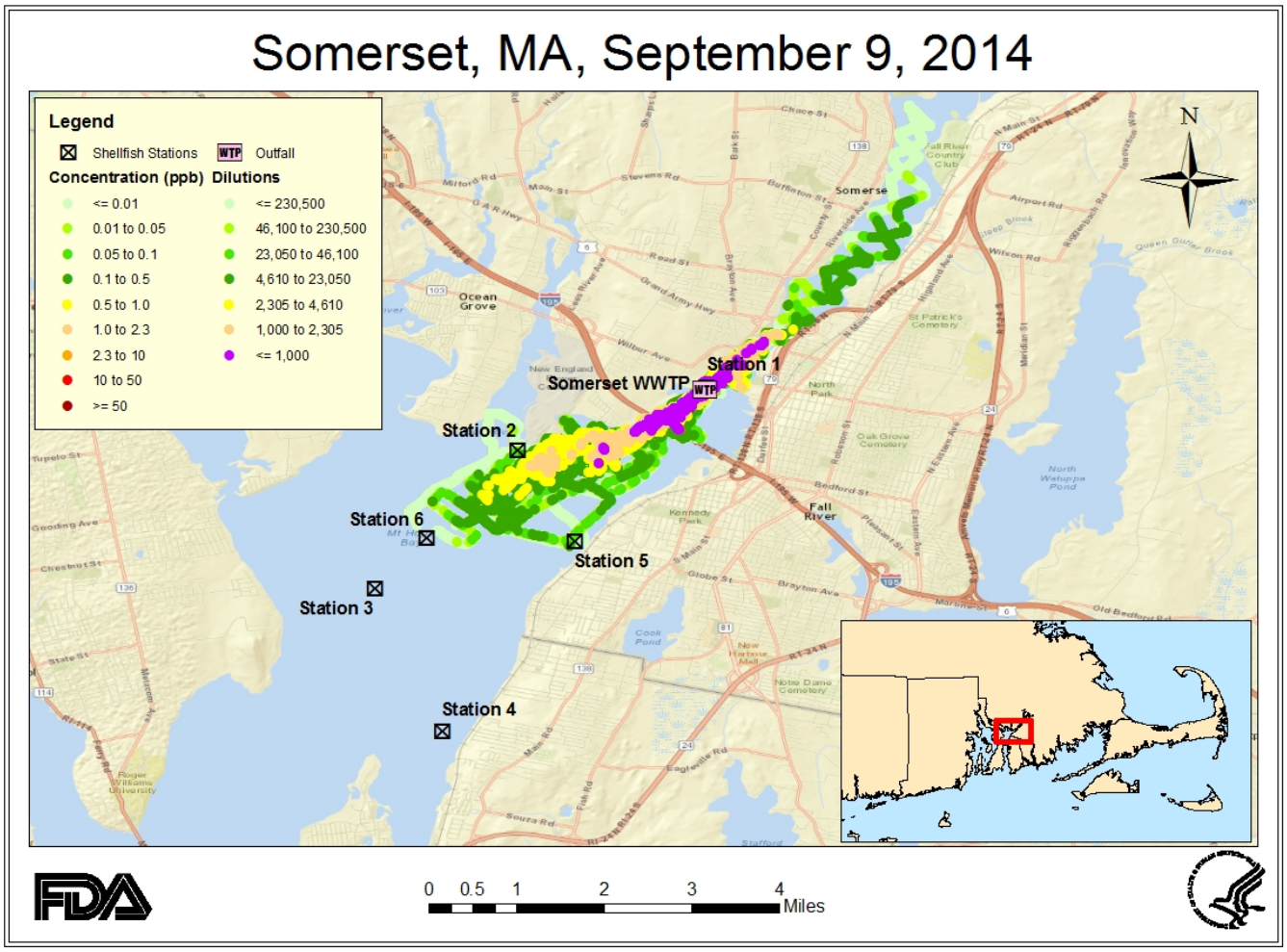


Figure 6: Dilution Levels for Day 2 Boat Tracking

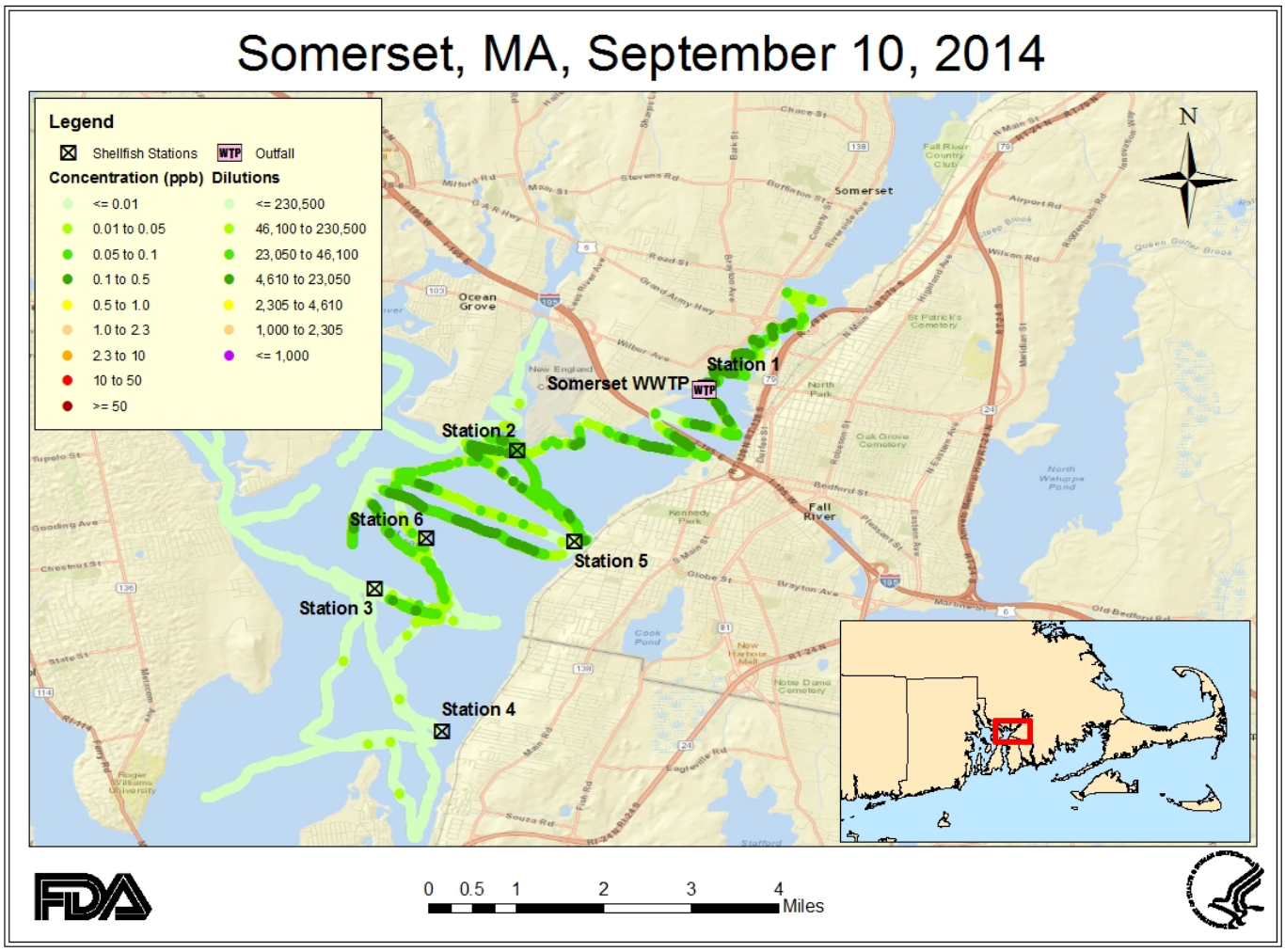


Figure 7: Dilution Levels for Day 3 Boat Tracking

