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"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§ 26-53),

Town of Marion
Department of Public Works

is authorized to discharge from the facility located at

Marion Water Pollution Control Facility (WPCF)
50 Benson Brook Road
Marion, MA 02738

to receiving water named

Unnamed Brook to Aucoot Cove

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.**

This permit expires at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on September 29, 2006 and modified on May 22, 2007.

This permit consists of 15 pages in Part I including effluent limitations and monitoring requirements, 25 pages in Part II including NPDES Part II Standard Conditions, Attachment A (USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013, 7 pages), and Attachment B (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages).

Signed this 13th day of April, 2017

Arthur V. Johnson, III, Acting Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

Douglas E. Fine, Assistant Commissioner
Bureau of Water Resources
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001** to Aucoot Cove. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS					MONITORING REQUIREMENTS [3]	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
FLOW[2]	*********	*********	0.588 MGD	*********	Report MGD	CONTINUOUS	RECORDER
FLOW[2]	*********	*********	Report MGD	*********	*********	CONTINUOUS	RECORDER
BOD_5 [4]	42 lbs/Day	63 lbs/Day	9 mg/L	13 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE[5]
TSS [4]	42 lbs/Day	63 lbs/Day	9 mg/L	13 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE
pH RANGE[1]	6.5 - 8.3 SU (SEE PERMIT PARAGRAPH I.A.1.b.)					1/DAY	GRAB
FECAL COLIFORM [1,6]	*********	**********	14 cfu/100 mL	*********	28 cfu/100 mL	2/WEEK	GRAB
ENTEROCOCCI [1,6]			35 cfu/100 mL		276 cfu/100 mL	2/WEEK	GRAB
DISSOLVED OXYGEN (June 1st - October 31st)	NOT LESS THAN 5.0 mg/l					1/WEEK	GRAB
WHOLE EFFLUENT TOXICITY [11, 12, 13, 14] Total Cadmium Total Lead Total Copper Total Zinc Total Nickel Total Aluminum	Acute $LC_{50} \geq 100\%$ Chronic C-NOEC ≥ 100% Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L					4/YEAR	24-HOUR COMPOSITE

CONTINUED FROM PREVIOUS PAGE

EFFLUENT CHARACTERISTIC	**EFFLUENT LIMITS**			**MONITORING REQUIREMENTS[3]**	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE MONTHLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
AMMONIA-NITROGEN (May 1 – May 31)	12.75 lbs/day	2.6 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE
AMMONIA-NITROGEN (June 1 – October 31)	8.53 lbs/day	1.74 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE
AMMONIA-NITROGEN (November 1 – April 30)	Report lbs/day	Report mg/L	Report mg/L	1/MONTH	24-HOUR COMPOSITE
TOTAL NITROGEN[7] (April 1 – October 31) TOTAL KJELDAHL NITROGEN TOTAL NITRITE + NITRATE	19.6 lbs/day Report lbs/day Report lbs/day	4.0 mg/L Report mg/L Report mg/L	Report mg/L Report mg/L Report mg/L	3/WEEK	24-HOUR COMPOSITE
TOTAL NITROGEN[8] (November 1 – March 31) TOTAL KJELDAHL NITROGEN TOTAL NITRITE + NITRATE	Report lbs/day Report lbs/day Report lbs/day	Report lbs/day Report lbs/day Report lbs/day	Report mg/L Report lbs/day Report lbs/day	1/MONTH	24-HOUR COMPOSITE
TOTAL PHOSPHORUS[9] (April 1 – October 31) (November 1 – March 31)	 0.98 lbs/day Report lbs/day	 200 µg/L Report mg/L	 Report µg/L Report mg/L	 1/WEEK 1/MONTH	24-HOUR COMPOSITE
TOTAL COPPER[10]	******	7.7 µg/L	11.3 µg/L	1/WEEK	24-HOUR COMPOSITE

Sampling Location: Effluent samples are required to be collected following disinfection by the UV unit.

Footnotes:

1. Required for State Certification.

2. Report annual average, monthly average, and the maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value 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.

3. Effluent sampling shall be of the discharge and shall be collected at the point specified on page 3. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

   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 in correspondence appended to the applicable discharge monitoring report.

   All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136.

4. Sampling required for influent and effluent.

5. 24-hour composite samples will consist 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 proportionally to flow.

6. The monthly average limits for fecal coliform and Enterococci are expressed as a geometric mean. The permittee shall comply with the fecal coliform and Enterococci limits in accordance with the schedule contained in Section I. F. Between the effective date of the permit and 12 months following the effective date, the permittee shall comply with an average monthly limitation for fecal coliform of 14 cfu/100 ml and a maximum daily limitation for fecal coliform of 43 cfu/100 ml.

7. The first value for the seasonal average will be reported after an entire May – October period has elapsed following the effective date of the permit (results do not have to be from the same year). For example, if the permit becomes effective on December 1, 2016, the permittee will calculate the first seasonal average from samples collected during the months of May through October 2017, and report this average on the October 2017 DMR. For each subsequent month that the seasonal limit is in effect, the seasonal average shall be calculated using samples from that month and the previous five months that the limit was in effect

8. The permittee shall operate the treatment facility to reduce the discharge of total nitrogen during the months of November to March to the maximum extent possible. 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. The addition of a carbon source that may be necessary to meet the total nitrogen limit during the months of April to October is not required during the months of November to March.

9. The permittee shall comply with the 200 μg/L total phosphorus limit or move the outfall to Aucoot Cove in accordance with the schedule contained in Section I. F. Between the effective date of the permit and 42 months following the effective date, the permittee must report total phosphorus.

10. The minimum level (ML) for copper is defined as 3 μg/L. This value is the minimum level for copper using the Furnace Atomic Absorption analytical method (EPA Method 220.2). This method or other EPA-approved method with an equivalent or lower ML shall be used for effluent limitations less than 3 μg/L. Compliance/non-compliance will be determined based on the ML. Sampling results of 3 μg/L or less shall be reported as zero on the Discharge Monitoring Report.

11. The permittee shall conduct chronic (and modified acute) toxicity tests *four* times per year. The chronic test may be used to calculate the acute LC_{50} at the 48-hour exposure interval. The permittee shall test the daphnid, *Ceriodaphnia dubia.* Toxicity test samples shall be collected during a designated week in the months of February, May, August, and November. The week of sampling (e.g. 1st week of the month) must be the same for all WET tests. The test results shall be submitted by the last day of the month following the completion of the test. The results are due March 31st, June 30th, September 30th, and December 31st, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

Test Dates during	**Submit Results By:**	**Test Species**	**Acute Limit LC_{50}**	**Chronic Limit C-NOEC**
February May August November	March 31st June 30th September 30th December 31st	Ceriodaphnia dubia (daphnid)	≥ 100%	≥ 100%

12. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

13. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction, based on a statistically significant difference from dilution control, at a specific time of observation as determined from hypothesis testing. As described in the EPA WET Method Manual EPA 821-R-02-013, Section 10.2.6.2, all test results are to be reviewed and reported in accordance with EPA guidance on the evaluation of the concentration-response relationship. The 100% or greater" limit is defined as a sample which is composed of 100% (or greater) effluent, the remainder being dilution water.

14. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test**

Procedure and Protocol) **Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance, which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of *NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs)*, which may be found on the EPA Region I web site at http://www.epa.gov/Region1/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

Part I.A.1. (Continued)

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

b. The pH of the effluent shall not be less than 6.5 or greater than 8.3 at any time.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.

e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.

f. The results of sampling for any parameter done in accordance with EPA approved methods above its required frequency must also be reported.

g. Use of chlorine is prohibited for disinfection. Any chlorine solutions used to clean disc filters or other treatment components must be dechlorinated to nontoxic levels and fully treated by the WPCF.

h. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow [1.2 MGD], the permittee will submit a report to MassDEP by **March 31**st of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions. The permittee is not required to submit this report to EPA.

2. All POTWs must provide adequate notice to the Director of the following:

   a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; 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.

3. Prohibitions Concerning Interference and Pass Through:

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

4. Toxics Control

a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.

b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), 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.

B. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall(s) listed in Part I A.1.of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported to EPA and MassDEP in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall follow the General Requirements of Part II and the following terms and conditions. The permittee is required to complete the following activities for the collection system which it owns:

1. 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 Collection System O & M Plan required pursuant to Section C.5. below.

2. 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 Collection System O & M Plan required pursuant to Section C.5. below.

3. 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. In addition to being required by federal regulations, this is also a state certification requirement. Plans and programs to control I/I shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

4. Collection 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 (see page 1 of this permit for the effective date). The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up to date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

   a. All sanitary sewer lines and related manholes;
   b. All combined sewer lines, related manholes, and catch basins;
   c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);
   d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;
   e. All pump stations and force mains;
   f. The wastewater treatment facility(ies);
   g. All surface waters (labeled);
   h. Other major appurtenances such as inverted siphons and air release valves;
   i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j. The scale and a north arrow; and

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

5. Collection System Operation and Maintenance Plan

The permittee shall develop and implement a Collection System Operation and Maintenance Plan.

a. **Within six (6) months of the effective date of the permit**, the permittee shall submit to EPA and MassDEP

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

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

(3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.8. below.

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

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;

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

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

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

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

(6) 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; and

(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.

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

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and MassDEP annually by **April 15**. 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. If treatment plant flow has reached 80% of its design flow [0.47 MGD] based on the annual average flow during the reporting year, or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
f. 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.

7. 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[1] it owns and operates.

D. 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 Part 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to Section 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

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1 As defined at 40 CFR §122.2, which references the definition at 40 CFR §403.3

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. For the purposes of this permit, the placement of sludge in unlined lagoons constitutes sludge disposal and is therefore subject to the requirements of Part 503 for sludge disposal.

6. The 40 CFR § 503 requirements including 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 C.F.R. § 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.[2]

7. 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

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.

8. 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.

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2 This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf

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 Part 503 Subpart B.

9. 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 "Monitoring and Reporting" section below).

E. SPECIAL CONDITIONS RELATED TO LAGOON OPERATIONS

The following requirements pertain to the use and operation of the three unlined facultative sewage lagoons on the site for sludge disposal and storage of wastewater.

In accordance with federal regulations, the permittee shall cease the placement, storage, and disposal of sludge and other treatment related solids in unlined lagoons, cease the use of the unlined lagoons for storage of wastewater, and remove sludge solids currently in the lagoons, in accordance with state and federal regulations. These requirements shall be met in accordance with the schedule in Section F below.

F. COMPLIANCE SCHEDULE

To comply with the fecal coliform, Enterococci, and total phosphorus permit limits and the Operation and Maintenance requirements relative to the unlined lagoons, as well as to ensure that the discharge from outfall 001 does not cause or contribute to exceedances of surface water quality standards, the Permittee shall take the following actions:

1. Within twelve (12) months of the effective date of the permit, the Permittee shall comply with the fecal coliform and Enterococci limits. In the interim, the permittee shall comply with an average monthly limitation for fecal coliform of 14 cfu/100 ml and a maximum daily limitation for fecal coliform of 43 cfu/100 ml.

2. Within twelve (12) months of the effective date of the permit, the Permittee shall submit a plan for achieving compliance with the lagoon related permit requirements. The plan shall include specific tasks to be completed, including time frames for completing the tasks, which is consistent with achieving full compliance with the lagoon related permit requirements as soon as possible but no later than forty-eight (48) months from the effective date of the permit.

3. Within twelve (12) months of the effective date of the permit, the Permittee shall submit an alternatives analysis/facility plan to EPA for the treatment and/or pollution prevention improvements required to achieve the total phosphorus limit of 200 µg/L or relocation of the outfall to Aucoot Cove.

4. Within twenty-four (24) months of the effective date of the permit, the Permittee shall complete design and initiate construction of improvements necessary for complying with the total phosphorus limit of 200 µg/L or relocation of the outfall to Aucoot Cove.

5. Within twenty-four (24) months and thirty-six (36) months of the effective date of the permit, the Permittee shall submit progress reports relative to achieving compliance with the lagoon related requirements of the permit.

6. Within forty-two (42) months of the effective date of the permit, the Permittee shall comply with the total phosphorus limit of 200 µg/L or relocation of the outfall to Aucoot Cove.

7. Within forty-eight (48) months of the effective date of the permit, the Permittee shall cease the disposal of wastewater, sludge and other treatment related solids in unlined lagoons, and shall remove sludge solids currently in the lagoons, in compliance with state and federal regulations.

G. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the MassDEP within the time specified within the permit.

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 MassDEP no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP.

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. Permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. (See Part I.G.5. 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 15^{th} 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 particular 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") found on the internet at https://www.epa.gov/compliance/npdes-ereporting.

4. Submittal of Requests and Reports to EPA/OEP

The following requests, reports, and information described in this permit shall be submitted to the EPA/OEP NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

A. Transfer of Permit notice
B. Request for changes in sampling location
C. Request for reduction in testing frequency
D. Request for Reduction in WET Testing Requirement
E. Report on unacceptable dilution water / request for alternative dilution water for WET testing
F. Notification of proposal to add or replace chemicals and bio-remedial agents including microbes

These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP NPDES Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

5. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to EPA.

A. Written notifications required under Part II
B. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting

This information shall be submitted to EPA/OES at the following address:

U.S. Environmental Protection Agency
Office or Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

6. State Reporting

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.G.3 and I.G.4 also shall be submitted to the State at the following addresses:

MassDEP – Southeast Region
Bureau of Water Resources
20 Riverside Drive
Lakeville, MA 02347

Copies of toxicity tests only shall be submitted to:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

7. Verbal Reports and Verbal Notifications

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 MassDEP. This includes verbal reports and notifications which require reporting within 24 hours. (As examples, see Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.) Verbal reports and verbal notifications shall be made to EPA's Office of Environmental Stewardship at:

U.S. Environmental Protection Agency
Office of Environmental Stewardship
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912
617-918-1510

H. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. Each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as a NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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PART II. 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) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the 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, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements 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.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete "Duty to Comply" regulations.

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 notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator 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 Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. 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).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

a. In accordance with 40 CFR 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 CFR 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 as defined in 40 CFR §2.302(a)(2).

c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §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.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, 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 Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. 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 and with the requirements of storm water pollution prevention plans. 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 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 be reasonably 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 provision of Paragraphs B.4.c. and 4.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.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

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

(2) 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

(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.

ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. <u>Upset</u>

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;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(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.

PART II. 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 for 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 five years (or longer as required by 40 CFR Part 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 except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator 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 results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. 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.

2. Inspection and Entry

The permittee shall allow the Regional Administrator 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 CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§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 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 Regional Administrator 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 Regional Administrator. The Regional Administrator 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 CWA. (See 40 CFR Part 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.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the 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 submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission 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.

(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 CFR §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 Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, 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.

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 Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §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 noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. 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 Regional Administrator. 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.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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 to, 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 and 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.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

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” measured during the calendar week divided by the number of “daily discharges” measured during the 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.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

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) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the 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.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard 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 (See "Point Source" definition).

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 Regional Administrator 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".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge 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 (CWA), 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 which is not a land application unit, surface impoundment, injection well, or waste pile.

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

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

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 tribe organization, or a designated and approved management agency under Section 208 of the CWA.

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 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 rig 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 Regional Administrator 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 Regional Administrator shall consider the factors specified in 40 CFR §§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 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).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

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

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 CFR §122.2).

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 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (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 any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

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

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

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

   (i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
   (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
   (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

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, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR 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 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, 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 EPCRA Section 313, 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 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 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 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

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 which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants 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 wastewater 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 wastewater 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 Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR 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 CFR Part 503.

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

Waters of the United States 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 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 the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration 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. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 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 sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

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

Industrial wastewater is wastewater generated in a commercial or industrial process.

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 with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

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.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

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

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is 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; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

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 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

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.

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

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

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

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. 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)	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
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
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)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". 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.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is 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.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL
USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

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

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

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 freshwater, 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 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 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.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

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. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

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.

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 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 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.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an 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 must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code OES04-4
Boston, MA 02109-3912

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 most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. 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.1. Use of Reference Toxicity Testing

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

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.

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.1.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 IC25 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.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids [6]	x		--
Total Dissolved Solids [6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon [6]	x	x	0.5
Total Metals [5]			
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
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  - -Method 2340B (hardness by calculation)
  - -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - -Method 4500-CL E Low Level Amperometric Titration
     - -Method 4500-CL G DPD Colorimetric Method
   - USEPA 1983. Manual of Methods Analysis of Water and Wastes
     - -Method 330.5
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

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-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . 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 endpoints reproduction and growth 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-02-013.

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 freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. 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-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. 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-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) 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 and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

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
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

ATTACHMENT B

USEPA REGION 1 FRESHWATER 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:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test 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:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

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 sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

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 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point 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. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

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 most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcement/water/dmr.html *for further important details on alternate dilution water substitution requests.*

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, *CERIODAPHNIA DUBIA* 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (°C)	20 ± 1°C or 25 ± 1°C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and *Selenastrum* to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q® or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	≥ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration	40
11.	Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	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
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

<u>LC50 Median Lethal Concentration (Determined at 48 Hours)</u>

Methods of Estimation:

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

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

<u>No Observed Acute Effect Level (NOAEL)</u>

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

RESPONSE TO COMMENTS
NPDES PERMIT NO. MA0100030
MARION WATER POLLUTION CONTROL FACILITY
MARION, MASSACHUSETTS

From December 3, 2014 through February 6, 2015, the U.S. Environmental Protection Agency Region 1 (EPA New England[1]) and the Massachusetts Department of Environmental Protection (MassDEP) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Marion Water Pollution Control Facility (WPCF) in Marion, MA.

EPA New England and MassDEP received comments from the Town of Marion, Buzzards Bay Coalition, and a group of citizens from Marion, MA. The following are responses by EPA New England to those comments and descriptions of any changes made to the public-noticed permit because of those comments.

Although EPA's knowledge of the facility has benefited from the various comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit. EPA did, however, make certain clarifications in response to comments. These improvements and changes are explained in this document and reflected in the final permit. A summary of the changes made in the final permit are listed starting on page 3. The analyses underlying these changes are explained in the responses to individual comments that follow.

A copy of the final permit and this response to comments document will be posted on the EPA Region 1 web site: http://www.epa.gov/region1/npdes/permits_listing_ma.html.

A copy of the final permit may also be obtained by writing or calling Robin Johnson, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1045.

On September 16, 2015; September 23, 2015; November 13, 2015; and November 21, 2016; the Town of Marion submitted to EPA "Supplemental comments" on the Draft Permit. The Buzzards Bay Coalition also submitted supplemental comments on December 10, 2015. These comments were submitted long after the close of the public comment period and are therefore not timely. Under applicable federal regulations, EPA is only required to respond to materials submitted during the public comment period. *See* 40 C.F.R. § 124.17(a)(2). "That is, within the interval of time between the beginning and end of the public comment period, not before, not after."[2] The

[1] EPA New England is also referred to in the text as "EPA."
[2] *In re Avon Custom Mixing Servs., Inc.*, 10 E.A.D. 700, 706 (EAB 2002); *see also In re City of Phoenix, Arizona Squaw Peak and Deer Valley Water Treatment Plants*, 9 E.A.D. 515, 524-31 (EAB 2000); *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 194 n.32 (EAB 2000) ("Permitting authorities are under no obligation to consider comments received after the close of the public comment period.").

Town had the opportunity to comment on the revised draft permit beyond the ordinary 30-day period required by regulation and submitted lengthy and voluminous comments on the permit (the Town's original comment document is over 3,700 pages including attachments). The "supplemental comments" relate generally to the subject matter of the Town's timely submitted comments.

Although these supplemental comments were submitted after the close of the public comment period, EPA has exercised its discretion to respond to them herein.

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Changes to the Permit

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- The dissolved oxygen monitoring frequency was changed from daily back to weekly, as it was in the previous permit. See Response 60.
- The starting date of the seasonal dissolved oxygen limit was changed from April 1st to June 1st, as originally intended. See Response 43.

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- The April through October total nitrogen limit was changed from 3.0 mg/L to 4.0 mg/L. See Response 20.
- The requirement to report separate nitrate and nitrite effluent concentrations was replaced with a requirement to report the combined nitrate and nitrite concentration. See Response 38.
- The nitrogen monitoring frequency for November through March was changed from once per week to once per month. See Response 59.
- The copper average monthly and maximum daily effluent limits were changed back to those of the current permit, which are 7.7 μg/L and 11.3 μg/L, respectively. See Response 49.
- The monitoring location for dissolved oxygen was changed from the point where the effluent enters the brook to following UV disinfection. See Response 60.
- The winter (November through March) total phosphorus limit of 1 mg/L was replaced with a monthly monitoring requirement. See Response 36.

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- A one-year compliance schedule has been added for the fecal coliform and Enterococci limits. In the interim, the permit includes an average monthly limitation for fecal coliform of 14 cfu/100 mL and a maximum daily limitation for fecal coliform of 43 cfu/100 mL. See Response 72.
- The total nitrogen compliance schedule language in Footnote 7 has been removed because the limit is now attainable for the WPCF based on current performance.
- Footnote 7 has been modified to indicate that the total nitrogen seasonal limit will be applied as a 6-month rolling average from April 1st through October 31st of each year. See Response 20.
- The interim phosphorus limit was changed from 1 mg/L to a reporting requirement. See Response 35.

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- Language was added to Footnote 9 indicating that the monthly average total phosphorus limit of 200 μg/L will not go into effect if the permittee moves its outfall to Aucoot Cove within 42 months of the effective date of the permit. See Response 1.

- The WET testing requirement for the fathead minnow (*Pimiphales promelas*) was removed from the final permit. See Response 45.
- The requirement to perform WET testing during the second week of the month was replaced by a requirement that the week of sampling (e.g. 1st week of the month) must be the same for all WET tests. See Response 46.
- Language allowing the permittee to request a reduction in WET testing frequency was removed because WET testing requirements were reduced elsewhere in the permit.

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- The prohibition against use of chlorine was clarified to indicate that chlorine may not be used in the treatment process. The permit now states that chlorine may be used to clean plant components, but that the cleaning water must be dechlorinated to nontoxic levels and fully treated by the WPCF. See Response 55.

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- Part I.F.9. has been updated to reflect electronic reporting requirements for sludge annual reports. The annual report due date has also changed from March 15 to February 19 to be consistent with other NPDES permits in Massachusetts.

- Part I.E., Special Conditions Related to Lagoon Operations, has been revised to clarify the intention of the special conditions. See Response 67.

- The final permit contains a revised compliance schedule. Specific changes include:
    - A 12-month compliance schedule for the fecal coliform and Enterococci limits was added.
    - The compliance schedule for nitrogen was removed, because the new 4.0 mg/L nitrogen limit is based on the current performance of the facility.
    - The option for the permittee to suggest and eliminate non-point sources of nitrogen to justify a less stringent nitrogen limit has been removed. See Response 20.
    - The deadline for compliance with the total phosphorus limit was changed from 24 to 42 months. See Response 34.
    - The deadline for compliance with the lagoon-related requirements was extended from 36 months to 48 months. See Response 70.

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- Part I.G.3., which pertained to the submittal of pretreatment reports, was removed from the final permit because the Town of Marion does not have a pretreatment program.

- Information relating to electronic submission of sludge annual reports was added to Part I.G.3.

Comments submitted February 6, 2015 by the Town of Marion

Comment 1. OPENING COMMENT/outfall relocation option

The United States Environmental Protection Agency (EPA) issued a draft National Pollution Discharge Elimination System (NPDES) permit to the Town of Marion (Town) for its water pollution control facility on November 28, 2014. The changes imposed within the Draft Permit are vast and, if left unchanged, will require a substantial, unprecedented and unwarranted revision to the Town's water pollution control facility (WPCF) liquid and solids processes. The Draft Permit would require significant upgrades to the existing facilities, which are less than 10 years old, and construction of new facilities to respond to the following conditions in the Draft Permit:

- Further reduction of already very low levels of total nitrogen in the effluent, which would only decrease the current WPCF's discharge of total nitrogen (TN) from an average of 3.46 mg/L to 3 mg/L.

- Reduction of total phosphorus (TP) in the effluent, which if done with chemical addition would create the need to handle and dispose of the chemical-laden sludge -- the byproduct of chemical use.

- Re-consideration of the use of the lagoons that are currently used as influent flow equalization and sludge treatment basins.

- Draining and lining the lagoons if they are going to continue to be part of the treatment facilities or making other provisions for influent equalization if they are not.

- Potentially disposing of existing biosolids in the lagoons at an offsite facility.

- Further reduction of copper concentrations in the effluent.

The Draft Permit, if left unchanged, would require a very significant capital improvements project for the treatment of the Town's wastewater. An initial engineering estimate of the capital cost of these improvement ranges from $20 million to over $30 million. The range reflects both use of different approaches to facilities needed to comply with permit requirements and assumptions about the ease and cost of implementation (especially offsite disposal costs for the existing biosolids if these need to be removed from the lagoons). The estimate does not include any costs to address the assumed, but undefined, groundwater contamination, nor do they include the operations and maintenance costs of the new facilities.

In addition to treatment facilities upgrades, the Draft Permit mandates the Town to comply with requirements for operating and maintaining the sewer collection system; Capacity, Management, Operations, and Maintenance (CMOM). It is estimated that approximately $400,000 would be needed to implement programs to meet the new CMOM requirements followed by a 10-year program compliance cost of about $1.2M.

As documented in the comments below, the Town disputes the both the legal and technical rationale for imposition of new requirements in the Draft Permit as provided in the Draft Permit and Fact Sheet. The Town believes these changes are unwarranted, with rationales based on flawed and unsupported analyses. The available scientific information confirms that no material change in plant growth or eelgrass extent would be expected to occur in response to the new restrictions the draft permit seeks to impose. Some statements contained in the Fact Sheet draw from a report prepared for the Buzzards Bay Coalition —a report that has been demonstrated to be fundamentally flawed—yet EPA used those same statements and calculations as part of the basis for the Draft Permit as if they were scientifically reliable, documented facts. The Draft Permit would also require abandonment of the current biosolids treatment process, which is the very definition of sustainable – as for over 40 years the WPCF's biosolids have been anaerobically digested onsite without the addition of any chemicals, excessive solids accumulation, or energy expenditures for sludge processing beyond the aeration system in the lagoons. EPA's action in this regard is unprecedented and beyond its statutory authority as EPA my not dictate plant design or regulate alleged groundwater impacts under the Clean Water Act. *See, e.g.*, *Iowa League of Cities v. EPA* (8th Cir. 2013).

Moreover, assuming that the proposed permit requirements were justified, the Town finds it problematic and objects to the fact that the Draft Permit envisions only one path forward for compliance with the new limits – as outlined in the Compliance Schedule - when several feasible options, not included in the Draft Permit, exist. In accordance with its responsibility to provide the sewer rate payers and citizens of Marion with cost-efficient wastewater services, the Town must have the time and ability to evaluate all alternatives – and not just those envisioned in the Draft Permit. Two clearly available alternatives that are not included in the permit involve changes to the discharge point of treated effluent, a common response to proposals for more restrictive effluent limitations. Very initial cost estimates suggest that these alternatives would offer the Town significant cost savings.

1. *Alternative 1 - Extend the existing outfall pipe to discharge at the head of saltmarsh that fronts Aucoot Cove.* Implementation would only require a modest pipe extension and it should eliminate the need for a phosphorus limit in the permit because the treated effluent would no longer discharge to Effluent Brook. While the capital cost of facilities to reduce phosphorus are modest on the scale of all the facilities upgrades envisioned with this permit, they are nonetheless sizable; and the O&M costs are significant primarily because the lagoons could no longer be used to treat the biosolids and offsite disposal of the greater volume of chemical-laden sludge would be required.

2. *Alternative 2 - Extend the existing outfall pipe into Outer Aucoot Cove.* A very preliminary concept is shown in [Marion] **Figure 1** attached – actual routing of the land-side pipe and terminus for the discharge would need to be evaluated in greater detail. This option only became permissible in August 2014 when the Legislature passed an

amendment to the Ocean Sanctuaries Act. Prior to this amendment, (non-vested) municipal wastewater discharges were prohibited in some ocean sanctuaries, while in others the applicant was required to demonstrate that there was no feasible alternative to ocean discharge. The 2014 amended Act allows new or modified discharges from municipal wastewater treatment plants to an ocean sanctuary provided:

a. a series of 10 conditions are met (Section 6G, Chapter 259 of Acts of 2014 §§28-45); (Marion currently meets most, if not all, of these requirements)
b. the wastewater treatment plant provides advanced treatment and disinfection to remove nutrients and pathogens (Marion's current facility meets this requirement)
c. the application be accompanied by a series of designated studies including a Comprehensive Wastewater Management Plan (CWMP) with Environmental Impact Report (EIR); benthic survey and fish habitat evaluation of the receiving water, 24 months of baseline nutrient water quality monitoring, a site-specific hydrodynamic model and an aquifer evaluation (this latter item would appear not be applicable to Marion's circumstance).

Some advantages of a mid-cove ocean discharge should include elimination of permit limits for nitrogen and phosphorus and relief, if not elimination, of the copper limit.

Additional options that could or must be evaluated and are not included in the compliance schedule for the permit include alternatives to using the lagoons for influent equalization, the possibility of downsizing the volume for flow equalization and repurposing one or more lagoons for another use such as a constructed wetland, and alternatives to lining the lagoons such as constructing a leachate collection system.

Assuming EPA does not modify the permit requirements in response to the City's comments, it is critical that EPA delay issuance or re-write and re-structure the Town's Draft Permit to allow the Town to investigate whether these or other similar cost savings options would provide cost-effective solutions while also protecting the environment and human health.

The compliance schedule offered in the Draft Permit is incomplete, does not allow for consideration of alternative approaches and does not allow sufficient time or flexibility to properly plan, permit, design, and construct selected alternatives. The steps the Town believes would constitute a sound program of wastewater improvements, along with a proposed schedule, are found in the comments on the compliance schedule below.

The importance of taking these steps in a rational, stepwise fashion is underscored by fact that today the WPCF periodically produces effluent quality that would meet the proposed permit limit of 3 mg/L total nitrogen (effluent total nitrogen has ranged from 1.7 to 7.4 mg/L). EPA has included a provision in the Draft Permit (page 13; and copied below) "allowing" for potential to modify the permit, when EPA must clearly understand that no such opportunity will ever exist should the permit be issued with a limit of 3 mg/L total nitrogen.

If, at any time, the Permittee can make a demonstration that nonpoint source and stormwater nitrogen improvements are sufficient to achieve water quality standards without further point source nitrogen reductions, the Permittee may submit a request for a permit modification

If the permit were to be issued final as is, the Town would lose the flexibility to evaluate and select the best options for wastewater improvements since the present schedule suggested by EPA would not allow for that to occur.

Response 1:
Detailed responses to specific issues included in the summary above are provided in the responses below.

While EPA agrees that the permit requires substantial changes to Marion's WPCF, EPA does not agree that they are unprecedented or unwarranted.

Contrary to the comment, the permit does not require abandonment of the "biosolids treatment process" but rather requires lining of the lagoons if they are to continue to be used.

While the schedule in the permit reflects EPA's judgement as to the most likely path forward, and is consistent with EPA's mandate to require compliance as soon as reasonably possible, it does not preclude alternative paths. The schedule can be modified by means of a consent order if sufficient justification is provided.

In light of the Town's desire to consider relocating the outfall to avoid some permit limits, the final permit includes an option for the Town to design and construct an outfall relocation to the estuarine portion of Aucoot Cove instead of designing and constructing WPCF improvements to meet the 200 μg/L total phosphorus limit.

NITROGEN

Comment 2. Eelgrass coverage levels are misinterpreted
EPA also justifies the need for nitrogen limits on the Marion WPCF by referencing the declining extent of the eelgrass within Aucoot Cove. Specifically, EPA states on Page 18 of the Fact Sheet that "Eelgrass continues to grow in middle Aucoot Cove, but is receding from inner Aucoot Cove. […] GIS data collected by MassDEP and analyzed by EPA indicate that eelgrass coverage in Aucoot Cove has retreated from its historical extent. (see Figure 5)." A number of eelgrass surveys have been performed in Aucoot Cove since the 1980s; Joe Costa surveyed eelgrass in Aucoot Cove as part of his PhD dissertation[3] and MassDEP surveyed eelgrass in 1995, 2001, 2007, and 2010 (Costello and Kenworthy, 2011) ; maps showing these surveys are included in [Marion] **Figure 2** and a comparison of the change in eelgrass extent between 1995 and 2001 in [Marion] **Figure 3**. A close examination of available eelgrass surveys within Aucoot Cove shows, in apparent contrast to the statements in the Fact Sheet, that the eelgrass is receding along the outer edge ("middle Aucoot Cove") but is fairly constant along the inner edge ("inner Aucoot Cove") where *higher TN concentrations would exist*. This holds true even between the 1995 and

2001 MassDEP surveys, where the average total nitrogen concentration at site AC2 between 1995 and 2005 was 0.50 mg/L (Buzzards Bay Coalition, 2014, via Robin Johnson, EPA). Furthermore, between the Costa 1980 survey and the 1995 MassDEP survey the eelgrass extent within Aucoot Cove actually increased, with the greatest gains in eelgrass habitat occurring along the outer edge that has seen habitat reduction in the years since. The receding eelgrass along the outer edge has occurred in an area of Aucoot Cove with *lower* total nitrogen concentrations than have been observed along inner Aucoot Cove where the eelgrass has been relatively stable. This evidence suggests that the nitrogen load from Marion is not a cause of eelgrass declines in Aucoot Cove, and presents a direct contradiction to the statements presented in the Fact Sheet. In fact, as eelgrass beds have been generally constant or expanding, there is no objective basis to assert that TN is having any adverse impact on the location or health of eelgrass beds in Aucoot Cove.

[1] Digitized GIS data based on Costa's 1980s eelgrass surveys are available at http://buzzardsbay.org/eelgrass-gis-data.htm

Response 2:
The maps provided by the commenter indicate that the overall additional loss of eelgrass between 1995 and 2010 is significant. The commenter's observation that eelgrass may have stabilized at the inner edge in more recent years, while declining at the outer edge, does little to support the conclusion that nitrogen is not the cause of eelgrass decline in Aucoot Cove.

The loss of eelgrass at greater depth is a predictable outcome of eutrophication. In the face of nutrient enrichment, eelgrass levels would be expected to recede in areas of deeper water because nutrient pollution increases turbidity (Benson, Shlezinger and Howes 2013). Joe Costa, in his thesis on eelgrass trends in Buzzards Bay, notes that "[e]elgrass beds often first disappear in upper estuaries where nutrient loading is highest, and at the deep edges of beds where light limits growth." (J. E. Costa 1988, 61-62) Research has found that "growth is light limited for eelgrass growing near the deep edge of the meadow, and that these plants appear to be living near the minimum light regime for growth and survival" (Dennison and Alberte 1985). Any reduction in water clarity would affect these plants first, and that is why eelgrass on the outer (deeper) edge of Aucoot Cove are the first to succumb to nutrient enrichment. In fact, the commenter discusses at length the interplay between turbidity, nutrients, and eelgrass survival in Comment 5.

Losses of eelgrass at the shallow edge and/or at the deep edge are entirely consistent with patterns seen in other eutrophic estuaries. The MassDEP Eelgrass Mapping Project Viewer (Massachusetts Department of Environmental Protection 2015) for Aucoot Cove indicates that between 1995 and 2001, Aucoot Cove lost 18% of its eelgrass, and the maps provided by the commenter indicate that as of 2010 there has been little change in this condition. The highest concentrations of nitrogen are typically at the shallow edge but the somewhat lower concentrations at the outer edge can have just as big of an impact due to the depth of the eelgrass beds and the naturally lower levels of light reaching these deeper beds. By focusing on the necessary reductions to restore eelgrass at the shallow edge, it is EPA's expectations that the lower concentrations that will result at the deeper edge will ensure the health of all eelgrass habitat.

The commenter states that the average total nitrogen concentration at station AC2 was 0.50 mg/L between 1995 and 2001, during which time eelgrass coverage in inner Aucoot Cove was stable. The source of this reference is unclear, but it may be referring to the Fact Sheet, which, on page 17, states that the median total nitrogen concentration at AC2 is 0.47 mg/L, based on data from The Buzzards Bay Coalition. The relevance of nitrogen concentrations at station AC2 to eelgrass presence in Aucoot Cove is unclear, but EPA notes that station AC2 is much closer inland than both the presumed historical inner edge of eelgrass habitat and the current inner edge of eelgrass habitat.

The loss of eelgrass in Aucoot Cove is consistent with what is happening throughout Buzzards Bay. Joe Costa believed that he saw a marked decrease in eelgrass coverage in Buzzards Bay between the 1980s and 1995, and discusses this on the Buzzard's Bay National Estuary Program website[4]:

> *DEP first conducted an aerial survey to map eelgrass in Buzzards Bay in 1995...*[which] *showed considerably less eelgrass in Buzzards Bay than the 1980s reports. Conclusions about the locations of eelgrass in new DEP surveys as compared to the 1980s map were difficult because with maps only available for two dates, it was unclear at the time whether the absence of eelgrass at specific locations was due to eutrophication, date of aerial imagery, storms, disease, natural variability, or other factors, or from differences in the time of year or limitations or visual limitations of the aerial imagery.*

Costa goes on to write,

> *It was not until DEP repeated its eelgrass aerial and field survey in 2001 (released about 2004), and when we began reviewing other sets of aerial photographs, that it became apparent that much of the eelgrass losses documented in 1996 survey were genuine and likely due to eutrophication…* (J. Costa 2012)

Comment 3. EPA uses the wrong baseline eelgrass coverage

The apparent contradiction between the available eelgrass survey data and the data cited in the Fact Sheet may amount to EPA selecting a different baseline year for its analysis. Figure 5 of the Fact Sheet clearly states that EPA considers the historical extent to mean the "estimated eelgrass cover circa 1600." While the caption states that "this is a purely speculative exercise," EPA simply assumes the presumed pre-Colonial eelgrass coverage to be undeniable fact even though the hypothetical pre-Colonial eelgrass distribution does not account for any of the other numerous factors that could have caused changes in eelgrass coverage over the past 400 years. This purely speculative and unsupported exercise should not be used to conclude that the eelgrass is retreating from its historical extent within the Inner Aucoot Cove relative to recent survey data. Further supporting the assertion that the pre-Colonial analysis should not be used as

[4] Retrieved April 3, 2015, from Buzzards Bay National Estuary Program: http://buzzardsbay.org/eelgrass-historical.htm

a baseline year is a comparison of the baseline year used in peer-reviewed studies of eelgrass in Buzzards Bay. Kenworthy *et al*. (2013)elected to use the peer-reviewed 1995 MassDEP eelgrass mapping data as their baseline even though historical photographic records of eelgrass distribution exist going back to 1950; the historic photographs were not considered reliable enough to quantify eelgrass extent because “the quality of the older imagery is poor and the methods used to interpret and verify the benthic habitat signatures were qualitative and unreliable,” a viewpoint the authors attribute to Charles Costello at MassDEP. Therefore, there is no credible scientific information indicating present eelgrass impairment, let alone significant impacts due to the low levels of nitrogen present in the system.

If the methodology cited in the Fact Sheet was indeed a reliable and accurate way to determine the baseline eelgrass level then MassDEP should have recommended that the study authors. Kenworthy *et al.* use the pre-Colonial study or similar methodology to set the baseline value instead of the 1995 MassDEP survey results given the relative unreliability of the 1950s photographic records. Marion requests that EPA provide the basis and documentation for its claim that eelgrass has been receding from inner Aucoot Cove and allow for public review.

Response 3:
Kenworthy *et al.* use data from 1995 on because this was the year that MassDEP began aerial surveys of eelgrass. For precise comparisons between years, it is best to use data collected by the same organization under the same program. The study they were conducting required accurate quantification of eelgrass coverage, and eelgrass data prior to 1995 was not quantified accurately enough for their study. That does not establish a baseline for determining where this critical habitat for ensuring attainment of designated uses should occur. Moreover, Kenworthy *et al.* never states that the 1995 data are representative of a pristine, unimpaired state. On the contrary, the 1995 survey showed significant eelgrass losses compared to Costa’s 1988 survey (J. E. Costa 1988) (see Response 2).

EPA used the pre-colonial coverage estimate as one of many data sources to determine whether nitrogen pollution is causing the loss of eelgrass beds. Other pieces of information used in our analysis include total nitrogen concentrations, algal growth, dissolved oxygen data, MassDEP’s designation of inner Aucoot Cove as impaired, and in situ observations. No one type of data is enough to prove a nutrient problem, but together they illustrate a picture of eelgrass degradation due to nutrient pollution.

Comment 4. Only dissolved inorganic nitrogen should be regulated
In addition to the objections to the threshold total nitrogen concentrations noted herein, we also note that the total nitrogen concentration is largely irrelevant because Aucoot Cove is well flushed and has a very short detention time. This means that only the dissolved inorganic nitrogen is important relative to algal production and possible epiphytic growth. Given the short detention time in Aucoot Cove, there is not enough time for other nitrogen species included in the total nitrogen concentration to be converted to bioavailable forms.

Response 4:
EPA disagrees that limits should be in terms of dissolved inorganic nitrogen (DIN) rather than total nitrogen. Consistent with recommendations in EPA Nutrient Criteria Manual (EPA 2001), and because of the recycling of nutrients in the environment it is best to limit total concentrations (i.e. total nitrogen) as opposed to fractions of the total.

The EPA Nutrient Criteria Technical Guidance Manual for Estuarine and Coastal Waters (EPA 2001) indicates that nitrogen cycling results in constant shifts between the different forms of nitrogen. In guidance for establishing nutrient criteria for estuaries, EPA identified total nitrogen as the causal variable of specific concern.[5]

In addition, research has documented that forms of nitrogen considered unavailable for plant growth, such as dissolved organic nitrogen (DON) are more bioreactive than previously thought. Other research has found that DON from urban sources was 59% bioavailable to estuarine plankton (Seitzinger, Sanders and Styles 2002).

Organic nitrogen in POTW effluent is no different. A study in the Chesapeake Bay watershed found that between 31% and 96% of the effluent derived organic nitrogen (EON) was removed during biotic bioassays within the first 2 days (Filippino, et al. 2010), and that EON also underwent abiotic reactions in natural water samples. Furthermore, a study trying to quantify the proportion of effluent EON that is not bioavailable determined that only 10 – 29% of effluent dissolved organic nitrogen is refractory, i.e. resistant to bacterial degradation (Sedlak, Jeong and Stensel 2011). Put another way, the study found that between 71% and 90% of effluent organic nitrogen is assimilated by bacteria and other plankton.

These studies demonstrate that effluent organic nitrogen undergoes rapid transformation in the environment and may contribute to eutrophication. The scientific evidence supports the need to control total nitrogen rather than just DIN.

Comment 5. Eelgrass Habitat Suitability Requirements
While the Fact Sheet asserts that "based on its depth, strata, and other characteristics the inner cove would be expected to support eelgrass," none of the data available presented in the Fact Sheet demonstrates that eelgrass could grow in the innermost portion of Aucoot Cove even if lower total nitrogen concentrations are attained. A comprehensive study of eelgrass habitat suitability in Aucoot Cove would need to also look at sediment composition, light availability, and the physical properties of the watershed and the embayment before unilaterally concluding that the reason eelgrass has *never* been recorded in the innermost portion of Aucoot Cove is excess total nitrogen concentrations. It is therefore inappropriate to suggest that simply reducing the Marion WPCF's total nitrogen effluent limit will increase the area of suitable eelgrass habitat. NPDES permits and Clean Water Act decision making is not to be made on "guesswork". *Leather Industries of America v. EPA*, 40 F. 3d 392 (D.C. Cir. 1994). As EPA is

[5] We also note that the Town has observed elsewhere that "[n]utrient loadings in the form of total nitrogen (TN) [have] been documented to affect aquatic life uses (e.g., decline/loss of eelgrass bed habitat) in Aucoot Cove," *2017 Project Evaluation Form—Part III—Project Narrative,* Town of Marion, 4 (undated) (hereinafter "2017 PEF").

simply “guessing” that TN levels are the cause of eelgrass changes, this proposed requirement must be withdrawn.

The assumed approach in the Fact Sheet is that total nitrogen causes enhanced phytoplankton and epiphyte productivity which shades eelgrass limiting or preventing growth and eliminating habitat suitability. This approach is quite simplistic in its assumption that eelgrass habitat suitability is solely based on whether total nitrogen is above or below a threshold value, which ample data from estuarine settings throughout the New England Area confirm is simply not true. There are a number of other factors that contribute to eelgrass habitat suitability beyond total nitrogen. Other relevant factors include:

- light availability
- sediment composition
- hypoxia, which can cause buildup of ammonium, nitrate, and sulfide concentrations in sediment that may be toxic to eelgrass
- high organic matter content in sediment
- channel and embayment morphology and configuration
- ice cover and impingement
- Grazing by geese

Light is an essential eelgrass habitat requirement, and numerous studies have investigated the correlation between light availability and eelgrass health. Benson *et al*. (2013) examined the relationship between light, total nitrogen, and eelgrass. The authors found that healthy eelgrass beds were found where the average total nitrogen concentration was 0.42 mg/L and degraded eelgrass beds where the average total nitrogen concentration was in excess of 0.6 mg/L. In addition, this study also examined conditions under which transplanted eelgrass survived. The authors found that over 75% of eelgrass colonies survived when total nitrogen was less than 0.39 ± 0.03 mg/L, and over 50% of eelgrass colonies survived when the total nitrogen concentration was 0.49 ± 0.12 mg/L. As EPA is also well aware, extensive eelgrass beds exist in Great Bay, NH with TN concentrations ranging 0.35 – 0.42 mg/L. This real world, field data confirms that the range of acceptable eelgrass habitat is not limited to total nitrogen concentrations below 0.35 mg/L and that a concentration of 0.45 mg/L in the Cove could not possibly eradicate all eelgrass populations from that area.

Kenworthy *et al.* (2013) examined the relationship between light attenuating substances (*i.e.,* algae, turbidity), eelgrass impairment, and sediment conditions. Several key conclusions from this study are summarized below.

- Minimum light requirements for eelgrass growth varies and is site specific. The authors state “Our data suggest that using a fixed estimate for the light requirement of eelgrass across a wide range of embayments may not be appropriate for generalized computations or application.”

- Recovery of eelgrass beds is not necessarily an immediate consequence of reductions in nitrogen loadings. In Marion, the nitrogen point source load decreased significantly after the WPCF was upgraded in 2005. Again, the Kenworthy *et al.* state "if the high apparent light requirements are due solely to shading by epiphytes and macroalgae, then success at curtailing algal blooms by reduction of N loading might be expected to restore seagrass on normal time scales of eelgrass recruitment and expansion rates. If, however, epiphyte and macro algal blooms and chronic organic matter loading to the sediments leads to reduced light utilization efficiency, sulfide and ammonium toxicity, or increases in sediment re-suspension, we might expect some delay in recovery…"
- High organic matter in sediment can inhibit eelgrass growth. In addition, hypoxic conditions, which are not uncommon in sediments, can cause buildup of ammonium, nitrate, and sulfide concentrations in sediment that may be toxic to eelgrass.

Studies have also found a significant relationship between estuary geometry and watershed characteristics and the growth of submerged aquatic vegetation. Li *et al.* (2007) examined 101 small sub-estuaries within Chesapeake Bay to determine how submerged aquatic vegetation is affected by parameters such as watershed size and characteristics, estuary perimeter, estuary surface area, and wave height. The authors found strong, significant relationships between aquatic vegetation growth and the ratio of estuary perimeter to estuary surface area (fractal dimension), dominant land cover, mean tidal range, ratio of watershed area to estuary surface area, and mean wave height.

The results of the studies cited herein confirm that conditions that limit eelgrass habitat suitability are far more complex than the simple total nitrogen threshold suggested in the Fact Sheet. More study is required to determine whether eelgrass growth is indeed limited by total nitrogen in inner Aucoot Cove. This study should look at sediment composition, the relative impacts of channel morphology on eelgrass throughout the region, the effects of naturally hypoxic conditions from the salt marsh, and whether light is a limiting factor within inner Aucoot Cove. If this study determines that total nitrogen adversely affects eelgrass habitat viability, this study needs to determine a cost-effective approach to reducing nitrogen and thus, whether a reduction in Marion's total nitrogen limit would cause an expansion of eelgrass in Aucoot Cove.

Response 5:
Joseph Costa estimated the historic coverage of eelgrass in upper Buzzards Bay (Falmouth to Mattapoisett) based on areas with mean low water depth less than 20 feet.[6] He observed that the limiting factor for eelgrass survival is light, and that in pre-development situations, light is a function of water depth. Salinity, temperature, and wave action were also examined but found to be of minor importance in Buzzards Bay (J. Costa 2012).

Regarding eelgrass habitat in Inner Aucoot Cove, photographic evidence from 2015 (see Attachment A to RTC) shows sparse growth of eelgrass in shallow areas of Aucoot Cove, which

[6] Retrieved April 3, 2015, from Buzzards Bay National Estuary Program: http://buzzardsbay.org/eelgrass-historical.htm

was confirmed by the Division of Marine Fisheries. The area documented in May and August 2015 is near the mouth of Aucoot Creek and about 100 yards landward of the edge of the MassDEP 2010/2013 Eelgrass GIS layer, shown in orange. This information demonstrates that eelgrass can grow in shallow areas of Aucoot Cove inland of the larger meadows depicted in the MassDEP Eelgrass maps. Eelgrass is also visible in photographs taken in August 2015, showing that the shoots survived through the growing season.

The Town accuses EPA of using a "simplistic" approach that "total nitrogen causes enhanced phytoplankton and epiphyte productivity which shades eelgrass limiting or preventing growth and eliminating habitat suitability." As discussed in Response 7, phytoplankton is less of a factor in estuaries than epiphytes and drift algae. Moreover, this supposedly faulty premise is very like that of Benson *et al.*, who undertook the study to "examine the cascading effects of nitrogen enrichment on water-column constituents resulting in reduced bottom light intensity, and how these coupled factors negatively affect eelgrass habitat and transplant survival." This is but one of several studies cited in the Fact Sheet and RTC that support the well-understood response of estuaries to elevated total nitrogen.

Further, the commenter seeks to obfuscate the causes of eelgrass loss by drawing attention to factors other than nitrogen, such as estuarine geometry, light availability, grazing, and sediment hypoxia. Low light availability and sediment hypoxia rather than nutrient concentrations may be proximal causes of eelgrass decline, but they themselves are caused by elevated nutrients. Estuarine geometry may exacerbate the problem, but only because it restricts flushing of nitrogen out of the estuary. As for grazing, the commenter has provided no evidence that this is a factor in Aucoot Cove.

Finally, the commenter contends that a total nitrogen "concentration of 0.45 mg/L in the Cove could not possibly eradicate all eelgrass populations from that area." EPA has not claimed that a certain total nitrogen concentration would eradicate eelgrass from a given area. The threshold for setting a permit limit is whether there is reasonable potential for the discharge to cause or contribute to excursions from water quality standards.

Benson *et al.* (2013) found that "Nitrogen thresholds that support eelgrass communities provide a fundamental tool for managing this habitat…[t]he strong relationship seen between TN and eelgrass habitat and survival point to the efficacy of using TN as a critical metric in predicting eelgrass restoration success in shallow estuaries," and goes on to conclude that "[s]ites with healthy eelgrass had a tidally-averaged total nitrogen concentration of 0.34 mg/L and ebb tide TN of 0.37 mg/L."

Reference to other areas in New England where eelgrass might exist under higher nitrogen concentrations may be useful in a general context, but the most relevant data for this permit are from Aucoot Cove. As the Town itself points out in the next comment, nitrogen levels that support eelgrass are site-specific. Using the available information for Aucoot Cove, EPA determined the nitrogen threshold concentration that would support designated uses.

Comment 6. Total Nitrogen Threshold

The Fact Sheet states that "The Massachusetts Department of Environmental Protection (MassDEP) has identified total nitrogen levels believed to be protective of eelgrass habitats as less than 0.39 mg/L and ideally less than 0.3 mg/L and chlorophyll *a* levels as 3-5 μg/L and ideally less than 3 μg/L" citing a MassDEP and University of Massachusetts at Dartmouth School for Marine Science and Technology report titled *Massachusetts Estuaries Project: Site-specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators, Interim Report* (MEP, 2003). This interpretation of this report is completely inaccurate and is entirely inconsistent with the report's conclusions. The report does cite several total nitrogen thresholds in Table 1, where the "Excellent" water quality category was observed to be less than 0.30 mg/L total nitrogen and the "Excellent/Good" category less than 0.39 mg/L total nitrogen. While these values do provide an initial suggestion of a possible numeric threshold for total nitrogen, the authors of this report state on Page 12:

> *Loss of bed area and/or thinning of beds (decreases in density) are generally both linked to nutrient enrichment. This linkage between eelgrass loss and nutrient enrichment needs to be corroborated on an embayment specific basis, as there are factors other than nutrients which have been linked to eelgrass declines (disturbance, disease, animal interactions, etc.).*

The authors go on to state in the caption to (Marion) Table 1, "Threshold values need to be site-specific, the values presented are for Great, Green and Bournes Ponds in the Town of Falmouth." As such, the citation of the total nitrogen thresholds in the Fact Sheet is a gross misrepresentation of the discussion in this report, as these numbers are meant to be an example of site-specific numeric thresholds observed in several recent studies of nutrient enrichment and eelgrass growth. Therefore, these values are irrelevant to the site-specific conditions of Aucoot Cove and cannot be credibly cited in relation to Aucoot Cove eelgrass habitat suitability.

Response 6:

Ideally, site-specific threshold total nitrogen values would be calculated for every embayment in Buzzards Bay. The reality, unfortunately, is that such analyses have not been completed due to lack of funding.

The commenter misreads the Fact Sheet discussion. The 2003 MEP report was not cited to imply a site-specific threshold for Aucoot Cove, but rather as a component of the evidence used to determine whether there is reasonable potential for the nitrogen loading from the Marion discharge to have caused or contributed to the impairments identified in Aucoot Cove and, if so, what range of TN would be necessary to restore the designated aquatic life uses in Aucoot Cove. Additional evidence, including site specific data on TN concentrations, eutrophication response variables, and watershed TN loadings, were used to determine the need for a TN limit and for establishing TN reductions necessary to ensure attainment of water quality standards. However, even in the absence of site specific data, use of the 2003 MEP report for interpreting narrative nutrient criteria and establishing protective TN values would be appropriate.

In developing an ambient TN target, EPA examined the continuum of water quality conditions in Aucoot Cove to identify a transition point from impaired to unimpaired conditions. This is a reference-based approach, and the results are consistent with ranges and thresholds for acceptable TN concentrations found in other estuaries and within the scientific literature. This approach is entirely appropriate for assessing large-scale nutrient load reductions over relatively long averaging periods.

EPA used a weight of evidence approach to determine if the discharge has a reasonable potential to cause or contribute to an exceedance of the water quality standards. The weight of evidence approach minimizes the inherent uncertainty associated with assessing reasonable potential and making informed management decisions. EPA then used a reference based approach to develop protective thresholds. This approach is consistent with the EPA Nutrient Criteria Technical Guidance Manual (2001).

Comment 7. Chlorophyll A threshold

Furthermore, the Fact Sheet's assertion that this study identified protective chlorophyll *a* levels is also a gross misrepresentation of the discussion in the Massachusetts Estuaries Project *Interim Report.* In the *Interim Report*, the authors discuss "a preliminary attempt at integrating quantitative and qualitative information on the key indicators," suggesting generalized characteristics of "Excellent" and "Excellent/Good" waters. "Excellent" waters have chlorophyll-*a* concentrations "typically less than 3 μg/l," and "Excellent/Good" waters have chlorophyll *a* concentrations "in the 3 to 5 μg/l range." Thus, while eelgrass habitat suitability may coincide with the "Excellent" or "Excellent/Good" classifications, the *Interim Report* does not state that these concentrations are required to be protective of eelgrass populations. It is inappropriate to interpret this statement to mean that eelgrass cannot survive with chlorophyll *a* concentrations in excess of 5 μg/l, and this statement is again irrelevant to Aucoot Cove and demonstrably false based on data from other estuarine systems.

The applicability of these thresholds is especially questionable because the chlorophyll *a* observed in the reference location (AC3) is *above* the threshold of 5 μg/L cited in the Fact Sheet. If a chlorophyll *a* concentration above 5 μg/L cannot support eelgrass, then the reference location should be devoid of eelgrass growth. The fact that there is a healthy eelgrass population in this location suggests that the chlorophyll *a* threshold proposed in the Fact Sheet is unnecessarily low (and, by proxy, at least insinuates that the total nitrogen threshold is similarly unnecessarily low) in order to be protective of eelgrass habitat.

Yet another point of comparison comes from a compilation of protective total nitrogen concentrations assessed by the Massachusetts Estuaries Project. (Marion) **Table 1**, next page, presents a comparison of these values considered protective of eelgrass habitats. The "protective" total nitrogen limits ranged from 0.34 to 0.48 mg/L total nitrogen, with an average total nitrogen threshold of 0.40 mg/L. (Hall & Associates, 2013)

(Marion) Table 1: Comparison of Total Nitrogen Limits Protective of Eelgrass in Massachusetts Estuaries Project Reports[1]

Report Title	Date	Total Nitrogen Limit (mg/L)
Great Pond, Falmouth	2005	0.40
Green Pond, Falmouth	2005	0.40 – 0.42
Bournes Pond, Falmouth	2005	0.42 – 0.45
Little Pond, Falmouth	2006	0.45
Three Bays, Barnstable	2006	0.38 – 0.40
West Falmouth Harbor, Falmouth	2006	0.35
Phinneys Harbor and Back River, Bourne	2006	0.35
Centerville River, Barnstable	2006	0.37
Nantucket Harbor, Nantucket	2006	0.35
Lewis Bay, Barnstable	2008	0.38
Sengekontaket Pond, Oak Bluffs and Edgartown	2011	0.35
Farm Pond, Oak Bluffs	2010	0.45
Madaket Harbor and Long Pond, Nantucket	2010	0.45
Swan Pond River, Dennis	2012	0.40
Wild Harbor, Falmouth	2013	0.35
Quissett Harbor, Falmouth	2013	0.34
Harwich	2013	0.48

Note: 1. Table modified from Hall & Associates, 2013

This significant variation noted in (Marion) **Table 1** suggests several key points. First, these results corroborate the statement that total nitrogen concentrations deemed protective of eelgrass are site- and resource-specific. Second, the variation shown in these results suggests that total nitrogen may not be the only factor controlling eelgrass growth or degradation. Nonetheless, these results indicate that a total nitrogen concentration of 0.42 (the median concentration at the "impaired" monitoring site AC2) is certainly not preventing eelgrass from growing, and suggest that potentially other factors are causative with respect to the observation that eelgrass grow at site AC3 but not at site AC2.

We request that EPA revise its discussion of permissible total nitrogen concentrations that are supportive of eelgrass to: (1) incorporate the fact that site-specific constraints have a demonstrable effect on the relationship between total nitrogen and eelgrass, (2) to reflect the fact that the numbers cited in MEP (2003) are not meant to be used as a universally applicable eelgrass-total nitrogen threshold relationship, and (3) that more recent and credible peer reviewed studies have demonstrated that total nitrogen concentrations significantly higher than those cited in the Fact Sheet have been shown to be protective of eelgrass in Massachusetts estuarine environments.

Response 7:
The Massachusetts Estuaries Project: Site-specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators, Interim Report (MEP, 2003) is more than just a "suggestion" of nitrogen and chlorophyll *a* values that would be protective of various water quality classification. These values are based on the scientific literature, including studies in other Massachusetts Estuaries, and the report is an appropriate tool for interpreting narrative nutrient criteria in the absence of site specific data. While the SMAST values in (Marion) Table 1 are based on studies conducted in Falmouth MA, the nitrogen values discussed as likely protective of SA waters are also within the range of protective targets developed by CCC and BBC and included in EPA Table 1 (reproduced below). EPA agrees that, wherever possible, the linkage between eelgrass loss and nutrient enrichment should be corroborated on an embayment specific basis and that is what was done here using a reference site within Aucoot Cove.

Table 1.	Nitrogen thresholds and coastal water classifications for refinement by the Massachusetts Estuaries Project. Threshold values need to be site-specific, the values presented are for Great, Green and Bournes Ponds in the Town of Falmouth. Abbreviations: CCC – Cape Cod Commission, BBP/MCZM – Buzzards Bay Project/ Massachusetts Coastal Zone Management, ND – not determined. Values are long-term (>3 yr) average mid-ebb tide concentrations of total nitrogen (mg/L) in the water column.				
Classification of N based water quality	Trophic classification	SMAST[1]	CCC	BBP/MCZM	314 CMR 4.05(4) Classification
Excellent	Oligotrophic	< 0.30	ND	ND	SA
Excellent/Good	Oligo to Mesotrophic	0.30 – 0.39	< 0.34	< 0.39	SA
Good/Fair	Mesotrophic	0.39 – 0.50	0.34 – 0.39	0.39 – 0.44	SB
Moderate Impairment	Mesotrophic to Eutrophic	0.50 – 0.70	ND	ND	Impaired
Significant Impairment	Eutrophic	0.70 – 0.80	ND	ND	Impaired
Severe Degradation	Hyper-Eutrophic	>0.80	ND	ND	Impaired

SA waters: (a) suitable for shellfish harvesting without depuration, (b) excellent habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation, (c) excellent aesthetic value.

SB waters: (a) suitable for shellfish harvesting with depuration, (b) habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation, (c) consistently good aesthetic value

1 The nitrogen values presented were developed as part of the Ashumet Valley Plume Nitrogen Management Project for the Town of Falmouth and AFCEE by MEP Tech Team members B.L. Howes and J.R. Ramsey. These values are preliminary and need refinement by the MEP. Note that classification is by sampling location not full estuary, since each system shows a nitrogen gradient from headwaters to inlet.

(EPA) Table 1 from SMAST Interim Report, 2003.

EPA also agrees that loss of bed area and the thinning of beds (decreases in density) are generally both linked to nutrient enrichment. While EPA has used site specific data from AC3, EPA only has information relative to eelgrass presence at this site and no information on the health/density of this eelgrass. The fact that the nitrogen value at this site is within the range of values identified in the 2003 MEP report provides some assurance that it is sufficiently low enough of a value to ensure healthy eelgrass habitat. The fact that the chlorophyll-*a* value at this site is slightly higher than protective values cited in the 2003 MEP report is further evidence that we did not rely solely on the 2003 MEP report and have not chosen an overly protective threshold. Additionally, in this estuary as in many estuaries, macro-algae and epiphyte growth, as opposed to chlorophyll *a*, are as much or greater concern relative to eelgrass impairments (Burkholder, Tomasko and Touchette 2007). EPA is not aware of quantitative data existing on macro algae and epiphytes, but a site visit in 2012 provided visual confirmation of macroalgae growth on eelgrass in Aucoot Cove.

As far as factors other than nutrients which have been linked to eelgrass declines (disturbance, disease, animal interactions, etc.), EPA knows of no information, and the commenter provides no information, indicating that these factors are significant in Aucoot Cove.

The commenter's suggestion that because acceptable total nitrogen levels for protection of eelgrass in other Massachusetts Estuaries ranged from 0.34 – 0.48 the value used for Aucoot Cove is overly protective is without merit, especially given the commenter's assertion that it is important to use site-specific information in determining protective values. EPA also notes that the site-specific value for Aucoot Cove is within the range of the protective values for other Massachusetts Estuaries. See EPA Table 1.

Comment 8. Misapplication of Stressor-Response and Reference Condition Methods
The methodology cited in the Fact Sheet states that an implementation of the reference condition and the stressor-response methodology was used to determine the allowable total nitrogen concentration within Aucoot Cove that is supportive of eelgrass. This approach is described at the top of Page 18 of the Fact Sheet, where EPA identifies a reference waterbody that "provides appropriate values upon which criteria can be based." The stressor-response methodology is used to link the stressor (in this case, total nitrogen) to the response (in this case, eelgrass degradation).

Response 8:
The commenter misreads the Fact Sheet. EPA did not use the stressor-response methodology to link total nitrogen to eelgrass degradation. EPA only mentioned stressor-response methodology as one of three approaches to derive numeric nutrient criteria. After this brief mention, the Fact Sheet describes the reference condition approach in more detail and uses that approach to interpret the narrative nutrient criteria.

Comment 9. Total Nitrogen Thresholds
To implement this methodology, EPA cites data from two Buzzards Bay Coalition data sampling sites. Site AC2, located close to the salt marsh near Effluent Brook, has a median total nitrogen concentration of 0.46 mg/L[1] and does not have eelgrass. Site AC3, located farther offshore, has a median total nitrogen concentration of 0.35 mg/L and does have eelgrass. EPA uses this limited data based on a single stressor variable to determine that a total nitrogen concentration of 0.35 mg/L should be the water quality target, as, the Fact Sheet implies, this is the threshold value at which eelgrass can survive. Thus, the EPA analysis is devoid of any consideration of any other factors but simply assumes that TN is the cause of the difference in eelgrass populations at the different sites.

[1] EPA incorrectly states in the Fact Sheet that the median total nitrogen concentration, 2007-2012 is 0.47 mg/L. A follow up message from Robin Johnson, EPA NPDES Permit Writer stated that the median concentration is 0.45 mg/L. We found that this calculation erroneously included one sample from site AC1A. The correct 2007-2012 median total nitrogen at site AC2 is 0.46 mg/L.

Response 9:
This is a mischaracterization of the Fact Sheet basis for the TN limit. Again, EPA did not use the stressor-response methodology. See Response 8. Moreover, EPA clearly did not simply rely on a single stressor variable either in determining reasonable potential or in establishing a protective TN threshold based on site specific data. The analysis included dissolved oxygen levels, eelgrass habitat, and algal growth in reaching the conclusions as documented in the Fact Sheet.

Comment 10. Lack of Supporting Data for Nitrogen Threshold
EPA supports using the long-term median AC3 total nitrogen concentration of 0.35 mg/L by stating that "this value is consistent with TN concentration thresholds to protect eelgrass beds in other estuaries" but does not cite or reference any studies to support this claim. Marion requests EPA provide the studies referenced here for review and comment. In addition, EPA does not state whether the Buzzards Bay Coalition's data program has appropriate QA/QC protocols for its data collection efforts. If these data are not subjected to QA/QC they should not be used to set nutrient limits in Marion's NPDES permit or as a basis for reaching any other regulatory conclusions. Marion requests that EPA provide the Buzzards Bay Coalition QA/QC procedures and confirm that the data used in its analysis conform to these procedures.

Response 10:
In the Fact Sheet, EPA cites "Massachusetts Estuaries Project: Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators, Interim Report," total nitrogen concentrations protective of eelgrass to be less than 0.39 mg/L and ideally less than 0.30 mg/L. EPA should have also referenced Benson *et al.* (2013), but because the commenter referenced it in Comment 5, it was aware of the availability and applicability of this study.

Data collected pursuant to the Buzzard's Bay Coalition (BBC) water quality monitoring program are collected in adherence with a Quality Assurance Project Plan (QAPP) that was reviewed and approved by EPA in 2014 and is included in the administrative record. The Quality Assurance/Quality Control (QA/QC) procedures and protocols followed by the Coalition in the collection of water quality data are well known by and accepted by the EPA. MassDEP reviews and regularly uses data collected by the BBC monitoring program to determine the status of impaired waters for the 303(d) list as well as for the establishments of TMDLs for nitrogen. It is reasonable for the EPA to use the BBC's data to evaluate water quality conditions in Aucoot Cove. Specifically, the oxygen data for Aucoot Cove include both surface (0.15 m) and deep measurements. The low dissolved oxygen values were recorded using Hach instruments with professionally trained staff using YSI Sondes.

Comment 11. Scientific Advisory Board Report
The EPA Science Advisory Board (SAB) reviewed this type of methodology with respect to its use for setting numeric nutrient criteria (EPA, 2010). While the stressor-response method was not explicitly applied by EPA in its development of Marion's Draft Permit, numerous points made by the SAB relate to EPA's misapplication of the reference condition and stressor-response methodologies to Marion's discharge. While the SAB does notes that "the stressor-response method is a legitimate, scientifically based method for developing numeric nutrient criteria *if the*

approach is appropriately applied," EPA grossly misinterpreted the approach, considered none other physical habitat, chemical or biological factors that could also fully explain the presence or absence of eelgrass at a particular location. Thus, EPA has applied this otherwise scientifically defensible methodology in an entirely unreasonable and scientifically indefensible manner. Marion notes the several points raised by the SAB and incorporated by EPA into the revised "Stressor –Response Guidance" (EPA 2010) confirm that EPA's approach to identifying the nutrient objectives for calculating the Marion permit requirements constitute a scientifically indefensible application of the reference condition and stressor-response methodologies. "When an agency adopts a regulation based on a study not designed for the purpose and which is limited and criticized by its authors on points essential to the use sought to be made of it, the administrative action is arbitrary and capricious and a clear error in judgment." *Humana of Aurora, Inc. v. Heckler*, 753 F.2d 1579, 1583 (10th Cir. 1985) (citing *Almay, Inc. v. Califano*, 569 F.2d 674 (D.C. Cir. 1977)); *accord St. James Hospital v. Heckler*, 760 F.2d 1460, 1468 (7th Cir. 1985); *Menorah Medical Center v. Heckler*, 768 F.2d 292 (8th Cir. 1985). As discussed below, since EPA has thoroughly misapplied its applicable guidance for identifying defensible nutrient criteria, the action is arbitrary and capricious.

Response 11:
The comment's reference to stressor-response documents is not applicable, as the permit limit analysis was not based on stressor-response relationships (see also Response 8). However, the causal relationship among nitrogen, chlorophyll-*a* and dissolved oxygen is in fact well understood and is supported by data in this system. In areas of Aucoot Cove where total nitrogen and algal pigments are high, such as Site AC2 in the inner part of Aucoot Cove, dissolved oxygen levels tend to be low. From 2007 through 2012, AC2 had high levels of nitrogen, high levels of total algal pigment (including chlorophyll-*a* and pheophytin), and no eelgrass growth. Dissolved oxygen was only measured at this station in 2007, but it failed to meet the 6.0 mg/L water quality criteria 45% of the time.

Comment 12. Reference condition approach
We first challenge the selection of a single site as a "reference condition" suitable for inferring whether the stressor variable is supportive of eelgrass habitat. The SAB comments partially address this issue, both in terms of the link between the measurement of a nutrient concentration at a point compared with a biologic response variable and with respect to a mismatch between the timescales that data are collected that describe total nitrogen and eelgrass extent. In its comments, the SAB notes that "A basic conceptual problem concerning selection of nutrient concentrations as stressor variables […] is that nutrient concentrations directly control only point-in-time, point-in-space kinetics, not peak or standing stock plant biomass." (EPA, 2010). Furthermore, the SAB warns of mixing data collected at different time scales. The example given in the SAB report is comparing seasonally averaged chlorophyll-*a* concentrations with total phosphorus grab samples, as this introduces a significant amount of uncertainty. A similar parallel exists between total nitrogen samples – computed as a median summer concentration – and eelgrass, sampled sporadically on an annual timescale. This mismatch between the data collection timelines introduces significant error to any causative relationship that may exist between these two variables.

A similar comment was made by Dr. Stephen Chapra in his critique of a similar methodology used to derive a numeric total nitrogen criteria for the Taunton Wastewater Treatment Plant's draft NPDES permit. His assessment leans heavily on the 2010 SAB analysis to conclude that "the use of a single station by the present study [Taunton River Estuary] without any documentation that the other locations of the estuary are similar in hydrology/ hydrodynamics provides little confidence that the oxygen objective will be met…" (Chapra, 2014).

Response 12:
EPA again notes that it did not use a stressor-response method to derive the nitrogen threshold used in the Marion Fact Sheet. See Response 8.

The commenter indicates that factors other than nutrient concentration affect submerged aquatic vegetation and argues that extensive further study is necessary to adequately understand the relationship between TN values and eutrophication response variables before a nitrogen limit can be established. However, the commenter offers no specific information relevant to Aucoot Cove that could be used to determine an alternate allowable nitrogen load. Aucoot Cove is a semi-enclosed shallow estuary with a significantly developed watershed, and as such, would be expected to be vulnerable to elevated nitrogen loads as the water quality evidence clearly indicates it is. There is no indication, or evidence cited, that the hydrology/hydrodynamics varies significantly within this small embayment. See also Response 5.

As with the Taunton Wastewater Treatment Plant, it is misleading to suggest that EPA's decision was based on a single site. EPA's approach examined the continuum of water quality conditions in Aucoot Cove to identify a transition point from impaired to unimpaired conditions. It is not a stressor-response approach, and the cited guidance documents on stressor-response analyses and criteria development are not applicable to reference-based approaches to site-specific analyses for permit limits.

Furthermore, EPA's reference site approach in the Taunton permit was upheld on appeal unanimously by the Environmental Appeals Board on May 3, 2016. In its ruling, the EAB stated that "NPDES regulations do not require the Region to use any particular methodology or conduct any specific modeling to determine whether the 'reasonable potential' standard is met, and the Region is not required to demonstrate that nitrogen is causing impairment before setting a nitrogen limit."

Rather, this approach is a form of reference-based approach, and a similar approach has been widely applied in TMDLs developed under the MEP and approved by MassDEP and EPA. The results are consistent with ranges and thresholds for acceptable TN concentrations found in other estuaries within and outside of Massachusetts. Although this is a simplified approach that does not attempt to quantify individual subprocesses involved in eutrophication, it is entirely appropriate for assessing large scale nutrient load reductions over relatively long averaging periods. This is a scientifically defensible approach that is neither arbitrary nor capricious.

Regarding effluent limitations, EPA has reconsidered the need for the 3.0 mg/L nitrogen limit in the final permit (see Response 20). However, given the extended groundwater travel time and thus the extended period for which groundwater nitrogen loadings from the lagoons will continue discharging to Aucoot Cove, as well as the uncertainty over EPA's estimate of the other non-point source nitrogen loadings, it is prudent to minimize the allowable nitrogen loading from the Marion discharge. A final seasonal average permit limit of 4.0 mg/L total nitrogen from April 1 – October 31 has been established based on documented performance.

Comment 13. Total Nitrogen as Stressor Variable

Second, we question whether total nitrogen is an appropriately defined stressor variable. Numerous studies examining eelgrass habitat suitability have shown that total nitrogen is not the only variable affecting eelgrass habitat suitability (*e.g.*, Benson *et al.*, 2013; Kenworthy *et al.*, 2013; Li *et al.*, 2007). One significant criticism of the stressor-response guidance that is relevant to Marion's situation is "The absence of a direct causative relationship between stressor and response." One of the key general criticisms of the guidance document is that "statistical associations may not be biologically relevant and do not prove cause and effect." The authors continue, stating

> *Without a mechanistic understanding and a clear causative link between nutrient levels and impairment, there is no assurance that managing for particular nutrient levels will lead to the desired outcome. There are numerous empirical examples where a given nutrient level is associated with a wide range of response variables due to the influence of habitat, light levels, grazer populations, and other factors. If the numeric criteria are not based upon well-established causative relationships,* ***the scientific basis of the water quality standards will be seriously undermined****. [emphasis added].*

EPA, 2010

One observation particularly applicable to Marion is that

> *The problem of eutrophication is complex, involving multiple causal variables, multiple response variables, and feedback among the variables. […] A change in a response variable [i.e., eelgrass] is unlikely to be satisfactorily described by changes in a single "causal" variable (e.g., total nitrogen […] or total phosphorus. […] For example, the stressor-response relationship is relatively strong and well-established in lakes and reservoirs as opposed to streams and rivers where the relationship is more complex and influenced by many factors (e.g., shading, sediment, flow regime).*

EPA, 2010

The basic premise of the SAB comments on the stressor-response guidance is that it is imperative that nutrient criteria be based upon a mechanistic conceptual model that describes the clear causative link between the stressor and response variables. As there are many stressor variables that may affect eelgrass habitat suitability (*e.g.*, sediment composition, light, channel morphology), it is far too simplistic to assume that the only variable controlling eelgrass growth or degradation is total nitrogen. Indeed, the SAB speaks to this point, stating that "Single variable stressor-response relationships […] that explain a substantial amount of variation are likely to be uncommon for most aquatic ecosystems (in particular, streams)." (EPA, 2010). The SAB report also states, "In order to be scientifically defensible, empirical methods must take into consideration the influence of other variables." This suggests that basing a numeric nutrient criteria on the cause and effect relationship between total nitrogen and eelgrass - regardless of any correlations that may exist - is not scientifically defensible unless a clear conceptual model that causally links these two variables is developed. It is also important to note that Massachusetts state narrative nutrient criteria require that a reasonable causal demonstration that nutrients are resulting in an impairment (314 CMR 4.00).

In light of the issues identified about EPA's methodology for developing the numeric total nitrogen criteria, we request that EPA share its conceptual model—or any evidence—that reliably links total nitrogen to eelgrass degradation in Aucoot Cove. We also note that the logic used to claim that total nitrogen concentrations sufficiently protective of eelgrass is fundamentally flawed, as it is difficult if not impossible to justify using a temporally and spatially limited dataset to compare to eelgrass growth over annual time scales. Marion is committed to protecting the health of Aucoot Cove, but needs assurance, and the law requires, that reducing its nitrogen limit at an estimated capital cost of over $10 million will have a beneficial effect on eelgrass within Aucoot Cove. As EPA's assertion that TN is the sole cause of the absence of eelgrass in the inner cove and that assessment is not based on any credible scientific assessment, the proposed TN limitations should be withdrawn.

Response 13:
The commenter misinterprets the Fact Sheet language. The state environmental agency develops and proposes numeric criteria, which EPA has not done here. Because the Massachusetts Water Quality Standards use narrative nitrogen criteria, EPA interprets the criterion using available and relevant data. As the commenter has noted, using site specific data, wherever possible, is best. In this case, EPA used a reference condition, i.e., a location where water quality meets standards, data from within the estuary to establish a reasonably protective interpretation of the state's narrative nutrient criteria and further supported this value with values from the Thresholds Report (Massachusetts Estuary Program 2003). This report is based on studies and data from many Massachusetts estuaries.

The commenter accuses EPA of using datasets with mismatched temporal scales, i.e. water column nitrogen and dissolved oxygen, and chlorophyll *a* data collected monthly with eelgrass data collected annually. EPA only used the median (where available) of data collected from 2007 through 2012 in the Fact Sheet to determine reasonable potential.

Regarding the comments on the stressor-response approach, EPA again notes that it did not use this method to derive the nitrogen threshold. Please see Responses 6, 8, and 11 relative to stressor/response analysis, development of numeric criteria versus interpretation of narrative criteria, and SAB comments. As far as a conceptual model, EPA provided a detailed description of the eutrophication effects of nitrogen enrichment in estuarine systems, including numerous references to the applicable scientific literature. See Response 5.

Furthermore, EPA's NPDES regulations do not require cause-and-effect proof between a pollutant discharge and an existing water quality impairment before the permit writer can derive a numeric in-stream target to interpret a narrative water quality criterion, or impose a water quality-based effluent limitation to implement that criterion. The comment simply misstates the plain text of 40 C.F.R. § 122.44(d)(1). *See In re Town of Newmarket, NH*, NPDES Appeal No. 12-05, 16 E.A.D. __ (2013), slip op. at 54 n.23 ("The plain language of the regulatory requirement (that a permit issuer determines whether a source has the 'reasonable potential to cause or contribute' to an exceedance of a water quality standard) does not require a conclusive demonstration of "cause and effect.") Under this regulation, permit issuers are required to determine whether a given point source discharge "cause[s], ha[s] the reasonable potential to cause, or contribute[s] to an excursion above" the narrative or numeric criteria set forth in state water quality standards. 40 C.F.R. § 122.44(d)(1)(i). Thus, the regulations require nothing more than a *reasonable potential to cause, or contribute to* an excursion of a numeric or narrative state water quality criterion; whenever such a potential exists, a permit must contain effluent limits to meet state water quality standards.[7] *See id.* § 122.44(d)(1), (5) (providing in part that a permit must incorporate any more stringent limits required by CWA § 301(b)(1)(C)). "'Reasonable potential' requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary." *In re Upper Blackstone Water Pollution Abatement Dist*., NPDES Appeal Nos. 08-11 to 08-18 & 09-06, slip op. at 32-33, n.29 (May 28, 2010). As EPA's preamble to its final rulemaking promulgating 40 C.F.R. § 122.44(d)(1) explained:

> *Some commenters said that the phrase "reasonable potential to cause" was too vague and could apply to permittees that are not actually exceeding a water quality criterion. EPA does not believe that it is appropriate to be more specific because a permitting authority has a significant amount of flexibility in determining whether a particular discharge has a reasonable potential to cause an excursion above a water quality criterion, taking the factors in subparagraph (ii) into account.*

54 Fed. Reg. 23,868, 23,873 (June 2, 1989). This regulatory provision has been upheld as a reasonable, authorized approach of necessary gap-filling in the CWA statutory scheme as it provides permit writers with guidance on how to interpret state narrative water quality standards in deriving effluent limitations. *See Am. Paper Inst. v. EPA*, 996 F.2d 346, 348, 351 (D.C. Cir. 1993); *see also Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 990-991 (D.C. Cir. 1997). Although EPA acknowledges some unavoidable level of scientific and technical uncertainty in this permitting action, the existence of uncertainty does not excuse EPA from its obligation to set permit limits where a discharge "causes, has a reasonable potential to cause, or contributes to an excursion above a narrative criterion." 40 CFR § 122.44(d)(1)(i). EPA also agrees that there is some uncertainty with respect to the precise numeric water quality criterion for nitrogen that "will attain and maintain applicable narrative water quality criteria and fully protect the

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[7] The state narrative standard does not impose a higher standard of causation for purposes of permit limits, and such an interpretation, if it existed, would not override the requirements of 40 C.F.R. § 122.44(d).

designated use" as required pursuant to 40 CFR § 122.44(d)(1)(vi)(A), although such uncertainty is within a relatively narrow zone. As set forth in 40 CFR 122.44(d)(1)(vi):

> Where a State has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority **must** establish effluent limits using one or more of the following options . . ."

This obligation exists even where there is incomplete or uncertain information concerning the precise target that will meet the narrative criterion. The Board has specifically held that "[i]n the face of unavoidable scientific uncertainty, the Region is authorized, if not required, to exercise reasonable discretion and judgment." *In re Dominion Energy Brayton Point, LLC*, 13 E.A.D. 407, 426 (EAB 2007). The federal courts in reviewing Agency decisions have similarly recognized that scientific uncertainty is not a bar to administrative decision making: "We do not demand certainty where there is none. There may be no strong reason for choosing [a particular numerical standard] rather than a somewhat higher or lower number. If so, we will uphold the agency's choice of a numerical standard if it is within a 'zone of reasonableness.'" *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 525 (D.C. Cir. 1983) (citation omitted); *see also Hercules, Inc. v. EPA*, 598 F.2d 91, 116-17 (D.C. Cir. 1978). More than three decades ago, the D.C. Circuit aptly described the CWA's balance when confronted with a difficult situation and the obligation to eliminate water quality impairments: ". . . EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels. This may well mean opting for a gross reduction in pollutant discharge rather than the fine-tuning suggested by numerical limitations. *But this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all.*" *Natural Resources Defense Council, Inc. v. Costle*, 568 F.2d 1369, 1380 (D.C. Cir. 1977) (emphasis added) (finding unlawful a rule that would have exempted certain discharges from permitting requirements based on the difficulty in setting limits).

The final permit requires closure and/or lining of the lagoons (see Response 70). This action alone will eliminate a significant source of nitrogen loading to the Aucoot Cove watershed and will lower the total nitrogen load below the allowable nitrogen loading threshold of 34.5 lbs/day. For this reason, EPA has reconsidered the need for the 3.0 mg/L nitrogen limit in the final permit (see Response 20). The permit includes a total nitrogen limit of 4.0 mg/L as a seasonal average, which the current facility can meet, thus reducing capital investment needed to comply with the permit.

Comment 14. Watershed Load

In lieu of a detailed watershed load calculation, EPA uses the "nonpoint source and stormwater point source areal loading rate calculated for the Segreganset [sic] River watershed, which has similar land use patterns as Marion"; this work was the basis of the draft NPDES permit issued by EPA in March 2013 for the Taunton WWTP. EPA justifies using the Seregansett River areal load rate for Marion's draft permit because "a planned nitrogen loading study under

Massachusetts Estuary Project (MEP) for Aucoot Cove has not been completed, nor is it expected in the near future."

EPA's analysis does not acknowledge work done by the BBNEP (1999). The BBNEP has developed watershed loading estimates using the methodology similar to that used by the MEP, and estimated nitrogen load from the Aucoot Cove watershed nitrogen load in 1999. This analysis found that the non-point source load is approximately 30 lbs/day.

The BBNEP load estimate is over three times larger than the transposed load proposed in the Fact Sheet. Therefore, the Marion WPCF contribution to the overall nitrogen load to Aucoot Cove is significantly less than is implied in the Fact Sheet. Obviously, this shows the lack of understanding of the actual, up-to-date nonpoint source and stormwater load in Aucoot Cove. In the face of these quite different estimates, the only reasonable action is to undertake a new assessment of watershed load, and certainly not transform an overall nitrogen areal loading rate from one watershed to another.