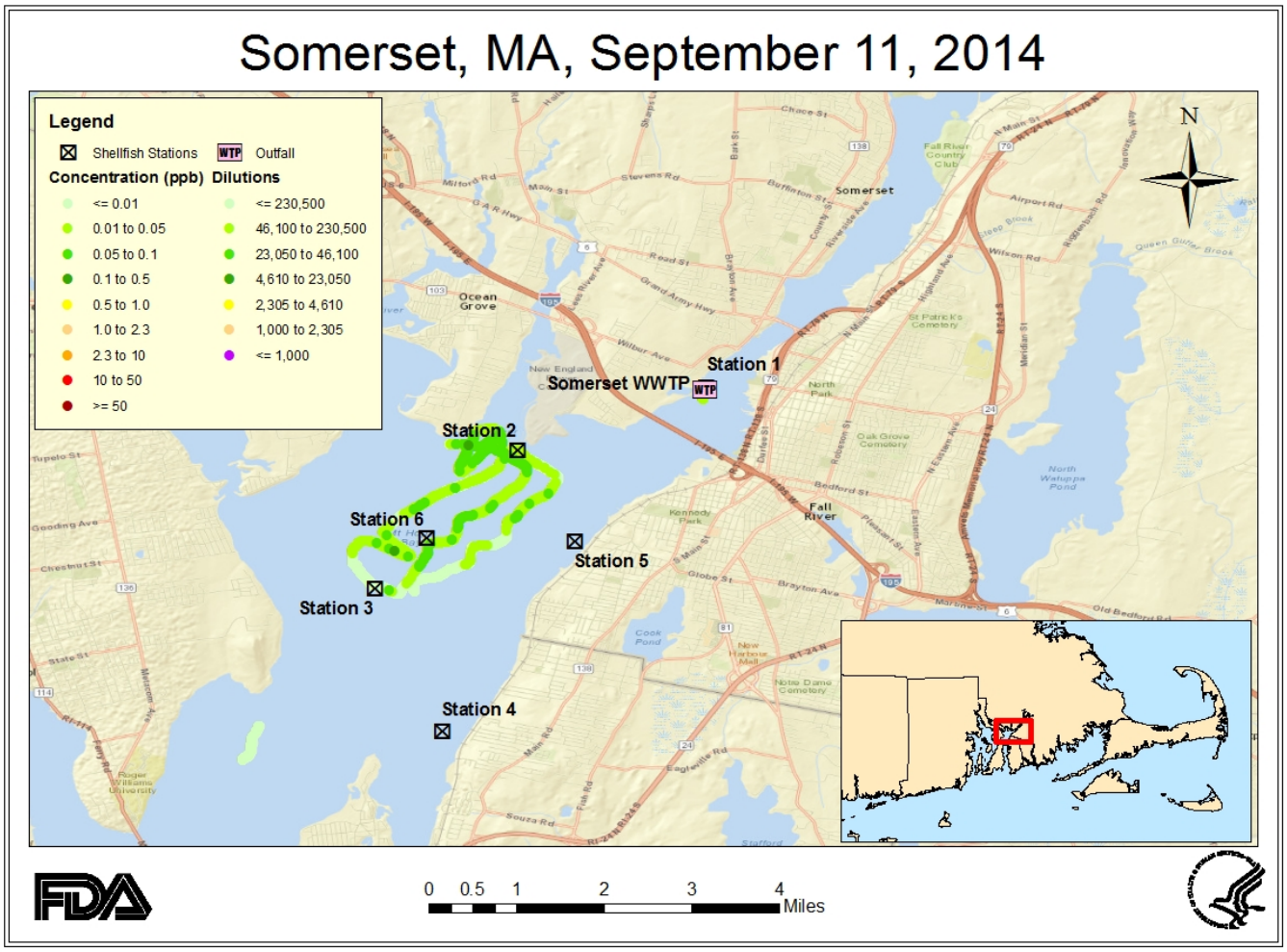


Figure 8: Accumulated Dilutions and Shellfish Classification Areas for MA

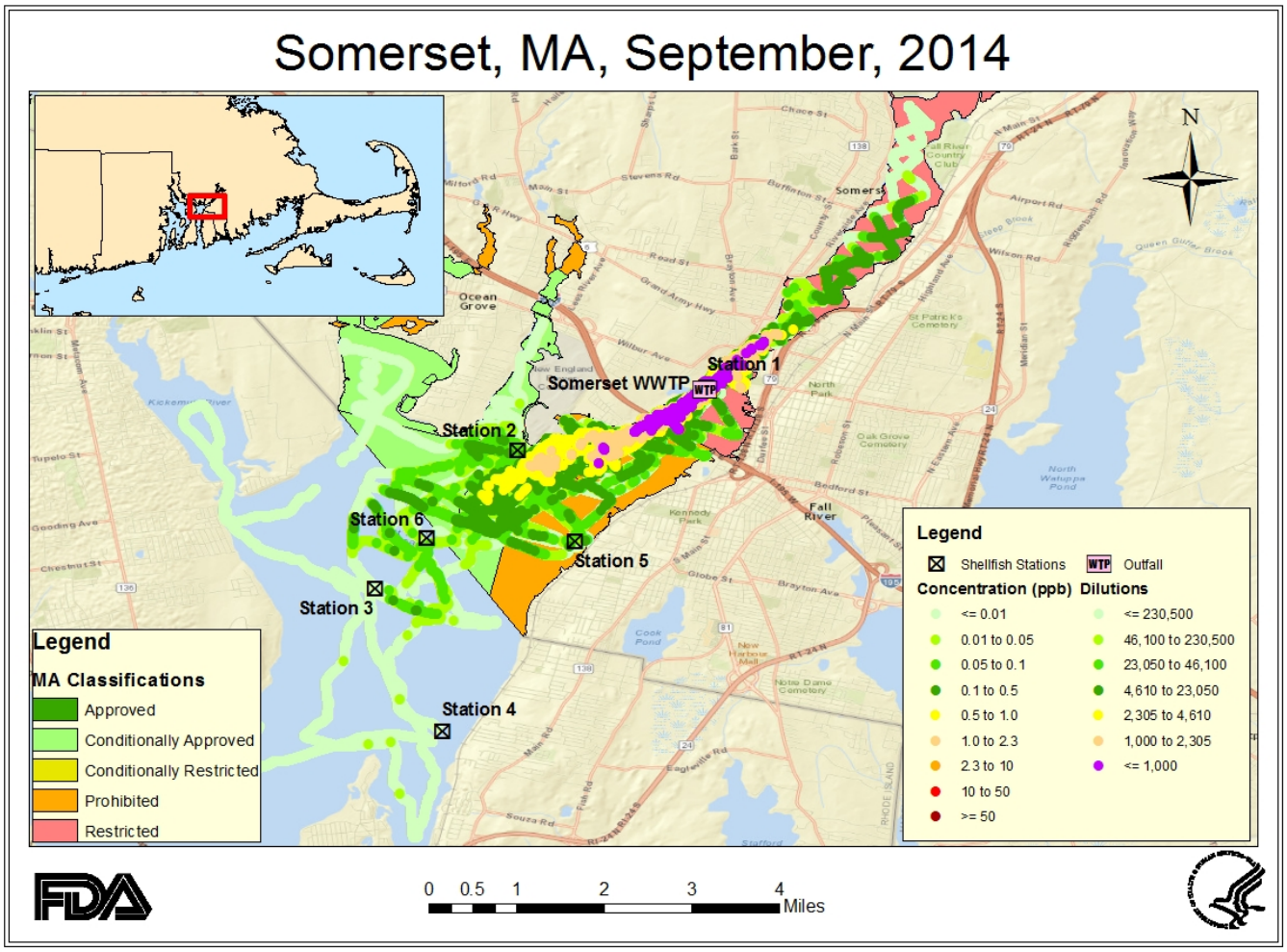


Figure 9: Accumulated Dilutions and Shellfish Classification Areas for RI

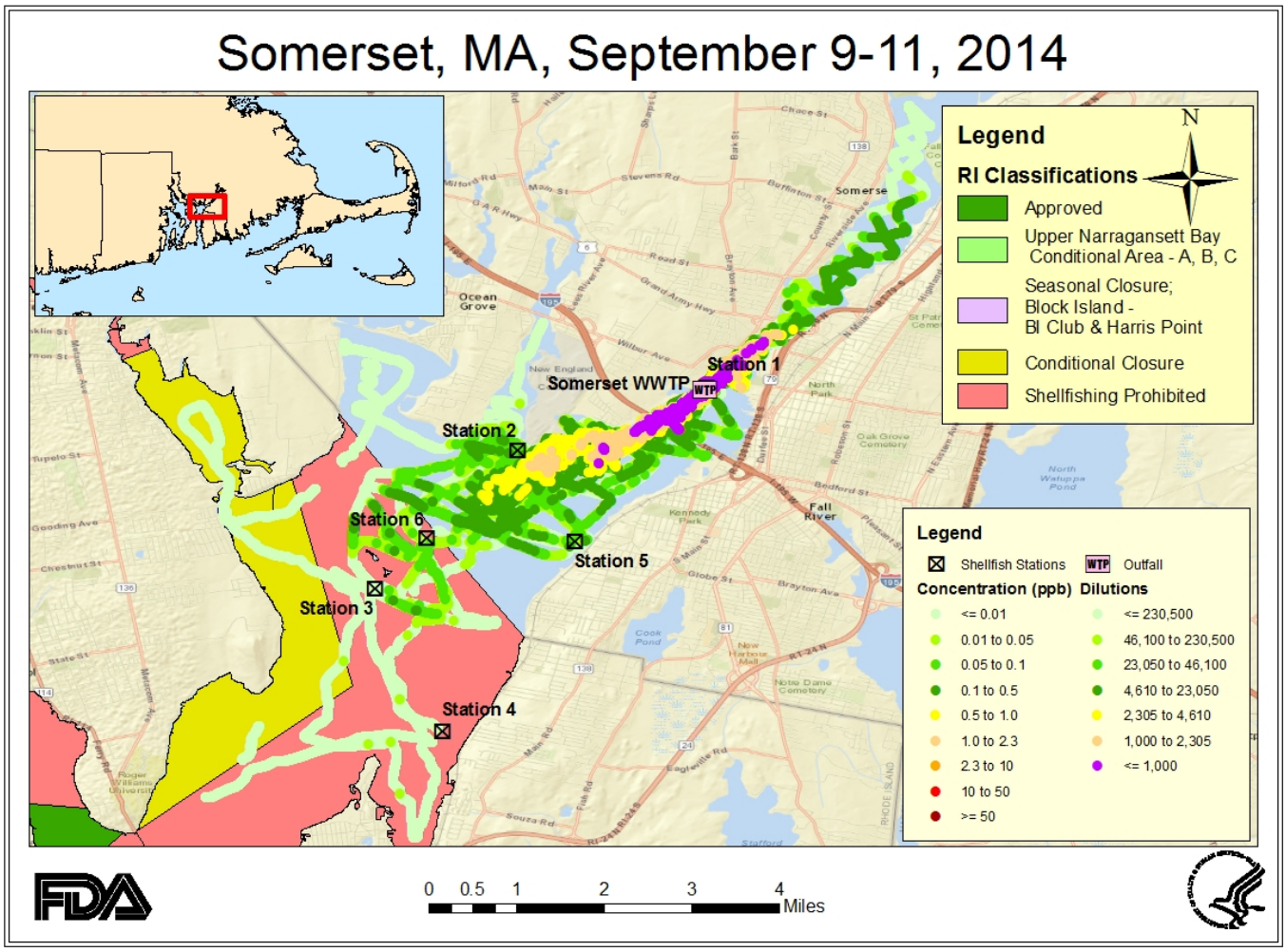


Figure 10: Station 1 Wet Labs 2219 Data

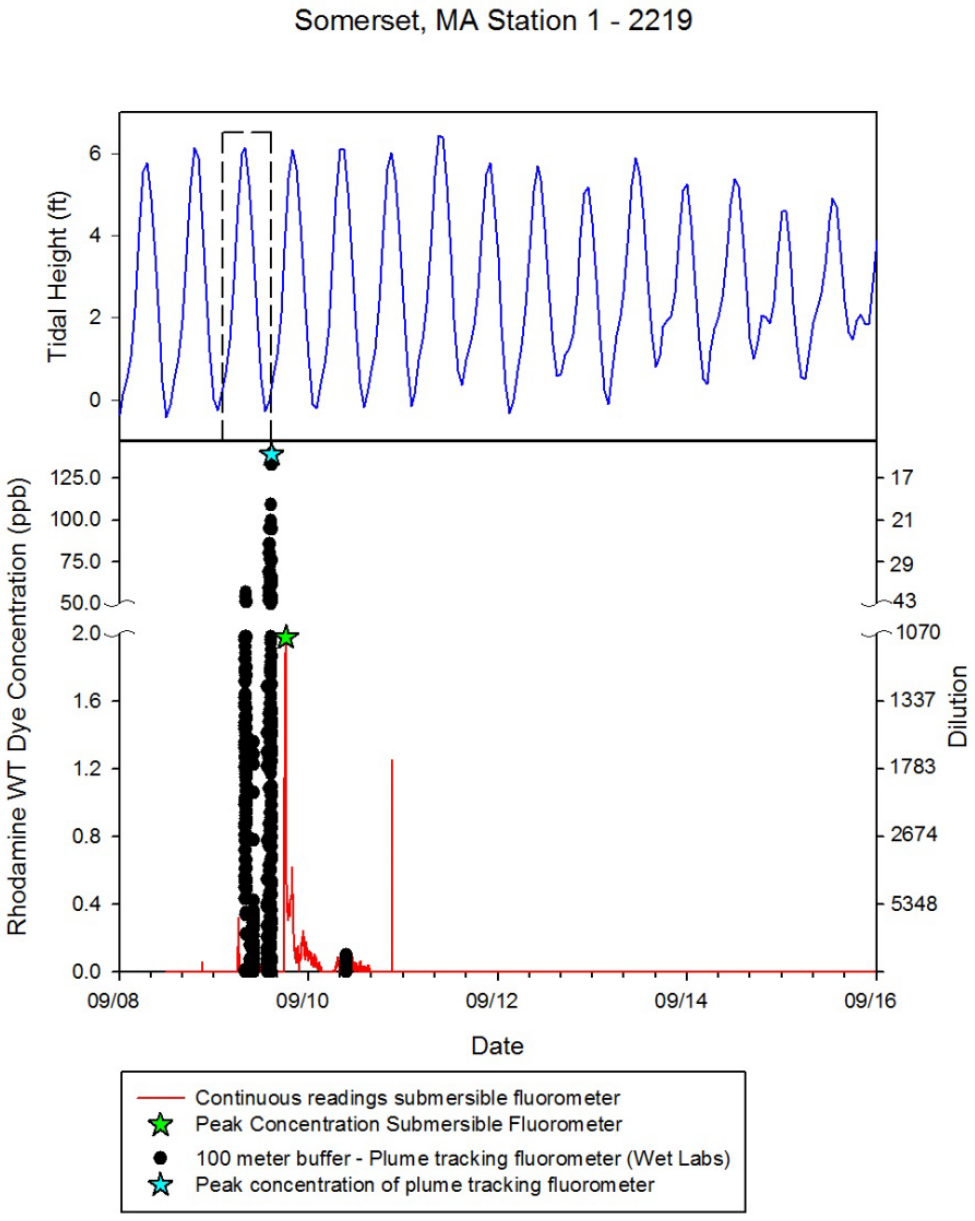