This is particularly important because it changes the perspective of the amount of nitrogen load to Aucoot Cove that could be coming from the wastewater treatment plant. Thus establishing a reasonable estimate of watershed load will allow the Town to properly decide how to cost effectively mitigate nitrogen load to the cove, should this prove to be needed.

Response 14:
Given that the final permit requires the lagoons to be closed or lined, EPA has reconsidered the need for a total nitrogen limit of 3.0 mg/L and has replaced it with a seasonal average limit of 4.0 mg/L. See Response 20.

A higher watershed nonpoint source nitrogen contribution, as alleged by the comment, would suggest that an even lower total nitrogen limit may be necessary for Aucoot Cove to meet water quality standards. If new information leads to this conclusion, then further restriction will be incorporated in a future permit action. EPA strongly encourages the Town of Marion to address the non-point sources of nitrogen that are within their control in order to restore water quality in Aucoot Cove and avoid the potential for more stringent point source nitrogen requirements.

Regardless of the magnitude of nonpoint source nitrogen contributions to Aucoot Cove, it is clear that there is reasonable potential for the Marion WPCF's nitrogen discharges to cause or contribute to a violation of MAWQS. Because the necessary nitrogen reductions are larger than technologically possible at the Marion WPCF, the draft permit included reductions to a level considered achievable in 2015. A higher watershed nonpoint source nitrogen contribution would make the situation worse for the Marion WPCF, taking up more of the allowable total nitrogen load to Aucoot Cove and lowering the Marion WPCF nitrogen limit to 3.0 mg/l even assuming elimination of the lagoon source. There would be no effect on the proposed limit in the unlined lagoons scenario because the allocation would still be less than zero. In these situations, EPA typically defaults to the limit of technology, 3.0 mg/l.

Regardless of the magnitude of nonpoint source nitrogen contributions to Aucoot Cove, there is reasonable potential for the Marion WPCF's nitrogen discharges to cause or contribute to a violation of MAWQS.

Comment 15. Allowable effluent load

EPA's methodology for computing the allowable total nitrogen effluent load required to maintain a concentration of 0.35 mg/L in inner Aucoot Cove is overly simplistic and grossly understates the allowable load to the cove that is protective of eelgrass and other designated uses. This proposed methodology is not sufficient to compute the allowable load required to achieve the stated water quality goals in Aucoot Cove because it ignores key elements required to accurately estimate the allowable load. Elements that must be added to this calculation are other drivers besides total nitrogen that affect eelgrass habitat suitability, estuarine mixing and exchange, total nitrogen load from the ocean, and dilution of the effluent into the full volume within the reference area.

EPA used the following procedure to compute the allowable load to Aucoot Cove. Our comments on the proposed approach are interspersed between the enumerated steps.

1. Assume the impaired area to be the 0.05 square mile area closest to the shoreline and the reference area to be the 0.1 square mile area extending to sampling point AC3 as shown in Fact Sheet Figure 6.

The assumption that the inner Aucoot Cove area is "impaired" due to the lack of eelgrass needs to be conclusively linked to total nitrogen. Light availability, sediment composition, and embayment morphology have all been linked to eelgrass habitat suitability (*e.g.*, Benson *et al.*, 2013; Kenworthy *et al.*, 2013; Li *et al.*, 2007), so the lack of eelgrass in a certain area of Aucoot Cove is not a prima facie indication that the habitat is unsuitable due to excess total nitrogen. Therefore, Marion rejects the use of the proposed impaired and reference areas for determining an allowable total nitrogen load because factors other than total nitrogen may prevent eelgrass from growing in the proposed impaired area.

2. Determine the load rate per unit area for the reference area by dividing the computed loading rate by the surface area of the reference area. This assumes that "the nitrogen loading is not causing an impairment" to the reference area. This load rate is 689 lbs/day/sq. mi. Apply the areal load rate computed for the reference area to the impaired area to determine the allowable nitrogen load in pounds per day. Note that this calculation is equivalent to a 50% reduction in combined nonpoint source, WPCF, and lagoon loads because the impaired area is one half of the reference area. The target load rate using this methodology is 34.45 lbs/day total nitrogen.

Several important elements are missing from this calculation. First, while the surface area of the impaired area is 50 percent of the reference area, the volume of the impaired area is significantly less than 50 percent of the reference area volume. Wind action, wave action, and tidal forcing will cause the water in Aucoot Cove to mix throughout the vertical dimension. Furthermore, the water volume in Aucoot Cove will mix within the larger Buzzards Bay, transporting nitrogen out of Aucoot Cove. Studies have found that "Aucoot Cove is one of the deepest, well flushed embayments in Buzzards Bay." A tidal prism model suggests that the flushing time for Aucoot Cove is 1.4 days, and Costa asserts that "it is unlikely that the residence time of the upper 1/3 of Aucoot Cove is no more than 3 days…" (Costa, 1998). This means that any nitrogen load from the Marion WPCF will be well mixed with the much larger volume of the Cove and much of the nitrogen will be flushed out of Aucoot Cove before significant phytoplankton growth can occur, further minimizing the effect of the minimal load reduction realized by changing the summer-average total nitrogen effluent concentration from 3.8 mg/L to 3.0 mg/L.

3. Assume no nonpoint source reduction, so the required load reduction is 25.05 lbs/day total nitrogen, subtracting the assumed 9.4 lbs/day nonpoint source load.

The Buzzards Bay National Estuary Project (BBNEP) estimated the Aucoot Cove nonpoint source load to be 30 pounds per day, which is three times larger than EPA's nonpoint source load estimate. This updated [sic] represents a significant portion of the total load to Aucoot Cove. Marion believes that it is unacceptable to suggest that a minor load reduction from one of the minor sources to Aucoot Cove while ignoring the larger nonpoint source load source that may be a more cost effective solution for reducing overall total nitrogen loads. We request that EPA revisit the load calculation to make it more scientifically defensible. This includes accounting for dilution and mixing within the estuary and using published load estimates for nonpoint sources from Aucoot Cove instead of transposing a load from a different watershed that may not be comparable to Aucoot Cove. We believe that this would provide a much better basis for setting a nitrogen limit, if needed, that would be protective of eelgrass within Aucoot Cove without unnecessarily imposing a regulatory burden predicated on a flawed analysis that will cause significant economic harm to the community.

Response 15:
Regardless of any mitigating or aggravating factors, the weight of evidence indicates that Aucoot Cove is impaired by excess nitrogen and MassDEP has identified it as impaired for nitrogen. EPA need not quantify every factor affecting nitrogen levels and nitrogen responses before finding reasonable potential and setting a permit limit. See Response 13.

As far as the comment that reducing the discharge from 3.8 to 3.0 mg/L will not be significant, the commenter misunderstands or misrepresents the analysis in the Fact Sheet. The Fact Sheet identifies a much larger reduction in nitrogen as necessary to achieve water quality standards, but recognizes that this reduction may come from NPS controls, including lining of the lagoons.

EPA agrees that nonpoint source reductions will be necessary for Inner Aucoot Cove to reach attainment of water quality standards. EPA clearly has not ignored the larger non-point source loads. The Fact Sheet clearly indicates that if sufficient non-point source reductions are achieved, further reductions in the point source total nitrogen loadings would not be necessary (Note: both the Total Nitrogen limit of 3.0 mg/L and the option to get the limit modified have been removed from the final permit. See Response 20.)

While it is true that the middle and outer portions of Aucoot Cove are well-mixed, Inner Aucoot Cove experiences less mixing because of its proximity to the discharge and shallow depth, in addition to its protected location. Data collected by the Buzzards Bay Coalition, show increasing average total nitrogen concentrations as one moves closer to the Marion WPCF discharge.

Detailed modeling of volumetric mixing, including wind, wave and tidal actions is not available for this discharge. The desire for further study is not sufficient reason to delay reductions in nitrogen loadings where nitrogen related impairments have been so clearly documented.

Regarding the watershed load, see Response 14.

Comment 16. EPA Miscalculated the "Safe" TN Concentration and Impact of the City's Discharge

In addition, Page 18 of the Fact Sheet states that Marion's "[annual] average effluent concentration of 3.46 mg/L is still ten times higher than the concentration needed to support eelgrass in the cove." This statement ignores any denitrification that occurs as the treated effluent pass through both wooded wetland and the salt marsh (Figure 1) and the subsequent dilution that occurs as the effluent mixes into the Cove. We believe it simply wrong to assume no denitrification and no dilution when the effluent moves from channelized Effluent Brook to the wetland and then the well-flushed Aucoot Cove. Therefore, we request that EPA remove this statement from the Fact Sheet. EPA's failure to consider dilution in assessing the need for a water quality-based limit, violates the requirements of 40 CFR 122.44(d) which specifies that dilution must be accounted for when available.

Response 16:

The basis of the limit calculation is the difference between ambient total nitrogen concentrations and loads per unit area in the inner cove and in the larger reference area. EPA agrees that nitrogen discharges into Aucoot Cove are reduced by attenuation and dilution. However, when nitrogen concentrations are measured in the environment, dilution and attenuation have already occurred. The limit calculation simply compares the nitrogen levels in the impaired area with the nitrogen levels at the reference location. It then determines what proportion of the nitrogen load to the inner cove needs to be eliminated to bring it to the concentration of nitrogen in the reference area after the load is subject to attenuation and dilution

While the wetland may provide some attenuation of nitrogen discharges, the significance of this attenuation is far from certain. Wetlands can assimilate nitrogen but they can also release nitrogen at times. EPA made the reasonably conservative assumption that all of the nitrogen discharged by the WPCF reaches Aucoot Cove eventually. The evaluation also includes non-conservative assumptions such as the use of actual WPCF discharge flow rates instead of using the permitted design flow.

The purpose of saying that the discharge being ten times the receiving water target for healthy eelgrass was to highlight that the discharge concentration (approximately 3.5 mg/L), while commendably low, is still large compared to the allowable instream nitrogen concentration (0.35 mg/L). In situations where there is reasonable potential to cause or contribute to an exceedance of the water quality standards and no attenuation or dilution, the effluent limit would be set equal to the allowable instream concentration. That is clearly not the case here.

Comment 17. Marion WPCF Nitrogen Removal has improved
Further supporting the need to account for mixing and dilution that occurs within Aucoot Cove comes from a detailed look at the history of Marion's effluent discharge. Prior to the 2005 plant upgrade no substantive nitrogen removal occurred besides some settling in the lagoons. Our best estimate is that between 25 and 50 percent of the influent nitrogen concentration was removed through settling in these lagoons. Sampling of the present-day influent indicates that its total nitrogen concentration is approximately 20 mg/L. Conservatively assuming 25 percent total nitrogen removal yields an effluent discharge of 15 mg/L, which is significantly larger than the present annual average effluent concentration of 3.46 mg/L. This conservative assumption means that pre-upgrade the plant contributed on the order of four times more total nitrogen load to Aucoot Cove. Therefore, the TN concentration where "healthy" eelgrass populations existed in 1995 had to be higher than the concentration measured by EPA, post WWTP improvements. EPA's analysis completely failed to account for this factor.

While the total nitrogen load to Aucoot Cove from Marion's treatment plant has decreased significantly since 2005, the eelgrass extent has been relatively constant. Most notably, as mentioned above, the edge of the eelgrass closest to Effluent Brook has been unchanged since the Costa's 1980s eelgrass survey of Aucoot Cove. The fact that the load from Marion has decreased by a factor of four with the upgrade of the treatment plant that went online in 2005 with no apparent influence on the eelgrass extent closest to Effluent Brook suggests that further reducing Marion's load by a nominal amount will most certainly not result in a sudden regeneration of the eelgrass anywhere in this system. Moreover, this information confirms that the City's discharge is not "causing or contributing" to eelgrass declines or any absence of eelgrass. If the major TN reductions had no effect on eelgrass populations even over a 5 year period, there is no credible basis to claim that the remaining TN load is somehow critical to eelgrass propagation in this system.

Response 17:
The Town of Marion upgraded the WPCF in 2005, adding a sequencing batch reactor and cloth filters. These upgrades resulted in a marked reduction in effluent nitrogen discharging from the facility. It is notable that the facility is attaining nitrogen concentrations ranging from 3 to 4 mg/L, which is close to the limit of technology.

EPA agrees that a reduction in effluent nitrogen concentrations from an average of 3.46 mg/L to under 3.0 mg/L would not, on its own, result in water quality standard attainment for Aucoot Cove. For that reason, EPA has reconsidered the need for a nitrogen limit of 3.0 mg/L and instead has included a seasonal average limit of 4.0 mg/L in the final permit. Retaining the current level of nitrogen removal together with closing or lining the lagoons will reduce nitrogen loading to a level that will allow Aucoot Cove to meet water quality standards.

Having conceded the exceptional level of treatment at the WPCF after 2005, EPA cannot agree with the other views expressed in the comment. First, the lack of recorded impairment in Aucoot

Cove at any given date does not indicate lack of impairment. Limited monitoring resources do not allow for regular comprehensive assessments of receiving water quality and scientific research and sampling technology now allow for detection of impairments that may have escaped notice in years past. Second, estimated historic eelgrass coverage by Costa (1988) in Aucoot Cove far exceeds levels seen today. (EPA never cites 1995 eelgrass coverage as "healthy;" this is a term ascribed by the commenter.)

Even if Aucoot Cove was not impaired in prior decades despite higher nitrogen discharges, it is not valid to conclude that nitrogen has little effect on eelgrass communities. First, it is well known that ecological response to pollution is rarely smooth and predictable. Eelgrass meadows promote their own survival by slowing currents and improving water clarity (van der Heide, et al. 2011). This means that an eelgrass bed may appear to withstand nutrient inputs until it reaches a tipping point, leading to a rapid decline.

Comment 18. TN Concentrations and Eelgrass Have Not Responded to Improvements at Marion

Another key aspect of the historic total nitrogen concentration at sites AC2 and AC3 is the relative consistency of the concentrations despite significant reductions in treatment plant total nitrogen. The Buzzards Bay Coalition has been collecting data since 1992, which allows a comprehensive picture of the health of Aucoot Cove relative to total nitrogen concentrations over time. The long-term median total nitrogen concentration at AC2 between 1992 and 2005 was 0.42 mg/L, compared with the median concentration between 2007 and 2012 of 0.46 mg/L. This suggests that total nitrogen concentrations in Aucoot Cove have actually *increased* even though the load from the Marion treatment plant has decreased. Furthermore, the eelgrass extent closest to Effluent Brook has not changed over this time period based on the Costa and MassDEP eelgrass survey, showing that the eelgrass is not responding positively or negatively to this concentration. A similar comparison can be made of the total nitrogen trends at AC3. The long-term median concentration between 1992 and 2005 was 0.34 mg/L, which is almost identical to the median concentration of 0.35 mg/L observed between 2007 and 2012. This result suggests that significant dilution and mixing occur within Inner Aucoot Cove, since the concentration is essentially unchanged despite significant load decreases from the Marion treatment plant. This evidence also indicates that the effect of Marion's effluent on the eelgrass is negligible, and the mixing and dilution within Aucoot Cove is an essential element of a rigorous analysis.

Finally, the use of the 5-year average to create a monthly maximum load is improper. Criteria must be applied as derived (EPA, 1985). Within the 5-year average, higher and lower monthly total nitrogen conditions can safely occur; difference between 5-year average and monthly maximum (assuming a coefficient of variation of 0.6) would mean monthly maximum could be up to 0.5 mg/L total nitrogen per EPA Technical Support Document procedures (EPA, 1991). The effluent limits need to be adjusted to reflect the large difference in criteria versus permit limit averaging period.

Response 18:

The Fact Sheet makes it clear that nonpoint sources must be addressed to lower nitrogen concentrations below the threshold to allow healthy eelgrass growth. There is little information on nonpoint sources that would inform as to how this loading has changed over that time frame. Clearly, development in the watershed has continued and EPA would expect a greater nonpoint source load. The fact that eelgrass has not fully reestablished in the inner cove is to be expected since total nitrogen loadings are higher than values necessary to support eelgrass[8]. Similarly, while the inner edge of the eelgrass areal coverage may not have changed significantly, little is known about the density and health of this eelgrass and eelgrass is being lost at the outer edge. The evidence clearly indicates, and MassDEP's listing confirms, that nitrogen loadings are excessive.

EPA agrees that the Marion WPCF discharge is no longer the sole source of nitrogen in the watershed. For this reason, the final permit includes a limit on the WPCF discharge that will not require further point source reductions but will require it to maintain its current level of performance. Furthermore, the permit requires closure and/or lining of the sewage lagoons which will have the effect of eliminating this ongoing source of nitrogen loading to Aucoot Cove.

Regarding averaging periods, the total nitrogen limit in the final permit has been changed to a seasonal average limit. See Response 20.

Comment 19. Antibacksliding

The Draft Permit proposes a 48-month compliance schedule for meeting the 3 mg/L total nitrogen effluent limit, including the opportunity to use stormwater and nonpoint source reductions to "attempt to offset and [sic] WPCF reductions and documents that WPCF nitrogen limits need not be reduced to 3.0 mg/L." The draft comment letter [sic] continues, stating that "If other nitrogen reductions obviate the need to go to 3.0 mg/L, the Town can request a permit modification." The Town of Marion notes that its average total nitrogen discharge between the months of May and October is 3.8 mg/L, close to the proposed 3 mg/L effluent limit. In some months, the average total nitrogen discharge is below 3.0 mg/L (individual samples have range from 1.7 to 7.4 mg/L). The Clean Water Act, Section 402(o) covers anti-backsliding and states that a permit cannot be "renewed, reissued, or modified […] to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit." Marion believes this provision of the Clean Water Act would prevent such a permit modification from occurring if its WPCF meets the 3.0 mg/L total nitrogen limit even if significant nonpoint source reduction is realized. EPA's clarification on the ability to amend the permit in the future is requested. Statements in the Fact Sheet (Page 13) on ammonia indicate that this indeed is how EPA will interpret the any request to change the permit limit after the plant meets an imposed 3 mg/L limit, as the historic data suggest the plant has been able to achieve: "The draft permit retains the limits that were established to ensure attainment of the 1994 ammonia criteria, and these limits have been retained to ensure consistency with antibacksliding requirements.

[8] See Attachment A, which includes a recently identified 2015 eelgrass survey that indicates some eelgrass within the inner cove, although not necessarily evidence of a permanent eelgrass bed having been established.

Response 19:
The total nitrogen limit of 3.0 mg/L has been replaced with a seasonal average limit of 4.0 mg/L, which the facility can currently achieve (see Response 20). Therefore, the final permit contains no compliance schedule for total nitrogen.

In response to the antibacksliding question, these provisions apply only to permit limits that have gone into effect. The antibacksliding provisions at 40 CFR § 122.44(*l*) require that "when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the *final* effluent limitations, standards, or conditions in the previous permit." (emphasis added)

Comment 20. Effect of Stormwater & Nonpoint Sources
Related to the above referenced discussion relating using stormwater and nonpoint source reductions to offset WPCF reductions, Page 24 of the Fact Sheet states that "The Draft Permit recognizes that there may be an appropriate pause point in the future when stormwater and nonpoint sources of nitrogen are adequately accounted for and remedied and field data indicates that all of the Aucoot Cove ecosystem has recovered to a healthy state free of cultural eutrophication." This statement is overly ambiguous. First, EPA does not state the conditions under which stormwater and nonpoint sources of nitrogen are "adequately accounted for." Second, EPA does not state the data and requirements necessary to deem that "the Aucoot Cove ecosystem has recovered to a healthy state free of cultural eutrophication." Marion asks for clarification on these points.

Response 20:
EPA concurs that the referenced language in the Fact Sheet needs clarification. Upon closure and/or lining of the lagoons as required by the permit, a significant ongoing source of nitrogen loading to the Aucoot Cove watershed will be eliminated. Based on EPA's estimate of other non-point source loadings of nitrogen (9.4 lbs/day) and the draft permit point source nitrogen loading (14.7 lbs/day), the resultant total nitrogen load is less than the allowable nitrogen loading threshold of 34.5 lbs/day. Consequently, EPA has reconsidered the need for the 3.0 mg/L nitrogen limit in the final permit. Given the extended groundwater travel time and thus the extended period for which groundwater nitrogen loadings from the lagoons will continue discharging to Aucoot Cove, as well as the uncertainty over EPA's estimate of the other non-point source nitrogen loadings, as pointed out by the commenter, it is prudent to minimize the allowable nitrogen loading from the Marion discharge. A final seasonal average permit limit of 4.0 mg/L total nitrogen from April 1 – October 31 has been established based on documented performance. The 2013 through 2015 reported seasonal (April through October) average total nitrogen discharge values range from 2.9 mg/L – 3.6 mg/L.

If new information indicates that the other non-point sources of nitrogen are significantly higher than EPA's estimate and/or water quality continues to show signs of impairment relative to water quality standards, EPA will impose a more stringent nitrogen limit in a future permit action. Any determination of ongoing water quality impairments will be based on a weight of the evidence analysis that considers ambient total nitrogen, chlorophyll *a*, and dissolved oxygen levels as well as available information on extent and health of eelgrass and presence/abundance of macroalgae.

Comment 21. Aucoot Cove is not impaired
Additionally, EPA's discussion on stormwater and nonpoint source controls is predicated on the unsupported presumption that Aucoot Cove is impaired. The justification for this impairment as presented in the Fact Sheet is the lack of eelgrass in the inner portion of Aucoot Cove. As discussed elsewhere in this comment letter, many other factors besides total nitrogen affect eelgrass habitat suitability. EPA has not conclusively shown that the eelgrass in Aucoot Cove is degraded nor has EPA shown Marion's total nitrogen effluent has degraded eelgrass in Aucoot Cove. How does EPA propose showing that the Aucoot Cove ecosystem has "recovered to a healthy state" without first conclusively proving that it is degraded?

Response 21:
Establishment of a water quality-based total nitrogen limit is not dependent upon the listing or demonstrating of an impairment, but rather on the establishment of a reasonable potential to cause or contribute to an impairment. *See* 40 CFR § 122.44(d)(1). However, in this case the impairment has been well documented both by the fact that it is listed as impaired for nutrients and eutrophication on the state's 303d list, by the data presented in the Fact Sheet that is consistent with conceptual models for cultural eutrophication, and by the information about eel grass impacts in Response 5.[9]

Comment 22. Lagoon study
One of the justifications given for including the lagoons in the Draft Permit is a study on groundwater leakage from the lagoons into nearby embayments by Horsley Witten Group, Inc. prepared on behalf of the Buzzards Bay Coalition titled *Environmental Assessment of the Marion Wastewater Treatment Plant Sewage Lagoons* (Report) dated April 2011 (Horsley Witten, 2011). While the Town commends the Buzzards Bay Coalition for spearheading the important work of helping protect receiving waters of Buzzards Bay; based on a peer review of the report by the Town's consulting engineer, the report contains a number of critical logical and scientific flaws and some curious potential data anomalies that cast doubt on the report's principal conclusions. In fact, the conclusions of the report regarding the degree of lagoon leakage are physically impossible.

Rather than assess the wastewater flows at the plant, the report uses information on water levels and water quality samples collected at a series of nested piezometers that were installed on or near the WPCF site together with water levels and water quality samples for surface streams to find that "effluent from the Marion WPCF sewage lagoons appears to be infiltrating into underlying groundwater" and recommend that the "lagoons be lined with an impermeable geotextile membrane to prevent further leaking from the bottom and sides of the sewage lagoons." The analysis to support this recommendation concludes that leakage occurs at a rate of 1 inch per day, discharging 33,400 pounds of nitrogen (equal to 1,965 homes with septic systems) to the aquifer each year.

[9] We also note that the Town recognizes elsewhere that there is a documented "decline/loss of eelgrass bed habitat" in Aucoot Cove and other marine waters in the Town due, in part, to "[n]utrient loadings in the form of total nitrogen (TN)." 2017 PEF, at 4, 21.

The findings in the Report are overstated and the estimates of leakage from the lagoons do not match the operating experience and data at the WPCF. Major comments are provided below:

The assumption made for nitrogen loading is unreasonably high and without support. The Report estimates that this load would be the equivalent that generated by 1,965 homes on septic systems. This is larger than the number of homes in Marion cited in the Report as 1,700 single family homes from the 2005-2009 census. Given that less than half of all the homes in Marion are connected to the public sewerage system, the nitrogen load is over estimated. It is also approaching the total influent nitrogen load to the plant, and therefore does not consider the fact that the plant provides a high level of nitrogen removal. Under this report's assumptions, Marion is actually creating far more nitrogen than it is receiving.

Response 22:
The principal conclusion that EPA has drawn from the Horsley Witten report is that groundwater near the lagoons is contaminated with excess levels of nitrogen, based on actual groundwater measurements of nitrogen. EPA acknowledges that there is uncertainty associated with attempts to quantify the volume and nitrogen concentration of sewerage exfiltrating from the unlined lagoons. While the analysis included in the comment ignores the effect of precipitation on lagoon volumes, EPA concurs that the leakage rate estimate of 1 inch per day is likely higher than actual leakage rates. However, EPA also notes that the Horsley Witten report assumes a relatively low total nitrogen concentration of 20 mg/L for sewerage exfiltrating the lagoons compared to a more typical value for sewerage of 35 mg/L. EPA explicitly recognized that the magnitude of nitrogen loading cited by the Horsley Witten report was a rough estimate and discussed the uncertainty associated with this loading estimate in the Fact Sheet.

However, regardless of the amount of nitrogen exfiltrating the unlined lagoons, continuing to discharge untreated wastewater and sludge into unlined lagoons is not an acceptable option. The requirement to line or abandon the lagoons does not turn on a precise quantification of the magnitude of nitrogen loading from the lagoons. As EPA noted in the Fact Sheet to the Draft Permit: "[T]he results of the loading analysis would be similar if the actual lagoon loading were one half of the Horsley Witten estimate." FS at 19.

Section 405 of the Clean Water Act provides EPA with the authority to regulate use and disposal of biosolids, which authority the agency may implement via a NPDES permit. *See also* 40 CFR § 503.3(a). Further, section 402(a)(2) of the Act may be used to impose conditions in a permit that are designed to effectuate the requirements of § 405. In addition, EPA has independent authority under § 402(a)(2) to prescribe permit requirements that will assure compliance with the requirements of section 402(a)(1) "as [the EPA Administrator] deems appropriate." The Supreme Court has described section 402(a)(2) as providing the Administrator with "broad discretion to establish conditions for NPDES permits." *Arkansas v. Oklahoma*, 503 U.S. 91, 105 (1992) (citing 33 U.S.C. § 1342(a)(2)).

Disposal of pollutant rich sludge and untreated wastewater in unlined lagoons is not proper operations and maintenance of the treatment plant. Federal regulations require all NPDES permits to include certain standard conditions, including with respect to the duty to mitigate and proper operation and maintenance of the treatment works:

> *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.*
>
> *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 and with the requirements of storm water pollution prevention plans.*

40 CFR § 122.41(d), (e). The lagoon system at the Marion WPCF is covered by these standard provisions.[10] EPA has determined that the use of unlined lagoons for flow equalization and sludge disposal is not in compliance with the operation and maintenance requirements of 40 CFR § 122.41(e).

Additionally, the regulations pertaining to sludge disposal provide that, "[o]n a case-by case basis, the permitting authority may impose requirements for the use or disposal of sewage sludge in addition to or more stringent than the requirements in this part when necessary to protect public health and the environment from any adverse effect of a pollutant in the sewage sludge." *Id.* § 503.5; *see also* 58 Fed. Reg. at 9248, 9359 (Feb. 19, 1993) (Permits issued to POTWs "may include conditions related to any aspect of sewage sludge management developed on a case-by-case basis where the permitting authority determines that such conditions are necessary to protect public health and the environment. For example, [Part 503] does not establish standards for temporary storage of sewage sludge. The permitting authority may develop permit requirements to address potential problems at temporary storage facilities such as contamination of surface water or ground water . . . .").

Comment 23. Boron as Wastewater Indicator

The report uses boron as an indicator of human wastewater stating the boron indicates the presence of detergents. Two of the surface water sampling locations (HGSW1 and HGSW2) are located on Effluent Brook, a stream whose flow is dominated by treated wastewater effluent from the Marion plant. The boron concentrations in four of the six samples at these locations were not detected. Further, a detailed study by Dr. Robert Pitt (no date) of the University of Alabama of chemical indicators of wastewater found that "boron was "a poor indicator of sewage possible due to changes in modern laundry detergents' formulations."

The report states that boron concentrations occur in nature at very low levels (0.02 mg/L) and "any concentrations greater than this typically represents the presence of detergents found in

[10] The lagoon system is subject to NPDES regulation as part of the "treatment works." Section 212(2)(A) of the Act defines treatment works to mean, *inter alia*, "intercepting sewers, outfall sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances." POTW also "includes *any* devices and systems used in the *storage*, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature." 40 CFR § 403.3(q) (emphases added).

wastewater." The detection limit for the boron analysis appears to be 0.05 mg/L, which is higher than typical background concentrations. This high detection limit does not allow for the typical background concentration in Marion to be determined. Also, the results of analytical measurements are generally less reliable when concentrations are measured near detection limits, with a factor of five times the detection limit indicating a level where confidence in measurements increase. All but one boron result detected above five times the detection limit is within this range of increased uncertainty about the magnitude of the result.

Response 23:
Boron is widely used by scientists to indicate wastewater contamination of groundwater, including Pitt, who wrote in 1998 that "[o]ur research found that boron and detergents can be used to distinguish the clean waters from the dirty waters." The USGS (2008) also used boron to study groundwater contamination from on-site sewage systems in South Dakota.

Notwithstanding the contention that boron is a poor indicator of wastewater, the presence or absence of boron is not the determining factor that EPA used to determine whether the lagoons may be exfiltrating. More concerning to EPA are the high levels of total nitrogen measured in groundwater monitoring wells adjacent to the lagoons.

Regarding the detection level for boron, while it may have been informative to determine the background concentration of boron in the local groundwater, EPA fails to see why the lack of this information invalidates the lagoon study. Similarly, the contention of a vague and uncited "range of increased uncertainty" is unconvincing. Data within this range are routinely used in scientific research and regulatory decision making. Finally, the boron results are but one line of evidence among many that the lagoons are exfiltrating nitrogen-laden groundwater. Nitrogen levels in the groundwater adjacent to the lagoons are several times greater than natural levels, and the only plausible sources are the lagoons themselves.

Comment 24. Groundwater
Water table map – The water table map provided in Figure 3 within the report does not account for all the surface water features of the site, such as the portion of the brook south of staff gauge location HWSG5. As shown in the cross section in Figure 5 within the report, the stream is conceptualized as a full penetrating stream meaning the groundwater from the treatment plant site will discharge there. Without further information it is reasonable to assume this would also be the case for the upgradient portion of the stream.

Response 24:
The commenter seems to be implying that the brook south of HWSG5 would intercept groundwater and convey it to a location outside the Aucoot Cove drainage area. EPA notes that in this area, the direction of groundwater flow is away from Aucoot Cove and toward the Sippican/Weweantic River and would not reach Aucoot Cove anyway. Even if this were an error in the groundwater map, and it is unclear that it is an error, it would make no difference to the conclusion of the study that nitrogen from the lagoons is reaching groundwater.

Comment 25. Distribution of groundwater flow

Figure 4 in the Report uses water table contours to define the proportion of groundwater flow is assumed to reach major surface water resources. This approximation does not account for interception of groundwater by streams and wetlands nor potential differences in aquifer properties that would cause flow to be distributed differently.

The head measured at monitoring HWMW 4, where higher TN concentrations are found is actually 3 feet lower than the head measured at HWMW 6, which is 300 feet east of the nearest lagoon. The head at well 5, where TN concentrations of 1.1 mg/L or less do not indicate significant lagoon leakage, is also approximately 3 feet higher than the head at HWMW 4. Hence, the data do not indicate that the quantity of lagoon leakage is significant enough to create a groundwater mound, something that would be anticipated if the lagoons were indeed leaking significant quantities of water (understanding that a detailed hydrogeologic report on the area has not been prepared to understand local geology). The lagoons are located near a natural topographic high in the area and it would not be unreasonable to expect that water table to have a correspondingly high local elevation. Nonetheless, the water table maps in the Report (Figures 3 and 4 interpret the groundwater high as being located to the south southeast of the lagoons. This result is unexpected given the Report's assumption that the lagoons leak one inch per day (or 365 inches per year). If this quantity of water were leaking from the lagoons the water table would surely reflect it, and the local high point would not be located south southeast [sic]quantity of leakage from the lagoons cannot therefore be significantly greater than natural groundwater recharge in the area (which would likely be in the range of 10 to 20 inches/year), all other things being equal.

Water level data provided in the Report indicate discharge of groundwater into the stream associated with HWSG 5a. In general, it is reasonable to assume that a very substantial portion of shallow groundwater in the vicinity of the lagoons discharges to streams, wetlands, or ponds before reaching the shore. Hence, most of the shallow groundwater in the vicinity of the lagoons is probably not reaching the shore as groundwater, and the average travel time is probably much less than suggested within the Report. Residence time in streams, ponds and wetlands provides opportunity for attenuation of nitrogen through denitrification.

The report travel times calculated in the report do not account for the interception of groundwater flow by the many surface water features (streams and wetlands) present in the project area.

Groundwater flow that is intercepted by surface water features will undergo some nitrogen attenuation through denitrification in stream bottoms and wetlands reducing the amount of nitrogen discharges to surface water. Estimates of attenuation from studies in southeastern Massachusetts generally range from 50 to 60 percent (a detailed analysis of nitrogen loads to the Agawam River in the adjacent Town of Wareham suggested the removal of nitrogen in freshwater ponds and streams was 53 to 61 percent). Studies of denitrification in ponds by the Massachusetts Estuaries Project have found a range of values. In Falmouth, MEP sampling found that the nitrogen load attenuation ranged between 26 and 69% (MEP, 2005), whereas in

Namskaket Creek in Nantucket sampling found the nitrogen load attenuation ranged between 50 and 82% (MEP, 2007).

Response 25:
Both leakage from the lagoons that migrates to Aucoot Cove via groundwater or leakage that migrates to Aucoot Cove via streams would contribute to Aucoot Cove's impairment. As noted in responses above, the magnitude and travel time of nitrogen leaching from the lagoons are less important than the established fact that the leaching is occurring and is affecting groundwater levels of nitrogen.

There are not enough data available to estimate how much groundwater flow is intercepted by surface waters and nitrogen attenuation is highly variable and site specific. This reasonably conservative assumption that nitrogen attenuation is zero is balanced by the areal loading model used in the Fact Sheet, which yielded a negative nitrogen allocation to Outfall 001 if the lagoons were not addressed. See Response 22 above relative to the uncertainty of estimating nitrogen loads to Aucoot Cove from the unlined lagoons as well as the uncertainty of estimating other nonpoint source loadings of nitrogen to Aucoot Cove.

Comment 26. Plume of nitrogen
Page 9 of the report mentions that even if seepage from the lagoons was stopped "the plume underneath the sewage lagoons would continue to migrate" to surface waters for many years to come. The report does not demonstrate that there is a "plume" of nitrogen emanating from the Marion lagoons.

The data show that HWMW 2, 4 and 8, all of which are located adjacent to the lagoons are the only wells with concentrations greater than 3 mg/L total nitrogen. This concentration – 3 mg/L total nitrogen – is at the low end of effluent discharge limits (3 to 7 mg/L total nitrogen) given to the advanced wastewater treatment plants discharging to sensitive waters.

Elevated TN concentrations (up to 10 mg/L) observed at monitoring wells HWMW 4 and 8 immediately adjacent to the lagoons is consistent with downward seepage of wastewater from the lagoons to the groundwater. Elevated TN concentrations (up to 5 mg/L) at monitoring well HWMW2 approximately 500 feet north of the lagoons, adjacent to the treatment plant, could be the result of downgradient transport of groundwater impacted by lagoon seepage. HWMW 2 is downgradient of the lagoons, with a head approximately 5 feet lower than the groundwater head at HWMW 4 and 8 near the lagoons.

In contrast to monitoring wells 4 and 8, however, TN concentrations at HWMW5, also immediately adjacent to the lagoons but on the southeast side of Lagoon 2, have been 1 mg/L or less. There appears to be no significant leakage of wastewater near this well. Other monitoring wells sampling groundwater potentially tributary to Aucoot Cove, HWMW 3, 6 and 7, all have had measured TN concentrations less than 1.5 mg/L. Hence, there is no data indicating the presence of a significant TN groundwater plume migrating towards Aucoot Cove.

While sampling and analysis of groundwater at a few monitoring wells indicates elevated TN consistent with some downward leakage from the lagoons, the water level data do not indicate the presence of a groundwater mound at these locations. Therefore, as described below, the rate of leakage is likely much less than estimated in the 2011 Report. Further, there is no data indicating the presence of a significant TN groundwater plume migrating towards Aucoot Cove. This evidence suggests that any nitrogen contribution from the lagoons to groundwater is at best overstated.

Given the substantive issues associated with the Horsley Witten's characterization of the potential groundwater flow from the lagoons to Aucoot Cove, we request that EPA remove the discussion of the Horsley Witten report from the Draft Permit. The numerous logical and scientific shortcomings of the report call into question the validity of using the results as the basis for establishing conditions for the WPCF's permit. As this analysis formed the basis for EPA's concerns regarding lagoon operations and the report plainly has no credible scientific basis, further requirements related to this issue should cease.

Response 26:
The comment acknowledges that nitrogen-laden water is indeed seeping from the lagoons to the groundwater. As such, the lagoons are required to be properly operated and maintained by being closed or lined independent of any estimate of how much nitrogen is reaching Aucoot Cove. While there is uncertainty associated with the exact direction of groundwater flow from the entire 20-acre lagoon area, all nitrogen from the lagoons will reach a surface water and may have a detrimental effect on that surface water.

TOTAL PHOSPHORUS

Comment 27. Total Phosphorus Limit
Similar to the objections noted above with respect to nitrogen limitations, the need for a limit on phosphorus has not been demonstrated, no support for the same exists beyond generalized observations and, accordingly, this requirement should be removed from the permit. No measurements are presented for levels of algae or other parameters that would indicate an impairment to an existing or designated use as required under the Commonwealth of Massachusetts's (Commonwealth) narrative nutrient criteria. Furthermore, we note that all streams can have periphyton, and its presence does not mean that a nutrient impact is occurring. Periphyton can grow well with a total phosphorus concentration of 10 μg/l, and natural conditions likely exceed this level (Smith *et al.*, 2003; Chapra, 2014b).

Response 27:
When EPA finds that a there is reasonable potential for an excursion from water quality standards from phosphorus in a discharge, it is required to set a protective limit. EPA based the phosphorus limit on effluent data submitted by the permittee and the well-documented fact that the stream has no flow during 7Q10 conditions. EPA did not base its reasonable potential analysis solely on the presence of periphyton. While some level of periphyton growth is normal in almost all rivers, the presence of filamentous algae, on the other hand, is a well understood indication of cultural eutrophication. Filamentous algae form stringy "mats" in warm, nutrient

enriched surface waters and are considered a nuisance to other aquatic life and recreation. Evidence of filamentous algae and other indications of cultural eutrophication are documented in the 2007 memorandum "Qualitative benthos assessment upstream and downstream of Marion WWTP discharge", in which MassDEP evaluated the ecological communities upstream and downstream of the discharge. This report was Appendix A of the Fact Sheet.

Comment 28. Effluent Brook is not impaired

Effluent Brook flows beneath a relatively thick forest canopy causing the brook to be in deep shade resulting in light being the limiting conditions for growth of algae. As shown in **Figure 4**, during a site visit with EPA in late summer 2014, the brook was clear with a sandy bottom and showed no visible signs of eutrophication. In addition, Effluent Brook is not included on the most recent 303D List of Impaired Waters in the Commonwealth.

Response 28:

The commenter is correct that the brook is shaded in most areas, and that this shade reduces the growth of algae and other nuisance vegetation. For this reason, EPA set a limit of 200 μg/L that is consistent with the Highest and Best Practical Treatment requirement of the Massachusetts Surface Water Quality Standards and should also ensure attainment of the narrative nutrient standard. In the absence of the extensive shading of the brook, a limit of 0.1 mg/L would have been imposed.

While it is true that the receiving water is not included on the 303(d) list of Impaired Waters, it is also not included in the lists of waters attaining standards. This situation is common for smaller bodies of water. Moreover, inclusion on a state's 303(d) list is not a precondition for EPA to set a permit limit. *See* 40 CFR § 122.44(d)(1)(i), (ii); *In re City of Taunton*, NPDES Appeal No. 15-08, slip op. at 39 (EAB May 3, 2016); *see also In re Upper Blackstone Water Pollution Abatement Dist.*, 14 E.A.D. 577, 599 (EAB 2010) (explaining that the NPDES regulations require a "precautionary" approach to determining whether the permit must contain a water quality-based effluent limit for a particular pollutant), *aff'd.* 690 F.3d 9 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2382 (2013).

Even if there were no evidence of exceedances of water quality standards related to total phosphorus — a conclusion with which the Region disagrees— it is well established under EAB precedent and guidance that **EPA does *not* need to wait for water quality violations to occur prior to imposing a protective effluent limitation in an NPDES permit**. The requirement to impose a permit limit is not only premised on a finding that the pollutant discharges "are" at a level that "causes" violation of the applicable water quality standards, but the requirement is also triggered by a finding that the facility's pollutant discharges "may" be at a level that "contributes" to or has the "reasonable potential" to cause a violation. 40 CFR § 122.44(d)(1)(i). The regulation requires water quality-based effluent limits even when there is some degree of uncertainty regarding both the precise pollutant discharge levels and the potential causal effects of those discharges, so long as the record is sufficient to establish that there is a "reasonable potential" for that discharge to cause or contribute to a violation of water quality standards. EPA in the Final Rule Preamble for 40 CFR § 122.44(d)(1) dispels any doubt over the necessity of proving an impairment and causation of that impairment prior to either deriving a numeric instream target to implement a narrative water quality criterion, or imposing a water quality-based effluent limitation to implement that criterion:

> *Several commenters asked if it was necessary to show in-stream impact, or to show adverse effects on human health before invoking [§122.44(d)(1)(vi)] as a basis for establishing water quality-based limits on a pollutant of concern. It is not necessary to show adverse effects on aquatic life or human health to invoke this paragraph []. The CWA does not require such a demonstration and it is EPA's position that it is not necessary to demonstrate such effects before establishing limits on a pollutant of concern.*

54 Fed. Reg. 23,868, 23,878 (June 2, 1989). “Reasonable potential” requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary. *In re Upper Blackstone*, 14 E.A.D. at 599 n.29. The regulations, thus, require a precautionary approach when determining whether the permit must contain a water quality-based effluent limit for a particular pollutant. *Id.* at 599.

See Response 30.

Comment 29. MassDEP Macroinvertebrate Study

In 2007, the Massachusetts Department of Environmental Protection (MassDEP) conducted a macroinvertebrate sampling program of the brook and found organisms upstream and downstream of the discharge point were comparable, indicating that the effluent discharge itself is not causing an impairment (MassDEP, 2007). The assemblages in all locations indicated those of a pollution tolerant community. This type of rapid bioassessment protocol is usually aimed at determining if there is evidence of eutrophication in the stream, which is not the case in Effluent Brook; conditions such as low dissolved oxygen (DO) levels and prolific algal growth are not present. Thus, the cause of the pollution tolerant assemblages is likely the stress on the organisms due to the intermittent nature of the stream itself; this is a natural condition as the stream is ephemeral with little or no flow regularly occurring during the summer months. Under dry conditions, there is no water in the brook upstream of the discharge and the treated effluent is the only source of water. Since the WPCF operates as a batch reactor with 10 cycles per day and utilizes a downstream flow equalization tank, the Town of Marion’s (Town) process engineer estimates that flow may discharge from the current outfall pipe only about 50% of time under the low flow conditions of summer and early fall. Indeed, lack of streamflow is a well-recognized cause and condition of impairment of macroinvertebrate community structure (e.g., NJ DEP’s Ambient Biomonitoring Network Generalized Executive Summary). Fritz and Dodds (2004) studied the effects of drying cycles (and floods) on macroinvertebrate assemblages and found significant impacts relative to pre-drying assemblages. As an example, a 2-month drying period reduced species richness by half. While not directly analogous to the more frequent wetting/drying that occurs in Effluent Brook during the summer, studies such as these show that stress tolerant organisms should be expected to be the normal condition in streams with naturally dry periods.

The discharge of plant effluent could be seen as enhancing the habitat in Effluent Brook, which is otherwise ephemeral. This hypothesis was supported by the conclusions of the MassDEP macroinvertebrate study which indicated: “It is possible that the discharge is actually improving conditions for benthic macroinvertebrates by increasing flow within Effluent Brook (e.g., creating riffle habitats).”

The claim that nutrients are causing adverse impacts in Effluent Brook is inconsistent with the available studies. There is no evidence that phosphorus is limiting any form of plant growth in this system nor affecting the macroinvertebrate community nor is there information indicating that a narrative criteria violation is occurring due to the TP discharge (a prerequisite for triggering limitations under 40 CFR 122.44(d).

Response 29:
Intermittent streams are common features of the New England landscape and are not, as the commenter implies, inferior versions of their permanent counterparts. Animals and plants inhabiting these temporary aquatic habitats are well-adapted to those conditions and do not require artificial habitat enhancement. To say that addition of sewage effluent to an intermittent stream constitutes an improvement indicates a basic misunderstanding of ecology.

The commenter dismisses the results of the 2007 MassDEP memorandum, “Qualitative benthos assessment upstream and downstream of Marion WWTP discharge”, which revealed an impaired macroinvertebrate community, because low DO and “prolific” algae have, according to the commenter, not been observed. On the contrary, the biological study notes that “[p]rolific growth of green algae was observed at all biomonitoring stations, with the community comprised of mainly filamentous forms of green algae and diatoms.” See Fact Sheet, Appendix A at 2. Photos from the biological study clearly show abundant aquatic plant growth immediately downstream of the discharge (see Figure 1).

While permit issuers are only required to determine whether a given point source discharge “cause[s], ha[s] the reasonable potential to cause, or contribute[s] to an excursion above” the narrative or numeric criteria set forth in state water quality standards, 40 C.F.R. § 122.44(d)(1)(i), in this case there is an actual documented impairment as evidenced by the algal growth.

EPA acknowledges that in many parts of the receiving water, plant growth may be limited by shading rather than by phosphorus. For this reason, EPA proposed a total phosphorus limit of 200 µg/L (0.2 mg/L) during the summer months rather than 0.1 mg/L, which would generally apply in streams without available dilution such as the receiving water. Also, the final permit includes an option to relocate the outfall to the estuarine portion of Aucoot Cove to avoid the need for a phosphorus limit.

Comment 30. Gold Book Criteria
Ignoring all these lines of evidence for a lack of impairment, EPA instead relied on nutrient guideline concentrations from the Gold Book because (Page 25 of the Fact Sheet) “its effects based approach … is more directly associated with an impairment to a designated use (e.g. fishing). The effects-based approach provides a threshold value above which water quality

impairments are likely to occur." Further, EPA justifies increasing the Gold Book threshold value for exactly the same reasons that there is no demonstrated impairment of a narrative nutrient criteria (i.e., sandy bottom, canopy shading making light – and not phosphorus – the limit variable in algal growth, EPA's own field observations of "minor amounts of aquatic plant and algal growth"). The simple presence of phosphorus in a receiving water without any evidence of impact is an entirely insufficient and unfounded reason for including a permit limit for total phosphorus. EPA's argument seems to be that because concentrations are above a "threshold" value, there simply must be an impairment that, however, is precisely what the Gold Book criteria states is NOT true.

The Gold Book discusses the need to regulate phosphate phosphorus for eutrophication in some situations but specifically states that "a total phosphorus criterion to control nuisance aquatic growths is not presented". Therefore, claiming that the Gold Book created nutrient criteria that should be presumed applicable in this instance, in accordance with 40 CFR 122.44(d), is plainly in error. While the Gold Book *suggests* TP criteria of 100 µg/L may be appropriate for some streams, the Gold Book observes also that "there may be waterways wherein higher concentrations or loadings of total phosphorus do not produce eutrophy […]". Such conditions are influenced by natural confounding factors such as "naturally occurring phenomena [which] may limit the development of plant nuisances", "natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis", "morphometric features of steep banks, great depth, and substantial flows [which] contribute to a history of no plant problems", and "nutrient[s] other than phosphorus […] limiting plant growth". The Gold Book specifically indicates the need to consider such site-specific factors, not that such factors or lack of response be ignored in setting nutrient limitations for phosphorus. The phosphate phosphorus discussion ends with a reiteration that "no national criterion is presented for phosphate phosphorus for the control of eutrophication."

As noted earlier, implementing a requirement inconsistent with the very recommendations and limitations presented in the expert report is, *per se*, arbitrary and capricious. As EPA's reference document specifically notes that TP does not cause uniform impacts in streams and site-specific response should control decision making, EPA decision to include TP reductions even where an adverse stream response is not found is not a defensible action.

Response 30:
In the course of determining the trophic status of the receiving water and deriving a protective phosphorus effluent limit that would meet the narrative phosphorus criterion, the Region looked to a variety of sources, including the Gold Book, Ecoregional Nutrient Criteria (*Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, December 2000*) and Nutrient Criteria Guidance (*Nutrient Criteria Technical Guidance Manual: Rivers and Streams, July 2000)*. These constitute information published under CWA § 304(a) and were used as *guidance* to interpret the State's narrative criterion for nutrients and not as substitutes for state water quality criteria. The Region's use of the Gold Book and other relevant materials published under Section 304(a) to develop a numeric phosphorus limit sufficiently stringent to achieve the narrative nutrient criterion is consistent

with applicable NPDES regulations. When deriving a numeric limit to implement a narrative water quality criterion, EPA is authorized (40 CFR §122.44(d)(1)(vi)(B)) to "[e]stablish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under Section 304(a) of the CWA, supplemented where necessary by other relevant information."

EPA recognizes that the Gold Book does not contain a phosphorus criterion *per se*, but instead presents a "rationale to support such a criterion." Gold Book at 240. The guidance document goes on to recommend in-stream phosphorus concentrations of 0.05 mg/L in any stream entering a lake or reservoir, 0.1 mg/L for any stream not discharging directly to lakes or impoundments, and 0.025 mg/L within the lake or reservoir.

The commenter references a statement in the Gold Book that indicates that, at the time of the Gold Book's publication, there was more data to support the establishment of a limiting phosphorus level in lakes than in streams or rivers. Much more recent data and criteria guidance published under Section 304(a) of the CWA reinforces the Gold Book recommendations related to streams and rivers.

The more recent Nutrient Criteria Guidance document, as well as the Ecoregional Nutrient Criteria, indicate that instream phosphorus concentrations need to be less than 100 μg/L (0.1 mg/L) in order to control cultural eutrophication. The Nutrient Criteria Guidance document cites a range from 10-90 μg/L to control periphyton and from 35-70 μg/L to control plankton (see Table 4 on page 101). The Ecoregional Nutrient Criteria document outlines so-called "reference" conditions in waters within specific ecoregions across the country, which are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. Marion is in Ecoregion XIV, *Eastern Coastal Plain*. Recommended criteria for this ecoregion is a total phosphorus criterion of 24 μg/L.

The commenter cites factors that the Gold Book indicates can reduce the threat of eutrophication. Contrary to the commenter's assertion, EPA did consider site-specific factors in the unnamed brook that could limit the effects of phosphorus loading. See Fact Sheet at 25. Shading by tree cover is one example of "naturally occurring phenomena [which] may limit the development of plant nuisances." It is possible that "natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis" affects plant growth in the brook given the tannic colored water that is frequently present upstream of the outfall. Downstream of the outfall, however, the Marion WPCF effluent dominates, and the brook color is clear. Therefore, EPA did not consider naturally-occurring tannins as a factor mitigating plant growth. Morphometric and flow characteristics were considered but did not appear remarkable.

See also Response 28.

Comment 31. Proposed Limitations Will Have No Effect on Plant Growth
EPA created a technology based limit of 0.2 mg/L total phosphorus stating that EPA "believes this limit will ensure attainment of the narrative nutrient criteria applicable to this particular receiving stream." This logic disregards the actual site-specific conditions of Effluent Brook, which has long had much higher concentrations than 0.2 mg/L without experiencing a documented impairment due to Marion's discharge. Lacking an actual demonstration of an

impairment, phosphorus limits should be removed from the permit. Moreover, as repeatedly confirmed by leading experts, a concentration of 0.2 mg/L TP, instream, will control nothing (Chapra, 2014b; Hall and Hall, 2009). Thus, assuming that there was some need to control plant growth, the selected water quality target will be thoroughly inadequate for ensuring narrative criteria compliance. Fortunately, it is not needed under the circumstances.

Response 31:
The commenter argues that TP concentrations in the brook have been over 200 μg/L without negative effects. EPA disputes this claim. While EPA agrees that total phosphorus in the brook exceeds 200 μg/L virtually year-round, as shown by the Horsley Witten Study, it is also clear that phosphorus is present in the effluent at a level that will cause, has the reasonable potential to cause, or contributes to a violation of water quality standards, as explained in Responses 28 and 29. Of the two "leading experts" cited, only one (Chapra) is recognized as having expertise in water quality and water quality modeling. The Chapra 2014 paper makes no conclusions about which levels, if any, at which total phosphorus may be limiting. Moreover, the paper states that its model "would not be appropriate for systems with highly non-steady hydraulics …or where biotic activity is transient", such as intermittent streams like the receiving water. However, if the commenter is correct that the currently proposed phosphorus effluent limitation of 200 μg/L would not be protective, a more stringent phosphorus limit may be included in a future permit action.

Comment 32. Mechanistic Model
An alternative methodology of setting a site-specific total phosphorus (TP) limit that is protective of aquatic life and will not cause excess periphyton growth is described by Chapra *et al.* (2014b). In this study, the authors developed and applied a mechanistic model of a point source discharge to a stream. This methodology is suggested to be an excellent "screening tool for assessing individual point sources" and as "the basis for establishing nutrient criteria." The Town notes that this is a more robust and scientifically defensible mechanism for establishing a numeric nutrient criteria within Effluent Brook as it takes into account site-specific characteristics of Effluent Brook. The use of such a model will allow the selection of a numeric nutrient criteria protective of designated uses within the stream but not overly protective so as to require significant treatment upgrades without a significant environmental benefit.

Response 32:
The data to support such a modeling effort is not available. The desire for more study is not sufficient reason to delay implementation of water quality-based effluent limits. To the contrary, EPA is obligated to establish effluent limitations necessary to achieve water quality standards where it finds that a pollutant is "or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." 40 CFR § 122.44(d)(1)(1); *see also* Upper Blackstone Water Pollution Abatement Dist. v. United States EPA, 690 F.3d 9, 22 (1st Cir. 2012) (explaining that "neither the CWA nor EPA regulations permit the EPA to delay issuance of a new permit indefinitely until better science can be developed").

Comment 33. Limit is not low enough to control periphyton

Some of the issues surrounding setting TP effluent limits in flowing streams as a means to control periphyton and algae growth are illustrated by numerous case studies. Hall and Hall (2009) examined several recent TMDL studies where TP limits were set for point sources. In Pennsylvania, a TMDL was set based on a generic regression analysis to set an endpoint TP estimate of 0.20 mg/L in effluent dominated streams. Data show that the algae growing in this stream could thrive "even in the cleanest of waters," and the generic regression did not match site-specific data linking chlorophyll-*a* and TP concentrations. The 0.2 mg/L total phosphorus level was not effective at limiting algae growth to target levels, which the authors note is not surprising because "the regression factor indicated that over 80 percent of the variability in periphyton biomass was attributed to factors *unrelated* to nutrient concentration." In yet another example, in the Jackson River in Virginia, a TMDL was developed based on a regression between total dissolved phosphorus and periphyton biomass. Following the implementation of the TMDL, in-stream TP averaged about 0.02 mg/L, but "there was *no* material change in the periphyton biomass between 2001 and 2006 (Hall and Hall, 2009). This suggests that other factors control periphyton and algal productivity within streams, and setting a stringent phosphorus limit to below natural background conditions may not have any effect whatsoever on growth in the stream.

Response 33:

EPA does not need to demonstrate that phosphorus is the only cause, or even the primary cause, before imposing an effluent limit. An effluent limit may still be required if the pollutant contributes to an exceedance of water quality standards. *See also* Upper Blackstone Water Pollution Abatement Dist. v. United States EPA, 690 F.3d 9, 33 (1st Cir. 2012) (rejecting the claim that "the EPA must show that the new limits, in and of themselves, will cure any water quality problem"). The average discharge concentration of phosphorus is currently 1.6 mg/L, or eight times the receiving water level that is consistent with achieving water quality standards, and the receiving water provides minimal effective dilution.

The commenter points to case studies presented in Hall and Hall, 2009 to support the contention that an effluent limit of 200 μg/L will have no effect on periphyton growth. This is an opinion submission in a business periodical, and EPA does not consider the source to be valid in a scientific context. EPA does not dispute the fact that phosphorus is not the only factor involved in the degree of cultural eutrophication in a particular water body. In any event, vague references to TMDLs developed for other waterbodies do not provide a convincing argument that controlling phosphorus will not have a beneficial impact on the documented algal growth in this receiving water.

It is well-documented that nutrient removal by POTWs decreases algal growth in receiving waters. The commenter cites Chapra *et al* 2014 in its argument that nutrient reductions will have no effect. They ignore, however, Chapra *et al*'s discussion (see page 6) of four cases where treatment plant upgrades reduced periphyton biomass downstream of the discharge.

Chapra *et al*'s thesis is that the effect of nutrient reductions fades as one moves downstream, outside of what they term the "wastewater response region," extending several miles downstream of a discharge. This argument does not pertain to the unnamed brook (referred to in comments as "Effluent Brook") because, at only about 2 miles long and effluent-dominated; the entire stream is in the "wastewater response region."

Comment 34. TP Compliance Schedule
Footnote 9 (Page 4 of the Draft Permit) references the compliance schedule for meeting the proposed phosphorus limit and establishes an interim limit from April to October of 1 mg/L. The logic provided in the Fact Sheet for the duration of the compliance schedule is flawed. The schedule assumes that the only WPCF upgrade needed to meet the proposed total phosphorus limit is the addition of chemical storage and dosing facilities. EPA believes 24 months allows sufficient time to evaluate**,** jar test, and pilot these facilities. Additional upgrades will be needed to meet this limit and include: rapid-mix facilities (potentially, if testing indicates rapid mixing is required), some modification to the filters themselves, and new sludge handling facilities. The need for the sludge handling facilities arises because use of a chemical for phosphorus precipitation will create a chemically-laden (non-biodegradable) sludge that will need to be processed on site and held for off-site disposal.

Response 34:
Because the addition of chemicals will likely be required to comply with the phosphorus limits, implementation of the limits before new sludge handling procedures are in place may impose a logistical problem relative to sludge handling capacity and/or sludge disposal. Therefore, EPA has changed the phosphorus compliance schedule to allow more time to address sludge handling concerns. The final permit requires compliance with the phosphorus limit within 42 months of the effective date of the permit. The final permit also includes an option for the permittee to relocate its outfall to the estuarine portion Aucoot Cove, which would eliminate the need for an effluent phosphorus limit.

Comment 35. Interim Phosphorus Limit
Phosphorus levels in the treated effluent from September 2010 to August 2014 averaged 1.6 mg/L and ranged from 0.54 to 3.79 mg/L. The current plant, without chemical addition facilities and associated improvements, cannot meet the proposed interim limit of 1 mg/L. Given that the Town will be unable to change its treatment processes to reduce phosphorus levels prior to constructing any upgrades, it is completely unreasonable to select an interim limit of 1 mg/L knowing that this limit could cause the discharge to be immediately out of compliance with the permit. No rationale is provided in the Fact Sheet for imposing any interim limit, nor for selecting an interim limit of any magnitude (not less one greater than the current average discharge concentration). As there is no demonstrated impairment in Effluent Brook (See **Figure 2** above), there should be no interim limit in the permit and the Town requests that EPA remove the same.

Response 35:
On further examination, EPA agrees that the Marion WPCF would be unable to meet a 1 mg/L interim phosphorus limit without significant upgrades. Therefore, the interim phosphorus limit has been removed and replaced with a report-only requirement. The final limit of 200 μg/L from

May through October remains in place and will go into effect 42 months after the effective date of the permit, if the Town chooses not to relocate the outfall to Aucoot Cove.

Comment 36. Winter Phosphorus Limit

The Draft Permit cites a winter (November 1 – March 31) total phosphorus limit of 1 mg/L. In contrast to the summer limit of 0.2 mg/L, there is no stated basis for imposing this wintertime limit or any analysis showing that TP reduction is required in the winter to meet state narrative criteria as mandated by 40 CFR 122.44(d). This period is associated with low algal productivity, and it is not necessary to limit phosphorus in order to prevent algae from growing in Effluent Brook. The Town requests EPA remove the winter total phosphorus limit from the permit.

Response 36:

Total phosphorus has separate limits for summer and winter to account for the growing season. During the growing season (i.e. April through October) the phosphorus in the discharge will be taken up by plant and algal biomass in the river system. Therefore, during this period, the effluent limit of 200 μg/L needs to be met to prevent excessive plant and algal growth. The winter period (November through March) limitation on total phosphorus is necessary to ensure that the higher levels of phosphorus discharged in the winter do not result in the accumulation of phosphorus in downstream sediments. The limitation assumes that the vast majority of the phosphorus discharged will be in the dissolved fraction and that dissolved phosphorus will pass through the system during the winter period. However, winter limits are generally imposed where there are downstream impoundments that could act as a sink for the higher levels of phosphorus discharged in the winter period which can then become a source of phosphorus to the water column in the summer growing season. Given the lack of impoundments in this receiving water, EPA has removed the winter phosphorus limit from the final permit and replaced it with a monthly monitoring requirement.

Comment 37. Mass-Based Phosphorus Limit

In the event that EPA somehow fails to modify the permit based on the above comments, at a minimum, the Town requests the concentration limit be removed for the permit and that phosphorous be regulated based on mass. This is certainly appropriate and is consistent with other recent NPDES permits issued for Massachusetts treatment plants.

Response 37:

If EPA were to include a mass-based phosphorus limit, it would be calculated to ensure that downstream effluent concentrations are 200 μg/L or lower in low flow conditions. Because of the lack of dilution, the mass-based limit would be 0.28 lbs/day, equal to the load discharged at 200 μg/L at 0.168 MGD (monthly average flow during August 2016).

Effluent concentrations less than 200 μg/L would be required to meet this mass-based limit during most months, however. For example, if the monthly average effluent flow rate were 0.3 MGD, the phosphorus concentration required to meet a mass-based limit of 0.28 lbs/day would be 111 μg/L. At a flow rate of 0.4 MGD, the required concentration would be 84 μg/L.

EPA also rejected the mass-based limit discussed above because it is unnecessarily stringent. EPA has set the receiving water target phosphorus concentration at 200 μg/L, and due to the lack of dilution, the only way of ensuring that this target is met is to set the effluent concentration to the same level. Consequently, the final permit maintains the concentration limit only.

OTHER PERMIT LIMITS AND CONDITIONS

Comment 38. Nutrient Parameters

As stated in the Fact Sheet, the monitoring for the nitrogen species (other than ammonia) is being done because of eutrophication concerns. As these concerns are only manifested in the summer season, it does not make sense to spend the Town's limited resources to collect this data for nitrogen at a 4-fold increased frequency and phosphorus at 2-fold frequency during the winter season. The Town requests that TKN, nitrate, nitrite, and phosphorus be returned to once a month for the period of October through May.

The Town also requests the analytical result for nitrate and nitrite be allowed to be reported as a combined result (nitrate + nitrite). The goal of nitrogen monitoring is to determine total nitrogen. The combined analytical test achieves this objective and is less costly.

Response 38:

EPA agrees that total nitrogen monitoring is less critical in the winter than in the warm weather months. Therefore, EPA has changed the nitrogen monitoring requirements to once per month from November through March. The phosphorus monitoring requirement from November through March was already once per month in the draft permit, making that request moot.

The nitrogen monitoring requirement has also been changed to allow for the reporting of combined nitrate + nitrite.

Comment 39. Flow

The flow limitation in the permit should be removed or be designated as a "report only" requirement. EPA has long recognized that flow is not a regulated parameter because it is not a "pollutant" and as such should not be included with a limit in the permit. This understanding is reflected in NPDES permits issued all over the Country. The Fact Sheet improperly EPA describes effluent flow as a "non-conventional" pollutant on Page 11 of the Fact Sheet, citing the Clean Water Act (CWA):

> *The term "pollutant" means dredged spoil [sic], solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.*

33 U.S.C. §1362(6)

However, EPA's identification of "non-conventional *pollutants"* as defined in federal rules at 40 C.F.R. § 439.1(n) —does not identify flow as such a parameter – it only identifies "pollutants". In essence, the draft permit is seeking to not only re-write the adopted NPDES rules, it is seeking to re-write the Clean Water Act to regulate flow, regardless of the pollutant levels present – that is simply not permissible as federal courts have repeatedly confirmed. *See, e.g., Iowa League of Cities v. EPA* (8th Cir. 2013).

Response 39:
EPA unintentionally included wastewater effluent flow in the Fact Sheet under Section V.B.4., "Non-Conventional Pollutants;" and EPA acknowledges that it should have been included in its own section which is the normal practice in EPA New England issued permits. Effluent flow rate and the dilution factor calculation normally precede the non-conventional and conventional pollutant discussion because the dilution factor is a key factor in deriving effluent limits. See Responses 40 and 41 for EPA's rationale for including an effluent flow limit in the permit.

Comment 40. Water Flow as a Pollutant
The Town of Marion (Town) disagrees with EPA's assertion that the flow of water is considered a pollutant in 33 U.S.C. §1362(6). Marion's opinion is supported by a US District Court decision in the case Virginia Department of Transportation *et al.* vs. EPA, where the Court decided in favor of Virginia DOT that stormwater cannot be considered a pollutant as a surrogate for sediment load. The Court affirms that there is "no ambiguity in the wording" of 33 U.S.C. §1362(6), stating on Page 9 that "Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL." The Court goes on to state that

> *Claiming that the maximum stormwater load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority.*

Virginia DOT *et al. vs.* EPA, 2013

This decision is applicable to Marion's case in that EPA intends to use "design flow as a reasonable and important worst-case condition," or, in other words, as a surrogate for the load of pollutants to Effluent Brook, when in fact EPA has included for the first time in this Draft Permit load limits for ammonia, total nitrogen, total phosphorus, and total copper. Putting aside the factual validity of EPA's assertion, as with Virginia DOT *et al. vs.* EPA, EPA cannot exceed its statutory authority even if it believes that flow is a reasonable and efficient mechanism for limiting nutrient and other loads to Aucoot Cove.

Response 40:
The final permit includes an effluent flow limit of 0.588 MGD, expressed as an annual average. EPA Region 1 and MassDEP have included effluent flow limits in POTW permits throughout Massachusetts. Moreover, States and other EPA Regions have issued permits with similar conditions in other parts of the country. The inclusion of an effluent flow limit condition in the Marion WPCF permit is authorized by CWA § 402(a)(2), which provides that "[t]he Administrator shall prescribe conditions for such permits to assure compliance with the requirements of" CWA § 402(a)(1) – including, by reference, CWA § 301 - "and such other requirements as he deems appropriate."

Additionally, and as noted in the Fact Sheet, 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). The limitation on wastewater effluent flow is within EPA's authority to condition a permit in order to carry out the objectives of the Act. *See* CWA §§ 402(a)(2), 301(b)(1)(C); 40 C.F.R. §§ 122.4(a) and (d), 122.43, 122.44(d). 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. Failure to restrict wastewater effluent flow could result in an increased loading of individual pollutants, such as pharmaceuticals, endocrine disrupters, etc., which are not currently limited in the permit and which for many of these pollutants, there is no monitoring data.

Additionally, as provided in Part II.B.1 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 facility's wastewater treatment systems as designed includes operating within the facility's design effluent flow. Thus, the permit's wastewater effluent flow limitation is necessary to ensure proper facility operation, which in turn is a requirement applicable to all NPDES permits. *See* 40 CFR § 122.41.

Comment 41. Instream Dilution

Furthermore, EPA justifies the flow limit in the context of instream dilution within Effluent Brook, stating "Should the effluent discharge flow exceed the flow assumed in these calculations, the instream dilution would decrease and the calculated effluent limits would not be protective of WQS." While this observation is true from a mathematical perspective in some situations where dilution of an effluent into a stream is a major consideration, EPA's assertion is not even factually accurate as a general principle given the specific circumstances and structure of the permit. First, EPA states on page 13 of the Fact Sheet that the 7Q10 flow is considered zero. Therefore, EPA's concern about the reduced instream dilution caused by an increased effluent discharge flow is irrelevant to this discussion because there is no mixing available. In addition, if the load limits associated with the Draft Permit are maintained, discharging flow in excess of the proposed limit in the Draft Permit would necessitate lower effluent concentrations which, assuming no dilution, would produce better overall conditions in the receiving water.

Consequently, the Town requests that the flow limit in its permit be deleted, recognizing that EPA does not have the authority to regulate its effluent flow and that the proposed flow limit is not protective of the environment.

Response 41:

As discussed in Section V. of the Fact Sheet, NPDES permits are required to include limitations that ensure the meeting of water quality standards in the receiving water. Specifically, 40 C.F.R. § 122.4 provides that "No permit may be issued . . . [w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States."

In the case of the Marion WPCF, where the receiving water downstream of the discharge under 7Q10 flow conditions is comprised almost entirely of wastewater effluent, it is even more important to limit the quantity of wastewater effluent flow allowed to be discharged. Permit limits are calculated using a dilution factor for the receiving water under 7Q10 flow conditions. This approach is generally considered to address the critical conditions of maximum pollutant impact, where dilution of the discharge is at a minimum. Since at most times receiving water flow is well above the 7Q10, use of the 7Q10 as an assumed flow ensures that exceedances of the water quality criteria will be limited in duration and frequency as assumed in the calculation of the criteria (for example, chronic criteria reflect concentrations to be exceeded less than once every three years for a four-day period), so that the limit is protective.

These effluent dominated receiving waters, where there is essentially no dilution by the receiving water for extended periods of time, represent a challenge in the context of setting water quality-based limits. When there is no significant dilution of the discharge, permit limits must be set that ensure that the discharge itself meets water quality standards. However, where the varying flow of the receiving water is not sufficient to ensure that critical pollutant concentrations are limited in duration and frequency, it is not always clear that average monthly and maximum daily permit limits will be sufficiently protective to meet water quality standards. For most facilities a permit limit based on the ambient criteria values will ensure that concentrations are below the criteria values for most of the year, which should be sufficient to protect the duration and frequency component of the criteria. Increased wastewater effluent flows in already effluent dominated streams can result in stream concentrations being equal to the criteria value with a greater frequency and for longer durations which is not consistent with achieving the magnitude, duration, and frequency components of the criteria. EPA rejects the notion that adding more wastewater effluent volume, even if treatment is improved in order not to increase pollutant loads for certain pollutants that contain limits in the permit, to a receiving water that already consist entirely of wastewater effluent during low flow conditions will somehow result in “better overall conditions in the receiving water.”

Secondly, the comment neglects to consider the effluent’s effect on Aucoot Cove. While an increase in wastewater discharge effluent would not technically change the dilution factor in the receiving water, increased wastewater effluent flows would increase pollution loading to Aucoot Cove possibly leading to further deterioration in water quality.

For these reasons, the flow limit remains unchanged.

Comment 42. EPA Did Not Account for Dilution and Other Pollutant Sources

Furthermore, on Page 9 of the Fact Sheet, EPA discusses the conditions under which the permit writer can establish the permit level at the criteria level. We note that under 40 C.F.R. § 122.44(d) EPA is required to account for any available dilution as well as other pollutant load sources based on current and reliable information when calculating effluent limitations. EPA did not account for dilution in the marine receiving water while setting the total nitrogen and new bacteria requirements using the relevant averaging period for the criteria that were selected. Furthermore, EPA did not account for the change in total nitrogen level that occurred in the past 7 years when assessing the possible impacts on eelgrass populations, including the “safe” level of TN for eelgrass growth. These are both serious deficiencies that require resolution to ensure that the proper limitations are set.

Response 42:
The comment mischaracterizes both 40 C.F.R. § 122.44(d) and EPA's analysis in this permit proceeding. First, the only reference to dilution in § 122.44(d) is in the context of "determining whether a discharge causes, has the reasonable potential to cause, or contributes to" an exceedance of a water quality standard, 40 CFR § 122.44(d)(1)(ii), not, as the comment asserts, in the context of "calculating effluent limitations." Second, even where dilution is explicitly mentioned in § 122.44(d) with reference to determining reasonable potential, the provision directs the permit writer to account for dilution "where appropriate." *Id*.

In any event, allowing for dilution would not be in compliance with the Final Pathogen TMDL for the Buzzards Bay Watershed, approved in 2009.[11] The fecal coliform wasteload allocation (WLA) for Class SA Waters with Shellfishing is a monthly geometric mean 14 cfu/100 mL and no more than 10% of samples be equal to or greater than 28 cfu/100 mL. See also Response 72.

Moreover, in reference to total nitrogen, the load per unit area calculation does account for dilution. The nitrogen allocation used to derive the permit limit is averaged over the surface area (i.e. the reference area) that EPA has designated for dilution of effluent nitrogen in Aucoot Cove. The larger the surface area, the larger the dilution. If the nitrogen limit derivation had not accounted for dilution, e.g., if the allowable load per unit area was applied at the most upper part of Aucoot Cove, the calculated allowable TN load would be significantly lower.

In the penultimate sentence of the comment, it is unclear whether the commenter is referring to the "change in total nitrogen level" in the effluent or in Aucoot Cove. Regardless, EPA used current effluent and ambient nitrogen data in its reasonable potential analysis. The time period EPA used for the effluent data was May – October 2011 through 2013, and the ambient data were collected from 2007 through 2012, 2012 being the most recent data year available at the time the Fact Sheet was written.

Comment 43. Dissolved Oxygen Limit
The Draft Permit and Fact Sheet are inconsistent with respect to the timeframe for the seasonal dissolved oxygen (DO) limit. The Draft Permit states that the seasonal dissolved oxygen (DO) limit is in effect from April – October; however, the Fact Sheet (Page 11) states that "The Draft Permit includes a seasonal (June – October) limitation." The Draft Permit should be made consistent with the statement in the Fact Sheet that the seasonal limit be applicable from June 1st to October 31st, which is consistent with provisions in the current permit. It should be noted that given the lower temperatures present in April and May, which naturally increase DO saturation, DO related issues would not be expected to occur in this period.

Response 43:
The inconsistency was unintentional. The final permit contains a dissolved oxygen limit from June 1 through October 31.

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[11] Accessed at http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/buzzbay1.pdf

Comment 44. Ambient dissolved oxygen

On Page 17 of the Fact Sheet, EPA cites numerous violations of the 6 mg/L DO criteria at several Buzzards Bay Coalition monitoring locations throughout Aucoot Cove, including station AC1 located in an arm of the cove reaching into the heart of the saltmarsh, presumed on Page 15 of the Fact Sheet to be causally related to algae growth. This conclusion is based upon weekly grab samples taken by Buzzards Bay Coalition volunteers. This data is not sufficient to conclude that:

- DO violations exist,
- Such violations are caused by nutrient loadings from Marion, or
- Any ecological impairment is associated with this condition.

Further, EPA does not state whether the Buzzards Bay Coalition's data program has appropriate QA/QC protocols for its data collection efforts. If these data are not subjected to QA/QC they should not be used to set describe violations of the state dissolved oxygen standard in Aucoot Cove. Examination of the data indicates some low oxygen level found at the surface in the middle of the outer Aucoot Cove, which is a well-flushed embayment. These values are implausible and should result in a detailed assessment of the reliability of all the data. Marion requests that EPA provide the Buzzards Bay Coalition QA/QC procedures and confirm that the data used in its analysis conform to these procedures.

Continuous, diurnal DO is required to show that algae is actually causing the low DO concentrations measured; since only grab samples exist, it is not possible to determine whether the low DO concentrations are linked to excess nitrogen loads to Aucoot Cove. More rigorous monitoring must be performed in order to demonstrate that some form of excessive plant growth is the reason periodic low DO has been encountered in Aucoot Cove before it is possible to tie such conditions to excess nutrient concentrations.

Neither the Clean Water Act (CWA) nor Commonwealth of Massachusetts (Commonwealth) law regulate water quality that is caused by natural conditions (314 CMR 4.03(5). Consequently, such conditions are considered "in compliance" with adopted standards and the CWA. This provision is important as it is probable that whatever DO is occurring in the Cove, it is natural, given the significant tidal flushing that occurs every day in this area. The saltmarsh along the northern inner edge of Aucoot Cove is a likely source of low DO in this region. A saltmarsh is an example of a system that has naturally low dissolved oxygen concentrations. An example of this local to Marion is the Namskaket salt marsh system in Nantucket. This system was studied by Brian Howes and the Massachusetts Estuaries Project (MEP). This analysis found that "the central tidal salt marsh creek of the extensive Namskaket salt marsh system has periodic oxygen depletion to 2 mg/L." The authors note that "salt marshes are nutrient and organic matter enriched as part of their ecological design, which makes them such important nursery areas for adjacent offshore waters; however, a natural consequence of their organic rich sediments is periodic oxygen depletion within the tidal creeks, particularly during the summer." (MEP, 2007). Thus, before EPA can leap to the conclusion that low DO is an excess plant growth, nutrient induced condition, the expected impact of the salt marsh on the DO regime must be investigated.

This sampling approach is straightforward. The natural DO deficit would need to be confirmed through DO sampling throughout the salt marsh to determine whether this is indeed a source of low DO water and in the receiving waters at high, low, and Ebb tides. The Town proposes sampling to establish that the salt marsh is a potential cause of low DO in Aucoot Cove, and would like EPA to recognize that low DO and its total nitrogen discharge may not be casually [sic] related.

Another note relative to the contribution relative to Marion's effluent is related to whether Effluent Brook ever violates DO standards. Effluent Brook is almost entirely comprised of Marion's effluent during dry weather, and no DO violations have been observed (*e.g.*, Horsley Witten, 2011). Thus, during dry weather the DO concentration in stream is representative of the effluent, which is always in compliance with the regulations. How the low DO in Aucoot Cove could manifest itself given this reality is unclear, but certainly does not appear to tie back to the effluent.

In addition, given the well mixed nature of Aucoot Cove, it is impossible that Marion's discharge could cause low DO throughout a wide area or generate the type of excess algal growth that would be needed to alter the DO of such a large volume of water. First, the well flushed bay has significant tidal exchange that refreshes the water volume frequently, limiting the amount of time that oxygen demanding substances can consume oxygen within the embayment or that nutrients could cause phytoplankton growth. Unless such algal growth creates some type of elevated sediment oxygen demand, the means for total nitrogen (TN)-induced low DO is not apparent. Second, there is a low level of oxygen demanding inputs to Aucoot Cove, further limiting the effect of Marion's effluent.

The available information simply does not provide a credible basis for asserting that the Town's effluent is responsible for DO conditions in Aucoot Cove. Simply speculating that the DO was caused by nitrogen inputs is not scientifically defensible. Further investigation, not imposition of effluent limitations, should occur at this point.

Response 44:
Aucoot Cove shows all of the signs of cultural eutrophication consistent with conceptual models for cultural eutrophication in the scientific literature, including elevated levels of nitrogen and chlorophyll (Dennison, et al. 1993), reduced levels of dissolved oxygen (O'Connor, Gallagher and Hallden 1981) (Lowery 1998) (Bricker, et al. 2007), and the loss of eelgrass habitat (Short and Burdick 1996). The gradient of nitrogen concentrations and eelgrass loss is consistent with land-use-based loadings of nitrogen with the most impaired conditions in the inner Aucoot Cove.

Establishment of a water quality-based total nitrogen limit is not dependent upon demonstrating an impairment but rather on the establishment of a reasonable potential to cause or contribute to an impairment. However, in this case the impairment has been well documented both by the fact that it is listed as impaired for nitrogen (total), nutrient/eutrophication biological indicators, and dissolved oxygen on the state's 303d list and by the data presented in the Fact Sheet that is consistent with conceptual models for cultural eutrophication.

EPA notes that in complex systems such as estuaries, DO conditions are affected by several interacting factors and it is generally not the case that algal growth (or any other single condition) is the *only* factor influencing DO concentrations. Nor is it ever possible to establish actual causation to a scientific certainty, as that can be achieved only through controlled experiments that are impossible to conduct in a natural system. Despite these limitations, the consistent pattern of high TN concentration, elevated chlorophyll-a and depleted DO provide strong evidence that the well understood mechanism of nutrient overenrichment is occurring in this system. EPA is not required to indefinitely defer permit limits to await the possibility of better quantifying the extent to which other factors are also contributing to the impairment. Notwithstanding the above, the commenter's focus on DO is somewhat misplaced. The evidence clearly indicates that nitrogen is impairing dissolved oxygen levels; the conceptual models clearly predict that elevated TN levels cause elevated chlorophyll levels and/or macro-algae levels and that those elevated levels affect the DO directly through algal respiration and indirectly through contributing to the sediment oxygen demand. However, it is eelgrass rather than dissolved oxygen that drives the nitrogen limit in this permit. Nitrogen levels necessary to restore and protect eelgrass are significantly lower than nitrogen levels necessary to achieve DO standards. In the absence of DO concerns there would still be a reasonable potential to cause or contribute to eelgrass impairments, the nitrogen level established to be protective of eelgrass would not change, and the load reduction analysis determined to be necessary to achieve the ambient target would not change.

The commenter's point about the Marion discharge not being the cause of DO impairment in Aucoot Cove because DO meets standards in the unnamed brook is similarly misplaced. Consistent with the conceptual models, excess nitrogen would be expected to have the greatest impact on algal growth in the estuarine portion of the receiving water, i.e., in Aucoot Cove versus the unnamed brook, and the data clearly support this.

It is well established that low DO levels are a clear indication of nitrogen pollution. This conclusion has also been reached in other nearby Buzzards Bay estuaries. Specifically, in 2002, a water quality investigation (CDM 2002) of the Wareham River estuary complex for the Town of Wareham clearly made the link between nitrogen and dissolved oxygen. The report concluded that "nitrogen controls at the WPCF would show improvement in the area around the confluence of the Agawam River and Wakinko River estuaries, would improve the algal levels, and increase dissolved oxygen." The findings of this report were later used to set the WPCF nitrogen limit by EPA in the 2003 NPDES permit. Furthermore, the report specifically cites and uses the Buzzards Bay Coalition's dissolved oxygen data.

For more information regarding the Buzzards Bay Coalition's sampling program and QA/QC, please see Response 10.

The connection between nitrogen pollution and dissolved oxygen has been documented in many EPA-approved TMDLs for coastal estuaries in southeastern Massachusetts. These TMDLs specifically state that decreases in dissolved oxygen concentrations that threaten aquatic life are caused by excess nitrogen (for example see West Falmouth Harbor TMDL) (Commonwealth of

Massachusetts 2007). See http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/falmouth.pdf.

Comment 45. Whole Effluent Toxicity Testing

The Town of Marion (Town) water pollution control facility (WPCF) treated effluent has passed its last nine consecutive Whole Effluent Toxicity (WET) tests (over two years). Both the current permit (Page 5) and Draft Permit (Page 5) state that "After submitting one year and a minimum of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements." Marion requests a reduction in the testing frequency to annually be included in this permit renewal recognizing that it has passed nine consecutive WET tests.

Response 45:

Given the compliance record for whole effluent toxicity testing requirements, EPA has reduced the number of species to be tested from two to one. EPA does not, however, concur that annual testing is sufficient. Testing to ensure the discharge is not toxic is already at a low frequency, i.e., quarterly. Only in limited cases, such as small discharges with a large amount of dilution, is annual testing frequency considered adequate. Given the lack of dilution of the discharge in the receiving water, EPA is maintaining the quarterly WET testing requirement with one species, *Ceriodaphnia dubia*, which appears to be more sensitive to toxicity in the effluent than the minnow (*Pimiphales promelas*).

Comment 46. WET Test Timing

There is inconsistency in the Draft Permit (Item 11, Page 5) about the timing for whole effluent toxicity tests, where the text requires tests be performed the second week of February, May, August and November, while the table below requires testing in the second week of March, June, September, and December; note the latter set of months matches the Town's current permit.

The inconsistency notwithstanding, the Town would like to request that testing be changed to January, April, July, and October (or a subset of one or more of these months assuming the Town's request for reducing the testing frequency is granted). The reason for the request is December has proven problematic with the lab given the conflicts with holiday scheduling. In addition, the Town requests that language requiring testing in the second week of the month to be changed to allow testing to take place in the first or third week of the month if any state or federal holiday falls within the second week.