Figure 11: Station 2 Wet Labs 2153 Data

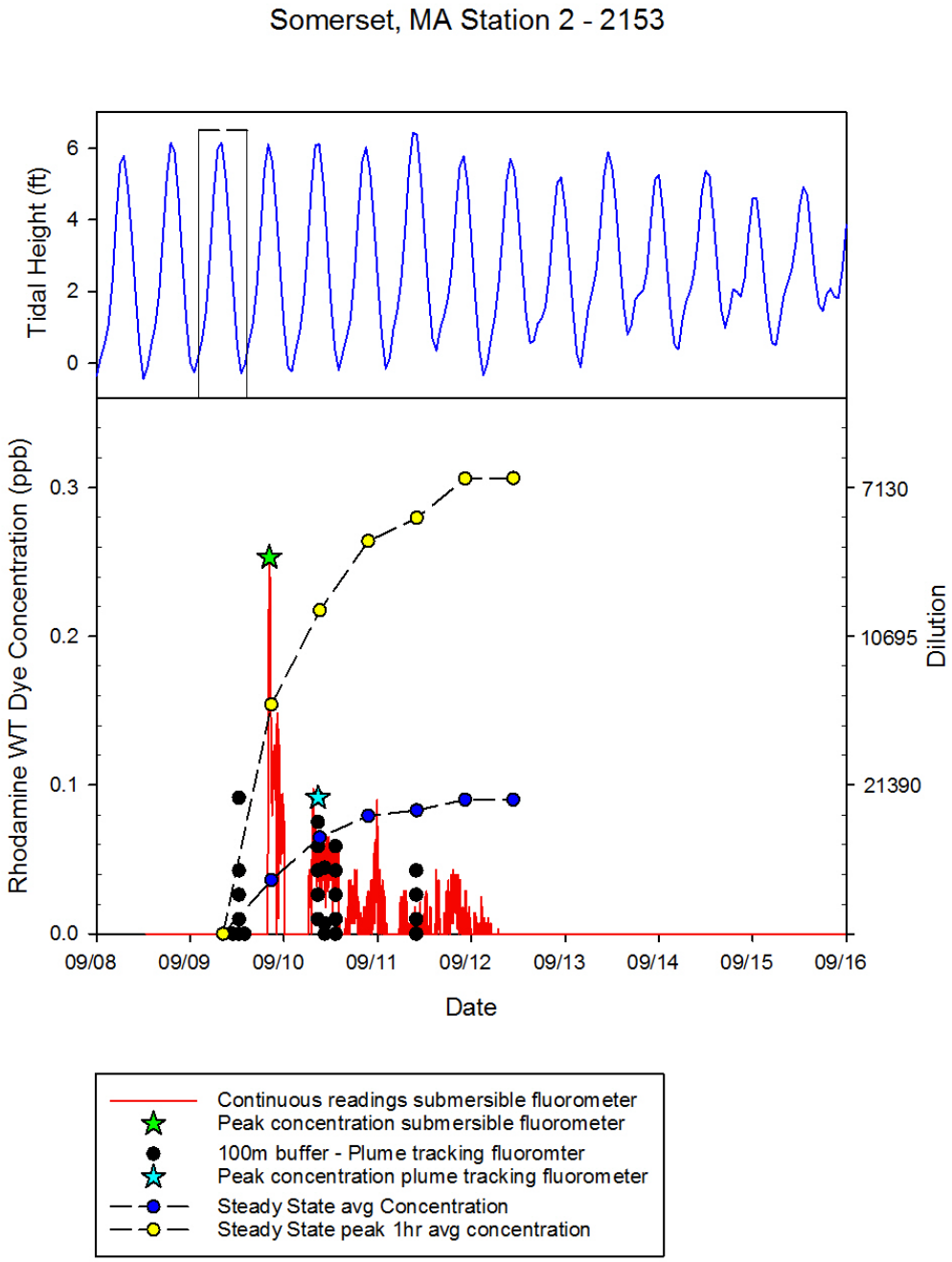


Figure 12: Station 3 Wet Labs 2032 Data

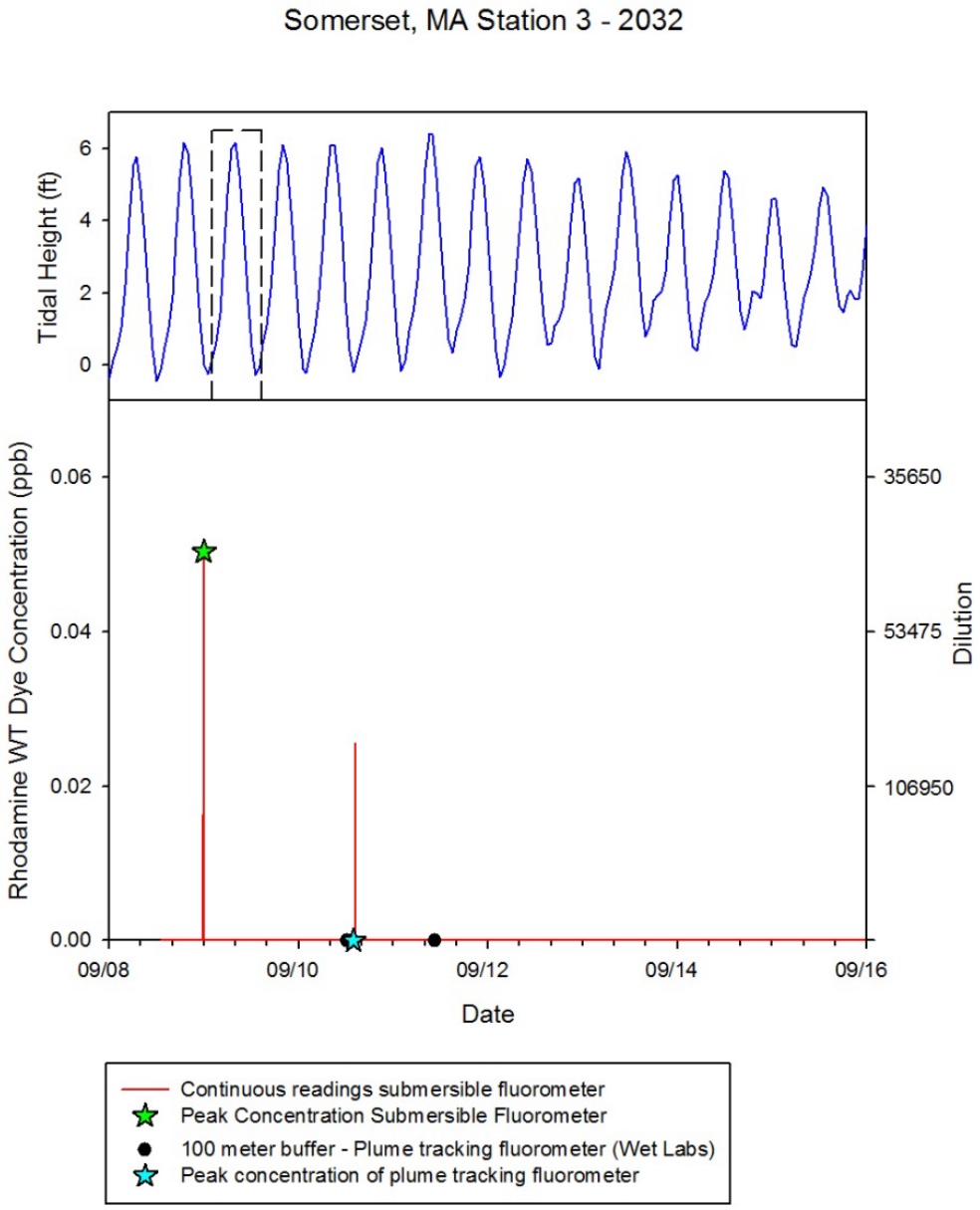