Response 46:

EPA regrets the inconsistency. The WET testing schedule has not changed. However, the final permit will only require that testing take place during the same week each month, which the permittee may choose. Given the flexibility of choosing the week of testing, EPA does not believe it is necessary to allow adjustments in the testing schedule due to holidays.

Comment 47. Alternate Dilution Water

Both the current permit (Pages 5-6) and Draft Permit (Pages 5-6) state that "If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable" the permittee can follow certain procedures to obtain "approval for use of an alternate dilution water." The receiving stream has proven to be both unreliable and occasionally non-existent. Page 13 of the Fact Sheet notes that "the unnamed brook to which Marion WPCF discharges has minimal or no flow of its own during dry periods," and Page 25 of the Fact Sheet states that "no dilution of the discharge occurs in the unnamed brook." Because EPA has recognized that the stream may be dry during periods of dry weather, the Town requests the Draft Permit include approval for the use of an alternate dilution water.

Response 47:
Due to the absence of flow in the receiving water during certain times of year, Marion WPCF may use alternate dilution water for WET testing. A review of recent WET test reports indicates that Marion has already been using laboratory soft water as dilution water in WET tests. The laboratory runs a control WET test with the receiving water except when the brook is dry and EPA expects that Marion will continue to do this. No change has been made to the final permit as a result of this comment.

Comment 48. Ammonia Limit
The Fact Sheet (Page 13) misstates the ammonia applicable dates of the limits in the current permit. The Fact Sheet states that the average month limit of 1.74 mg/L applies form June 15th to October 15th, when in the current permit the actual dates are June 1st to October 31st. Similarly, the average month limit of 2.6 mg/L is stated as applying from May 1st to June 14th when they actually apply from May 1st to May 31st. The Fact Sheet should be corrected.

Response 48:
The Fact Sheet provides the basis for the draft permit and is not updated with the final permit. However, the administrative record will show this correction. The draft and final permits themselves contain the correct dates and therefore do not need to be revised.

Comment 49. Copper dilution consideration
The Draft Permit contains revised concentration limits and a new mass limit for total copper. The revised concentration limits are based on marine water quality standards and assume no dilution of copper prior to discharge to Aucoot Cove, and no dilution upon reaching marine waters. This logic is flawed on several points as follows:

The Fact Sheet is inconsistent as to whether the dilution is afforded to the discharge to Effluent Brook. At various points it states there is no dilution at 7Q10 conditions and then uses the United State Geological Survey (USGS) StreamStats program to calculate a dilution at 7Q10 conditions. As the permit limits that are being imposed are for saltwater, dilution at 7Q10 conditions is not relevant but rather dilution upon mixing with the receiving water needs to be evaluated.

Response *49*:
The 7Q10 at the point of discharge is zero because under 7Q10 conditions, the receiving water has no flow. Because the brook one mile downstream of the discharge, where it enters Aucoot Cove, has a larger drainage area than it does at the discharge point, it may have flow during 7Q10 conditions. The calculation referenced in the comment is for this location, and its purpose was to determine if other flows in the receiving water provide enough dilution to copper in the discharge to meet marine water quality criteria for copper where the brook enters Aucoot Cove.

The commenter is correct that 7Q10 hydrologic conditions do not apply in marine waters, but rather that "[i]n coastal and marine waters…, the Department will establish extreme hydrologic conditions at which aquatic life criteria must be applied on a case-by-case basis." 314 CMR 4.03(3)(c).

In light of the comments received, EPA has reevaluated the copper limits and revised the limits in the final permit to reflect the limits that were contained in the previous permit. While a mixing zone analysis has not been conducted for Aucoot Cove, given the freshwater dilution available at the mouth of the unnamed brook, minimal additional dilution in Aucoot Cove is necessary to ensure attainment of the marine water criteria applicable to Aucoot Cove.

Comment 50. Copper Background Concentration
As part of the analysis, EPA cites (Table 4 in the Fact Sheet) a series of background concentrations from 2011 to 2013 and uses a median value as part of its analysis. The concentrations in this table show a steady and remarkable decrease in values from 64 to 5 µg/l over time. Such a trend indicates that the median is not going to be a reflective value and instead the data needs to be reviewed to understand why there has been a continuous decrease in concentrations to select a representative value for current conditions.

Response 50:
The commenter is correct that background copper concentrations in the unnamed brook, when there was flow, declined from 2011 through 2013. A review of more recent background data indicates that the background copper concentrations range from 2.74 µg/L to 11.4 µg/L with a median of 4.5 µg/L and no appreciable decreasing or increasing trend, as shown in Table 2, below.

EPA Table 2. Background copper concentrations in the unnamed brook receiving Marion WPCF discharge.

Date	Copper Concentration, µg/L
3/10/2014	2.74
6/9/2014	6.42
9/8/2014	Dry
11/8/2014	11.4
3/9/2015	3.54
6/10/2015	4.75
9/14/2015	10.12
12/7/2015	4.25
3/7/2016	3.96
Median	4.5

Comment 51. Copper in Municipal Effluents is not toxic
Notwithstanding the above discussion about the inappropriate calculations resulting in an overly restrictive permit limit, the Town of Marion (Town) questions the need for a limit at all. Several studies (*e.g.*, Hall *et al.*, 1997) have been conducted showing that copper in municipal effluents is not discharged in toxic form. The Town intends to petition the Commonwealth to allow regulatory relief from the copper permit limit to use the simplified water effects ratio procedure.

Response 51:
MassDEP has developed site-specific water quality criteria in the unnamed brook that are less stringent than the criteria used to derive the limits in the current permit. However, because the discharge enters marine waters at the mouth of the unnamed brook, effluent limits in the permit must be consistent with marine water quality criteria as well. As discussed in Response 49, EPA has revisited the copper limit analysis in light of comments received about mixing and dilution in the cove and has decided to retain the limits from the previous permit.

The commenter references the bioavailability of copper in biologically treated effluents to support its argument that application of the national chronic criterion is too stringent in setting the copper effluent limitation in this permit. Metal bioavailability and toxicity have long been recognized to be a function of water chemistry. The Biotic Ligand Model was developed to incorporate metal speciation and the protective effects of competing cations into predictions of metal bioavailability and toxicity. EPA currently recommends the use of this model or a Water Effects Ratio for determining alternative copper water quality criteria. This model may be used to derive site-specific copper water quality criteria for review and adoption by MassDEP.

If the Town wishes to encourage Massachusetts to develop site-specific copper criteria for Aucoot Cove, then EPA suggests that the Town begin a dialogue with the Massachusetts Department of Environmental Protection on this issue. EPA is happy to provide any guidance and assistance that EPA can if the Commonwealth determines it appropriate to pursue this approach.

In those cases where the state does develop site-specific criteria, Massachusetts regulations require that such an effort be documented and subject to full inter-governmental coordination and public participation. *See* 314 CMR 4.05(5)(e)(4). In addition, federal law requires EPA's review and approval of Massachusetts' development and adoption of site-specific criteria. *See* 40 C.F.R. §§ 131.11(b)(1)(ii), 131.21.

Comment 52. Natural Causes - pH
Item b. The previous permit included the following phrase at the end of sentence "unless these values are exceeded due to natural causes or as a result of the approved treatment processes." This phrase should again be included in the permit.

Response 52:
EPA is no longer including a blanket statement permitting pH exceedances that are "due to natural causes" in POTW permits. That language is vague and on its face would allow excursions from the technology-based secondary treatment pH range of 6.0 to 9.0 s.u. that are not permissible under 40 C.F.R. § 133.102. Rather, individual treatment plants are being considered

on a case-by-case basis to determine whether "natural causes" are present that would support a relaxation of the permit range, and if so to determine a specific alternative pH limit for the facility. In doing so, EPA must ensure that the pH limit complies with both the technology-based standard for secondary treatment of 6.0 to 9.0 s.u., and water quality requirements based on the Massachusetts SWQS for pH requiring that the receiving water: "[s]hall be in the range of 6.5 through 8.3 standard units and not more than 0.5 units outside of the natural background range. There shall be no change from natural background conditions that would impair any use assigned to this Class." 314 CMR 4.05(3)(b)(3). In most cases, MassDEP requires a permit range of 6.5 to 8.3 s.u. as a condition of state certification.

In the case of the Marion WPCF, the facility has had no excursions from the pH limit in the past seven years. This indicates an ability to comply with the limit over a range of natural conditions and no basis for expanding the permit limit range. The permit was not changed in this regard.

Comment 53. 80% design flow provision
Item g. This item requires the Town to develop a plan to describe how it will handle increases in flow once the plant exceeds 80 percent of the design flow. Though we recognize that this is "template" language in many NPDES permits, reaching 80 percent of the facility's design flow is not a violation of the Draft Permit, and reaching this value should not trigger a required response by the Town. The Town requests that this provision be removed from the permit.

Response 53:
The 80% design flow provision at Part I.A.1.g is a Massachusetts state certification requirement and provides:

> *If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.*

The intent of this requirement is to proactively ensure that planning is in place when actual flow is approaching permitted flow. This planning is required to ensure the prevention of permit violations. Furthermore, it is within the Region's discretion to include conditions, such as the one referenced, to ensure proper operations and maintenance and to prevent sanitary sewer overflows and other permit violations. *See* CWA § 308(a)(A), 33 U.S.C. § 1318(a)(A) (specifying that permittees must provide records, reports, and other information EPA reasonably requires); CWA § 402(a)(2), 33 U.S.C. § 1342(a)(2) (authorizing permit conditions on data and information collection, reporting, and such other requirements as EPA deems appropriate); *accord In re Town of Concord*, NPDES Appeal No. 13-08, slip op. at 39 (EAB Aug. 28, 2014) ("It is well established that permit writers enjoy broad authority under the CWA and regulations to prescribe municipal data collection and reporting requirements.").

Comment 54. Chlorine
Item h. This item prohibits the use of chlorine. This provision is simply too broad to be included in the permit, and the Town requests it be removed. Bleach is a form of chlorine and this provision would prohibit its use in the treatment facility for disinfection of workspaces and

bathrooms, where the use of bleach is a reasonable cleaning technique to protect the health of workers at the water pollution control facility (WPCF).

Response 54:
EPA intended I.A.2.h. to prohibit the use of chlorine in the treatment process, not in cleaning workspaces and bathrooms at the WPCF facility. Such activities would not be expected to cause an exceedance of water quality standards in the effluent.

Comment 55. Bleach
In addition, as part of the process operations themselves, chlorine has a necessary and important uses at the WPCF. Bleach is used on rare, but necessary, occasions to control filamentous bacteria. Chlorine is used for periodic cleaning of the disc filters. Periodic soaking of the filters in a hypochlorite solution is necessary to preserve the long-term performance of the disc filters. Without this soaking procedure, the filter media will become fouled, leading to reduction in throughput capacity and treatment ability. When the plant takes one of their filter basins off-line for soaking, the spent chlorine solution is then drained back to the head of the plant (in this case at least for now, the lagoons), and is not discharged. This practice will have to continue in some manner. Hypochlorite is definitely the chemical of choice for cleaning the media. Perhaps other chemicals could work, but would be breaking new ground. And, in any case, the spent soak water would be returned to the head of the plant.

Response 55:
The final permit allows use of a hypochlorite solution to clean the filters, provided that the used solution is dechlorinated to nontoxic levels and drained to the head of the plant for full treatment.

Comment 56. Toxics Control
The Draft Permit (Page 7, Provision 4) includes a new provision and restriction on toxics control. There is no basis in federal or state law for imposing these provisions as general requirements given that the permit already assessed for “reasonable potential” and the Wet Effluent Toxicity (WET) test requirement is intended to address other non-regulated pollutants. The Town requests that EPA remove this provision from the permit as it is unenforceable since it would be void for vagueness. Further, WET testing is intended to mitigate this concern, and additional narrative provisions for toxic control are not needed nor authorized. Requiring a reopener, where new information indicates additional parameters may require control is appropriate. Holding the City responsible for matters it has not received notice of and has no means to determine or control, is not reasonable.

Response 56:
Part I.A.4., which states in part, “[t]he permittee shall not discharge any pollutant or combination of pollutants in toxic amounts,” is not a new provision or new requirement. The basis for this clause is the Clean Water Act itself, which says at Section 101 (a)(3) that “it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited.” 33 U.S.C. § 1251(a)(3). Also, Massachusetts SWQS provide that “[a]ll surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife.” 314 CMR 4.05(5)(e). EPA is not precluded from including narrative permit conditions requiring

compliance with water quality standards. *In re Gov't of the Dist. of Columbia Mun. Separate Storm Sewer Sys.*, 10 E.A.D. 323, 343 n.23 (EAB 2002). The intent of these clauses is not just to prohibit toxic discharges during WET tests, but to prohibit toxic discharges **at all times**.

Secondly, the requirement is not vague or unenforceable. Because there are numeric water quality criteria for most toxic pollutants, it is reasonably straightforward to measure these constituents in the permittee's discharge and determine if toxic amounts are present. This clause is also readily enforceable in the case where an upset or spill causes widespread toxicity, such as a chemical spill that causes a fish kill. Such an incident is illegal regardless of whether it shows up on a WET test report.

If unknown toxicity is present in the discharge, as identified in WET test results or observed toxic effects in the receiving water, the typical course of action is to conduct a Toxicity Identification Evaluation (TIE) and a Toxicity Reduction Evaluation (TRE). In most cases, with the permittee's cooperation, the TIE/TRE process can identify and remove toxicity without need for enforcement of Section I.A.4. However, it is necessary for EPA to retain enforcement ability when the permittee refuses to cooperate with the EPA or has shown gross negligence. The clause remains in the final permit.

Comment 57. Unauthorized Discharges

The Draft Permit (Page 7) includes language concerning unauthorized discharges from the Town of Marion's wastewater system. The City agreed that overflows and other discharges are generally prohibited. However, this does not preclude the application of upset and bypass defenses where conditions beyond the City's control (e.g., flood) cause overflows in the collection system. This provision must be applicable in conjunction with federal upset or bypass rules from events beyond the reasonable control of the permittee. If this is an absolute provision, EPA has not presented the required technology-based or water quality based analysis in support of this provision.

Response 57:

The condition referenced in the comment is found in Part I.B (Unauthorized Discharges) of the permit and reads, in part:

> *The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall(s) listed in Part I A.1.of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported to EPA and MassDEP in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four-hour reporting).*

The commenter apparently seeks assurance that permit violations from an upset or bypass would not be subject to enforcement under this provision. EPA notes that "the terms and conditions of th[e] permit" include the standard conditions at Part II.B.4 and .5 regarding bypass and upset, respectively, which are required conditions in all NPDES permits pursuant to 40 CFR § 122.41(m) and (n). Depending on the particular circumstances of the event, these standard provisions of the permit may be applicable, as provided for in regulation.

Comment 58. Operation and Maintenance of the Collection System
The Draft Permit (Pages 7 to 10) includes many new requirements regarding the operations and maintenance (O&M) of the collection system. The provisions provided are what are typically included in Capacity Management Operations and Maintenance (CMOM) programs as defined within EPA's Guide for Evaluating Capacity, Management, Operations, and Maintenance (CMOM) Programs at Sanitary Sewer Systems (EPA 305-B-05-002) dated January 2005. The Town of Marion has been proactive in the maintenance and up-keep of their wastewater collection system. In fact, they are at the fore-front of I/I and the removal of private inflow sources within the Commonwealth with the current programs and initiatives that are on-going. The Town over the past 10 years has spent in excess of $500,000 in studies, engineering designs, inspections and investigations, monitoring and measuring flows, infiltration and inflow (I/I) analysis, addressing private inflow sources, adopting new I/I regulations, developing enforcement guidelines within the Town's sewer use regulations, and constructing improvements to their wastewater collection system. These improvements, and the documented I/I reduction rates have been clearly documented within the Town's Annual Infiltration and Inflow report submitted to the MassDEP as part of their current permit.

The Town requests that the entire provisions be withdrawn as they have been pro-active in the upkeep and operation of their system and the additional financial burden imposed by the additional CMOM provisions will inhibit the on-going programs by redirecting limited funds away from those programs to meeting compliance with CMOM provisions within the draft permit.

- Any facility planning provisions of the permit are state-level provisions beyond the federal program and must be so identified so federal enforcement is not triggered over this provision.

- The provisions were not part of adopted NPDES rules, and they never have been presented for public notice and comment.

- EPA has provided no data demonstrating that the current Town program is insufficient, nor does the reported SSOs to the EPA and Massachusetts Department of Environmental Protection (MassDEP) within the system document that the Town's program is insufficient for maintenance.

- EPA has provided no basis for the individual program requirements that are being imposed as necessary to achieve technology or water quality based requirements.

- The provisions represent an unlawful amendment of the O&M rule which is to ensure effluent quality is met. EPA has changed the requirement to mandate that the collection system, regardless of plant performance must be operated and managed in a specific fashion.

- The NPDES program has never established sewer system operational requirements nor demonstration necessary to meet technology or water quality-based limitations. Inclusion of these requirements is ultra vires.

- EPA has no legal authority to mandate I/I reduction program or a specific type of collection system map or new reporting requirements that are unrelated to effluent limitation provisions.

To the degree EPA is claiming that the adopted NPDES rules mandate these requirements, EPA has unlawfully modified the adopted rules. To the degree EPA is claiming that the plan language of the rule allows EPA to impose such requirements, EPA's reading of the rule in unsupported. Finally, to the degree EPA is attempting to dictate the management of the facility, EPA is operating beyond statutory authority. See, *Iowa League of Cities v. EPA* (8th Cir. 2013).

Response 58:
EPA commends the Town of Marion for maintaining their preventative maintenance program as well as for undertaking a program to address I/I. Any operation and maintenance programs currently in place (or portions of such programs) may be used to satisfy the requirements of Part I.C. of the permit, to the extent these programs (or portions thereof) comply with permit requirements.

As an initial matter, MassDEP has stated that the inclusion in NPDES permits of I/I control conditions is a standard State Certification requirement under Section 401 of the CWA and 40 CFR § 124.55(b). Moreover, EPA disagrees with the comment that EPA is not authorized to impose requirements regarding the operation and maintenance (O&M) of the collection system as set forth in the Marion draft permit. The O&M requirements of the draft permit are being included in all NPDES permits issued to POTWs throughout Massachusetts, in order to ensure, amongst the other requirements of this section, that all permittees (including co-permittees) are working towards developing I/I control programs, and that sufficient funds are being allocated to support such programs.

The O&M requirements included in the final permit are intended to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment. Contrary to the commenter's claim, the imposition of the provisions by the Region is indeed case specific. The fact that similar language appears in other municipal discharge permits is immaterial; EPA Region 1 has exercised its permit writing expertise and experience to tailor many specific permit provisions that it has employed across many permits, and it is an efficient practice to utilize provisions that it has found to be effective and clear across many permits, as necessary. The elements of the O&M plan in the draft permit have been fashioned by the Region to carry out the objective of protecting human health and the environment. These provisions are being placed into individual permits where, based on the administrative record of a particular permitting action, the Region has ascertained the need for more information about the operation and maintenance of a particular treatment works and, until that information is provided, to assure the permit contains conditions sufficient to assure compliance with the Act.

EPA notes that the Region is not making any judgment on the merits of Marion's existing O&M program regarding whether it is sufficient to comply with these requirements. Rather, the Region is exercising its discretion to apply these preventative requirements to all newly issued municipal permits. If the Town's current program is sufficient to comply with these requirements, the Town must simply document and report this compliance according to the reporting requirements in the permit. The permit conditions represent a starting point, and the Region expects to further tailor their terms in future permit cycles as more information and operational data become available. In the Region's view, these conditions are not highly prescriptive but provide the permittee with continued flexibility and discretion in determining how to operate and maintain its treatment works.

As mentioned in the Fact Sheet Section VI. Operation and Maintenance, the Marion WPCF is a Publicly Owned Treatment Works (POTW) as defined at 40 C.F.R. § 403.3. This definition also includes sewers, pipes, and other conveyances that convey wastewater to a POTW treatment plant. Conditions applicable to all permits include the regulation of proper operation and maintenance (*see* 40 C.F.R. § 122.41(e)). This regulation requires that "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." The treatment plant and collection system are included in the definition "facilities and systems of treatment and control" and are therefore subject to proper operation and maintenance requirements.

EPA regulations also specify a standard condition that specifically imposes on permittees a "duty to mitigate." *See* 40 CFR § 122.41(d). This condition requires permittees to take all reasonable steps – which in some cases may include operations and maintenance work - to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment. The general requirements for mitigation and proper operation and maintenance are typically found in Part II, Standard Conditions. Recently, EPA has included the specific permit conditions found in Parts I.B and I.C in all reissued municipal permits as reasonable and logical practices to implement these requirements.

This requirement is neither a new mandate nor beyond EPA's authority. Sections 308(a) and 402(a)(2) of the Clean Water Act and regulations found at 40 C.F.R. § 122.44(i) provide broad authority to require owners and operators of point sources to establish monitoring methods and to prescribe permit conditions for data collection and reporting, and are not expressly or impliedly delimited to the end of the pipe. As the Environmental Appeals Board has described: "It is well established that permit writers enjoy broad authority under the CWA and regulations to prescribe municipal data collection and reporting requirements." *Town of Concord*, slip op. at 39. *See* CWA § 308(a)(A), 33 U.S.C. § 1318(a)(A) (specifying that permittees must provide records, reports, and other information EPA reasonably requires); CWA § 402(a)(2), 33 U.S.C. § 1342(a)(2) (requiring permittees to provide data and other information EPA deems appropriate); 40 C.F.R. § 122.41(h) (permittees shall furnish "any information" needed to determine permit compliance); 40 C.F.R. § 122.44(i) (permittees must supply monitoring data and other measurements as appropriate); *see also, e.g., In re City of Moscow*, 10 E.A.D. 135, 170-71 (EAB 2001) (holding that EPA has "broad authority" to impose information-gathering requirements on permittees); *In re Town of Ashland Wastewater Treatment Facility*, 9 E.A.D. 661, 671-72 (EAB 2001) (holding that CWA confers "broad authority" on permit issuers to require monitoring and information from permittees).

In *In re Town of Concord*, NPDES Appeal No. 13-08, slip op. at 39 (EAB Aug. 28, 2014), EPA's decision to include the O&M requirements in the permit was reasonable and consistent with its responsibilities under the Clean Water Act, particularly given the environmental imperatives identified by the Region as driving the collection system requirements (e.g., SSO prevention) and receiving water conditions. As EPA stated in the Fact Sheet, at 31:

> *Proper operation of collection systems is critical to prevent blockages and equipment failures that would cause overflows of the collection system (sanitary sewer overflows, or SSOs), and to limit the amount of non-wastewater flow entering the collection system (inflow and infiltration or I/I). I/I in a collection system can pose a significant environmental problem because it may displace wastewater flow and thereby cause, or contribute to causing, SSOs. Moreover, I/I could reduce the capacity and efficiency of the treatment plant and cause bypasses of secondary treatment. Therefore, reducing I/I will help to minimize any SSOs and maximize the flow receiving proper treatment at the treatment plant. The permittee reports that approximately 220,400 gallons per day of (I/I) enters the sewer system.*

SSOs that reach waters of the U.S. are discharges in violation of section 301(a) of the CWA to the extent not authorized by an NPDES permit. Furthermore, high levels of I/I dilute the strength of influent wastewater and increase the hydraulic load on treatment plants, which can reduce treatment efficiency (*e.g.*, result in violations of technology-based percent removal limitations for BOD and TSS due to less concentrated influent, or violation of other technology-based or water quality-based effluent limitations due to reduction in treatment efficiency).[12]

The Town appears to argue that the Act does not authorize EPA to impose either monitoring requirements or effluent limitations on internal treatment processes of a point source subject to an NPDES permit. For this proposition, the Town cites the Eighth Circuit decision in *Iowa League of Cities*, 711 F.3d 844 (8th Cir. 2013), that did not concern monitoring and reporting requirement, such as those at issue here. Further, the Town's legal theory directly conflicts with a long line of Board precedent on the breadth of authority conferred on the Region by the Act to impose reasonable reporting and monitoring requirements on owners and operators of "point sources," without reference to whether that person even has a permit. That authority, found in Section 308 of the Act, is supplemented in this case by Section 402, as the discharges from the Town are governed by the NPDES program. Under Section 402(a)(2), an NPDES permit may include "conditions on data and information collection, reporting, and such other requirements as [the Administrator] deems appropriate." The provisions at issue here are appropriate, designed as they are to assess consistency with Section 301 of the Act, including water quality standards.

[12] We note that the Town recognizes that "excessive" I/I in its system contributes to water quality impairment in Aucoot Cove, permit violations, and sewer system backups and SSOs. 2017 PEF 3, 4, 13-15, 21; *see also id.* at 5 (observing that the Town's "wastewater collection system still has a fairly significant I/I issue").

Against this backdrop, the Town's primary claim of error underlying its challenge to the monitoring and reporting conditions—that EPA is barred under Section 308 and 402 from prescribing such conditions on internal treatment process flow on facilities even though their discharges are from point sources—is unpersuasive.

There is, furthermore, no basis to conclude under the Board's precedent construing Sections 308(a) and 402(a)(2) of the Act, and implementing regulations, that the monitoring conditions at issue here are unwarranted simply because they pertain to processes that occur at a remove from the outfall. *In re Westborough*, 10 E.A.D. 297, 316-17 (EAB 2002) (requiring monitoring of the actual influent of phosphorus coming into the headworks of the Westborough POTW from industrial and other sources discharging waste into the sewer system prior to treatment by the POTW, and noting "The regulatory scheme clearly anticipates that both discharges *from* and discharges *into* POTWs are subject to regulation by means of NPDES permits."). *See, e.g., Town of Concord*, slip op. at 38-40; *In re Charles River Pollution Control Dist.*, NPDES Appeal No. 14-01 (EAB Feb. 2, 2015) (holding that the Region has authority under the Clean Water Act and EPA's regulations to include municipal satellite collection systems as co-permittees and subject them to monitoring and reporting requirements). Indeed, the authority to impose effluent limitations on internal waste streams, and associated monitoring requirements, is expressly recognized in EPA's regulations. 40 C.F.R. § 122.45(h). The broad objective of the Clean Water Act, 33 U.S.C. § 1251 *et seq.*, is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. CWA § 101(a), 33 U.S.C. § 1251(a). Section 402 of the Act established the NPDES program as the primary mechanism for controlling discharges of pollutants to navigable waters of the United States, and, subject to certain conditions, authorizes the Administrator of the EPA to issue permits for the discharge of pollutants, and to "prescribe conditions for such permits … including conditions on data and information collection, reporting, and such other requirements as [the Administrator] deems appropriate." 33 U.S.C. § 1342(a)(1)-(2).

To this end, EPA passed regulations further defining the procedures and requirements of the NPDES program, codified in 40 CFR Parts 122-125. Regulations governing permit requirements for NPDES discharges are contained in 40 CFR Part 122, and the regulations specifically authorizing CMOM collection requirements in NPDES permits include 40 CFR § 122.48(a) and § 122.44(i)(1)(iii). Section 122.48(a) provides that all permits shall specify, "[r]equirements concerning the proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods (including biological monitoring methods when appropriate)." Section 122.44(i)(1)(iii) provides for monitoring requirements in addition to those in § 122.48, specifically: Other measurements as appropriate including pollutants in internal waste streams under § 122.45(i); pollutants in intake water for net limitations under § 122.45(f); frequency, rate of discharge, etc., for noncontinuous discharges under § 122.45(e); pollutants subject to notification requirements under § 122.42(a); and pollutants in sewage sludge or other monitoring as specified in 40 CFR part 503; or as determined to be necessary on a case-by-case basis pursuant to section 405(d)(4) of the CWA.

Additional broad authority for CMOM requirements has also been derived from 40 CFR § 122.41(d) and (e).[13] Section 122.41 provides, "[c]onditions applicable to all permits," with subsection (d) providing for a duty to mitigate "discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment." Subsection (e) requires, "[p]roper operation and maintenance … [of] all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee."

MONITORING

Comment 59. Monitoring Frequency

As summarized in (Marion) **Table 2** below, The Draft Permit includes revised, more frequent or new monitoring of several parameters than the current permit, as follows:

Marion Table 2: Summary of Monitoring Requirements

Parameter	Monitoring Requirement – Draft NPDES Permit	Monitoring Requirement – Current NPDES Permit	Additional Yearly Samples
Enterococci	2/week	NA	104
Dissolved oxygen	1/day	1/week	140 or 201*
Total aluminum during WET tests	4/year	NA	4
Total Kjeldahl Nitrogen#	3/week	1/month	67
Total Nitrate Nitrogen#	3/week	1/month	67
Total Nitrite Nitrogen#	3/week	1/month	67
Total Kjeldahl Nitrogen**	1/week	1/month	20
Total Nitrate Nitrogen**	1/week	1/month	20
Total Nitrite Nitrogen**	1/week	1/month	20
Total Phosphorus#	1/week	2/month	52
Total Phosphorus**	1/month	2/month	(6)
Copper, Total Recoverable	1/week	1/month	40

* Depends on which monitoring period is required; # From April 1 to October 31; ** November 1 to March 31

We estimate that this increased sampling regimen will add 455 extra laboratory samples at an estimated operating expense of approximately $12,000 per year not including the labor costs for

[13] *See e.g.*, 2010 NPDES Permit Writers' Manual ("2010 Manual"), pp. 9-21 (asserting that "[p]ermits should clarify requirements for proper operation and maintenance of the collection system," which, "may include requiring the development and implementation of capacity, management, operation and maintenance (CMOM) programs"). *See also* Marion Draft NPDES Permit Fact Sheet, at 30-31 (citing to 40 CFR § 122.41(d) and (e) in its justification for permit requirements pertaining to Operation and Maintenance of the Sewer System).

Town of Marion (Town) employees to collect the samples. The cost of additional sampling for dissolved oxygen at the outfall is even greater at $26,000 which will require two water pollution control facility (WPCF) staff to make up to 201 additional trips to the remote outfall location. Below we provide our requests and reasons for changing the monitoring frequency for many of these parameters.

Response 59:
EPA recognizes the concern with cost of testing and has provided an alternative approach in the final permit. In doing so, EPA notes that testing for Total Nitrogen requires that TKN and Nitrate and Nitrite be tested, as there is currently no EPA-approved method for direct testing of Total Nitrogen. Sampling for nitrogen species is also important to provide important information relative to treatment effectiveness and bioavailability in the receiving water. Therefore, it is EPA's intent that the monitoring frequencies for TKN, Nitrate and Nitrite be consistent. However, EPA agrees that less frequent monitoring is appropriate during periods when the Total Nitrogen limit is not in effect and therefore has modified the permit as follows:

(1) Monitoring frequency for TKN, Nitrate and Nitrite is reduced to 1/Month in the period November 1 to March 31. Reporting of TN is also required in the winter months.

(2) Increased concerns associated with nitrogen impacts during the growing season warrant better characterization than can be provided with once per week monitoring.

EPA believes that the frequency of sampling is necessary to adequately characterize loads to the system and monitor compliance and therefore is not now setting any schedule or benchmarks for reduction in monitoring frequency.

Comment 60. Dissolved Oxygen
Collection of daily readings of dissolved oxygen (DO) would require a significant expenditure of limited WPCF staff time and budget, particularly given the change in requirement that the sample be collected "at the point of entering the unnamed brook." (Page 3 of the Draft Permit) Previously, the samples were collected at the UV facility only taking a few minutes on a weekly basis. This new provision could require at least an hour every day for two staff (It is Marion's practice that an operator not to travel to the outfall unaccompanied for both safety and security reasons.) to drive from the WPCF, walk to the end of the outfall pipe, collect the reading, and return to the WPCF. In addition, there will be days, particularly during the inclement weather or deep snow cover, when collection of the sample poses an additional unnecessary hazard for sampling personnel. As noted in the Fact Sheet [Page 11], no samples in four years have violated permit limits. No legal or scientific justification has been provided for increasing the monitoring frequency for DO, and the Town requests that the frequency be returned to once per week. We also request that the sampling location be changed to the UV facility. Note that the Fact Sheet (page 11) incorrectly states that the current monitoring frequency is once per day.

Response 60:
Because the facility has not had a dissolved oxygen violation during the current permit term, and the logistical and safety risks posed by directly sampling the outfall, EPA has changed the

dissolved oxygen monitoring frequency and location to that of the current permit, which is once per week and to the UV facility, respectively.

Comment 61. Total Cadmium, Total Lead, Total Nickel and Total Zinc
Per the analysis in the Fact Sheet (Page 27), no reasonable potential exists for these parameters to exceed water quality standards. Monitoring for these parameters as part of the whole effluent toxicity testing should thus be removed from the permit.

Response 61:
The metals mentioned in the comment are ones frequently found in municipal effluent at levels above water quality criteria. Neither the draft nor final permit propose any additional monitoring for these metals than is required under the current permit. The only change is the requirement to report the effluent metal concentrations measured during WET testing on the WET test DMR. Furthermore, the commenter provides no authority for the suggestion that EPA may only require monitoring of those parameters for which it has demonstrated Reasonable Potential. To the contrary, the Clean Water Act provides EPA with broad authority to impose monitoring and reporting requirements. CWA § 308(a)(A), 33 U.S.C. § 1318(a)(A) (specifying that permittees must provide records, reports, and other information EPA reasonably requires); CWA § 402(a)(2), 33 U.S.C. § 1342(a)(2) (requiring permittees to provide data and other information EPA deems appropriate); *see also, e.g.*, *In re City of Moscow*, 10 E.A.D. 135, 170-71 (EAB 2001). "This is true regardless of a pollutant's potential to cause or contribute to a water quality violation." *In re Town of Concord*, NPDES Appeal No. 13-08, slip op. at 36 (EAB Aug. 28, 2014).

Comment 62. Total Aluminum
The Draft Permit requires analysis for total aluminum as part of Whole Effluent Toxicity (WET) testing. As explained in the Fact Sheet (Page 28), this sampling requirement is predicated on the assumption that the Town will implement a treatment process modification that uses alum to meet the new phosphorous limit. Since no such decision has been made at this time (many treatment plants choose to use ferric chloride instead for economic reasons), nor has EPA demonstrated that such use of alum would create a reasonable potential to exceed the aluminum water quality standards, this requirement should be removed from the permit. If EPA insists on continuing with the requirement, then at a minimum the analysis should not be required until and at as such time alum is used at the WPCF.

Response 62:
The aluminum monitoring requirement is the same as in the current permit and is predicated on the fact that aluminum is routinely found in municipal wastewater regardless of whether it is added during the treatment process. Aluminum is frequently detected in the WPCF's discharge, and will likely increase if the facility uses alum compounds for phosphorus removal.

The requirement to report effluent metals concentrations on the WET test DMR is a new requirement, but is a standard permit requirement for all Region 1 individual NPDES permittees regardless of treatment process or reasonable potential. Please see Attachments A and B to the final permit. As also noted in Response 61, EPA may establish a monitoring and reporting requirement regardless of a pollutant's potential to cause or contribute to a water quality violation.

Comment 63. Total Copper
The Town requests the sampling frequency be returned to once per month. The Fact Sheet (Page 29) simply states a different monitoring frequency without providing any justification for the change. Further, the Town knows of no other Massachusetts discharge permit for a small treatment plant that requires monitoring for copper at a frequency greater than once per month, including those recently released as draft permits. The increased frequency of testing places an arbitrary and unsupported burden on the Town of Marion.

Response 63:
EPA set the monitoring frequency for total copper at once per week because this monitoring frequency provides a better picture of effluent variability. However, EPA is aware that the additional monitoring is a financial burden and that it is more common for the Region to require once per month copper monitoring. Therefore, the monitoring frequency for copper has been changed to once per month in the final permit.

BIOSOLIDS

Comment 64. Biosolids Conditions
The Draft Permit requires the Town to stop using the water pollution control facility's lagoons for biosolids processing, and the Fact Sheet indicates that "*EPA has determined that the lagoons are functioning as sludge disposal rather than treatment or storage sites under 40 CFR Part 503 Regulations*." The Town dispute [sic] this determination and asks that this requirement be removed from the final permit. The Fact Sheet does not cite any specific language in Part 503 that provides that [sic] the basis for this determination. This action is contrary to EPA's longstanding recognition that such treatment lagoons are exempt from Section 503 requirements. Anaerobic digestion of the waste activated sludge that is pumped to the lagoons is an important part of the overall plant's treatment processes, and results in low-cost, environmentally sound sludge volume reduction and stabilization.

Response 64:
Section 405(a) of the Clean Water Act prohibits the disposal of sewage sludge when it results in pollutants from the sewage sludge entering navigable waters, except in compliance with an NPDES permit. In addition, section 405(e) of the Act prohibits any person from using or disposing of sewage sludge generated by a treatment works except in accordance with regulations developed by EPA pursuant to section 405(d), which regulations include 40 CFR Part 503. Part 503 regulations in turn provide that they apply, *inter alia*, "to any person who prepares sewage sludge," "to the owner/operator of a surface disposal site," to sewage sludge "placed on a surface disposal site," and "to a surface disposal site." 40 CFR § 503.1(b). Because the permittee is a "person who generates sewage sludge during the treatment of domestic sewage in a treatment works," it meets the definition of a "person who prepares sewage sludge." *Id.* § 503.9(r). Moreover, as explained both in the Fact Sheet and in the additional responses below, EPA has concluded, in accordance with Part 503 regulations and multiple guidance documents, that lagoons in which biosolids have been deposited for decades with no plan for removal are

"surface disposal sites" within the meaning of Part 503. Furthermore, EPA disagrees that the disposal of sewage sludge in unlined lagoons at the Marion WPCF is "environmentally sound." As EPA explained in the Fact Sheet, the disposal of nitrogen rich sludge and untreated wastewater in unlined lagoons has the potential to leach significant amounts of nitrogen into the groundwater, which would not occur if the lagoon portion of the treatment works were being properly operated and maintained. Fact Sheet at 19. In this case, the Horsley Witten report provides a reasonable basis for EPA to conclude that significant amounts of nitrogen are leaching into groundwater from the lagoons and ultimately entering Aucoot Cove.[14] See Responses 22 through 26 and 65 through 67.

Comment 65. Anaerobic digestion
That anaerobic digestion and sludge stabilization occur in the bottom layers of all facultative lagoons cannot be disputed. Innumerable technical literature sources can be cited as evidence; however, for the purposes of this comment, we simply cite EPA's own *Wastewater Technology Fact Sheet - Facultative Lagoons, EPA Document EPA-832-F-02-014* (September 2002), which states "Anaerobic fermentation is the dominant activity in the bottom layer in the lagoon," and "Removal of pathogens and coliforms can be effective, depending on temperature and detention time."

Response 65:
EPA does not dispute that facultative lagoons can provide some treatment of sludge. The Agency is, however, requiring the Town to operate its lagoons in compliance with the proper operation and maintenance requirement of 40 CFR § 122.41(e) and to dispose of sewage sludge in a manner that does not result in groundwater and surface water contamination and that protects public health and the environment from any adverse effect of a pollutant in the sewage sludge.

Comment 66. Applicability of 40 CFR part 503
Further, EPA's *A Plain English Guide to the EPA Part 503 Biosolids Rule, EPA Document EPA/832/R-93/003* (September 1994) states on page 59 that "**The surface disposal provisions of the Part 503 rule do not apply when biosolids are treated on the land, such as in a treatment lagoon or stabilization pond, and treatment could be for an indefinite period.**" Therefore, given EPA's own published interpretation, Part 503 does not apply to the lagoons at the Town's WPCF. This citation is also consistent with EPA's *Biosolids Management Handbook*, EPA Region VIII, by Robert Brobst, which indicates that operating lagoons used in wastewater treatment are not covered in Part 503. According to this EPA document, lagoons are not "surface disposal sites", and moreover, there is no liner mandate. Referring to §503.6 Exclusions, in Section 1.17-8, 10 of the Biosolids Management Handbook:

[14] EPA has not made a determination whether the groundwater flow of nitrogen from the lagoons to Aucoot Cove constitutes a point source discharge. The sewage sludge-related requirements in the permit are included pursuant to 40 CFR § 122.41 (d) (Duty to mitigate) and (e) (Proper operation and maintenance) and CWA § 405 (Disposal or use of sewage sludge).

(a) Treatment processes. This part does not establish requirements for processes used to treat domestic sewage or for processes used to treat sewage sludge prior to final use or disposal, except as provided in §503.32 and §503.33.

(b) Selection of a use or disposal practice. This part does not require the selection of a sewage sludge use or disposal practice. The determination of the manner in which sewage sludge is used or disposed is a local determination.

(c) Co-firing of sewage sludge. This part does not establish requirements for sewage sludge co-fired in an incinerator with other wastes or for the incinerator in which sewage sludge and other wastes are co-fired. Other wastes do not include auxiliary fuel, as defined in 40 CFR 503.41(b), fired in a sewage sludge incinerator.

(d) Sludge generated at an industrial facility. This part does not establish requirements for the use or disposal of sludge generated at an industrial facility during the treatment of industrial wastewater, including sewage sludge generated during the treatment of industrial wastewater combined with domestic sewage.

(e) Hazardous sewage sludge. This part does not establish requirements for the use or disposal of sewage sludge determined to be hazardous in accordance with 40 CFR part 261.

(f) Sewage sludge with high PCB concentration. This part does not establish requirements for the use or disposal of sewage sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry weight basis).

(g) Incinerator ash. This part does not establish requirements for the use or disposal of ash generated during the firing of sewage sludge in a sewage sludge incinerator.

(h) Grit and screenings. This part does not establish requirements for the use or disposal of grit (e.g., sand, gravel, cinders, or other materials with a high specific gravity) or screenings (e.g., relatively large materials such as rags) generated during preliminary treatment of domestic sewage in a treatment works.

(i) Drinking water treatment sludge. This part does not establish requirements for the use or disposal of sludge generated during the treatment of either surface water or ground water used for drinking water.

Thus, it is clear from the federal rules that the proposed action is beyond regulatory and statutory authority. EPA cannot mandate the closure of our wastewater operations under the guise of Section 503 authority. This permit provision, in its entirety, must be removed.

Response 66:
The Plain English Guide to the Part 503 rule addresses this issue specifically. Chapter 3, page 77 of the EPA Plain Language Guide to the Part 503 Rule provides the following question and answer:

> *Q: If biosolids are stored in a lagoon for 20 years and the generator has no intention or [sic] ever removing the biosolids from the lagoon, is the lagoon a surface disposal site? If so, what requirements would apply?*
>
> *A: The facility would be considered a surface disposal site since there is no intent to ever move the biosolids. The lagoon is subject to the surface disposal requirements under Part 503.*

It is clear from this question and answer that long-term storage of sludge in lagoons should generally be considered disposal subject to regulation under 40 CFR Part 503. In this case, the Town has been using the lagoons for over 40 years, and nothing in its application materials or other submittals shows intent of ever removing the biosolids. It is clearly within EPA's discretion to regulate the lagoons as sludge disposal sites.

Further, the EPA Biosolids Handbook, at page 1.1-8, provides:

> *Storage vs. Disposal*
>
> *The Part 503 regulation allows sewage sludge to be stored for up to two years without any restrictions or control. However, if sewage sludges remain on the land beyond 2 years, EPA may consider this "disposal" and regulate it as a surface disposal site.*
>
> *If the wastewater authority can provide an adequate explanation concerning why the material has to remain on the land for longer than 2 years, EPA will not regulate these operations as surface disposal sites. A common example would be a sewage sludge lagoon that has a 4 or 5 year cycle time between sludge cleanout operations. In this example, the lagoon may be considered "treatment" or "storage," and not "disposal."*

In the 44 years that the Town has deposited sewage sludge in the lagoons, it has not removed any sludge from the ponds and has not communicated any intention of removing sludge from the ponds. As discussed above, leaving sewage sludge on the land for longer than two years is typically considered disposal. However, EPA may allow slightly longer treatment cycles at its discretion, **if** the wastewater authority has presented an adequate explanation for a longer cycle between sludge cleanout operations. In this case, considering the length of time sludge has been in the lagoons and the absence of any plan for removing the sludge, it is reasonable for EPA to consider, as recommended by the cited guidance, the lagoons surface disposal sites subject to Part 503 regulations.

Furthermore, the commenter's suggestion that the lagoons should not be considered disposal sites and are exempt from regulation merely because they may provide some undetermined level of sludge treatment is unpersuasive. First, the commenter does not explain why the possibility that there may be some sludge "treatment" occurring in the lagoons precludes a conclusion that they are, in fact, used as disposal sites. Second, there is no indication the permittee has sought to monitor the treatment allegedly provided in the lagoons, that it actively manages such treatment or regularly assesses its effectiveness it in any way. Similarly, the commenter provides no indication whether it has assessed that such treatment by itself, or in conjunction with some other unspecified treatment methods, will suffice or when it will end. Nor does the commenter indicate any ultimate disposal site for the sewage sludge or time period when the supposed treatment will end. Third, the suggestion runs counter to EPA statements from the preamble accompanying the Part 503 rulemaking. For instance,

> *In 1984, when the Agency initiated the part 503 rulemaking process, surface disposal sites were considered surface impoundments that were used for treatment or interim storage, not permanent disposal facilities. Subsequently, the Agency has learned that some communities use surface impoundments for extended periods of time, suggesting that the practice is, in fact, the community's method of disposal. When surface impoundments are used for the final disposal of sewage sludge, they are surface disposal sites and are subject to the CWA's requirements as a disposal method.*

58 Fed. Reg. 9248, 9314 (Feb. 19, 1993) (emphasis added).[15] At bottom, the commenter's claim amounts to the untenable position that, because some indeterminate and incidental level of treatment may occur, EPA may not consider the sites to be surface disposal sites and Part 503 regulations are rendered inapplicable. Were that the case, a sewage sludge preparer could evade section 405 of the Act and its prohibition against the disposal of sewage sludge that "would result in any pollutant from such sewage sludge entering the navigable waters . . . except in accordance with a permit" and its prohibition against disposal of sludge not in accordance with Part 503, merely by pointing to any attendant level of incidental treatment that may be occurring, however small, even where the particular practice is, in fact, its method of disposal.

As it is, section 503.20(b) provides that sites where sewage sludge remains for longer than two years will generally be considered surface disposal sites, unless the sludge preparer has, among other requirements, explained why the sludge must remain for longer than two years before it can be finally used or disposed and specified the approximate period when the sewage sludge will be used or disposed. *See also* 58 Fed. Reg. at 9314 ("The Agency believes a two-year time period is appropriate for differentiating sewage sludge surface disposal from treatment and storage, and has made this change to the definition of surface disposal because certain treatment practices (e.g., composting, sludge drying beds, etc.) and storage facilities may process and store sewage sludge for periods exceeding the proposed one-year time limit. The Agency believes that permit writers will be better able to distinguish between those facilities legitimately treating and storing sewage sludge and those practicing surface disposal if EPA specifies a general time limitation."). Again, in the 44 years that the Town has deposited sewage sludge in the lagoons, it has not removed any sludge and has not communicated any intention of removing sludge from the ponds.

Finally, section 503.6(a) of EPA's sewage sludge regulations does not support the commenter's interpretation. It merely provides that Part 503 generally does not "establish requirements for processes used to treat domestic sewage or for processes used to treat sewage sludge prior to

[15] *See also id.* at 9340 ("The purpose of allowing sewage sludge to remain on the land for a period longer than two years and not having to meet the requirements in [Part 503, subpart C] apply [sic] is to address *unique* situations. In such a situation, mitigating factors may justify the longer period. Without mitigating factors, EPA concluded that a *two-year period provides enough time to store sewage sludge for most purposes prior to final use or disposal*.") (emphases added).

final use or disposal." But EPA has not relied on Part 503 in this permit to establish any "requirements for processes used to treat" domestic sewage or sludge prior to final use or disposal. Rather, the permit prohibits *the disposal* of sludge in unlined lagoons pursuant to section 405 and Part 503, for the reasons indicated in the Fact Sheet.

Comment 67. Special Conditions related to Lagoon Operations
Part E of the Draft Permit requires that the Town cease using the existing lagoons as they were designed to function in accordance with an approved Comprehensive Wastewater Management Plan (CWMP) dated May 2001, the water pollution control facility (WPCF) design, and the 2006 NPDES permit. Further, the Draft Permit requires abatement any ongoing contamination of groundwater as a result of "sludge or other wastewater solids that were deposited in the unlined lagoons."

EPA provides no credible information, data, or supporting facts to include such a mandate in the permit. EPA has authority to regulate effluent limits and disposal of biosolids, not the internal working of a wastewater facility. See, *Iowa League of Cities v. EPA* (8th Cir. 2013).

As discussed above, the Town is using the lagoons in lawful compliance with the provisions of Section 503 of the Clean Water Act. Further, there is no credible evidence that the lagoons have caused contamination to the groundwater, or indeed how EPA would intend for contamination to be defined.

If the lagoons were to be found to be discharging to groundwater, their regulation is not in the province of an EPA-issued NPDES permit (which strictly regulates discharges to surface water), but rather would be the responsibility of Massachusetts DEP, and then only if the any such leakage would exceed the threshold for permitting.

The Town requests Part E of the Draft Permit be removed in its entirety.

Response 67:
It is true that the 2006 NPDES permit, and permits before it, did not seek to regulate the lagoons under Part 503 authority, but this fact does not preclude EPA from doing so now, and the commenter cites to no authority to the contrary. [16] Moreover, new information about the lagoons has become available since the issuance of the 2006 permit, and EPA is required to consider this information when reissuing NPDES permits.

Buzzards Bay Coalition (BBC) first raised the issue of lagoon seepage in 2010 when nearby Sippican Harbor showed signs of nitrogen impairment without any apparent nitrogen source. BBC retained Horsley Witten to determine if seepage from the lagoons was polluting the area's groundwater. The resulting report, published in 2011, showed clear evidence of groundwater

[16] To the extent the commenter also disputes the need to line or close the lagoons, as well as EPA's authority to require it, we note that the Town has applied for SRF funding for a project that would accomplish "lining/closure" of the lagoons, which the Town observes will "improve the water quality leaving the plant and allow the Town to continue to meet NPDES permit limits." 2017 PEF, at 18, 21. MassDEP has included the project in its "2017 Intended Use Plan for Clean Water State Revolving Fund" (hereinafter "2017 Intended Use Plan"). *See id.*, Table 1, *available at* http://www.mass.gov/eea/docs/dep/water/approvals/year-thru-alpha/06-thru-d/17cwiupf.pdf (last visited Mar. 29, 2017).

contamination around the lagoons and documented that groundwater flows south and east from the lagoons.

While there is uncertainty about the magnitude of groundwater contamination from the lagoons, the Horsley Witten report provides evidence that contamination is occurring. EPA must evaluate the existing data when writing NPDES permits and cannot rely on studies that may or may not occur in the future.

With respect to state permitting, the commenter is correct that MassDEP administers a groundwater permitting program in Massachusetts pursuant to state law, but state regulations, while welcome, are not subject to EPA enforcement and are not a substitute for permit requirements arising under the Clean Water Act. This is also the position that the EAB recently took when considering the impact of state regulations on EPA's authority to regulate operation of sewage collection systems. *See In re Charles River Pollution Control Dist.*, NPDES Appeal No. 14-01, slip op. at 20-22 (EAB Feb. 4, 2015) ("The existence (and revision) of Massachusetts regulations addressing infiltration and inflow control does not diminish the Region's authority to permit the Towns under the Clean Water Act.").

However, EPA agrees that the language in Part I.E. of the draft permit is ambiguous with respect to the abatement of groundwater contamination. The intention of the language was to require that Marion remove existing sludge solids currently in the lagoons, not that the Town remediate all past groundwater contamination caused by the lagoons. The language in Part I.E has been revised to clarify this intention.

The *Iowa League of Cities* ruling is not relevant to the set of facts in this permit. That case concerned bacterial mixing zones and blending, which is the practice of combining secondary effluent with primary effluent to produce discharge that complies with NPDES permit limits. It did not concern EPA's authority to regulate disposal of biosolids, an authority even the comment recognizes EPA has been granted.

COMPLIANCE SCHEDULE

Comment 68. Compliance Schedule
As noted in the overview to this comment letter, the compliance schedule included in the Draft Permit is incomplete, internally inconsistent, and offers an inadequate time and inflexible schedule to address any improvements that prove necessary. Nor does the compliance schedule address the potential limitations on implementation that could be placed based on their value (plus other reasonably included expenditures per EPA guidance) per EPA's affordability guidelines.

Response 68:
There is currently no indication that the permittee will not be able to afford to comply with the permit requirements. At any time, a permittee can conduct an analysis of affordability and if that information supports it, an extension of the schedule can be allowed. Until then, permit schedules are required to be consistent with achieving compliance as soon as reasonably possible. In determining affordability for such an analysis, EPA uses Interim Economic Guidance for Water Quality Standards, EPA-823-B-95-002 (March 1995).

Also, see responses 69 through 72 regarding specific compliance deadlines.

Comment 69. Approval of lagoon plans
Page 12 of the Draft Permit states that within 12 months of draft permit's effective date, a plan for bringing lagoons into compliance must be filed, and that "The plan must achieve compliance with the lagoon related permit requirements as soon as possible, but no later than forty-eight (48) months from the effective date of the permit." The permit does not state whether the plan must be approved by EPA and MassDEP, nor does it give a timetable for any potentially needed approval.

Response 69:
The permit does not require EPA or MassDEP to approve the lagoon plans. However, the plan must identify the steps, including the time frame, that the Town will take to comply with the permit requirements (e.g. eliminating seepage from the lagoons) by the date indicated in the compliance schedule.

Comment 70. Lagoon Schedule
Furthermore, Page 13 states that there are only 36 months after the effective date to "complete construction of the lagoon liners." 36 months is also the deadline for constructing all necessary facilities to cease the disposal of sludge, and cease the use of the unlined lagoons. This is a direct contradiction of the statements on Page 12 which state that compliance schedule of up to 48 months is available for compliance with the lagoon-related permit requirements.

Also, requirements in the nitrogen and phosphorus compliance timetables (page 13) have the same issue where there is a deadline to submit a plan for compliance, no mention of a timetable for EPA/DEP approval of that plan, but a very tight 2-year window to finish engineering, bid(s) solicitation, financing and construction.

The Town has reviewed the proposed compliance schedule for the actions that the permit mandates (and not the alternatives that the Town also thinks needs to be considered) and requests revisions to the compliance schedule for these items as follows [on next page]:

Marion Table 3: Suggested NPDES Permit Compliance Schedule

Permit Section	NPDES Permit Item	Draft Deadline	Suggested Deadline
F.1	Report on Lagoon/Aucoot Cove Compliance	12 months	18 months
F.3	Facilities Plan Amendment	12 months	24 months
F.3	Evaluation/Facilities Plan on TN, TP Limits	12 months	24 months
F.4	Comply with TP Limit (Design/Construction)	24 months	42 months
F.6.a	Progress Report on Lagoons/Sludge Handling	24 months	42 months
F.6.b	Complete Lagoon Liner or Alt. Sludge Handling	36 months	60 months
F.7	Complete Design of Modifications for TN	36 months	48 months
F.6.b	Comply with Lagoon Requirements (Sludge Management Facilities Design/Construction)	48 months	72 months
F.8	Progress Report on Modifications to Meet TN	48 months	60 months
F.9	Comply with TN Limit (Construction)	60 months	72 months
C.4	Collection System Mapping	30 months	36 months
C.5.a	Phase 1 – Collection System O&M Plan	6 months	12 months
C.5.b	Phase 2 – Collection System O&M Plan	24 months	48 months
C.6	Annual CMOM Reporting	Annually	Annually*

* Notes – the Town requests that EPA combine the reporting requirements under the CMOM program and on Page 6 within the Draft Permit into a single report to reduce the reporting requirements and burden on the Town. The schedule also assumes timely review and approval of documents by the regulatory agencies.

Response 70:
With some exceptions, as noted below, EPA does not concur with the length of time requested for compliance, and the comment does not provide adequate justification for such a lengthy schedule. Based on the comments, as well as changes made in the final permit, the compliance

schedule has been modified significantly. The final schedule is consistent with the requirement for achieving compliance as soon as reasonably possible and for having annual milestones. While EPA may provide feedback on the submittals required under this schedule, no formal EPA approval is required for each submittal. To the extent that MassDEP review may be appropriate, the schedule allows for ample time to complete tasks and allow for MassDEP review. Nothing in this schedule prevents the Permittee from combining permit reporting requirements.

Changes in the final schedule include:

- The time frame for completing the lagoon related requirements within 48 months has been clarified.
- The schedule has been modified to reflect the removal of the total nitrogen limit of 3.0 mg/L and activities related to non-point source nitrogen reductions that could offset the need to achieve the 3.0 mg/L limit.
- The time frame for complying with the total phosphorus has been extended to forty-two months, consistent with the time frame requested by the permittee. This extension allows time for the Permittee to address any sludge handling concerns associated with additional phosphorus treatment. Also, the final permit includes an option for the permittee to relocate the outfall to the head of the salt marsh of Aucoot Cove, which would eliminate the need for an effluent phosphorus limit.

A Different Plan

As summarized below, the Town has proposed what it believes to be a legally supported, common sense, cost-effective approach to determining which, if any, improvements are needed to the Town's WPCF to meet the requirements of the CWA.

The Town suggests the following actions be taken to address the potential issues raised in the permit:

1. Conduct a study of the suitability of Inner Aucoot Cove to support eelgrass to determine if there is validity for the assumption in the Draft Permit that eelgrass is the most sensitive use for which this surface water should be enhanced, maintained or protected; and, if the habitat is found to be suitable for eelgrass, assess the quantity of nitrogen that can be present in Inner Aucoot Cove to support this resource.

2. Modify data collection at the treatment plant (e.g., electronic staff gauges in stilling wells) to obtain more rigorous data for a water mass balance at the lagoons to estimate if leakage could be occurring from the lagoons, and if so, what quantity of leakage could be occurring from the lagoons.

3. Prepare a detailed cost estimate for upgrades at the treatment plant assuming changes suggested by permit need to be implemented.

4. Evaluate the feasibility of changing the discharge location of treated effluent to be either the head of the saltmarsh in Aucoot Cove or in Outer Aucoot Cove, including establishing which studies that would be required to meet new Ocean Sanctuaries Act, performing a concept analysis and a detailed cost estimate.

5. If needed, prepare an analysis of nitrogen loading to Aucoot Cove to understand the relative contributions from the point source (wastewater treatment facility) and non-point sources (septic systems, stormwater runoff, cranberry bogs etc.)

6. If needed, evaluate alternatives for controlling non-point sources of nitrogen to Aucoot Cove to determine the degree to which sources are affected. Determine which sources of nitrogen can be most cost effectively controlled.

7. Subject the planned improvements to EPA's affordability guidelines and then seek agreement on an implementation schedule that matches these guidelines.

8. Conduct a simplified water effects ratio study on copper to seek regulatory relief from the copper limit in the permit.

Response 71:
The commenter's desire for greater scientific certainty, as a matter of law, cannot preclude or delay EPA from proceeding with the finalization of its proposed permit. As the EPA's Environmental Appeals Board recently explained: "scientific uncertainty is not a basis for delay in issuing an NPDES permit. The Board has specifically held that '[i]n the face of unavoidable scientific uncertainty, the Region is authorized, if not required, to exercise reasonable discretion and judgment.'" *In re Upper Blackstone Water Pollution Abatement Dist.*, 14 E.A.D. 577, 606 (EAB 2010) (quoting *In re Dominion Energy Brayton Point, LLC*, 13 E.A.D. 407, 426 (EAB 2007)).

Indeed, the call for further study upon further study would amount to delays that would greatly undermine the ability of the Clean Water Act to achieve its objectives. *See id.* ("[M]ore than three decades ago, the D.C. Circuit aptly described the CWA's balance when confronted with a difficult situation and the obligation to eliminate water quality impairments: 'EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels. This may well mean opting for a gross reduction in pollutant discharge rather than the fine-tuning suggested by numerical limitations. *But this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all*.") (quoting *Nat. Resources Def. Council, Inc.*, 568 F.2d 1369, 1380 (D.C. Cir. 1977)) (emphasis added by EAB).

Comment 71. Compliance Schedule for New Fecal Coliform and Enterococci Limits
The UV disinfection system was designed to meet the current permit limits of 14/43 cfu/100 ml for fecal coliform. This system provides effective treatment at the current permit levels. The Draft Permit proposes to reduce the fecal coliform limits and introduce limits for *Enterococci*.

As noted earlier, the proper calculation of bacteria limitations should have included dilution available over the tidal cycle ion the Cove.

The Town is concerned that it could have difficulty meeting revised permit limits and thus requests that the compliance schedule included in Section F of the Draft Permit be modified to allow a one-year compliance period for *Enterococci* and the more stringent fecal coliform bacteria. In this way, the Town will be able to determine the most cost-effective solution to meet both of the new limits for pathogens.

Response 72:
EPA is not establishing bacterial limits that account for dilution, in part because there are other sources of bacteria in stormwater that effectively eliminate the dilution benefit of higher flows. EPA also notes that bacteria limits in NPDES permits issued in Massachusetts have historically been established equal to the water quality criteria, with no allowance for dilution. Particularly in light of the existing and designated aquatic life uses in the receiving waters, and the human health concerns associated with excursions of bacteria criteria, EPA believes it is appropriate to follow this conservative approach. In this case, a discharge that elevates bacteria levels beyond criteria is not viewed as protective of primary contact recreation uses. If dilution were allowed, people recreating in or downstream from a zone of initial dilution may be exposed to greater risk of the acute endpoint of gastrointestinal illness. Furthermore, the bacteria limits in the permit are consistent with the assumptions and requirements of the wasteload allocation for wastewater treatment plant discharges set forth in the 2009 Final Pathogen TMDL for the Buzzards Bay Watershed. See also Response 42.

That being said, because the fecal coliform limit has been lowered, and the facility has not yet treated for Enterococci, EPA is granting a one-year compliance schedule for the facility to comply with the Enterococci limits as requested.

Comment 72. Annual Reporting Requirement
Part I.A.1(g) of the Draft Permit states that "If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions."

The WPCF regularly has a 12-month rolling average in excess of 0.4704 MGD (which is 80% of 0.588 MGD). For calendar year 2014, the 12-month rolling average was 0.531 MGD; this is before the addition of flows from a new 40-B project and a new dormitory at Tabor Academy.

Marion has several objections to this requirement of the Draft Permit as follows:

- As described in comments above, EPA lacks statutory authority to regulate flow in a NPDES permit. Therefore, EPA has no basis to set a flow limit within this permit and thus has no basis to require actions to be taken when the plant approaches this limit.

- Reaching 80 percent of the facility's design flow is not a violation of the Draft Permit, and reaching this value should not trigger a required response by the Town.

In addition to the requirements listed on Page 6 of the Draft Permit, Page 10 of the Draft Permit discusses the annual "Collection System O & M Plan" report, due to be submitted to MassDEP and EPA by April 15. The separate report lists further requirements for when the WPCF 80 percent of the design flow, including separate calculations of "maximum daily, weekly and monthly" inflow and infiltration. EPA lacks statutory authority to regulate treatment plant flow. Further, the reporting requirements listed on Page 6 and Page 10 necessitate two separate reports to be submitted at different times.

Marion requests that the requirement for action when the WPCF reaches 80 percent of its design flow be removed from the Draft Permit. Marion also requests that EPA seek to reduce the burden of report submittals to the best of its ability; an example would be to require *one* report containing all of the requested information on Page 6 and Page 10.

Response 73:
See Response 53 regarding the required reporting when the facility reaches 80% of its design flow. Regarding the rationale for the effluent flow limitation, see Responses 39-41. Regarding the rationale for the Collection System O & M Plan requirements, see Response 58. Nothing in these requirements prevents the Permittee from combining permit reporting requirements as long as the timeframes and content requirements are achieved.

REFERENCES (TO MARION'S COMMENTS)

A. 314 CMR 4.00. Massachusetts Surface Water Quality Standards.

B. 33 U.S.C § 1362(6). Clean Water Act, Water Pollution Control Advisory Board.

C. 40 C.F.R. 122.44(d). Establishing limitations, standards, and other permit conditions.

D. 40 C.F.R. 261. Identification and Listing of Hazardous Waste.

E. 40 C.F.R. 503. Standards for the Use or Disposal of Sewage Sludge.

F. Acts of 2014, Chapter 259. An Act Improving Drinking Water and Wastewater Infrastructure.

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February 6, 2015 Comments submitted by The Buzzards Bay Coalition ("Coalition").

The Coalition submitted comments that were mostly supportive of the draft permit. Three comments requesting clarification or changes to the permit are presented and addressed below.

Comment 73. The Interim Total Nitrogen Effluent Limit should be lowered to 4.0mg/L.
The Coalition urges the EPA to establish a lower interim total nitrogen effluent limit. Footnote 7 on page 4 of the Draft Permit establishes an interim nitrogen limit of 5.0 mg/L total nitrogen limit from April through October. The Coalition urges the EPA to establish an interim permit limit of 4 mg/L. The critical need to reduce nitrogen to Aucoot Cove together with the WPCF's ability to achieve an average effluent concentration of 3.46 mg/L total nitrogen supports an interim limit of 4 mg/L total nitrogen.

Response 74:
See Responses 12, 13, 14, 17 and 20 relative to the nitrogen limit in the permit.

Comment 74. The draft permit's total nitrogen effluent limit compliance schedule is too generous.
The Draft Permit proposes to grant the Permittee 60 months, the entire term of the permit, to implement facility improvements required to meet the 3.0 mg/L total nitrogen effluent limit. This appears to be an overly generous timeframe given the evidence that the WPCF currently achieves an average total nitrogen limit of 3.46 mg/L. The Coalition supports the requirement that the Permittee submit an alternatives analysis/facilities plan to EPA for improvements required to achieve the total nitrogen limit within 12 months after the effective date of the permit in requirement I.F.3. However, the Coalition urges the EPA to require that full implementation of that plan be achieved within 36 months of the effective date of the permit.

Response 75:
See Responses 12, 13, 14, 17 and 20 relative to the final nitrogen limit. Given the uncertainty over non-point source nitrogen loads and the nitrogen reductions that will be achieved through remediating the nitrogen loadings from the lagoons, the final permit contains a seasonal average total nitrogen limit of 4.0 mg/L. Additionally, the total nitrogen compliance schedule has been removed because the limit is now attainable for the WPCF based on current performance. The elimination of the nitrogen compliance schedule makes this comment on adjustments to the compliance schedule moot.

That begin said, EPA has indicated that future permit actions may require a lower total nitrogen limit. Accordingly, it would be prudent for the Town of Marion to evaluate and plan for further improvements to its nitrogen treatment capability as part of the required facilities planning for addressing the lagoon and phosphorus related requirements of the permit.

Comment 75. Clarification requested on permit condition I.F.2.
Condition I.F.2 allows the Permittee to “supplement such reductions” for a higher total nitrogen limit at the Outfall sufficient to meet the SWQS. This condition also requires that “such plan” include any additional non-point source and stormwater reductions that the Permittee implements. It is not clear what the phrase “such reductions” in this condition refers to or what and when such a “plan” must be completed. Lastly, this provision lacks an implementation timeframe.

If the intent of this condition is to allow the Permittee to demonstrate that the load from other sources of nitrogen can be reduced (“such reductions”) in an amount to meet SWQS and justify a higher total nitrogen effluent limit on Outfall 001, then clarifications are needed including inclusion of a timeframe to submit a plan for an alternative nitrogen reduction strategy. In the event that the Permittee avails itself of this opportunity, the Draft Permit must require that a plan showing the reduction of sources of nitrogen to Aucoot Cove in an amount sufficient to meet SWQS be submitted to EPA and be made available for public comment. Furthermore, that plan must be fully implemented within 36 months of EPA’s approval of the plan.

Response 76:
See Response 20. The condition referenced by the commenter was part of the nitrogen compliance schedule, which has been removed from the final permit. The seasonal total nitrogen limit has been changed to 4.0 mg/L, and the total nitrogen compliance schedule has been removed because the limit is now attainable for the WPCF based on current performance.

February 2, 2015 Comments submitted by 44 Marion residents

Comment 76. Support for permit
We, the undersigned 44 Marion residents and property owners, write to express our strong support for the draft NPDES Permit as issued by the US Environmental Protection Agency and Massachusetts Department of Environmental Protection on December 3, 2014. It is clear that the unlined sewage lagoons at the town’s wastewater treatment plant are a critical source of pollution to the harbors and coves of our town and must be remediated immediately. The special condition in the draft NPDES permit which requires the town to cease using the twenty acres of unlined

lagoons for the storage and disposal of sludge and untreated wastewater will terminate the lagoons as a harmful pollution source.

A study completed by the Horsley Witten Group in 2010 determined that the unlined lagoons were in fact leaking. A series of groundwater monitoring wells were installed, with the town's permission, to determine nitrogen levels and flow of groundwater. The data collected from this investigation indicated that the lagoons are leaching and contributing nitrogen to the groundwater and to Marion's coastal waters. In some instances, groundwater nitrogen data are fifty times higher than natural background conditions.

The Horsley Witten Group study was commissioned by the Buzzards Bay Coalition and at no time has the town presented evidence to the contrary.

While the lagoons present a significant source of nitrogen pollution, the solution need not be onerous on the town. The lagoons can be lined with an impermeable geotextile membrane which could be done in multiple phases to keep the wastewater treatment plant in operation. Better still, new flow controls and upgrades to the plant could eliminate the need for the lagoons as part of an updated design for the plant and open up valuable acreage for other municipal uses. It is clear that the permit provides the town with sufficient flexibility to implement alternatives to unlined lagoons.

Local residents have been urging the town to take action to remediate this known pollution source for nearly four years now. We are immensely pleased that the US Environmental Protection Agency is taking meaningful steps towards requiring an alternative to unlined lagoons and we, as residents of the town of Marion, support a requirement that the town upgrade the lagoons.

Response 77: EPA has taken note of this comment in deciding to require closure or lining of the sewage lagoons.

Supplemental Comments

These supplemental comments were submitted after the close of the public comment period. While specific responses to these late-filed comments are not required, EPA has exercised its discretion to respond to certain of these comments herein. All comments were, however, reviewed and considered relative to EPA's final determination as reflected in the final permit.

Below are all the comments received and EPA's responses. The supplemental comments reproduced verbatim are indicated in quotes, while the others have been summarized.

SEPTEMBER 16, 2015 LETTER FROM THE TOWN OF MARION.

This letter describes the Town's ongoing efforts to

1. Update the Town's Wastewater Facility's Plan;
2. Prepare a watershed loading analysis of nitrogen loading to Aucoot Cove;
3. Determine exfiltration rate from the lagoons;
4. Evaluate sludge and lagoon scenarios;

5. Examine historical data of eelgrass in Upper Aucoot Cove; and
6. Determine feasibility of an outfall extension to outer Aucoot Cove.

The letter also includes a timeline for the completion of these activities others. Finally, the Town requests that EPA delay issuance of the final permit until the Town can complete its studies, projected in March 2016.

Response:
Please see Response to 0. Please note that EPA did refrain from issuing the final permit until early in 2017, a year longer than the delay that the Town requested in this supplemental comment. This provided the Town time to work on the listed studies.

SEPTEMBER 23, 2015 LETTER FROM THE TOWN OF MARION

This letter consists of a proposed timeline for the Town to comply with the requirement to line or abandon the sewage lagoons. The letter proposed a schedule in which the lagoon lining and/or closure would be complete by December 2020, or 63 months from the date of the letter. The compliance schedule in the final permit requires completion of lagoon lining and/or closure within 48 months of the effective date of the permit.

Although this letter was submitted after the public comment period, EPA considered the suggested compliance schedule in issuing the final permit. EPA determined that such a lengthy schedule is excessive, has not been sufficiently justified, and is inconsistent with the mandate for achieving compliance as soon as reasonably possible.

NOVEMBER 13, 2015 LETTER FROM THE TOWN OF MARION

Request for seasonal average nutrient limits
"The proposed nutrient limits in the Draft Permit are on an average monthly basis. The Town notes that the recently issued Taunton Wastewater Treatment Plant permit (MA0100030) uses a rolling seasonal average nutrient limit, recognizing that the nitrogen load over the entire growing season is more important than the nitrogen load in any given month. Marion requests that the permit limits in its permit be changed to a rolling seasonal average basis.

The Draft Permit states that the total nitrogen, total phosphorus, and dissolved oxygen seasonal limits will be in effect from April 1 – October 31. We request that the basis for the seasonal limit be changed to be in effect between May 1 – October 31. This is consistent with the recently issued Taunton Wastewater Treatment Plant permit, and is also consistent with the seasonal ammonia nitrogen limits in the Marion Draft Permit."

Response:
The total nitrogen limit of 3.0 mg/L has been eliminated from the final permit. See Response 20. The limit in the final permit is based on a seasonal average, because the loading analysis that was used to determine the TN limit was based on seasonal average. As indicated in Response 20, given the extended groundwater travel time and thus the extended period of time for which groundwater nitrogen loadings from the lagoons will continue discharging to Aucoot Cove, as well as the uncertainty over EPA's estimate of the other non-point source nitrogen loadings, it is

prudent to minimize the allowable nitrogen loading from the Marion discharge. The final permit limit also is informed by the demonstrated performance for the April - October seasonal period. The month of April is considered a shoulder season relative to the critical period for algal growth. Given the need to minimize nitrogen loadings to Aucoot Cove and the fact that the final permit limit is based on demonstrated performance for the April – October time frame, the seasonal period is not changed in the final permit.

The applicable season for ammonia is based on stream temperatures as they relate to toxicity and not algal growth. The total phosphorus limit, like total nitrogen, is based on the season where algal growth is the greatest concern. Given that algal growth in streams typically begins in April, the final permit has not been changed. The critical period for dissolved oxygen however, does not typically begin in April and the final permit has been changed to June through October, consistent with the current permit.

Affordability – claim that project will cause ratepayers to spend more than 2% of income on sewer.

"The proposed conditions in the Draft Permit – especially those relating to the lagoon provisions and the more stringent nutrient limitations – will require significant capital expenditure to be in compliance. With only 1,646 sewer ratepayers who would need to bear the costs associated with these upgrades and significant projected costs of improvements to meet the requirements of the draft NPDES permit, Marion believes the improvements will place the Town above the affordability threshold, and thus subject to regulatory relief as allowed under the Clean Water Act. The Town has not yet completed a detailed affordability analysis but provides the following high-level information to demonstrate the high probability of exceeding the affordability threshold. The Town is undertaking a more detailed affordability analysis and will forward the results when this is completed.

The median household income (MHI) in Marion is $80,456 (see Attachment 3)[[17]] based on 2013 census data. This MHI is based on all residents within the community; however, it should be noted that not all residents in Marion are connected to the sewer system. Based on the location of the sewered parcels within Town, many of the more affluent portions of Town that drive up the MHI are not connected to the sewer system. As such, it is expected that the MHI of the Town's sewer ratepayers is much less than the Census Bureau's estimated $80,456. Unfortunately, Marion has only one census tract, and we are currently exploring other analyses to determine if it will be possible to refine the MHI to reflect (or at least better reflect) that of the sewer ratepayers.

The Town of Marion estimates that the average household sewer bill is currently about $997 per year, based on a fixed quarterly fee of $104.55 and a tiered billing system based on water consumption. The estimated average bill was developed from actual metered water use data (AMR data) from the Town's MUNIS billing system. Using an existing rate model that accounts for existing debt service, expenditures, O&M and staffing costs, the estimated costs of projects required to meet the conditions in the Draft Permit and other required MS4 expenses, the Town

[17] Attachment 3 to Marion's comments is not included in this RTC but is available on request.

projects that sewer rates will increase by 269%. This increase would mean that the average household sewer bill is projected to increase to $2,683, which is approximately 3.3% of the MHI; significantly above the 2% EPA screening criteria."

Response:
See Response 68. An affordability analysis will require detailed documentation supporting the analysis, including actual versus theoretical average water use values. While median household income can be based on the sewer users only, EPA notes that the Town can also require the "more affluent portions of Town" to contribute to the cost of cleaning up Aucoot Cove, especially considering that they likely also contribute to the excessive nitrogen loadings. While a future demonstration that achieving compliance will result in exceeding the affordability threshold could form the basis for an extension of the compliance schedule, it does not support a change in the necessary permit requirements. We also note that MassDEP recently included several Town of Marion projects, including $12 million for "lagoon lining/closure," *see* 2017 PEF, at 7-8, 12, on the Commonwealth's 2017 Intended Use Plan listing POTW projects to be funded through the State Revolving Fund.[18]

Request for longer phosphorus compliance schedule
With the Town's affordability constraints (see previous comment), additional time will be required to meet the TP conditions described in the Draft Permit. While the final schedule would be based on the forthcoming more detailed affordability analysis, it seems clear at this time that the start of facilities related to phosphorus/sludge handling would need to be delayed until after the completion of the lagoon lining. We would envision a schedule as follows (again from the date that Town Meeting voted affirmatively to support project funding):

- Month 1 (assumed to be May) – Town Meeting, funds appropriated for planning and design
- Month 3 (assumed to be July) – Funds available to start work on TP and sludge processing facilities planning and design
- Month 15 – Complete facilities planning on TP and sludge processing facilities
- Month 21 – Submit draft preliminary design report to EPA/DEP
- Month 23 – Submit final preliminary design report
- Month 27 – Submit 60% plans and specifications
- Month 27 – Begin permitting process
- Month 28 – Submit PEF for SRF funding for construction
- Month 31– Begin public hearings leading up to Town Meeting
- Month 32 – Complete final design, including cost estimate
- Month 37 (typically May) – Town meeting article to fund construction
- Month 39 – Submit SRF loan application with Town appropriation for construction improvements
- Month 40 – DEP issues permission to advertise and project permits in place

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[18] *Available at* http://www.mass.gov/eea/docs/dep/water/approvals/year-thru-alpha/06-thru-d/17cwiupf.pdf (last visited Mar. 29, 2017).

- Month 42 – Open bids
- Month 43 – Award construction contract
- Month 45 – Begin construction
- Month 63 – Substantial completion on construction
- Month 65 – Start up period for new facilities prior to permit limits being effective

Response:
See Response 70. The final permit contains a schedule for meeting the total phosphorus limit that is consistent with the time frame that Marion requested in its timely-filed comments and is consistent with EPA's experience with similar municipal treatment upgrades. These late-filed comments provide no justification for such a lengthy schedule.

In Comment 1, however, Marion contemplated relocating the outfall to Aucoot Cove, which would eliminate the need for an effluent phosphorus limit. EPA has included an option in the final permit that allows Marion the option to relocate the outfall instead of upgrading its WPCF facility to meet the 200 μg/L total phosphorus limit. See Response 1.

Updates on planning and data collection activities
The November 2015 letter also contained updates on work being done by CDM and the Town of Marion to determine exfiltration rates from the lagoons, characterize sludge currently in the lagoons, determine the historical extent of eelgrass in Aucoot Cove, investigate watershed nitrogen loading, and explore the feasibility of extending the discharge pipe further into Aucoot Cove. While these studies may yield further information to guide the Town in its planning, they do not change the basis of the limits in the final permit.

DECEMBER 10, 2015 SUPPLEMENTAL COMMENT LETTER SUBMITTED BY THE BUZZARD'S BAY COALITION

The WPCF Draft Permit requires a monthly average nitrogen limit.
The Coalition urges the EPA to reject CDM's request for a seasonal average nitrogen limit. A seasonal average nitrogen limit is not sufficiently stringent to achieve compliance with water quality standards for Aucoot Cove. Instead, compliance must be measured by using a monthly average. Meeting a monthly nitrogen limit during this time period provides better water quality protection to Aucoot Cove and the ecological resources therein. The town of Marion's neighbor to the east, the town of Wareham, operates a wastewater treatment facility within the Buzzards Bay watershed. The town of Wareham's Final NPDES permit, MA0101893, sets an effluent limit for total nitrogen measured on an average monthly basis between the months of April 1 to October 31. The town of Marion's Draft Permit total nitrogen limit should also be measured on a monthly average basis.

Response:
See Response 20. The selection of the averaging period for the nitrogen limit reflects the time span of the environmental effects and the time span of the loading analysis. The limit in the final permit is based on a seasonal average, because the loading analysis that was used to determine the TN limit was based on seasonal average.

If new information indicates that the other non-point sources of nitrogen are significantly higher than EPA's estimate and/or water quality continues to show signs of impairment relative to water quality standards, EPA may consider a more stringent nitrogen limit in a future permit action

The Draft Permit's proposed April 1 to October 31 seasonal limit should be maintained in the final permit.

The Coalition urges the EPA to reject CDM's request for a shortened season. An examination of the Coalition's long-term dataset shows that the temperature in the waters around Buzzards Bay are warming over time, including Aucoot Cove which has warmed at a rate of approximately 1.2 F per decade.[1] The average July and August water temperatures was 72.3 F in 1992 in Aucoot Cove, whereas results in a lengthening of the time during which water temperatures are favorable for algae growth. The growing season is lengthening, not shortening. It is therefore reasonable, and consistent with the town of Wareham's seasonal nitrogen limit, to require Marion to meet its nitrogen limit between April 1 and October 31.

[1] Rheuban, J. E., S. C. Williamson, J. E. Costa, D. M. Glover, R. W. Jakuba, D. C. McCorkle, C. Neill, T. Williams, and S. C. Doney. Spatial and temporal trend in summertime climate and water quality indicators in the coastal embayments of Buzzards Bay, Massachusetts. In review.

Response:

EPA has retained the April 1 through October 31 season for the total nitrogen effluent limit, as algal growth starts in April.

The Coalition supports an expedited schedule for achieving compliance with the Lagoon Condition (Condition I.E.) in Draft Permit Condition I.F.

Marion does not dispute that the twenty acres of unlined sewage are leaking. Concern over the integrity of the lagoons was initially discussed in the WPCF's 1995 Draft Wastewater Facility Plan, produced by Camp Dresser & McKee, stating that "[t]here are two possible sources of contamination from the treatment facility: the wastewater lagoons and the septage lagoons."[1] The 1995 Plan goes on to report that Well 1 contained nitrate levels above primary drinking water standards and total nitrogen concentrations as high as 19.4 mg/L.[2] Now, twenty years later, Marion's consultants, CDM Smith's recent investigations further clarify that the lagoons are leaking. Specifically, in their supplemental comments to EPA on September 16, 2015, CDM finds that the leakage from the lagoons could be "on the order of 0.01 to 0.05 mgd."

It is clear that federal regulations require that all facilities and systems of treatment and control, including all related appurtenances, be properly operated and maintained at all times.[3] This requirement applies to the WPCF's wastewater lagoons as well. The continued operation of unlined leaking lagoons and the practice of sludge disposal in unlined lagoons is inconsistent with proper operation and maintenance requirements of the WPCF.[4] The Coalition urges EPA to maintain an expedited compliance timeframe to line or otherwise remediate the lagoons to protect Marion's sensitive coastal waters.

[1] Town of Marion Draft Wastewater Facilities Plan, Camp Dresser & McKee, June 1995 at 6-10; Town of Marion Draft Wastewater Facilities Plan, May 2001 at 2-3.

[2] Town of Marion Draft Wastewater Facilities Plan, Camp Dresser & McKee, June 1995, at 6-15.

[3] 40 CFR § 122.41(e); Fact Sheet at 19.

[4] Fact Sheet at 19.

Response:
The final permit contains a compliance schedule of 48 months for the Town to close or line the lagoons such that they are not a source of nitrogen to the groundwater and to discontinue the placement of sewage in unlined sewage lagoons, which is the same as in the draft permit.

Conclusion
The Coalition is optimistic that the Town is taking the necessary steps to comply with the Draft Permit's requirement that the lagoons be properly lined and maintained. CDM presented a construction schedule in support of this end in their September 23, 2015 comments and we look forward to supporting Marion's completion of this task.

Furthermore, the Coalition was recently pleased to partner with Marion on a grant application expand municipal sewer to existing homes serviced by on-site septic systems around Aucoot Cove. If awarded, the project will take a critical step towards reducing nitrogen to Aucoot Cove from other wastewater sources.

The ongoing, persistent nutrient pollution of Aucoot Cove, Sippican Harbor, and the Sippican River from Marion's leaking sewage lagoons cannot be allowed to continue and we urge EPA to issue a final NPDES permit that expedites lagoons cleanup as its top priority.

Response:
EPA is also pleased that Marion plans to connect septic systems near Aucoot Cove to the municipal sewer system. This action will remove a source of nitrogen that is contributing to the impairment of Aucoot Cove, and may avert the need for a more stringent effluent total nitrogen limit in future permit reissuances.

NOVEMBER 21, 2016 LETTER FROM THE TOWN OF MARION
In this letter, the Town requests that EPA defer permit issuance in exchange for a commitment from the Town to pursue initiatives such as

- Implementing Capacity, Management, Operations and Maintenance requirements contained in the draft permit
- Reliability modifications at the wastewater treatment facility
- Aucoot Cove sewering
- Regionalization planning
- Groundwater and field studies to determine impact of lagoons on Aucoot Cove
- Reduce phosphorus in the discharge with temporary chemical feed facilities
- Submittal of a recommended plan based on results of above reports and studies.