Figure 13: Station 4 Wet Labs 1730 Data

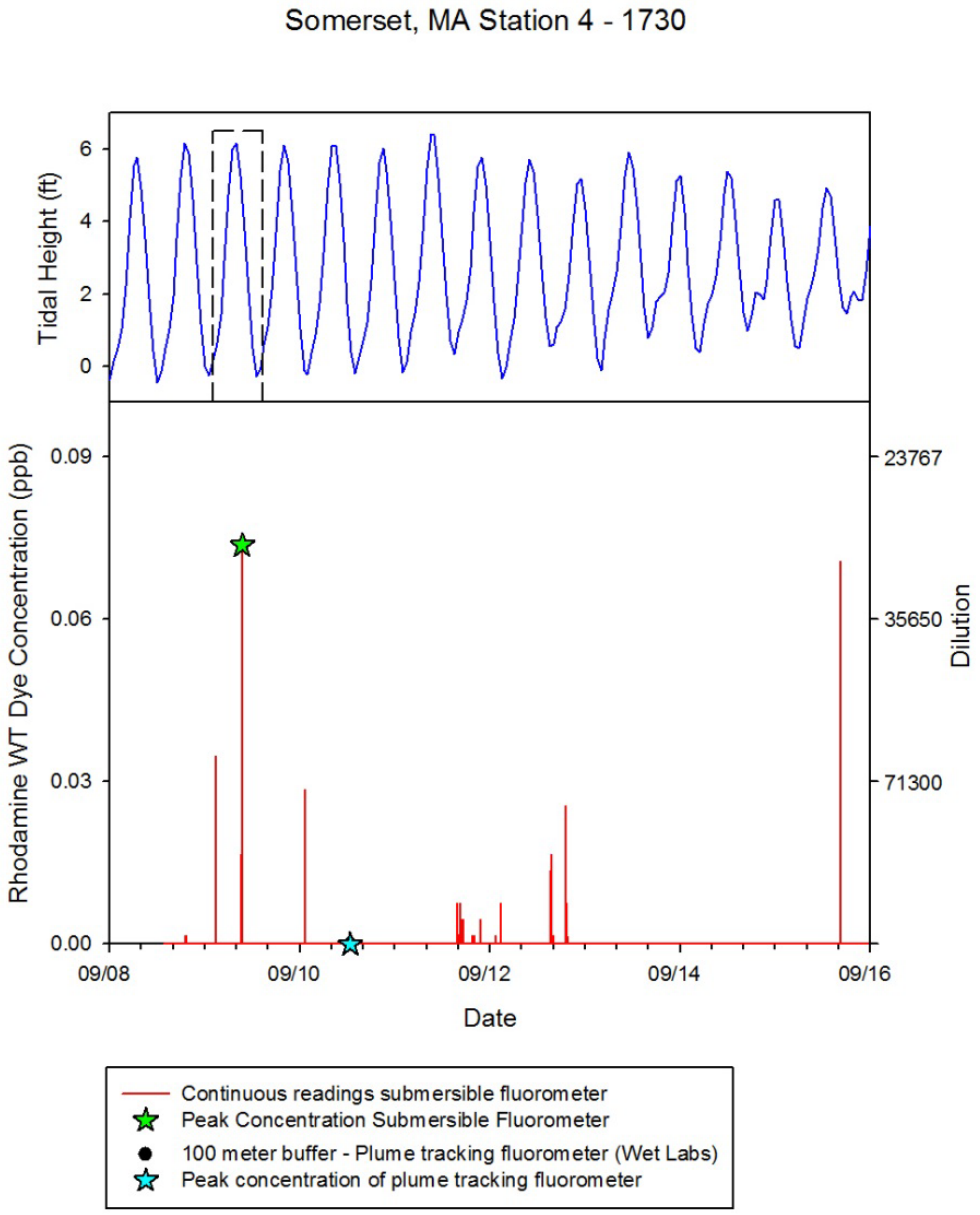


Figure 14: Station 5 Wet Labs 915 Data

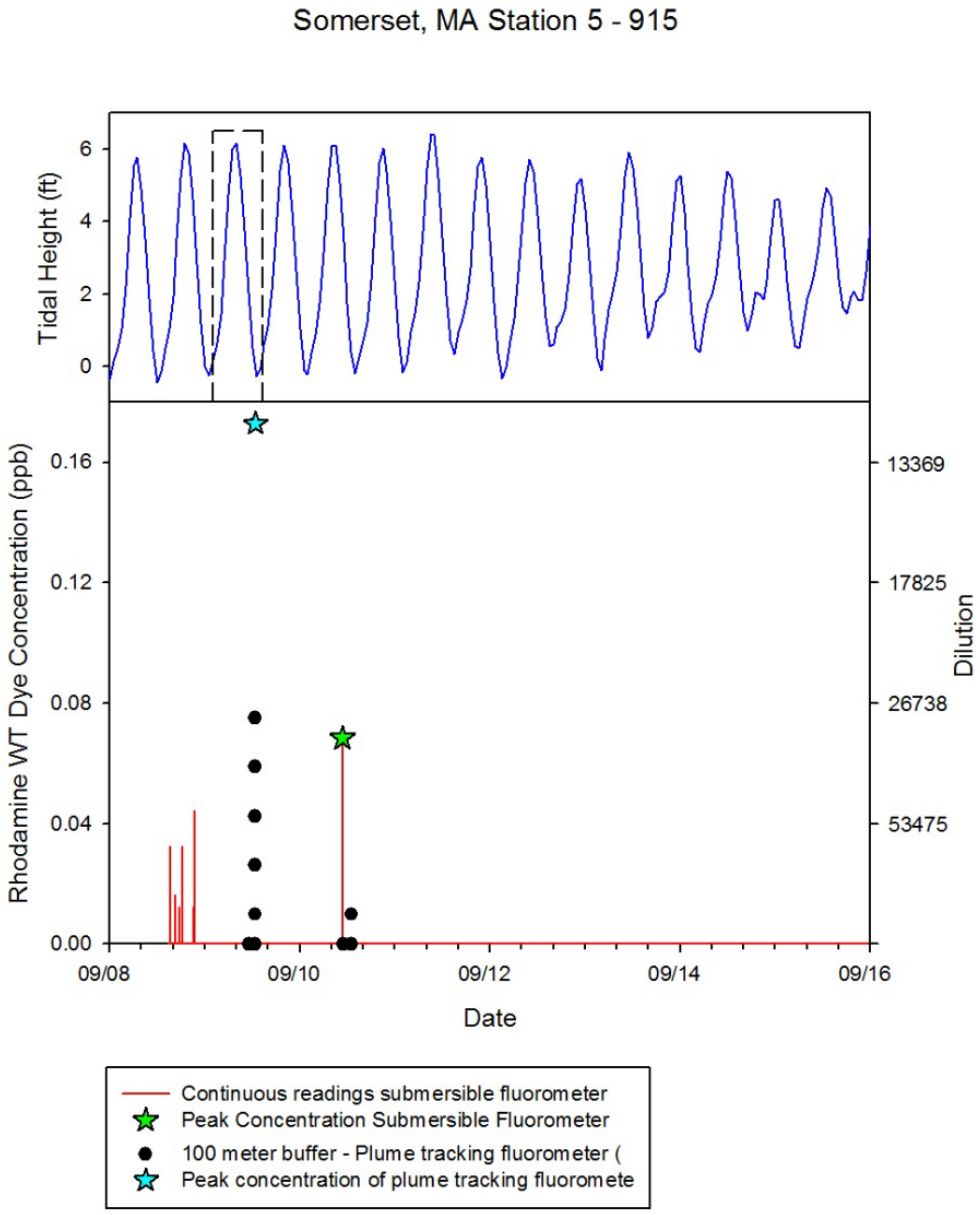


Figure 15: Salinity, Temperature, Rhodamine WT Concentration and Depth Profile

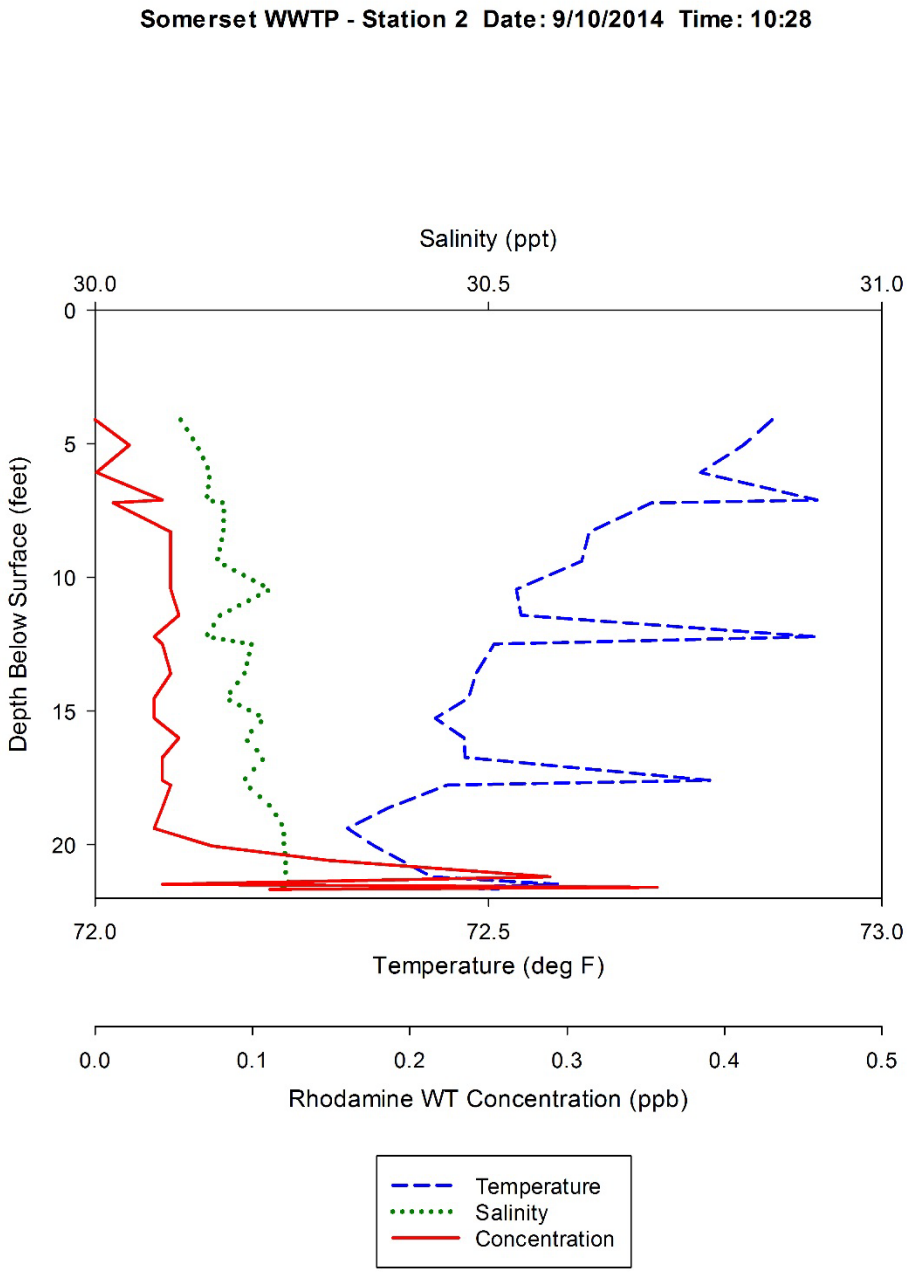


Figure 16: Results Projected for a 4.2 MGD Flow (NPDES Permitted Monthly Flow Rate) - MA