Response:
EPA understands the Town's interest in a continuing dialogue about the permit. However, the schedule and plan contained in the letter are unacceptable to EPA. Specifically, the plan only includes a lagoon study with no provisions for lagoon lining or closure and the need to remediate the ongoing nitrogen loadings would not be an enforceable requirement.

The continued operation of unlined sewage lagoons for sludge disposal and raw wastewater equalization is in violation of the Clean Water Act and should cease as soon as possible. The submittal of a plan that includes only lagoon study is particularly puzzling, given the fact that the Town proposed a schedule for lining or closing the lagoons both in its November 2015 letter to EPA and at an April 2016 meeting with the agencies.

EPA and MassDEP have met with the Town and its consultants, at the Town's request, four times over the past two years. The agencies have given the Town ample opportunity to discuss its views on the permit compliance schedule and put forth the Town's ideas to reduce nitrogen loading to Aucoot Cove.

For these reasons, the agencies have decided to reissue the permit with requirements for lagoon closure and/or lining.

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June 15, 2015

Carlos T. B. Fragata
Environmental Analyst
DEP Waterways Regulation Program
20 Riverside Drive
Lakeville, MA 02347

Town of Mattapoisett Waterways Application
Notice of License Application Pursuant to M.G.L. Chapter 91
Waterways License Application Number W15-4368 Julie M. Starr-Duker

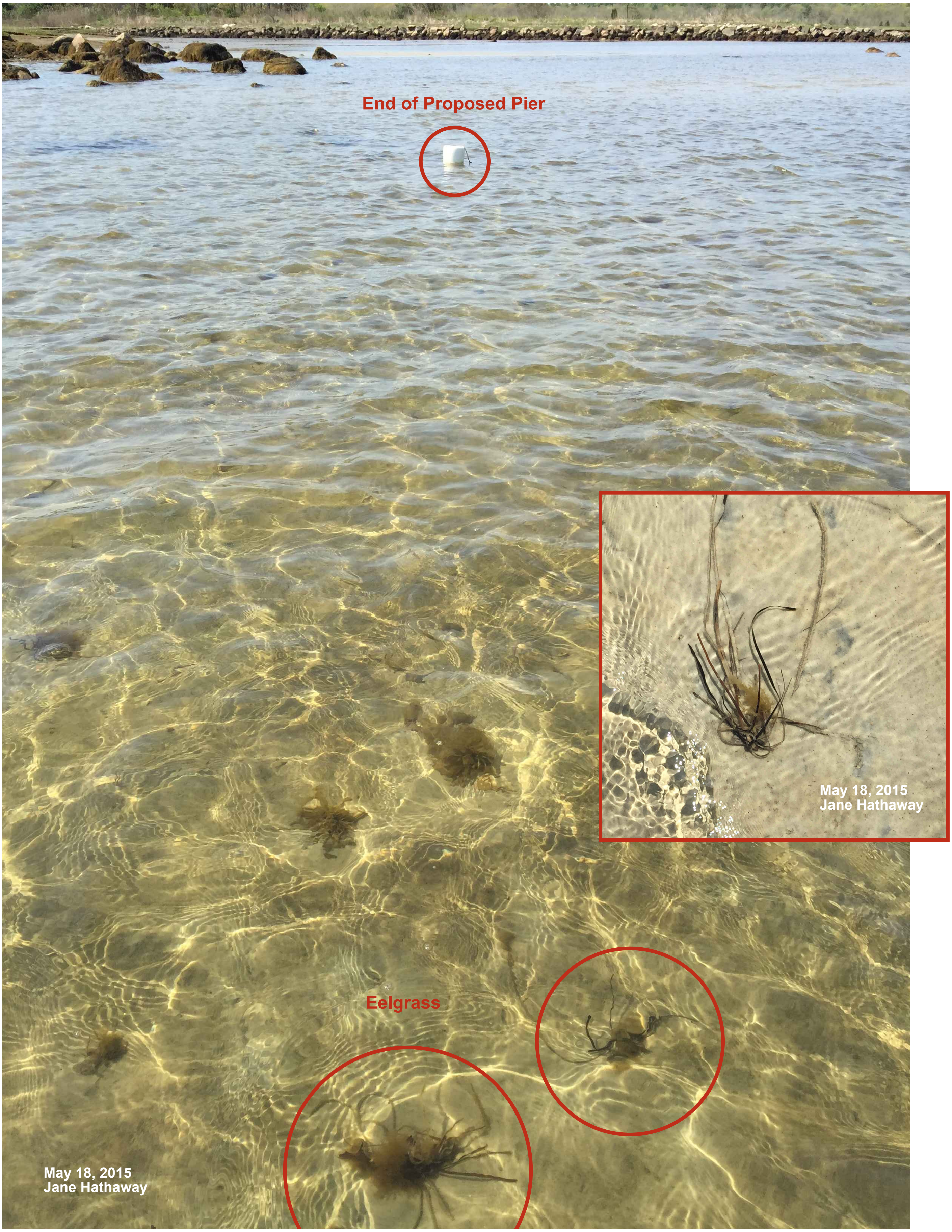
Application by Julie M. Starr-Duker to construct and maintain a pier, gangway, float and float piles at 112 Aucoot Road in the municipality of Mattapoisett in and over flowed tidelands of Aucoot Cove

Dear Mr. Fragata,

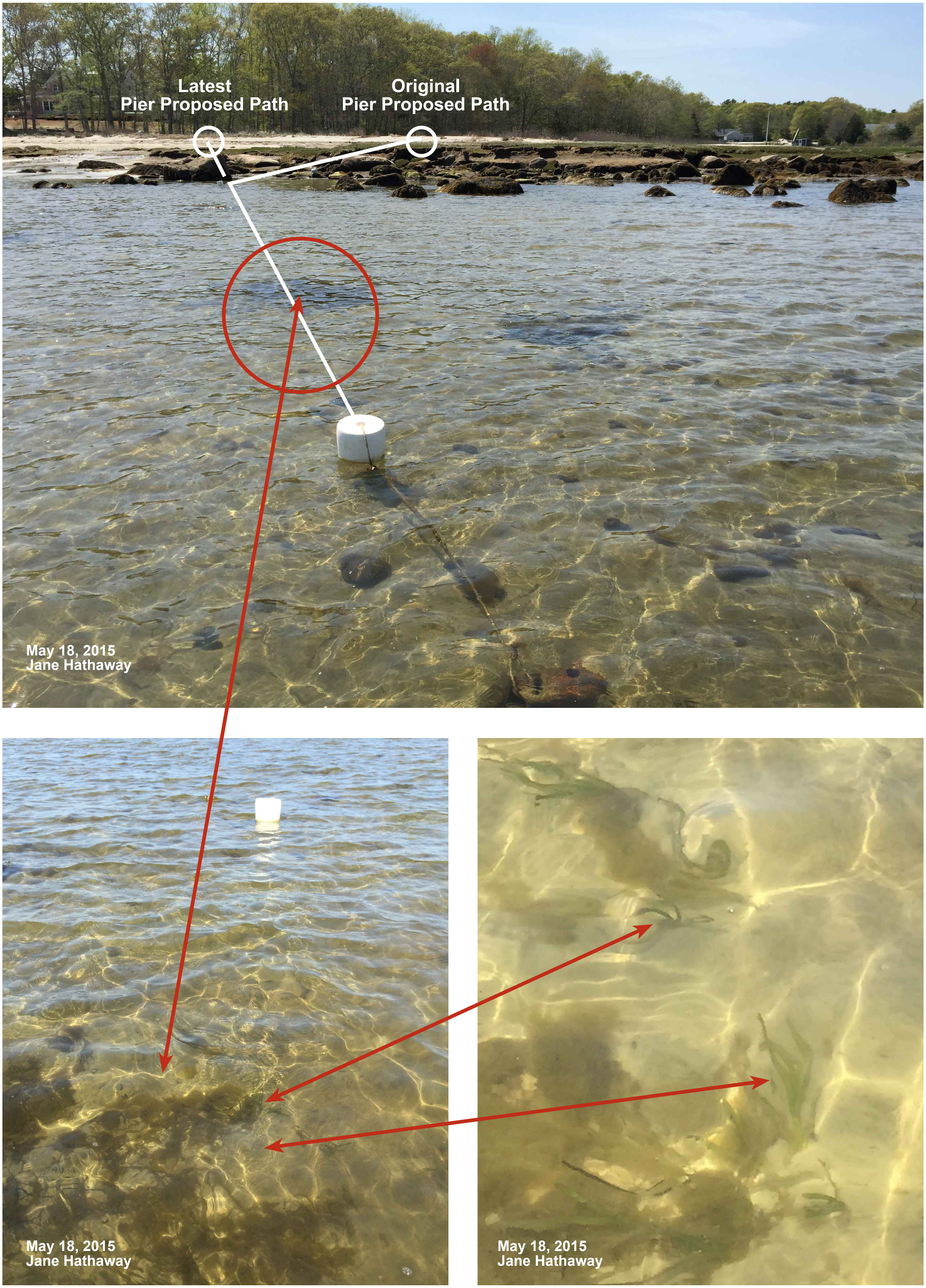
Thank you for responding to my June 10th email and giving me the opportunity to send to you the following images that support the Division of Marine Fisheries May 21, 2015 letter and content on Eelgrass and shallow water with respect to potential impacts to marine fisheries resources and habitats.

As mentioned in my email - on May 18th of this year, I walked the sand flats at low tide from our beach over to the area where the proposed Duker pier ends and saw newly sprouting eelgrass growing all along the sand flats and also within the direct path of the proposed Duker pier. While it does not exist in large beds, it does exist - as it struggles to replenish itself in this area. The Eelgrass was just starting to sprout new growth at this time. This existing Eelgrass is contrary to the April 2015 finding by Stantec Consulting Services that "no Eelgrass was observed".

Eelgrass is re-establishing itself along the sand flats and in very close proximity of the proposed pier



Eelgrass is in close proximity of the proposed pier and is also growing in its direct path


Latest
Pier Proposed Path
Original
Pier Proposed Path
May 18, 2015
Jane Hathaway
May 18, 2015
Jane Hathaway
May 18, 2015
Jane Hathaway

Beyond the end of the proposed pier, heading seaward, there are several sand flats that are exposed at low tide. During the lowest tides these sand flats extend all the way over to Haskell Island. This entire area is home to many shellfish and the wildlife that live and feed here and should not be disturbed.

As seen in this photograph (to the left) the end of the proposed Duker pier will sit in less than 12” of water at low tide. It is our understanding that there needs to be at least 18” of water at low tide for a pier location.

The Division of Marine Fisheries has stated “the combination of shallow depth and proximity to eelgrass beds could result in disturbance to this habitat through prop dredging by boat propellers”

Thank you again for letting me share this important information on the existing Eelgrass in proximity to the proposed Duker Pier, as well as the shallow waters surrounding this pier.

I am sending this letter in a electronic PDF format so that you can zoom in on the images (if needed) as well as mailing a hardcopy for your records.

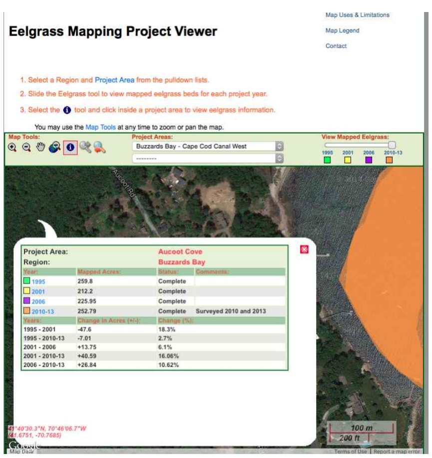
With kind regards,

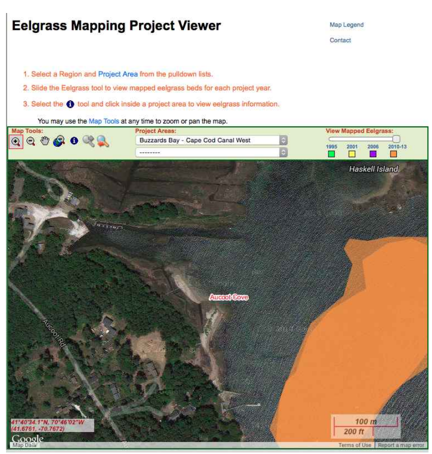
Jane Hathaway
jhathaway24@gmail.com

120 Olde Knoll Road
Marion, MA 02738

cc: Division of Marine Fisheries
Mattapoisett Conservation Commission


Haskell Island
Aucoot Cove
Jane Hathaway
Eelgrass Photos
Aucoot Rd
41°40'34.1"N, 70°46'02"W
(41.6761, -70.7672)
100 m
200 ft


Eelgrass Mapping Project Viewer
Map Uses & Limitations
Map Legend
Contact
1. Select a Region and Project Area from the pulldown lists.
2. Slide the Eelgrass tool to view mapped eelgrass beds for each project year.
3. Select the tool and click inside a project area to view eelgrass information.
You may use the Map Tools at any time to zoom or pan the map.
Map Tools:
Project Areas:
Buzzards Bay - Cape Cod Canal West
View Mapped Eelgrass:
1995 2001 2006 2010-13
Project Area: Aucoot Cove
Region: Buzzards Bay
Year: | Mapped Acres: | Status: | Comments:
1995 | 259.8 | Complete |
2001 | 212.2 | Complete |
2006 | 225.95 | Complete |
2010-13 | 252.79 | Complete | Surveyed 2010 and 2013
Years: | Change in Acres (+/-): | Change (%):
1995 - 2001 | -47.6 | 18.3%
1995 - 2010-13 | -7.01 | 2.7%
2001 - 2006 | +13.75 | 6.1%
2001 - 2010-13 | +40.59 | 16.06%
2006 - 2010-13 | +26.84 | 10.62%
41°40'30.3"N, 70°46'06.7"W
(41.6751, -70.7685)
100 m
200 ft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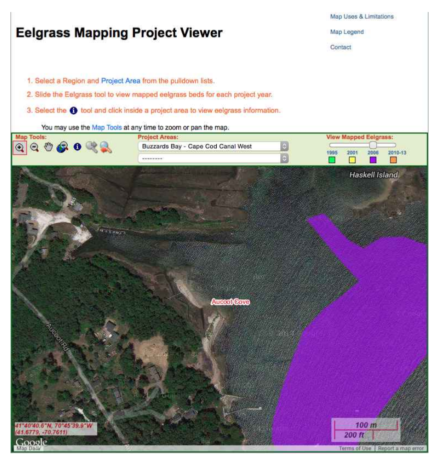
Project Areas:
Buzzards Bay - Cape Cod Canal West
View Mapped Eelgrass:
1995 2001 2006 2010-13
Haskell Island
Aucoot Cove
41°40'34.1"N, 70°46'02"W
(41.6761, -70.7672)
100 m
200 ft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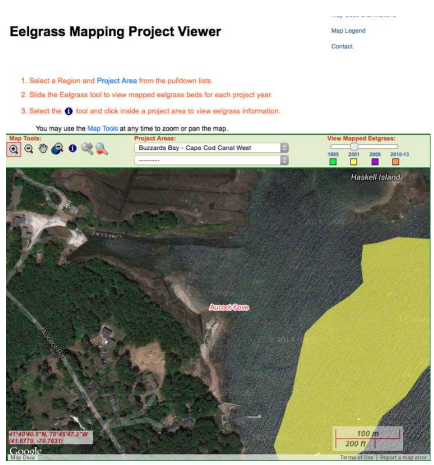
View Mapped Eelgrass:
1995 2001 2006 2010-13
Haskell Island
Aucoot Cove
100 m
200 ft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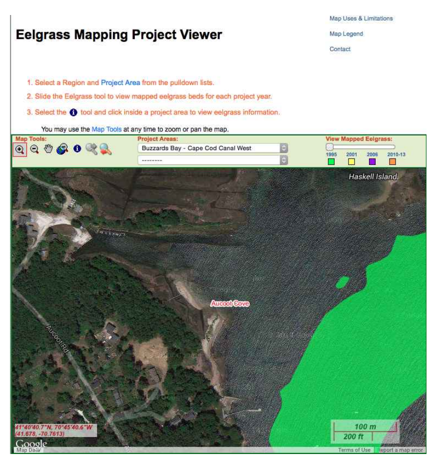
Eelgrass Mapping Project Viewer
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Project Areas:
Buzzards Bay - Cape Cod Canal West
View Mapped Eelgrass:
1995 2001 2006 2010-13
Haskell Island
Aucoot Cove
100 m
200 ft

Johnson, Robin

From: Korrin Petersen <petersen@savebuzzardsbay.org>
Sent: Monday, December 05, 2016 9:38 AM
To: Johnson, Robin
Subject: FW: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Categories: Record Saved - Shared

More photos

From: Jane Hathaway [mailto:jhathaway24@gmail.com]
Sent: Monday, November 28, 2016 4:45 PM
To: petersen@savebuzzardsbay.org
Subject: Fwd: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Here are the photos (see attached) I had sent to the Division of Marine Fisheries. They had requested additional photos so they could send them to an expert to confirm that it was eelgrass. Which they did, and it was. I will forward that confirmation email next.

Begin forwarded message:

> **From:** Jane Hathaway <jhathaway24@gmail.com>
> **Date:** August 31, 2015 at 8:09:35 PM EDT
> **To:** eileen.feeney@state.ma.us
> **Subject: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368**
>
> Dear Ms. Feeney,
>
> My Dad (Brad Hathaway) spoke to you several weeks ago and he suggested I send to you some additional pictures of Eelgrass growing in close proximity to the proposed 112 Aucoot Road Mattapoisett - Aucoot Cove Duker pier - proposal **Re: W15-4368**.
>
> He mentioned that an eelgrass expert was coming to view the pictures I had originally sent to you in a letter to the DEP, to determine if they were indeed eelgrass vs Codium. When I looked up images of Codium on the internet - my pictures were not of Codium.
>
> I was finally able to get a good day yesterday, with little wind, to get some additional pictures of eelgrass (see the 12 photos

attached to this email). All of the pictures are taken next to the pier marker that marks the end of the proposed Duker pier and float. The proposed Duker pier and float would directly overlay this eelgrass seen in these photos. While the eelgrass is not in large beds - it is evident that it trying to restore itself in this area. Little fish could be seen hiding in the eelgrass as well (you can see a little fish in photo 12 just in front of the eelgrass).

Is this enough proof for the Division of Marine Fisheries to take a stronger stand with the DEP in opposition to this pier being built in this area due to eelgrass? Particularly since the Engineer is using letters from his Consultants that state there is NO EELGRASS in this area.

FYI - The Mattapoisett Conservation Commission approved the proposed Duker pier plan because the submitted plans, according to them, did not violate any part of the States Wetlands Protection Act. Mattapoisett has no wetlands by-law. The DEP is still in the review process.

Thank you in advance for any and all help the Division of Marine Fisheries can provide by informing the DEP that in fact eelgrass does exist at the very site of the proposed Duker pier.

Sincerely,
Jane Hathaway

Johnson, Robin

From: Korrin Petersen <petersen@savebuzzardsbay.org>
Sent: Monday, December 05, 2016 9:39 AM
To: Johnson, Robin
Subject: FW: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Categories: Record Saved - Shared

Division of Marine Fisheries confirmation.

From: Jane Hathaway [mailto:jhathaway24@gmail.com]
Sent: Monday, November 28, 2016 4:56 PM
To: petersen@savebuzzardsbay.org
Subject: Fwd: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Below is the email from Eileen Feeney, Division of Marine Fisheries - confirming the photos were eelgrass.

Let me know if you need any further help.
With kind regards,
Jane

---------- Forwarded message ----------
From: **Feeney, Eileen (FWE)** <eileen.feeney@state.ma.us>
Date: Wed, Sep 9, 2015 at 1:49 PM
Subject: RE: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368
To: Jane Hathaway <jhathaway24@gmail.com>

Hi Jane,

The pictures you sent are indeed eelgrass! Comment letters were sent to the Conservation Commission, DEP and the Corps. *MarineFisheries* offers technical assistance to those agencies via our comment letters. We mention what resources are present, what potential impacts may occur if the project were to move forward, and recommendations on how to minimize those impacts. Sometimes, we can make a difference but sometimes we can't. It is not under our purview to say if we do or do not think a project should move forward. That is up to the permitting agency who issues their respective permits.

Thank you for your interest in protecting eelgrass!

Eileen Feeney

| Eileen M. Feeney | Fisheries Habitat Specialist | Division of Marine Fisheries | 1213 Purchase St. - 3rd floor
| New Bedford, MA 02740 | telephone: 508.990.2860 x 117 |
fax: 508.990.0449 | email: Eileen.Feeney@state.ma.us

From: Jane Hathaway [mailto:jhathaway24@gmail.com]
Sent: Monday, August 31, 2015 8:10 PM

To: Feeney, Eileen (FWE)
Subject: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Dear Ms. Feeney,

My Dad (Brad Hathaway) spoke to you several weeks ago and he suggested I send to you some additional pictures of Eelgrass growing in close proximity to the proposed 112 Aucoot Road Mattapoisett - Aucoot Cove Duker pier - proposal **Re: W15-4368**.

He mentioned that an eelgrass expert was coming to view the pictures I had originally sent to you in a letter to the DEP, to determine if they were indeed eelgrass vs Codium. When I looked up images of Codium on the internet - my pictures were not of Codium.

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FYI - The Mattapoisett Conservation Commission approved the proposed Duker pier plan because the submitted plans, according to them, did not violate any part of the States Wetlands Protection Act. Mattapoisett has no wetlands by-law. The DEP is still in the review process.

Thank you in advance for any and all help the Division of Marine Fisheries can provide by informing the DEP that in fact eelgrass does exist at the very site of the proposed Duker pier.

Sincerely,

Jane Hathaway

FRESHWATER CHRONIC
TOXICITY TEST PROCEDURE AND PROTOCOL
USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

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

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

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 freshwater, 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 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 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.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

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. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

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.

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 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 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.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an 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 must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code OES04-4
Boston, MA 02109-3912

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 most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. 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.1. Use of Reference Toxicity Testing

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

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.

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.1.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 IC25 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.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids [6]	x		--
Total Dissolved Solids [6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon [6]	x	x	0.5
Total Metals [5]			
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
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     -Method 4500-CL E Low Level Amperometric Titration
     -Method 4500-CL G DPD Colorimetric Method
   - USEPA 1983. Manual of Methods Analysis of Water and Wastes
     -Method 330.5
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

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-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . 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 endpoints reproduction and growth 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-02-013.

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 freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. 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-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. 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-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) 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 and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

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
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

USEPA REGION 1 FRESHWATER 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:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test 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:

http://water.epa.gov/scitech/swguidance/methods/wet/index.cfm#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 sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

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 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point 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. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

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 most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^oC)	20 ± 1^o C or 25 ± 1^oC
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q[R] or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions[3]	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C):	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality:	Ambient laboratory illumination
4.	Photoperiod:	16 hr light, 8 hr dark
5.	Size of test vessels:	250 mL minimum
6.	Volume of test solution:	Minimum 200 mL/replicate
7.	Age of fish:	1-14 days old and age within 24 hrs of each ~~the~~ other~~s~~
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration:	40
11.	Feeding regime:	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration:	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water:[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions[3]	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1,]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3,]	x		0.02
Alkalinity	x	x	2.0
pH[4]	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	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
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     -Method 2340B (hardness by calculation)
     -Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     -Method 4500-CL E Low Level Amperometric Titration
     -Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

RESPONSE TO COMMENTS
NPDES PERMIT NO. MA0100030
MARION WATER POLLUTION CONTROL FACILITY
MARION, MASSACHUSETTS

From December 3, 2014 through February 6, 2015, the U.S. Environmental Protection Agency Region 1 (EPA New England[1]) and the Massachusetts Department of Environmental Protection (MassDEP) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Marion Water Pollution Control Facility (WPCF) in Marion, MA.

EPA New England and MassDEP received comments from the Town of Marion, Buzzards Bay Coalition, and a group of citizens from Marion, MA. The following are responses by EPA New England to those comments and descriptions of any changes made to the public-noticed permit because of those comments.

Although EPA's knowledge of the facility has benefited from the various comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit. EPA did, however, make certain clarifications in response to comments. These improvements and changes are explained in this document and reflected in the final permit. A summary of the changes made in the final permit are listed starting on page 3. The analyses underlying these changes are explained in the responses to individual comments that follow.

A copy of the final permit and this response to comments document will be posted on the EPA Region 1 web site: http://www.epa.gov/region1/npdes/permits_listing_ma.html.

A copy of the final permit may also be obtained by writing or calling Robin Johnson, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1045.

On September 16, 2015; September 23, 2015; November 13, 2015; and November 21, 2016; the Town of Marion submitted to EPA "Supplemental comments" on the Draft Permit. The Buzzards Bay Coalition also submitted supplemental comments on December 10, 2015. These comments were submitted long after the close of the public comment period and are therefore not timely. Under applicable federal regulations, EPA is only required to respond to materials submitted during the public comment period. *See* 40 C.F.R. § 124.17(a)(2). "That is, within the interval of time between the beginning and end of the public comment period, not before, not after."[2] The

[1] EPA New England is also referred to in the text as "EPA."
[2] *In re Avon Custom Mixing Servs., Inc.*, 10 E.A.D. 700, 706 (EAB 2002); *see also In re City of Phoenix, Arizona Squaw Peak and Deer Valley Water Treatment Plants*, 9 E.A.D. 515, 524-31 (EAB 2000); *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 194 n.32 (EAB 2000) ("Permitting authorities are under no obligation to consider comments received after the close of the public comment period.").

Town had the opportunity to comment on the revised draft permit beyond the ordinary 30-day period required by regulation and submitted lengthy and voluminous comments on the permit (the Town's original comment document is over 3,700 pages including attachments). The "supplemental comments" relate generally to the subject matter of the Town's timely submitted comments.

Although these supplemental comments were submitted after the close of the public comment period, EPA has exercised its discretion to respond to them herein.

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Changes to the Permit

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- The dissolved oxygen monitoring frequency was changed from daily back to weekly, as it was in the previous permit. See Response 60.
- The starting date of the seasonal dissolved oxygen limit was changed from April 1st to June 1st, as originally intended. See Response 43.

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- The April through October total nitrogen limit was changed from 3.0 mg/L to 4.0 mg/L. See Response 20.
- The requirement to report separate nitrate and nitrite effluent concentrations was replaced with a requirement to report the combined nitrate and nitrite concentration. See Response 38.
- The nitrogen monitoring frequency for November through March was changed from once per week to once per month. See Response 59.
- The copper average monthly and maximum daily effluent limits were changed back to those of the current permit, which are 7.7 μg/L and 11.3 μg/L, respectively. See Response 49.
- The monitoring location for dissolved oxygen was changed from the point where the effluent enters the brook to following UV disinfection. See Response 60.
- The winter (November through March) total phosphorus limit of 1 mg/L was replaced with a monthly monitoring requirement. See Response 36.

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- A one-year compliance schedule has been added for the fecal coliform and Enterococci limits. In the interim, the permit includes an average monthly limitation for fecal coliform of 14 cfu/100 mL and a maximum daily limitation for fecal coliform of 43 cfu/100 mL. See Response 72.
- The total nitrogen compliance schedule language in Footnote 7 has been removed because the limit is now attainable for the WPCF based on current performance.
- Footnote 7 has been modified to indicate that the total nitrogen seasonal limit will be applied as a 6-month rolling average from April 1st through October 31st of each year. See Response 20.
- The interim phosphorus limit was changed from 1 mg/L to a reporting requirement. See Response 35.

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- Language was added to Footnote 9 indicating that the monthly average total phosphorus limit of 200 μg/L will not go into effect if the permittee moves its outfall to Aucoot Cove within 42 months of the effective date of the permit. See Response 1.

- The WET testing requirement for the fathead minnow (*Pimiphales promelas*) was removed from the final permit. See Response 45.
- The requirement to perform WET testing during the second week of the month was replaced by a requirement that the week of sampling (e.g. 1st week of the month) must be the same for all WET tests. See Response 46.
- Language allowing the permittee to request a reduction in WET testing frequency was removed because WET testing requirements were reduced elsewhere in the permit.

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- The prohibition against use of chlorine was clarified to indicate that chlorine may not be used in the treatment process. The permit now states that chlorine may be used to clean plant components, but that the cleaning water must be dechlorinated to nontoxic levels and fully treated by the WPCF. See Response 55.

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- Part I.F.9. has been updated to reflect electronic reporting requirements for sludge annual reports. The annual report due date has also changed from March 15 to February 19 to be consistent with other NPDES permits in Massachusetts.

- Part I.E., Special Conditions Related to Lagoon Operations, has been revised to clarify the intention of the special conditions. See Response 67.

- The final permit contains a revised compliance schedule. Specific changes include:
  - A 12-month compliance schedule for the fecal coliform and Enterococci limits was added.
  - The compliance schedule for nitrogen was removed, because the new 4.0 mg/L nitrogen limit is based on the current performance of the facility.
  - The option for the permittee to suggest and eliminate non-point sources of nitrogen to justify a less stringent nitrogen limit has been removed. See Response 20.
  - The deadline for compliance with the total phosphorus limit was changed from 24 to 42 months. See Response 34.
  - The deadline for compliance with the lagoon-related requirements was extended from 36 months to 48 months. See Response 70.

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- Part I.G.3., which pertained to the submittal of pretreatment reports, was removed from the final permit because the Town of Marion does not have a pretreatment program.

- Information relating to electronic submission of sludge annual reports was added to Part I.G.3.

Comments submitted February 6, 2015 by the Town of Marion

Comment 1. OPENING COMMENT/outfall relocation option

The United States Environmental Protection Agency (EPA) issued a draft National Pollution Discharge Elimination System (NPDES) permit to the Town of Marion (Town) for its water pollution control facility on November 28, 2014. The changes imposed within the Draft Permit are vast and, if left unchanged, will require a substantial, unprecedented and unwarranted revision to the Town's water pollution control facility (WPCF) liquid and solids processes. The Draft Permit would require significant upgrades to the existing facilities, which are less than 10 years old, and construction of new facilities to respond to the following conditions in the Draft Permit:

- Further reduction of already very low levels of total nitrogen in the effluent, which would only decrease the current WPCF's discharge of total nitrogen (TN) from an average of 3.46 mg/L to 3 mg/L.

- Reduction of total phosphorus (TP) in the effluent, which if done with chemical addition would create the need to handle and dispose of the chemical-laden sludge -- the byproduct of chemical use.

- Re-consideration of the use of the lagoons that are currently used as influent flow equalization and sludge treatment basins.

- Draining and lining the lagoons if they are going to continue to be part of the treatment facilities or making other provisions for influent equalization if they are not.

- Potentially disposing of existing biosolids in the lagoons at an offsite facility.

- Further reduction of copper concentrations in the effluent.

The Draft Permit, if left unchanged, would require a very significant capital improvements project for the treatment of the Town's wastewater. An initial engineering estimate of the capital cost of these improvement ranges from $20 million to over $30 million. The range reflects both use of different approaches to facilities needed to comply with permit requirements and assumptions about the ease and cost of implementation (especially offsite disposal costs for the existing biosolids if these need to be removed from the lagoons). The estimate does not include any costs to address the assumed, but undefined, groundwater contamination, nor do they include the operations and maintenance costs of the new facilities.

In addition to treatment facilities upgrades, the Draft Permit mandates the Town to comply with requirements for operating and maintaining the sewer collection system; Capacity, Management, Operations, and Maintenance (CMOM). It is estimated that approximately $400,000 would be needed to implement programs to meet the new CMOM requirements followed by a 10-year program compliance cost of about $1.2M.

As documented in the comments below, the Town disputes the both the legal and technical rationale for imposition of new requirements in the Draft Permit as provided in the Draft Permit and Fact Sheet. The Town believes these changes are unwarranted, with rationales based on flawed and unsupported analyses. The available scientific information confirms that no material change in plant growth or eelgrass extent would be expected to occur in response to the new restrictions the draft permit seeks to impose. Some statements contained in the Fact Sheet draw from a report prepared for the Buzzards Bay Coalition —a report that has been demonstrated to be fundamentally flawed—yet EPA used those same statements and calculations as part of the basis for the Draft Permit as if they were scientifically reliable, documented facts. The Draft Permit would also require abandonment of the current biosolids treatment process, which is the very definition of sustainable – as for over 40 years the WPCF's biosolids have been anaerobically digested onsite without the addition of any chemicals, excessive solids accumulation, or energy expenditures for sludge processing beyond the aeration system in the lagoons. EPA's action in this regard is unprecedented and beyond its statutory authority as EPA my not dictate plant design or regulate alleged groundwater impacts under the Clean Water Act. *See, e.g., Iowa League of Cities v. EPA* (8th Cir. 2013).

Moreover, assuming that the proposed permit requirements were justified, the Town finds it problematic and objects to the fact that the Draft Permit envisions only one path forward for compliance with the new limits – as outlined in the Compliance Schedule - when several feasible options, not included in the Draft Permit, exist. In accordance with its responsibility to provide the sewer rate payers and citizens of Marion with cost-efficient wastewater services, the Town must have the time and ability to evaluate all alternatives – and not just those envisioned in the Draft Permit. Two clearly available alternatives that are not included in the permit involve changes to the discharge point of treated effluent, a common response to proposals for more restrictive effluent limitations. Very initial cost estimates suggest that these alternatives would offer the Town significant cost savings.

1. *Alternative 1 - Extend the existing outfall pipe to discharge at the head of saltmarsh that fronts Aucoot Cove.* Implementation would only require a modest pipe extension and it should eliminate the need for a phosphorus limit in the permit because the treated effluent would no longer discharge to Effluent Brook. While the capital cost of facilities to reduce phosphorus are modest on the scale of all the facilities upgrades envisioned with this permit, they are nonetheless sizable; and the O&M costs are significant primarily because the lagoons could no longer be used to treat the biosolids and offsite disposal of the greater volume of chemical-laden sludge would be required.

2. *Alternative 2 - Extend the existing outfall pipe into Outer Aucoot Cove.* A very preliminary concept is shown in [Marion] **Figure 1** attached – actual routing of the land-side pipe and terminus for the discharge would need to be evaluated in greater detail. This option only became permissible in August 2014 when the Legislature passed an

amendment to the Ocean Sanctuaries Act. Prior to this amendment, (non-vested) municipal wastewater discharges were prohibited in some ocean sanctuaries, while in others the applicant was required to demonstrate that there was no feasible alternative to ocean discharge. The 2014 amended Act allows new or modified discharges from municipal wastewater treatment plants to an ocean sanctuary provided:

a. a series of 10 conditions are met (Section 6G, Chapter 259 of Acts of 2014 §§28-45); (Marion currently meets most, if not all, of these requirements)
b. the wastewater treatment plant provides advanced treatment and disinfection to remove nutrients and pathogens (Marion's current facility meets this requirement)
c. the application be accompanied by a series of designated studies including a Comprehensive Wastewater Management Plan (CWMP) with Environmental Impact Report (EIR); benthic survey and fish habitat evaluation of the receiving water, 24 months of baseline nutrient water quality monitoring, a site-specific hydrodynamic model and an aquifer evaluation (this latter item would appear not be applicable to Marion's circumstance).

Some advantages of a mid-cove ocean discharge should include elimination of permit limits for nitrogen and phosphorus and relief, if not elimination, of the copper limit.

Additional options that could or must be evaluated and are not included in the compliance schedule for the permit include alternatives to using the lagoons for influent equalization, the possibility of downsizing the volume for flow equalization and repurposing one or more lagoons for another use such as a constructed wetland, and alternatives to lining the lagoons such as constructing a leachate collection system.

Assuming EPA does not modify the permit requirements in response to the City's comments, it is critical that EPA delay issuance or re-write and re-structure the Town's Draft Permit to allow the Town to investigate whether these or other similar cost savings options would provide cost-effective solutions while also protecting the environment and human health.

The compliance schedule offered in the Draft Permit is incomplete, does not allow for consideration of alternative approaches and does not allow sufficient time or flexibility to properly plan, permit, design, and construct selected alternatives. The steps the Town believes would constitute a sound program of wastewater improvements, along with a proposed schedule, are found in the comments on the compliance schedule below.

The importance of taking these steps in a rational, stepwise fashion is underscored by fact that today the WPCF periodically produces effluent quality that would meet the proposed permit limit of 3 mg/L total nitrogen (effluent total nitrogen has ranged from 1.7 to 7.4 mg/L). EPA has included a provision in the Draft Permit (page 13; and copied below) "allowing" for potential to modify the permit, when EPA must clearly understand that no such opportunity will ever exist should the permit be issued with a limit of 3 mg/L total nitrogen.

If, at any time, the Permittee can make a demonstration that nonpoint source and stormwater nitrogen improvements are sufficient to achieve water quality standards without further point source nitrogen reductions, the Permittee may submit a request for a permit modification

If the permit were to be issued final as is, the Town would lose the flexibility to evaluate and select the best options for wastewater improvements since the present schedule suggested by EPA would not allow for that to occur.

Response 1:
Detailed responses to specific issues included in the summary above are provided in the responses below.

While EPA agrees that the permit requires substantial changes to Marion's WPCF, EPA does not agree that they are unprecedented or unwarranted.

Contrary to the comment, the permit does not require abandonment of the "biosolids treatment process" but rather requires lining of the lagoons if they are to continue to be used.

While the schedule in the permit reflects EPA's judgement as to the most likely path forward, and is consistent with EPA's mandate to require compliance as soon as reasonably possible, it does not preclude alternative paths. The schedule can be modified by means of a consent order if sufficient justification is provided.

In light of the Town's desire to consider relocating the outfall to avoid some permit limits, the final permit includes an option for the Town to design and construct an outfall relocation to the estuarine portion of Aucoot Cove instead of designing and constructing WPCF improvements to meet the 200 μg/L total phosphorus limit.

NITROGEN

Comment 2. Eelgrass coverage levels are misinterpreted
EPA also justifies the need for nitrogen limits on the Marion WPCF by referencing the declining extent of the eelgrass within Aucoot Cove. Specifically, EPA states on Page 18 of the Fact Sheet that "Eelgrass continues to grow in middle Aucoot Cove, but is receding from inner Aucoot Cove. […] GIS data collected by MassDEP and analyzed by EPA indicate that eelgrass coverage in Aucoot Cove has retreated from its historical extent. (see Figure 5)." A number of eelgrass surveys have been performed in Aucoot Cove since the 1980s; Joe Costa surveyed eelgrass in Aucoot Cove as part of his PhD dissertation[3] and MassDEP surveyed eelgrass in 1995, 2001, 2007, and 2010 (Costello and Kenworthy, 2011) ; maps showing these surveys are included in [Marion] **Figure 2** and a comparison of the change in eelgrass extent between 1995 and 2001 in [Marion] **Figure 3**. A close examination of available eelgrass surveys within Aucoot Cove shows, in apparent contrast to the statements in the Fact Sheet, that the eelgrass is receding along the outer edge ("middle Aucoot Cove") but is fairly constant along the inner edge ("inner Aucoot Cove") where *higher TN concentrations would exist*. This holds true even between the 1995 and

2001 MassDEP surveys, where the average total nitrogen concentration at site AC2 between 1995 and 2005 was 0.50 mg/L (Buzzards Bay Coalition, 2014, via Robin Johnson, EPA). Furthermore, between the Costa 1980 survey and the 1995 MassDEP survey the eelgrass extent within Aucoot Cove actually increased, with the greatest gains in eelgrass habitat occurring along the outer edge that has seen habitat reduction in the years since. The receding eelgrass along the outer edge has occurred in an area of Aucoot Cove with *lower* total nitrogen concentrations than have been observed along inner Aucoot Cove where the eelgrass has been relatively stable. This evidence suggests that the nitrogen load from Marion is not a cause of eelgrass declines in Aucoot Cove, and presents a direct contradiction to the statements presented in the Fact Sheet. In fact, as eelgrass beds have been generally constant or expanding, there is no objective basis to assert that TN is having any adverse impact on the location or health of eelgrass beds in Aucoot Cove.

[1] Digitized GIS data based on Costa's 1980s eelgrass surveys are available at http://buzzardsbay.org/eelgrass-gis-data.htm

Response 2:
The maps provided by the commenter indicate that the overall additional loss of eelgrass between 1995 and 2010 is significant. The commenter's observation that eelgrass may have stabilized at the inner edge in more recent years, while declining at the outer edge, does little to support the conclusion that nitrogen is not the cause of eelgrass decline in Aucoot Cove.

The loss of eelgrass at greater depth is a predictable outcome of eutrophication. In the face of nutrient enrichment, eelgrass levels would be expected to recede in areas of deeper water because nutrient pollution increases turbidity (Benson, Shlezinger and Howes 2013). Joe Costa, in his thesis on eelgrass trends in Buzzards Bay, notes that "[e]elgrass beds often first disappear in upper estuaries where nutrient loading is highest, and at the deep edges of beds where light limits growth." (J. E. Costa 1988, 61-62) Research has found that "growth is light limited for eelgrass growing near the deep edge of the meadow, and that these plants appear to be living near the minimum light regime for growth and survival" (Dennison and Alberte 1985). Any reduction in water clarity would affect these plants first, and that is why eelgrass on the outer (deeper) edge of Aucoot Cove are the first to succumb to nutrient enrichment. In fact, the commenter discusses at length the interplay between turbidity, nutrients, and eelgrass survival in Comment 5.

Losses of eelgrass at the shallow edge and/or at the deep edge are entirely consistent with patterns seen in other eutrophic estuaries. The MassDEP Eelgrass Mapping Project Viewer (Massachusetts Department of Environmental Protection 2015) for Aucoot Cove indicates that between 1995 and 2001, Aucoot Cove lost 18% of its eelgrass, and the maps provided by the commenter indicate that as of 2010 there has been little change in this condition. The highest concentrations of nitrogen are typically at the shallow edge but the somewhat lower concentrations at the outer edge can have just as big of an impact due to the depth of the eelgrass beds and the naturally lower levels of light reaching these deeper beds. By focusing on the necessary reductions to restore eelgrass at the shallow edge, it is EPA's expectations that the lower concentrations that will result at the deeper edge will ensure the health of all eelgrass habitat.

The commenter states that the average total nitrogen concentration at station AC2 was 0.50 mg/L between 1995 and 2001, during which time eelgrass coverage in inner Aucoot Cove was stable. The source of this reference is unclear, but it may be referring to the Fact Sheet, which, on page 17, states that the median total nitrogen concentration at AC2 is 0.47 mg/L, based on data from The Buzzards Bay Coalition. The relevance of nitrogen concentrations at station AC2 to eelgrass presence in Aucoot Cove is unclear, but EPA notes that station AC2 is much closer inland than both the presumed historical inner edge of eelgrass habitat and the current inner edge of eelgrass habitat.

The loss of eelgrass in Aucoot Cove is consistent with what is happening throughout Buzzards Bay. Joe Costa believed that he saw a marked decrease in eelgrass coverage in Buzzards Bay between the 1980s and 1995, and discusses this on the Buzzard's Bay National Estuary Program website[4]:

> *DEP first conducted an aerial survey to map eelgrass in Buzzards Bay in 1995...*[which] *showed considerably less eelgrass in Buzzards Bay than the 1980s reports. Conclusions about the locations of eelgrass in new DEP surveys as compared to the 1980s map were difficult because with maps only available for two dates, it was unclear at the time whether the absence of eelgrass at specific locations was due to eutrophication, date of aerial imagery, storms, disease, natural variability, or other factors, or from differences in the time of year or limitations or visual limitations of the aerial imagery.*

Costa goes on to write,

> *It was not until DEP repeated its eelgrass aerial and field survey in 2001 (released about 2004), and when we began reviewing other sets of aerial photographs, that it became apparent that much of the eelgrass losses documented in 1996 survey were genuine and likely due to eutrophication…* (J. Costa 2012)

Comment 3. EPA uses the wrong baseline eelgrass coverage

The apparent contradiction between the available eelgrass survey data and the data cited in the Fact Sheet may amount to EPA selecting a different baseline year for its analysis. Figure 5 of the Fact Sheet clearly states that EPA considers the historical extent to mean the "estimated eelgrass cover circa 1600." While the caption states that "this is a purely speculative exercise," EPA simply assumes the presumed pre-Colonial eelgrass coverage to be undeniable fact even though the hypothetical pre-Colonial eelgrass distribution does not account for any of the other numerous factors that could have caused changes in eelgrass coverage over the past 400 years. This purely speculative and unsupported exercise should not be used to conclude that the eelgrass is retreating from its historical extent within the Inner Aucoot Cove relative to recent survey data. Further supporting the assertion that the pre-Colonial analysis should not be used as

[4] Retrieved April 3, 2015, from Buzzards Bay National Estuary Program: http://buzzardsbay.org/eelgrass-historical.htm

a baseline year is a comparison of the baseline year used in peer-reviewed studies of eelgrass in Buzzards Bay. Kenworthy *et al*. (2013)elected to use the peer-reviewed 1995 MassDEP eelgrass mapping data as their baseline even though historical photographic records of eelgrass distribution exist going back to 1950; the historic photographs were not considered reliable enough to quantify eelgrass extent because “the quality of the older imagery is poor and the methods used to interpret and verify the benthic habitat signatures were qualitative and unreliable,” a viewpoint the authors attribute to Charles Costello at MassDEP. Therefore, there is no credible scientific information indicating present eelgrass impairment, let alone significant impacts due to the low levels of nitrogen present in the system.

If the methodology cited in the Fact Sheet was indeed a reliable and accurate way to determine the baseline eelgrass level then MassDEP should have recommended that the study authors. Kenworthy *et al.* use the pre-Colonial study or similar methodology to set the baseline value instead of the 1995 MassDEP survey results given the relative unreliability of the 1950s photographic records. Marion requests that EPA provide the basis and documentation for its claim that eelgrass has been receding from inner Aucoot Cove and allow for public review.

Response 3:
Kenworthy *et al.* use data from 1995 on because this was the year that MassDEP began aerial surveys of eelgrass. For precise comparisons between years, it is best to use data collected by the same organization under the same program. The study they were conducting required accurate quantification of eelgrass coverage, and eelgrass data prior to 1995 was not quantified accurately enough for their study. That does not establish a baseline for determining where this critical habitat for ensuring attainment of designated uses should occur. Moreover, Kenworthy *et al.* never states that the 1995 data are representative of a pristine, unimpaired state. On the contrary, the 1995 survey showed significant eelgrass losses compared to Costa’s 1988 survey (J. E. Costa 1988) (see Response 2).

EPA used the pre-colonial coverage estimate as one of many data sources to determine whether nitrogen pollution is causing the loss of eelgrass beds. Other pieces of information used in our analysis include total nitrogen concentrations, algal growth, dissolved oxygen data, MassDEP’s designation of inner Aucoot Cove as impaired, and in situ observations. No one type of data is enough to prove a nutrient problem, but together they illustrate a picture of eelgrass degradation due to nutrient pollution.

Comment 4. Only dissolved inorganic nitrogen should be regulated
In addition to the objections to the threshold total nitrogen concentrations noted herein, we also note that the total nitrogen concentration is largely irrelevant because Aucoot Cove is well flushed and has a very short detention time. This means that only the dissolved inorganic nitrogen is important relative to algal production and possible epiphytic growth. Given the short detention time in Aucoot Cove, there is not enough time for other nitrogen species included in the total nitrogen concentration to be converted to bioavailable forms.

Response 4:
EPA disagrees that limits should be in terms of dissolved inorganic nitrogen (DIN) rather than total nitrogen. Consistent with recommendations in EPA Nutrient Criteria Manual (EPA 2001), and because of the recycling of nutrients in the environment it is best to limit total concentrations (i.e. total nitrogen) as opposed to fractions of the total.

The EPA Nutrient Criteria Technical Guidance Manual for Estuarine and Coastal Waters (EPA 2001) indicates that nitrogen cycling results in constant shifts between the different forms of nitrogen. In guidance for establishing nutrient criteria for estuaries, EPA identified total nitrogen as the causal variable of specific concern.[5]

In addition, research has documented that forms of nitrogen considered unavailable for plant growth, such as dissolved organic nitrogen (DON) are more bioreactive than previously thought. Other research has found that DON from urban sources was 59% bioavailable to estuarine plankton (Seitzinger, Sanders and Styles 2002).

Organic nitrogen in POTW effluent is no different. A study in the Chesapeake Bay watershed found that between 31% and 96% of the effluent derived organic nitrogen (EON) was removed during biotic bioassays within the first 2 days (Filippino, et al. 2010), and that EON also underwent abiotic reactions in natural water samples. Furthermore, a study trying to quantify the proportion of effluent EON that is not bioavailable determined that only 10 – 29% of effluent dissolved organic nitrogen is refractory, i.e. resistant to bacterial degradation (Sedlak, Jeong and Stensel 2011). Put another way, the study found that between 71% and 90% of effluent organic nitrogen is assimilated by bacteria and other plankton.

These studies demonstrate that effluent organic nitrogen undergoes rapid transformation in the environment and may contribute to eutrophication. The scientific evidence supports the need to control total nitrogen rather than just DIN.

Comment 5. Eelgrass Habitat Suitability Requirements
While the Fact Sheet asserts that "based on its depth, strata, and other characteristics the inner cove would be expected to support eelgrass," none of the data available presented in the Fact Sheet demonstrates that eelgrass could grow in the innermost portion of Aucoot Cove even if lower total nitrogen concentrations are attained. A comprehensive study of eelgrass habitat suitability in Aucoot Cove would need to also look at sediment composition, light availability, and the physical properties of the watershed and the embayment before unilaterally concluding that the reason eelgrass has *never* been recorded in the innermost portion of Aucoot Cove is excess total nitrogen concentrations. It is therefore inappropriate to suggest that simply reducing the Marion WPCF's total nitrogen effluent limit will increase the area of suitable eelgrass habitat. NPDES permits and Clean Water Act decision making is not to be made on "guesswork". *Leather Industries of America v. EPA*, 40 F. 3d 392 (D.C. Cir. 1994). As EPA is

[5] We also note that the Town has observed elsewhere that "[n]utrient loadings in the form of total nitrogen (TN) [have] been documented to affect aquatic life uses (e.g., decline/loss of eelgrass bed habitat) in Aucoot Cove," *2017 Project Evaluation Form—Part III—Project Narrative,* Town of Marion, 4 (undated) (hereinafter "2017 PEF").

simply “guessing” that TN levels are the cause of eelgrass changes, this proposed requirement must be withdrawn.

The assumed approach in the Fact Sheet is that total nitrogen causes enhanced phytoplankton and epiphyte productivity which shades eelgrass limiting or preventing growth and eliminating habitat suitability. This approach is quite simplistic in its assumption that eelgrass habitat suitability is solely based on whether total nitrogen is above or below a threshold value, which ample data from estuarine settings throughout the New England Area confirm is simply not true. There are a number of other factors that contribute to eelgrass habitat suitability beyond total nitrogen. Other relevant factors include:

- light availability
- sediment composition
- hypoxia, which can cause buildup of ammonium, nitrate, and sulfide concentrations in sediment that may be toxic to eelgrass
- high organic matter content in sediment
- channel and embayment morphology and configuration
- ice cover and impingement
- Grazing by geese

Light is an essential eelgrass habitat requirement, and numerous studies have investigated the correlation between light availability and eelgrass health. Benson *et al*. (2013) examined the relationship between light, total nitrogen, and eelgrass. The authors found that healthy eelgrass beds were found where the average total nitrogen concentration was 0.42 mg/L and degraded eelgrass beds where the average total nitrogen concentration was in excess of 0.6 mg/L. In addition, this study also examined conditions under which transplanted eelgrass survived. The authors found that over 75% of eelgrass colonies survived when total nitrogen was less than 0.39 ± 0.03 mg/L, and over 50% of eelgrass colonies survived when the total nitrogen concentration was 0.49 ± 0.12 mg/L. As EPA is also well aware, extensive eelgrass beds exist in Great Bay, NH with TN concentrations ranging 0.35 – 0.42 mg/L. This real world, field data confirms that the range of acceptable eelgrass habitat is not limited to total nitrogen concentrations below 0.35 mg/L and that a concentration of 0.45 mg/L in the Cove could not possibly eradicate all eelgrass populations from that area.

Kenworthy *et al.* (2013) examined the relationship between light attenuating substances (*i.e.,* algae, turbidity), eelgrass impairment, and sediment conditions. Several key conclusions from this study are summarized below.

- Minimum light requirements for eelgrass growth varies and is site specific. The authors state “Our data suggest that using a fixed estimate for the light requirement of eelgrass across a wide range of embayments may not be appropriate for generalized computations or application.”

- Recovery of eelgrass beds is not necessarily an immediate consequence of reductions in nitrogen loadings. In Marion, the nitrogen point source load decreased significantly after the WPCF was upgraded in 2005. Again, the Kenworthy *et al.* state "if the high apparent light requirements are due solely to shading by epiphytes and macroalgae, then success at curtailing algal blooms by reduction of N loading might be expected to restore seagrass on normal time scales of eelgrass recruitment and expansion rates. If, however, epiphyte and macro algal blooms and chronic organic matter loading to the sediments leads to reduced light utilization efficiency, sulfide and ammonium toxicity, or increases in sediment re-suspension, we might expect some delay in recovery…"
- High organic matter in sediment can inhibit eelgrass growth. In addition, hypoxic conditions, which are not uncommon in sediments, can cause buildup of ammonium, nitrate, and sulfide concentrations in sediment that may be toxic to eelgrass.

Studies have also found a significant relationship between estuary geometry and watershed characteristics and the growth of submerged aquatic vegetation. Li *et al.* (2007) examined 101 small sub-estuaries within Chesapeake Bay to determine how submerged aquatic vegetation is affected by parameters such as watershed size and characteristics, estuary perimeter, estuary surface area, and wave height. The authors found strong, significant relationships between aquatic vegetation growth and the ratio of estuary perimeter to estuary surface area (fractal dimension), dominant land cover, mean tidal range, ratio of watershed area to estuary surface area, and mean wave height.

The results of the studies cited herein confirm that conditions that limit eelgrass habitat suitability are far more complex than the simple total nitrogen threshold suggested in the Fact Sheet. More study is required to determine whether eelgrass growth is indeed limited by total nitrogen in inner Aucoot Cove. This study should look at sediment composition, the relative impacts of channel morphology on eelgrass throughout the region, the effects of naturally hypoxic conditions from the salt marsh, and whether light is a limiting factor within inner Aucoot Cove. If this study determines that total nitrogen adversely affects eelgrass habitat viability, this study needs to determine a cost-effective approach to reducing nitrogen and thus, whether a reduction in Marion's total nitrogen limit would cause an expansion of eelgrass in Aucoot Cove.

Response 5:
Joseph Costa estimated the historic coverage of eelgrass in upper Buzzards Bay (Falmouth to Mattapoisett) based on areas with mean low water depth less than 20 feet.[6] He observed that the limiting factor for eelgrass survival is light, and that in pre-development situations, light is a function of water depth. Salinity, temperature, and wave action were also examined but found to be of minor importance in Buzzards Bay (J. Costa 2012).

Regarding eelgrass habitat in Inner Aucoot Cove, photographic evidence from 2015 (see Attachment A to RTC) shows sparse growth of eelgrass in shallow areas of Aucoot Cove, which

[6] Retrieved April 3, 2015, from Buzzards Bay National Estuary Program: http://buzzardsbay.org/eelgrass-historical.htm

was confirmed by the Division of Marine Fisheries. The area documented in May and August 2015 is near the mouth of Aucoot Creek and about 100 yards landward of the edge of the MassDEP 2010/2013 Eelgrass GIS layer, shown in orange. This information demonstrates that eelgrass can grow in shallow areas of Aucoot Cove inland of the larger meadows depicted in the MassDEP Eelgrass maps. Eelgrass is also visible in photographs taken in August 2015, showing that the shoots survived through the growing season.

The Town accuses EPA of using a "simplistic" approach that "total nitrogen causes enhanced phytoplankton and epiphyte productivity which shades eelgrass limiting or preventing growth and eliminating habitat suitability." As discussed in Response 7, phytoplankton is less of a factor in estuaries than epiphytes and drift algae. Moreover, this supposedly faulty premise is very like that of Benson *et al.*, who undertook the study to "examine the cascading effects of nitrogen enrichment on water-column constituents resulting in reduced bottom light intensity, and how these coupled factors negatively affect eelgrass habitat and transplant survival." This is but one of several studies cited in the Fact Sheet and RTC that support the well-understood response of estuaries to elevated total nitrogen.

Further, the commenter seeks to obfuscate the causes of eelgrass loss by drawing attention to factors other than nitrogen, such as estuarine geometry, light availability, grazing, and sediment hypoxia. Low light availability and sediment hypoxia rather than nutrient concentrations may be proximal causes of eelgrass decline, but they themselves are caused by elevated nutrients. Estuarine geometry may exacerbate the problem, but only because it restricts flushing of nitrogen out of the estuary. As for grazing, the commenter has provided no evidence that this is a factor in Aucoot Cove.

Finally, the commenter contends that a total nitrogen "concentration of 0.45 mg/L in the Cove could not possibly eradicate all eelgrass populations from that area." EPA has not claimed that a certain total nitrogen concentration would eradicate eelgrass from a given area. The threshold for setting a permit limit is whether there is reasonable potential for the discharge to cause or contribute to excursions from water quality standards.

Benson *et al.* (2013) found that "Nitrogen thresholds that support eelgrass communities provide a fundamental tool for managing this habitat…[t]he strong relationship seen between TN and eelgrass habitat and survival point to the efficacy of using TN as a critical metric in predicting eelgrass restoration success in shallow estuaries," and goes on to conclude that "[s]ites with healthy eelgrass had a tidally-averaged total nitrogen concentration of 0.34 mg/L and ebb tide TN of 0.37 mg/L."

Reference to other areas in New England where eelgrass might exist under higher nitrogen concentrations may be useful in a general context, but the most relevant data for this permit are from Aucoot Cove. As the Town itself points out in the next comment, nitrogen levels that support eelgrass are site-specific. Using the available information for Aucoot Cove, EPA determined the nitrogen threshold concentration that would support designated uses.

Comment 6. Total Nitrogen Threshold
The Fact Sheet states that "The Massachusetts Department of Environmental Protection (MassDEP) has identified total nitrogen levels believed to be protective of eelgrass habitats as less than 0.39 mg/L and ideally less than 0.3 mg/L and chlorophyll *a* levels as 3-5 μg/L and ideally less than 3 μg/L" citing a MassDEP and University of Massachusetts at Dartmouth School for Marine Science and Technology report titled *Massachusetts Estuaries Project: Site-specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators, Interim Report* (MEP, 2003). This interpretation of this report is completely inaccurate and is entirely inconsistent with the report's conclusions. The report does cite several total nitrogen thresholds in Table 1, where the "Excellent" water quality category was observed to be less than 0.30 mg/L total nitrogen and the "Excellent/Good" category less than 0.39 mg/L total nitrogen. While these values do provide an initial suggestion of a possible numeric threshold for total nitrogen, the authors of this report state on Page 12:

> *Loss of bed area and/or thinning of beds (decreases in density) are generally both linked to nutrient enrichment. This linkage between eelgrass loss and nutrient enrichment needs to be corroborated on an embayment specific basis, as there are factors other than nutrients which have been linked to eelgrass declines (disturbance, disease, animal interactions, etc.).*

The authors go on to state in the caption to (Marion) Table 1, "Threshold values need to be site-specific, the values presented are for Great, Green and Bournes Ponds in the Town of Falmouth." As such, the citation of the total nitrogen thresholds in the Fact Sheet is a gross misrepresentation of the discussion in this report, as these numbers are meant to be an example of site-specific numeric thresholds observed in several recent studies of nutrient enrichment and eelgrass growth. Therefore, these values are irrelevant to the site-specific conditions of Aucoot Cove and cannot be credibly cited in relation to Aucoot Cove eelgrass habitat suitability.

Response 6:
Ideally, site-specific threshold total nitrogen values would be calculated for every embayment in Buzzards Bay. The reality, unfortunately, is that such analyses have not been completed due to lack of funding.

The commenter misreads the Fact Sheet discussion. The 2003 MEP report was not cited to imply a site-specific threshold for Aucoot Cove, but rather as a component of the evidence used to determine whether there is reasonable potential for the nitrogen loading from the Marion discharge to have caused or contributed to the impairments identified in Aucoot Cove and, if so, what range of TN would be necessary to restore the designated aquatic life uses in Aucoot Cove. Additional evidence, including site specific data on TN concentrations, eutrophication response variables, and watershed TN loadings, were used to determine the need for a TN limit and for establishing TN reductions necessary to ensure attainment of water quality standards. However, even in the absence of site specific data, use of the 2003 MEP report for interpreting narrative nutrient criteria and establishing protective TN values would be appropriate.

In developing an ambient TN target, EPA examined the continuum of water quality conditions in Aucoot Cove to identify a transition point from impaired to unimpaired conditions. This is a reference-based approach, and the results are consistent with ranges and thresholds for acceptable TN concentrations found in other estuaries and within the scientific literature. This approach is entirely appropriate for assessing large-scale nutrient load reductions over relatively long averaging periods.

EPA used a weight of evidence approach to determine if the discharge has a reasonable potential to cause or contribute to an exceedance of the water quality standards. The weight of evidence approach minimizes the inherent uncertainty associated with assessing reasonable potential and making informed management decisions. EPA then used a reference based approach to develop protective thresholds. This approach is consistent with the EPA Nutrient Criteria Technical Guidance Manual (2001).

Comment 7. Chlorophyll A threshold

Furthermore, the Fact Sheet's assertion that this study identified protective chlorophyll *a* levels is also a gross misrepresentation of the discussion in the Massachusetts Estuaries Project *Interim Report.* In the *Interim Report*, the authors discuss "a preliminary attempt at integrating quantitative and qualitative information on the key indicators," suggesting generalized characteristics of "Excellent" and "Excellent/Good" waters. "Excellent" waters have chlorophyll-*a* concentrations "typically less than 3 μg/l," and "Excellent/Good" waters have chlorophyll *a* concentrations "in the 3 to 5 μg/l range." Thus, while eelgrass habitat suitability may coincide with the "Excellent" or "Excellent/Good" classifications, the *Interim Report* does not state that these concentrations are required to be protective of eelgrass populations. It is inappropriate to interpret this statement to mean that eelgrass cannot survive with chlorophyll *a* concentrations in excess of 5 μg/l, and this statement is again irrelevant to Aucoot Cove and demonstrably false based on data from other estuarine systems.

The applicability of these thresholds is especially questionable because the chlorophyll *a* observed in the reference location (AC3) is *above* the threshold of 5 μg/L cited in the Fact Sheet. If a chlorophyll *a* concentration above 5 μg/L cannot support eelgrass, then the reference location should be devoid of eelgrass growth. The fact that there is a healthy eelgrass population in this location suggests that the chlorophyll *a* threshold proposed in the Fact Sheet is unnecessarily low (and, by proxy, at least insinuates that the total nitrogen threshold is similarly unnecessarily low) in order to be protective of eelgrass habitat.

Yet another point of comparison comes from a compilation of protective total nitrogen concentrations assessed by the Massachusetts Estuaries Project. (Marion) **Table 1**, next page, presents a comparison of these values considered protective of eelgrass habitats. The "protective" total nitrogen limits ranged from 0.34 to 0.48 mg/L total nitrogen, with an average total nitrogen threshold of 0.40 mg/L. (Hall & Associates, 2013)

(Marion) Table 1: Comparison of Total Nitrogen Limits Protective of Eelgrass in Massachusetts Estuaries Project Reports[1]

Report Title	Date	Total Nitrogen Limit (mg/L)
Great Pond, Falmouth	2005	0.40
Green Pond, Falmouth	2005	0.40 – 0.42
Bournes Pond, Falmouth	2005	0.42 – 0.45
Little Pond, Falmouth	2006	0.45
Three Bays, Barnstable	2006	0.38 – 0.40
West Falmouth Harbor, Falmouth	2006	0.35
Phinneys Harbor and Back River, Bourne	2006	0.35
Centerville River, Barnstable	2006	0.37
Nantucket Harbor, Nantucket	2006	0.35
Lewis Bay, Barnstable	2008	0.38
Sengekontaket Pond, Oak Bluffs and Edgartown	2011	0.35
Farm Pond, Oak Bluffs	2010	0.45
Madaket Harbor and Long Pond, Nantucket	2010	0.45
Swan Pond River, Dennis	2012	0.40
Wild Harbor, Falmouth	2013	0.35
Quissett Harbor, Falmouth	2013	0.34
Harwich	2013	0.48

Note: 1. Table modified from Hall & Associates, 2013

This significant variation noted in (Marion) **Table 1** suggests several key points. First, these results corroborate the statement that total nitrogen concentrations deemed protective of eelgrass are site- and resource-specific. Second, the variation shown in these results suggests that total nitrogen may not be the only factor controlling eelgrass growth or degradation. Nonetheless, these results indicate that a total nitrogen concentration of 0.42 (the median concentration at the "impaired" monitoring site AC2) is certainly not preventing eelgrass from growing, and suggest that potentially other factors are causative with respect to the observation that eelgrass grow at site AC3 but not at site AC2.

We request that EPA revise its discussion of permissible total nitrogen concentrations that are supportive of eelgrass to: (1) incorporate the fact that site-specific constraints have a demonstrable effect on the relationship between total nitrogen and eelgrass, (2) to reflect the fact that the numbers cited in MEP (2003) are not meant to be used as a universally applicable eelgrass-total nitrogen threshold relationship, and (3) that more recent and credible peer reviewed studies have demonstrated that total nitrogen concentrations significantly higher than those cited in the Fact Sheet have been shown to be protective of eelgrass in Massachusetts estuarine environments.

Response 7:
The Massachusetts Estuaries Project: Site-specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators, Interim Report (MEP, 2003) is more than just a "suggestion" of nitrogen and chlorophyll *a* values that would be protective of various water quality classification. These values are based on the scientific literature, including studies in other Massachusetts Estuaries, and the report is an appropriate tool for interpreting narrative nutrient criteria in the absence of site specific data. While the SMAST values in (Marion) Table 1 are based on studies conducted in Falmouth MA, the nitrogen values discussed as likely protective of SA waters are also within the range of protective targets developed by CCC and BBC and included in EPA Table 1 (reproduced below). EPA agrees that, wherever possible, the linkage between eelgrass loss and nutrient enrichment should be corroborated on an embayment specific basis and that is what was done here using a reference site within Aucoot Cove.

Table 1.	Nitrogen thresholds and coastal water classifications for refinement by the Massachusetts Estuaries Project. Threshold values need to be site-specific, the values presented are for Great, Green and Bournes Ponds in the Town of Falmouth. Abbreviations: CCC – Cape Cod Commission, BBP/MCZM – Buzzards Bay Project/ Massachusetts Coastal Zone Management, ND – not determined. Values are long-term (>3 yr) average mid-ebb tide concentrations of total nitrogen (mg/L) in the water column.				
Classification of N based water quality	Trophic classification	SMAST[1]	CCC	BBP/MCZM	314 CMR 4.05(4) Classification
Excellent	Oligotrophic	< 0.30	ND	ND	SA
Excellent/Good	Oligo to Mesotrophic	0.30 – 0.39	< 0.34	< 0.39	SA
Good/Fair	Mesotrophic	0.39 – 0.50	0.34 – 0.39	0.39 – 0.44	SB
Moderate Impairment	Mesotrophic to Eutrophic	0.50 – 0.70	ND	ND	Impaired
Significant Impairment	Eutrophic	0.70 – 0.80	ND	ND	Impaired
Severe Degradation	Hyper-Eutrophic	>0.80	ND	ND	Impaired
SA waters:	(a) suitable for shellfish harvesting without depuration, (b) excellent habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation, (c) excellent aesthetic value.				
SB waters:	(a) suitable for shellfish harvesting with depuration, (b) habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation, (c) consistently good aesthetic value				
1	The nitrogen values presented were developed as part of the Ashumet Valley Plume Nitrogen Management Project for the Town of Falmouth and AFCEE by MEP Tech Team members B.L. Howes and J.R. Ramsey. These values are preliminary and need refinement by the MEP. Note that classification is by sampling location not full estuary, since each system shows a nitrogen gradient from headwaters to inlet.				

(EPA) Table 1 from SMAST Interim Report, 2003.

EPA also agrees that loss of bed area and the thinning of beds (decreases in density) are generally both linked to nutrient enrichment. While EPA has used site specific data from AC3, EPA only has information relative to eelgrass presence at this site and no information on the health/density of this eelgrass. The fact that the nitrogen value at this site is within the range of values identified in the 2003 MEP report provides some assurance that it is sufficiently low enough of a value to ensure healthy eelgrass habitat. The fact that the chlorophyll-*a* value at this site is slightly higher than protective values cited in the 2003 MEP report is further evidence that we did not rely solely on the 2003 MEP report and have not chosen an overly protective threshold. Additionally, in this estuary as in many estuaries, macro-algae and epiphyte growth, as opposed to chlorophyll *a*, are as much or greater concern relative to eelgrass impairments (Burkholder, Tomasko and Touchette 2007). EPA is not aware of quantitative data existing on macro algae and epiphytes, but a site visit in 2012 provided visual confirmation of macroalgae growth on eelgrass in Aucoot Cove.

As far as factors other than nutrients which have been linked to eelgrass declines (disturbance, disease, animal interactions, etc.), EPA knows of no information, and the commenter provides no information, indicating that these factors are significant in Aucoot Cove.

The commenter's suggestion that because acceptable total nitrogen levels for protection of eelgrass in other Massachusetts Estuaries ranged from 0.34 – 0.48 the value used for Aucoot Cove is overly protective is without merit, especially given the commenter's assertion that it is important to use site-specific information in determining protective values. EPA also notes that the site-specific value for Aucoot Cove is within the range of the protective values for other Massachusetts Estuaries. See EPA Table 1.

Comment 8. Misapplication of Stressor-Response and Reference Condition Methods
The methodology cited in the Fact Sheet states that an implementation of the reference condition and the stressor-response methodology was used to determine the allowable total nitrogen concentration within Aucoot Cove that is supportive of eelgrass. This approach is described at the top of Page 18 of the Fact Sheet, where EPA identifies a reference waterbody that "provides appropriate values upon which criteria can be based." The stressor-response methodology is used to link the stressor (in this case, total nitrogen) to the response (in this case, eelgrass degradation).

Response 8:
The commenter misreads the Fact Sheet. EPA did not use the stressor-response methodology to link total nitrogen to eelgrass degradation. EPA only mentioned stressor-response methodology as one of three approaches to derive numeric nutrient criteria. After this brief mention, the Fact Sheet describes the reference condition approach in more detail and uses that approach to interpret the narrative nutrient criteria.

Comment 9. Total Nitrogen Thresholds
To implement this methodology, EPA cites data from two Buzzards Bay Coalition data sampling sites. Site AC2, located close to the salt marsh near Effluent Brook, has a median total nitrogen concentration of 0.46 mg/L[1] and does not have eelgrass. Site AC3, located farther offshore, has a median total nitrogen concentration of 0.35 mg/L and does have eelgrass. EPA uses this limited data based on a single stressor variable to determine that a total nitrogen concentration of 0.35 mg/L should be the water quality target, as, the Fact Sheet implies, this is the threshold value at which eelgrass can survive. Thus, the EPA analysis is devoid of any consideration of any other factors but simply assumes that TN is the cause of the difference in eelgrass populations at the different sites.

[1] EPA incorrectly states in the Fact Sheet that the median total nitrogen concentration, 2007-2012 is 0.47 mg/L. A follow up message from Robin Johnson, EPA NPDES Permit Writer stated that the median concentration is 0.45 mg/L. We found that this calculation erroneously included one sample from site AC1A. The correct 2007-2012 median total nitrogen at site AC2 is 0.46 mg/L.

Response 9:
This is a mischaracterization of the Fact Sheet basis for the TN limit. Again, EPA did not use the stressor-response methodology. See Response 8. Moreover, EPA clearly did not simply rely on a single stressor variable either in determining reasonable potential or in establishing a protective TN threshold based on site specific data. The analysis included dissolved oxygen levels, eelgrass habitat, and algal growth in reaching the conclusions as documented in the Fact Sheet.

Comment 10. Lack of Supporting Data for Nitrogen Threshold
EPA supports using the long-term median AC3 total nitrogen concentration of 0.35 mg/L by stating that "this value is consistent with TN concentration thresholds to protect eelgrass beds in other estuaries" but does not cite or reference any studies to support this claim. Marion requests EPA provide the studies referenced here for review and comment. In addition, EPA does not state whether the Buzzards Bay Coalition's data program has appropriate QA/QC protocols for its data collection efforts. If these data are not subjected to QA/QC they should not be used to set nutrient limits in Marion's NPDES permit or as a basis for reaching any other regulatory conclusions. Marion requests that EPA provide the Buzzards Bay Coalition QA/QC procedures and confirm that the data used in its analysis conform to these procedures.

Response 10:
In the Fact Sheet, EPA cites "Massachusetts Estuaries Project: Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators, Interim Report," total nitrogen concentrations protective of eelgrass to be less than 0.39 mg/L and ideally less than 0.30 mg/L. EPA should have also referenced Benson *et al.* (2013), but because the commenter referenced it in Comment 5, it was aware of the availability and applicability of this study.

Data collected pursuant to the Buzzard's Bay Coalition (BBC) water quality monitoring program are collected in adherence with a Quality Assurance Project Plan (QAPP) that was reviewed and approved by EPA in 2014 and is included in the administrative record. The Quality Assurance/Quality Control (QA/QC) procedures and protocols followed by the Coalition in the collection of water quality data are well known by and accepted by the EPA. MassDEP reviews and regularly uses data collected by the BBC monitoring program to determine the status of impaired waters for the 303(d) list as well as for the establishments of TMDLs for nitrogen. It is reasonable for the EPA to use the BBC's data to evaluate water quality conditions in Aucoot Cove. Specifically, the oxygen data for Aucoot Cove include both surface (0.15 m) and deep measurements. The low dissolved oxygen values were recorded using Hach instruments with professionally trained staff using YSI Sondes.

Comment 11. Scientific Advisory Board Report
The EPA Science Advisory Board (SAB) reviewed this type of methodology with respect to its use for setting numeric nutrient criteria (EPA, 2010). While the stressor-response method was not explicitly applied by EPA in its development of Marion's Draft Permit, numerous points made by the SAB relate to EPA's misapplication of the reference condition and stressor-response methodologies to Marion's discharge. While the SAB does notes that "the stressor-response method is a legitimate, scientifically based method for developing numeric nutrient criteria *if the*

approach is appropriately applied," EPA grossly misinterpreted the approach, considered none other physical habitat, chemical or biological factors that could also fully explain the presence or absence of eelgrass at a particular location. Thus, EPA has applied this otherwise scientifically defensible methodology in an entirely unreasonable and scientifically indefensible manner. Marion notes the several points raised by the SAB and incorporated by EPA into the revised "Stressor –Response Guidance" (EPA 2010) confirm that EPA's approach to identifying the nutrient objectives for calculating the Marion permit requirements constitute a scientifically indefensible application of the reference condition and stressor-response methodologies. "When an agency adopts a regulation based on a study not designed for the purpose and which is limited and criticized by its authors on points essential to the use sought to be made of it, the administrative action is arbitrary and capricious and a clear error in judgment." *Humana of Aurora, Inc. v. Heckler*, 753 F.2d 1579, 1583 (10th Cir. 1985) (citing *Almay, Inc. v. Califano*, 569 F.2d 674 (D.C. Cir. 1977)); *accord St. James Hospital v. Heckler*, 760 F.2d 1460, 1468 (7th Cir. 1985); *Menorah Medical Center v. Heckler*, 768 F.2d 292 (8th Cir. 1985). As discussed below, since EPA has thoroughly misapplied its applicable guidance for identifying defensible nutrient criteria, the action is arbitrary and capricious.

Response 11:
The comment's reference to stressor-response documents is not applicable, as the permit limit analysis was not based on stressor-response relationships (see also Response 8). However, the causal relationship among nitrogen, chlorophyll-*a* and dissolved oxygen is in fact well understood and is supported by data in this system. In areas of Aucoot Cove where total nitrogen and algal pigments are high, such as Site AC2 in the inner part of Aucoot Cove, dissolved oxygen levels tend to be low. From 2007 through 2012, AC2 had high levels of nitrogen, high levels of total algal pigment (including chlorophyll-*a* and pheophytin), and no eelgrass growth. Dissolved oxygen was only measured at this station in 2007, but it failed to meet the 6.0 mg/L water quality criteria 45% of the time.

Comment 12. Reference condition approach
We first challenge the selection of a single site as a "reference condition" suitable for inferring whether the stressor variable is supportive of eelgrass habitat. The SAB comments partially address this issue, both in terms of the link between the measurement of a nutrient concentration at a point compared with a biologic response variable and with respect to a mismatch between the timescales that data are collected that describe total nitrogen and eelgrass extent. In its comments, the SAB notes that "A basic conceptual problem concerning selection of nutrient concentrations as stressor variables […] is that nutrient concentrations directly control only point-in-time, point-in-space kinetics, not peak or standing stock plant biomass." (EPA, 2010). Furthermore, the SAB warns of mixing data collected at different time scales. The example given in the SAB report is comparing seasonally averaged chlorophyll-*a* concentrations with total phosphorus grab samples, as this introduces a significant amount of uncertainty. A similar parallel exists between total nitrogen samples – computed as a median summer concentration – and eelgrass, sampled sporadically on an annual timescale. This mismatch between the data collection timelines introduces significant error to any causative relationship that may exist between these two variables.

A similar comment was made by Dr. Stephen Chapra in his critique of a similar methodology used to derive a numeric total nitrogen criteria for the Taunton Wastewater Treatment Plant's draft NPDES permit. His assessment leans heavily on the 2010 SAB analysis to conclude that "the use of a single station by the present study [Taunton River Estuary] without any documentation that the other locations of the estuary are similar in hydrology/ hydrodynamics provides little confidence that the oxygen objective will be met…" (Chapra, 2014).

Response 12:
EPA again notes that it did not use a stressor-response method to derive the nitrogen threshold used in the Marion Fact Sheet. See Response 8.

The commenter indicates that factors other than nutrient concentration affect submerged aquatic vegetation and argues that extensive further study is necessary to adequately understand the relationship between TN values and eutrophication response variables before a nitrogen limit can be established. However, the commenter offers no specific information relevant to Aucoot Cove that could be used to determine an alternate allowable nitrogen load. Aucoot Cove is a semi-enclosed shallow estuary with a significantly developed watershed, and as such, would be expected to be vulnerable to elevated nitrogen loads as the water quality evidence clearly indicates it is. There is no indication, or evidence cited, that the hydrology/hydrodynamics varies significantly within this small embayment. See also Response 5.

As with the Taunton Wastewater Treatment Plant, it is misleading to suggest that EPA's decision was based on a single site. EPA's approach examined the continuum of water quality conditions in Aucoot Cove to identify a transition point from impaired to unimpaired conditions. It is not a stressor-response approach, and the cited guidance documents on stressor-response analyses and criteria development are not applicable to reference-based approaches to site-specific analyses for permit limits.

Furthermore, EPA's reference site approach in the Taunton permit was upheld on appeal unanimously by the Environmental Appeals Board on May 3, 2016. In its ruling, the EAB stated that "NPDES regulations do not require the Region to use any particular methodology or conduct any specific modeling to determine whether the 'reasonable potential' standard is met, and the Region is not required to demonstrate that nitrogen is causing impairment before setting a nitrogen limit."

Rather, this approach is a form of reference-based approach, and a similar approach has been widely applied in TMDLs developed under the MEP and approved by MassDEP and EPA. The results are consistent with ranges and thresholds for acceptable TN concentrations found in other estuaries within and outside of Massachusetts. Although this is a simplified approach that does not attempt to quantify individual subprocesses involved in eutrophication, it is entirely appropriate for assessing large scale nutrient load reductions over relatively long averaging periods. This is a scientifically defensible approach that is neither arbitrary nor capricious.

Regarding effluent limitations, EPA has reconsidered the need for the 3.0 mg/L nitrogen limit in the final permit (see Response 20). However, given the extended groundwater travel time and thus the extended period for which groundwater nitrogen loadings from the lagoons will continue discharging to Aucoot Cove, as well as the uncertainty over EPA's estimate of the other non-point source nitrogen loadings, it is prudent to minimize the allowable nitrogen loading from the Marion discharge. A final seasonal average permit limit of 4.0 mg/L total nitrogen from April 1 – October 31 has been established based on documented performance.

Comment 13. Total Nitrogen as Stressor Variable

Second, we question whether total nitrogen is an appropriately defined stressor variable. Numerous studies examining eelgrass habitat suitability have shown that total nitrogen is not the only variable affecting eelgrass habitat suitability (*e.g.*, Benson *et al.*, 2013; Kenworthy *et al.*, 2013; Li *et al.*, 2007). One significant criticism of the stressor-response guidance that is relevant to Marion's situation is "The absence of a direct causative relationship between stressor and response." One of the key general criticisms of the guidance document is that "statistical associations may not be biologically relevant and do not prove cause and effect." The authors continue, stating

> *Without a mechanistic understanding and a clear causative link between nutrient levels and impairment, there is no assurance that managing for particular nutrient levels will lead to the desired outcome. There are numerous empirical examples where a given nutrient level is associated with a wide range of response variables due to the influence of habitat, light levels, grazer populations, and other factors. If the numeric criteria are not based upon well-established causative relationships,* ***the scientific basis of the water quality standards will be seriously undermined****. [emphasis added].*

EPA, 2010

One observation particularly applicable to Marion is that

> *The problem of eutrophication is complex, involving multiple causal variables, multiple response variables, and feedback among the variables. […] A change in a response variable [i.e., eelgrass] is unlikely to be satisfactorily described by changes in a single "causal" variable (e.g., total nitrogen […] or total phosphorus. […] For example, the stressor-response relationship is relatively strong and well-established in lakes and reservoirs as opposed to streams and rivers where the relationship is more complex and influenced by many factors (e.g., shading, sediment, flow regime).*

EPA, 2010

The basic premise of the SAB comments on the stressor-response guidance is that it is imperative that nutrient criteria be based upon a mechanistic conceptual model that describes the clear causative link between the stressor and response variables. As there are many stressor variables that may affect eelgrass habitat suitability (*e.g.*, sediment composition, light, channel morphology), it is far too simplistic to assume that the only variable controlling eelgrass growth or degradation is total nitrogen. Indeed, the SAB speaks to this point, stating that "Single variable stressor-response relationships […] that explain a substantial amount of variation are likely to be uncommon for most aquatic ecosystems (in particular, streams)." (EPA, 2010). The SAB report also states, "In order to be scientifically defensible, empirical methods must take into consideration the influence of other variables." This suggests that basing a numeric nutrient criteria on the cause and effect relationship between total nitrogen and eelgrass - regardless of any correlations that may exist - is not scientifically defensible unless a clear conceptual model that causally links these two variables is developed. It is also important to note that Massachusetts state narrative nutrient criteria require that a reasonable causal demonstration that nutrients are resulting in an impairment (314 CMR 4.00).

In light of the issues identified about EPA's methodology for developing the numeric total nitrogen criteria, we request that EPA share its conceptual model—or any evidence—that reliably links total nitrogen to eelgrass degradation in Aucoot Cove. We also note that the logic used to claim that total nitrogen concentrations sufficiently protective of eelgrass is fundamentally flawed, as it is difficult if not impossible to justify using a temporally and spatially limited dataset to compare to eelgrass growth over annual time scales. Marion is committed to protecting the health of Aucoot Cove, but needs assurance, and the law requires, that reducing its nitrogen limit at an estimated capital cost of over $10 million will have a beneficial effect on eelgrass within Aucoot Cove. As EPA's assertion that TN is the sole cause of the absence of eelgrass in the inner cove and that assessment is not based on any credible scientific assessment, the proposed TN limitations should be withdrawn.

Response 13:
The commenter misinterprets the Fact Sheet language. The state environmental agency develops and proposes numeric criteria, which EPA has not done here. Because the Massachusetts Water Quality Standards use narrative nitrogen criteria, EPA interprets the criterion using available and relevant data. As the commenter has noted, using site specific data, wherever possible, is best. In this case, EPA used a reference condition, i.e., a location where water quality meets standards, data from within the estuary to establish a reasonably protective interpretation of the state's narrative nutrient criteria and further supported this value with values from the Thresholds Report (Massachusetts Estuary Program 2003). This report is based on studies and data from many Massachusetts estuaries.

The commenter accuses EPA of using datasets with mismatched temporal scales, i.e. water column nitrogen and dissolved oxygen, and chlorophyll *a* data collected monthly with eelgrass data collected annually. EPA only used the median (where available) of data collected from 2007 through 2012 in the Fact Sheet to determine reasonable potential.

Regarding the comments on the stressor-response approach, EPA again notes that it did not use this method to derive the nitrogen threshold. Please see Responses 6, 8, and 11 relative to stressor/response analysis, development of numeric criteria versus interpretation of narrative criteria, and SAB comments. As far as a conceptual model, EPA provided a detailed description of the eutrophication effects of nitrogen enrichment in estuarine systems, including numerous references to the applicable scientific literature. See Response 5.

Furthermore, EPA's NPDES regulations do not require cause-and-effect proof between a pollutant discharge and an existing water quality impairment before the permit writer can derive a numeric in-stream target to interpret a narrative water quality criterion, or impose a water quality-based effluent limitation to implement that criterion. The comment simply misstates the plain text of 40 C.F.R. § 122.44(d)(1). *See In re Town of Newmarket, NH*, NPDES Appeal No. 12-05, 16 E.A.D. __ (2013), slip op. at 54 n.23 ("The plain language of the regulatory requirement (that a permit issuer determines whether a source has the 'reasonable potential to cause or contribute' to an exceedance of a water quality standard) does not require a conclusive demonstration of "cause and effect.") Under this regulation, permit issuers are required to determine whether a given point source discharge "cause[s], ha[s] the reasonable potential to cause, or contribute[s] to an excursion above" the narrative or numeric criteria set forth in state water quality standards. 40 C.F.R. § 122.44(d)(1)(i). Thus, the regulations require nothing more than a *reasonable potential to cause, or contribute to* an excursion of a numeric or narrative state water quality criterion; whenever such a potential exists, a permit must contain effluent limits to meet state water quality standards.[7] *See id.* § 122.44(d)(1), (5) (providing in part that a permit must incorporate any more stringent limits required by CWA § 301(b)(1)(C)). "'Reasonable potential' requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary." *In re Upper Blackstone Water Pollution Abatement Dist*., NPDES Appeal Nos. 08-11 to 08-18 & 09-06, slip op. at 32-33, n.29 (May 28, 2010). As EPA's preamble to its final rulemaking promulgating 40 C.F.R. § 122.44(d)(1) explained:

> *Some commenters said that the phrase "reasonable potential to cause" was too vague and could apply to permittees that are not actually exceeding a water quality criterion. EPA does not believe that it is appropriate to be more specific because a permitting authority has a significant amount of flexibility in determining whether a particular discharge has a reasonable potential to cause an excursion above a water quality criterion, taking the factors in subparagraph (ii) into account.*

54 Fed. Reg. 23,868, 23,873 (June 2, 1989). This regulatory provision has been upheld as a reasonable, authorized approach of necessary gap-filling in the CWA statutory scheme as it provides permit writers with guidance on how to interpret state narrative water quality standards in deriving effluent limitations. *See Am. Paper Inst. v. EPA*, 996 F.2d 346, 348, 351 (D.C. Cir. 1993); *see also Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 990-991 (D.C. Cir. 1997). Although EPA acknowledges some unavoidable level of scientific and technical uncertainty in this permitting action, the existence of uncertainty does not excuse EPA from its obligation to set permit limits where a discharge "causes, has a reasonable potential to cause, or contributes to an excursion above a narrative criterion." 40 CFR § 122.44(d)(1)(i). EPA also agrees that there is some uncertainty with respect to the precise numeric water quality criterion for nitrogen that "will attain and maintain applicable narrative water quality criteria and fully protect the

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[7] The state narrative standard does not impose a higher standard of causation for purposes of permit limits, and such an interpretation, if it existed, would not override the requirements of 40 C.F.R. § 122.44(d).

designated use" as required pursuant to 40 CFR § 122.44(d)(1)(vi)(A), although such uncertainty is within a relatively narrow zone. As set forth in 40 CFR 122.44(d)(1)(vi):

> Where a State has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority **must** establish effluent limits using one or more of the following options . . ."

This obligation exists even where there is incomplete or uncertain information concerning the precise target that will meet the narrative criterion. The Board has specifically held that "[i]n the face of unavoidable scientific uncertainty, the Region is authorized, if not required, to exercise reasonable discretion and judgment." *In re Dominion Energy Brayton Point, LLC*, 13 E.A.D. 407, 426 (EAB 2007). The federal courts in reviewing Agency decisions have similarly recognized that scientific uncertainty is not a bar to administrative decision making: "We do not demand certainty where there is none. There may be no strong reason for choosing [a particular numerical standard] rather than a somewhat higher or lower number. If so, we will uphold the agency's choice of a numerical standard if it is within a 'zone of reasonableness.'" *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 525 (D.C. Cir. 1983) (citation omitted); *see also Hercules, Inc. v. EPA*, 598 F.2d 91, 116-17 (D.C. Cir. 1978). More than three decades ago, the D.C. Circuit aptly described the CWA's balance when confronted with a difficult situation and the obligation to eliminate water quality impairments: ". . . EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels. This may well mean opting for a gross reduction in pollutant discharge rather than the fine-tuning suggested by numerical limitations. *But this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all.*" *Natural Resources Defense Council, Inc. v. Costle*, 568 F.2d 1369, 1380 (D.C. Cir. 1977) (emphasis added) (finding unlawful a rule that would have exempted certain discharges from permitting requirements based on the difficulty in setting limits).

The final permit requires closure and/or lining of the lagoons (see Response 70). This action alone will eliminate a significant source of nitrogen loading to the Aucoot Cove watershed and will lower the total nitrogen load below the allowable nitrogen loading threshold of 34.5 lbs/day. For this reason, EPA has reconsidered the need for the 3.0 mg/L nitrogen limit in the final permit (see Response 20). The permit includes a total nitrogen limit of 4.0 mg/L as a seasonal average, which the current facility can meet, thus reducing capital investment needed to comply with the permit.

Comment 14. Watershed Load

In lieu of a detailed watershed load calculation, EPA uses the "nonpoint source and stormwater point source areal loading rate calculated for the Segreganset [sic] River watershed, which has similar land use patterns as Marion"; this work was the basis of the draft NPDES permit issued by EPA in March 2013 for the Taunton WWTP. EPA justifies using the Seregansett River areal load rate for Marion's draft permit because "a planned nitrogen loading study under

Massachusetts Estuary Project (MEP) for Aucoot Cove has not been completed, nor is it expected in the near future."

EPA's analysis does not acknowledge work done by the BBNEP (1999). The BBNEP has developed watershed loading estimates using the methodology similar to that used by the MEP, and estimated nitrogen load from the Aucoot Cove watershed nitrogen load in 1999. This analysis found that the non-point source load is approximately 30 lbs/day.

The BBNEP load estimate is over three times larger than the transposed load proposed in the Fact Sheet. Therefore, the Marion WPCF contribution to the overall nitrogen load to Aucoot Cove is significantly less than is implied in the Fact Sheet. Obviously, this shows the lack of understanding of the actual, up-to-date nonpoint source and stormwater load in Aucoot Cove. In the face of these quite different estimates, the only reasonable action is to undertake a new assessment of watershed load, and certainly not transform an overall nitrogen areal loading rate from one watershed to another.

This is particularly important because it changes the perspective of the amount of nitrogen load to Aucoot Cove that could be coming from the wastewater treatment plant. Thus establishing a reasonable estimate of watershed load will allow the Town to properly decide how to cost effectively mitigate nitrogen load to the cove, should this prove to be needed.

Response 14:
Given that the final permit requires the lagoons to be closed or lined, EPA has reconsidered the need for a total nitrogen limit of 3.0 mg/L and has replaced it with a seasonal average limit of 4.0 mg/L. See Response 20.

A higher watershed nonpoint source nitrogen contribution, as alleged by the comment, would suggest that an even lower total nitrogen limit may be necessary for Aucoot Cove to meet water quality standards. If new information leads to this conclusion, then further restriction will be incorporated in a future permit action. EPA strongly encourages the Town of Marion to address the non-point sources of nitrogen that are within their control in order to restore water quality in Aucoot Cove and avoid the potential for more stringent point source nitrogen requirements.

Regardless of the magnitude of nonpoint source nitrogen contributions to Aucoot Cove, it is clear that there is reasonable potential for the Marion WPCF's nitrogen discharges to cause or contribute to a violation of MAWQS. Because the necessary nitrogen reductions are larger than technologically possible at the Marion WPCF, the draft permit included reductions to a level considered achievable in 2015. A higher watershed nonpoint source nitrogen contribution would make the situation worse for the Marion WPCF, taking up more of the allowable total nitrogen load to Aucoot Cove and lowering the Marion WPCF nitrogen limit to 3.0 mg/l even assuming elimination of the lagoon source. There would be no effect on the proposed limit in the unlined lagoons scenario because the allocation would still be less than zero. In these situations, EPA typically defaults to the limit of technology, 3.0 mg/l.

Regardless of the magnitude of nonpoint source nitrogen contributions to Aucoot Cove, there is reasonable potential for the Marion WPCF's nitrogen discharges to cause or contribute to a violation of MAWQS.

Comment 15. Allowable effluent load

EPA's methodology for computing the allowable total nitrogen effluent load required to maintain a concentration of 0.35 mg/L in inner Aucoot Cove is overly simplistic and grossly understates the allowable load to the cove that is protective of eelgrass and other designated uses. This proposed methodology is not sufficient to compute the allowable load required to achieve the stated water quality goals in Aucoot Cove because it ignores key elements required to accurately estimate the allowable load. Elements that must be added to this calculation are other drivers besides total nitrogen that affect eelgrass habitat suitability, estuarine mixing and exchange, total nitrogen load from the ocean, and dilution of the effluent into the full volume within the reference area.

EPA used the following procedure to compute the allowable load to Aucoot Cove. Our comments on the proposed approach are interspersed between the enumerated steps.

1. Assume the impaired area to be the 0.05 square mile area closest to the shoreline and the reference area to be the 0.1 square mile area extending to sampling point AC3 as shown in Fact Sheet Figure 6.

The assumption that the inner Aucoot Cove area is "impaired" due to the lack of eelgrass needs to be conclusively linked to total nitrogen. Light availability, sediment composition, and embayment morphology have all been linked to eelgrass habitat suitability (*e.g.*, Benson *et al.*, 2013; Kenworthy *et al.*, 2013; Li *et al.*, 2007), so the lack of eelgrass in a certain area of Aucoot Cove is not a prima facie indication that the habitat is unsuitable due to excess total nitrogen. Therefore, Marion rejects the use of the proposed impaired and reference areas for determining an allowable total nitrogen load because factors other than total nitrogen may prevent eelgrass from growing in the proposed impaired area.

2. Determine the load rate per unit area for the reference area by dividing the computed loading rate by the surface area of the reference area. This assumes that "the nitrogen loading is not causing an impairment" to the reference area. This load rate is 689 lbs/day/sq. mi. Apply the areal load rate computed for the reference area to the impaired area to determine the allowable nitrogen load in pounds per day. Note that this calculation is equivalent to a 50% reduction in combined nonpoint source, WPCF, and lagoon loads because the impaired area is one half of the reference area. The target load rate using this methodology is 34.45 lbs/day total nitrogen.

Several important elements are missing from this calculation. First, while the surface area of the impaired area is 50 percent of the reference area, the volume of the impaired area is significantly less than 50 percent of the reference area volume. Wind action, wave action, and tidal forcing will cause the water in Aucoot Cove to mix throughout the vertical dimension. Furthermore, the water volume in Aucoot Cove will mix within the larger Buzzards Bay, transporting nitrogen out of Aucoot Cove. Studies have found that "Aucoot Cove is one of the deepest, well flushed embayments in Buzzards Bay." A tidal prism model suggests that the flushing time for Aucoot Cove is 1.4 days, and Costa asserts that "it is unlikely that the residence time of the upper 1/3 of Aucoot Cove is no more than 3 days…" (Costa, 1998). This means that any nitrogen load from the Marion WPCF will be well mixed with the much larger volume of the Cove and much of the nitrogen will be flushed out of Aucoot Cove before significant phytoplankton growth can occur, further minimizing the effect of the minimal load reduction realized by changing the summer-average total nitrogen effluent concentration from 3.8 mg/L to 3.0 mg/L.

3. Assume no nonpoint source reduction, so the required load reduction is 25.05 lbs/day total nitrogen, subtracting the assumed 9.4 lbs/day nonpoint source load.

The Buzzards Bay National Estuary Project (BBNEP) estimated the Aucoot Cove nonpoint source load to be 30 pounds per day, which is three times larger than EPA's nonpoint source load estimate. This updated [sic] represents a significant portion of the total load to Aucoot Cove. Marion believes that it is unacceptable to suggest that a minor load reduction from one of the minor sources to Aucoot Cove while ignoring the larger nonpoint source load source that may be a more cost effective solution for reducing overall total nitrogen loads. We request that EPA revisit the load calculation to make it more scientifically defensible. This includes accounting for dilution and mixing within the estuary and using published load estimates for nonpoint sources from Aucoot Cove instead of transposing a load from a different watershed that may not be comparable to Aucoot Cove. We believe that this would provide a much better basis for setting a nitrogen limit, if needed, that would be protective of eelgrass within Aucoot Cove without unnecessarily imposing a regulatory burden predicated on a flawed analysis that will cause significant economic harm to the community.

Response 15:
Regardless of any mitigating or aggravating factors, the weight of evidence indicates that Aucoot Cove is impaired by excess nitrogen and MassDEP has identified it as impaired for nitrogen. EPA need not quantify every factor affecting nitrogen levels and nitrogen responses before finding reasonable potential and setting a permit limit. See Response 13.

As far as the comment that reducing the discharge from 3.8 to 3.0 mg/L will not be significant, the commenter misunderstands or misrepresents the analysis in the Fact Sheet. The Fact Sheet identifies a much larger reduction in nitrogen as necessary to achieve water quality standards, but recognizes that this reduction may come from NPS controls, including lining of the lagoons.

EPA agrees that nonpoint source reductions will be necessary for Inner Aucoot Cove to reach attainment of water quality standards. EPA clearly has not ignored the larger non-point source loads. The Fact Sheet clearly indicates that if sufficient non-point source reductions are achieved, further reductions in the point source total nitrogen loadings would not be necessary (Note: both the Total Nitrogen limit of 3.0 mg/L and the option to get the limit modified have been removed from the final permit. See Response 20.)

While it is true that the middle and outer portions of Aucoot Cove are well-mixed, Inner Aucoot Cove experiences less mixing because of its proximity to the discharge and shallow depth, in addition to its protected location. Data collected by the Buzzards Bay Coalition, show increasing average total nitrogen concentrations as one moves closer to the Marion WPCF discharge.

Detailed modeling of volumetric mixing, including wind, wave and tidal actions is not available for this discharge. The desire for further study is not sufficient reason to delay reductions in nitrogen loadings where nitrogen related impairments have been so clearly documented.

Regarding the watershed load, see Response 14.

Comment 16. EPA Miscalculated the "Safe" TN Concentration and Impact of the City's Discharge

In addition, Page 18 of the Fact Sheet states that Marion's "[annual] average effluent concentration of 3.46 mg/L is still ten times higher than the concentration needed to support eelgrass in the cove." This statement ignores any denitrification that occurs as the treated effluent pass through both wooded wetland and the salt marsh (Figure 1) and the subsequent dilution that occurs as the effluent mixes into the Cove. We believe it simply wrong to assume no denitrification and no dilution when the effluent moves from channelized Effluent Brook to the wetland and then the well-flushed Aucoot Cove. Therefore, we request that EPA remove this statement from the Fact Sheet. EPA's failure to consider dilution in assessing the need for a water quality-based limit, violates the requirements of 40 CFR 122.44(d) which specifies that dilution must be accounted for when available.

Response 16:

The basis of the limit calculation is the difference between ambient total nitrogen concentrations and loads per unit area in the inner cove and in the larger reference area. EPA agrees that nitrogen discharges into Aucoot Cove are reduced by attenuation and dilution. However, when nitrogen concentrations are measured in the environment, dilution and attenuation have already occurred. The limit calculation simply compares the nitrogen levels in the impaired area with the nitrogen levels at the reference location. It then determines what proportion of the nitrogen load to the inner cove needs to be eliminated to bring it to the concentration of nitrogen in the reference area after the load is subject to attenuation and dilution

While the wetland may provide some attenuation of nitrogen discharges, the significance of this attenuation is far from certain. Wetlands can assimilate nitrogen but they can also release nitrogen at times. EPA made the reasonably conservative assumption that all of the nitrogen discharged by the WPCF reaches Aucoot Cove eventually. The evaluation also includes non-conservative assumptions such as the use of actual WPCF discharge flow rates instead of using the permitted design flow.

The purpose of saying that the discharge being ten times the receiving water target for healthy eelgrass was to highlight that the discharge concentration (approximately 3.5 mg/L), while commendably low, is still large compared to the allowable instream nitrogen concentration (0.35 mg/L). In situations where there is reasonable potential to cause or contribute to an exceedance of the water quality standards and no attenuation or dilution, the effluent limit would be set equal to the allowable instream concentration. That is clearly not the case here.

Comment 17. Marion WPCF Nitrogen Removal has improved

Further supporting the need to account for mixing and dilution that occurs within Aucoot Cove comes from a detailed look at the history of Marion's effluent discharge. Prior to the 2005 plant upgrade no substantive nitrogen removal occurred besides some settling in the lagoons. Our best estimate is that between 25 and 50 percent of the influent nitrogen concentration was removed through settling in these lagoons. Sampling of the present-day influent indicates that its total nitrogen concentration is approximately 20 mg/L. Conservatively assuming 25 percent total nitrogen removal yields an effluent discharge of 15 mg/L, which is significantly larger than the present annual average effluent concentration of 3.46 mg/L. This conservative assumption means that pre-upgrade the plant contributed on the order of four times more total nitrogen load to Aucoot Cove. Therefore, the TN concentration where "healthy" eelgrass populations existed in 1995 had to be higher than the concentration measured by EPA, post WWTP improvements. EPA's analysis completely failed to account for this factor.

While the total nitrogen load to Aucoot Cove from Marion's treatment plant has decreased significantly since 2005, the eelgrass extent has been relatively constant. Most notably, as mentioned above, the edge of the eelgrass closest to Effluent Brook has been unchanged since the Costa's 1980s eelgrass survey of Aucoot Cove. The fact that the load from Marion has decreased by a factor of four with the upgrade of the treatment plant that went online in 2005 with no apparent influence on the eelgrass extent closest to Effluent Brook suggests that further reducing Marion's load by a nominal amount will most certainly not result in a sudden regeneration of the eelgrass anywhere in this system. Moreover, this information confirms that the City's discharge is not "causing or contributing" to eelgrass declines or any absence of eelgrass. If the major TN reductions had no effect on eelgrass populations even over a 5 year period, there is no credible basis to claim that the remaining TN load is somehow critical to eelgrass propagation in this system.

Response 17:

The Town of Marion upgraded the WPCF in 2005, adding a sequencing batch reactor and cloth filters. These upgrades resulted in a marked reduction in effluent nitrogen discharging from the facility. It is notable that the facility is attaining nitrogen concentrations ranging from 3 to 4 mg/L, which is close to the limit of technology.

EPA agrees that a reduction in effluent nitrogen concentrations from an average of 3.46 mg/L to under 3.0 mg/L would not, on its own, result in water quality standard attainment for Aucoot Cove. For that reason, EPA has reconsidered the need for a nitrogen limit of 3.0 mg/L and instead has included a seasonal average limit of 4.0 mg/L in the final permit. Retaining the current level of nitrogen removal together with closing or lining the lagoons will reduce nitrogen loading to a level that will allow Aucoot Cove to meet water quality standards.

Having conceded the exceptional level of treatment at the WPCF after 2005, EPA cannot agree with the other views expressed in the comment. First, the lack of recorded impairment in Aucoot

Cove at any given date does not indicate lack of impairment. Limited monitoring resources do not allow for regular comprehensive assessments of receiving water quality and scientific research and sampling technology now allow for detection of impairments that may have escaped notice in years past. Second, estimated historic eelgrass coverage by Costa (1988) in Aucoot Cove far exceeds levels seen today. (EPA never cites 1995 eelgrass coverage as "healthy;" this is a term ascribed by the commenter.)

Even if Aucoot Cove was not impaired in prior decades despite higher nitrogen discharges, it is not valid to conclude that nitrogen has little effect on eelgrass communities. First, it is well known that ecological response to pollution is rarely smooth and predictable. Eelgrass meadows promote their own survival by slowing currents and improving water clarity (van der Heide, et al. 2011). This means that an eelgrass bed may appear to withstand nutrient inputs until it reaches a tipping point, leading to a rapid decline.

Comment 18. TN Concentrations and Eelgrass Have Not Responded to Improvements at Marion

Another key aspect of the historic total nitrogen concentration at sites AC2 and AC3 is the relative consistency of the concentrations despite significant reductions in treatment plant total nitrogen. The Buzzards Bay Coalition has been collecting data since 1992, which allows a comprehensive picture of the health of Aucoot Cove relative to total nitrogen concentrations over time. The long-term median total nitrogen concentration at AC2 between 1992 and 2005 was 0.42 mg/L, compared with the median concentration between 2007 and 2012 of 0.46 mg/L. This suggests that total nitrogen concentrations in Aucoot Cove have actually *increased* even though the load from the Marion treatment plant has decreased. Furthermore, the eelgrass extent closest to Effluent Brook has not changed over this time period based on the Costa and MassDEP eelgrass survey, showing that the eelgrass is not responding positively or negatively to this concentration. A similar comparison can be made of the total nitrogen trends at AC3. The long-term median concentration between 1992 and 2005 was 0.34 mg/L, which is almost identical to the median concentration of 0.35 mg/L observed between 2007 and 2012. This result suggests that significant dilution and mixing occur within Inner Aucoot Cove, since the concentration is essentially unchanged despite significant load decreases from the Marion treatment plant. This evidence also indicates that the effect of Marion's effluent on the eelgrass is negligible, and the mixing and dilution within Aucoot Cove is an essential element of a rigorous analysis.

Finally, the use of the 5-year average to create a monthly maximum load is improper. Criteria must be applied as derived (EPA, 1985). Within the 5-year average, higher and lower monthly total nitrogen conditions can safely occur; difference between 5-year average and monthly maximum (assuming a coefficient of variation of 0.6) would mean monthly maximum could be up to 0.5 mg/L total nitrogen per EPA Technical Support Document procedures (EPA, 1991). The effluent limits need to be adjusted to reflect the large difference in criteria versus permit limit averaging period.

Response 18:

The Fact Sheet makes it clear that nonpoint sources must be addressed to lower nitrogen concentrations below the threshold to allow healthy eelgrass growth. There is little information on nonpoint sources that would inform as to how this loading has changed over that time frame. Clearly, development in the watershed has continued and EPA would expect a greater nonpoint source load. The fact that eelgrass has not fully reestablished in the inner cove is to be expected since total nitrogen loadings are higher than values necessary to support eelgrass[8]. Similarly, while the inner edge of the eelgrass areal coverage may not have changed significantly, little is known about the density and health of this eelgrass and eelgrass is being lost at the outer edge. The evidence clearly indicates, and MassDEP's listing confirms, that nitrogen loadings are excessive.

EPA agrees that the Marion WPCF discharge is no longer the sole source of nitrogen in the watershed. For this reason, the final permit includes a limit on the WPCF discharge that will not require further point source reductions but will require it to maintain its current level of performance. Furthermore, the permit requires closure and/or lining of the sewage lagoons which will have the effect of eliminating this ongoing source of nitrogen loading to Aucoot Cove.

Regarding averaging periods, the total nitrogen limit in the final permit has been changed to a seasonal average limit. See Response 20.

Comment 19. Antibacksliding

The Draft Permit proposes a 48-month compliance schedule for meeting the 3 mg/L total nitrogen effluent limit, including the opportunity to use stormwater and nonpoint source reductions to "attempt to offset and [sic] WPCF reductions and documents that WPCF nitrogen limits need not be reduced to 3.0 mg/L." The draft comment letter [sic] continues, stating that "If other nitrogen reductions obviate the need to go to 3.0 mg/L, the Town can request a permit modification." The Town of Marion notes that its average total nitrogen discharge between the months of May and October is 3.8 mg/L, close to the proposed 3 mg/L effluent limit. In some months, the average total nitrogen discharge is below 3.0 mg/L (individual samples have range from 1.7 to 7.4 mg/L). The Clean Water Act, Section 402(o) covers anti-backsliding and states that a permit cannot be "renewed, reissued, or modified […] to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit." Marion believes this provision of the Clean Water Act would prevent such a permit modification from occurring if its WPCF meets the 3.0 mg/L total nitrogen limit even if significant nonpoint source reduction is realized. EPA's clarification on the ability to amend the permit in the future is requested. Statements in the Fact Sheet (Page 13) on ammonia indicate that this indeed is how EPA will interpret the any request to change the permit limit after the plant meets an imposed 3 mg/L limit, as the historic data suggest the plant has been able to achieve: "The draft permit retains the limits that were established to ensure attainment of the 1994 ammonia criteria, and these limits have been retained to ensure consistency with antibacksliding requirements.

[8] See Attachment A, which includes a recently identified 2015 eelgrass survey that indicates some eelgrass within the inner cove, although not necessarily evidence of a permanent eelgrass bed having been established.

Response 19:
The total nitrogen limit of 3.0 mg/L has been replaced with a seasonal average limit of 4.0 mg/L, which the facility can currently achieve (see Response 20). Therefore, the final permit contains no compliance schedule for total nitrogen.

In response to the antibacksliding question, these provisions apply only to permit limits that have gone into effect. The antibacksliding provisions at 40 CFR § 122.44(*l*) require that "when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the *final* effluent limitations, standards, or conditions in the previous permit." (emphasis added)

Comment 20. Effect of Stormwater & Nonpoint Sources
Related to the above referenced discussion relating using stormwater and nonpoint source reductions to offset WPCF reductions, Page 24 of the Fact Sheet states that "The Draft Permit recognizes that there may be an appropriate pause point in the future when stormwater and nonpoint sources of nitrogen are adequately accounted for and remedied and field data indicates that all of the Aucoot Cove ecosystem has recovered to a healthy state free of cultural eutrophication." This statement is overly ambiguous. First, EPA does not state the conditions under which stormwater and nonpoint sources of nitrogen are "adequately accounted for." Second, EPA does not state the data and requirements necessary to deem that "the Aucoot Cove ecosystem has recovered to a healthy state free of cultural eutrophication." Marion asks for clarification on these points.

Response 20:
EPA concurs that the referenced language in the Fact Sheet needs clarification. Upon closure and/or lining of the lagoons as required by the permit, a significant ongoing source of nitrogen loading to the Aucoot Cove watershed will be eliminated. Based on EPA's estimate of other non-point source loadings of nitrogen (9.4 lbs/day) and the draft permit point source nitrogen loading (14.7 lbs/day), the resultant total nitrogen load is less than the allowable nitrogen loading threshold of 34.5 lbs/day. Consequently, EPA has reconsidered the need for the 3.0 mg/L nitrogen limit in the final permit. Given the extended groundwater travel time and thus the extended period for which groundwater nitrogen loadings from the lagoons will continue discharging to Aucoot Cove, as well as the uncertainty over EPA's estimate of the other non-point source nitrogen loadings, as pointed out by the commenter, it is prudent to minimize the allowable nitrogen loading from the Marion discharge. A final seasonal average permit limit of 4.0 mg/L total nitrogen from April 1 – October 31 has been established based on documented performance. The 2013 through 2015 reported seasonal (April through October) average total nitrogen discharge values range from 2.9 mg/L – 3.6 mg/L.

If new information indicates that the other non-point sources of nitrogen are significantly higher than EPA's estimate and/or water quality continues to show signs of impairment relative to water quality standards, EPA will impose a more stringent nitrogen limit in a future permit action. Any determination of ongoing water quality impairments will be based on a weight of the evidence analysis that considers ambient total nitrogen, chlorophyll *a*, and dissolved oxygen levels as well as available information on extent and health of eelgrass and presence/abundance of macroalgae.

Comment 21. Aucoot Cove is not impaired
Additionally, EPA's discussion on stormwater and nonpoint source controls is predicated on the unsupported presumption that Aucoot Cove is impaired. The justification for this impairment as presented in the Fact Sheet is the lack of eelgrass in the inner portion of Aucoot Cove. As discussed elsewhere in this comment letter, many other factors besides total nitrogen affect eelgrass habitat suitability. EPA has not conclusively shown that the eelgrass in Aucoot Cove is degraded nor has EPA shown Marion's total nitrogen effluent has degraded eelgrass in Aucoot Cove. How does EPA propose showing that the Aucoot Cove ecosystem has "recovered to a healthy state" without first conclusively proving that it is degraded?

Response 21:
Establishment of a water quality-based total nitrogen limit is not dependent upon the listing or demonstrating of an impairment, but rather on the establishment of a reasonable potential to cause or contribute to an impairment. *See* 40 CFR § 122.44(d)(1). However, in this case the impairment has been well documented both by the fact that it is listed as impaired for nutrients and eutrophication on the state's 303d list, by the data presented in the Fact Sheet that is consistent with conceptual models for cultural eutrophication, and by the information about eel grass impacts in Response 5.[9]

Comment 22. Lagoon study
One of the justifications given for including the lagoons in the Draft Permit is a study on groundwater leakage from the lagoons into nearby embayments by Horsley Witten Group, Inc. prepared on behalf of the Buzzards Bay Coalition titled *Environmental Assessment of the Marion Wastewater Treatment Plant Sewage Lagoons* (Report) dated April 2011 (Horsley Witten, 2011). While the Town commends the Buzzards Bay Coalition for spearheading the important work of helping protect receiving waters of Buzzards Bay; based on a peer review of the report by the Town's consulting engineer, the report contains a number of critical logical and scientific flaws and some curious potential data anomalies that cast doubt on the report's principal conclusions. In fact, the conclusions of the report regarding the degree of lagoon leakage are physically impossible.

Rather than assess the wastewater flows at the plant, the report uses information on water levels and water quality samples collected at a series of nested piezometers that were installed on or near the WPCF site together with water levels and water quality samples for surface streams to find that "effluent from the Marion WPCF sewage lagoons appears to be infiltrating into underlying groundwater" and recommend that the "lagoons be lined with an impermeable geotextile membrane to prevent further leaking from the bottom and sides of the sewage lagoons." The analysis to support this recommendation concludes that leakage occurs at a rate of 1 inch per day, discharging 33,400 pounds of nitrogen (equal to 1,965 homes with septic systems) to the aquifer each year.

[9] We also note that the Town recognizes elsewhere that there is a documented "decline/loss of eelgrass bed habitat" in Aucoot Cove and other marine waters in the Town due, in part, to "[n]utrient loadings in the form of total nitrogen (TN)." 2017 PEF, at 4, 21.

The findings in the Report are overstated and the estimates of leakage from the lagoons do not match the operating experience and data at the WPCF. Major comments are provided below:

The assumption made for nitrogen loading is unreasonably high and without support. The Report estimates that this load would be the equivalent that generated by 1,965 homes on septic systems. This is larger than the number of homes in Marion cited in the Report as 1,700 single family homes from the 2005-2009 census. Given that less than half of all the homes in Marion are connected to the public sewerage system, the nitrogen load is over estimated. It is also approaching the total influent nitrogen load to the plant, and therefore does not consider the fact that the plant provides a high level of nitrogen removal. Under this report's assumptions, Marion is actually creating far more nitrogen than it is receiving.

Response 22:
The principal conclusion that EPA has drawn from the Horsley Witten report is that groundwater near the lagoons is contaminated with excess levels of nitrogen, based on actual groundwater measurements of nitrogen. EPA acknowledges that there is uncertainty associated with attempts to quantify the volume and nitrogen concentration of sewerage exfiltrating from the unlined lagoons. While the analysis included in the comment ignores the effect of precipitation on lagoon volumes, EPA concurs that the leakage rate estimate of 1 inch per day is likely higher than actual leakage rates. However, EPA also notes that the Horsley Witten report assumes a relatively low total nitrogen concentration of 20 mg/L for sewerage exfiltrating the lagoons compared to a more typical value for sewerage of 35 mg/L. EPA explicitly recognized that the magnitude of nitrogen loading cited by the Horsley Witten report was a rough estimate and discussed the uncertainty associated with this loading estimate in the Fact Sheet.

However, regardless of the amount of nitrogen exfiltrating the unlined lagoons, continuing to discharge untreated wastewater and sludge into unlined lagoons is not an acceptable option. The requirement to line or abandon the lagoons does not turn on a precise quantification of the magnitude of nitrogen loading from the lagoons. As EPA noted in the Fact Sheet to the Draft Permit: "[T]he results of the loading analysis would be similar if the actual lagoon loading were one half of the Horsley Witten estimate." FS at 19.

Section 405 of the Clean Water Act provides EPA with the authority to regulate use and disposal of biosolids, which authority the agency may implement via a NPDES permit. *See also* 40 CFR § 503.3(a). Further, section 402(a)(2) of the Act may be used to impose conditions in a permit that are designed to effectuate the requirements of § 405. In addition, EPA has independent authority under § 402(a)(2) to prescribe permit requirements that will assure compliance with the requirements of section 402(a)(1) "as [the EPA Administrator] deems appropriate." The Supreme Court has described section 402(a)(2) as providing the Administrator with "broad discretion to establish conditions for NPDES permits." *Arkansas v. Oklahoma*, 503 U.S. 91, 105 (1992) (citing 33 U.S.C. § 1342(a)(2)).

Disposal of pollutant rich sludge and untreated wastewater in unlined lagoons is not proper operations and maintenance of the treatment plant. Federal regulations require all NPDES permits to include certain standard conditions, including with respect to the duty to mitigate and proper operation and maintenance of the treatment works:

> *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.*
>
> *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 and with the requirements of storm water pollution prevention plans.*

40 CFR § 122.41(d), (e). The lagoon system at the Marion WPCF is covered by these standard provisions.[10] EPA has determined that the use of unlined lagoons for flow equalization and sludge disposal is not in compliance with the operation and maintenance requirements of 40 CFR § 122.41(e).

Additionally, the regulations pertaining to sludge disposal provide that, "[o]n a case-by case basis, the permitting authority may impose requirements for the use or disposal of sewage sludge in addition to or more stringent than the requirements in this part when necessary to protect public health and the environment from any adverse effect of a pollutant in the sewage sludge." *Id.* § 503.5; *see also* 58 Fed. Reg. at 9248, 9359 (Feb. 19, 1993) (Permits issued to POTWs "may include conditions related to any aspect of sewage sludge management developed on a case-by-case basis where the permitting authority determines that such conditions are necessary to protect public health and the environment. For example, [Part 503] does not establish standards for temporary storage of sewage sludge. The permitting authority may develop permit requirements to address potential problems at temporary storage facilities such as contamination of surface water or ground water . . . .").

Comment 23. Boron as Wastewater Indicator

The report uses boron as an indicator of human wastewater stating the boron indicates the presence of detergents. Two of the surface water sampling locations (HGSW1 and HGSW2) are located on Effluent Brook, a stream whose flow is dominated by treated wastewater effluent from the Marion plant. The boron concentrations in four of the six samples at these locations were not detected. Further, a detailed study by Dr. Robert Pitt (no date) of the University of Alabama of chemical indicators of wastewater found that "boron was "a poor indicator of sewage possible due to changes in modern laundry detergents' formulations."

The report states that boron concentrations occur in nature at very low levels (0.02 mg/L) and "any concentrations greater than this typically represents the presence of detergents found in

[10] The lagoon system is subject to NPDES regulation as part of the "treatment works." Section 212(2)(A) of the Act defines treatment works to mean, *inter alia*, "intercepting sewers, outfall sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances." POTW also "includes *any* devices and systems used in the *storage*, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature." 40 CFR § 403.3(q) (emphases added).

wastewater.” The detection limit for the boron analysis appears to be 0.05 mg/L, which is higher than typical background concentrations. This high detection limit does not allow for the typical background concentration in Marion to be determined. Also, the results of analytical measurements are generally less reliable when concentrations are measured near detection limits, with a factor of five times the detection limit indicating a level where confidence in measurements increase. All but one boron result detected above five times the detection limit is within this range of increased uncertainty about the magnitude of the result.

Response 23:
Boron is widely used by scientists to indicate wastewater contamination of groundwater, including Pitt, who wrote in 1998 that “[o]ur research found that boron and detergents can be used to distinguish the clean waters from the dirty waters.” The USGS (2008) also used boron to study groundwater contamination from on-site sewage systems in South Dakota.

Notwithstanding the contention that boron is a poor indicator of wastewater, the presence or absence of boron is not the determining factor that EPA used to determine whether the lagoons may be exfiltrating. More concerning to EPA are the high levels of total nitrogen measured in groundwater monitoring wells adjacent to the lagoons.

Regarding the detection level for boron, while it may have been informative to determine the background concentration of boron in the local groundwater, EPA fails to see why the lack of this information invalidates the lagoon study. Similarly, the contention of a vague and uncited “range of increased uncertainty” is unconvincing. Data within this range are routinely used in scientific research and regulatory decision making. Finally, the boron results are but one line of evidence among many that the lagoons are exfiltrating nitrogen-laden groundwater. Nitrogen levels in the groundwater adjacent to the lagoons are several times greater than natural levels, and the only plausible sources are the lagoons themselves.

Comment 24. Groundwater
Water table map – The water table map provided in Figure 3 within the report does not account for all the surface water features of the site, such as the portion of the brook south of staff gauge location HWSG5. As shown in the cross section in Figure 5 within the report, the stream is conceptualized as a full penetrating stream meaning the groundwater from the treatment plant site will discharge there. Without further information it is reasonable to assume this would also be the case for the upgradient portion of the stream.

Response 24:
The commenter seems to be implying that the brook south of HWSG5 would intercept groundwater and convey it to a location outside the Aucoot Cove drainage area. EPA notes that in this area, the direction of groundwater flow is away from Aucoot Cove and toward the Sippican/Weweantic River and would not reach Aucoot Cove anyway. Even if this were an error in the groundwater map, and it is unclear that it is an error, it would make no difference to the conclusion of the study that nitrogen from the lagoons is reaching groundwater.

Comment 25. Distribution of groundwater flow

Figure 4 in the Report uses water table contours to define the proportion of groundwater flow is assumed to reach major surface water resources. This approximation does not account for interception of groundwater by streams and wetlands nor potential differences in aquifer properties that would cause flow to be distributed differently.

The head measured at monitoring HWMW 4, where higher TN concentrations are found is actually 3 feet lower than the head measured at HWMW 6, which is 300 feet east of the nearest lagoon. The head at well 5, where TN concentrations of 1.1 mg/L or less do not indicate significant lagoon leakage, is also approximately 3 feet higher than the head at HWMW 4. Hence, the data do not indicate that the quantity of lagoon leakage is significant enough to create a groundwater mound, something that would be anticipated if the lagoons were indeed leaking significant quantities of water (understanding that a detailed hydrogeologic report on the area has not been prepared to understand local geology). The lagoons are located near a natural topographic high in the area and it would not be unreasonable to expect that water table to have a correspondingly high local elevation. Nonetheless, the water table maps in the Report (Figures 3 and 4 interpret the groundwater high as being located to the south southeast of the lagoons. This result is unexpected given the Report's assumption that the lagoons leak one inch per day (or 365 inches per year). If this quantity of water were leaking from the lagoons the water table would surely reflect it, and the local high point would not be located south southeast [sic]quantity of leakage from the lagoons cannot therefore be significantly greater than natural groundwater recharge in the area (which would likely be in the range of 10 to 20 inches/year), all other things being equal.

Water level data provided in the Report indicate discharge of groundwater into the stream associated with HWSG 5a. In general, it is reasonable to assume that a very substantial portion of shallow groundwater in the vicinity of the lagoons discharges to streams, wetlands, or ponds before reaching the shore. Hence, most of the shallow groundwater in the vicinity of the lagoons is probably not reaching the shore as groundwater, and the average travel time is probably much less than suggested within the Report. Residence time in streams, ponds and wetlands provides opportunity for attenuation of nitrogen through denitrification.

The report travel times calculated in the report do not account for the interception of groundwater flow by the many surface water features (streams and wetlands) present in the project area.

Groundwater flow that is intercepted by surface water features will undergo some nitrogen attenuation through denitrification in stream bottoms and wetlands reducing the amount of nitrogen discharges to surface water. Estimates of attenuation from studies in southeastern Massachusetts generally range from 50 to 60 percent (a detailed analysis of nitrogen loads to the Agawam River in the adjacent Town of Wareham suggested the removal of nitrogen in freshwater ponds and streams was 53 to 61 percent). Studies of denitrification in ponds by the Massachusetts Estuaries Project have found a range of values. In Falmouth, MEP sampling found that the nitrogen load attenuation ranged between 26 and 69% (MEP, 2005), whereas in

Namskaket Creek in Nantucket sampling found the nitrogen load attenuation ranged between 50 and 82% (MEP, 2007).

Response 25:
Both leakage from the lagoons that migrates to Aucoot Cove via groundwater or leakage that migrates to Aucoot Cove via streams would contribute to Aucoot Cove's impairment. As noted in responses above, the magnitude and travel time of nitrogen leaching from the lagoons are less important than the established fact that the leaching is occurring and is affecting groundwater levels of nitrogen.

There are not enough data available to estimate how much groundwater flow is intercepted by surface waters and nitrogen attenuation is highly variable and site specific. This reasonably conservative assumption that nitrogen attenuation is zero is balanced by the areal loading model used in the Fact Sheet, which yielded a negative nitrogen allocation to Outfall 001 if the lagoons were not addressed. See Response 22 above relative to the uncertainty of estimating nitrogen loads to Aucoot Cove from the unlined lagoons as well as the uncertainty of estimating other nonpoint source loadings of nitrogen to Aucoot Cove.

Comment 26. Plume of nitrogen
Page 9 of the report mentions that even if seepage from the lagoons was stopped "the plume underneath the sewage lagoons would continue to migrate" to surface waters for many years to come. The report does not demonstrate that there is a "plume" of nitrogen emanating from the Marion lagoons.

The data show that HWMW 2, 4 and 8, all of which are located adjacent to the lagoons are the only wells with concentrations greater than 3 mg/L total nitrogen. This concentration – 3 mg/L total nitrogen – is at the low end of effluent discharge limits (3 to 7 mg/L total nitrogen) given to the advanced wastewater treatment plants discharging to sensitive waters.

Elevated TN concentrations (up to 10 mg/L) observed at monitoring wells HWMW 4 and 8 immediately adjacent to the lagoons is consistent with downward seepage of wastewater from the lagoons to the groundwater. Elevated TN concentrations (up to 5 mg/L) at monitoring well HWMW2 approximately 500 feet north of the lagoons, adjacent to the treatment plant, could be the result of downgradient transport of groundwater impacted by lagoon seepage. HWMW 2 is downgradient of the lagoons, with a head approximately 5 feet lower than the groundwater head at HWMW 4 and 8 near the lagoons.

In contrast to monitoring wells 4 and 8, however, TN concentrations at HWMW5, also immediately adjacent to the lagoons but on the southeast side of Lagoon 2, have been 1 mg/L or less. There appears to be no significant leakage of wastewater near this well. Other monitoring wells sampling groundwater potentially tributary to Aucoot Cove, HWMW 3, 6 and 7, all have had measured TN concentrations less than 1.5 mg/L. Hence, there is no data indicating the presence of a significant TN groundwater plume migrating towards Aucoot Cove.

While sampling and analysis of groundwater at a few monitoring wells indicates elevated TN consistent with some downward leakage from the lagoons, the water level data do not indicate the presence of a groundwater mound at these locations. Therefore, as described below, the rate of leakage is likely much less than estimated in the 2011 Report. Further, there is no data indicating the presence of a significant TN groundwater plume migrating towards Aucoot Cove. This evidence suggests that any nitrogen contribution from the lagoons to groundwater is at best overstated.

Given the substantive issues associated with the Horsley Witten's characterization of the potential groundwater flow from the lagoons to Aucoot Cove, we request that EPA remove the discussion of the Horsley Witten report from the Draft Permit. The numerous logical and scientific shortcomings of the report call into question the validity of using the results as the basis for establishing conditions for the WPCF's permit. As this analysis formed the basis for EPA's concerns regarding lagoon operations and the report plainly has no credible scientific basis, further requirements related to this issue should cease.

Response 26:
The comment acknowledges that nitrogen-laden water is indeed seeping from the lagoons to the groundwater. As such, the lagoons are required to be properly operated and maintained by being closed or lined independent of any estimate of how much nitrogen is reaching Aucoot Cove. While there is uncertainty associated with the exact direction of groundwater flow from the entire 20-acre lagoon area, all nitrogen from the lagoons will reach a surface water and may have a detrimental effect on that surface water.

TOTAL PHOSPHORUS

Comment 27. Total Phosphorus Limit
Similar to the objections noted above with respect to nitrogen limitations, the need for a limit on phosphorus has not been demonstrated, no support for the same exists beyond generalized observations and, accordingly, this requirement should be removed from the permit. No measurements are presented for levels of algae or other parameters that would indicate an impairment to an existing or designated use as required under the Commonwealth of Massachusetts's (Commonwealth) narrative nutrient criteria. Furthermore, we note that all streams can have periphyton, and its presence does not mean that a nutrient impact is occurring. Periphyton can grow well with a total phosphorus concentration of 10 μg/l, and natural conditions likely exceed this level (Smith *et al.*, 2003; Chapra, 2014b).

Response 27:
When EPA finds that a there is reasonable potential for an excursion from water quality standards from phosphorus in a discharge, it is required to set a protective limit. EPA based the phosphorus limit on effluent data submitted by the permittee and the well-documented fact that the stream has no flow during 7Q10 conditions. EPA did not base its reasonable potential analysis solely on the presence of periphyton. While some level of periphyton growth is normal in almost all rivers, the presence of filamentous algae, on the other hand, is a well understood indication of cultural eutrophication. Filamentous algae form stringy "mats" in warm, nutrient

enriched surface waters and are considered a nuisance to other aquatic life and recreation. Evidence of filamentous algae and other indications of cultural eutrophication are documented in the 2007 memorandum “Qualitative benthos assessment upstream and downstream of Marion WWTP discharge”, in which MassDEP evaluated the ecological communities upstream and downstream of the discharge. This report was Appendix A of the Fact Sheet.

Comment 28. Effluent Brook is not impaired

Effluent Brook flows beneath a relatively thick forest canopy causing the brook to be in deep shade resulting in light being the limiting conditions for growth of algae. As shown in **Figure 4**, during a site visit with EPA in late summer 2014, the brook was clear with a sandy bottom and showed no visible signs of eutrophication. In addition, Effluent Brook is not included on the most recent 303D List of Impaired Waters in the Commonwealth.

Response 28:

The commenter is correct that the brook is shaded in most areas, and that this shade reduces the growth of algae and other nuisance vegetation. For this reason, EPA set a limit of 200 μg/L that is consistent with the Highest and Best Practical Treatment requirement of the Massachusetts Surface Water Quality Standards and should also ensure attainment of the narrative nutrient standard. In the absence of the extensive shading of the brook, a limit of 0.1 mg/L would have been imposed.

While it is true that the receiving water is not included on the 303(d) list of Impaired Waters, it is also not included in the lists of waters attaining standards. This situation is common for smaller bodies of water. Moreover, inclusion on a state’s 303(d) list is not a precondition for EPA to set a permit limit. *See* 40 CFR § 122.44(d)(1)(i), (ii); *In re City of Taunton*, NPDES Appeal No. 15-08, slip op. at 39 (EAB May 3, 2016); *see also In re Upper Blackstone Water Pollution Abatement Dist.*, 14 E.A.D. 577, 599 (EAB 2010) (explaining that the NPDES regulations require a “precautionary” approach to determining whether the permit must contain a water quality-based effluent limit for a particular pollutant), *aff’d.* 690 F.3d 9 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2382 (2013).

Even if there were no evidence of exceedances of water quality standards related to total phosphorus — a conclusion with which the Region disagrees— it is well established under EAB precedent and guidance that **EPA does *not* need to wait for water quality violations to occur prior to imposing a protective effluent limitation in an NPDES permit**. The requirement to impose a permit limit is not only premised on a finding that the pollutant discharges “are” at a level that “causes” violation of the applicable water quality standards, but the requirement is also triggered by a finding that the facility's pollutant discharges “may” be at a level that “contributes” to or has the “reasonable potential” to cause a violation. 40 CFR § 122.44(d)(1)(i). The regulation requires water quality-based effluent limits even when there is some degree of uncertainty regarding both the precise pollutant discharge levels and the potential causal effects of those discharges, so long as the record is sufficient to establish that there is a “reasonable potential” for that discharge to cause or contribute to a violation of water quality standards. EPA in the Final Rule Preamble for 40 CFR § 122.44(d)(1) dispels any doubt over the necessity of proving an impairment and causation of that impairment prior to either deriving a numeric instream target to implement a narrative water quality criterion, or imposing a water quality-based effluent limitation to implement that criterion:

> *Several commenters asked if it was necessary to show in-stream impact, or to show adverse effects on human health before invoking [§122.44(d)(1)(vi)] as a basis for establishing water quality-based limits on a pollutant of concern. It is not necessary to show adverse effects on aquatic life or human health to invoke this paragraph []. The CWA does not require such a demonstration and it is EPA's position that it is not necessary to demonstrate such effects before establishing limits on a pollutant of concern.*

54 Fed. Reg. 23,868, 23,878 (June 2, 1989). "Reasonable potential" requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary. *In re Upper Blackstone*, 14 E.A.D. at 599 n.29. The regulations, thus, require a precautionary approach when determining whether the permit must contain a water quality-based effluent limit for a particular pollutant. *Id.* at 599.

See Response 30.

Comment 29. MassDEP Macroinvertebrate Study
In 2007, the Massachusetts Department of Environmental Protection (MassDEP) conducted a macroinvertebrate sampling program of the brook and found organisms upstream and downstream of the discharge point were comparable, indicating that the effluent discharge itself is not causing an impairment (MassDEP, 2007). The assemblages in all locations indicated those of a pollution tolerant community. This type of rapid bioassessment protocol is usually aimed at determining if there is evidence of eutrophication in the stream, which is not the case in Effluent Brook; conditions such as low dissolved oxygen (DO) levels and prolific algal growth are not present. Thus, the cause of the pollution tolerant assemblages is likely the stress on the organisms due to the intermittent nature of the stream itself; this is a natural condition as the stream is ephemeral with little or no flow regularly occurring during the summer months. Under dry conditions, there is no water in the brook upstream of the discharge and the treated effluent is the only source of water. Since the WPCF operates as a batch reactor with 10 cycles per day and utilizes a downstream flow equalization tank, the Town of Marion's (Town) process engineer estimates that flow may discharge from the current outfall pipe only about 50% of time under the low flow conditions of summer and early fall. Indeed, lack of streamflow is a well-recognized cause and condition of impairment of macroinvertebrate community structure (e.g., NJ DEP's Ambient Biomonitoring Network Generalized Executive Summary). Fritz and Dodds (2004) studied the effects of drying cycles (and floods) on macroinvertebrate assemblages and found significant impacts relative to pre-drying assemblages. As an example, a 2-month drying period reduced species richness by half. While not directly analogous to the more frequent wetting/drying that occurs in Effluent Brook during the summer, studies such as these show that stress tolerant organisms should be expected to be the normal condition in streams with naturally dry periods.

The discharge of plant effluent could be seen as enhancing the habitat in Effluent Brook, which is otherwise ephemeral. This hypothesis was supported by the conclusions of the MassDEP macroinvertebrate study which indicated: “It is possible that the discharge is actually improving conditions for benthic macroinvertebrates by increasing flow within Effluent Brook (e.g., creating riffle habitats).”

The claim that nutrients are causing adverse impacts in Effluent Brook is inconsistent with the available studies. There is no evidence that phosphorus is limiting any form of plant growth in this system nor affecting the macroinvertebrate community nor is there information indicating that a narrative criteria violation is occurring due to the TP discharge (a prerequisite for triggering limitations under 40 CFR 122.44(d).

Response 29:
Intermittent streams are common features of the New England landscape and are not, as the commenter implies, inferior versions of their permanent counterparts. Animals and plants inhabiting these temporary aquatic habitats are well-adapted to those conditions and do not require artificial habitat enhancement. To say that addition of sewage effluent to an intermittent stream constitutes an improvement indicates a basic misunderstanding of ecology.

The commenter dismisses the results of the 2007 MassDEP memorandum, “Qualitative benthos assessment upstream and downstream of Marion WWTP discharge”, which revealed an impaired macroinvertebrate community, because low DO and “prolific” algae have, according to the commenter, not been observed. On the contrary, the biological study notes that “[p]rolific growth of green algae was observed at all biomonitoring stations, with the community comprised of mainly filamentous forms of green algae and diatoms.” See Fact Sheet, Appendix A at 2. Photos from the biological study clearly show abundant aquatic plant growth immediately downstream of the discharge (see Figure 1).

While permit issuers are only required to determine whether a given point source discharge “cause[s], ha[s] the reasonable potential to cause, or contribute[s] to an excursion above” the narrative or numeric criteria set forth in state water quality standards, 40 C.F.R. § 122.44(d)(1)(i), in this case there is an actual documented impairment as evidenced by the algal growth.

EPA acknowledges that in many parts of the receiving water, plant growth may be limited by shading rather than by phosphorus. For this reason, EPA proposed a total phosphorus limit of 200 µg/L (0.2 mg/L) during the summer months rather than 0.1 mg/L, which would generally apply in streams without available dilution such as the receiving water. Also, the final permit includes an option to relocate the outfall to the estuarine portion of Aucoot Cove to avoid the need for a phosphorus limit.

Comment 30. Gold Book Criteria
Ignoring all these lines of evidence for a lack of impairment, EPA instead relied on nutrient guideline concentrations from the Gold Book because (Page 25 of the Fact Sheet) “its effects based approach … is more directly associated with an impairment to a designated use (e.g. fishing). The effects-based approach provides a threshold value above which water quality

impairments are likely to occur." Further, EPA justifies increasing the Gold Book threshold value for exactly the same reasons that there is no demonstrated impairment of a narrative nutrient criteria (i.e., sandy bottom, canopy shading making light – and not phosphorus – the limit variable in algal growth, EPA's own field observations of "minor amounts of aquatic plant and algal growth"). The simple presence of phosphorus in a receiving water without any evidence of impact is an entirely insufficient and unfounded reason for including a permit limit for total phosphorus. EPA's argument seems to be that because concentrations are above a "threshold" value, there simply must be an impairment that, however, is precisely what the Gold Book criteria states is NOT true.

The Gold Book discusses the need to regulate phosphate phosphorus for eutrophication in some situations but specifically states that "a total phosphorus criterion to control nuisance aquatic growths is not presented". Therefore, claiming that the Gold Book created nutrient criteria that should be presumed applicable in this instance, in accordance with 40 CFR 122.44(d), is plainly in error. While the Gold Book *suggests* TP criteria of 100 µg/L may be appropriate for some streams, the Gold Book observes also that "there may be waterways wherein higher concentrations or loadings of total phosphorus do not produce eutrophy […]". Such conditions are influenced by natural confounding factors such as "naturally occurring phenomena [which] may limit the development of plant nuisances", "natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis", "morphometric features of steep banks, great depth, and substantial flows [which] contribute to a history of no plant problems", and "nutrient[s] other than phosphorus […] limiting plant growth". The Gold Book specifically indicates the need to consider such site-specific factors, not that such factors or lack of response be ignored in setting nutrient limitations for phosphorus. The phosphate phosphorus discussion ends with a reiteration that "no national criterion is presented for phosphate phosphorus for the control of eutrophication."

As noted earlier, implementing a requirement inconsistent with the very recommendations and limitations presented in the expert report is, *per se*, arbitrary and capricious. As EPA's reference document specifically notes that TP does not cause uniform impacts in streams and site-specific response should control decision making, EPA decision to include TP reductions even where an adverse stream response is not found is not a defensible action.

Response 30:
In the course of determining the trophic status of the receiving water and deriving a protective phosphorus effluent limit that would meet the narrative phosphorus criterion, the Region looked to a variety of sources, including the Gold Book, Ecoregional Nutrient Criteria (*Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, December 2000*) and Nutrient Criteria Guidance (*Nutrient Criteria Technical Guidance Manual: Rivers and Streams, July 2000)*. These constitute information published under CWA § 304(a) and were used as *guidance* to interpret the State's narrative criterion for nutrients and not as substitutes for state water quality criteria. The Region's use of the Gold Book and other relevant materials published under Section 304(a) to develop a numeric phosphorus limit sufficiently stringent to achieve the narrative nutrient criterion is consistent

with applicable NPDES regulations. When deriving a numeric limit to implement a narrative water quality criterion, EPA is authorized (40 CFR §122.44(d)(1)(vi)(B)) to "[e]stablish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under Section 304(a) of the CWA, supplemented where necessary by other relevant information."

EPA recognizes that the Gold Book does not contain a phosphorus criterion *per se*, but instead presents a "rationale to support such a criterion." Gold Book at 240. The guidance document goes on to recommend in-stream phosphorus concentrations of 0.05 mg/L in any stream entering a lake or reservoir, 0.1 mg/L for any stream not discharging directly to lakes or impoundments, and 0.025 mg/L within the lake or reservoir.

The commenter references a statement in the Gold Book that indicates that, at the time of the Gold Book's publication, there was more data to support the establishment of a limiting phosphorus level in lakes than in streams or rivers. Much more recent data and criteria guidance published under Section 304(a) of the CWA reinforces the Gold Book recommendations related to streams and rivers.

The more recent Nutrient Criteria Guidance document, as well as the Ecoregional Nutrient Criteria, indicate that instream phosphorus concentrations need to be less than 100 μg/L (0.1 mg/L) in order to control cultural eutrophication. The Nutrient Criteria Guidance document cites a range from 10-90 μg/L to control periphyton and from 35-70 μg/L to control plankton (see Table 4 on page 101). The Ecoregional Nutrient Criteria document outlines so-called "reference" conditions in waters within specific ecoregions across the country, which are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. Marion is in Ecoregion XIV, *Eastern Coastal Plain*. Recommended criteria for this ecoregion is a total phosphorus criterion of 24 μg/L.

The commenter cites factors that the Gold Book indicates can reduce the threat of eutrophication. Contrary to the commenter's assertion, EPA did consider site-specific factors in the unnamed brook that could limit the effects of phosphorus loading. See Fact Sheet at 25. Shading by tree cover is one example of "naturally occurring phenomena [which] may limit the development of plant nuisances." It is possible that "natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis" affects plant growth in the brook given the tannic colored water that is frequently present upstream of the outfall. Downstream of the outfall, however, the Marion WPCF effluent dominates, and the brook color is clear. Therefore, EPA did not consider naturally-occurring tannins as a factor mitigating plant growth. Morphometric and flow characteristics were considered but did not appear remarkable.

See also Response 28.

Comment 31. Proposed Limitations Will Have No Effect on Plant Growth
EPA created a technology based limit of 0.2 mg/L total phosphorus stating that EPA "believes this limit will ensure attainment of the narrative nutrient criteria applicable to this particular receiving stream." This logic disregards the actual site-specific conditions of Effluent Brook, which has long had much higher concentrations than 0.2 mg/L without experiencing a documented impairment due to Marion's discharge. Lacking an actual demonstration of an

impairment, phosphorus limits should be removed from the permit. Moreover, as repeatedly confirmed by leading experts, a concentration of 0.2 mg/L TP, instream, will control nothing (Chapra, 2014b; Hall and Hall, 2009). Thus, assuming that there was some need to control plant growth, the selected water quality target will be thoroughly inadequate for ensuring narrative criteria compliance. Fortunately, it is not needed under the circumstances.

Response 31:
The commenter argues that TP concentrations in the brook have been over 200 µg/L without negative effects. EPA disputes this claim. While EPA agrees that total phosphorus in the brook exceeds 200 µg/L virtually year-round, as shown by the Horsley Witten Study, it is also clear that phosphorus is present in the effluent at a level that will cause, has the reasonable potential to cause, or contributes to a violation of water quality standards, as explained in Responses 28 and 29. Of the two "leading experts" cited, only one (Chapra) is recognized as having expertise in water quality and water quality modeling. The Chapra 2014 paper makes no conclusions about which levels, if any, at which total phosphorus may be limiting. Moreover, the paper states that its model "would not be appropriate for systems with highly non-steady hydraulics …or where biotic activity is transient", such as intermittent streams like the receiving water. However, if the commenter is correct that the currently proposed phosphorus effluent limitation of 200 µg/L would not be protective, a more stringent phosphorus limit may be included in a future permit action.

Comment 32. Mechanistic Model
An alternative methodology of setting a site-specific total phosphorus (TP) limit that is protective of aquatic life and will not cause excess periphyton growth is described by Chapra *et al.* (2014b). In this study, the authors developed and applied a mechanistic model of a point source discharge to a stream. This methodology is suggested to be an excellent "screening tool for assessing individual point sources" and as "the basis for establishing nutrient criteria." The Town notes that this is a more robust and scientifically defensible mechanism for establishing a numeric nutrient criteria within Effluent Brook as it takes into account site-specific characteristics of Effluent Brook. The use of such a model will allow the selection of a numeric nutrient criteria protective of designated uses within the stream but not overly protective so as to require significant treatment upgrades without a significant environmental benefit.

Response 32:
The data to support such a modeling effort is not available. The desire for more study is not sufficient reason to delay implementation of water quality-based effluent limits. To the contrary, EPA is obligated to establish effluent limitations necessary to achieve water quality standards where it finds that a pollutant is "or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." 40 CFR § 122.44(d)(1)(1); *see also* *Upper Blackstone Water Pollution Abatement Dist. v. United States EPA*, 690 F.3d 9, 22 (1st Cir. 2012) (explaining that "neither the CWA nor EPA regulations permit the EPA to delay issuance of a new permit indefinitely until better science can be developed").

Comment 33. Limit is not low enough to control periphyton
Some of the issues surrounding setting TP effluent limits in flowing streams as a means to control periphyton and algae growth are illustrated by numerous case studies. Hall and Hall (2009) examined several recent TMDL studies where TP limits were set for point sources. In Pennsylvania, a TMDL was set based on a generic regression analysis to set an endpoint TP estimate of 0.20 mg/L in effluent dominated streams. Data show that the algae growing in this stream could thrive "even in the cleanest of waters," and the generic regression did not match site-specific data linking chlorophyll-*a* and TP concentrations. The 0.2 mg/L total phosphorus level was not effective at limiting algae growth to target levels, which the authors note is not surprising because "the regression factor indicated that over 80 percent of the variability in periphyton biomass was attributed to factors *unrelated* to nutrient concentration." In yet another example, in the Jackson River in Virginia, a TMDL was developed based on a regression between total dissolved phosphorus and periphyton biomass. Following the implementation of the TMDL, in-stream TP averaged about 0.02 mg/L, but "there was *no* material change in the periphyton biomass between 2001 and 2006 (Hall and Hall, 2009). This suggests that other factors control periphyton and algal productivity within streams, and setting a stringent phosphorus limit to below natural background conditions may not have any effect whatsoever on growth in the stream.

Response 33:
EPA does not need to demonstrate that phosphorus is the only cause, or even the primary cause, before imposing an effluent limit. An effluent limit may still be required if the pollutant contributes to an exceedance of water quality standards. *See also* Upper Blackstone Water Pollution Abatement Dist. v. United States EPA, 690 F.3d 9, 33 (1st Cir. 2012) (rejecting the claim that "the EPA must show that the new limits, in and of themselves, will cure any water quality problem"). The average discharge concentration of phosphorus is currently 1.6 mg/L, or eight times the receiving water level that is consistent with achieving water quality standards, and the receiving water provides minimal effective dilution.

The commenter points to case studies presented in Hall and Hall, 2009 to support the contention that an effluent limit of 200 μg/L will have no effect on periphyton growth. This is an opinion submission in a business periodical, and EPA does not consider the source to be valid in a scientific context. EPA does not dispute the fact that phosphorus is not the only factor involved in the degree of cultural eutrophication in a particular water body. In any event, vague references to TMDLs developed for other waterbodies do not provide a convincing argument that controlling phosphorus will not have a beneficial impact on the documented algal growth in this receiving water.

It is well-documented that nutrient removal by POTWs decreases algal growth in receiving waters. The commenter cites Chapra *et al* 2014 in its argument that nutrient reductions will have no effect. They ignore, however, Chapra *et al*'s discussion (see page 6) of four cases where treatment plant upgrades reduced periphyton biomass downstream of the discharge.

Chapra *et al*'s thesis is that the effect of nutrient reductions fades as one moves downstream, outside of what they term the "wastewater response region," extending several miles downstream of a discharge. This argument does not pertain to the unnamed brook (referred to in comments as "Effluent Brook") because, at only about 2 miles long and effluent-dominated; the entire stream is in the "wastewater response region."

Comment 34. TP Compliance Schedule
Footnote 9 (Page 4 of the Draft Permit) references the compliance schedule for meeting the proposed phosphorus limit and establishes an interim limit from April to October of 1 mg/L. The logic provided in the Fact Sheet for the duration of the compliance schedule is flawed. The schedule assumes that the only WPCF upgrade needed to meet the proposed total phosphorus limit is the addition of chemical storage and dosing facilities. EPA believes 24 months allows sufficient time to evaluate**,** jar test, and pilot these facilities. Additional upgrades will be needed to meet this limit and include: rapid-mix facilities (potentially, if testing indicates rapid mixing is required), some modification to the filters themselves, and new sludge handling facilities. The need for the sludge handling facilities arises because use of a chemical for phosphorus precipitation will create a chemically-laden (non-biodegradable) sludge that will need to be processed on site and held for off-site disposal.

Response 34:
Because the addition of chemicals will likely be required to comply with the phosphorus limits, implementation of the limits before new sludge handling procedures are in place may impose a logistical problem relative to sludge handling capacity and/or sludge disposal. Therefore, EPA has changed the phosphorus compliance schedule to allow more time to address sludge handling concerns. The final permit requires compliance with the phosphorus limit within 42 months of the effective date of the permit. The final permit also includes an option for the permittee to relocate its outfall to the estuarine portion Aucoot Cove, which would eliminate the need for an effluent phosphorus limit.

Comment 35. Interim Phosphorus Limit
Phosphorus levels in the treated effluent from September 2010 to August 2014 averaged 1.6 mg/L and ranged from 0.54 to 3.79 mg/L. The current plant, without chemical addition facilities and associated improvements, cannot meet the proposed interim limit of 1 mg/L. Given that the Town will be unable to change its treatment processes to reduce phosphorus levels prior to constructing any upgrades, it is completely unreasonable to select an interim limit of 1 mg/L knowing that this limit could cause the discharge to be immediately out of compliance with the permit. No rationale is provided in the Fact Sheet for imposing any interim limit, nor for selecting an interim limit of any magnitude (not less one greater than the current average discharge concentration). As there is no demonstrated impairment in Effluent Brook (See **Figure 2** above), there should be no interim limit in the permit and the Town requests that EPA remove the same.

Response 35:
On further examination, EPA agrees that the Marion WPCF would be unable to meet a 1 mg/L interim phosphorus limit without significant upgrades. Therefore, the interim phosphorus limit has been removed and replaced with a report-only requirement. The final limit of 200 µg/L from

May through October remains in place and will go into effect 42 months after the effective date of the permit, if the Town chooses not to relocate the outfall to Aucoot Cove.

Comment 36. Winter Phosphorus Limit
The Draft Permit cites a winter (November 1 – March 31) total phosphorus limit of 1 mg/L. In contrast to the summer limit of 0.2 mg/L, there is no stated basis for imposing this wintertime limit or any analysis showing that TP reduction is required in the winter to meet state narrative criteria as mandated by 40 CFR 122.44(d). This period is associated with low algal productivity, and it is not necessary to limit phosphorus in order to prevent algae from growing in Effluent Brook. The Town requests EPA remove the winter total phosphorus limit from the permit.

Response 36:
Total phosphorus has separate limits for summer and winter to account for the growing season. During the growing season (i.e. April through October) the phosphorus in the discharge will be taken up by plant and algal biomass in the river system. Therefore, during this period, the effluent limit of 200 μg/L needs to be met to prevent excessive plant and algal growth. The winter period (November through March) limitation on total phosphorus is necessary to ensure that the higher levels of phosphorus discharged in the winter do not result in the accumulation of phosphorus in downstream sediments. The limitation assumes that the vast majority of the phosphorus discharged will be in the dissolved fraction and that dissolved phosphorus will pass through the system during the winter period. However, winter limits are generally imposed where there are downstream impoundments that could act as a sink for the higher levels of phosphorus discharged in the winter period which can then become a source of phosphorus to the water column in the summer growing season. Given the lack of impoundments in this receiving water, EPA has removed the winter phosphorus limit from the final permit and replaced it with a monthly monitoring requirement.

Comment 37. Mass-Based Phosphorus Limit
In the event that EPA somehow fails to modify the permit based on the above comments, at a minimum, the Town requests the concentration limit be removed for the permit and that phosphorous be regulated based on mass. This is certainly appropriate and is consistent with other recent NPDES permits issued for Massachusetts treatment plants.

Response 37:
If EPA were to include a mass-based phosphorus limit, it would be calculated to ensure that downstream effluent concentrations are 200 μg/L or lower in low flow conditions. Because of the lack of dilution, the mass-based limit would be 0.28 lbs/day, equal to the load discharged at 200 μg/L at 0.168 MGD (monthly average flow during August 2016).

Effluent concentrations less than 200 μg/L would be required to meet this mass-based limit during most months, however. For example, if the monthly average effluent flow rate were 0.3 MGD, the phosphorus concentration required to meet a mass-based limit of 0.28 lbs/day would be 111 μg/L. At a flow rate of 0.4 MGD, the required concentration would be 84 μg/L.

EPA also rejected the mass-based limit discussed above because it is unnecessarily stringent. EPA has set the receiving water target phosphorus concentration at 200 μg/L, and due to the lack of dilution, the only way of ensuring that this target is met is to set the effluent concentration to the same level. Consequently, the final permit maintains the concentration limit only.

OTHER PERMIT LIMITS AND CONDITIONS

Comment 38. Nutrient Parameters

As stated in the Fact Sheet, the monitoring for the nitrogen species (other than ammonia) is being done because of eutrophication concerns. As these concerns are only manifested in the summer season, it does not make sense to spend the Town's limited resources to collect this data for nitrogen at a 4-fold increased frequency and phosphorus at 2-fold frequency during the winter season. The Town requests that TKN, nitrate, nitrite, and phosphorus be returned to once a month for the period of October through May.

The Town also requests the analytical result for nitrate and nitrite be allowed to be reported as a combined result (nitrate + nitrite). The goal of nitrogen monitoring is to determine total nitrogen. The combined analytical test achieves this objective and is less costly.

Response 38:

EPA agrees that total nitrogen monitoring is less critical in the winter than in the warm weather months. Therefore, EPA has changed the nitrogen monitoring requirements to once per month from November through March. The phosphorus monitoring requirement from November through March was already once per month in the draft permit, making that request moot.

The nitrogen monitoring requirement has also been changed to allow for the reporting of combined nitrate + nitrite.

Comment 39. Flow

The flow limitation in the permit should be removed or be designated as a "report only" requirement. EPA has long recognized that flow is not a regulated parameter because it is not a "pollutant" and as such should not be included with a limit in the permit. This understanding is reflected in NPDES permits issued all over the Country. The Fact Sheet improperly EPA describes effluent flow as a "non-conventional" pollutant on Page 11 of the Fact Sheet, citing the Clean Water Act (CWA):

> *The term "pollutant" means dredged spoil [sic], solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.*

33 U.S.C. §1362(6)

However, EPA's identification of "non-conventional *pollutants"* as defined in federal rules at 40 C.F.R. § 439.1(n) —does not identify flow as such a parameter – it only identifies "pollutants". In essence, the draft permit is seeking to not only re-write the adopted NPDES rules, it is seeking to re-write the Clean Water Act to regulate flow, regardless of the pollutant levels present – that is simply not permissible as federal courts have repeatedly confirmed. *See, e.g., Iowa League of Cities v. EPA* (8^{th} Cir. 2013).

Response 39:
EPA unintentionally included wastewater effluent flow in the Fact Sheet under Section V.B.4., "Non-Conventional Pollutants;" and EPA acknowledges that it should have been included in its own section which is the normal practice in EPA New England issued permits. Effluent flow rate and the dilution factor calculation normally precede the non-conventional and conventional pollutant discussion because the dilution factor is a key factor in deriving effluent limits. See Responses 40 and 41 for EPA's rationale for including an effluent flow limit in the permit.

Comment 40. Water Flow as a Pollutant
The Town of Marion (Town) disagrees with EPA's assertion that the flow of water is considered a pollutant in 33 U.S.C. §1362(6). Marion's opinion is supported by a US District Court decision in the case Virginia Department of Transportation *et al.* vs. EPA, where the Court decided in favor of Virginia DOT that stormwater cannot be considered a pollutant as a surrogate for sediment load. The Court affirms that there is "no ambiguity in the wording" of 33 U.S.C. §1362(6), stating on Page 9 that "Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL." The Court goes on to state that

> *Claiming that the maximum stormwater load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority.*

Virginia DOT *et al. vs.* EPA, 2013

This decision is applicable to Marion's case in that EPA intends to use "design flow as a reasonable and important worst-case condition," or, in other words, as a surrogate for the load of pollutants to Effluent Brook, when in fact EPA has included for the first time in this Draft Permit load limits for ammonia, total nitrogen, total phosphorus, and total copper. Putting aside the factual validity of EPA's assertion, as with Virginia DOT *et al. vs.* EPA, EPA cannot exceed its statutory authority even if it believes that flow is a reasonable and efficient mechanism for limiting nutrient and other loads to Aucoot Cove.

Response 40:
The final permit includes an effluent flow limit of 0.588 MGD, expressed as an annual average. EPA Region 1 and MassDEP have included effluent flow limits in POTW permits throughout Massachusetts. Moreover, States and other EPA Regions have issued permits with similar conditions in other parts of the country. The inclusion of an effluent flow limit condition in the Marion WPCF permit is authorized by CWA § 402(a)(2), which provides that "[t]he Administrator shall prescribe conditions for such permits to assure compliance with the requirements of" CWA § 402(a)(1) – including, by reference, CWA § 301 - "and such other requirements as he deems appropriate."

Additionally, and as noted in the Fact Sheet, 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). The limitation on wastewater effluent flow is within EPA's authority to condition a permit in order to carry out the objectives of the Act. *See* CWA §§ 402(a)(2), 301(b)(1)(C); 40 C.F.R. §§ 122.4(a) and (d), 122.43, 122.44(d). 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. Failure to restrict wastewater effluent flow could result in an increased loading of individual pollutants, such as pharmaceuticals, endocrine disrupters, etc., which are not currently limited in the permit and which for many of these pollutants, there is no monitoring data.

Additionally, as provided in Part II.B.1 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 facility's wastewater treatment systems as designed includes operating within the facility's design effluent flow. Thus, the permit's wastewater effluent flow limitation is necessary to ensure proper facility operation, which in turn is a requirement applicable to all NPDES permits. *See* 40 CFR § 122.41.

Comment 41. Instream Dilution
Furthermore, EPA justifies the flow limit in the context of instream dilution within Effluent Brook, stating "Should the effluent discharge flow exceed the flow assumed in these calculations, the instream dilution would decrease and the calculated effluent limits would not be protective of WQS." While this observation is true from a mathematical perspective in some situations where dilution of an effluent into a stream is a major consideration, EPA's assertion is not even factually accurate as a general principle given the specific circumstances and structure of the permit. First, EPA states on page 13 of the Fact Sheet that the 7Q10 flow is considered zero. Therefore, EPA's concern about the reduced instream dilution caused by an increased effluent discharge flow is irrelevant to this discussion because there is no mixing available. In addition, if the load limits associated with the Draft Permit are maintained, discharging flow in excess of the proposed limit in the Draft Permit would necessitate lower effluent concentrations which, assuming no dilution, would produce better overall conditions in the receiving water.

Consequently, the Town requests that the flow limit in its permit be deleted, recognizing that EPA does not have the authority to regulate its effluent flow and that the proposed flow limit is not protective of the environment.

Response 41:
As discussed in Section V. of the Fact Sheet, NPDES permits are required to include limitations that ensure the meeting of water quality standards in the receiving water. Specifically, 40 C.F.R. § 122.4 provides that "No permit may be issued . . . [w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States."

In the case of the Marion WPCF, where the receiving water downstream of the discharge under 7Q10 flow conditions is comprised almost entirely of wastewater effluent, it is even more important to limit the quantity of wastewater effluent flow allowed to be discharged. Permit limits are calculated using a dilution factor for the receiving water under 7Q10 flow conditions. This approach is generally considered to address the critical conditions of maximum pollutant impact, where dilution of the discharge is at a minimum. Since at most times receiving water flow is well above the 7Q10, use of the 7Q10 as an assumed flow ensures that exceedances of the water quality criteria will be limited in duration and frequency as assumed in the calculation of the criteria (for example, chronic criteria reflect concentrations to be exceeded less than once every three years for a four-day period), so that the limit is protective.

These effluent dominated receiving waters, where there is essentially no dilution by the receiving water for extended periods of time, represent a challenge in the context of setting water quality-based limits. When there is no significant dilution of the discharge, permit limits must be set that ensure that the discharge itself meets water quality standards. However, where the varying flow of the receiving water is not sufficient to ensure that critical pollutant concentrations are limited in duration and frequency, it is not always clear that average monthly and maximum daily permit limits will be sufficiently protective to meet water quality standards. For most facilities a permit limit based on the ambient criteria values will ensure that concentrations are below the criteria values for most of the year, which should be sufficient to protect the duration and frequency component of the criteria. Increased wastewater effluent flows in already effluent dominated streams can result in stream concentrations being equal to the criteria value with a greater frequency and for longer durations which is not consistent with achieving the magnitude, duration, and frequency components of the criteria. EPA rejects the notion that adding more wastewater effluent volume, even if treatment is improved in order not to increase pollutant loads for certain pollutants that contain limits in the permit, to a receiving water that already consist entirely of wastewater effluent during low flow conditions will somehow result in "better overall conditions in the receiving water."

Secondly, the comment neglects to consider the effluent's effect on Aucoot Cove. While an increase in wastewater discharge effluent would not technically change the dilution factor in the receiving water, increased wastewater effluent flows would increase pollution loading to Aucoot Cove possibly leading to further deterioration in water quality.

For these reasons, the flow limit remains unchanged.

Comment 42. EPA Did Not Account for Dilution and Other Pollutant Sources
Furthermore, on Page 9 of the Fact Sheet, EPA discusses the conditions under which the permit writer can establish the permit level at the criteria level. We note that under 40 C.F.R. § 122.44(d) EPA is required to account for any available dilution as well as other pollutant load sources based on current and reliable information when calculating effluent limitations. EPA did not account for dilution in the marine receiving water while setting the total nitrogen and new bacteria requirements using the relevant averaging period for the criteria that were selected. Furthermore, EPA did not account for the change in total nitrogen level that occurred in the past 7 years when assessing the possible impacts on eelgrass populations, including the "safe" level of TN for eelgrass growth. These are both serious deficiencies that require resolution to ensure that the proper limitations are set.

Response 42:
The comment mischaracterizes both 40 C.F.R. § 122.44(d) and EPA's analysis in this permit proceeding. First, the only reference to dilution in § 122.44(d) is in the context of "determining whether a discharge causes, has the reasonable potential to cause, or contributes to" an exceedance of a water quality standard, 40 CFR § 122.44(d)(1)(ii), not, as the comment asserts, in the context of "calculating effluent limitations." Second, even where dilution is explicitly mentioned in § 122.44(d) with reference to determining reasonable potential, the provision directs the permit writer to account for dilution "where appropriate." *Id*.

In any event, allowing for dilution would not be in compliance with the Final Pathogen TMDL for the Buzzards Bay Watershed, approved in 2009.[11] The fecal coliform wasteload allocation (WLA) for Class SA Waters with Shellfishing is a monthly geometric mean 14 cfu/100 mL and no more than 10% of samples be equal to or greater than 28 cfu/100 mL. See also Response 72.

Moreover, in reference to total nitrogen, the load per unit area calculation does account for dilution. The nitrogen allocation used to derive the permit limit is averaged over the surface area (i.e. the reference area) that EPA has designated for dilution of effluent nitrogen in Aucoot Cove. The larger the surface area, the larger the dilution. If the nitrogen limit derivation had not accounted for dilution, e.g., if the allowable load per unit area was applied at the most upper part of Aucoot Cove, the calculated allowable TN load would be significantly lower.

In the penultimate sentence of the comment, it is unclear whether the commenter is referring to the "change in total nitrogen level" in the effluent or in Aucoot Cove. Regardless, EPA used current effluent and ambient nitrogen data in its reasonable potential analysis. The time period EPA used for the effluent data was May – October 2011 through 2013, and the ambient data were collected from 2007 through 2012, 2012 being the most recent data year available at the time the Fact Sheet was written.

Comment 43. Dissolved Oxygen Limit
The Draft Permit and Fact Sheet are inconsistent with respect to the timeframe for the seasonal dissolved oxygen (DO) limit. The Draft Permit states that the seasonal dissolved oxygen (DO) limit is in effect from April – October; however, the Fact Sheet (Page 11) states that "The Draft Permit includes a seasonal (June – October) limitation." The Draft Permit should be made consistent with the statement in the Fact Sheet that the seasonal limit be applicable from June 1st to October 31st, which is consistent with provisions in the current permit. It should be noted that given the lower temperatures present in April and May, which naturally increase DO saturation, DO related issues would not be expected to occur in this period.

Response 43:
The inconsistency was unintentional. The final permit contains a dissolved oxygen limit from June 1 through October 31.

[11] Accessed at http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/buzzbay1.pdf

Comment 44. Ambient dissolved oxygen

On Page 17 of the Fact Sheet, EPA cites numerous violations of the 6 mg/L DO criteria at several Buzzards Bay Coalition monitoring locations throughout Aucoot Cove, including station AC1 located in an arm of the cove reaching into the heart of the saltmarsh, presumed on Page 15 of the Fact Sheet to be causally related to algae growth. This conclusion is based upon weekly grab samples taken by Buzzards Bay Coalition volunteers. This data is not sufficient to conclude that:

- DO violations exist,
- Such violations are caused by nutrient loadings from Marion, or
- Any ecological impairment is associated with this condition.

Further, EPA does not state whether the Buzzards Bay Coalition's data program has appropriate QA/QC protocols for its data collection efforts. If these data are not subjected to QA/QC they should not be used to set describe violations of the state dissolved oxygen standard in Aucoot Cove. Examination of the data indicates some low oxygen level found at the surface in the middle of the outer Aucoot Cove, which is a well-flushed embayment. These values are implausible and should result in a detailed assessment of the reliability of all the data. Marion requests that EPA provide the Buzzards Bay Coalition QA/QC procedures and confirm that the data used in its analysis conform to these procedures.

Continuous, diurnal DO is required to show that algae is actually causing the low DO concentrations measured; since only grab samples exist, it is not possible to determine whether the low DO concentrations are linked to excess nitrogen loads to Aucoot Cove. More rigorous monitoring must be performed in order to demonstrate that some form of excessive plant growth is the reason periodic low DO has been encountered in Aucoot Cove before it is possible to tie such conditions to excess nutrient concentrations.

Neither the Clean Water Act (CWA) nor Commonwealth of Massachusetts (Commonwealth) law regulate water quality that is caused by natural conditions (314 CMR 4.03(5). Consequently, such conditions are considered "in compliance" with adopted standards and the CWA. This provision is important as it is probable that whatever DO is occurring in the Cove, it is natural, given the significant tidal flushing that occurs every day in this area. The saltmarsh along the northern inner edge of Aucoot Cove is a likely source of low DO in this region. A saltmarsh is an example of a system that has naturally low dissolved oxygen concentrations. An example of this local to Marion is the Namskaket salt marsh system in Nantucket. This system was studied by Brian Howes and the Massachusetts Estuaries Project (MEP). This analysis found that "the central tidal salt marsh creek of the extensive Namskaket salt marsh system has periodic oxygen depletion to 2 mg/L." The authors note that "salt marshes are nutrient and organic matter enriched as part of their ecological design, which makes them such important nursery areas for adjacent offshore waters; however, a natural consequence of their organic rich sediments is periodic oxygen depletion within the tidal creeks, particularly during the summer." (MEP, 2007). Thus, before EPA can leap to the conclusion that low DO is an excess plant growth, nutrient induced condition, the expected impact of the salt marsh on the DO regime must be investigated.

This sampling approach is straightforward. The natural DO deficit would need to be confirmed through DO sampling throughout the salt marsh to determine whether this is indeed a source of low DO water and in the receiving waters at high, low, and Ebb tides. The Town proposes sampling to establish that the salt marsh is a potential cause of low DO in Aucoot Cove, and would like EPA to recognize that low DO and its total nitrogen discharge may not be casually [sic] related.

Another note relative to the contribution relative to Marion's effluent is related to whether Effluent Brook ever violates DO standards. Effluent Brook is almost entirely comprised of Marion's effluent during dry weather, and no DO violations have been observed (*e.g.*, Horsley Witten, 2011). Thus, during dry weather the DO concentration in stream is representative of the effluent, which is always in compliance with the regulations. How the low DO in Aucoot Cove could manifest itself given this reality is unclear, but certainly does not appear to tie back to the effluent.