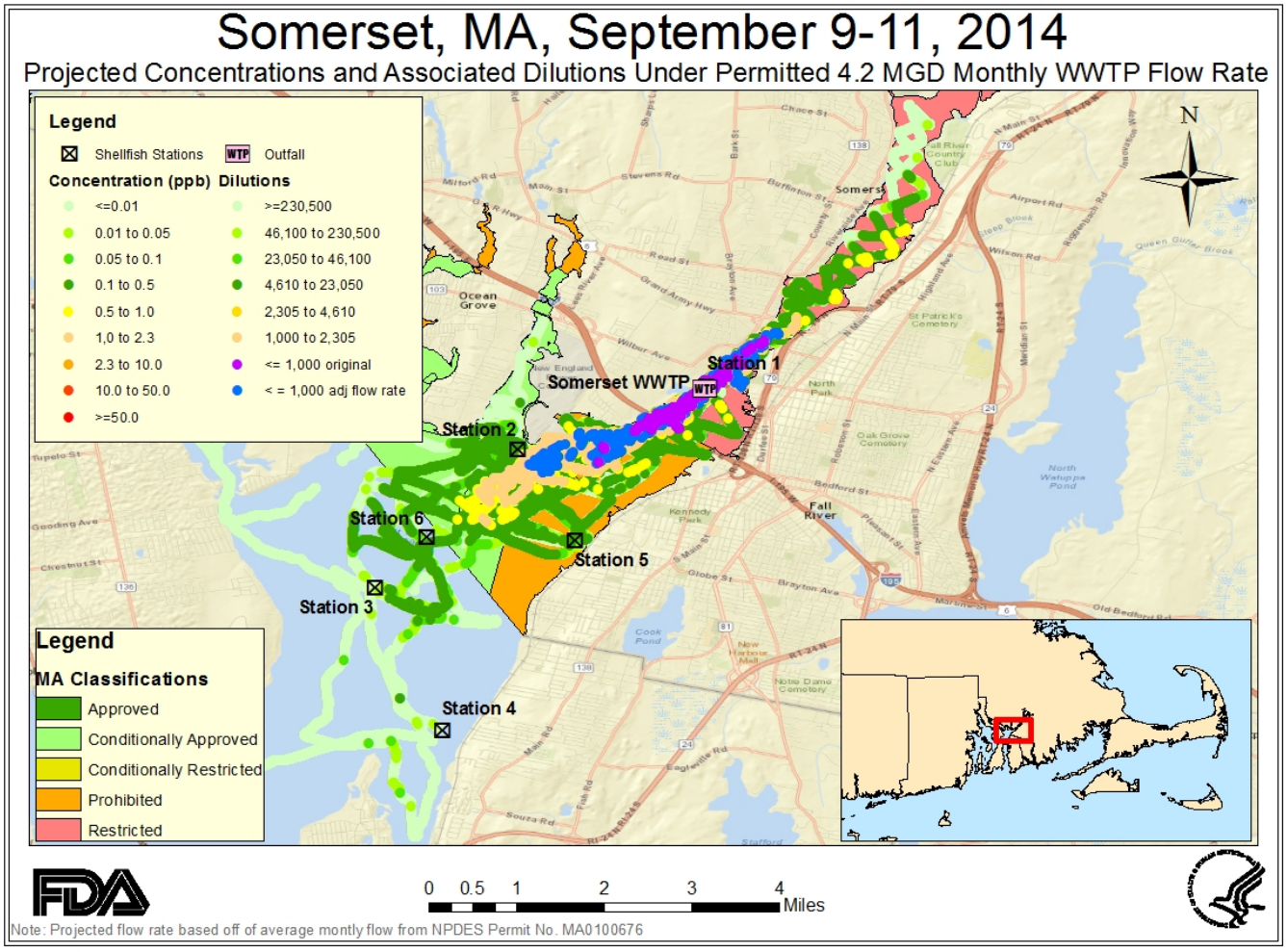


Figure 17: Results Projected for a 4.2 MGD Flow (NPDES Permitted Monthly Flow Rate) – RI

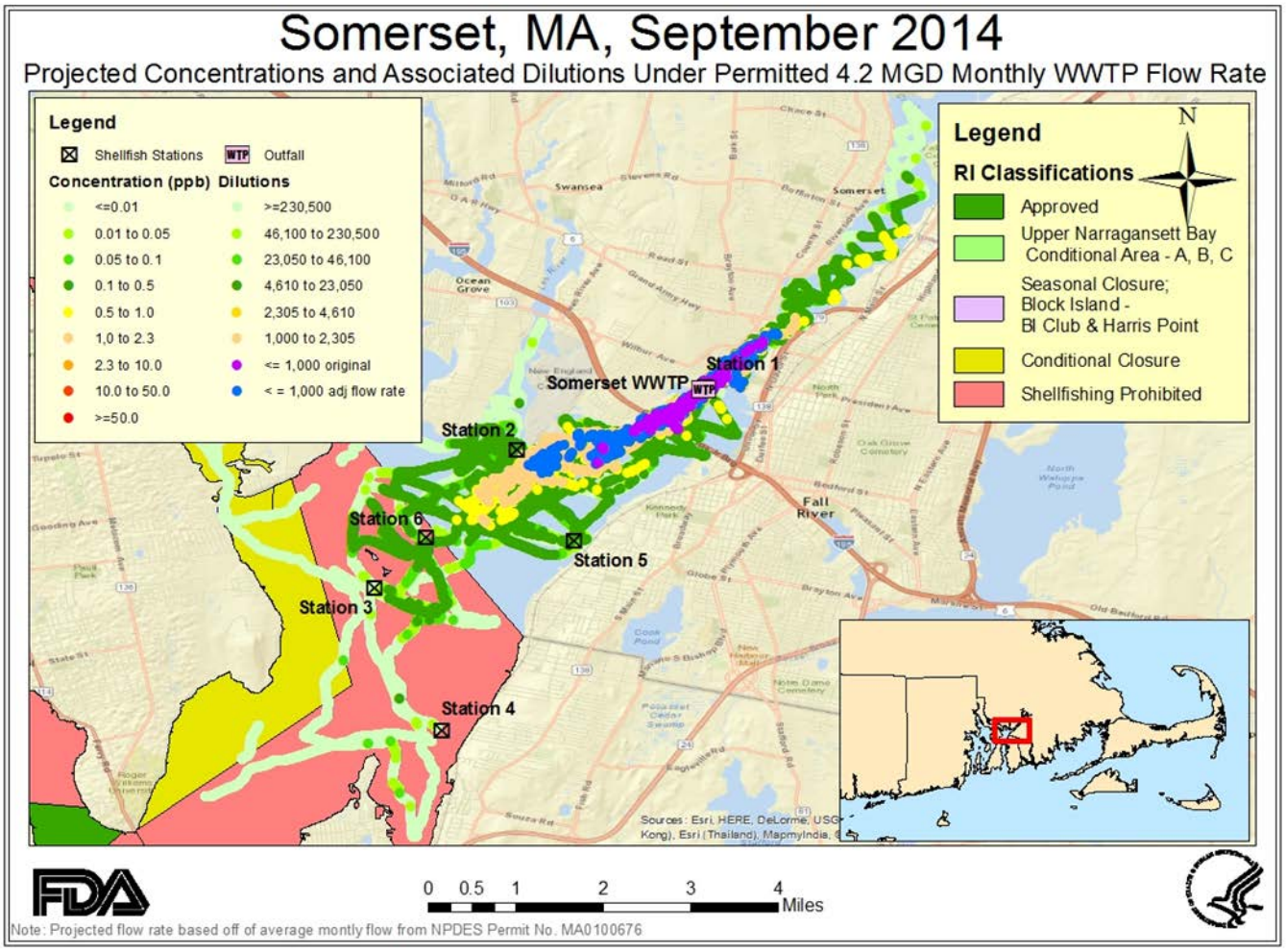


Figure 18: Dilution of Dye Tagged Effluent vs Distance

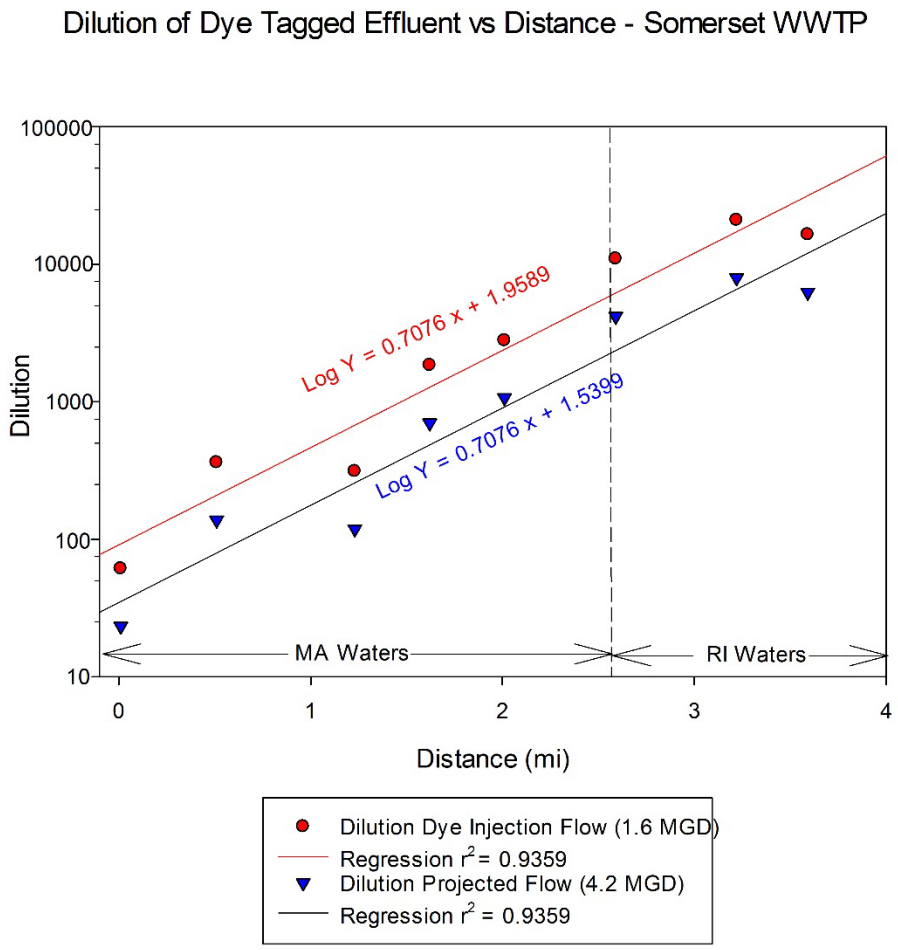


Figure 19: Levels of MSC in Sentinel Shellfish Stations – Somerset Study September 2014