In addition, given the well mixed nature of Aucoot Cove, it is impossible that Marion's discharge could cause low DO throughout a wide area or generate the type of excess algal growth that would be needed to alter the DO of such a large volume of water. First, the well flushed bay has significant tidal exchange that refreshes the water volume frequently, limiting the amount of time that oxygen demanding substances can consume oxygen within the embayment or that nutrients could cause phytoplankton growth. Unless such algal growth creates some type of elevated sediment oxygen demand, the means for total nitrogen (TN)-induced low DO is not apparent. Second, there is a low level of oxygen demanding inputs to Aucoot Cove, further limiting the effect of Marion's effluent.

The available information simply does not provide a credible basis for asserting that the Town's effluent is responsible for DO conditions in Aucoot Cove. Simply speculating that the DO was caused by nitrogen inputs is not scientifically defensible. Further investigation, not imposition of effluent limitations, should occur at this point.

Response 44:
Aucoot Cove shows all of the signs of cultural eutrophication consistent with conceptual models for cultural eutrophication in the scientific literature, including elevated levels of nitrogen and chlorophyll (Dennison, et al. 1993), reduced levels of dissolved oxygen (O'Connor, Gallagher and Hallden 1981) (Lowery 1998) (Bricker, et al. 2007), and the loss of eelgrass habitat (Short and Burdick 1996). The gradient of nitrogen concentrations and eelgrass loss is consistent with land-use-based loadings of nitrogen with the most impaired conditions in the inner Aucoot Cove.

Establishment of a water quality-based total nitrogen limit is not dependent upon demonstrating an impairment but rather on the establishment of a reasonable potential to cause or contribute to an impairment. However, in this case the impairment has been well documented both by the fact that it is listed as impaired for nitrogen (total), nutrient/eutrophication biological indicators, and dissolved oxygen on the state's 303d list and by the data presented in the Fact Sheet that is consistent with conceptual models for cultural eutrophication.

EPA notes that in complex systems such as estuaries, DO conditions are affected by several interacting factors and it is generally not the case that algal growth (or any other single condition) is the *only* factor influencing DO concentrations. Nor is it ever possible to establish actual causation to a scientific certainty, as that can be achieved only through controlled experiments that are impossible to conduct in a natural system. Despite these limitations, the consistent pattern of high TN concentration, elevated chlorophyll-a and depleted DO provide strong evidence that the well understood mechanism of nutrient overenrichment is occurring in this system. EPA is not required to indefinitely defer permit limits to await the possibility of better quantifying the extent to which other factors are also contributing to the impairment. Notwithstanding the above, the commenter's focus on DO is somewhat misplaced. The evidence clearly indicates that nitrogen is impairing dissolved oxygen levels; the conceptual models clearly predict that elevated TN levels cause elevated chlorophyll levels and/or macro-algae levels and that those elevated levels affect the DO directly through algal respiration and indirectly through contributing to the sediment oxygen demand. However, it is eelgrass rather than dissolved oxygen that drives the nitrogen limit in this permit. Nitrogen levels necessary to restore and protect eelgrass are significantly lower than nitrogen levels necessary to achieve DO standards. In the absence of DO concerns there would still be a reasonable potential to cause or contribute to eelgrass impairments, the nitrogen level established to be protective of eelgrass would not change, and the load reduction analysis determined to be necessary to achieve the ambient target would not change.

The commenter's point about the Marion discharge not being the cause of DO impairment in Aucoot Cove because DO meets standards in the unnamed brook is similarly misplaced. Consistent with the conceptual models, excess nitrogen would be expected to have the greatest impact on algal growth in the estuarine portion of the receiving water, i.e., in Aucoot Cove versus the unnamed brook, and the data clearly support this.

It is well established that low DO levels are a clear indication of nitrogen pollution. This conclusion has also been reached in other nearby Buzzards Bay estuaries. Specifically, in 2002, a water quality investigation (CDM 2002) of the Wareham River estuary complex for the Town of Wareham clearly made the link between nitrogen and dissolved oxygen. The report concluded that "nitrogen controls at the WPCF would show improvement in the area around the confluence of the Agawam River and Wakinko River estuaries, would improve the algal levels, and increase dissolved oxygen." The findings of this report were later used to set the WPCF nitrogen limit by EPA in the 2003 NPDES permit. Furthermore, the report specifically cites and uses the Buzzards Bay Coalition's dissolved oxygen data.

For more information regarding the Buzzards Bay Coalition's sampling program and QA/QC, please see Response 10.

The connection between nitrogen pollution and dissolved oxygen has been documented in many EPA-approved TMDLs for coastal estuaries in southeastern Massachusetts. These TMDLs specifically state that decreases in dissolved oxygen concentrations that threaten aquatic life are caused by excess nitrogen (for example see West Falmouth Harbor TMDL) (Commonwealth of

Massachusetts 2007). See http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/falmouth.pdf.

Comment 45. Whole Effluent Toxicity Testing
The Town of Marion (Town) water pollution control facility (WPCF) treated effluent has passed its last nine consecutive Whole Effluent Toxicity (WET) tests (over two years). Both the current permit (Page 5) and Draft Permit (Page 5) state that "After submitting one year and a minimum of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements." Marion requests a reduction in the testing frequency to annually be included in this permit renewal recognizing that it has passed nine consecutive WET tests.

Response 45:
Given the compliance record for whole effluent toxicity testing requirements, EPA has reduced the number of species to be tested from two to one. EPA does not, however, concur that annual testing is sufficient. Testing to ensure the discharge is not toxic is already at a low frequency, i.e., quarterly. Only in limited cases, such as small discharges with a large amount of dilution, is annual testing frequency considered adequate. Given the lack of dilution of the discharge in the receiving water, EPA is maintaining the quarterly WET testing requirement with one species, *Ceriodaphnia dubia*, which appears to be more sensitive to toxicity in the effluent than the minnow (*Pimiphales promelas*).

Comment 46. WET Test Timing
There is inconsistency in the Draft Permit (Item 11, Page 5) about the timing for whole effluent toxicity tests, where the text requires tests be performed the second week of February, May, August and November, while the table below requires testing in the second week of March, June, September, and December; note the latter set of months matches the Town's current permit.

The inconsistency notwithstanding, the Town would like to request that testing be changed to January, April, July, and October (or a subset of one or more of these months assuming the Town's request for reducing the testing frequency is granted). The reason for the request is December has proven problematic with the lab given the conflicts with holiday scheduling. In addition, the Town requests that language requiring testing in the second week of the month to be changed to allow testing to take place in the first or third week of the month if any state or federal holiday falls within the second week.

Response 46:
EPA regrets the inconsistency. The WET testing schedule has not changed. However, the final permit will only require that testing take place during the same week each month, which the permittee may choose. Given the flexibility of choosing the week of testing, EPA does not believe it is necessary to allow adjustments in the testing schedule due to holidays.

Comment 47. Alternate Dilution Water
Both the current permit (Pages 5-6) and Draft Permit (Pages 5-6) state that "If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable" the permittee can follow certain procedures to obtain "approval for use of an alternate dilution water." The

receiving stream has proven to be both unreliable and occasionally non-existent. Page 13 of the Fact Sheet notes that "the unnamed brook to which Marion WPCF discharges has minimal or no flow of its own during dry periods," and Page 25 of the Fact Sheet states that "no dilution of the discharge occurs in the unnamed brook." Because EPA has recognized that the stream may be dry during periods of dry weather, the Town requests the Draft Permit include approval for the use of an alternate dilution water.

Response 47:
Due to the absence of flow in the receiving water during certain times of year, Marion WPCF may use alternate dilution water for WET testing. A review of recent WET test reports indicates that Marion has already been using laboratory soft water as dilution water in WET tests. The laboratory runs a control WET test with the receiving water except when the brook is dry and EPA expects that Marion will continue to do this. No change has been made to the final permit as a result of this comment.

Comment 48. Ammonia Limit
The Fact Sheet (Page 13) misstates the ammonia applicable dates of the limits in the current permit. The Fact Sheet states that the average month limit of 1.74 mg/L applies form June 15th to October 15th, when in the current permit the actual dates are June 1st to October 31st. Similarly, the average month limit of 2.6 mg/L is stated as applying from May 1st to June 14th when they actually apply from May 1st to May 31st. The Fact Sheet should be corrected.

Response 48:
The Fact Sheet provides the basis for the draft permit and is not updated with the final permit. However, the administrative record will show this correction. The draft and final permits themselves contain the correct dates and therefore do not need to be revised.

Comment 49. Copper dilution consideration
The Draft Permit contains revised concentration limits and a new mass limit for total copper. The revised concentration limits are based on marine water quality standards and assume no dilution of copper prior to discharge to Aucoot Cove, and no dilution upon reaching marine waters. This logic is flawed on several points as follows:

The Fact Sheet is inconsistent as to whether the dilution is afforded to the discharge to Effluent Brook. At various points it states there is no dilution at 7Q10 conditions and then uses the United State Geological Survey (USGS) StreamStats program to calculate a dilution at 7Q10 conditions. As the permit limits that are being imposed are for saltwater, dilution at 7Q10 conditions is not relevant but rather dilution upon mixing with the receiving water needs to be evaluated.

Response *49*:
The 7Q10 at the point of discharge is zero because under 7Q10 conditions, the receiving water has no flow. Because the brook one mile downstream of the discharge, where it enters Aucoot Cove, has a larger drainage area than it does at the discharge point, it may have flow during 7Q10 conditions. The calculation referenced in the comment is for this location, and its purpose was to determine if other flows in the receiving water provide enough dilution to copper in the discharge to meet marine water quality criteria for copper where the brook enters Aucoot Cove.

The commenter is correct that 7Q10 hydrologic conditions do not apply in marine waters, but rather that "[i]n coastal and marine waters…, the Department will establish extreme hydrologic conditions at which aquatic life criteria must be applied on a case-by-case basis." 314 CMR 4.03(3)(c).

In light of the comments received, EPA has reevaluated the copper limits and revised the limits in the final permit to reflect the limits that were contained in the previous permit. While a mixing zone analysis has not been conducted for Aucoot Cove, given the freshwater dilution available at the mouth of the unnamed brook, minimal additional dilution in Aucoot Cove is necessary to ensure attainment of the marine water criteria applicable to Aucoot Cove.

Comment 50. Copper Background Concentration
As part of the analysis, EPA cites (Table 4 in the Fact Sheet) a series of background concentrations from 2011 to 2013 and uses a median value as part of its analysis. The concentrations in this table show a steady and remarkable decrease in values from 64 to 5 µg/l over time. Such a trend indicates that the median is not going to be a reflective value and instead the data needs to be reviewed to understand why there has been a continuous decrease in concentrations to select a representative value for current conditions.

Response 50:
The commenter is correct that background copper concentrations in the unnamed brook, when there was flow, declined from 2011 through 2013. A review of more recent background data indicates that the background copper concentrations range from 2.74 µg/L to 11.4 µg/L with a median of 4.5 µg/L and no appreciable decreasing or increasing trend, as shown in Table 2, below.

EPA Table 2. Background copper concentrations in the unnamed brook receiving Marion WPCF discharge.

Date	Copper Concentration, µg/L
3/10/2014	2.74
6/9/2014	6.42
9/8/2014	Dry
11/8/2014	11.4
3/9/2015	3.54
6/10/2015	4.75
9/14/2015	10.12
12/7/2015	4.25
3/7/2016	3.96
Median	4.5

Comment 51. Copper in Municipal Effluents is not toxic

Notwithstanding the above discussion about the inappropriate calculations resulting in an overly restrictive permit limit, the Town of Marion (Town) questions the need for a limit at all. Several studies (*e.g.*, Hall *et al.*, 1997) have been conducted showing that copper in municipal effluents is not discharged in toxic form. The Town intends to petition the Commonwealth to allow regulatory relief from the copper permit limit to use the simplified water effects ratio procedure.

Response 51:

MassDEP has developed site-specific water quality criteria in the unnamed brook that are less stringent than the criteria used to derive the limits in the current permit. However, because the discharge enters marine waters at the mouth of the unnamed brook, effluent limits in the permit must be consistent with marine water quality criteria as well. As discussed in Response 49, EPA has revisited the copper limit analysis in light of comments received about mixing and dilution in the cove and has decided to retain the limits from the previous permit.

The commenter references the bioavailability of copper in biologically treated effluents to support its argument that application of the national chronic criterion is too stringent in setting the copper effluent limitation in this permit. Metal bioavailability and toxicity have long been recognized to be a function of water chemistry. The Biotic Ligand Model was developed to incorporate metal speciation and the protective effects of competing cations into predictions of metal bioavailability and toxicity. EPA currently recommends the use of this model or a Water Effects Ratio for determining alternative copper water quality criteria. This model may be used to derive site-specific copper water quality criteria for review and adoption by MassDEP.

If the Town wishes to encourage Massachusetts to develop site-specific copper criteria for Aucoot Cove, then EPA suggests that the Town begin a dialogue with the Massachusetts Department of Environmental Protection on this issue. EPA is happy to provide any guidance and assistance that EPA can if the Commonwealth determines it appropriate to pursue this approach.

In those cases where the state does develop site-specific criteria, Massachusetts regulations require that such an effort be documented and subject to full inter-governmental coordination and public participation. *See* 314 CMR 4.05(5)(e)(4). In addition, federal law requires EPA's review and approval of Massachusetts' development and adoption of site-specific criteria. *See* 40 C.F.R. §§ 131.11(b)(1)(ii), 131.21.

Comment 52. Natural Causes - pH

Item b. The previous permit included the following phrase at the end of sentence "unless these values are exceeded due to natural causes or as a result of the approved treatment processes." This phrase should again be included in the permit.

Response 52:

EPA is no longer including a blanket statement permitting pH exceedances that are "due to natural causes" in POTW permits. That language is vague and on its face would allow excursions from the technology-based secondary treatment pH range of 6.0 to 9.0 s.u. that are not permissible under 40 C.F.R. § 133.102. Rather, individual treatment plants are being considered on a case-by-case basis to determine whether "natural causes" are present that would support a relaxation of the permit range, and if so to determine a specific alternative pH limit for the facility. In doing so, EPA must ensure that the pH limit complies with both the technology-based standard for secondary treatment of 6.0 to 9.0 s.u., and water quality requirements based on the Massachusetts SWQS for pH requiring that the receiving water: "[s]hall be in the range of 6.5 through 8.3 standard units and not more than 0.5 units outside of the natural background range. There shall be no change from natural background conditions that would impair any use assigned to this Class." 314 CMR 4.05(3)(b)(3). In most cases, MassDEP requires a permit range of 6.5 to 8.3 s.u. as a condition of state certification.

In the case of the Marion WPCF, the facility has had no excursions from the pH limit in the past seven years. This indicates an ability to comply with the limit over a range of natural conditions and no basis for expanding the permit limit range. The permit was not changed in this regard.

Comment 53. 80% design flow provision
Item g. This item requires the Town to develop a plan to describe how it will handle increases in flow once the plant exceeds 80 percent of the design flow. Though we recognize that this is "template" language in many NPDES permits, reaching 80 percent of the facility's design flow is not a violation of the Draft Permit, and reaching this value should not trigger a required response by the Town. The Town requests that this provision be removed from the permit.

Response 53:
The 80% design flow provision at Part I.A.1.g is a Massachusetts state certification requirement and provides:

> *If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.*

The intent of this requirement is to proactively ensure that planning is in place when actual flow is approaching permitted flow. This planning is required to ensure the prevention of permit violations. Furthermore, it is within the Region's discretion to include conditions, such as the one referenced, to ensure proper operations and maintenance and to prevent sanitary sewer overflows and other permit violations. *See* CWA § 308(a)(A), 33 U.S.C. § 1318(a)(A) (specifying that permittees must provide records, reports, and other information EPA reasonably requires); CWA § 402(a)(2), 33 U.S.C. § 1342(a)(2) (authorizing permit conditions on data and information collection, reporting, and such other requirements as EPA deems appropriate); *accord In re Town of Concord*, NPDES Appeal No. 13-08, slip op. at 39 (EAB Aug. 28, 2014) ("It is well established that permit writers enjoy broad authority under the CWA and regulations to prescribe municipal data collection and reporting requirements.").

Comment 54. Chlorine
Item h. This item prohibits the use of chlorine. This provision is simply too broad to be included in the permit, and the Town requests it be removed. Bleach is a form of chlorine and this provision would prohibit its use in the treatment facility for disinfection of workspaces and

bathrooms, where the use of bleach is a reasonable cleaning technique to protect the health of workers at the water pollution control facility (WPCF).

Response 54:
EPA intended I.A.2.h. to prohibit the use of chlorine in the treatment process, not in cleaning workspaces and bathrooms at the WPCF facility. Such activities would not be expected to cause an exceedance of water quality standards in the effluent.

Comment 55. Bleach
In addition, as part of the process operations themselves, chlorine has a necessary and important uses at the WPCF. Bleach is used on rare, but necessary, occasions to control filamentous bacteria. Chlorine is used for periodic cleaning of the disc filters. Periodic soaking of the filters in a hypochlorite solution is necessary to preserve the long-term performance of the disc filters. Without this soaking procedure, the filter media will become fouled, leading to reduction in throughput capacity and treatment ability. When the plant takes one of their filter basins off-line for soaking, the spent chlorine solution is then drained back to the head of the plant (in this case at least for now, the lagoons), and is not discharged. This practice will have to continue in some manner. Hypochlorite is definitely the chemical of choice for cleaning the media. Perhaps other chemicals could work, but would be breaking new ground. And, in any case, the spent soak water would be returned to the head of the plant.

Response 55:
The final permit allows use of a hypochlorite solution to clean the filters, provided that the used solution is dechlorinated to nontoxic levels and drained to the head of the plant for full treatment.

Comment 56. Toxics Control
The Draft Permit (Page 7, Provision 4) includes a new provision and restriction on toxics control. There is no basis in federal or state law for imposing these provisions as general requirements given that the permit already assessed for “reasonable potential” and the Wet Effluent Toxicity (WET) test requirement is intended to address other non-regulated pollutants. The Town requests that EPA remove this provision from the permit as it is unenforceable since it would be void for vagueness. Further, WET testing is intended to mitigate this concern, and additional narrative provisions for toxic control are not needed nor authorized. Requiring a reopener, where new information indicates additional parameters may require control is appropriate. Holding the City responsible for matters it has not received notice of and has no means to determine or control, is not reasonable.

Response 56:
Part I.A.4., which states in part, “[t]he permittee shall not discharge any pollutant or combination of pollutants in toxic amounts,” is not a new provision or new requirement. The basis for this clause is the Clean Water Act itself, which says at Section 101 (a)(3) that “it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited.” 33 U.S.C. § 1251(a)(3). Also, Massachusetts SWQS provide that “[a]ll surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife.” 314 CMR 4.05(5)(e). EPA is not precluded from including narrative permit conditions requiring

compliance with water quality standards. *In re Gov't of the Dist. of Columbia Mun. Separate Storm Sewer Sys.*, 10 E.A.D. 323, 343 n.23 (EAB 2002). The intent of these clauses is not just to prohibit toxic discharges during WET tests, but to prohibit toxic discharges **at all times**.

Secondly, the requirement is not vague or unenforceable. Because there are numeric water quality criteria for most toxic pollutants, it is reasonably straightforward to measure these constituents in the permittee's discharge and determine if toxic amounts are present. This clause is also readily enforceable in the case where an upset or spill causes widespread toxicity, such as a chemical spill that causes a fish kill. Such an incident is illegal regardless of whether it shows up on a WET test report.

If unknown toxicity is present in the discharge, as identified in WET test results or observed toxic effects in the receiving water, the typical course of action is to conduct a Toxicity Identification Evaluation (TIE) and a Toxicity Reduction Evaluation (TRE). In most cases, with the permittee's cooperation, the TIE/TRE process can identify and remove toxicity without need for enforcement of Section I.A.4. However, it is necessary for EPA to retain enforcement ability when the permittee refuses to cooperate with the EPA or has shown gross negligence. The clause remains in the final permit.

Comment 57. Unauthorized Discharges
The Draft Permit (Page 7) includes language concerning unauthorized discharges from the Town of Marion's wastewater system. The City agreed that overflows and other discharges are generally prohibited. However, this does not preclude the application of upset and bypass defenses where conditions beyond the City's control (e.g., flood) cause overflows in the collection system. This provision must be applicable in conjunction with federal upset or bypass rules from events beyond the reasonable control of the permittee. If this is an absolute provision, EPA has not presented the required technology-based or water quality based analysis in support of this provision.

Response 57:
The condition referenced in the comment is found in Part I.B (Unauthorized Discharges) of the permit and reads, in part:

> *The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall(s) listed in Part I A.1.of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported to EPA and MassDEP in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four-hour reporting).*

The commenter apparently seeks assurance that permit violations from an upset or bypass would not be subject to enforcement under this provision. EPA notes that "the terms and conditions of th[e] permit" include the standard conditions at Part II.B.4 and .5 regarding bypass and upset, respectively, which are required conditions in all NPDES permits pursuant to 40 CFR § 122.41(m) and (n). Depending on the particular circumstances of the event, these standard provisions of the permit may be applicable, as provided for in regulation.

Comment 58. Operation and Maintenance of the Collection System

The Draft Permit (Pages 7 to 10) includes many new requirements regarding the operations and maintenance (O&M) of the collection system. The provisions provided are what are typically included in Capacity Management Operations and Maintenance (CMOM) programs as defined within EPA's Guide for Evaluating Capacity, Management, Operations, and Maintenance (CMOM) Programs at Sanitary Sewer Systems (EPA 305-B-05-002) dated January 2005. The Town of Marion has been proactive in the maintenance and up-keep of their wastewater collection system. In fact, they are at the fore-front of I/I and the removal of private inflow sources within the Commonwealth with the current programs and initiatives that are on-going. The Town over the past 10 years has spent in excess of $500,000 in studies, engineering designs, inspections and investigations, monitoring and measuring flows, infiltration and inflow (I/I) analysis, addressing private inflow sources, adopting new I/I regulations, developing enforcement guidelines within the Town's sewer use regulations, and constructing improvements to their wastewater collection system. These improvements, and the documented I/I reduction rates have been clearly documented within the Town's Annual Infiltration and Inflow report submitted to the MassDEP as part of their current permit.

The Town requests that the entire provisions be withdrawn as they have been pro-active in the upkeep and operation of their system and the additional financial burden imposed by the additional CMOM provisions will inhibit the on-going programs by redirecting limited funds away from those programs to meeting compliance with CMOM provisions within the draft permit.

- Any facility planning provisions of the permit are state-level provisions beyond the federal program and must be so identified so federal enforcement is not triggered over this provision.

- The provisions were not part of adopted NPDES rules, and they never have been presented for public notice and comment.

- EPA has provided no data demonstrating that the current Town program is insufficient, nor does the reported SSOs to the EPA and Massachusetts Department of Environmental Protection (MassDEP) within the system document that the Town's program is insufficient for maintenance.

- EPA has provided no basis for the individual program requirements that are being imposed as necessary to achieve technology or water quality based requirements.

- The provisions represent an unlawful amendment of the O&M rule which is to ensure effluent quality is met. EPA has changed the requirement to mandate that the collection system, regardless of plant performance must be operated and managed in a specific fashion.

- The NPDES program has never established sewer system operational requirements nor demonstration necessary to meet technology or water quality-based limitations. Inclusion of these requirements is ultra vires.

- EPA has no legal authority to mandate I/I reduction program or a specific type of collection system map or new reporting requirements that are unrelated to effluent limitation provisions.

To the degree EPA is claiming that the adopted NPDES rules mandate these requirements, EPA has unlawfully modified the adopted rules. To the degree EPA is claiming that the plan language of the rule allows EPA to impose such requirements, EPA's reading of the rule in unsupported. Finally, to the degree EPA is attempting to dictate the management of the facility, EPA is operating beyond statutory authority. See, *Iowa League of Cities v. EPA* (8th Cir. 2013).

Response 58:
EPA commends the Town of Marion for maintaining their preventative maintenance program as well as for undertaking a program to address I/I. Any operation and maintenance programs currently in place (or portions of such programs) may be used to satisfy the requirements of Part I.C. of the permit, to the extent these programs (or portions thereof) comply with permit requirements.

As an initial matter, MassDEP has stated that the inclusion in NPDES permits of I/I control conditions is a standard State Certification requirement under Section 401 of the CWA and 40 CFR § 124.55(b). Moreover, EPA disagrees with the comment that EPA is not authorized to impose requirements regarding the operation and maintenance (O&M) of the collection system as set forth in the Marion draft permit. The O&M requirements of the draft permit are being included in all NPDES permits issued to POTWs throughout Massachusetts, in order to ensure, amongst the other requirements of this section, that all permittees (including co-permittees) are working towards developing I/I control programs, and that sufficient funds are being allocated to support such programs.

The O&M requirements included in the final permit are intended to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment. Contrary to the commenter's claim, the imposition of the provisions by the Region is indeed case specific. The fact that similar language appears in other municipal discharge permits is immaterial; EPA Region 1 has exercised its permit writing expertise and experience to tailor many specific permit provisions that it has employed across many permits, and it is an efficient practice to utilize provisions that it has found to be effective and clear across many permits, as necessary. The elements of the O&M plan in the draft permit have been fashioned by the Region to carry out the objective of protecting human health and the environment. These provisions are being placed into individual permits where, based on the administrative record of a particular permitting action, the Region has ascertained the need for more information about the operation and maintenance of a particular treatment works and, until that information is provided, to assure the permit contains conditions sufficient to assure compliance with the Act.

EPA notes that the Region is not making any judgment on the merits of Marion's existing O&M program regarding whether it is sufficient to comply with these requirements. Rather, the Region is exercising its discretion to apply these preventative requirements to all newly issued municipal permits. If the Town's current program is sufficient to comply with these requirements, the Town must simply document and report this compliance according to the reporting requirements in the permit. The permit conditions represent a starting point, and the Region expects to further tailor their terms in future permit cycles as more information and operational data become available. In the Region's view, these conditions are not highly prescriptive but provide the permittee with continued flexibility and discretion in determining how to operate and maintain its treatment works.

As mentioned in the Fact Sheet Section VI. Operation and Maintenance, the Marion WPCF is a Publicly Owned Treatment Works (POTW) as defined at 40 C.F.R. § 403.3. This definition also includes sewers, pipes, and other conveyances that convey wastewater to a POTW treatment plant. Conditions applicable to all permits include the regulation of proper operation and maintenance (*see* 40 C.F.R. § 122.41(e)). This regulation requires that "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." The treatment plant and collection system are included in the definition "facilities and systems of treatment and control" and are therefore subject to proper operation and maintenance requirements.

EPA regulations also specify a standard condition that specifically imposes on permittees a "duty to mitigate." *See* 40 CFR § 122.41(d). This condition requires permittees to take all reasonable steps – which in some cases may include operations and maintenance work - to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment. The general requirements for mitigation and proper operation and maintenance are typically found in Part II, Standard Conditions. Recently, EPA has included the specific permit conditions found in Parts I.B and I.C in all reissued municipal permits as reasonable and logical practices to implement these requirements.

This requirement is neither a new mandate nor beyond EPA's authority. Sections 308(a) and 402(a)(2) of the Clean Water Act and regulations found at 40 C.F.R. § 122.44(i) provide broad authority to require owners and operators of point sources to establish monitoring methods and to prescribe permit conditions for data collection and reporting, and are not expressly or impliedly delimited to the end of the pipe. As the Environmental Appeals Board has described: "It is well established that permit writers enjoy broad authority under the CWA and regulations to prescribe municipal data collection and reporting requirements." *Town of Concord*, slip op. at 39. *See* CWA § 308(a)(A), 33 U.S.C. § 1318(a)(A) (specifying that permittees must provide records, reports, and other information EPA reasonably requires); CWA § 402(a)(2), 33 U.S.C. § 1342(a)(2) (requiring permittees to provide data and other information EPA deems appropriate); 40 C.F.R. § 122.41(h) (permittees shall furnish "any information" needed to determine permit compliance); 40 C.F.R. § 122.44(i) (permittees must supply monitoring data and other measurements as appropriate); *see also, e.g., In re City of Moscow*, 10 E.A.D. 135, 170-71 (EAB 2001) (holding that EPA has "broad authority" to impose information-gathering requirements on permittees); *In re Town of Ashland Wastewater Treatment Facility*, 9 E.A.D. 661, 671-72 (EAB 2001) (holding that CWA confers "broad authority" on permit issuers to require monitoring and information from permittees).

In *In re Town of Concord*, NPDES Appeal No. 13-08, slip op. at 39 (EAB Aug. 28, 2014), EPA's decision to include the O&M requirements in the permit was reasonable and consistent with its responsibilities under the Clean Water Act, particularly given the environmental imperatives identified by the Region as driving the collection system requirements (e.g., SSO prevention) and receiving water conditions. As EPA stated in the Fact Sheet, at 31:

> *Proper operation of collection systems is critical to prevent blockages and equipment failures that would cause overflows of the collection system (sanitary sewer overflows, or SSOs), and to limit the amount of non-wastewater flow entering the collection system (inflow and infiltration or I/I). I/I in a collection system can pose a significant environmental problem because it may displace wastewater flow and thereby cause, or contribute to causing, SSOs. Moreover, I/I could reduce the capacity and efficiency of the treatment plant and cause bypasses of secondary treatment. Therefore, reducing I/I will help to minimize any SSOs and maximize the flow receiving proper treatment at the treatment plant. The permittee reports that approximately 220,400 gallons per day of (I/I) enters the sewer system.*

SSOs that reach waters of the U.S. are discharges in violation of section 301(a) of the CWA to the extent not authorized by an NPDES permit. Furthermore, high levels of I/I dilute the strength of influent wastewater and increase the hydraulic load on treatment plants, which can reduce treatment efficiency (*e.g.*, result in violations of technology-based percent removal limitations for BOD and TSS due to less concentrated influent, or violation of other technology-based or water quality-based effluent limitations due to reduction in treatment efficiency).[12]

The Town appears to argue that the Act does not authorize EPA to impose either monitoring requirements or effluent limitations on internal treatment processes of a point source subject to an NPDES permit. For this proposition, the Town cites the Eighth Circuit decision in *Iowa League of Cities*, 711 F.3d 844 (8th Cir. 2013), that did not concern monitoring and reporting requirement, such as those at issue here. Further, the Town's legal theory directly conflicts with a long line of Board precedent on the breadth of authority conferred on the Region by the Act to impose reasonable reporting and monitoring requirements on owners and operators of "point sources," without reference to whether that person even has a permit. That authority, found in Section 308 of the Act, is supplemented in this case by Section 402, as the discharges from the Town are governed by the NPDES program. Under Section 402(a)(2), an NPDES permit may include "conditions on data and information collection, reporting, and such other requirements as [the Administrator] deems appropriate." The provisions at issue here are appropriate, designed as they are to assess consistency with Section 301 of the Act, including water quality standards.

[12] We note that the Town recognizes that "excessive" I/I in its system contributes to water quality impairment in Aucoot Cove, permit violations, and sewer system backups and SSOs. 2017 PEF 3, 4, 13-15, 21; *see also id.* at 5 (observing that the Town's "wastewater collection system still has a fairly significant I/I issue").

Against this backdrop, the Town's primary claim of error underlying its challenge to the monitoring and reporting conditions—that EPA is barred under Section 308 and 402 from prescribing such conditions on internal treatment process flow on facilities even though their discharges are from point sources—is unpersuasive.

There is, furthermore, no basis to conclude under the Board's precedent construing Sections 308(a) and 402(a)(2) of the Act, and implementing regulations, that the monitoring conditions at issue here are unwarranted simply because they pertain to processes that occur at a remove from the outfall. *In re Westborough*, 10 E.A.D. 297, 316-17 (EAB 2002) (requiring monitoring of the actual influent of phosphorus coming into the headworks of the Westborough POTW from industrial and other sources discharging waste into the sewer system prior to treatment by the POTW, and noting "The regulatory scheme clearly anticipates that both discharges *from* and discharges *into* POTWs are subject to regulation by means of NPDES permits."). *See, e.g., Town of Concord*, slip op. at 38-40; *In re Charles River Pollution Control Dist.*, NPDES Appeal No. 14-01 (EAB Feb. 2, 2015) (holding that the Region has authority under the Clean Water Act and EPA's regulations to include municipal satellite collection systems as co-permittees and subject them to monitoring and reporting requirements). Indeed, the authority to impose effluent limitations on internal waste streams, and associated monitoring requirements, is expressly recognized in EPA's regulations. 40 C.F.R. § 122.45(h). The broad objective of the Clean Water Act, 33 U.S.C. § 1251 *et seq.*, is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. CWA § 101(a), 33 U.S.C. § 1251(a). Section 402 of the Act established the NPDES program as the primary mechanism for controlling discharges of pollutants to navigable waters of the United States, and, subject to certain conditions, authorizes the Administrator of the EPA to issue permits for the discharge of pollutants, and to "prescribe conditions for such permits … including conditions on data and information collection, reporting, and such other requirements as [the Administrator] deems appropriate." 33 U.S.C. § 1342(a)(1)-(2).

To this end, EPA passed regulations further defining the procedures and requirements of the NPDES program, codified in 40 CFR Parts 122-125. Regulations governing permit requirements for NPDES discharges are contained in 40 CFR Part 122, and the regulations specifically authorizing CMOM collection requirements in NPDES permits include 40 CFR § 122.48(a) and § 122.44(i)(1)(iii). Section 122.48(a) provides that all permits shall specify, "[r]equirements concerning the proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods (including biological monitoring methods when appropriate)." Section 122.44(i)(1)(iii) provides for monitoring requirements in addition to those in § 122.48, specifically: Other measurements as appropriate including pollutants in internal waste streams under § 122.45(i); pollutants in intake water for net limitations under § 122.45(f); frequency, rate of discharge, etc., for noncontinuous discharges under § 122.45(e); pollutants subject to notification requirements under § 122.42(a); and pollutants in sewage sludge or other monitoring as specified in 40 CFR part 503; or as determined to be necessary on a case-by-case basis pursuant to section 405(d)(4) of the CWA.

Additional broad authority for CMOM requirements has also been derived from 40 CFR § 122.41(d) and (e).[13] Section 122.41 provides, "[c]onditions applicable to all permits," with subsection (d) providing for a duty to mitigate "discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment." Subsection (e) requires, "[p]roper operation and maintenance … [of] all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee."

MONITORING

Comment 59. Monitoring Frequency

As summarized in (Marion) **Table 2** below, The Draft Permit includes revised, more frequent or new monitoring of several parameters than the current permit, as follows:

Marion Table 2: Summary of Monitoring Requirements

Parameter	Monitoring Requirement – Draft NPDES Permit	Monitoring Requirement – Current NPDES Permit	Additional Yearly Samples
Enterococci	2/week	NA	104
Dissolved oxygen	1/day	1/week	140 or 201*
Total aluminum during WET tests	4/year	NA	4
Total Kjeldahl Nitrogen#	3/week	1/month	67
Total Nitrate Nitrogen#	3/week	1/month	67
Total Nitrite Nitrogen#	3/week	1/month	67
Total Kjeldahl Nitrogen**	1/week	1/month	20
Total Nitrate Nitrogen**	1/week	1/month	20
Total Nitrite Nitrogen**	1/week	1/month	20
Total Phosphorus#	1/week	2/month	52
Total Phosphorus**	1/month	2/month	(6)
Copper, Total Recoverable	1/week	1/month	40

* Depends on which monitoring period is required; # From April 1 to October 31; ** November 1 to March 31

We estimate that this increased sampling regimen will add 455 extra laboratory samples at an estimated operating expense of approximately $12,000 per year not including the labor costs for

[13] *See e.g.*, 2010 NPDES Permit Writers' Manual ("2010 Manual"), pp. 9-21 (asserting that "[p]ermits should clarify requirements for proper operation and maintenance of the collection system," which, "may include requiring the development and implementation of capacity, management, operation and maintenance (CMOM) programs"). *See also* Marion Draft NPDES Permit Fact Sheet, at 30-31 (citing to 40 CFR § 122.41(d) and (e) in its justification for permit requirements pertaining to Operation and Maintenance of the Sewer System).

Town of Marion (Town) employees to collect the samples. The cost of additional sampling for dissolved oxygen at the outfall is even greater at $26,000 which will require two water pollution control facility (WPCF) staff to make up to 201 additional trips to the remote outfall location. Below we provide our requests and reasons for changing the monitoring frequency for many of these parameters.

Response 59:
EPA recognizes the concern with cost of testing and has provided an alternative approach in the final permit. In doing so, EPA notes that testing for Total Nitrogen requires that TKN and Nitrate and Nitrite be tested, as there is currently no EPA-approved method for direct testing of Total Nitrogen. Sampling for nitrogen species is also important to provide important information relative to treatment effectiveness and bioavailability in the receiving water. Therefore, it is EPA's intent that the monitoring frequencies for TKN, Nitrate and Nitrite be consistent. However, EPA agrees that less frequent monitoring is appropriate during periods when the Total Nitrogen limit is not in effect and therefore has modified the permit as follows:

(1) Monitoring frequency for TKN, Nitrate and Nitrite is reduced to 1/Month in the period November 1 to March 31. Reporting of TN is also required in the winter months.

(2) Increased concerns associated with nitrogen impacts during the growing season warrant better characterization than can be provided with once per week monitoring.

EPA believes that the frequency of sampling is necessary to adequately characterize loads to the system and monitor compliance and therefore is not now setting any schedule or benchmarks for reduction in monitoring frequency.

Comment 60. Dissolved Oxygen
Collection of daily readings of dissolved oxygen (DO) would require a significant expenditure of limited WPCF staff time and budget, particularly given the change in requirement that the sample be collected "at the point of entering the unnamed brook." (Page 3 of the Draft Permit) Previously, the samples were collected at the UV facility only taking a few minutes on a weekly basis. This new provision could require at least an hour every day for two staff (It is Marion's practice that an operator not to travel to the outfall unaccompanied for both safety and security reasons.) to drive from the WPCF, walk to the end of the outfall pipe, collect the reading, and return to the WPCF. In addition, there will be days, particularly during the inclement weather or deep snow cover, when collection of the sample poses an additional unnecessary hazard for sampling personnel. As noted in the Fact Sheet [Page 11], no samples in four years have violated permit limits. No legal or scientific justification has been provided for increasing the monitoring frequency for DO, and the Town requests that the frequency be returned to once per week. We also request that the sampling location be changed to the UV facility. Note that the Fact Sheet (page 11) incorrectly states that the current monitoring frequency is once per day.

Response 60:
Because the facility has not had a dissolved oxygen violation during the current permit term, and the logistical and safety risks posed by directly sampling the outfall, EPA has changed the

dissolved oxygen monitoring frequency and location to that of the current permit, which is once per week and to the UV facility, respectively.

Comment 61. Total Cadmium, Total Lead, Total Nickel and Total Zinc
Per the analysis in the Fact Sheet (Page 27), no reasonable potential exists for these parameters to exceed water quality standards. Monitoring for these parameters as part of the whole effluent toxicity testing should thus be removed from the permit.

Response 61:
The metals mentioned in the comment are ones frequently found in municipal effluent at levels above water quality criteria. Neither the draft nor final permit propose any additional monitoring for these metals than is required under the current permit. The only change is the requirement to report the effluent metal concentrations measured during WET testing on the WET test DMR. Furthermore, the commenter provides no authority for the suggestion that EPA may only require monitoring of those parameters for which it has demonstrated Reasonable Potential. To the contrary, the Clean Water Act provides EPA with broad authority to impose monitoring and reporting requirements. CWA § 308(a)(A), 33 U.S.C. § 1318(a)(A) (specifying that permittees must provide records, reports, and other information EPA reasonably requires); CWA § 402(a)(2), 33 U.S.C. § 1342(a)(2) (requiring permittees to provide data and other information EPA deems appropriate); *see also, e.g., In re City of Moscow*, 10 E.A.D. 135, 170-71 (EAB 2001). "This is true regardless of a pollutant's potential to cause or contribute to a water quality violation." *In re Town of Concord*, NPDES Appeal No. 13-08, slip op. at 36 (EAB Aug. 28, 2014).

Comment 62. Total Aluminum
The Draft Permit requires analysis for total aluminum as part of Whole Effluent Toxicity (WET) testing. As explained in the Fact Sheet (Page 28), this sampling requirement is predicated on the assumption that the Town will implement a treatment process modification that uses alum to meet the new phosphorous limit. Since no such decision has been made at this time (many treatment plants choose to use ferric chloride instead for economic reasons), nor has EPA demonstrated that such use of alum would create a reasonable potential to exceed the aluminum water quality standards, this requirement should be removed from the permit. If EPA insists on continuing with the requirement, then at a minimum the analysis should not be required until and at as such time alum is used at the WPCF.

Response 62:
The aluminum monitoring requirement is the same as in the current permit and is predicated on the fact that aluminum is routinely found in municipal wastewater regardless of whether it is added during the treatment process. Aluminum is frequently detected in the WPCF's discharge, and will likely increase if the facility uses alum compounds for phosphorus removal.

The requirement to report effluent metals concentrations on the WET test DMR is a new requirement, but is a standard permit requirement for all Region 1 individual NPDES permittees regardless of treatment process or reasonable potential. Please see Attachments A and B to the final permit. As also noted in Response 61, EPA may establish a monitoring and reporting requirement regardless of a pollutant's potential to cause or contribute to a water quality violation.

Comment 63. Total Copper
The Town requests the sampling frequency be returned to once per month. The Fact Sheet (Page 29) simply states a different monitoring frequency without providing any justification for the change. Further, the Town knows of no other Massachusetts discharge permit for a small treatment plant that requires monitoring for copper at a frequency greater than once per month, including those recently released as draft permits. The increased frequency of testing places an arbitrary and unsupported burden on the Town of Marion.

Response 63:
EPA set the monitoring frequency for total copper at once per week because this monitoring frequency provides a better picture of effluent variability. However, EPA is aware that the additional monitoring is a financial burden and that it is more common for the Region to require once per month copper monitoring. Therefore, the monitoring frequency for copper has been changed to once per month in the final permit.

BIOSOLIDS

Comment 64. Biosolids Conditions
The Draft Permit requires the Town to stop using the water pollution control facility's lagoons for biosolids processing, and the Fact Sheet indicates that "*EPA has determined that the lagoons are functioning as sludge disposal rather than treatment or storage sites under 40 CFR Part 503 Regulations*." The Town dispute [sic] this determination and asks that this requirement be removed from the final permit. The Fact Sheet does not cite any specific language in Part 503 that provides that [sic] the basis for this determination. This action is contrary to EPA's longstanding recognition that such treatment lagoons are exempt from Section 503 requirements. Anaerobic digestion of the waste activated sludge that is pumped to the lagoons is an important part of the overall plant's treatment processes, and results in low-cost, environmentally sound sludge volume reduction and stabilization.

Response 64:
Section 405(a) of the Clean Water Act prohibits the disposal of sewage sludge when it results in pollutants from the sewage sludge entering navigable waters, except in compliance with an NPDES permit. In addition, section 405(e) of the Act prohibits any person from using or disposing of sewage sludge generated by a treatment works except in accordance with regulations developed by EPA pursuant to section 405(d), which regulations include 40 CFR Part 503. Part 503 regulations in turn provide that they apply, *inter alia*, "to any person who prepares sewage sludge," "to the owner/operator of a surface disposal site," to sewage sludge "placed on a surface disposal site," and "to a surface disposal site." 40 CFR § 503.1(b). Because the permittee is a "person who generates sewage sludge during the treatment of domestic sewage in a treatment works," it meets the definition of a "person who prepares sewage sludge." *Id.* § 503.9(r). Moreover, as explained both in the Fact Sheet and in the additional responses below, EPA has concluded, in accordance with Part 503 regulations and multiple guidance documents, that lagoons in which biosolids have been deposited for decades with no plan for removal are

"surface disposal sites" within the meaning of Part 503. Furthermore, EPA disagrees that the disposal of sewage sludge in unlined lagoons at the Marion WPCF is "environmentally sound." As EPA explained in the Fact Sheet, the disposal of nitrogen rich sludge and untreated wastewater in unlined lagoons has the potential to leach significant amounts of nitrogen into the groundwater, which would not occur if the lagoon portion of the treatment works were being properly operated and maintained. Fact Sheet at 19. In this case, the Horsley Witten report provides a reasonable basis for EPA to conclude that significant amounts of nitrogen are leaching into groundwater from the lagoons and ultimately entering Aucoot Cove.[14] See Responses 22 through 26 and 65 through 67.

Comment 65. Anaerobic digestion
That anaerobic digestion and sludge stabilization occur in the bottom layers of all facultative lagoons cannot be disputed. Innumerable technical literature sources can be cited as evidence; however, for the purposes of this comment, we simply cite EPA's own *Wastewater Technology Fact Sheet - Facultative Lagoons, EPA Document EPA-832-F-02-014* (September 2002), which states "Anaerobic fermentation is the dominant activity in the bottom layer in the lagoon," and "Removal of pathogens and coliforms can be effective, depending on temperature and detention time."

Response 65:
EPA does not dispute that facultative lagoons can provide some treatment of sludge. The Agency is, however, requiring the Town to operate its lagoons in compliance with the proper operation and maintenance requirement of 40 CFR § 122.41(e) and to dispose of sewage sludge in a manner that does not result in groundwater and surface water contamination and that protects public health and the environment from any adverse effect of a pollutant in the sewage sludge.

Comment 66. Applicability of 40 CFR part 503
Further, EPA's *A Plain English Guide to the EPA Part 503 Biosolids Rule, EPA Document EPA/832/R-93/003* (September 1994) states on page 59 that "**The surface disposal provisions of the Part 503 rule do not apply when biosolids are treated on the land, such as in a treatment lagoon or stabilization pond, and treatment could be for an indefinite period.**" Therefore, given EPA's own published interpretation, Part 503 does not apply to the lagoons at the Town's WPCF. This citation is also consistent with EPA's *Biosolids Management Handbook*, EPA Region VIII, by Robert Brobst, which indicates that operating lagoons used in wastewater treatment are not covered in Part 503. According to this EPA document, lagoons are not "surface disposal sites", and moreover, there is no liner mandate. Referring to §503.6 Exclusions, in Section 1.17-8, 10 of the Biosolids Management Handbook:

[14] EPA has not made a determination whether the groundwater flow of nitrogen from the lagoons to Aucoot Cove constitutes a point source discharge. The sewage sludge-related requirements in the permit are included pursuant to 40 CFR § 122.41 (d) (Duty to mitigate) and (e) (Proper operation and maintenance) and CWA § 405 (Disposal or use of sewage sludge).

(a) Treatment processes. This part does not establish requirements for processes used to treat domestic sewage or for processes used to treat sewage sludge prior to final use or disposal, except as provided in §503.32 and §503.33.

(b) Selection of a use or disposal practice. This part does not require the selection of a sewage sludge use or disposal practice. The determination of the manner in which sewage sludge is used or disposed is a local determination.

(c) Co-firing of sewage sludge. This part does not establish requirements for sewage sludge co-fired in an incinerator with other wastes or for the incinerator in which sewage sludge and other wastes are co-fired. Other wastes do not include auxiliary fuel, as defined in 40 CFR 503.41(b), fired in a sewage sludge incinerator.

(d) Sludge generated at an industrial facility. This part does not establish requirements for the use or disposal of sludge generated at an industrial facility during the treatment of industrial wastewater, including sewage sludge generated during the treatment of industrial wastewater combined with domestic sewage.

(e) Hazardous sewage sludge. This part does not establish requirements for the use or disposal of sewage sludge determined to be hazardous in accordance with 40 CFR part 261.

(f) Sewage sludge with high PCB concentration. This part does not establish requirements for the use or disposal of sewage sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry weight basis).

(g) Incinerator ash. This part does not establish requirements for the use or disposal of ash generated during the firing of sewage sludge in a sewage sludge incinerator.

(h) Grit and screenings. This part does not establish requirements for the use or disposal of grit (e.g., sand, gravel, cinders, or other materials with a high specific gravity) or screenings (e.g., relatively large materials such as rags) generated during preliminary treatment of domestic sewage in a treatment works.

(i) Drinking water treatment sludge. This part does not establish requirements for the use or disposal of sludge generated during the treatment of either surface water or ground water used for drinking water.

Thus, it is clear from the federal rules that the proposed action is beyond regulatory and statutory authority. EPA cannot mandate the closure of our wastewater operations under the guise of Section 503 authority. This permit provision, in its entirety, must be removed.

Response 66:
The Plain English Guide to the Part 503 rule addresses this issue specifically. Chapter 3, page 77 of the EPA Plain Language Guide to the Part 503 Rule provides the following question and answer:

Q: If biosolids are stored in a lagoon for 20 years and the generator has no intention or [sic] ever removing the biosolids from the lagoon, is the lagoon a surface disposal site? If so, what requirements would apply?

A: The facility would be considered a surface disposal site since there is no intent to ever move the biosolids. The lagoon is subject to the surface disposal requirements under Part 503.

It is clear from this question and answer that long-term storage of sludge in lagoons should generally be considered disposal subject to regulation under 40 CFR Part 503. In this case, the Town has been using the lagoons for over 40 years, and nothing in its application materials or other submittals shows intent of ever removing the biosolids. It is clearly within EPA's discretion to regulate the lagoons as sludge disposal sites.

Further, the EPA Biosolids Handbook, at page 1.1-8, provides:

Storage vs. Disposal

The Part 503 regulation allows sewage sludge to be stored for up to two years without any restrictions or control. However, if sewage sludges remain on the land beyond 2 years, EPA may consider this "disposal" and regulate it as a surface disposal site.

If the wastewater authority can provide an adequate explanation concerning why the material has to remain on the land for longer than 2 years, EPA will not regulate these operations as surface disposal sites. A common example would be a sewage sludge lagoon that has a 4 or 5 year cycle time between sludge cleanout operations. In this example, the lagoon may be considered "treatment" or "storage," and not "disposal."

In the 44 years that the Town has deposited sewage sludge in the lagoons, it has not removed any sludge from the ponds and has not communicated any intention of removing sludge from the ponds. As discussed above, leaving sewage sludge on the land for longer than two years is typically considered disposal. However, EPA may allow slightly longer treatment cycles at its discretion, **if** the wastewater authority has presented an adequate explanation for a longer cycle between sludge cleanout operations. In this case, considering the length of time sludge has been in the lagoons and the absence of any plan for removing the sludge, it is reasonable for EPA to consider, as recommended by the cited guidance, the lagoons surface disposal sites subject to Part 503 regulations.

Furthermore, the commenter's suggestion that the lagoons should not be considered disposal sites and are exempt from regulation merely because they may provide some undetermined level of sludge treatment is unpersuasive. First, the commenter does not explain why the possibility that there may be some sludge "treatment" occurring in the lagoons precludes a conclusion that they are, in fact, used as disposal sites. Second, there is no indication the permittee has sought to monitor the treatment allegedly provided in the lagoons, that it actively manages such treatment or regularly assesses its effectiveness it in any way. Similarly, the commenter provides no indication whether it has assessed that such treatment by itself, or in conjunction with some other unspecified treatment methods, will suffice or when it will end. Nor does the commenter indicate any ultimate disposal site for the sewage sludge or time period when the supposed treatment will end. Third, the suggestion runs counter to EPA statements from the preamble accompanying the Part 503 rulemaking. For instance,

> *In 1984, when the Agency initiated the part 503 rulemaking process, surface disposal sites were considered surface impoundments that were used for treatment or interim storage, not permanent disposal facilities. Subsequently, the Agency has learned that some communities use surface impoundments for extended periods of time, suggesting that the practice is, in fact, the community's method of disposal. When surface impoundments are used for the final disposal of sewage sludge, they are surface disposal sites and are subject to the CWA's requirements as a disposal method.*

58 Fed. Reg. 9248, 9314 (Feb. 19, 1993) (emphasis added).[15] At bottom, the commenter's claim amounts to the untenable position that, because some indeterminate and incidental level of treatment may occur, EPA may not consider the sites to be surface disposal sites and Part 503 regulations are rendered inapplicable. Were that the case, a sewage sludge preparer could evade section 405 of the Act and its prohibition against the disposal of sewage sludge that "would result in any pollutant from such sewage sludge entering the navigable waters . . . except in accordance with a permit" and its prohibition against disposal of sludge not in accordance with Part 503, merely by pointing to any attendant level of incidental treatment that may be occurring, however small, even where the particular practice is, in fact, its method of disposal.

As it is, section 503.20(b) provides that sites where sewage sludge remains for longer than two years will generally be considered surface disposal sites, unless the sludge preparer has, among other requirements, explained why the sludge must remain for longer than two years before it can be finally used or disposed and specified the approximate period when the sewage sludge will be used or disposed. *See also* 58 Fed. Reg. at 9314 ("The Agency believes a two-year time period is appropriate for differentiating sewage sludge surface disposal from treatment and storage, and has made this change to the definition of surface disposal because certain treatment practices (e.g., composting, sludge drying beds, etc.) and storage facilities may process and store sewage sludge for periods exceeding the proposed one-year time limit. The Agency believes that permit writers will be better able to distinguish between those facilities legitimately treating and storing sewage sludge and those practicing surface disposal if EPA specifies a general time limitation."). Again, in the 44 years that the Town has deposited sewage sludge in the lagoons, it has not removed any sludge and has not communicated any intention of removing sludge from the ponds.

Finally, section 503.6(a) of EPA's sewage sludge regulations does not support the commenter's interpretation. It merely provides that Part 503 generally does not "establish requirements for processes used to treat domestic sewage or for processes used to treat sewage sludge prior to

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[15] *See also id.* at 9340 ("The purpose of allowing sewage sludge to remain on the land for a period longer than two years and not having to meet the requirements in [Part 503, subpart C] apply [sic] is to address *unique* situations. In such a situation, mitigating factors may justify the longer period. Without mitigating factors, EPA concluded that a *two-year period provides enough time to store sewage sludge for most purposes prior to final use or disposal*.") (emphases added).

final use or disposal." But EPA has not relied on Part 503 in this permit to establish any "requirements for processes used to treat" domestic sewage or sludge prior to final use or disposal. Rather, the permit prohibits *the disposal* of sludge in unlined lagoons pursuant to section 405 and Part 503, for the reasons indicated in the Fact Sheet.

Comment 67. Special Conditions related to Lagoon Operations
Part E of the Draft Permit requires that the Town cease using the existing lagoons as they were designed to function in accordance with an approved Comprehensive Wastewater Management Plan (CWMP) dated May 2001, the water pollution control facility (WPCF) design, and the 2006 NPDES permit. Further, the Draft Permit requires abatement any ongoing contamination of groundwater as a result of "sludge or other wastewater solids that were deposited in the unlined lagoons."

EPA provides no credible information, data, or supporting facts to include such a mandate in the permit. EPA has authority to regulate effluent limits and disposal of biosolids, not the internal working of a wastewater facility. See, *Iowa League of Cities v. EPA* (8th Cir. 2013).

As discussed above, the Town is using the lagoons in lawful compliance with the provisions of Section 503 of the Clean Water Act. Further, there is no credible evidence that the lagoons have caused contamination to the groundwater, or indeed how EPA would intend for contamination to be defined.

If the lagoons were to be found to be discharging to groundwater, their regulation is not in the province of an EPA-issued NPDES permit (which strictly regulates discharges to surface water), but rather would be the responsibility of Massachusetts DEP, and then only if the any such leakage would exceed the threshold for permitting.

The Town requests Part E of the Draft Permit be removed in its entirety.

Response 67:
It is true that the 2006 NPDES permit, and permits before it, did not seek to regulate the lagoons under Part 503 authority, but this fact does not preclude EPA from doing so now, and the commenter cites to no authority to the contrary. [16] Moreover, new information about the lagoons has become available since the issuance of the 2006 permit, and EPA is required to consider this information when reissuing NPDES permits.

Buzzards Bay Coalition (BBC) first raised the issue of lagoon seepage in 2010 when nearby Sippican Harbor showed signs of nitrogen impairment without any apparent nitrogen source. BBC retained Horsley Witten to determine if seepage from the lagoons was polluting the area's groundwater. The resulting report, published in 2011, showed clear evidence of groundwater

[16] To the extent the commenter also disputes the need to line or close the lagoons, as well as EPA's authority to require it, we note that the Town has applied for SRF funding for a project that would accomplish "lining/closure" of the lagoons, which the Town observes will "improve the water quality leaving the plant and allow the Town to continue to meet NPDES permit limits." 2017 PEF, at 18, 21. MassDEP has included the project in its "2017 Intended Use Plan for Clean Water State Revolving Fund" (hereinafter "2017 Intended Use Plan"). *See id.*, Table 1, *available at* http://www.mass.gov/eea/docs/dep/water/approvals/year-thru-alpha/06-thru-d/17cwiupf.pdf (last visited Mar. 29, 2017).

contamination around the lagoons and documented that groundwater flows south and east from the lagoons.

While there is uncertainty about the magnitude of groundwater contamination from the lagoons, the Horsley Witten report provides evidence that contamination is occurring. EPA must evaluate the existing data when writing NPDES permits and cannot rely on studies that may or may not occur in the future.

With respect to state permitting, the commenter is correct that MassDEP administers a groundwater permitting program in Massachusetts pursuant to state law, but state regulations, while welcome, are not subject to EPA enforcement and are not a substitute for permit requirements arising under the Clean Water Act. This is also the position that the EAB recently took when considering the impact of state regulations on EPA's authority to regulate operation of sewage collection systems. *See In re Charles River Pollution Control Dist.*, NPDES Appeal No. 14-01, slip op. at 20-22 (EAB Feb. 4, 2015) ("The existence (and revision) of Massachusetts regulations addressing infiltration and inflow control does not diminish the Region's authority to permit the Towns under the Clean Water Act.").

However, EPA agrees that the language in Part I.E. of the draft permit is ambiguous with respect to the abatement of groundwater contamination. The intention of the language was to require that Marion remove existing sludge solids currently in the lagoons, not that the Town remediate all past groundwater contamination caused by the lagoons. The language in Part I.E has been revised to clarify this intention.

The *Iowa League of Cities* ruling is not relevant to the set of facts in this permit. That case concerned bacterial mixing zones and blending, which is the practice of combining secondary effluent with primary effluent to produce discharge that complies with NPDES permit limits. It did not concern EPA's authority to regulate disposal of biosolids, an authority even the comment recognizes EPA has been granted.

COMPLIANCE SCHEDULE

Comment 68. Compliance Schedule

As noted in the overview to this comment letter, the compliance schedule included in the Draft Permit is incomplete, internally inconsistent, and offers an inadequate time and inflexible schedule to address any improvements that prove necessary. Nor does the compliance schedule address the potential limitations on implementation that could be placed based on their value (plus other reasonably included expenditures per EPA guidance) per EPA's affordability guidelines.

Response 68:

There is currently no indication that the permittee will not be able to afford to comply with the permit requirements. At any time, a permittee can conduct an analysis of affordability and if that information supports it, an extension of the schedule can be allowed. Until then, permit schedules are required to be consistent with achieving compliance as soon as reasonably possible. In determining affordability for such an analysis, EPA uses Interim Economic Guidance for Water Quality Standards, EPA-823-B-95-002 (March 1995).

Also, see responses 69 through 72 regarding specific compliance deadlines.

Comment 69. Approval of lagoon plans

Page 12 of the Draft Permit states that within 12 months of draft permit's effective date, a plan for bringing lagoons into compliance must be filed, and that "The plan must achieve compliance with the lagoon related permit requirements as soon as possible, but no later than forty-eight (48) months from the effective date of the permit." The permit does not state whether the plan must be approved by EPA and MassDEP, nor does it give a timetable for any potentially needed approval.

Response 69:

The permit does not require EPA or MassDEP to approve the lagoon plans. However, the plan must identify the steps, including the time frame, that the Town will take to comply with the permit requirements (e.g. eliminating seepage from the lagoons) by the date indicated in the compliance schedule.

Comment 70. Lagoon Schedule

Furthermore, Page 13 states that there are only 36 months after the effective date to "complete construction of the lagoon liners." 36 months is also the deadline for constructing all necessary facilities to cease the disposal of sludge, and cease the use of the unlined lagoons. This is a direct contradiction of the statements on Page 12 which state that compliance schedule of up to 48 months is available for compliance with the lagoon-related permit requirements.

Also, requirements in the nitrogen and phosphorus compliance timetables (page 13) have the same issue where there is a deadline to submit a plan for compliance, no mention of a timetable for EPA/DEP approval of that plan, but a very tight 2-year window to finish engineering, bid(s) solicitation, financing and construction.

The Town has reviewed the proposed compliance schedule for the actions that the permit mandates (and not the alternatives that the Town also thinks needs to be considered) and requests revisions to the compliance schedule for these items as follows [on next page]:

Marion Table 3: Suggested NPDES Permit Compliance Schedule

Permit Section	NPDES Permit Item	Draft Deadline	Suggested Deadline
F.1	Report on Lagoon/Aucoot Cove Compliance	12 months	18 months
F.3	Facilities Plan Amendment	12 months	24 months
F.3	Evaluation/Facilities Plan on TN, TP Limits	12 months	24 months
F.4	Comply with TP Limit (Design/Construction)	24 months	42 months
F.6.a	Progress Report on Lagoons/Sludge Handling	24 months	42 months
F.6.b	Complete Lagoon Liner or Alt. Sludge Handling	36 months	60 months
F.7	Complete Design of Modifications for TN	36 months	48 months
F.6.b	Comply with Lagoon Requirements (Sludge Management Facilities Design/Construction)	48 months	72 months
F.8	Progress Report on Modifications to Meet TN	48 months	60 months
F.9	Comply with TN Limit (Construction)	60 months	72 months
C.4	Collection System Mapping	30 months	36 months
C.5.a	Phase 1 – Collection System O&M Plan	6 months	12 months
C.5.b	Phase 2 – Collection System O&M Plan	24 months	48 months
C.6	Annual CMOM Reporting	Annually	Annually*

* Notes – the Town requests that EPA combine the reporting requirements under the CMOM program and on Page 6 within the Draft Permit into a single report to reduce the reporting requirements and burden on the Town. The schedule also assumes timely review and approval of documents by the regulatory agencies.

Response 70:
With some exceptions, as noted below, EPA does not concur with the length of time requested for compliance, and the comment does not provide adequate justification for such a lengthy schedule. Based on the comments, as well as changes made in the final permit, the compliance

schedule has been modified significantly. The final schedule is consistent with the requirement for achieving compliance as soon as reasonably possible and for having annual milestones. While EPA may provide feedback on the submittals required under this schedule, no formal EPA approval is required for each submittal. To the extent that MassDEP review may be appropriate, the schedule allows for ample time to complete tasks and allow for MassDEP review. Nothing in this schedule prevents the Permittee from combining permit reporting requirements.

Changes in the final schedule include:

- The time frame for completing the lagoon related requirements within 48 months has been clarified.
- The schedule has been modified to reflect the removal of the total nitrogen limit of 3.0 mg/L and activities related to non-point source nitrogen reductions that could offset the need to achieve the 3.0 mg/L limit.
- The time frame for complying with the total phosphorus has been extended to forty-two months, consistent with the time frame requested by the permittee. This extension allows time for the Permittee to address any sludge handling concerns associated with additional phosphorus treatment. Also, the final permit includes an option for the permittee to relocate the outfall to the head of the salt marsh of Aucoot Cove, which would eliminate the need for an effluent phosphorus limit.

A Different Plan

As summarized below, the Town has proposed what it believes to be a legally supported, common sense, cost-effective approach to determining which, if any, improvements are needed to the Town's WPCF to meet the requirements of the CWA.

The Town suggests the following actions be taken to address the potential issues raised in the permit:

1. Conduct a study of the suitability of Inner Aucoot Cove to support eelgrass to determine if there is validity for the assumption in the Draft Permit that eelgrass is the most sensitive use for which this surface water should be enhanced, maintained or protected; and, if the habitat is found to be suitable for eelgrass, assess the quantity of nitrogen that can be present in Inner Aucoot Cove to support this resource.

2. Modify data collection at the treatment plant (e.g., electronic staff gauges in stilling wells) to obtain more rigorous data for a water mass balance at the lagoons to estimate if leakage could be occurring from the lagoons, and if so, what quantity of leakage could be occurring from the lagoons.

3. Prepare a detailed cost estimate for upgrades at the treatment plant assuming changes suggested by permit need to be implemented.

4. Evaluate the feasibility of changing the discharge location of treated effluent to be either the head of the saltmarsh in Aucoot Cove or in Outer Aucoot Cove, including establishing which studies that would be required to meet new Ocean Sanctuaries Act, performing a concept analysis and a detailed cost estimate.

5. If needed, prepare an analysis of nitrogen loading to Aucoot Cove to understand the relative contributions from the point source (wastewater treatment facility) and non-point sources (septic systems, stormwater runoff, cranberry bogs etc.)

6. If needed, evaluate alternatives for controlling non-point sources of nitrogen to Aucoot Cove to determine the degree to which sources are affected. Determine which sources of nitrogen can be most cost effectively controlled.

7. Subject the planned improvements to EPA's affordability guidelines and then seek agreement on an implementation schedule that matches these guidelines.

8. Conduct a simplified water effects ratio study on copper to seek regulatory relief from the copper limit in the permit.

Response 71:
The commenter's desire for greater scientific certainty, as a matter of law, cannot preclude or delay EPA from proceeding with the finalization of its proposed permit. As the EPA's Environmental Appeals Board recently explained: "scientific uncertainty is not a basis for delay in issuing an NPDES permit. The Board has specifically held that '[i]n the face of unavoidable scientific uncertainty, the Region is authorized, if not required, to exercise reasonable discretion and judgment.'" *In re Upper Blackstone Water Pollution Abatement Dist.*, 14 E.A.D. 577, 606 (EAB 2010) (quoting *In re Dominion Energy Brayton Point, LLC,* 13 E.A.D. 407, 426 (EAB 2007)).

Indeed, the call for further study upon further study would amount to delays that would greatly undermine the ability of the Clean Water Act to achieve its objectives. *See id.* ("[M]ore than three decades ago, the D.C. Circuit aptly described the CWA's balance when confronted with a difficult situation and the obligation to eliminate water quality impairments: 'EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels. This may well mean opting for a gross reduction in pollutant discharge rather than the fine-tuning suggested by numerical limitations. *But this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all*.") (quoting *Nat. Resources Def. Council, Inc.*, 568 F.2d 1369, 1380 (D.C. Cir. 1977)) (emphasis added by EAB).

Comment 71. Compliance Schedule for New Fecal Coliform and Enterococci Limits
The UV disinfection system was designed to meet the current permit limits of 14/43 cfu/100 ml for fecal coliform. This system provides effective treatment at the current permit levels. The Draft Permit proposes to reduce the fecal coliform limits and introduce limits for *Enterococci*.

As noted earlier, the proper calculation of bacteria limitations should have included dilution available over the tidal cycle ion the Cove.

The Town is concerned that it could have difficulty meeting revised permit limits and thus requests that the compliance schedule included in Section F of the Draft Permit be modified to allow a one-year compliance period for *Enterococci* and the more stringent fecal coliform bacteria. In this way, the Town will be able to determine the most cost-effective solution to meet both of the new limits for pathogens.

Response 72:
EPA is not establishing bacterial limits that account for dilution, in part because there are other sources of bacteria in stormwater that effectively eliminate the dilution benefit of higher flows. EPA also notes that bacteria limits in NPDES permits issued in Massachusetts have historically been established equal to the water quality criteria, with no allowance for dilution. Particularly in light of the existing and designated aquatic life uses in the receiving waters, and the human health concerns associated with excursions of bacteria criteria, EPA believes it is appropriate to follow this conservative approach. In this case, a discharge that elevates bacteria levels beyond criteria is not viewed as protective of primary contact recreation uses. If dilution were allowed, people recreating in or downstream from a zone of initial dilution may be exposed to greater risk of the acute endpoint of gastrointestinal illness. Furthermore, the bacteria limits in the permit are consistent with the assumptions and requirements of the wasteload allocation for wastewater treatment plant discharges set forth in the 2009 Final Pathogen TMDL for the Buzzards Bay Watershed. See also Response 42.

That being said, because the fecal coliform limit has been lowered, and the facility has not yet treated for Enterococci, EPA is granting a one-year compliance schedule for the facility to comply with the Enterococci limits as requested.

Comment 72. Annual Reporting Requirement
Part I.A.1(g) of the Draft Permit states that "If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions."

The WPCF regularly has a 12-month rolling average in excess of 0.4704 MGD (which is 80% of 0.588 MGD). For calendar year 2014, the 12-month rolling average was 0.531 MGD; this is before the addition of flows from a new 40-B project and a new dormitory at Tabor Academy.

Marion has several objections to this requirement of the Draft Permit as follows:

- As described in comments above, EPA lacks statutory authority to regulate flow in a NPDES permit. Therefore, EPA has no basis to set a flow limit within this permit and thus has no basis to require actions to be taken when the plant approaches this limit.

- Reaching 80 percent of the facility's design flow is not a violation of the Draft Permit, and reaching this value should not trigger a required response by the Town.

In addition to the requirements listed on Page 6 of the Draft Permit, Page 10 of the Draft Permit discusses the annual "Collection System O & M Plan" report, due to be submitted to MassDEP and EPA by April 15. The separate report lists further requirements for when the WPCF 80 percent of the design flow, including separate calculations of "maximum daily, weekly and monthly" inflow and infiltration. EPA lacks statutory authority to regulate treatment plant flow. Further, the reporting requirements listed on Page 6 and Page 10 necessitate two separate reports to be submitted at different times.

Marion requests that the requirement for action when the WPCF reaches 80 percent of its design flow be removed from the Draft Permit. Marion also requests that EPA seek to reduce the burden of report submittals to the best of its ability; an example would be to require *one* report containing all of the requested information on Page 6 and Page 10.

Response 73:
See Response 53 regarding the required reporting when the facility reaches 80% of its design flow. Regarding the rationale for the effluent flow limitation, see Responses 39-41. Regarding the rationale for the Collection System O & M Plan requirements, see Response 58. Nothing in these requirements prevents the Permittee from combining permit reporting requirements as long as the timeframes and content requirements are achieved.

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B. 33 U.S.C § 1362(6). Clean Water Act, Water Pollution Control Advisory Board.

C. 40 C.F.R. 122.44(d). Establishing limitations, standards, and other permit conditions.

D. 40 C.F.R. 261. Identification and Listing of Hazardous Waste.

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NN. Virginia Department of Transportation *et al. versus* EPA *et al.* (2013).

February 6, 2015 Comments submitted by The Buzzards Bay Coalition ("Coalition").

The Coalition submitted comments that were mostly supportive of the draft permit. Three comments requesting clarification or changes to the permit are presented and addressed below.

Comment 73. The Interim Total Nitrogen Effluent Limit should be lowered to 4.0mg/L.
The Coalition urges the EPA to establish a lower interim total nitrogen effluent limit. Footnote 7 on page 4 of the Draft Permit establishes an interim nitrogen limit of 5.0 mg/L total nitrogen limit from April through October. The Coalition urges the EPA to establish an interim permit limit of 4 mg/L. The critical need to reduce nitrogen to Aucoot Cove together with the WPCF's ability to achieve an average effluent concentration of 3.46 mg/L total nitrogen supports an interim limit of 4 mg/L total nitrogen.

Response 74:
See Responses 12, 13, 14, 17 and 20 relative to the nitrogen limit in the permit.

Comment 74. The draft permit's total nitrogen effluent limit compliance schedule is too generous.
The Draft Permit proposes to grant the Permittee 60 months, the entire term of the permit, to implement facility improvements required to meet the 3.0 mg/L total nitrogen effluent limit. This appears to be an overly generous timeframe given the evidence that the WPCF currently achieves an average total nitrogen limit of 3.46 mg/L. The Coalition supports the requirement that the Permittee submit an alternatives analysis/facilities plan to EPA for improvements required to achieve the total nitrogen limit within 12 months after the effective date of the permit in requirement I.F.3. However, the Coalition urges the EPA to require that full implementation of that plan be achieved within 36 months of the effective date of the permit.

Response 75:
See Responses 12, 13, 14, 17 and 20 relative to the final nitrogen limit. Given the uncertainty over non-point source nitrogen loads and the nitrogen reductions that will be achieved through remediating the nitrogen loadings from the lagoons, the final permit contains a seasonal average total nitrogen limit of 4.0 mg/L. Additionally, the total nitrogen compliance schedule has been removed because the limit is now attainable for the WPCF based on current performance. The elimination of the nitrogen compliance schedule makes this comment on adjustments to the compliance schedule moot.

That begin said, EPA has indicated that future permit actions may require a lower total nitrogen limit. Accordingly, it would be prudent for the Town of Marion to evaluate and plan for further improvements to its nitrogen treatment capability as part of the required facilities planning for addressing the lagoon and phosphorus related requirements of the permit.

Comment 75. Clarification requested on permit condition I.F.2.
Condition I.F.2 allows the Permittee to "supplement such reductions" for a higher total nitrogen limit at the Outfall sufficient to meet the SWQS. This condition also requires that "such plan" include any additional non-point source and stormwater reductions that the Permittee implements. It is not clear what the phrase "such reductions" in this condition refers to or what and when such a "plan" must be completed. Lastly, this provision lacks an implementation timeframe.

If the intent of this condition is to allow the Permittee to demonstrate that the load from other sources of nitrogen can be reduced ("such reductions") in an amount to meet SWQS and justify a higher total nitrogen effluent limit on Outfall 001, then clarifications are needed including inclusion of a timeframe to submit a plan for an alternative nitrogen reduction strategy. In the event that the Permittee avails itself of this opportunity, the Draft Permit must require that a plan showing the reduction of sources of nitrogen to Aucoot Cove in an amount sufficient to meet SWQS be submitted to EPA and be made available for public comment. Furthermore, that plan must be fully implemented within 36 months of EPA's approval of the plan.

Response 76:
See Response 20. The condition referenced by the commenter was part of the nitrogen compliance schedule, which has been removed from the final permit. The seasonal total nitrogen limit has been changed to 4.0 mg/L, and the total nitrogen compliance schedule has been removed because the limit is now attainable for the WPCF based on current performance.

February 2, 2015 Comments submitted by 44 Marion residents

Comment 76. Support for permit
We, the undersigned 44 Marion residents and property owners, write to express our strong support for the draft NPDES Permit as issued by the US Environmental Protection Agency and Massachusetts Department of Environmental Protection on December 3, 2014. It is clear that the unlined sewage lagoons at the town's wastewater treatment plant are a critical source of pollution to the harbors and coves of our town and must be remediated immediately. The special condition in the draft NPDES permit which requires the town to cease using the twenty acres of unlined

lagoons for the storage and disposal of sludge and untreated wastewater will terminate the lagoons as a harmful pollution source.

A study completed by the Horsley Witten Group in 2010 determined that the unlined lagoons were in fact leaking. A series of groundwater monitoring wells were installed, with the town's permission, to determine nitrogen levels and flow of groundwater. The data collected from this investigation indicated that the lagoons are leaching and contributing nitrogen to the groundwater and to Marion's coastal waters. In some instances, groundwater nitrogen data are fifty times higher than natural background conditions.

The Horsley Witten Group study was commissioned by the Buzzards Bay Coalition and at no time has the town presented evidence to the contrary.

While the lagoons present a significant source of nitrogen pollution, the solution need not be onerous on the town. The lagoons can be lined with an impermeable geotextile membrane which could be done in multiple phases to keep the wastewater treatment plant in operation. Better still, new flow controls and upgrades to the plant could eliminate the need for the lagoons as part of an updated design for the plant and open up valuable acreage for other municipal uses. It is clear that the permit provides the town with sufficient flexibility to implement alternatives to unlined lagoons.

Local residents have been urging the town to take action to remediate this known pollution source for nearly four years now. We are immensely pleased that the US Environmental Protection Agency is taking meaningful steps towards requiring an alternative to unlined lagoons and we, as residents of the town of Marion, support a requirement that the town upgrade the lagoons.

Response 77: EPA has taken note of this comment in deciding to require closure or lining of the sewage lagoons.

Supplemental Comments

These supplemental comments were submitted after the close of the public comment period. While specific responses to these late-filed comments are not required, EPA has exercised its discretion to respond to certain of these comments herein. All comments were, however, reviewed and considered relative to EPA's final determination as reflected in the final permit.

Below are all the comments received and EPA's responses. The supplemental comments reproduced verbatim are indicated in quotes, while the others have been summarized.

SEPTEMBER 16, 2015 LETTER FROM THE TOWN OF MARION.

This letter describes the Town's ongoing efforts to

1. Update the Town's Wastewater Facility's Plan;
2. Prepare a watershed loading analysis of nitrogen loading to Aucoot Cove;
3. Determine exfiltration rate from the lagoons;
4. Evaluate sludge and lagoon scenarios;

5. Examine historical data of eelgrass in Upper Aucoot Cove; and
6. Determine feasibility of an outfall extension to outer Aucoot Cove.

The letter also includes a timeline for the completion of these activities others. Finally, the Town requests that EPA delay issuance of the final permit until the Town can complete its studies, projected in March 2016.

Response:
Please see Response to 0. Please note that EPA did refrain from issuing the final permit until early in 2017, a year longer than the delay that the Town requested in this supplemental comment. This provided the Town time to work on the listed studies.

SEPTEMBER 23, 2015 LETTER FROM THE TOWN OF MARION

This letter consists of a proposed timeline for the Town to comply with the requirement to line or abandon the sewage lagoons. The letter proposed a schedule in which the lagoon lining and/or closure would be complete by December 2020, or 63 months from the date of the letter. The compliance schedule in the final permit requires completion of lagoon lining and/or closure within 48 months of the effective date of the permit.

Although this letter was submitted after the public comment period, EPA considered the suggested compliance schedule in issuing the final permit. EPA determined that such a lengthy schedule is excessive, has not been sufficiently justified, and is inconsistent with the mandate for achieving compliance as soon as reasonably possible.

NOVEMBER 13, 2015 LETTER FROM THE TOWN OF MARION

Request for seasonal average nutrient limits
"The proposed nutrient limits in the Draft Permit are on an average monthly basis. The Town notes that the recently issued Taunton Wastewater Treatment Plant permit (MA0100030) uses a rolling seasonal average nutrient limit, recognizing that the nitrogen load over the entire growing season is more important than the nitrogen load in any given month. Marion requests that the permit limits in its permit be changed to a rolling seasonal average basis.

The Draft Permit states that the total nitrogen, total phosphorus, and dissolved oxygen seasonal limits will be in effect from April 1 – October 31. We request that the basis for the seasonal limit be changed to be in effect between May 1 – October 31. This is consistent with the recently issued Taunton Wastewater Treatment Plant permit, and is also consistent with the seasonal ammonia nitrogen limits in the Marion Draft Permit."

Response:
The total nitrogen limit of 3.0 mg/L has been eliminated from the final permit. See Response 20. The limit in the final permit is based on a seasonal average, because the loading analysis that was used to determine the TN limit was based on seasonal average. As indicated in Response 20, given the extended groundwater travel time and thus the extended period of time for which groundwater nitrogen loadings from the lagoons will continue discharging to Aucoot Cove, as well as the uncertainty over EPA's estimate of the other non-point source nitrogen loadings, it is

prudent to minimize the allowable nitrogen loading from the Marion discharge. The final permit limit also is informed by the demonstrated performance for the April - October seasonal period. The month of April is considered a shoulder season relative to the critical period for algal growth. Given the need to minimize nitrogen loadings to Aucoot Cove and the fact that the final permit limit is based on demonstrated performance for the April – October time frame, the seasonal period is not changed in the final permit.

The applicable season for ammonia is based on stream temperatures as they relate to toxicity and not algal growth. The total phosphorus limit, like total nitrogen, is based on the season where algal growth is the greatest concern. Given that algal growth in streams typically begins in April, the final permit has not been changed. The critical period for dissolved oxygen however, does not typically begin in April and the final permit has been changed to June through October, consistent with the current permit.

Affordability – claim that project will cause ratepayers to spend more than 2% of income on sewer.

"The proposed conditions in the Draft Permit – especially those relating to the lagoon provisions and the more stringent nutrient limitations – will require significant capital expenditure to be in compliance. With only 1,646 sewer ratepayers who would need to bear the costs associated with these upgrades and significant projected costs of improvements to meet the requirements of the draft NPDES permit, Marion believes the improvements will place the Town above the affordability threshold, and thus subject to regulatory relief as allowed under the Clean Water Act. The Town has not yet completed a detailed affordability analysis but provides the following high-level information to demonstrate the high probability of exceeding the affordability threshold. The Town is undertaking a more detailed affordability analysis and will forward the results when this is completed.

The median household income (MHI) in Marion is $80,456 (see Attachment 3)[[17]] based on 2013 census data. This MHI is based on all residents within the community; however, it should be noted that not all residents in Marion are connected to the sewer system. Based on the location of the sewered parcels within Town, many of the more affluent portions of Town that drive up the MHI are not connected to the sewer system. As such, it is expected that the MHI of the Town's sewer ratepayers is much less than the Census Bureau's estimated $80,456. Unfortunately, Marion has only one census tract, and we are currently exploring other analyses to determine if it will be possible to refine the MHI to reflect (or at least better reflect) that of the sewer ratepayers.

The Town of Marion estimates that the average household sewer bill is currently about $997 per year, based on a fixed quarterly fee of $104.55 and a tiered billing system based on water consumption. The estimated average bill was developed from actual metered water use data (AMR data) from the Town's MUNIS billing system. Using an existing rate model that accounts for existing debt service, expenditures, O&M and staffing costs, the estimated costs of projects required to meet the conditions in the Draft Permit and other required MS4 expenses, the Town

[17] Attachment 3 to Marion's comments is not included in this RTC but is available on request.

projects that sewer rates will increase by 269%. This increase would mean that the average household sewer bill is projected to increase to $2,683, which is approximately 3.3% of the MHI; significantly above the 2% EPA screening criteria."

Response:
See Response 68. An affordability analysis will require detailed documentation supporting the analysis, including actual versus theoretical average water use values. While median household income can be based on the sewer users only, EPA notes that the Town can also require the "more affluent portions of Town" to contribute to the cost of cleaning up Aucoot Cove, especially considering that they likely also contribute to the excessive nitrogen loadings. While a future demonstration that achieving compliance will result in exceeding the affordability threshold could form the basis for an extension of the compliance schedule, it does not support a change in the necessary permit requirements. We also note that MassDEP recently included several Town of Marion projects, including $12 million for "lagoon lining/closure," *see* 2017 PEF, at 7-8, 12, on the Commonwealth's 2017 Intended Use Plan listing POTW projects to be funded through the State Revolving Fund.[18]

Request for longer phosphorus compliance schedule
With the Town's affordability constraints (see previous comment), additional time will be required to meet the TP conditions described in the Draft Permit. While the final schedule would be based on the forthcoming more detailed affordability analysis, it seems clear at this time that the start of facilities related to phosphorus/sludge handling would need to be delayed until after the completion of the lagoon lining. We would envision a schedule as follows (again from the date that Town Meeting voted affirmatively to support project funding):

- Month 1 (assumed to be May) – Town Meeting, funds appropriated for planning and design
- Month 3 (assumed to be July) – Funds available to start work on TP and sludge processing facilities planning and design
- Month 15 – Complete facilities planning on TP and sludge processing facilities
- Month 21 – Submit draft preliminary design report to EPA/DEP
- Month 23 – Submit final preliminary design report
- Month 27 – Submit 60% plans and specifications
- Month 27 – Begin permitting process
- Month 28 – Submit PEF for SRF funding for construction
- Month 31– Begin public hearings leading up to Town Meeting
- Month 32 – Complete final design, including cost estimate
- Month 37 (typically May) – Town meeting article to fund construction
- Month 39 – Submit SRF loan application with Town appropriation for construction improvements
- Month 40 – DEP issues permission to advertise and project permits in place

[18] *Available at* http://www.mass.gov/eea/docs/dep/water/approvals/year-thru-alpha/06-thru-d/17cwiupf.pdf (last visited Mar. 29, 2017).

- Month 42 – Open bids
- Month 43 – Award construction contract
- Month 45 – Begin construction
- Month 63 – Substantial completion on construction
- Month 65 – Start up period for new facilities prior to permit limits being effective

Response:
See Response 70. The final permit contains a schedule for meeting the total phosphorus limit that is consistent with the time frame that Marion requested in its timely-filed comments and is consistent with EPA's experience with similar municipal treatment upgrades. These late-filed comments provide no justification for such a lengthy schedule.

In Comment 1, however, Marion contemplated relocating the outfall to Aucoot Cove, which would eliminate the need for an effluent phosphorus limit. EPA has included an option in the final permit that allows Marion the option to relocate the outfall instead of upgrading its WPCF facility to meet the 200 μg/L total phosphorus limit. See Response 1.

Updates on planning and data collection activities
The November 2015 letter also contained updates on work being done by CDM and the Town of Marion to determine exfiltration rates from the lagoons, characterize sludge currently in the lagoons, determine the historical extent of eelgrass in Aucoot Cove, investigate watershed nitrogen loading, and explore the feasibility of extending the discharge pipe further into Aucoot Cove. While these studies may yield further information to guide the Town in its planning, they do not change the basis of the limits in the final permit.

DECEMBER 10, 2015 SUPPLEMENTAL COMMENT LETTER SUBMITTED BY THE BUZZARD'S BAY COALITION

The WPCF Draft Permit requires a monthly average nitrogen limit.
The Coalition urges the EPA to reject CDM's request for a seasonal average nitrogen limit. A seasonal average nitrogen limit is not sufficiently stringent to achieve compliance with water quality standards for Aucoot Cove. Instead, compliance must be measured by using a monthly average. Meeting a monthly nitrogen limit during this time period provides better water quality protection to Aucoot Cove and the ecological resources therein. The town of Marion's neighbor to the east, the town of Wareham, operates a wastewater treatment facility within the Buzzards Bay watershed. The town of Wareham's Final NPDES permit, MA0101893, sets an effluent limit for total nitrogen measured on an average monthly basis between the months of April 1 to October 31. The town of Marion's Draft Permit total nitrogen limit should also be measured on a monthly average basis.

Response:
See Response 20. The selection of the averaging period for the nitrogen limit reflects the time span of the environmental effects and the time span of the loading analysis. The limit in the final permit is based on a seasonal average, because the loading analysis that was used to determine the TN limit was based on seasonal average.

If new information indicates that the other non-point sources of nitrogen are significantly higher than EPA's estimate and/or water quality continues to show signs of impairment relative to water quality standards, EPA may consider a more stringent nitrogen limit in a future permit action

The Draft Permit's proposed April 1 to October 31 seasonal limit should be maintained in the final permit.

The Coalition urges the EPA to reject CDM's request for a shortened season. An examination of the Coalition's long-term dataset shows that the temperature in the waters around Buzzards Bay are warming over time, including Aucoot Cove which has warmed at a rate of approximately 1.2 F per decade.[1] The average July and August water temperatures was 72.3 F in 1992 in Aucoot Cove, whereas results in a lengthening of the time during which water temperatures are favorable for algae growth. The growing season is lengthening, not shortening. It is therefore reasonable, and consistent with the town of Wareham's seasonal nitrogen limit, to require Marion to meet its nitrogen limit between April 1 and October 31.

[1] Rheuban, J. E., S. C. Williamson, J. E. Costa, D. M. Glover, R. W. Jakuba, D. C. McCorkle, C. Neill, T. Williams, and S. C. Doney. Spatial and temporal trend in summertime climate and water quality indicators in the coastal embayments of Buzzards Bay, Massachusetts. In review.

Response:

EPA has retained the April 1 through October 31 season for the total nitrogen effluent limit, as algal growth starts in April.

The Coalition supports an expedited schedule for achieving compliance with the Lagoon Condition (Condition I.E.) in Draft Permit Condition I.F.

Marion does not dispute that the twenty acres of unlined sewage are leaking. Concern over the integrity of the lagoons was initially discussed in the WPCF's 1995 Draft Wastewater Facility Plan, produced by Camp Dresser & McKee, stating that "[t]here are two possible sources of contamination from the treatment facility: the wastewater lagoons and the septage lagoons."[1] The 1995 Plan goes on to report that Well 1 contained nitrate levels above primary drinking water standards and total nitrogen concentrations as high as 19.4 mg/L.[2] Now, twenty years later, Marion's consultants, CDM Smith's recent investigations further clarify that the lagoons are leaking. Specifically, in their supplemental comments to EPA on September 16, 2015, CDM finds that the leakage from the lagoons could be "on the order of 0.01 to 0.05 mgd."

It is clear that federal regulations require that all facilities and systems of treatment and control, including all related appurtenances, be properly operated and maintained at all times.[3] This requirement applies to the WPCF's wastewater lagoons as well. The continued operation of unlined leaking lagoons and the practice of sludge disposal in unlined lagoons is inconsistent with proper operation and maintenance requirements of the WPCF.[4] The Coalition urges EPA to maintain an expedited compliance timeframe to line or otherwise remediate the lagoons to protect Marion's sensitive coastal waters.

[1] Town of Marion Draft Wastewater Facilities Plan, Camp Dresser & McKee, June 1995 at 6-10; Town of Marion Draft Wastewater Facilities Plan, May 2001 at 2-3.

[2] Town of Marion Draft Wastewater Facilities Plan, Camp Dresser & McKee, June 1995, at 6-15.

[3] 40 CFR § 122.41(e); Fact Sheet at 19.

[4] Fact Sheet at 19.

Response:
The final permit contains a compliance schedule of 48 months for the Town to close or line the lagoons such that they are not a source of nitrogen to the groundwater and to discontinue the placement of sewage in unlined sewage lagoons, which is the same as in the draft permit.

Conclusion
The Coalition is optimistic that the Town is taking the necessary steps to comply with the Draft Permit's requirement that the lagoons be properly lined and maintained. CDM presented a construction schedule in support of this end in their September 23, 2015 comments and we look forward to supporting Marion's completion of this task.

Furthermore, the Coalition was recently pleased to partner with Marion on a grant application expand municipal sewer to existing homes serviced by on-site septic systems around Aucoot Cove. If awarded, the project will take a critical step towards reducing nitrogen to Aucoot Cove from other wastewater sources.

The ongoing, persistent nutrient pollution of Aucoot Cove, Sippican Harbor, and the Sippican River from Marion's leaking sewage lagoons cannot be allowed to continue and we urge EPA to issue a final NPDES permit that expedites lagoons cleanup as its top priority.

Response:
EPA is also pleased that Marion plans to connect septic systems near Aucoot Cove to the municipal sewer system. This action will remove a source of nitrogen that is contributing to the impairment of Aucoot Cove, and may avert the need for a more stringent effluent total nitrogen limit in future permit reissuances.

NOVEMBER 21, 2016 LETTER FROM THE TOWN OF MARION

In this letter, the Town requests that EPA defer permit issuance in exchange for a commitment from the Town to pursue initiatives such as

- Implementing Capacity, Management, Operations and Maintenance requirements contained in the draft permit
- Reliability modifications at the wastewater treatment facility
- Aucoot Cove sewering
- Regionalization planning
- Groundwater and field studies to determine impact of lagoons on Aucoot Cove
- Reduce phosphorus in the discharge with temporary chemical feed facilities
- Submittal of a recommended plan based on results of above reports and studies.

Response:
EPA understands the Town’s interest in a continuing dialogue about the permit. However, the schedule and plan contained in the letter are unacceptable to EPA. Specifically, the plan only includes a lagoon study with no provisions for lagoon lining or closure and the need to remediate the ongoing nitrogen loadings would not be an enforceable requirement.

The continued operation of unlined sewage lagoons for sludge disposal and raw wastewater equalization is in violation of the Clean Water Act and should cease as soon as possible. The submittal of a plan that includes only lagoon study is particularly puzzling, given the fact that the Town proposed a schedule for lining or closing the lagoons both in its November 2015 letter to EPA and at an April 2016 meeting with the agencies.

EPA and MassDEP have met with the Town and its consultants, at the Town’s request, four times over the past two years. The agencies have given the Town ample opportunity to discuss its views on the permit compliance schedule and put forth the Town’s ideas to reduce nitrogen loading to Aucoot Cove.

For these reasons, the agencies have decided to reissue the permit with requirements for lagoon closure and/or lining.

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June 15, 2015

Carlos T. B. Fragata
Environmental Analyst
DEP Waterways Regulation Program
20 Riverside Drive
Lakeville, MA 02347

Town of Mattapoisett Waterways Application
Notice of License Application Pursuant to M.G.L. Chapter 91
Waterways License Application Number W15-4368 Julie M. Starr-Duker

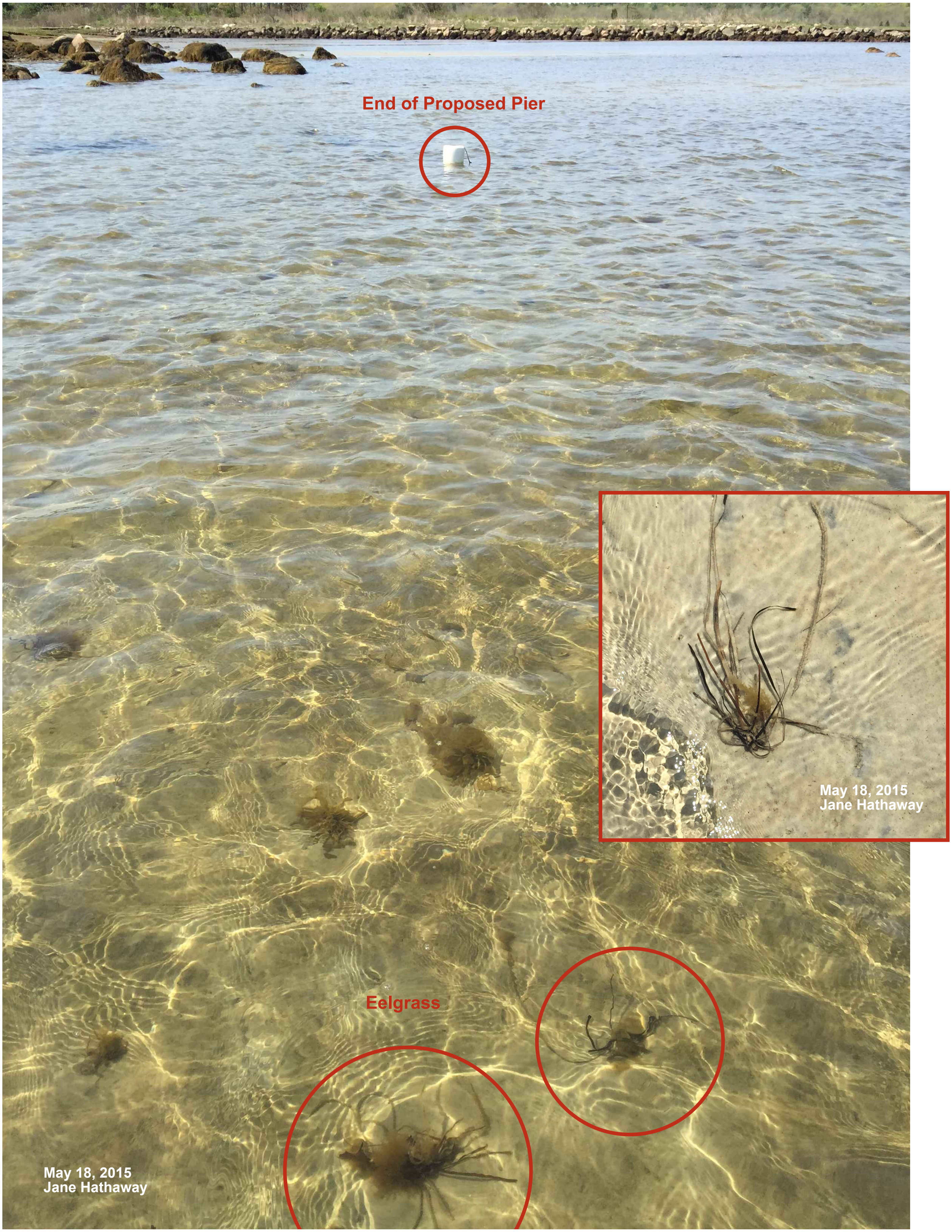
Application by Julie M. Starr-Duker to construct and maintain a pier, gangway, float and float piles at 112 Aucoot Road in the municipality of Mattapoisett in and over flowed tidelands of Aucoot Cove

Dear Mr. Fragata,

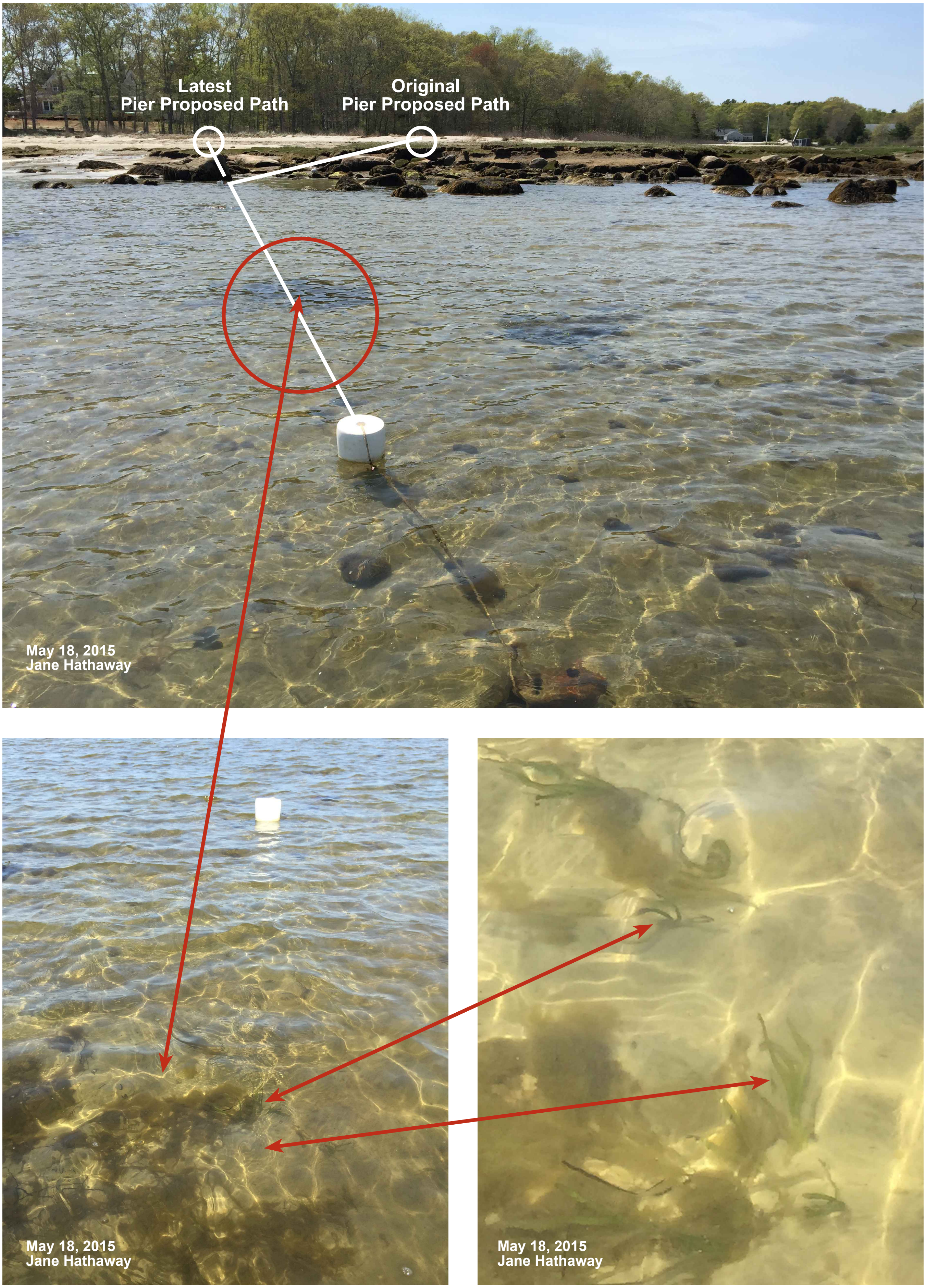
Thank you for responding to my June 10th email and giving me the opportunity to send to you the following images that support the Division of Marine Fisheries May 21, 2015 letter and content on Eelgrass and shallow water with respect to potential impacts to marine fisheries resources and habitats.

As mentioned in my email - on May 18th of this year, I walked the sand flats at low tide from our beach over to the area where the proposed Duker pier ends and saw newly sprouting eelgrass growing all along the sand flats and also within the direct path of the proposed Duker pier. While it does not exist in large beds, it does exist - as it struggles to replenish itself in this area. The Eelgrass was just starting to sprout new growth at this time. This existing Eelgrass is contrary to the April 2015 finding by Stantec Consulting Services that "no Eelgrass was observed".

Eelgrass is re-establishing itself along the sand flats and in very close proximity of the proposed pier



Eelgrass is in close proximity of the proposed pier and is also growing in its direct path


Latest
Pier Proposed Path
Original
Pier Proposed Path
May 18, 2015
Jane Hathaway
May 18, 2015
Jane Hathaway
May 18, 2015
Jane Hathaway

Beyond the end of the proposed pier, heading seaward, there are several sand flats that are exposed at low tide. During the lowest tides these sand flats extend all the way over to Haskell Island. This entire area is home to many shellfish and the wildlife that live and feed here and should not be disturbed.

As seen in this photograph (to the left) the end of the proposed Duker pier will sit in less than 12” of water at low tide. It is our understanding that there needs to be at least 18” of water at low tide for a pier location.

The Division of Marine Fisheries has stated “the combination of shallow depth and proximity to eelgrass beds could result in disturbance to this habitat through prop dredging by boat propellers”

Thank you again for letting me share this important information on the existing Eelgrass in proximity to the proposed Duker Pier, as well as the shallow waters surrounding this pier.

I am sending this letter in a electronic PDF format so that you can zoom in on the images (if needed) as well as mailing a hardcopy for your records.

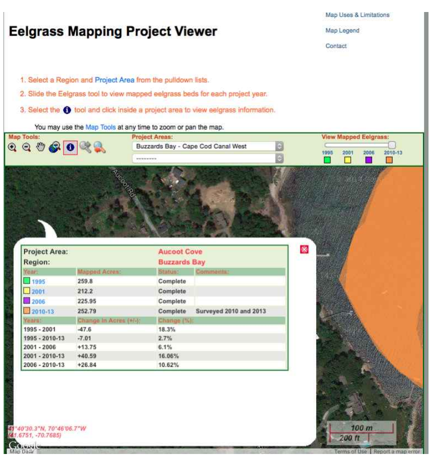
With kind regards,

Jane Hathaway
jhathaway24@gmail.com

120 Olde Knoll Road
Marion, MA 02738

cc: Division of Marine Fisheries
Mattapoisett Conservation Commission


Haskell Island
Aucoot Cove
Jane Hathaway
Eelgrass Photos
Aucoot Rd
41°40'34.1"N, 70°46'02"W
(41.6761, -70.7672)
100 m
200 ft


Eelgrass Mapping Project Viewer
Map Uses & Limitations
Map Legend
Contact
1. Select a Region and Project Area from the pulldown lists.
2. Slide the Eelgrass tool to view mapped eelgrass beds for each project year.
3. Select the tool and click inside a project area to view eelgrass information.
You may use the Map Tools at any time to zoom or pan the map.
Map Tools:
Project Areas:
Buzzards Bay - Cape Cod Canal West
View Mapped Eelgrass:
1995 2001 2006 2010-13
Project Area: Aucoot Cove
Region: Buzzards Bay
Year: Mapped Acres: Status: Comments:
1995 259.8 Complete
2001 212.2 Complete
2006 225.95 Complete
2010-13 252.79 Complete Surveyed 2010 and 2013
Years: Change in Acres (+/-): Change (%):
1995 - 2001 -47.6 18.3%
1995 - 2010-13 -7.01 2.7%
2001 - 2006 +13.75 6.1%
2001 - 2010-13 +40.59 16.06%
2006 - 2010-13 +26.84 10.62%
41°40'30.3"N, 70°46'06.7"W
(41.6751, -70.7685)
100 m
200 ft


Eelgrass Mapping Project Viewer
Map Legend
Contact
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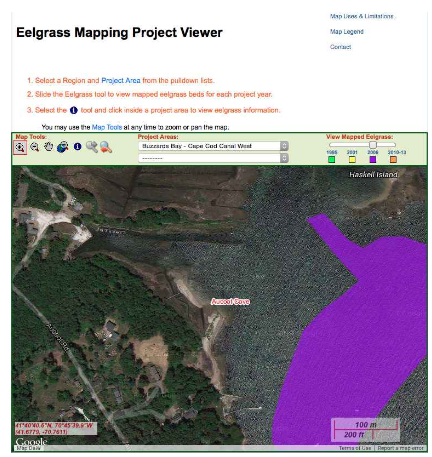
Map Tools:
Project Areas:
Buzzards Bay - Cape Cod Canal West
View Mapped Eelgrass:
Haskell Island
Aucoot Cove
100 m
200 ft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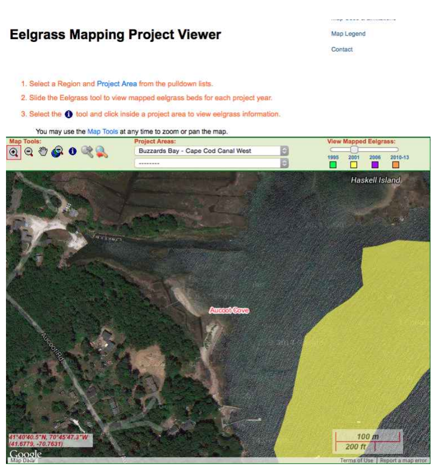
Buzzards Bay - Cape Cod Canal West
View Mapped Eelgrass:
Haskell Island
Aucoot Cove
100 m
200 ft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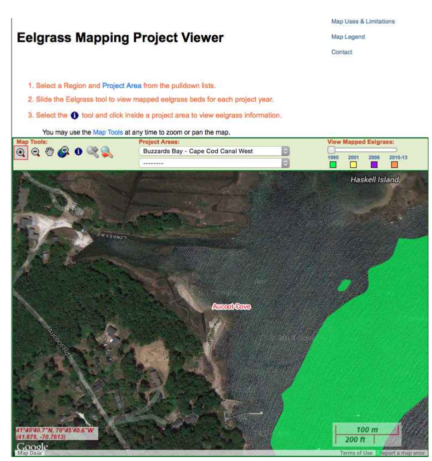
Haskell Island
Aucoot Cove
100 m
200 ft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Map Tools:
Project Areas:
Buzzards Bay - Cape Cod Canal West
View Mapped Eelgrass:
Haskell Island
Aucoot Cove
100 m
200 ft

Johnson, Robin

From: Korrin Petersen <petersen@savebuzzardsbay.org>
Sent: Monday, December 05, 2016 9:38 AM
To: Johnson, Robin
Subject: FW: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Categories: Record Saved - Shared

More photos

From: Jane Hathaway [mailto:jhathaway24@gmail.com]
Sent: Monday, November 28, 2016 4:45 PM
To: petersen@savebuzzardsbay.org
Subject: Fwd: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Here are the photos (see attached) I had sent to the Division of Marine Fisheries. They had requested additional photos so they could send them to an expert to confirm that it was eelgrass. Which they did, and it was. I will forward that confirmation email next.

Begin forwarded message:

> **From:** Jane Hathaway <jhathaway24@gmail.com>
> **Date:** August 31, 2015 at 8:09:35 PM EDT
> **To:** eileen.feeney@state.ma.us
> **Subject: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368**
>
> Dear Ms. Feeney,
>
> My Dad (Brad Hathaway) spoke to you several weeks ago and he suggested I send to you some additional pictures of Eelgrass growing in close proximity to the proposed 112 Aucoot Road Mattapoisett - Aucoot Cove Duker pier - proposal **Re: W15-4368**.
>
> He mentioned that an eelgrass expert was coming to view the pictures I had originally sent to you in a letter to the DEP, to determine if they were indeed eelgrass vs Codium. When I looked up images of Codium on the internet - my pictures were not of Codium.
>
> I was finally able to get a good day yesterday, with little wind, to get some additional pictures of eelgrass (see the 12 photos

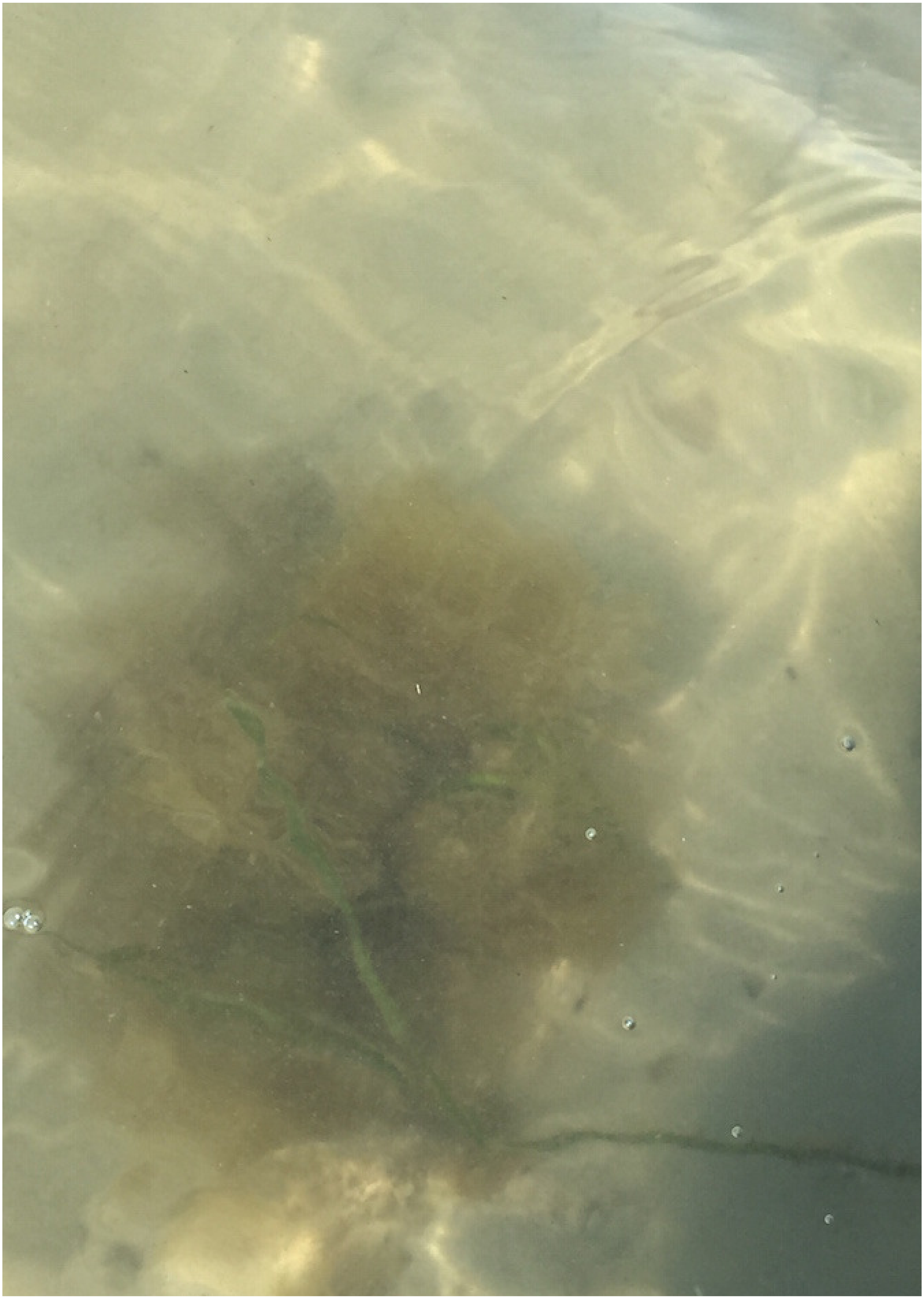
attached to this email). All of the pictures are taken next to the pier marker that marks the end of the proposed Duker pier and float. The proposed Duker pier and float would directly overlay this eelgrass seen in these photos. While the eelgrass is not in large beds - it is evident that it trying to restore itself in this area. Little fish could be seen hiding in the eelgrass as well (you can see a little fish in photo 12 just in front of the eelgrass).

Is this enough proof for the Division of Marine Fisheries to take a stronger stand with the DEP in opposition to this pier being built in this area due to eelgrass? Particularly since the Engineer is using letters from his Consultants that state there is NO EELGRASS in this area.

FYI - The Mattapoisett Conservation Commission approved the proposed Duker pier plan because the submitted plans, according to them, did not violate any part of the States Wetlands Protection Act. Mattapoisett has no wetlands by-law. The DEP is still in the review process.

Thank you in advance for any and all help the Division of Marine Fisheries can provide by informing the DEP that in fact eelgrass does exist at the very site of the proposed Duker pier.

Sincerely,
Jane Hathaway



Johnson, Robin

From: Korrin Petersen <petersen@savebuzzardsbay.org>
Sent: Monday, December 05, 2016 9:39 AM
To: Johnson, Robin
Subject: FW: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Categories: Record Saved - Shared

Division of Marine Fisheries confirmation.

From: Jane Hathaway [mailto:jhathaway24@gmail.com]
Sent: Monday, November 28, 2016 4:56 PM
To: petersen@savebuzzardsbay.org
Subject: Fwd: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Below is the email from Eileen Feeney, Division of Marine Fisheries - confirming the photos were eelgrass.

Let me know if you need any further help.
With kind regards,
Jane

---------- Forwarded message ----------
From: **Feeney, Eileen (FWE)** <eileen.feeney@state.ma.us>
Date: Wed, Sep 9, 2015 at 1:49 PM
Subject: RE: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368
To: Jane Hathaway <jhathaway24@gmail.com>

Hi Jane,

The pictures you sent are indeed eelgrass! Comment letters were sent to the Conservation Commission, DEP and the Corps. *MarineFisheries* offers technical assistance to those agencies via our comment letters. We mention what resources are present, what potential impacts may occur if the project were to move forward, and recommendations on how to minimize those impacts. Sometimes, we can make a difference but sometimes we can't. It is not under our purview to say if we do or do not think a project should move forward. That is up to the permitting agency who issues their respective permits.

Thank you for your interest in protecting eelgrass!

Eileen Feeney

| Eileen M. Feeney | Fisheries Habitat Specialist | Division of Marine Fisheries | 1213 Purchase St. - 3rd floor
| New Bedford, MA 02740 | telephone: 508.990.2860 x 117 |
fax: 508.990.0449 | email: Eileen.Feeney@state.ma.us

From: Jane Hathaway [mailto:jhathaway24@gmail.com]
Sent: Monday, August 31, 2015 8:10 PM

To: Feeney, Eileen (FWE)
Subject: EELGRASS Aucoot Cove Duker Pier Proposal W15-4368

Dear Ms. Feeney,

My Dad (Brad Hathaway) spoke to you several weeks ago and he suggested I send to you some additional pictures of Eelgrass growing in close proximity to the proposed 112 Aucoot Road Mattapoisett - Aucoot Cove Duker pier - proposal **Re: W15-4368**.

He mentioned that an eelgrass expert was coming to view the pictures I had originally sent to you in a letter to the DEP, to determine if they were indeed eelgrass vs Codium. When I looked up images of Codium on the internet - my pictures were not of Codium.

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FYI - The Mattapoisett Conservation Commission approved the proposed Duker pier plan because the submitted plans, according to them, did not violate any part of the States Wetlands Protection Act. Mattapoisett has no wetlands by-law. The DEP is still in the review process.

Thank you in advance for any and all help the Division of Marine Fisheries can provide by informing the DEP that in fact eelgrass does exist at the very site of the proposed Duker pier.

Sincerely,

Jane Hathaway

Draft Permit

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"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§ 26-53),

Town of Marion
Department of Public Works

is authorized to discharge from the facility located at

Marion Water Pollution Control Facility
50 Benson Brook Road
Marion, MA 02738

to receiving water named

Unnamed Brook to Aucoot Cove

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

This permit shall become effective on **(See * below)**

This permit expires at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on September 29, 2006 and modified on May 22, 2007.

This permit consists of 16 pages in Part I including effluent limitations and monitoring requirements, 25 pages in Part II including NPDES Part II Standard Conditions, Attachment A (USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013, 7 pages), Attachment B (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages), and Attachment C, Required Reports.

Signed this day of

Ken Moraff, Director Office of Ecosystem Protection Environmental Protection Agency Boston, MA	David Ferris, Director Massachusetts Wastewater Management Program Department of Environmental Protection Commonwealth of Massachusetts Boston, MA

*Pursuant to 40 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

PART I

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001** to Aucoot Cove. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	**EFFLUENT LIMITS**					**MONITORING REQUIREMENTS** [3]	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE**[P] **TYPE**
FLOW[2]	*********	*********	0.588 MGD	*********	Report MGD	CONTINUOUS	RECORDER
FLOW[2]	*********	*********	Report MGD	*********	*********	CONTINUOUS	RECORDER
BOD_5 [4]	42 lbs/Day	63 lbs/Day	9 mg/L	13 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE[5]
TSS [4]	42 lbs/Day	63 lbs/Day	9 mg/L	13 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE
pH RANGE[1]	6.5 - 8.3 SU (SEE PERMIT PARAGRAPH I.A.1.b.)					1/DAY	GRAB
FECAL COLIFORM [1,6]	*********	**********	14 cfu/100 mL	*********	28 cfu/100 mL	2/WEEK	GRAB
ENTEROCOCCI [1,6]			35 cfu/100 mL		276 cfu/100 mL	2/WEEK	GRAB
DISSOLVED OXYGEN (April 1st-October 31st)	NOT LESS THAN 5.0 mg/l					1/DAY	GRAB
WHOLE EFFLUENT TOXICITY [11, 12, 13, 14] Total Cadmium Total Lead Total Copper Total Zinc Total Nickel Total Aluminum	Acute $LC_{50} \geq 100\%$ Chronic C-NOEC ≥ 100% Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L Report maximum daily, µg/L					4/YEAR	24-HOUR COMPOSITE

CONTINUED FROM PREVIOUS PAGE

EFFLUENT CHARACTERISTIC	**EFFLUENT LIMITS**			**MONITORING REQUIREMENTS**	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE MONTHLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE TYPE**
AMMONIA-NITROGEN (May 1 – May 31)	12.75 lbs/day	2.6 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE
AMMONIA-NITROGEN (June 1 – October 31)	8.53 lbs/day	1.74 mg/L	Report mg/L	1/WEEK	24-HOUR COMPOSITE
AMMONIA-NITROGEN (November 1 – April 30)	Report lbs/day	Report mg/L	Report mg/L	1/MONTH	24-HOUR COMPOSITE
TOTAL NITROGEN[7] (April 1 – October 31) TOTAL KJELDAHL NITROGEN TOTAL NITRITE TOTAL NITRATE	14.7 lbs/day Report lbs/day Report lbs/day Report lbs/day	3.0 mg/L Report mg/L Report mg/L Report mg/L	Report mg/L Report mg/L Report mg/L Report mg/L	3/WEEK	24-HOUR COMPOSITE
TOTAL NITROGEN[8] (November 1 – March 31) TOTAL KJELDAHL NITROGEN TOTAL NITRITE TOTAL NITRATE	Report lbs/day Report lbs/day Report lbs/day Report lbs/day	Report lbs/day Report lbs/day Report lbs/day Report lbs/day	Report mg/L Report lbs/day Report lbs/day Report lbs/day	1/WEEK	24-HOUR COMPOSITE
TOTAL PHOSPHORUS[9] (April 1 – October 31) (November 1 – March 31)	 0.98 lbs/day 4.9 lbs/day	 200 µg/L 1.0 mg/L	 Report µg/L Report mg/L	 1/WEEK 1/MONTH	24-HOUR COMPOSITE
TOTAL COPPER[10]	0.018 lbs/day	3.73 µg/L	5.78 µg/L	1/WEEK	24-HOUR COMPOSITE

Sampling Location: Effluent samples are required to be collected following disinfection by the UV unit; dissolved oxygen samples must be taken at the point of entering the unnamed brook.

Footnotes:

1. Required for State Certification.

2. Report annual average, monthly average, and the maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value 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.

3. Effluent sampling shall be of the discharge and shall be collected at the point specified on page 3. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

   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 in correspondence appended to the applicable discharge monitoring report.

   All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136.

4. Sampling required for influent and effluent.

5. 24-hour composite samples will consist 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 proportionally to flow.

6. The monthly average limits for fecal coliform and Enterococci are expressed as a geometric mean.

7. The permittee shall comply with the 3.0 mg/L total nitrogen limit in accordance with the schedule contained in Section F below. Upon the effective date of the permit, and until the date specified in Section F below for compliance with the total nitrogen final limit of 3.0 mg/l, the interim total nitrogen limit from April through October will be 5.0 mg/L.

8. The permittee shall operate the treatment facility to reduce the discharge of total nitrogen during the months of November to March to the maximum extent possible. 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. The addition of a carbon source that may be necessary in order to meet the total nitrogen limit during the months of April to October is not required during the months of November to March.

9. The permittee shall comply with the 200 µg/L total phosphorus limit in accordance with the schedule contained in Section F below. Upon the effective date of the permit, and until the date specified in Section F below for compliance with the total phosphorus final limit of 200 µg/L, the interim limit from April through October will be 1 mg/L.

10. The minimum level (ML) for copper is defined as 3 µg/L. This value is the minimum level for copper using the Furnace Atomic Absorption analytical method (EPA Method 220.2). This method or other EPA-approved method with an equivalent or lower ML shall be used for effluent limitations less than 3 µg/L. Compliance/non-compliance will be determined based on the ML. Sampling results of 3 µg/L or less shall be reported as zero on the Discharge Monitoring Report.

11. The permittee shall conduct chronic (and modified acute) toxicity tests *four* times per year. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the daphnid, *Ceriodaphnia dubia* and the fathead minnow, *Pimiphales promelas.* Toxicity test samples shall be collected during the second week of the months of February, May, August and November. The test results shall be submitted by the last day of the month following the completion of the test. The results are due April 30th, July 31st, October 31st, and January 31st, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

Test Dates 2nd week of	**Submit Results By:**	**Test Species**	**Acute Limit LC_{50}**	**Chronic Limit C-NOEC**
March June September December	April 30th July 31st October 31st January 31st	Ceriodaphnia dubia (daphnid), Pimiphales promelas (minnow)	$\geq$ 100%	$\geq$ 100%

After submitting **one year** and a **minimum** of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed.

12. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

13. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction, based on a statistically significant difference from dilution control, at a specific time of observation as determined from hypothesis testing. As described in the EPA WET Method Manual EPA 821-R-02-013, Section 10.2.6.2, all test results are to be reviewed and reported in accordance with EPA guidance on the evaluation of the concentration-response relationship. The 100% or greater" limit is defined as a sample which is composed of 100% (or greater) effluent, the remainder being dilution water.

14. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test**

Procedure and Protocol) **Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance, which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of *NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs)*, which may be found on the EPA Region I web site at http://www.epa.gov/Region1/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

Part I.A.1. (Continued)

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

b. The pH of the effluent shall not be less than 6.5 or greater than 8.3 at any time.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.

e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.

f. The results of sampling for any parameter done in accordance with EPA approved methods above its required frequency must also be reported.

g. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.

h. Use of chlorine is prohibited.

2. All POTWs must provide adequate notice to the Director of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; 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.

3. Prohibitions Concerning Interference and Pass Through:

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

4. Toxics Control

a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.

b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), 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.

B. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall(s) listed in Part I A.1.of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported to EPA and MassDEP in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions. The permittee is required to complete the following activities for the collection system which it owns:

1. 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 Collection System O & M Plan required pursuant to Section C.5. below.

2. 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 Collection System O & M Plan required pursuant to Section C.5. below.

3. 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. In addition to being required by federal regulations, this is also a state certification requirement. Plans and programs to control I/I shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

4. Collection 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 (see page 1 of this permit for the effective date). The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up to date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

   a. All sanitary sewer lines and related manholes;
   b. All combined sewer lines, related manholes, and catch basins;
   c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);
   d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;
   e. All pump stations and force mains;
   f. The wastewater treatment facility(ies);
   g. All surface waters (labeled);
   h. Other major appurtenances such as inverted siphons and air release valves;
   i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j. The scale and a north arrow; and
k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System Operation and Maintenance Plan

The permittee shall develop and implement a Collection System Operation and Maintenance Plan.

a. **Within six (6) months of the effective date of the permit**, the permittee shall submit to EPA and MassDEP

(1) A description of the collection system management goals, staffing, information management, and legal authorities;
(2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and
(3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.8. below.

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

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventive maintenance and monitoring program for the collection system;
(3) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;
(4) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(6) 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; and
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.
(8) An <u>Overflow Emergency Response Plan</u> to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and MassDEP annually by **April 15**. 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. If treatment plant flow has reached 80% of its design flow [0.47 MGD] based on the annual average flow during the reporting year, or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
f. 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.

7. 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[1] it owns and operates.

D. 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 Part 503, which prescribe “Standards for the Use or Disposal of Sewage Sludge” pursuant to Section 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

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1 As defined at 40 CFR §122.2, which references the definition at 40 CFR §403.3

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. For the purposes of this permit, the placement of sludge in unlined lagoons constitutes sludge disposal and is therefore subject to the requirements of Part 503 for sludge disposal.

6. The 40 CFR § 503 requirements including 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 C.F.R. § 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.[2]

7. 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

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.

8. 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.

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2 This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf

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 Part 503 Subpart B.

9. 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 **March 15** (*see also* "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted to the address contained in the reporting section of the permit. If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:

   a. Name and address of contractor(s) responsible for sludge preparation, use or disposal
   b. Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge.

E. SPECIAL CONDITIONS RELATED TO LAGOON OPERATIONS

The following requirements pertain to the use and operation of the three unlined facultative sewage lagoons on the site for sludge disposal and storage of wastewater.

In accordance with federal regulations, the permittee shall cease the placement, storage, and disposal of sludge and other treatment related solids in unlined lagoons, cease the use of the unlined lagoons for storage of wastewater, and abate any ongoing contamination of groundwater occurring as a result of sludge and other wastewater solids that were deposited in the unlined lagoons. These requirements shall be met in accordance with the schedule in Section F below.

F. COMPLIANCE SCHEDULE

In order to comply with the total nitrogen permit limit and the Operation and Maintenance requirements relative to the unlined lagoons, as well as to ensure that the discharge from outfall 001 does not cause or contribute to exceedances of surface water quality standards, the Permittee shall take the following actions:

1. Within twelve (12) months of the effective date of the permit, the Permittee shall submit a plan for achieving compliance with the lagoon related permit requirements consistent with the schedule below. The plan must achieve compliance with the lagoon related permit requirements as soon as possible but no later than forty-eight (48) months from the effective date of the permit.

2. Should the permittee choose to supplement such reductions as part of this permit to demonstrate that a higher total nitrogen limit at Outfall 001 is sufficient to meet water quality standards, the plan shall also include any additional non-point source and stormwater related nitrogen reductions that the Permittee will implement. These may include documentation of the estimated nitrogen load reductions to Aucoot Cove that will result from such implementation, the estimated increases in nitrogen loads, and the net resultant change in nitrogen loading from the Aucoot Cove watershed, and controls, as

necessary, to ensure that sludge and other wastewater solids in the lagoon sediments are not an ongoing source of nitrogen contamination of groundwater.

3. Within twelve (12) months of the effective date of the permit, the Permittee shall submit an alternatives analysis/facilities plan to EPA for the treatment and/or pollution prevention improvements required to achieve the total nitrogen limit of 3.0 mg/L and the total phosphorus limits of 200 µg/L.

4. Within twenty-four (24) months of the effective date of the permit, the Permittee shall comply with the total phosphorus limit of 200 µg/L.

5. If the plan submitted under #1 above includes lining the lagoons in a manner that abates any continuing contamination of groundwater from sludge or other wastewater deposited in the lagoons and continued use of the lagoons, the Permittee shall:

   a. Within twenty-four (24) months of the effective date of the permit, submit a progress report relative to achieving compliance with the lagoon related requirements of the permit as well as any additional non-point source reduction efforts implemented.

   b. Within thirty-six (36) months of the effective date of the permit, complete construction of the lagoon liners.

6. If the plan submitted under #1 above includes implementing alternative methods for sludge disposal and/or wastewater storage than the Permittee shall:

   a. Within twenty-four (24) months of the effective date of the permit, submit a progress report relative to achieving compliance with the lagoon related requirements of the permit as well as any additional non-point source reduction efforts implemented.

   b. Within thirty-six (36) months of the effective date of the permit, complete construction of the necessary facilities and cease the disposal of sludge and other treatment related solids in unlined lagoons and cease the use of the unlined lagoons for storage of wastewater.

7. Within thirty-six (36) months of the effective date of the permit, the Permittee shall complete the design of the facility improvements required to meet the 3.0 mg/l total nitrogen seasonal limit as set out in Part I.

8. Within forty-eight (48) months of the effective date of the permit, the Permittee shall submit a progress report relative to construction of the facility improvements required to meet the 3.0 mg/l total nitrogen seasonal limit as set out in Part I.

9. Within sixty (60) months of the effective date of the permit, the Permittee shall complete construction of the facility improvements required to meet the 3.0 mg/l total nitrogen seasonal limits as set out in Part I.

If, at any time, the Permittee can make a demonstration that nonpoint source and stormwater nitrogen improvements are sufficient to achieve water quality standards without further point source nitrogen reductions, the Permittee may submit a request for a permit modification.

G. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the MassDEP within the time specified within the permit.

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 MassDEP no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP.

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. Permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. (See Part I.G.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 particular report due date specified in this permit.

3. Submittal of Pre-treatment Related Reports

All reports and information required of the permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Office of Ecosystem Protection's Pretreatment Coordinator in Region 1 EPA's Office of Ecosystem Protection (OEP). These requests, reports and notices include:

A. Annual Pretreatment Reports,
B. Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,
C. Revisions to Industrial Discharge Limits,
D. Report describing Pretreatment Program activities, and
E. Proposed changes to a Pretreatment Program

This information shall be submitted to EPA/OEP as a hard copy at the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. Submittal of Requests and Reports to EPA/OEP

The following requests, reports, and information described in this permit shall be submitted to the EPA/OEP NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

A. Transfer of Permit notice
B. Request for changes in sampling location
C. Request for reduction in testing frequency
D. Request for Reduction in WET Testing Requirement
E. Report on unacceptable dilution water / request for alternative dilution water for WET testing
F. Notification of proposal to add or replace chemicals and bio-remedial agents including microbes

These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP NPDES Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

5. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to EPA.

A. Written notifications required under Part II
B. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting

This information shall be submitted to EPA/OES at the following address:

U.S. Environmental Protection Agency
Office or Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

6. State Reporting

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.G.3, I.G.4, and I.G.5 also shall be submitted to the State at the following addresses:

MassDEP – Southeast Region
Bureau of Resource Protection (Municipal)
20 Riverside Drive
Lakeville, MA 02347

Copies of toxicity tests only shall be submitted to:

Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

7. Verbal Reports and Verbal Notifications

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 MassDEP. This includes verbal reports and notifications which require reporting within 24 hours. (As examples, see Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.) Verbal reports and verbal notifications shall be made to EPA's Office of Environmental Stewardship at:

U.S. Environmental Protection Agency
Office of Environmental Stewardship
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912
617-918-1510

H. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. Each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as a NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL

USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

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

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

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 freshwater, 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 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 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.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

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. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

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.

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 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 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.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an 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 must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code OES04-4
Boston, MA 02109-3912

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 most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. 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.1. Use of Reference Toxicity Testing

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

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.

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.1.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 IC25 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.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids [6]	x		--
Total Dissolved Solids [6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon [6]	x	x	0.5
Total Metals [5]			
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
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA <u>Standard Methods for the Examination of Water and Wastewater</u>, 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater, 21st Edition
  -Method 4500-CL E Low Level Amperometric Titration
  -Method 4500-CL G DPD Colorimetric Method
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

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-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . 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 endpoints reproduction and growth 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-02-013.

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 freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. 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-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. 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-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) 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 and reproduction)
    - Permit limit and toxicity test results
    - Summary of test sensitivity and concentration response evaluation

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
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

ATTACHMENT B

USEPA REGION 1 FRESHWATER 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:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test 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:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

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 sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

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 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point 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. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

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 most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcement/water/dmr.html *for further important details on alternate dilution water substitution requests.*

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (°C)	20 ± 1°C or 25 ± 1°C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q[R] or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	≥ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration	40
11.	Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q[R] or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	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
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description

- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody

- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.

- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)

- Raw data and bench sheets.

- Provide a description of dechlorination procedures (as applicable).

- Any other observations or test conditions affecting test outcome.

Attachment C
Summary of Required Report Submittals*

Required Report	Date Due	Submitted to:
Whole Effluent Toxicity Test Report (Part I.A.1)	April 30, July 31, October 31, and January 31 of each year	1,2,3
Initial Collection System Operation and Maintenance Plan (Part I.C.5.a.)	Within 6 months of effective date	1,2
Full Collection System Operations and Maintenance Plan (Part I.C.5.b.)	Two years from the effective date of the permit	1,2
Collection System Annual Report (Part I.C.6.)	Annually by April 15	1,2
Notification of Sanitary Sewer Overflows (Part I.B.)	Oral Report -Within 24 hours of discovery of event (contact: David Turin, 617-918-1598) Written Report – Within 5 calendar days of discovery of event	1,2
Annual Sludge Report (Part I.D.9)	Annually by March 15	1,2
Lagoon Compliance Plan (I.F.1.)	One year from the effective date of the permit.	1,2
Alternatives Analysis/Facilities Plan for Point Source Improvements (I.E.2.)	One year from the effective date of the permit	1,2
Nitrogen Progress Report (I.E.4.)	Two years from the effective date of the permit	1,2
Nitrogen Progress Report (I.E.6)	Three years from the effective date of the permit	1,2
Nitrogen Progress Report (I.E.8.)	Four years from the effective date of the permit	1,2

* This table is a summary of the reports required to be submitted under this NPDES permit as an aid to the permittee(s). If there are any discrepancies between the permit and this summary, the permittee(s) shall follow the permit requirements.

1. EPA New England - Via NetDMR

2. MassDEP
   Bureau of Resource Protection
   Southeast Regional Office
   20 Riverside Drive
   Lakeville, MA 02347

3. MassDEP
   Division of Watershed Management
   Surface Water Discharge Permit Program
   627 Main Street, 2nd Floor
   Worcester, MA 01608

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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PART II. 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) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the 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, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements 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.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete "Duty to Comply" regulations.

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 notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator 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 Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. 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).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

   a. In accordance with 40 CFR 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 CFR 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 as defined in 40 CFR §2.302(a)(2).

   c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §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.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, 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 Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. 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 and with the requirements of storm water pollution prevention plans. 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 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 be reasonably 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 provision of Paragraphs B.4.c. and 4.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.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

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

(2) 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

(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. <u>Upset</u>

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;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(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.

PART II. 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 for 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 five years (or longer as required by 40 CFR Part 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 except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator 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 results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. 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.

2. Inspection and Entry

The permittee shall allow the Regional Administrator 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 CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§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 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 Regional Administrator 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 Regional Administrator. The Regional Administrator 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 CWA. (See 40 CFR Part 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.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the 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 submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission 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.

(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 CFR §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 Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, 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.

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 Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §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 noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. 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 Regional Administrator. 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.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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 to, 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 and 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.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

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" measured during the calendar week divided by the number of "daily discharges" measured during the 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.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

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) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the 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.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard 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 (See "Point Source" definition).

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 Regional Administrator 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".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge 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 (CWA), 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 which is not a land application unit, surface impoundment, injection well, or waste pile.

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

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

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 tribe organization, or a designated and approved management agency under Section 208 of the CWA.

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 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 rig 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 Regional Administrator 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 Regional Administrator shall consider the factors specified in 40 CFR §§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 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).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

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

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 CFR §122.2).

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 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (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 any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

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

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

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

   (i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
   (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
   (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

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, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR 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 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, 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 EPCRA Section 313, 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 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 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 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

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 which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants 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 wastewater 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 wastewater 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 Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR 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 CFR Part 503.

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

Waters of the United States 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 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 the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration 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. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 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 sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

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

Industrial wastewater is wastewater generated in a commercial or industrial process.

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 with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

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.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

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

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is 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; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

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 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

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.

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

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

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

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. 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)	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
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
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)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". 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.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is 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.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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.

NPDES PERMIT NO.: MA0100030

PUBLIC COMMENT PERIOD: December 3, 2014 – January 2, 2015

NAME AND ADDRESS OF APPLICANT:

Paul Dawson
Town of Marion
50 Benson Brook Road
Marion, MA 02738

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Marion Water Pollution Control Facility (WPCF)
50 Benson Brook Road
Marion, Massachusetts 02738

RECEIVING WATER: Unnamed Brook to Aucoot Cove (Buzzards Bay – 95)
HUC12: 010900020305

CLASSIFICATION: Class B (Unnamed Brook), Class SA & Shellfishing (Aucoot Cove)

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APPENDICES

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I. Proposed Action, Type of Facility, and Discharge Location

The above-named applicant has requested that the U.S. Environmental Protection Agency Region 1 reissue its NPDES permit to discharge into the designated receiving water. The facility is engaged in collection and treatment of domestic wastewater. See **Figures 1 and 2** for facility location and treatment process diagrams, respectively. The outfall discharges to an unnamed brook (sometimes called Effluent Brook) that flows into Aucoot Cove.

Table 1. General Discharge Information

Outfall	Description of Discharge	Receiving Water	Outfall Location
001	Treated Effluent	Unnamed Brook to Aucoot Cove	41º, 42', 09" N 70º, 46', 39" W

The collection system is 100% separate sanitary sewers. There have been no reported sanitary sewer overflows (SSOs) during the current permit term.

II. Recent Permit History

EPA and MassDEP issued the existing permit on September 29, 2006. On October 31, 2006, the Town of Marion (Town) filed a petition for review with the EPA Environmental Appeals Board (EAB) appealing certain conditions in the Final Permit. The contested portions of the permit were stayed, while the uncontested conditions went into effect on March 1, 2007. EPA and the Town reached a settlement in which EPA modified certain conditions of the permit, and the Town withdrew its appeal. The final modified permit became effective August 1, 2007.

The changes made to the existing permit as a result of the settlement were as follows:

- A requirement for the Town to conduct receiving water monitoring to evaluate the effects of the effluent on the biota of the unnamed brook was transferred to MassDEP.
- A requirement to sample fecal coliform 3 times per week was changed to a 3 times/week requirement for the first year of the permit, then 2/week if monitoring data showed that Marion Water Pollution Control Facility (WPCF) was consistently meeting its fecal coliform limit.
- A 6-month compliance schedule was established for the Town to procure and install flow-proportional sampling equipment so that it could take 24-hour composite samples, as required by the permit.

In 2007, MassDEP completed the biological evaluation of the unnamed brook, which included macroinvertebrate and algal community identification (see Appendix A). Aquatic invertebrates have specific habitat needs, and the presence or absence of certain sensitive groups can be an indicator of ecosystem health.

Overall, the study results indicated nutrient enrichment at all sampling stations in the unnamed brook, including the one upstream station. The study found that the macroinvertebrate community upstream of the discharge was similar to that 1 km downstream of the discharge, but that both communities were dominated by organisms tolerant of organic pollution. Stoneflies (Plecoptera), a pollution-intolerant group, were absent after being found at the upstream location in 2000. Algal coverage was higher at the downstream stations than at the upstream station. The report cited nearby residential development as a possible cause for the change in species assemblage.

III. Description of Discharge and Receiving Water

Quantitative descriptions of the discharge in terms of significant effluent parameters, based on discharge monitoring reports (DMRs) submitted from September 2010 through August 2014, are shown in Appendix B of this fact sheet.

The water quality classification of the unnamed brook receiving the Marion WPCF discharge is not specifically listed in the Buzzards Bay table of the MA Surface Water Quality Standards (SWQS) (see 314 CMR 4.06(5), Table 25), nor does the map of the Buzzards Bay watershed (see 314 CMR 4.06(5) Figure 25) show the water quality classification for this water. Therefore, pursuant to 314 CMR 4.06(4), the brook is a Class B High Quality Water. Under MA SWQS, such waters must have consistently good aesthetic value and, where designated, must be suitable as a source of public water supply with appropriate treatment, as well as for irrigation and other agricultural uses. *Id.* at 314 CMR 4.05(3)(b). They must also be free of floating, suspended or settleable solids that are aesthetically objectionable or could impair uses. *Id*. at 314 CMR 4.05(3)(b)(5). Changes to color or turbidity of the waters that are aesthetically objectionable or use-impairing are also prohibited. *Id*. at 314 CMR 4.05(3)(b)(6). Dissolved oxygen levels in Class B waters must not be less than 5.0 mg/L. *Id*. at 314 CMR 4.05(3)(b)(1).

Aucoot Cove is classified in the tables of the MA SWQS (314 CMR 4.06 (5), Table 25) as Class SA and for shellfishing (the listing is under the heading "Sippican River"). Class SA waters are designated as excellent 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, excellent habitat for fish, other aquatic life and wildlife may include, but is not limited to, sea grass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting without depuration (Approved and Conditionally Approved Shellfish Areas). These waters shall have excellent aesthetic value.

In addition to criteria specific to Class SA and B waters, Massachusetts imposes minimum narrative criteria applicable to all surface waters, including aesthetics ("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"); bottom pollutants and alterations ("free from pollutants in concentrations or combinations or from alterations that adversely affect the physical or chemical nature of the bottom, interfere with the propagation of fish or shellfish, or adversely affect populations of non-mobile or sessile benthic organisms"); nutrients[1] ("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 toxics ("free from pollutants in concentrations that are toxic to humans, aquatic life or wildlife"). *See* 314 CMR 4.05(5)(a),(b), (c) and (e).

The Commonwealth implements its narrative toxics standard at 314 CMR 4.05 (5)(e) by specifying that, "[f]or pollutants not otherwise listed in 314 CMR § 4.00, the *National Recommended Water Quality Criteria: 2002, EPA 822R-02-047, November 2002* ["Recommended Criteria"] published by EPA pursuant to Section 304(a) of the [CWA], are the allowable receiving water concentrations for the affected waters, unless the Department

[1] Massachusetts Standards do not establish a numeric criterion for total phosphorus or for nitrogen.

…establishes a site specific criterion or determines that naturally occurring background conditions are higher[.]"

Section 303(d) of the CWA requires states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such, require the development of total maximum daily loads (TMDL). Inner Aucoot Cove (MA95-71)[2] is listed in the Massachusetts 2012 Integrated List of Waters (303d) (2012 Integrated List) as Category 5: Waters Requiring a TMDL. Inner Aucoot Cove is listed as impaired and requiring a TMDL for total nitrogen, dissolved oxygen, fecal coliform and nutrient/eutrophication biological indicators. A Final Pathogen TMDL has been approved for all waters in the Buzzards Bay watershed. The draft permit is consistent with the assumptions and requirements of the WLA for the discharge.

IV. Limitations and Conditions

The effluent limitations and monitoring requirements may be found in the draft NPDES permit.

V. Permit Basis and Explanation of Effluent Limitation Derivation

A. Process Description

The Marion WCPF, located in Marion, Massachusetts, is a 0.588-MGD wastewater treatment facility. Treatment units include inlet aerated chamber with air handling and odor control, mechanical bar screens, vortex grit chamber with classifier, sequencing batch reactors (SBRs), equalization tank, disc filters, and ultraviolet (UV) disinfection. Treated effluent is discharged to an unnamed brook that discharges to Aucoot Cove. Scum, waste activated sludge from the SBRs, and filter backwash are discharged to onsite aerated lagoons. The lagoons are also used for equalization and storage of wastewater during high flows exceeding SBR capacity and when one of the SBRs is down for service.

B. Effluent Limitations and Monitoring Requirements

1. Overview of Federal and State Regulations

EPA is issuing this permit pursuant to Section 402(a) of the Clean Water Act. The Commonwealth of Massachusetts is also issuing this permit pursuant to Massachusetts General Laws ch. 21, § 43 (2004).

Under Clean Water Act ("CWA" or "Act") section 402, 33 U.S.C. § 1342, EPA may issue National Pollutant Discharge Elimination System ("NPDES") permits "for the discharge of any pollutant, or combination of pollutants" if the permit conditions assure that the discharge complies with certain requirements, including those of section 301 of the CWA, 33 U.S.C. § 1311.

CWA section 303 requires each State to adopt water quality standards for its waters. *See* 33 U.S.C. § 1313(a)-(c). Water quality standards consist of (1) designated "uses" of the water, such as propagation of fish, aquatic life, and wildlife, recreation and aesthetics; (2) "criteria," expressed either in numeric or narrative form, which, *inter alia*, specify the amounts of various pollutants that may be present in those waters without impairing the designated uses; and (3) an

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[2] Impaired area defined as "From the confluence with Aucoot Creek, Marion to the boundary of Division of Marine Fisheries designated shellfishing growing area BB31.1, north and southwest from Haskell Island, Marion (formerly part of segment 95-09).

antidegradation policy to maintain and protect existing uses and high quality waters. *See id.* § 1313(c)(2)(A); *see also* 40 CFR §§ 131.2, 131.3, 131.6, 131.10, 131.11, 131.12.

The Massachusetts Surface Water Quality Standards at 314 Commonwealth of Massachusetts Regulation (CMR) 4.00 (MA SWQS) establish designated uses of the State's waters, criteria to protect those uses, and an antidegradation provision to ensure that existing uses and high quality waters are protected and maintained. They also include requirements for the regulation and control of toxic constituents and specify that EPA's recommended water quality criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site-specific criterion is established.

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. *See* 33 U.S.C. §§ 1311, 1313, 1314(b); 40 CFR Parts 122, 125, 131 and 133. As a class, Publicly Owned Treatment Works ("POTWs") must meet technology-based requirements based on "secondary treatment." *See id.* § 1311(b)(1)(B). Section 301(b)(1)(C), 33 U.S.C. § 1311(b)(1)(C), of the Act requires that NPDES permits include effluent limits more stringent than technology-based limits whenever necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations…or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to [the CWA].

NPDES permits must contain effluent limitations necessary to attain and maintain water quality standards, without consideration of the cost, availability or effectiveness of treatment technologies. *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013); *In re City of Moscow*, 10 E.A.D. 135, 168 (EAB 2001); *In re City of Fayetteville, Ark.*, 2 E.A.D. 594, 600-601 (CJO 1988) (Section 301(b)(1)(C) "requires unequivocal compliance with applicable water quality standards, and does not make any exceptions for cost or technological feasibility.").

EPA has implemented its Sections 301(b)(1)(C) and 402 of the Act through numerous regulations, which specify when the Region must include permit conditions, water quality-based effluent limitations or other requirements in NPDES permits.[3] For example, 40 CFR § 122.4(d) *prohibits* issuance of an NPDES permit "[w]hen the imposition of conditions cannot *ensure* [emphasis added] compliance with the applicable water quality requirements of all affected States." Section 122.44(d)(1) is similarly broad in scope and obligates the Region to include in NPDES permits "any requirements…necessary to: (1) Achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

"Congress has vested in the Administrator [of EPA] broad discretion to establish conditions for NPDES permits" in order to achieve the statutory mandates of Section 301 and 402. *Arkansas v. Oklahoma*, 503 U.S. 91, 105 (1992).

Section 401(a)(1) of the CWA forbids the issuance of a federal license for a discharge to waters of the United States unless the state where the discharge originates either certifies that the discharge will comply with, among other things, state water quality standards, or waives certification. EPA's regulations at 40 CFR §122.44(d)(3), §124.53 and §124.55 describe the manner in which NPDES permits must conform to conditions contained in state certifications.

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[3] Effluent limits are restrictions on the quantities, rates, and concentrations of pollutants that may be discharged from point sources. 33 U.S.C. § 1362(11).

Section 402(o) of the CWA provides, generally, that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. Unless certain limited exceptions are met, "backsliding" from effluent limitations contained in previously issued permits that were based on CWA §§ 301(b)(1)(C) or 303 is prohibited. EPA has also promulgated anti-backsliding regulations, which are found at 40 CFR §122.44(l). Unless statutory and regulatory backsliding requirements are met, the limits in the reissued permit must be at least as stringent as those in the previous permit.

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). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit. Compliance schedules to meet water quality based effluent limits may be included in permits only when the state's water quality standards clearly authorize such schedules and where the limits are established to meet a water quality standard that is either newly adopted, revised, or interpreted after July 1, 1977. Finally, the permitting authority must make a reasonable determination that a compliance schedule is "appropriate" and that compliance is required "as soon as possible." *See* 40 CFR §122.47(a), §122.47(a)(1).

2. Development of Water Quality-based Limits

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from the state's water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable in-stream pollutant concentration. Maximum daily limits are generally derived from the acute aquatic life criteria, and the average monthly limit is generally derived from the chronic aquatic life criteria. Chemical specific limits are established in accordance with 40 CFR §122.44(d) and §122.45(d).

EPA's regulations set out the process for the Region to determine whether permit limits are "necessary" to achieve state water quality standards and for the formulation of these requirements. *See* 40 CFR § 122.44(d). Permit writers are first required to determine whether pollutants "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion" of the narrative or numeric criteria set forth in state water quality standards. *Id.* § 122.44(d)(1)(i). EPA guidance directs that this "reasonable potential" analysis be based on "worst-case" conditions. *In re Washington Aqueduct Water Supply Sys.*, 11 E.A.D. 565, 584 (EAB 2004); *Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1001 (D.C. Cir. 1997) (discussing EPA's policy that reasonable potential analysis be based on the worst case scenario). If a discharge is found to cause, have the reasonable potential to cause, or contribute to an excursion of a state water quality criterion, then a permit *must* contain effluent limits as stringent as necessary to achieve state water quality standards; see 40 CFR § 122.44(d)(1), (5). An excursion occurs if the projected or actual instream concentration resulting from the discharge exceeds the applicable criterion.

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from the permit application, monthly discharge monitoring reports (DMRs), and State and Federal water quality reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in *Technical Support Document for Water Quality-based Toxics Controls,* March 1991, EPA/505/2-90-001 in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water. In accordance with the MA SWQS at 314 CMR 4.03(3), available dilution for rivers and streams is based on a known or estimated value of the lowest mean flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10).

Establishing water quality-based effluent limitations that are sufficiently protective to meet in-stream water quality criteria requires the Region to account for both effluent and receiving water flows. When deriving permit effluent limits, EPA accounts for the effluent wastewater flow under POTW design flow conditions (40 CFR § 122.45(b)(1)); the concentration of a given pollutant in the effluent (discharge concentration); the percentage of effluent in the receiving water immediately downstream of the discharge under the critical low flow conditions identified in the state water quality standards (available dilution); and the concentration of pollutants upstream of the discharge (background) to determine how much the discharge can contribute such that the resulting mix downstream does not exceed the criterion. Where the discharge concentration exceeds the criterion, and the receiving water has no available dilution or remaining assimilative capacity for the pollutant, then the permit writer may establish the permit limit at the criterion level, to ensure the resulting discharge will not cause or contribute to an exceedance of the numeric criterion in-stream.

Narrative standards have the same force and effect as other state water quality standards; unlike numeric criteria, however, narrative water quality standards are necessarily subject to translation prior to their application. *See American Paper Inst. v. United States EPA*, 996 F.2d 346, 351 (D.C. Cir. 1993).

EPA in issuing an NPDES permit must, by necessity, also translate existing narrative criteria into instream numeric threshold concentrations over the course of developing water quality-based numeric effluent limitations. As explained by the D.C. Circuit:

> "As long as narrative criteria are permissible…and must be enforced through limitations in particular permits, a permit writer will inevitably have some discretion in applying the criteria to a particular case. The general language of narrative criteria can only take the permit writer so far in her task. Of course, that does not mean that the language of a narrative criterion does not cabin the permit writer's authority at all; rather, it is an acknowledgement that the writer will have to engage in some kind of interpretation to determine what chemical-specific numeric criteria--and thus what effluent limitations--are most consistent with the state's intent as evinced in its generic standard."

See American Paper Inst., 996 F.2d at 351 (citations omitted). This process of translating a narrative criterion is governed under EPA regulations by 40 CFR § 122.44(d)(1)(vi), which implements Sections 301 and 402 of the Act. Subsection (A) of that provision mandates at the outset a calculation of a protective ambient threshold concentration for the pollutant:

> "Where a State has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits using one or more of the following options:
>
> (A) Establish effluent limits *using a calculated numeric water quality criterion* [emphasis added] for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use."

See also Upper Blackstone Water Pollution Abatement Dist. v. United States EPA, 690 F.3d 9, 23 (1st Cir. 2012) ("Because both Massachusetts and Rhode Island employ narrative water quality criteria for the relevant pollutants, the EPA translated these into numeric limits under its procedures set out in 40 CFR § 122.44(d)(1)(vi).").

3. Conventional Pollutants

A) Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS)

The current permit contains BOD_5/TSS average weekly and average monthly limits of 13 mg/L and 9 mg/L, respectively. The mass limits are 63 lbs/day average weekly and 42 lbs/day average monthly. Though the effluent flow limit was increased in the current permit, pollutant loads stayed the same, consistent with antidegradation provisions in the MA SWQS (314 CMR 4.04). Thus, the 13 mg/L and 9 mg/L limits were calculated to maintain load levels from the previous 15 mg/L and 10 mg/L limits, respectively. From September 2010 through August 2014, there were no violations of the BOD_5 or TSS limits.

The effluent limitations and monitoring requirements for BOD_5 and TSS in the draft permit are the same as those in the current permit. These limits are sufficient to ensure attainment of water quality standards and have been carried forward from the current permit in accordance with antibacksliding requirements. The monitoring frequency remains once per week.

B) Bacteria

The current permit limits fecal coliform to 14 cfu/100 mL (colony forming units per 100 mL water) monthly geometric mean and 43 cfu/100 mL maximum daily. These limits were based on state certification requirements. Sampling frequency was 3/week for the first year of the permit, then 2/week for the remainder of the permit term. There were no violations of this limit from September 2010 through August 2014, with values considerably lower than the permit limit. The range of reported fecal coliform values was 1-8 cfu/100 mL.

There have been two key developments concerning bacteria limits since the issuance of the existing permit. First, MassDEP has revised the criteria for bacteria in the MA SWQS for protecting shellfishing and recreational uses. The metric for recreational uses has changed from fecal coliform to *enterococci*, and the single sample maximum for shellfishing was revised from 43 cfu/100 mL to 28 cfu/100 mL. Second, MassDEP finalized a TMDL for bacteria in Buzzards Bay. Because of the lack of dilution and the short travel time to Aucoot Cove, limits have been established in accordance with the SWQS to prevent impairment to Aucoot Cove. For point sources discharging to Class SA waters, the SWQS fecal coliform criteria are 14 mpn/100 mL monthly geometric mean and that no more than 10% of samples exceed 28 cfu/100 mL.

Fecal Coliform Bacteria - The MA SWQS (314 CMR § 4.05(4)(a)4) require that in SA waters designated for shellfishing: "fecal coliform shall not exceed a geometric mean Most Probable Number (MPNc) of 14 organisms per 100 mL, nor shall more than 10% of the samples exceed a MPN of 28 per 100 mL, or other values of equivalent protection based on sampling and analytical methods used by the Massachusetts Division of Marine Fisheries and approved by the National Shellfish Sanitation Program in the latest revision of the Guide for the Control of Molluscan Shellfish." The monthly average limit in the current permit (14 cfu/100 mL) is consistent with the current MA SWQS and has been retained in the draft permit. The maximum daily limit in the current permit is 43 cfu/100 mL, which was based on previous Massachusetts Surface Water Quality Standards for waters designated for shellfishing, and are less stringent than the criteria in the current Massachusetts water Quality Standards (28 MPN/100 mL). Accordingly, the maximum daily limit in the draft permit has been lowered to 28 cfu/100 mL. These limits are in accordance with the Buzzards Bay Pathogen TMDL. The monitoring frequency (twice per week) proposed in the draft permit is the same as in the current permit.

Enterococci Bacteria - MassDEP added new criteria to its surface water quality standards for bacteria in a revision to the MA SWQS (314 CMR 4.00) on December 29, 2006. EPA approved the changes to the bacteria criteria on September 19, 2007. The criteria require that, to preserve recreational uses, no single Enterococci sample exceed 104 colonies per 100 mL and that the geometric mean of all samples taken within the most recent six months based on a minimum of five samples shall not exceed 35 Enterococci colonies per 100 mL. MassDEP views the use of the 90% upper confidence level of 276 cfu/100mL as appropriate for setting the maximum daily limit for Enterococci. Thus, in the draft permit, EPA has established a monthly average (geometric mean) effluent limit of 35 cfu/100mL and a daily maximum effluent limit of 276 cfu/100mL for Enterococci to ensure that the discharge does not cause or contribute to exceedances of MA SWQS. The draft permit requires sampling twice per week.

pH

Due to the lack of information on receiving water pH levels and the variability and complexity of pH chemistry, EPA and the state have determined that establishing limits equal to the criteria range will be protective of designated uses. Where the receiving water has sufficient dilution and buffering capacity, EPA will consider limits outside of this range. Because that is not the case here, limits have been established equal to the criteria range.

The current permit limits effluent pH to a minimum of 6.5 and a maximum of 8.3 at any time. These limits are based on the MA SWQS. Sampling frequency is daily. There have been no violations of the pH limits during the September 2010 through August 2014 review period. The lowest minimum daily pH was 6.7 Standard Units (S.U.), and the highest daily maximum pH was 7.7 S.U.

The limits in the existing permit will be carried forward to the draft permit. Monitoring frequency remains daily.

C) Dissolved Oxygen

The draft permit includes a seasonal (June – October) limitation of not less than 5.0 mg/L for dissolved oxygen (DO). The limit has been established equal to the criteria to ensure that low DO discharge does not cause instream oxygen levels to fall below the criteria values. From September 2010 through August 2014, there were no violations of the minimum dissolved oxygen limit. The monitoring frequency remains once per day.

4. Non-Conventional Pollutants

A) Effluent Flow and Available Dilution

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).

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

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

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

The limitation on sewage effluent flow is within EPA's authority to condition a permit in order to carry out the objectives of the Act. *See* CWA §§ 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 protect EPA's WQBEL and reasonable calculations is encompassed by the references to "condition" and "limitations" in 402 and 301 and implementing regulations, as they are designed to assure compliance with applicable water quality regulations, including antidegradation. Regulating the quantity of pollutants in the discharge through a restriction on the quantity of wastewater effluent is consistent with the overall structure and purposes of the CWA.

In addition, as provided in Part II.B.1 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 effluent flow. Thus, the permit's effluent flow limitation is necessary to ensure proper facility operation, which in turn is a requirement applicable to all NPDES permits. *See* 40 CFR § 122.41.

Review of facility flow between December 2011 and November 2013 shows that the average flow was 0.51 MGD. During this period, the range of monthly average effluent flows was between 0.245 and 0.845 MGD.

The existing permit limits the 12-month rolling average flow to 0.588 MGD. From December 2011 through November 2013, the range of 12-month rolling average flows was 0.407 MGD to 0.555 MGD. The draft permit carries forward the flow limit, expressed as a 12-month rolling average.

Water quality-based limits are established with the use of a calculated available dilution. As previously stated, 314 CMR 4.03(3)(a) requires that effluent dilution be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, occurring over a 10-year recurrence interval. Additionally, the facility design flow is used to calculate available effluent dilution.

Because the unnamed brook to which Marion WPCF discharges has minimal or no flow of its own during dry periods, the 7Q10 is considered zero.

$$\text{Dilution Factor} = \frac{\text{7Q10} + \text{facility flow}}{\text{facility flow}} = \frac{0 + 0.588}{0.588} = 1$$

Thus, the dilution factor is 1.

B) Ammonia Nitrogen

Ammonia is a toxic pollutant which may be harmful to aquatic organisms, and nitrogen is a nutrient that can contribute to excessive plant growth in receiving waters, thus depleting dissolved oxygen in the water column necessary for aquatic life. The ammonia limitations in the permit are water quality-based effluent limitations necessary to prevent toxicity in the receiving water.

The existing permit contains monthly average ammonia limits of 1.74 mg/L from June 15 to October 15 and 2.6 mg/L from May 1 to June 14. The current limits were calculated using recommended 1994 water quality criteria for ammonia at a pH of 6.75 S.U. and 25 degrees Celsius (C) for the period from June 15 to October 1, and at a pH of 6.75 S.U. and 15 degrees C for the period of May 1 to June 14.

There was one violation of the ammonia limit in May 2012, when the reported concentration was 6.75 mg/L, higher than the limit of 2.6 mg/L.

The most current recommended ammonia criteria are found in the 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA-822-R-99-014). The recommended chronic criteria for total ammonia, at a pH of 6.75 and 25 degrees C, is 3.24; and at a pH of 6.75 and 15 degrees C is 6.15 mg/L.

The draft permit retains the limits that were established to ensure attainment of the 1994 ammonia criteria, and these limits have been retained to ensure consistency with antibacksliding requirements. The facility has been able to consistently attain these limits. The draft permit proposes an average monthly ammonia limit of 2.6 mg/L during May, and 1.74 mg/L from June 1st through October 31st.

The ammonia discharges during the winter have been far below the criteria; hence the draft permit does not propose winter ammonia limits. The permittee must report average monthly ammonia from November 1st through April 30th, and must report the maximum daily ammonia discharge concentration year-round. The monitoring frequency remains once per week from May 1 through October 31 and monthly for the remainder of the year.

The proposed draft permit also contains ammonia loading limits of 12.8 lbs/day in May, and 8.53 lbs/day from June through October.

Loading (lbs/day) = Design flow (MGD) x Limit (mg/L) x 8.34 (conversion factor)

Monthly Average Load - May (lbs/day) =
0.588 MGD x 2.6 mg/L x 8.34 = **12.75 lbs/day**

Monthly Average Load – June-October (lbs/day) =
0.588 MGD x 1.74 mg/L x 8.34 = **8.53 lbs/day**

C) Total Nitrogen

The basic cause of nutrient problems in estuaries and nearshore coastal waters is the enrichment of freshwater with nitrogen (N) on its way to the sea and by direct inputs within tidal systems. EPA defines nutrient overenrichment as the anthropogenic addition of nutrients, in addition to any natural processes, causing adverse effects or impairments to beneficial uses of a waterbody. Eutrophication is an aspect of nutrient overenrichment and is defined as an increase in the rate of supply of organic matter to a waterbody. Cultural eutrophication has been defined as the human-induced addition of wastes containing nutrients to surface waters that results in excessive plant growth and/or a decrease in dissolved oxygen.

Estuaries, especially large, productive ones like Buzzards Bay, 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 (EPA, 2001).

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

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 overenrichment 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 overenrichment 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 water body.

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 used 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. For example, losses of submerged aquatic vegetation (SAV), such as eelgrass, occur when light is decreased due to turbid water associated with overgrowth of algae or as a result of epiphyte growth on leaves (NOAA, 2007 and EPA, 2001). Excess nitrogen and phosphorus cause an increased growth of phytoplankton and epiphytes (plants that grow on other plants). Phytoplankton growth leads to increased turbidity, blocking light attenuation, and epiphytic growth further blocks sunlight from reaching the SAV surface. When sunlight cannot reach SAV, photosynthesis decreases and eventually the submerged plants die. (State-EPA Nutrient Innovations Task Group, 2009). The loss of SAV can have negative effects on the ecological functioning of an estuary and may impact some fisheries because the SAV beds serve as important habitat. Because SAV responds rapidly to water quality changes, its health can be an indicator of the overall health of the coastal ecosystem.

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 levels. Through respiration, and the decomposition of dead plant matter, excessive algae and plant growth can reduce in-stream dissolved oxygen 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, dissolved oxygen 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 dissolved oxygen. Many aquatic insects, fish, and other organisms become stressed and may even die when dissolved oxygen levels drop below a particular threshold level.

Nutrient overenrichment of estuaries and nearshore coastal waters from human-based causes is now recognized as a national problem on the basis of CWA 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; and EPA, 2001).

When permitting nutrient discharges, the Region analyzes available record materials from a reasonably conservative standpoint, as it regards one key function of a nutrient limit as preventative. This protective approach is appropriate because, once begun, the cycle of eutrophication can be difficult to reverse due to the tendency of nutrients to be retained in the sediments. Nutrients can be re-introduced into a waterbody from the sediment, or by microbial transformation, potentially resulting in a long recovery period even after pollutant sources have been reduced. Eutrophic conditions are often exacerbated around impoundments and in other slow moving reaches of rivers, where detention times increase relative to free flowing segments of rivers and streams. In addition, in flowing systems, nutrients may be rapidly transported downstream and the effects of nutrient inputs may be uncoupled from the nutrient source, which complicates source control. Thus, a second key function of a nutrient limit is to protect downstream receiving waters regardless of their proximity in linear distance.

Facility Performance

The existing permit requires Marion to operate the treatment facility within the design "target effluent quality" of 7-10 mg/L and report effluent total nitrogen on the monthly DMR. The Marion WPCF has achieved a high level of nitrogen removal during the current permit term, resulting in an average effluent concentration of 3.46 mg/L from September 2010 through August 2014. The May through October average effluent total nitrogen concentration was 3.8 mg/L during this period. However, impairments for nutrient enrichment and low DO persist, as evidenced by the information presented below. Inner Aucoot Cove is listed on the 2012 Integrated List of waters, and total nitrogen concentrations in Aucoot Cove exceed threshold targets identified by MassDEP for similar waters above which adverse nutrient-related impacts are expected to occur.

Reasonable Potential Analysis

The reasonable potential analysis examines the effects of nitrogen on water quality in Aucoot Cove rather than the unnamed brook. In freshwater systems, such as the unnamed brook, aquatic plant growth is typically limited by phosphorus, meaning that excess nitrogen does not increase plant growth. Please see page 25 of this fact sheet for a reasonable potential analysis of phosphorus in the unnamed brook.

Aucoot Cove is a deep, well flushed embayment of approximately 0.5 square miles area. The water quality classification of Aucoot Cove is SA, the most protective classification for saline waters. It is also a designated shellfishery. Inner Aucoot Cove is listed as impaired for total nitrogen, dissolved oxygen, and nutrients/eutrophication biological indicators. To interpret the narrative nutrient criteria, consistent with 122.44 (d)(1)(vi), and determine the appropriate threshold concentration, EPA reviewed nitrogen, dissolved oxygen and algal data collected by the Buzzards Bay Coalition at various locations in Aucoot Cove.

The water quality criterion for dissolved oxygen is 6.0 mg/L in Class SA Waters, such as Aucoot Cove. Aquatic plants and algae give off oxygen from photosynthesis during the day, but absorb oxygen during the night for respiration. Therefore, low dissolved oxygen (DO) in the early morning hours is one indication of eutrophication. Low DO events cause fish kills, noxious odors, and dead zones in estuaries.

Data collected by the Buzzards Bay Coalition indicates that the monitoring sites closest to the discharge have the highest likelihood for DO violations. Monitoring station AC7, at the mouth of the unnamed brook to Aucoot Cove, violated the DO criterion in 71% of monitoring events. Other monitoring stations in Aucoot Cove also frequently violate the DO criterion, with AC2 violating 45% of events, AC4 56%, and AC5a 45%.

Results from monitoring sites in Hiller's Cove, located adjacent to Aucoot Cove, show much lower violation frequencies. HL2 violated the 6.0 mg/L DO standard in 12% of sampling events, and HL1 violated the standard in only 7% of events. Hiller Cove, like Aucoot Cove, receives stormwater pollution from a developed area; but unlike Aucoot Cove has no POTW point sources.

The Massachusetts Department of Environmental Protection (MassDEP) has identified total nitrogen levels believed to be protective of eelgrass habitats as less than 0.39 mg/L and ideally less than 0.3 mg/L and *chlorophyll a* levels as 3-5 µg/L and ideally less than 3 µg/L (MADEP/SMAST, 2003))[4]. Monitoring station AC2, located in inner Aucoot Cove, has a median nitrogen concentration of 0.47 mg/L. In contrast, AC3, which currently supports eelgrass, has a median total nitrogen concentration of 0.35 mg/L[5].

To determine an appropriate threshold concentration, EPA considered the procedure developed by the Massachusetts Estuaries Project (MEP). This procedure identifies a target nitrogen concentration threshold based on a location within the estuary where water quality standards are not violated, in order to identify a nitrogen concentration consistent with unimpaired conditions. This approach is consistent with EPA guidance regarding the use of reference conditions for the purposes of developing nutrient water quality criteria.

EPA generally recommends three types of scientifically defensible empirical approaches for setting numeric criteria to address nitrogen/phosphorus pollution.[6] They are a reference condition

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[4] Massachusetts Department of Environmental Protection, UMASS-Dartmouth School for Marine Science and Technology. 2003. Massachusetts Estuaries Project: Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators Interim Report. Massachusetts Department of Environmental Protection. July 21, 2003. Revised September 16, 2003 and December 22, 2003.

[5] Data available at http://www.savebuzzardsbay.org/ProtectBay/CleanWater/SoundScience/BayHealthMap

[6] Environmental Protection Agency. 2001. Nutrient Criteria Technical Guidance Manual: Estuarine and Coastal Marine Waters. U.S. Environmental Protection Agency, Office of Water, EPA-822-B-01-001. October 2001. Published Online: http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/marine/index.cfm

approach, mechanistic modeling, and stressor-response analysis. The reference condition approach derives criteria from observations collected in reference waterbodies. Reference waterbodies represent least disturbed and/or minimally disturbed conditions within a region (Stoddard et al., 2006) that support designated uses (EPA, 2000a). Therefore, the range of conditions observed within reference waterbodies provides appropriate values upon which criteria can be based. The reference condition approach requires the ability to define and identify reference waterbodies, and relies on the availability of sufficient data from these reference waterbodies to characterize the distributions of different nutrient variables. Aucoot Cove is classified as an SA water and currently supports eelgrass in the middle cove, but not the inner cove. Based on its depth, strata, and other characteristics the inner cove would be expected to support eelgrass. Therefore, the primary water quality parameter considered in determining a reference location is eelgrass.