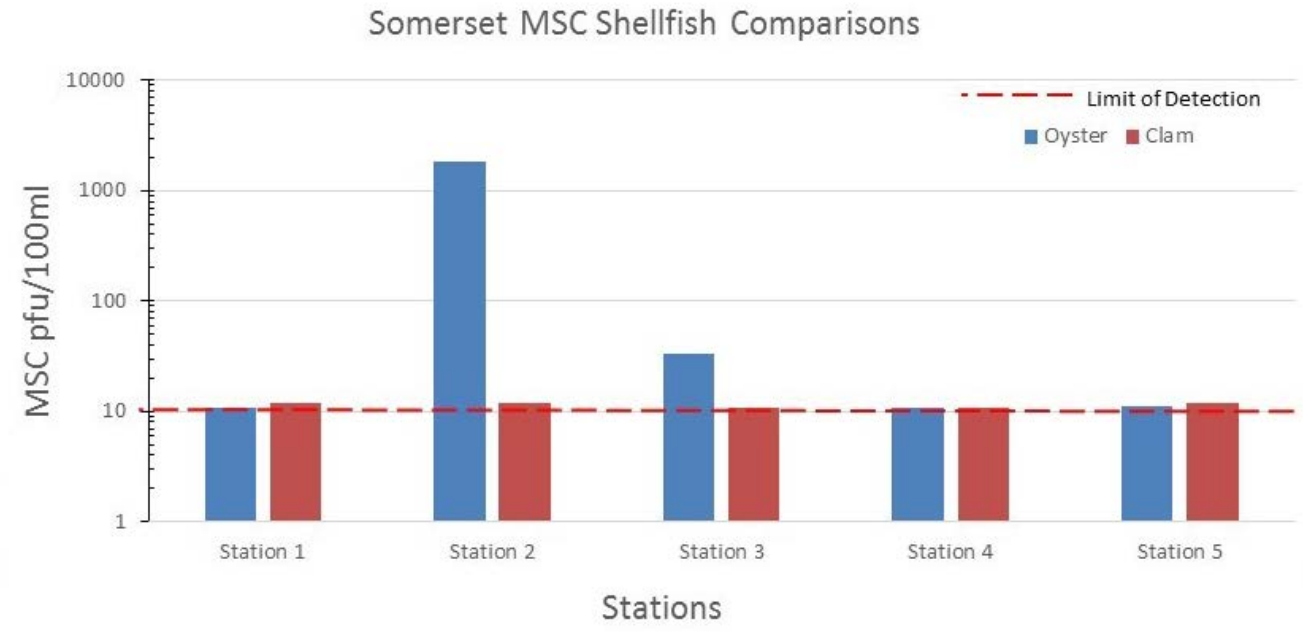
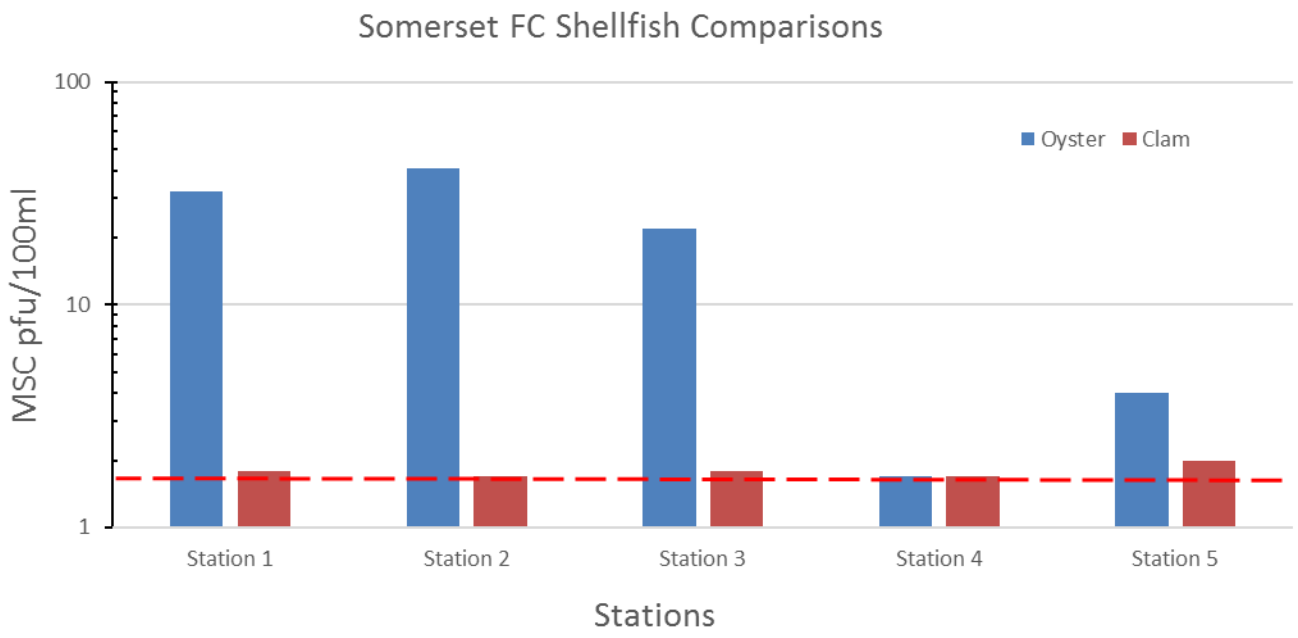


Figure 20: Levels of FC in Sentinel Shellfish Stations – Somerset Study September 2014



APPENDIX 3

Table 1: Sentinel Shellfish Results – Somerset WWTP Study – September 2014

Site	Date	type	MSC/ 100g	FC/ 100g	EC/ 100 g
Station 1 Oyster	9/26/2014	Oyster	<11	32.0	6.8
Station 1 Clam	9/26/2014	Clam	12	1.8	<1.8
Station 2 Oyster	9/26/2014	Oyster	1844	41.0	41.0
Station 2 Clam	9/26/2014	Clam	12	<1.8	<1.8
Station 3 Oyster	9/26/2014	Oyster	33	22.0	17.0
Station 3 Clam	9/26/2014	Clam	<11	1.8	<1.8
Station 4 Oyster	9/26/2014	Oyster	<11	<1.8	<1.8
Station 4 Clam	9/26/2014	Clam	<11	<1.8	<1.8
Station 5 Oyster	9/26/2014	Oyster	11	4.0	4.0
Station 5 Clam	9/26/2014	Clam	<12	2.0	<1.8

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.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1 (EPA)
WATER DIVISION
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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: December 22, 2023 to February 5, 2024

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Somerset Board of Water & Sewer Commissioners
116 Walker Street
Somerset, MA 02725

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Town of Somerset
Water Pollution Control Facility
116 Walker Street
Somerset, MA 02725

RECEIVING WATER AND CLASSIFICATION: Taunton River (Class SB)

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 Somerset WPCF, which discharges treated domestic and industrial wastewater. Sludge from this facility is transported to the Synagro facility in Woonsocket, 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 (06-4)
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 **February 5, 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