Eelgrass continues to grow in middle Aucoot Cove, but is receding from inner Aucoot Cove. This is a predictable result of the inner cove receiving nutrient inputs from point and non-point sources without the same degree of tidal flushing that characterizes the middle cove. GIS data collected by MassDEP and analyzed by EPA indicate that eelgrass coverage in Aucoot Cove has retreated from its historical extent. (see **Figure 5**). During a site visit on September 10, 2014, EPA staff observed eelgrass beds in Aucoot Cove that appeared patchy, yellowed, and shaded by attached algae. Some die-off may be expected late in the growing season. However, the thick algal cover seems to be the immediate cause of the poor condition of the eelgrass beds.

For this analysis, EPA is using monitoring station AC3 as the reference location. As shown in **Figure 4**, this location is in a current eelgrass bed. The median total nitrogen concentration at AC3 between 2007 and 2012 was 0.35 mg/L, which will be the target concentration for this analysis. EPA notes that this value is consistent with TN concentration thresholds to protect eelgrass beds identified in other estuaries. Moreover, AC3 has the lowest *chlorophyll a* levels of any monitoring station in Aucoot Cove for which these data are available. The average *chlorophyll a* level at AC3 between 2007 and 2012 was 7.0 μg/L, which is still higher than the MassDEP/SMAST protective level of 3-5 μg/L.

EPA has concluded that at existing levels, nitrogen in the Marion WPCF discharge has the reasonable potential to cause or contribute to water quality violations in Inner Aucoot Cove. as discussed in Section IV.B.3., Inner Aucoot Cove is listed as impaired and requiring a TMDL for total nitrogen, dissolved oxygen, and nutrient/eutrophication biological indicators. Monitoring stations closest to the discharge, such as AC2 and AC7, are more impaired than stations further out in the cove. While the Marion WPCF has attained an impressive level of nitrogen removal from its discharge, its average effluent nitrogen concentration of 3.46 mg/l is still ten times higher than the concentration needed to support eelgrass in the cove.

Environmental Protection Agency. 2000a. Nutrient Criteria Technical Guidance Manual: Rivers and Streams. U.S. Environmental Protection Agency, Office of Water and Office of Science and Technology, EPA-822-B-00-002. July 2000. Published Online: http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/rivers/index.cfm

Environmental Protection Agency. 2000b. Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs. U.S. Environmental Protection Agency, Office of Water and Office of Science and Technology, EPA-822-B00-001. April 2000. Published Online: http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/lakes/index.cfm

Contribution from Lagoons

The Marion WPCF deposits sludge from its treatment processes in the sewage lagoons. EPA has determined that the lagoons are functioning as sludge disposal rather than treatment or storage sites under 40 CFR Part 503 regulations. The Marion WPCF has deposited sludge in its unlined sewage lagoons for many years without any plan for removal and disposal. According to 40 CFR Part 503 Subpart C, EPA considers land that contains sewage sludge for more than two years to be a disposal site. Because the sludge storage practices constitute disposal, the draft permit contains sludge-related requirements in Sections D, E and F.

The Buzzard's Bay Coalition commissioned a study by Horsley Witten (HW) that estimated the lagoons were leaching 33,400 lbs of nitrogen per year into the groundwater, including 16,700 lbs/year to groundwater that flows in a diffuse circuitous path and ultimately discharges to Aucoot Cove. The Town of Marion and its consultant CDM Smith dispute this result, asserting that the infiltration rate and nitrogen concentration of water exiting the lagoons were overestimated, and that there may be other sources of nitrogen in the groundwater, such as the landfill, a transfer station, and a composting site.[7] The CDM analysis represents a general critique of the HW report, and no effort is made to quantify lagoon loadings or loadings from the other non-point sources referenced. EPA also notes that the sources the Town has stated may be significant are under the Town's control. Furthermore, the results of the loading analysis would be similar if the actual lagoon loading were one half of the Horsley Witten estimate.

EPA believes that like the nitrogen contributed from the surface water discharge portion of the treatment works, nitrogen from the lagoons is also contributing to nutrient impairments in Aucoot Cove and Sippican Harbor. Disposal of nitrogen rich sludge and untreated wastewater in unlined lagoons is not proper operations and maintenance of the treatment plant. Being unlined, the lagoons have the potential to leach significant amounts of nitrogen into the groundwater, which would not occur if the lagoon portion of the treatment works were being properly operated and maintained. Federal regulations require all NPDES to include certain standard conditions, including with respect to proper operation and maintenance of the treatment works:

> "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 and with the requirements of storm water pollution prevention plans." 40 CFR § 122.41(e).

The lagoon system at the Marion WPCF is covered by this provision.[8] EPA has determined that the use of unlined lagoons for flow equalization and sludge disposal is not in compliance with the operation and maintenance requirements of 40 CFR § 122.41(e).

Furthermore, the regulations pertaining to sludge disposal (40 CFR 503.5) indicate that "on a case-by case basis, the permitting authority may impose requirements for the use or disposal of sewage sludge in addition to or more stringent than the requirements in this part when necessary to protect public health and the environment from any adverse effect of a pollutant in the sewage sludge."

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[7] http://www.marionma.gov/pages/selectmenpresent%2015NOV11.pdf

[8] The lagoon system subject to NPDES regulation as part of the "treatment works." Section 212(2)(A) of the Act defines treatment works to mean, *inter alia*, "intercepting sewers, outfall sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances." POTW also "includes *any* devices and systems used in the *storage*, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature." 40 CFR § 403.3(q) (emphasis added).

The EPA May 1990 document, "Guidance For Writing Case-by Case Permit Requirements For Municipal Sewage Sludge", indicates that "…many of the standard permit conditions that apply to effluent discharge activities will also apply to sludge use and disposal activities (e.g., duty to mitigate, duty of proper operation and maintenance,…" Chapter 9 of this document indicates that "Because most surface disposal sites were developed as a temporary or stop-gap sludge storage/disposal facility, EPA does not consider them to be environmentally acceptable solutions for ultimate disposal."

The EPA November 1991 document, "Guidance For NPDES Inspectors: Verifying Compliance With Sludge Requirements" indicates that, "When conducting the walk-through visual inspection of the facility, the inspector should be aware of, and look for, physical conditions that are indicative of potential or existing problems. Some of the more common indicators of potential problems are listed in Table 3-1." Table 3-1 includes "unlined sludge lagoons."

The regulations pertaining to sludge at 40 CFR Part 503.24 indicate that, "Sewage sludge placed on an active sewage sludge unit shall not contaminate an aquifer." The EPA September 1995 document, "Process Design Manual, Surface Disposal of Sewage Sludge and Domestic Septage", indicates that this management practice requires that proof be obtained that ground water is not contaminated. "This proof must be either (1) the results of a ground-water monitoring program developed by a qualified ground-water scientist, or (2) certification by a ground-water scientist that ground water will not be contaminated by the placement of sewage sludge on an active sewage sludge unit." The document further indicates that "The certification option is usually obtainable only if the active sewage sludge unit has a liner and leachate collection system. It is generally infeasible for a ground-water scientist to certify that ground water will not be contaminated in the absence of a liner unless ground water is very deep and there is a natural clay layer or unless the amount of material placed on the site is quite low."

For the above reasons, EPA has formulated special conditions relative to operation and maintenance of the lagoon system, and disposal of sludge, to assure compliance with all applicable requirements of the CWA and regulations. *See* CWA §§ 301(b)(1)(C), 402(a)(2); 40 CFR §§ 122.4(a), (d); 122.43. "Permit writers are…encouraged to be specific in formulating proper O&M requirements in the permit, especially where poor or inadequate O&M practices have caused problems in the past." 49 FR 38039 (September 26, 1984).[9] The special conditions in the permit require discontinuation of use of the unlined lagoons for equalization and disposal of sludge, and abatement of any ongoing adverse effects to the environment, including nitrogen contamination of the aquifer, resulting from the accumulated sludge and wastewater solids in the lagoons.

Effluent Limitation Calculation

A planned nitrogen loading study under Massachusetts Estuary Project (MEP) for Aucoot Cove has not been completed, nor is it expected in the near future. In the absence of such a modeling study or TMDL, EPA is required to use available information to establish water quality limits when issuing NPDES permits to impaired waters.

EPA's calculation of an effluent limitation for nitrogen consists of several steps. First, EPA determined a threshold nitrogen concentration in the water body that is consistent with

[9] *See also* NPDES Permit Writer's Manual (Chapter 9-21) ("Permits should clarify requirements for proper operation and maintenance of the collection system.")

unimpaired conditions. As discussed in the reasonable potential analysis, this concentration is 0.35 mg/L.

EPA next determined an allowable total nitrogen load from the watershed that would result in TN concentrations at or below the 0.35 mg/L TN threshold for Inner Aucoot Cove. EPA delineated a 0.1 square-mile portion of Aucoot Cove that includes both the inner harbor and the healthy eelgrass beds in middle harbor. This "reference area" is able to assimilate the existing nitrogen inputs and still supports eelgrass because it is larger and better flushed than the impaired area. EPA calculated the current TN loading per square mile of water area in Aucoot Cove for the reference area, then calculated the total watershed load that would meet that loading rate in the impaired area. To determine the allowable TN load from Outfall 001, EPA assumed that the sum of the watershed loads from various sources, including those beyond the purview of this permit, plus the load from Outfall 001, was equal to the total watershed load.

Thus, the watershed TN load is considered to have three components: (1) nonpoint sources (NPS) and stormwater point sources, (2) the discharge from the Marion WWTF Outfall 001, and (3) the exfiltration to groundwater from the Marion WWTF lagoons. The assumptions behind the calculation of each TN source are explained below.

In the absence of a detailed NPS and stormwater point sources loading analysis for the Aucoot Cove watershed, EPA used the nonpoint source and stormwater point source areal loading rate calculated for the Segreganset River watershed, which has similar land use patterns as Marion.[10] This rate, 2.32 lbs/day/sq.mi, was multiplied by the watershed area for Aucoot Cove, 4.06 square miles (from the Buzzards Bay Project), to yield a nonpoint source and stormwater point sources load of 9.40 lbs/day. This number represents stormwater runoff and nonpoint sources, including septic systems.

EPA calculated the Marion WPCF nitrogen load by multiplying the reported total nitrogen concentration for May through October 2011 through 2013 by the monthly average flow for the same time period and then multiplying by a conversion factor. The calculated WPCF nitrogen load is 13.75 lbs/day.

Finally, EPA added the nitrogen exfiltration from the Marion WPCF sludge lagoons. The best available estimate of the nitrogen loading to Aucoot Cove from the lagoons is 16,700 lbs/year, from the April 2011 Horsley Witten lagoon study,[11] which translates to 45.753 lbs/day.

Based on these three estimated loads, the total watershed nitrogen load from all three sources was calculated as 68.90 lbs/day (9.4 lbs/day + 13.75 lbs/day + 45.753 lbs/day).

EPA delineated the impaired area of Aucoot Cove as the inner half of the reference area where the nitrogen contributions from the watershed first enter the cove without the volume of water or mixing that occurs further out in the cove. As shown in Figure 6, the impaired area is 0.05 square miles, while the reference area, which includes the impaired area, is 0.1 square miles and extends outward from the unnamed brook to reference point AC3. EPA then determined the level of

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[10] Calculated from the Taunton WWTP fact sheet. Drainage Area for Segreganset River = 14.9 sq. mi, total nitrogen loading = 34.5 lbs/day (see page 31 of fact sheet and Attachment A to fact sheet, respectively). http://epa.gov/region1/npdes/permits/draft/2013/draftma0100897permit.pdf

[11] Horsley & Whitten, 2011. Environmental Assessment of the Marion Wastewater Treatment Plant Sewage Lagoons. Prepared for Coalition for Buzzards Bay.

nitrogen contributions in Inner Aucoot Cove that would result in the same loading rate per unit area as currently exists for the larger area that encompasses the reference site, where it appears that nitrogen loading is not causing an impairment. **Figure 6** shows a map of the impaired and reference areas.

By dividing the loading rate by the surface area of the reference area, as shown below, EPA determined that the areal loading rate for the reference area is 689.0 lbs/day/sq.mi.

$$\frac{68.90\ \text{lbs/day}}{0.10\ \text{sq. mi.}} = 689.0\ \text{lbs/day/sq. mi.}$$

This is assumed to be an acceptable areal loading rate since the reference area extends outward to reference point AC3. To calculate the allowable daily load for the impaired area, EPA multiplied this loading rate by the area of the impaired area.

689.0 lbs/day/sq.mi. x 0.05 sq. mi. = 34.45 lbs/day total nitrogen <= Target Loading Rate for the impaired area

EPA believes that watershed loads need to be reduced to 34.45 lbs/day for the impaired area to meet water quality standards. EPA's calculations assume no reduction of nonpoint source and stormwater nitrogen. Therefore, the full nonpoint and stormwater source total was subtracted from the total loading to yield 25.05 lbs/day. This is the remaining nitrogen load allocated to the Marion WPCF outfall and lagoons combined. Because the estimated loading from the lagoons (45.753 lbs/day) exceeds the total load allocated for the Marion WPCF (25.05 lbs/day), point source reductions from the WPCF alone cannot achieve water quality standards in Aucoot Cove. If the lagoons were to continue their current mode of operation, the nitrogen allocation to the discharge would be negative.

In a scenario where the lagoon nitrogen source has been reduced to zero, the allocation to the Marion WPCF outfall would be 25.05 lbs/day TN. If the facility were running at design flow of 0.588 MGD, this flow would correlate to a TN concentration of 5.11 mg/L. However, because the lag time for groundwater to travel from the lagoons to Aucoot Cove is at least 20 years[12], nitrogen from the lagoons will continue to migrate to Aucoot Cove past the term of the next permit. WPCF effluent nitrogen concentrations need to be reduced well below 5 mg/L to achieve water quality standards in Aucoot Cove during the permit term.

The permit includes a total nitrogen limit of 3.0 mg/L, which is considered the limit of technology for nitrogen treatment, and this translates to a mass loading of 14.71 lbs/day. One permitting option considered by EPA was establishment of a limit equal to the instream target determined by EPA to implement narrative nutrient criteria. However, EPA determined that, as a first step, imposing a limit of 3 mg/L, which is consistent with maximizing nitrogen reductions based on available technology, is a reasonable at this time in order to allow the Town the opportunity to take steps to control nitrogen exfiltration from the lagoons.

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[12] The distance from the lagoons to Aucoot Cove is approximately 1.5 miles. Assuming a high rate of hydraulic conductivity (ki = 1 foot/day), a hydraulic gradient of 0.006, and soil porosity of 30%, it would take the groundwater approximately 20 years to travel from the lagoons to Aucoot Cove. At lower rates of hydraulic conductivity, the groundwater would take longer to migrate to Aucoot Cove. Hydraulic rate, hydraulic gradient, and soil porosity numbers were taken from Horsley & Whitten, 2011 (Environmental Assessment of the Marion Wastewater Treatment Plant Sewage Lagoons. Prepared for Coalition for Buzzards Bay)

The Horsley Witten estimate of nitrogen discharged to Aucoot Cove via groundwater is more than three times the load discharge to the unnamed brook through the Marion treatment plant outfall (current WPCF TN load = 5,019 lbs/year). This suggests that controlling exfiltration from the lagoons may be a more significant benefit to Aucoot Cove than further control of nitrogen in the treatment plant discharge. Because alterations to the Marion lagoon system are required under the permit, and these operational changes will sharply reduce the nitrogen exfiltration from the lagoons going forward, EPA has determined this step-wise approach to restoring water quality in the receiving waters is reasonable. Furthermore, the compliance schedule to meet the 3 mg/L is also designed to allow the Town to pursue other watershed load reductions, which could lead to a limit less stringent than 3 mg/L, as explained below.

Design Flow (mgd) x Permit Limit (mg/L) x 8.34 (conversion factor) = Loading limit (lbs/day)

0.588 mgd x 3.0 mg/L x 8.34 = 14.71 lbs/day

The draft permit includes an interim limit of 5 mg/L and a 48-month compliance schedule for achieving the more stringent limit of 3 mg/L. Additionally, the permit provides a schedule, should the permittee choose to address stormwater and nonpoint sources of nitrogen identified above to attempt offset and WPCF reductions and document that WPCF nitrogen limits need not be reduced to 3.0 mg/L. If other nitrogen reductions obviate the need to go to 3.0 mg/L, the Town can request a permit modification. The schedule requires a plan evaluating, among other things, alternatives for removing the lagoons as a source of nitrogen through lining of the lagoons and/or abandonment and cleaning of the lagoons; alternatives for controlling other significant sources of nitrogen as necessary; and alternatives for achieving the 3.0 mg/L total nitrogen limit for the wastewater discharge. The schedule also requires implementation of lagoon controls and design and construction of WPCF improvements to achieve 3.0 mg/L. If, at any time, the Permittee can make a demonstration that stormwater and nonpoint source nitrogen improvements are sufficient to achieve water quality standards without further point source nitrogen reductions, the Permittee may submit a request for a permit modification. EPA will consider *net* nonpoint source and stormwater reductions in evaluating a modification request; i.e. any additional stormwater and nonpoint sources added in the interim, such as, but not limited to, new impervious area or septic systems, must be accounted for in the analysis.

The draft permit proposes a monitoring frequency of twice per week. The proposed draft permit also contains a loading limit of 14.7 lbs/day for total nitrogen.

The compliance schedule for achieving the total nitrogen limit incorporates reporting requirements relative to progress made in achieving the necessary net stormwater and nonpoint source reductions. Following issuance of the final permit, EPA will review the status of the stormwater and nonpoint source controls at 12 month intervals from the date of issuance.

In summary, the decision over how to frame the permit and its effluent limitations to achieve a protective in-stream nitrogen threshold is a difficult one given the overall environmental context. A variety of sources contribute to the nitrogen load in Aucoot Cove, including Outfall 001 of the publicly owned treatment work, the lagoons of the POTW, stormwater regulated as a point source, and nonpoint sources such as septic systems and unpermitted storm water. Nonpoint sources of nitrogen, particularly the lagoons, are the dominant contributors to Aucoot Cove's nitrogen pollution problem but, at this time, are neither subject to any effective treatment or control nor accounted for through a Total Maximum Daily Load. Given this, and in the absence of any TMDL, existing or planned, or other meaningful nonpoint source controls, EPA deems it necessary to maximize point source reductions as a pragmatic matter, while at the same time to provide a framework to address other sources of nitrogen in the watershed.

EPA recognizes the challenges associated with controlling nitrogen through nonpoint source controls. However, these challenges do not obviate the need to carry out substantial nonpoint controls in concert with strong controls on point sources. The upcoming reissuance of the Massachusetts Small MS4 (municipal separate storm sewer) General Permit will require stronger control of municipal stormwater sources, especially when stormwater is contributing to nutrient impairments. The draft permit recognizes that there may be an appropriate pause point in the future when stormwater and nonpoint sources of nitrogen are adequately accounted for and remedied and field data indicates that all of the Aucoot Cove ecosystem has recovered to a healthy state free of cultural eutrophication.

EPA also weighed the possibility that immediate default to a more stringent effluent limitation would not give sufficient opportunity, nor incentive, for Marion to pursue necessary nonpoint source controls. Accordingly, EPA determined that, as an initial matter, a limit of 3.0 mg/l TN is adequate to comply with Section 301 of the CWA if imposed in conjunction with other efforts to address the nonpoint source component of the nitrogen pollution problem afflicting the receiving waters.[13] In an effort to effect this more comprehensive environmental objective, which is in keeping with the overall objectives of the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" by a date long since passed, EPA is setting permit limits to require "a gross reduction in pollutant discharges" because "this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all." NRDC v. Costle, 568 F.2d 1369, 1380 (D.C. Cir. 1977).

D) <u>Total Phosphorus</u>

State water quality standards require any point source discharge containing nutrients in concentrations that encourage eutrophication or growth of weeds or algae be provided with the highest and best practicable treatment to remove such nutrients. Phosphorus and other nutrients promote the growth of nuisance algae and aquatic plants. When these plants and algae undergo their decay processes, they generate strong odors, result in lower dissolved oxygen levels in the river, and impair the benthic habitat.

The MA SWQS (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The narrative criteria for nutrients is found at 314 CMR 4.05(5)(c), which states that nutrients "shall not exceed the site specific limits necessary to control accelerated or cultural eutrophication." The Standards also require that "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 practicable treatment" (314 CMR 4.05).

EPA has published national guidance documents that contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's Quality Criteria for Water 1986 (the Gold Book) recommends, to control eutrophication, that in-stream phosphorus concentrations should

[13] This choice was consistent with EPA policy to address the complex nutrient pollution problems confronting the Nation's waterways. See Memorandum from Nancy K. Stoner, "Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions," March 16, 2011 ("While EPA has a number of regulatory tools at its disposal, our resources can best be employed by catalyzing and supporting action by states that want to protect their waters from nitrogen and phosphorus pollution.").

be less than 100 µg/l (0.100 mg/L) in streams or other flowing waters not discharging directly to lakes or impoundments and less than 50 µg/l in flowing waters discharging to lakes or impoundments.

More recently, EPA released Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The ecoregion-specific criteria represent conditions in waters minimally impacted by human activities, and thus representative of water without cultural eutrophication. The Marion WPCF is within Ecoregion XIV, Eastern Coastal Plain, Northeastern Coastal Zone. Recommended criteria for this Ecoregion[14] includes a total phosphorus criteria of 23.75 µg/l (0.024 mg/L).

EPA has typically applied the Gold Book criterion because it was developed from an effects-based approach versus the reference conditions-based approach used to develop the ecoregion criteria. The effects-based approach is taken because it is more directly associated with an impairment to a designated use (e.g. fishing). The effects-based approach provides a threshold value above which water quality impairments are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. algal growth) associated with designated use impairments. Referenced-base values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

The effects-based Gold Book threshold is a general target applicable in free-flowing streams. As the Gold Book notes, natural conditions of a water body can lead to an either increased or reduced eutrophication response to phosphorus inputs; in some waters more stringent phosphorus reductions may be needed, while in some others a higher total phosphorus threshold could be assimilated without inducing a eutrophic response. In this case EPA believes that a phosphorus target higher than 100 µg/L is justified due to the relatively short distance of the freshwater portion of the receiving water, the sandy substrate that predominates in the freshwater reach, and the near 100 percent canopy cover that blocks sunlight from reaching the stream. In site visits conducted on August 27, 2014 and September 10, 2014, EPA visually surveyed the receiving stream downstream of the discharge and noted the presence of only minor amounts of aquatic plant and algae growth, possibly due to a heavily shaded stream corridor.

<u>Reasonable Potential Analysis for Phosphorus</u>
The existing permit requires Marion to monitor effluent phosphorus but does not include a limit. From September 2010 through August 2014, the average phosphorus concentration was 1.60 mg/L, with a range of 0.54 mg/L to 3.79 mg/L. Because no dilution of the discharge occurs in the unnamed brook, the concentration of phosphorus in the brook equals that of the effluent during low flow conditions. While EPA concludes that instream concentrations of total phosphorus ranging from 0.54 mg/L to 3.79 mg/L clearly represent a reasonable potential to cause or contribute to an exceedance of the narrative nutrient criteria, we do not believe, for the reasons cited above, that an instream target of 100 µg/L is necessary in this particular stream. Consequently, EPA is establishing a technology based total phosphorus limit of 0.2 mg/L (200 µg/L) based on the Highest and Best Practical Treatment requirement of the Massachusetts Surface Water Quality Standards. Highest and Best Practical Treatment has been consistently defined by EPA and MassDEP in municipal permits as 0.2 mg/L. EPA believes that this limit will ensure attainment of the narrative nutrient criteria applicable to this particular receiving stream. However, if water quality monitoring indicates that excessive plant and algae growth is occurring

[14] Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV, published in December, 2001

downstream of the discharge, the permit may be modified in order to incorporate a more stringent total phosphorus limit.

The draft permit contains a monthly average limit of 200 μg/L for the growing season months of April through October and a monthly average limit of 1 mg/L from November through March. The monitoring frequency is twice per week from April through October, and once per month from November through March.

In the event of increased effluent flow, the concentration limit may not protect water quality in Aucoot Cove. Hence, the proposed draft permit also contains phosphorus loading limits of 0.98 lbs/day for total phosphorus in April through October and 4.9 lbs/day from November through March.

Loading (lbs/day) = Design flow (MGD) x Limit (mg/L) x 8.34 (conversion factor)

Monthly Average Load: May - October (lbs/day)
= 0.588 MGD x 0.2 mg/L x 8.34 = **0.98 lbs/day**

Monthly Average Load: November - March (lbs/day)
= 0.588 MGD x 1.0 mg/L x 8.34 = **4.9 lbs/day**

Because it is likely to take time for the permittee to meet a total phosphorus limit of 200 μg/L, EPA has included a 24-month compliance schedule, with a progress report due after 12 months. Given that the existing treatment facility is capable of meeting a total phosphorus limit of 200 μg/L with the addition of chemical precipitation capabilities, 24 months allows sufficient time for evaluating/piloting chemical addition and construction of chemical storage and dosing facilities. During this period, the interim year round limit will be 1 mg/L.

E) Metals

Certain metals in water can be toxic to aquatic life. It is necessary to limit effluent toxic metal concentrations where the discharge has the reasonable potential to cause or contribute to water quality standards violations, including aquatic life impairment. An evaluation of the facility's effluent metals concentration from September 2011 to September 2013 (n=8) was used to determine reasonable potential for toxicity caused by aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Metals may be present in both dissolved and particulate forms in the water column. However, extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column. Water Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J (EPA 823-B-94-005a) (EPA 1994). Also see
http://water.epa.gov/scitech/swguidance/standards/handbook/chapter03.cfm#section6.
As a result, water quality criteria are established in terms of dissolved metals.

However, regulations at 40 CFR § 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals. This accounts for the potential for a transition from the particulate to dissolved form as the effluent mixes with the receiving water (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion)* (EPA-823-B96-007) (EPA 1996).

For metals with hardness-based water quality criteria, the criteria were determined using the equations in the MA SWQS (314 CMR 4.00), using the appropriate factors for the individual metals found in the MA SWQS (see table below). Because the unnamed brook has no natural streamflow at the discharge location during 7Q10 conditions, the discharge concentration equals the downstream concentration. Hence, EPA used the median hardness of the effluent to calculate hardness-dependent metals criteria[15]. Table 2, below, presents the factors used to determine the acute and chronic total recoverable criteria for each metal.

Q_d = facility's design flow (0.588 mgd = 0.910 cfs)
C_d = maximum effluent concentration
Q_s = natural 7Q10 flow (0 cfs)
C_s = median upstream concentration
Q_r = downstream 7Q10 flow (0.910 cfs)
C_r = resultant downstream concentration

Because the 7Q10 at the discharge location equals zero, the unnamed brook provides no dilution. Reasonable potential occurs when the discharge concentration exceeds the applicable criteria. To assure compliance with water quality criteria, and to prevent instream toxicity to aquatic life in this situation, EPA must impose a limit equal to criteria at the end of the pipe.

Table 2. Hardness Dependent Metals Criteria (hardness = 98.5)

Metal	**Parameters**				**Total Recoverable Criteria**	
	ma	**Ba**	**mc**	**bc**	**Acute Criteria (CMC) (µg/L)**	**Chronic Criteria (CCC) (µg/L)**
Aluminum	—	—	—	—	750	87
Cadmium	1.0166	-3.9240	0.7409	-4.7190	2.57	0.309763
Copper	N/A	N/A	N/A	N/A	5.78	3.73
Lead	1.273	-1.46	1.273	-4.705	102.97	4.01
Nickel	0.846	2.255	0.846	0.0584	547.42	60.86

Acute Criteria (CMC) = exp{ma*ln(hardness)+ba}
Chronic Criteria (CCC) = exp{mc*ln(hardness)+bc}
Marine copper criteria are 4.8 µg/L and 3.1 µg/L, expressed as the dissolved fraction. They were converted to total recoverable using the conversion factor 0.83 (dissolved = total recoverable x 0.83).

As indicated in Table 3, based on the 95th percentile projected effluent concentrations, no reasonable potential exists (for either acute or chronic conditions) that the discharge of cadmium, nickel, lead or zinc will cause or contribute to an exceedance of the applicable water quality criteria. However, the discharge does have reasonable potential to cause or contribute to an excursion from the marine chronic and/or acute water quality criteria for copper.

[15] The median is used for hardness calculations and upstream pollutants because it is less sensitive to extreme values that may be caused by measurement error. Also, the median is considered a better statistic for small sample sizes.

Although discharges of aluminum from the Marion WPCF have no reasonable potential to cause an excursion from water quality standards, this situation may change if Marion opts to use aluminum-based chemicals for phosphorus removal. Because the unnamed brook provides no dilution to the Marion discharge, the facility must ensure that its aluminum discharges stay below the chronic aquatic life water quality criterion of 87 µg/L to avoid an aluminum effluent limit in future permits. EPA will be monitoring aluminum data from WET test reports to ensure that aluminum levels do not cause or contribute to an excursion from water quality standards in the unnamed brook.

Table 3. Metals Reasonable Potential Analysis.

Metal	Cd (Max observed)	Cr = Cd	Criteria (expressed as total recoverable)		Reasonable Potential	Limit = Criteria (if needed) (total recoverable)	
	µg/L	µg/L	Acute (µg/L)	Chronic (µg/L)	Cr > Criteria	Acute (µg/L)	Chronic (µg/L)
Aluminum	21	21	750	87	N	N/A	N/A
Cadmium	<4	<4	2.10	0.268	N	N/A	N/A
Copper	63	63	5.78	3.73	Y	5.78	3.73
Lead	<1	<1	80.09	3.12	N	N/A	N/A
Nickel	1	1.0	463.21	51.50	N	N/A	N/A
Zinc	54	54	95.14	85.62	N	N/A	N/A

*In shaded cells, marine water quality criteria were used because they were more stringent than the freshwater criteria.

Copper

Copper is toxic to aquatic life at low concentrations. The current permit includes a monthly average limit of 7.7 µg/L and a maximum daily limit of 13.1 µg/L. These limits were calculated using a hardness value of 80 mg/L for the receiving water and a dilution factor of 1. After the Marion WPCF failed to meet the limits, EPA issued an Administrative Order with an interim maximum daily limit of 20 µg/L on October 22, 2007. An examination of the DMR and WET test data from September 2010 through August 2014 indicates that the monthly average effluent copper ranged from non-detect to 63 µg/L, and the maximum daily copper ranged from 0 µg/L to 71 µg/L. There have been 13 violations of the 20 µg/L interim limit between September 2010 and August 2014.

In the National Recommended Water Quality Criteria: 2002, EPA updated its national recommended water quality criteria for toxic metals such as copper. 314 CMR 4.05(5)(e) Toxic Pollutants of the State water quality standards specifies, "[t]he Department shall use the water quality criteria for the protection of aquatic life expressed in terms of the dissolved fraction of metals." EPA has used conversion factors provided by the National Recommended Water Quality Criteria: 2002 to translate criteria expressed as total dissolved to total recoverable for reasonable potential analysis and effluent limit derivation.

In December 2006, the MA SWQS were revised to include site-specific copper criteria that were developed for certain water bodies in the State where national criteria are overly protective due to site-specific physical, chemical, or biological considerations, and do not exceed the safe exposure levels determined by toxicity testing [314 CMR 4.05(5)(e) Table 28]. MassDEP adopted an acute dissolved copper criterion of 25.7 µg/L and a chronic dissolved criterion of 18.1 µg/L for the unnamed brook that drains to Aucoot Cove. The total recoverable acute copper criterion is 26.8 µg/L and the total recoverable chronic copper criteria is 18.9 µg/L. EPA approved these criteria on March 26, 2007. However, the marine chronic copper criterion is 3.1 µg/L, and the marine acute copper criterion is 4.8 µg/L, both expressed as dissolved copper. These criteria are not hardness dependent. These criteria apply in Aucoot Cove.

Because the unnamed brook provides no dilution, a limit equal to the freshwater copper criteria at the end of the pipe would assure compliance with water quality standards for the unnamed brook. Therefore, the limits to protect the freshwater brook would be a maximum daily limit of 26.8 µg/L and a monthly average limit of 18.9 µg/L.

However, marine water quality criteria must be met where the unnamed brook flows into Aucoot Cove. To determine if the limits above are protective of Aucoot Cove, EPA must first determine the copper concentration at the mouth of the unnamed brook, where marine criteria apply. According to USGS Streamstats, the natural (i.e. absent WWTF effluent) 7Q10 of the unnamed brook is 0.0213 cfs.

Table 4. Marion WPCF WET Test Background Copper

Date	**Copper conc., µg/L**
9/1/11	64
12/5/11	42
3/5/12	20
7/1012	15
9/19/12	12
12/10/12	14
6/1013	6
9/9/13	5
median	14.5

Because, as shown in Table 4 above, the copper concentration of the unnamed brook (14.5 µg/L) exceeds the acute and chronic copper marine criteria, it does not provide dilution to the effluent. EPA has imposed a limit equal to the criteria to protect the shellfishing uses and SA designation of Aucoot Cove. Therefore, the draft permit proposes a monthly average limit of 3.73 µg/L and a maximum daily limit of 5.78 µg/L (expressed as total recoverable). The monitoring frequency will be once per week.

The proposed draft permit also contains loading limit of 0.045 lbs/day for copper.

Loading (lbs/day) = Design flow (MGD) x Limit (mg/L) x 8.34 (conversion factor)
Monthly Average Load (lbs/day) = 0.588 MGD x 0.00373 mg/L x 8.34
Monthly Average Load (lbs/day) = 0.018 lbs/day

F) Whole Effluent Toxicity

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others.

Therefore, based on the potential for toxicity from domestic contributions, water quality standards and in accordance with EPA regional policy, the draft permit includes acute and chronic effluent toxicity limitations and monitoring requirements (LC50). (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants": 50 Fed. Reg. 30, 784 (July 24, 1985).

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in conjunction with pollutant specific control procedures to control the discharge of toxic pollutants.

The toxicity limits in the current permit were established using the Massachusetts Toxics Policy. The Policy requires that for discharges with dilution factors of 10 and under, the C-NOEC must equal or exceed the receiving water concentration (RWC) of the effluent, which is the inverse of the dilution factor.

From September 2010 through August 2014, there were three violations of the daphnid chronic limit, the most recent being in June 2012. There was also one violation each of the daphnid acute limit and the minnow chronic limit. There were no violations of the minnow acute limit during this time period.

$$
\begin{aligned}
\text{C-NOEC} \geq \text{RWC} &= 1/\text{dilution factor} \\
&= 1/1 \\
&= 1\ (100\%)
\end{aligned}
$$

The draft permit carries forward the requirements for quarterly chronic and acute toxicity tests using the species *Pimiphales promelas* and *Ceriodaphnia dubia*. The acute toxicity endpoint, expressed as LC50, must equal or exceed 100% effluent. The chronic toxicity endpoint, expressed as C-NOEC (no effect concentration), must also equal or exceed 100% effluent. The tests must be performed in accordance with the test procedures and protocols specified in **Permit Attachment A**. The tests will be conducted four times a year, during the following months: March, June, September and December.

The requirements for WET testing recently changed such that the modified acute toxicity test in the current permit, which is conducted as part of the chronic toxicity test, is no longer used for compliance. Thus, the modified acute testing requirement is being replaced by a standalone acute toxicity test. The acute toxicity testing protocol is **Permit Attachment B**.

VI. Operations and Maintenance

EPA regulations set forth a standard condition for "Proper Operation and Maintenance" that is included in all NPDES permits. *See* 40 CFR § 122.41(e). This condition is specified in Part II.B.1 (Standard Conditions) of the draft permit and it requires the proper operation and maintenance of all wastewater treatment systems and related facilities installed or used to achieve permit conditions.

EPA regulations also specify a standard condition to be included in all NPDES permits that specifically imposes on permittees a "duty to mitigate." *See* 40 CFR § 122.41(d). This condition is specified in Part II.B.3 of the draft permit and it requires permittees to take all reasonable steps – which in some cases may include operations and maintenance work - to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment.

Proper operation of collection systems is critical to prevent blockages and equipment failures that would cause overflows of the collection system (sanitary sewer overflows, or SSOs), and to limit the amount of non-wastewater flow entering the collection system (inflow and infiltration or I/I). I/I in a collection system can pose a significant environmental problem because it may displace wastewater flow and thereby cause, or contribute to causing, SSOs. Moreover, I/I could reduce the capacity and efficiency of the treatment plant and cause bypasses of secondary treatment. Therefore, reducing I/I will help to minimize any SSOs and maximize the flow receiving proper treatment at the treatment plant. The permittee reports that approximately 220,400 gallons per day of (I/I) enters the sewer system. MassDEP has stated that the inclusion in NPDES permits of I/I control conditions is a standard State Certification requirement under Section 401 of the CWA and 40 CFR § 124.55(b).

Therefore, specific permit conditions have been included in Part I.B., and 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 unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling infiltration and inflow to the extent necessary to prevent SSOs and I/I related-effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary. These requirements are intended to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment, such as SSOs.

Several of the requirements in the draft permit are not included in the existing permit, including collection system mapping, and preparation of a collection system operation and maintenance plan. EPA has determined that these additional requirements, such as collection system mapping and preparing an Operations and Maintenance Plan, are necessary to ensure the proper operation and maintenance of the collection system to prevent SSO and treatment upsets. The draft permit includes schedules for completing these requirements.

VII. Sludge

The permit prohibits any discharge of sludge to waters of the U.S. Section 405(d) of the Clean Water Act requires that sludge conditions be included in all NPDES permits.

Currently, the Marion WPCF deposits sludge from its treatment processes in the sewage lagoons. EPA has determined that the lagoons are, in effect, sludge disposal sites under 40 CFR Part 503 regulations. The Marion WPCF has deposited sludge in its unlined sewage lagoons for over 30 years without any apparent plan for removal and disposal. According to 40 CFR Part 503 Subpart C, EPA considers land that contains sewage sludge for more than two years to be a disposal site.

Because the sludge storage practices constitute disposal, the draft permit contains standard sludge requirements in Section D. A description of further permit conditions related to sludge disposal and the lagoons can be found in the "Contribution of Lagoons" section of V.4.(C) of this fact sheet and Parts I.D. and I.E. of the draft permit.

VIII. Pretreatment

The permittee does not have any major industries contributing industrial wastewater to the WWTF, and thus is not required to have a pretreatment program. Pollutants introduced into POTWs by a non-domestic source shall not pass through the POTW or interfere with the operation or performance of the treatment works.

IX. Antidegradation

This draft permit is being reissued with an allowable wasteload identical to the current permit and no change in outfall location. The State of Massachusetts has indicated that there will be no lowering of water quality and no loss of existing water uses and that no additional anti-degradation review is warranted.

X. Essential Fish Habitat (EFH)

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.(1998)), EPA is required to consult with National Marine Fisheries Service (NMFS) 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 as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. § 1802(10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 50CFR.§ 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 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.

EPA has determined that direct and indirect impacts associated with the proposed draft permit to the EFH species, their habitat and forage, have been minimized to the extent that no significant adverse impacts are expected. Further mitigation is not warranted. An EFH analysis containing information that supports EPA's determination is included in Appendix D of this fact sheet. NMFS Habitat Division will be notified if adverse impacts to EFH are detected as a result of this permit action or if new information becomes available that changes the basis for these conclusions.

XI. Endangered Species

The Endangered Species Act of 1973, as amended (ESA), imposes requirements on Federal agencies related to the potential effects of their actions on endangered or threatened species of fish, wildlife, or plants (listed species) and their designated "critical habitat."

Section 7 of the ESA requires, in general, that Federal agencies insure that any actions they authorize, fund, or carry out, in the United States or upon the high seas, are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated "critical habitat" for those species. Federal agencies carry out their responsibilities under the ESA in consultation with, and assisted by, the Departments of Interior (DOI) and/or Commerce (DOC), depending on the species involved. The United States Fish & Wildlife Service (USFWS) of the DOI administers Section 7 consultations for freshwater species, while the National Oceanic and Atmospheric Administration (NOAA) of DOC does so for marine species and anadromous fish.

The federal action being considered in this case is EPA's proposed draft NPDES permit to the Marion Water Pollution Control Facility. The draft permit is intended to replace the existing NPDES permit in regulating wastewater discharges from the Town's WPCF, as discussed above. The single outfall discharges into an unnamed brook (locally known as Effluent Brook) that travels about a mile before entering Aucoot Cove (Buzzards Bay – 95; HUC12: 010900020305). The brook and the inner Aucoot cove are considered the action area of this draft permit.

Coastal areas of Massachusetts provide habitat for a number of federally protected marine species, including: mammals (whales: North Atlantic Right, Humpback, Fin, Sei, Sperm, Blue – all endangered); reptiles (sea turtles: Kemp's Ridley, Leatherback, Green – all endangered; Loggerhead – Threatened but proposed for listing as endangered). In addition, the protected anadromous fish species shortnose sturgeon and Atlantic sturgeon are expected to be in Massachusetts coastal waters.

However, EPA does not consider the area influenced by facility discharge (the action area) to be suitable habitat for the species listed above. Based on the normal distribution of these species, it is extremely unlikely that there would be any NMFS listed species in the vicinity of the unnamed brook and the inner Aucoot Cove of Buzzards Bay. EPA has determined that no protected species are present in any area influenced by the discharge. Therefore, no section 7 consultation is required.

XII. Monitoring and Reporting

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), and 122.48.

The Draft Permit requires the permittee to continue to electronically report monitoring results obtained during each calendar month as Discharge Monitoring Report (DMRs) to EPA and the state using NetDMR no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool for regulated CWA permittees to submit DMRs electronically via a secure internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr. Further information about NetDMR can be found on the EPA Region 1 NetDMR website located at http://www.epa.gov/region1/npdes/netdmr/index.html.

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 Permit Conditions. With the use of NetDMR to report DMRs and reports, the permittee is no longer be required to submit hard copies of DMRs or other reports to EPA and is no longer required to submit hard copies of DMRs to MassDEP. However, permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. State reporting requirements are further explained in the draft permit.

XIII. State Certification Requirements

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection with jurisdiction over the receiving waters 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 State Water Quality Standards. The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the state pursuant to 40 CFR § 124.53 and expects that the draft permit will be certified.

XIV. Public Comment Period, Public Hearing, and Procedures For Final Decision

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and a supporting material for their arguments in full by the close of the public comment period, to Robin Johnson, U.S. EPA, Office of Ecosystem Protection, 5 Post Office Square, Suite 100, Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing to EPA and MassDEP 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 after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston Office. 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 forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XV. EPA Contact

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Robin Johnson
Municipal Permits Branch
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100 (OEP 6-1)
Boston, MA 02109-3912
Telephone: (617) 918-1045
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Claire Golden
MassDEP Surface Water Permitting Program
205B Lowell St
Wilmington, MA 01887
978-694-3244
Email: claire.golden@state.ma.us

____
Date

Ken Moraff, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency
Boston, MA

Memorandum

To: Paul Hogan, MassDEP/DEM, Worcester, MA

Through: Arthur Johnson, MassDEP/DWM, Worcester, MA
Robert Nuzzo, MassDEP/DWM, Worcester, MA
John Fiorentino, MassDEP/DWM, Worcester, MA

From: Peter Mitchell, MassDEP/DWM, Worcester, MA

Date: June 27, 2007

Subject: **Qualitative benthos assessment upstream and downstream of Marion WWTP discharge**

On 16 May 2007, the Massachusetts Department of Environmental Protection's Division of Watershed Management (MassDEP/DWM) conducted qualitative multi-habitat biological monitoring upstream and downstream of the Marion Wastewater Treatment Plant (NPDES Permit Number MA0100030) discharge to assess potential impacts to the facility's unnamed receiving water (locally known as Effluent Brook). This was a follow-up investigation of a similar monitoring effort conducted by MassDEP/DWM in 2000 prior to facility upgrades.

Aquatic benthic macroinvertebrate biomonitoring was performed based on modifications to the US EPA Rapid Bioassessment Protocol I (RBP I), a screening and reconnaissance assessment that documents specific visual observatories made in the field by a trained professional (Plafkin. et al. 1989). The RBP I protocol is able to discriminate between obviously impacted stream reaches and un-impacted stream reaches. The biological component of the RBPI protocol consists of sampling the benthic macroinvertebrate community and potentially the examination of other aquatic biota (periphyton, macrophytes and fish). The RBPI protocol also includes an assessment of instream and riparian habitat conditions. Benthic macroinvertebrates are captured using a "kick" net. A variety of instream habitats (riffles, pools, runs, snags, macrophytes) are sampled. Collected fauna are identified to Family in the field, and then transported to the MassDEP/DWM microscopy lab for verification of the identifications. Determinations of impairment are made based upon comparison of conditions below the discharge to an upstream (reference) station. Impairments may be determined by the absence of particularly pollution sensitive organisms downstream of the discharge if these organisms are present at the upstream station. Impairment may also be determined by the dominance of pollution tolerant organisms at the downstream sampling locations.

The RBP I survey was conducted at the three stations previously examined by MassDEP/DWM on 17 May 2000. The stations were immediately upstream of the Marion WWTP discharge, 100 meters downstream of the discharge, and approximately 1 kilometer (0.5 miles) downstream of the discharge (Figures 1 and 2). Epifaunal habitat within each sampling reach was generally similar. Fine substrates (sand and silt) dominated at all stations; however, there were patches of gravel (and some cobble) at the bends and constrictions. Snags and some instream vegetation also supplied habitat amenable to benthic macroinvertebrates. Aquatic vegetation—most notably, water starwort (*Callitriche* sp.)—was prevalent downstream from the discharge but virtually absent upstream. Prolific growth of green algae was observed at all biomonitoring stations, with the community comprised of mainly filamentous forms of green algae and diatoms. Algae densities were estimated as covering 60% (*Fragilaria* sp.—abundant; *Ulothrix* sp.—very abundant; *Chaetophora pisiformis*—very abundant) of the available habitat upstream of the outfall pipe, covering 85% (*Draparnaldia* sp.—very abundant; *Ulothrix* sp.—very abundant) of the available habitat immediately downstream of the outfall pipe, and covering 70% (*Draparnaldia* sp.—very abundant; *Tetraspora cylindrica*—very abundant) of the available habitat 1 kilometer downstream of the outfall pipe. The algae were attached to plants, and some of the more stable inorganic substrates. Baseflow was extremely reduced upstream from the discharge where stream depth was only about 0.10 m and current velocity was barely perceptible. The discharge significantly augmented flow conditions at the two downstream reaches, with greater depth (approximately 0.20 m) and swifter current velocities. In addition, the tea-stained water color above the discharge was not observed below the discharge. It appears that significant dilution of the tannin-laden water is taking place. The riparian zones abutting each of the sampling reaches were dominated by forest. Although some residences are proximal to the stream, the extensive riparian buffer minimizes the potential for non-point source pollution.

The collected benthic samples revealed generally similar communities at all stations (Table 1). There were 10 taxa collected above the discharge, 13 taxa collected immediately below the discharge, and 10 taxa 1 kilometer downstream of the discharge. Chironomidae (midges) and Simuliidae (black flies) were co-dominant at the station upstream of the discharge. Chironomidae, Physidae (physid snails) and Asellidae (isopods) were dominant at the station 100 meters downstream from the discharge. Chironomidae remained hyperdominant at the station 1 kilometer downstream from the discharge (Table 1). All of the above-mentioned taxa display fairly high tolerance of organic pollution (Table 1). Their abundance suggests organic/nutrient enrichment throughout Effluent Brook, and the importance of both suspended and deposited forms of organic materials as a food resource.

When MassDEP/DWM conducted biomonitoring in Effluent Brook in 2000 (Fiorentino 2000), two families of stoneflies (Plecoptera – generally considered the most pollution intolerant aquatic insects) were collected at the upstream station. Plecoptera, and other pollution-sensitive taxa, were absent during the 2007 biosurvey. The benthos samples from each station in 2007 were far more comparable than they were in 2000. This change appears more due to a decrease in intolerant taxa upstream from the discharge, than an increase in intolerant taxa below the discharge.

The benthic community observed in 2007 showed no obvious signs of impairment as a direct result of the Marion WWTP discharge. Rather, water quality degradation may occur throughout (i.e., upstream and downstream from the discharge) Effluent Brook, as evidenced by the lack of pollution-sensitive macroinvertebrate taxa, predominance of taxa highly tolerant of organic enrichment and low dissolved oxygen levels, and prolific algal growth. It is possible that the discharge is actually improving conditions for benthic macroinvertebrates by increasing flow within Effluent Brook (e.g. creating riffle habitats). Continued monitoring of these stations is recommended, especially if the operations of the Marion WWTP (in terms of either volume or treatment methods) change in the future. Additionally, many new homes have been constructed within the Effluent Brook subbasin since the 2000 survey. Continued residential development may ultimately lead to non-point source pollution impacts to adjacent and/or downstream portions of the stream. Monitoring for these effects is also recommended as part of future sampling efforts. Water quality sampling, particularly for nutrients and various physicochemical parameters (temperature, predawn dissolved oxygen levels, etc.), should be included in future monitoring activities in this stream.

Literature Cited:

Plafkin, J. L., M. T. Barbour, K. D. Porter, S. K. Gross, and R. M. Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. EPA/440/4-89-001. Office of Water, US Environmental Protection Agency, Washington, DC.

Fiorentino. 2000. *Memorandum*. From: John Fiorentino. To: Dave Pincumbre. Subject: Qualitative benthos assessment upstream and downstream of Marion WWTP. 21 August 2000. On file at Massachusetts Department of Environmental Protection, Division of Watershed Management, Worcester, MA.

Taxon	FFG[1]	TV[2]	Upstream	100m downstream	1km downstream
Physidae	GC	8	0[3]	4	0
Planorbidae	SC	6	2	1	1
Pisidiidae	FC	6	0	1	1
Lumbriculidae	GC	7	2	3	1
Tubificidae	GC	10	2	3	1
Enchytraeidae	GC	10	2	0	0
Lumbricina	GC	8	0	1	0
Asellidae	GC	8	3	4	2
Crangonyctidae	GC	6	1	1	0
Hydropsychidae	FC	4	0	1	3
Limnephilidae	SH	4	0	1	1
Phyrganeidae	SH	4	1	0	0
Chironomidae	GC	6	4	4	4
Simuliidae	FC	6	4	1	1
Tipulidae	SH	5	1	0	1
Total Richness	--	--	10	13	10

Table 1. Taxa list and relative abundance of benthic macroinvertebrates collected from stations in the vicinity of Marion WWTP discharge-Marion, MA.

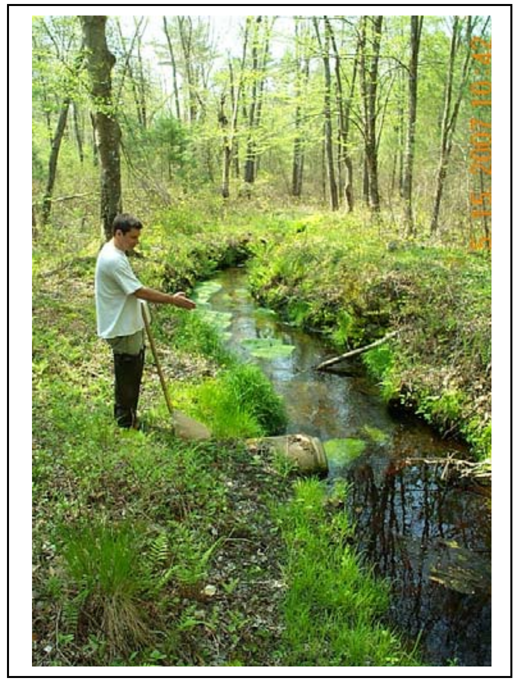
[1] FFG: Functional Feeding Groups. Lists the primary feeding habit of each taxon and follows the abbreviations: SH-Shredder, GC-Gathering Collector, FC-Filtering Collector, SC-Scraper, PR-Predator.

[2] TV: Tolerance Values. Range from 0 for organisms very intolerant of organic pollution to 10 for organisms very tolerant of organic pollution.

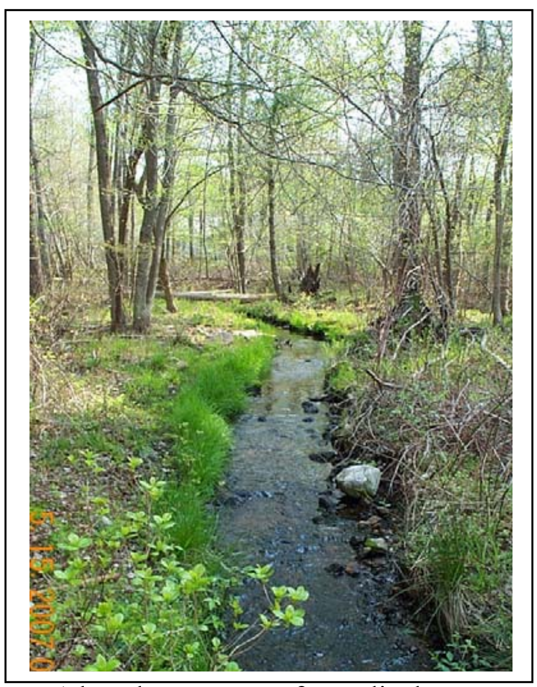
[3] Observed Density of taxon. 0 (Absent), 1 (Rare), 2 (Common), 3 (Abundant), 4 (Dominant).

Figure 1: Effluent Brook RBPI Stations Marion, MA

Immediately upstream of discharge



At Discharge, looking downstream



1 km downstream from discharge

Figure 2. Photographs of Marion WWTP discharge study area

Appendix B

DMR SUMMARY - Marion WPCF

September 2010 - August 2014

Monitoring Period End Date	Flow Max	Flow avg*	pH Min	pH Max	BOD, avg monthly loading	BOD, max daily loading	BOD, monthly avg	BOD, weekly avg	BOD, daily max	TSS, avg monthly loading	TSS, max daily loading	TSS, avg monthly	TSS, avg weekly	TSS, max daily
	MGD	MGD	s.u.	s.u.	lb/day	lb/day	mg/l	mg/l	mg/l	lb/day	lb/day	mg/l	mg/l	mg/l
09/30/2010	.539	.321	7.1	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10/31/2010	.413	.333	7.2	7.5	0.0	0.0	0.0	0.0	0.0	1.1	6.9	0.4	0.4	2.0
11/30/2010	.498	.369	7.1	7.4	2.3	12.5	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
12/31/2010	0.474	0.527	7.1	7.4	4.7	11.9	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
01/31/2011	0.537	0.501	7	7.4	0	0	0.0	0.0	0.0	2.8	13.4	1.0	1.0	3.0
02/28/2011	0.752	0.501	7	7.3	7.5	18.8	2.0	2.0	3.0	5.0	12.5	1.0	1.0	2.0
03/31/2011	0.836	0.491	6.8	7.2	12.2	27.9	2.0	2.0	4.0	7.8	20.9	1.0	1.0	3.0
04/30/2011	0.845	0.488	6.7	7.2	21.3	28.2	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0
05/31/2011	0.781	0.496	6.7	7.3	4.2	19.5	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
06/30/2011	0.573	0.489	7	7.3	9.9	38.2	3.0	3.0	8.0	0.0	0.0	0.0	0.0	0.0
07/31/2011	0.339	0.485	7.	7.5	3.4	7.0	1.0	1.0	2.0	1.5	6.2	1.0	1.0	2.0
08/31/2011	0.336	0.486	7.2	7.6	11.1	13.3	4.0	4.0	5.0	1.3	6.4	0.0	0.0	0.0
09/30/2011	0.406	0.492	7.1	7.5	2.7	10.9	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
10/31/2011	0.529	0.506	6.9	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11/30/2011	0.690	0.524	6.8	7.3	9.0	33.0	2.0	2.0	7.7	0.0	0.0	0.0	0.0	0.0
12/31/2011	0.664	0.546	7.	7.3	4.3	17.0	1.0	1.0	3.8	0.0	0.0	0.0	0.0	0.0
01/31/2012	0.544	0.555	6.9	7.2	6.6	14.4	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
02/29/2012	0.518	0.546	6.9	7.2	1.9	9.3	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
03/31/2012	0.425	0.526	7.	7.2	4.6	9.7	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
04/30/2012	0.355	0.494	7.1	7.4	4.3	17.3	1.0	1.0	5.0	0.0	0.0	0.0	0.0	0.0
05/31/2012	0.513	0.481	7.	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
06/30/2012	0.409	0.477	7.1	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07/31/2012	0.252	0.470	7.3	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08/31/2012	0.399	0.475	7.1	7.4	4.2	10.6	1.0	1.0	4.0	0.0	0.0	0.0	0.0	0.0
09/30/2012	0.323	0.468	7.3	7.7	3.0	6.9	1.0	1.0	2.0	0.0	0.0	0.0	0.0	0.0
10/31/2012	0.274	0.448	7.1	7.6	4.5	9.4	1.4	1.4	2.8	0.0	0.0	0.0	0.0	0.0
11/30/2012	0.420	0.426	7.2	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12/31/2012	0.491	0.411	6.9	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01/31/2013	0.494	0.407	7.	7.4	6.7	13.8	2.0	2.0	4.0	0.0	0.0	0.0	0.0	0.0
02/28/2013	0.573	0.412	6.8	7.2	3.2	12.6	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
03/31/2013	0.795	0.442	6.7	7.	5.2	20.8	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
04/30/2013	0.679	0.469	6.8	7.1	5.1	20.3	0.8	0.8	3.2	0.0	0.0	0.0	0.0	0.0
05/31/2013	0.604	0.477	7.	7.3	15.8	25.1	3.0	3.0	5.0	0.0	0.0	0.0	0.0	0.0
06/30/2013	0.764	0.507	6.9	7.3	4.9	19.7	0.8	0.8	3.3	0.0	0.0	0.0	0.0	0.0
07/31/2013	0.582	0.534	6.9	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08/31/2013	0.268	0.523	7.	7.5	4.4	13.3	2.0	2.0	5.0	0.0	0.0	0.0	0.0	0.0
09/30/2013	0.358	0.525	7.2	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10/31/2013	0.259	0.524	7.3	7.6	4.5	16.5	2.0	2.0	7.6	0.0	0.0	0.0	0.0	0.0
11/30/2013	0.245	0.509	7.2	7.5	2.9	6.3	1.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0
12/31/2013	0.543	0.500	7.1	7.3	7.6	37.8	1.9	1.9	9.5	0.0	0.0	0.0	0.0	0.0
01/31/2014	0.707	0.503	6.9	7.2	3.0	11.9	0.6	0.6	2.4	0.0	0.0	0.0	0.0	0.0
02/28/2014	0.782	0.503	6.8	7.3	7.5	16.4	1.7	1.7	4.3	0.0	0.0	0.0	0.0	0.0
03/31/2014	0.751	0.483	7.	7.6	3.0	15.2	0.5	0.5	2.3	0.0	0.0	0.0	0.0	0.0
04/30/2014	0.838	0.490	6.7	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
05/31/2014	0.798	0.496	7.	7.4	8.1	32.4	2.0	2.0	7.9	0.0	0.0	0.0	0.0	0.0
06/30/2014	0.578	0.474	6.9	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07/31/2014	0.773	0.465	6.9	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08/31/2014	0.507	0.477	7.	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May 2007 limits	Report	0.588	6.5	8.3	42	63	9	13	Report	42	63	9	13	Report
Minimum	.245	.321	6.7	7.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum	.845	.555	7.3	7.7	21.3	38.2	4.	4.	9.5	7.8	20.9	1.	1.	3.
Average	0.54	0.48	6.99	7.38	4.24	12.04	1.06	1.06	2.83	0.41	1.38	0.09	0.09	0.25
Standard Deviation	0.18	0.05	0.16	0.15	4.47	10.90	1.03	1.03	2.50	1.39	4.15	0.28	0.28	0.76
#measurement	48	48	48	48	48	48	48	48	48	48	48	48	48	48
#exceed 2007 limits	N/A	0	0	0	0	0	0	0	N/A	0	0	0	0	N/A

*Permit limit expressed as 12-month rolling average.

Appendix B
DMR SUMMARY - Marion WPCF
September 2010 - August 2014

Monitoring Period End Date	Fecal coliform, geo avg	Fecal coliform, daily max	Dissolved oxygen	Ammonia, monthly avg	Ammonia, daily max	Total Phosphorus, monthly avg	Total Phosphorus, daily max	Total Nitrogen, monthly avg	Total Nitrogen, max daily	Copper, monthly avg	Copper, daily max
	#/100 ml	#/100 ml	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	mg/L	µg/l	µg/l
09/30/2010	1	2	5.8	0.300	1.000	2.5	2.8	3.9	3.9	27.	31.
10/31/2010	1	1	5.87	0.000	0.000	2.1	2.2	4.	4.	16.	17.
11/30/2010	1	1	6.3	0.000	0.000	1.9	2.1	5.	5.	49.5	71.
12/31/2010	1	1		0.700	0.700	1.50	1.50	3.8	3.8	22.0	23.0
01/31/2011	1	1		0.000	0.000	1.40	1.50	3.7	3.7	25.0	34.0
02/28/2011	1	1		1.900	1.900	1.30	1.30	4.1	4.1	24.0	26.0
03/31/2011	1	1		1.700	1.700	0.60	1.10	3.1	3.1	13.5	17.0
04/30/2011	1	1		0.000	0.000	2.00	2.40	3.5	3.5	15.5	16.0
05/31/2011	1	1		0.700	2.800	3.30	3.90	5.4	8.6	17.3	23.0
06/30/2011	1	1	6.4	0.000	0.000	1.40	1.60	3.3	4.0	13.0	15.0
07/31/2011	2	3	6.1	0.000	0.000	1.80	1.80	3.6	3.9	0.0	0.0
08/31/2011	1	1	6.2	0.100	0.400	2.70	3.50	3.6	3.6	19.0	21.0
09/30/2011	1	1	6.3	0.200	0.400	1.70	2.20	6.1	6.1	28.5	30.0
10/31/2011	1	1	6.0	0.200	0.280	1.00	1.40	2.9	3.0	28.5	34.0
11/30/2011	1	1		0.110	0.110	0.90	1.10	3.2	3.2	23.0	24.0
12/31/2011	1	1		0.140	0.140	1.20	1.50	4.0	4.0	20.0	20.0
01/31/2012	1	1		0.280	0.280	1.40	1.60	3.1	3.1	17.5	22.0
02/29/2012	1	3		0.170	0.170	1.20	1.30	4.3	4.3	19.5	24.0
03/31/2012	1	2		0.353	0.350	0.82	0.86	2.4	2.4	16.0	16.0
04/30/2012	1	3		0.268	0.268	0.83	1.12	2.4	2.4	19.0	19.0
05/31/2012	1	3		6.750	11.600	0.89	0.92	7.4	7.4	16.0	16.0
06/30/2012	1	1	6.3	0.550	1.390	0.84	1.06	5.0	5.0	17.0	17.0
07/31/2012	1	1	5.9	0.310	0.440	1.67	1.84	1.9	1.9	15.0	15.0
08/31/2012	1	2	6.1	0.280	0.390	1.79	2.26	4.7	5.9	16.0	16.0
09/30/2012	1	5	6.0	0.210	0.250	1.49	1.84	3.3	3.3	17.0	17.0
10/31/2012	1	2	5.9	0.220	0.340	1.87	1.92	3.4	3.4	16.0	16.0
11/30/2012	1	2		0.122	0.122	1.37	1.46	3.0	3.0	15.0	15.0
12/31/2012	1	3		0.090	0.090	1.25	1.29	2.8	2.8	16.0	16.0
01/31/2013	1	2		0.110	0.110	1.02	1.08	2.4	2.4	37.8	60.0
02/28/2013	1	2		0.19	0.19	1.02	1.16	2.7	2.7	16.0	16.0
03/31/2013	1	2		0.41	0.41	0.56	0.70	2.4	2.4	12.0	12.0
04/30/2013	1	1		0.22	0.35	1.45	1.67	2.2	2.7	11.0	11.0
05/31/2013	1	5		0.61	1.18	2.57	2.96	3.7	4.6	10.0	10.0
06/30/2013	1	3	5.7	0.27	0.35	1.07	1.52	2.5	3.3	11.0	11.0
07/31/2013	1	2	5.4	0.24	0.29	2.67	3.18	2.9	2.9	14.0	14.0
08/31/2013	2	8	6.0	0.23	0.28	1.33	1.64	1.9	1.9	23.0	24.0
09/30/2013	2	7	5.3	0.14	0.15	3.43	3.61	4.0	4.0	18.8	23.0
10/31/2013	1	5	5.7	0.14	0.21	2.58	2.63	3.4	3.4	16.3	16.3
11/30/2013	1	2		0.12	0.12	2.37	2.58	2.3	2.3	19.8	19.8
12/31/2013	1.	2.		0.13	0.13	1.23	1.23	3.1	3.1	17.	17.
01/31/2014	1.	7.		0.11	0.11	0.89	1.03	2.5	2.5	13.3	13.3
02/28/2014	1.	2.		0.21	0.21	1.04	1.10	4.2	4.2	27.9	39.3
03/31/2014	1.	1.		1.22	1.22	0.91	0.99	3.5	3.5	14.9	14.9
04/30/2014	1.	1.		0.00	0.00	0.54	0.58	2.7	2.7	20.	20.
05/31/2014	1.	1.		0.18	0.27	2.17	2.48	3.2	3.2	10.1	10.1
06/30/2014	1.	1.	5.7	0.17	0.28	3.79	3.86	2.9	2.9	16.2	16.2
07/31/2014	1.	2.	5.4	0.10	0.14	2.18	2.29	3.3	3.3	26.6	27.2
08/31/2014	1.	3.	6.	0.08	0.12	1.29	1.73	3.5	3.5	50.6	50.6
May 2007 limits	14	43	5	Varies	Report	Report	Report	Report	Report	20	Report
Minimum	1.	1.	5.3	0.0	0.0	.54	.58	1.9	1.9	0.0	0.0
Maximum	2.	8.	6.4	6.75	11.6	3.79	3.9	7.4	8.6	50.6	71.
Average	1.07	2.21	5.92	0.43	0.65	1.60	1.82	3.46	3.62	19.34	21.60
Standard Deviation	0.25	1.73	0.31	1.01	1.71	0.77	0.84	1.06	1.29	8.92	12.51
#measurement	48	48	21	48	48	48	48	48	48	48	48
#exceed 2007 limits	0	0	0	1	N/A	N/A	N/A	N/A	N/A	13	N/A

*Permit limit expresse

Appendix B
WET Test Summary
Marion WPCF

Whole Effluent Toxicity											
Date	Daphnid Acute	Minnow Acute	Daphnid Chronic	Minnow Chronic	Aluminum (ug/l)	Copper (µg/L)	Zinc (ug/l)	Lead (ug/l)	Nickel (µg/L)	Cadmium (ug/l)	Hardness (mg/l)
June-11	100.	100.	100.	100.	<200	12	<50	<5	<40	<4	n/a
September-11	100.	100.	25.	6.25	<100	63	<50	<10	<25	<5	150
December-11	100.	100.	100.	100.	<100	10	<50	<10	<25	<5	82
March-12	70.7	100.	25.	100.	<100	13	<50	<10	<25	<5	120
June-12	100.	100.	12.5	100.	20	27	45	<1	<1	<1	140
September-12	100.	100.	100.	100.	<10	20	52	<0.5	1	<1	86
December-12	100.	100.	100.	100.	12	13	54	<1	1	<1	120
March-13	100.	100.	100.	100.	21	10	33	<0.5	<1	<1	93
June-13	100.	100.	100.	100.	15	9	35	<0.5	<1	<1	61
September-13	100.	100.	100.	100.	<10	19	49	<1	2	<1	130
December-13	100.	100.	100.	100.	11	15	43.91	<1	1.5	<1	210
March-14	100.	100.	100.	100.	11.8	14	37.8	<1	<1	<1	130
June-14	100.	100.	100.	100.	<10	19.42	33.71	<1	<1	<1	64
Limit	100.	100.	100.	100.	Report	Report	Report	Report	Report	Report	Report
Minimum	70.7	100.	12.5	6.25	11.	9.	33.	N/A	1.	N/A	61.
Median	100.	100.	100.	100.	13.5	14.	43.91	N/A	1.25	N/A	120.
Maximum	100.	100.	100.	100.	21.	63.	54.	N/A	2.	N/A	150
# measurements	13.	13.	13.	13.	13.	13.	13.	13.	13.	13.	12.
#exceed limit	1	0	3	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Nitrogen Loads to Aucoot Cove

Current Loading

Nonpoint Sources

34.5 lbs/day ÷ 14.9 sq. mi. 2.315436242 lbs/day/sq.mi (from Segregansett analysis)

Total NPS loading = loading rate * watershed area (from Taunton fact sheet)

Segreganset drainage area = 14.9 sq. mi. (p. 31 of FS)
Segreganset loading = 34.5 lbs/day (FS Att. A, page 1, avg. of 2004-5 loading)
Loading rate = 34.5 lbs/day / 14.9 sq. mi. = 2.32 lbs/day/sq.mi.

2.32 lbs/day/sq.mi. x 3.75 sq. mi. = **8.7** lbs/day

Total watershed area = 4.06 sq. mi. (from Buzzbaylanduse.xls)

Total NPS loading = loading rate * watershed area
9.40067114 lbs/day

Marion WWTF outfall (May-Oct 2011-2013)
13.7488761 lbs/day

avg flow 0.430056 MGD
avg conc 3.833333

Marion Lagoons (from Horsley Witten report)
16,700 lbs/year divide by 365= **45.7534247** lbs/day

Total load **68.902972** lbs/day
Total area 0.1 sq. mi. Aucoot Cove area (from Marion.mxd)

Load per area **689.02972** lbs TN/day/sq. mi. <--- target loading

Inner Aucoot Cove Target Nitrogen Loading

0.05 sq. mi. Area of Inner Aucoot Cove

Load per area per day = Loading (lbs/day)/Area = Load per area per day

Loading = Load per area * area

Loading rate = **34.45149** lbs/day Target Loading Rate for Inner Aucoot Cove

minus NPS **25.05081** lbs/day Target Loading Rate for Marion outfall and lagoons

Appendix C

Nitrogen Analysis - Marion WPCF

MA0100030

Lagoon Scenario

minus lagoons	-43.8522	lbs/day	Allowable Loading from WWTF	
Average Marion WWTF flow =	0.588	MGD		(May-Oct 2011-2013)

Loading(lbs/day) = Flow(mgd) * Conc.(mg/l) * 8.34

-8.942266 mg/l Permit Limit (with lagoon scenario)

Because negative load is not possible, limit would default to 3.0 mg/l (limit of technology).

No Lagoon Scenario

0.05 sq. mi. Area of Inner Aucoot Cove

Load per area per day = Loading (lbs/day)/Area = Load per area per day

Loading = Load per area * area

Loading rate = **34.45149** lbs/day Target Loading Rate for Inner Aucoot Cove

minus NPS **25.05081** lbs/day Target Loading Rate for Marion outfall

Average Marion WWTF flow = 0.588 MGD (May-Oct 2011-2013)

Conc. = Loading/(Flow * 8.34) 5.10832453 mg/l Permit Limit (no lagoon scenario)

Appendix D NPDES Permit for the Marion Water Pollution Control Facility, Marion, Massachusetts, Permit No. MA0100030
Essential Fish Habitat Assessment, November 2014

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed action that it funds, permits, or undertakes, may adversely impact any essential fish habitat (EFH). Adversely impact means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. § 600.910 (a)). Adverse impacts may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions. The Amendments broadly define essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. §1802 (10)). This letter serves as EPA's notification to NMFS of a proposed permit action that meets the criteria described above.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (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 and are identified on the NMFS website at http://www.nero.noaa.gov/hcd/webintro.html. In some cases, a narrative identifies rivers and other waterways that should be considered EFH due to present or historic use by federally managed species.

The federal action being considered in this case is EPA's proposed National Pollutant Discharge Elimination System (NPDES) permit reissuance for the Marion Water Pollution Control Facility (WPCF) in the Town of Marion, Massachusetts. The Draft Permit is intended to replace the existing NPDES permit in regulating discharges from the site. EPA and MassDEP issued the existing permit on September 29, 2006. On October 31, 2006, the Town of Marion (Town) filed a petition for review with the EPA Environmental Appeals Board (EAB) appealing certain conditions in the Final Permit. The contested portions of the permit were stayed, while the uncontested conditions went into effect on March 1, 2007. EPA and the Town reached a settlement in which EPA modified certain conditions of the permit, and the Town withdrew its appeal. The final modified permit became effective August 1, 2007. This permit has been administratively continued, as a complete application for permit reissuance was filed by the Town in accordance with the Administrative Procedures Act (5 U.S.C. 558(c)) and 40 CFR § 122.6.

Marion WPCF Description
The Marion WPCF is a 0.588-MGD wastewater treatment facility. Treatment units include inlet aerated chamber with air handling and odor control, mechanical bar screens, vortex grit chamber with classifier, sequencing batch reactors (SBRs), equalization tank, disc filters, and ultraviolet (UV) disinfection. Treated effluent is discharged to an unnamed brook that discharges to Aucoot Cove. Scum, waste activated sludge from the SBRs, and filter backwash are discharged to onsite

aerated lagoons. The lagoons are also used for equalization and storage of wastewater during high flows exceeding SBR capacity and when one of the SBRs is down for service.

Receiving Water Description
The water quality classification of the unnamed brook receiving the Marion WPCF discharge is not specifically listed in the Buzzards Bay table of the MA Surface Water Quality Standards (SWQS) (see 314 CMR 4.06(5), Table 25), nor does the map of the Buzzards Bay watershed (see 314 CMR 4.06(5) Figure 25) show the water quality classification for this water. Therefore, pursuant to 314 CMR 4.06(4), the brook is a Class B High Quality Water. Under MA SWQS, such waters must have consistently good aesthetic value and, where designated, must be suitable as a source of public water supply with appropriate treatment, as well as for irrigation and other agricultural uses. *Id.* at 314 CMR 4.05(3)(b). They must also be free of floating, suspended or settleable solids that are aesthetically objectionable or could impair uses. *Id*. at 314 CMR 4.05(3)(b)(5). Changes to color or turbidity of the waters that are aesthetically objectionable or use-impairing are also prohibited. *Id*. at 314 CMR 4.05(3)(b)(6). Dissolved oxygen levels in Class B waters must not be less than 5.0 mg/L. *Id*. at 314 CMR 4.05(3)(b)(1).

Aucoot Cove is classified in the tables of the MA SWQS (314 CMR 4.06 (5), Table 25) as Class SA and for shellfishing (the listing is under the heading "Sippican River"). Class SA waters are designated as excellent 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, excellent habitat for fish, other aquatic life and wildlife may include, but is not limited to, sea grass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting without depuration (Approved and Conditionally Approved Shellfish Areas). These waters shall have excellent aesthetic value.

In addition to criteria specific to Class SA and B waters, Massachusetts imposes minimum narrative criteria applicable to all surface waters, including aesthetics ("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"); bottom pollutants and alterations ("free from pollutants in concentrations or combinations or from alterations that adversely affect the physical or chemical nature of the bottom, interfere with the propagation of fish or shellfish, or adversely affect populations of non-mobile or sessile benthic organisms"); nutrients[1] ("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 toxics ("free from pollutants in concentrations that are toxic to humans, aquatic life or wildlife"). *See* 314 CMR 4.05(5)(a),(b), (c) and (e).

The Commonwealth implements its narrative toxics standard at 314 CMR 4.05 (5)(e) by specifying that, "[f]or pollutants not otherwise listed in 314 CMR § 4.00, the *National Recommended Water Quality Criteria: 2002, EPA 822R-02-047, November 2002* ["Recommended Criteria"] published by EPA pursuant to Section 304(a) of the [CWA], are the allowable receiving water concentrations for the affected waters, unless the Department

[1] Massachusetts Standards do not establish a numeric criterion for total phosphorus or for nitrogen.

…establishes a site specific criterion or determines that naturally occurring background conditions are higher[.]"

Section 303(d) of the CWA requires states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such, require the development of total maximum daily loads (TMDL). Inner Aucoot Cove (MA95-71)[2] is listed in the Massachusetts 2012 Integrated List of Waters (303d) (2012 Integrated List) as Category 5: Waters Requiring a TMDL. Inner Aucoot Cove is listed as impaired and requiring a TMDL for total nitrogen, dissolved oxygen, fecal coliform and nutrient/eutrophication biological indicators. A Final Pathogen TMDL has been approved for all waters in the Buzzards Bay watershed. The draft permit is consistent with the assumptions and requirements of the WLA for the discharge.

EFH Species
EFH is only designated for species for which federal fisheries management plans exist (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. The following list of EFH species associated with the action area of the Marion WPCF discharge was taken from the Summary of Essential Fish Habitat (EFH) Designation, at the website
http://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/CapecodtoNH/41407040.html

10' x 10' Square Coordinates:

Boundary	North	East	South	West
Coordinate	41° 50.0' N	70° 40.0' W	41° 40.0' N	70° 50.0' W

Square Description (i.e. habitat, landmarks, coastline markers): Atlantic Ocean waters within the square within Buzzards Bay affecting the following: south of Wareham, MA., from the west half of Great Neck west to Hiller Cove as well as affecting the far end of Stony Point Dike.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*	X	X	X	X
haddock *(Melanogrammus aeglefinus)*	X	X		
red hake *(Urophycis chuss)*			X	X
redfish *(Sebastes fasciatus)*	n/a			

[2] Impaired area defined as "From the confluence with Aucoot Creek, Marion to the boundary of Division of Marine Fisheries designated shellfishing growing area BB31.1, north and southwest from Haskell Island, Marion (formerly part of segment 95-09).

winter flounder *(Pseudopleuronectes americanus)*	X	X	X	X
windowpane flounder *(Scophthalmus aquosus)*	X	X	X	X
American plaice *(Hippoglossoides platessoides)*			X	X
Atlantic sea herring *(Clupea harengus)*			X	X
bluefish *(Pomatomus saltatrix)*			X	X
long finned squid *(Loligo pealeii)*	n/a	n/a	X	X
short finned squid *(Illex illecebrosus)*	n/a	n/a	X	X
Atlantic butterfish *(Peprilus triacanthus)*	X	X	X	X
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralichthys dentatus)*				X
scup *(Stenotomus chrysops)*	X	X	X	X
black sea bass *(Centropristis striata)*	X	X	X	X
surf clam *(Spisula solidissima)*	n/a	n/a		
ocean quahog *(Artica islandica)*	n/a	n/a		
spiny dogfish *(Squalus acanthias)*	n/a	n/a		
sandbar shark *(Carcharhinus plumbeus)*				X
bluefin tuna *(Thunnus thynnus)*			X	X

A review of the relevant essential fish habitat information provided by NMFS indicates that EFH has been designated for 21 managed species within the NMFS boundaries during one or more of the life stage categories (i.e. eggs, larvae, juveniles, adults, and spawning adults) encompassing Buzzards Bay. It is possible that a number of these species utilize these receiving waters for spawning, while others are present seasonally.

Eelgrass Protection

As stated earlier in this document, EPA consults with NMFS if EPA's action may adversely impact EFH, either directly, indirectly, in a site-specific manner or habitat wide. EPA is aware that the potential impact of a permitting action to eelgrass habitat is a site-specific indirect impact to EFH that must be evaluated as part of the consultation. The discharge of elevated nitrogen into an estuary has been identified as a cause of eelgrass degradation. A reasonable potential analysis was performed for the effects of nitrogen on the action area of the proposed discharge. The reasonable potential analysis examines the effects of nitrogen on water quality in Aucoot Cove rather than the unnamed brook. In freshwater systems, such as the unnamed brook, aquatic plant growth is typically limited by phosphorus, meaning that excess nitrogen does not increase plant growth. Please see page 25 of the fact sheet for a reasonable potential analysis of phosphorus in the unnamed brook.

Aucoot Cove is a deep, well flushed embayment of approximately 0.5 square miles area. The water quality classification of Aucoot Cove is SA, the most protective classification for saline waters. It is also a designated shellfishery. Inner Aucoot Cove is listed as impaired for total nitrogen, dissolved oxygen, and nutrients/eutrophication biological indicators. To interpret the narrative nutrient criteria, consistent with 122.44 (d)(1)(vi), and determine the appropriate threshold concentration, EPA reviewed nitrogen, dissolved oxygen and algal data collected by the Buzzards Bay Coalition at various locations in Aucoot Cove.

The water quality criterion for dissolved oxygen is 6.0 mg/L in Class SA Waters, such as Aucoot Cove. Aquatic plants and algae give off oxygen from photosynthesis during the day, but absorb oxygen during the night for respiration. Therefore, low dissolved oxygen (DO) in the early morning hours is one indication of eutrophication. Low DO events cause fish kills, noxious odors, and dead zones in estuaries.

Data collected by the Buzzards Bay Coalition indicates that the monitoring sites closest to the discharge have the highest likelihood for DO violations. Monitoring station AC7, at the mouth of the unnamed brook to Aucoot Cove, violated the DO criterion in 71% of monitoring events. Other monitoring stations in Aucoot Cove also frequently violate the DO criterion, with AC2 violating 45% of events, AC4 56%, and AC5a 45%.

Results from monitoring sites in Hiller's Cove, located adjacent to Aucoot Cove, show much lower violation frequencies. HL2 violated the 6.0 mg/L DO standard in 12% of sampling events, and HL1 violated the standard in only 7% of events. Hiller Cove, like Aucoot Cove, receives stormwater pollution from a developed area; but unlike Aucoot Cove has no POTW point sources.

The Massachusetts Department of Environmental Protection (MassDEP) has identified total nitrogen levels believed to be protective of eelgrass habitats as less than 0.39 mg/L and ideally less than 0.3 mg/L and *chlorophyll a* levels as 3-5 µg/L and ideally less than 3 µg/L (MADEP/SMAST, 2003)[3]. Monitoring station AC2, located in inner Aucoot Cove, has a median

[3] Massachusetts Department of Environmental Protection, UMASS-Dartmouth School for Marine Science and Technology. 2003. Massachusetts Estuaries Project: Site-Specific Nitrogen Thresholds for Southeastern Massachusetts

nitrogen concentration of 0.47 mg/L. In contrast, AC3, which currently supports eelgrass, has a median total nitrogen concentration of 0.35 mg/L[4].

To determine an appropriate threshold concentration, EPA considered the procedure developed by the Massachusetts Estuaries Project (MEP). This procedure identifies a target nitrogen concentration threshold based on a location within the estuary where water quality standards are not violated, in order to identify a nitrogen concentration consistent with unimpaired conditions. This approach is consistent with EPA guidance regarding the use of reference conditions for the purposes of developing nutrient water quality criteria.

EPA generally recommends three types of scientifically defensible empirical approaches for setting numeric criteria to address nitrogen/phosphorus pollution[5] a reference condition approach, mechanistic modeling, and stressor-response analysis. The reference condition approach derives criteria from observations collected in reference waterbodies. Reference waterbodies represent least disturbed and/or minimally disturbed conditions within a region (Stoddard et al., 2006) that support designated uses (EPA, 2000a). Therefore, the range of conditions observed within reference waterbodies provides appropriate values upon which criteria can be based. The reference condition approach requires the ability to define and identify reference waterbodies, and relies on the availability of sufficient data from these reference waterbodies to characterize the distributions of different nutrient variables. Aucoot Cove is classified as an SA water and currently supports eelgrass in the middle cove, but not the inner cove. Based on its depth, strata, and other characteristics the inner cove would be expected to support eelgrass. Therefore, the primary water quality parameter considered in determining a reference location is eelgrass.

Eelgrass continues to grow in middle Aucoot Cove, but is receding from inner Aucoot Cove. This is a predictable result of the inner cove receiving nutrient inputs from point and non-point sources without the same degree of tidal flushing that characterizes the middle cove. GIS data collected by MassDEP and analyzed by EPA indicate that eelgrass coverage in Aucoot Cove has retreated from its historical extent. (see Figure 5 of the fact sheet). During a site visit on September 10, 2014, EPA staff observed eelgrass beds in Aucoot Cove that appeared patchy, yellowed, and shaded by attached algae. Some die-off may be expected late in the growing

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Embayments: Critical Indicators Interim Report. Massachusetts Department of Environmental Protection. July 21, 2003. Revised September 16, 2003 and December 22, 2003.

[4] Data available at http://www.savebuzzardsbay.org/ProtectBay/CleanWater/SoundScience/BayHealthMap

[5] Environmental Protection Agency. 2001. Nutrient Criteria Technical Guidance Manual: Estuarine and Coastal Marine Waters. U.S. Environmental Protection Agency, Office of Water, EPA-822-B-01-001. October 2001. Published Online: http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/marine/index.cfm

Environmental Protection Agency. 2000a. Nutrient Criteria Technical Guidance Manual: Rivers and Streams. U.S. Environmental Protection Agency, Office of Water and Office of Science and Technology, EPA-822-B-00-002. July 2000. Published Online:
http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/rivers/index.cfm

Environmental Protection Agency. 2000b. Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs. U.S. Environmental Protection Agency, Office of Water and Office of Science and Technology, EPA-822-B00-001. April 2000. Published Online: http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/lakes/index.cfm season. However, the thick algal cover seems to be the immediate cause of the poor condition of the eelgrass beds.

For this analysis, EPA is using monitoring station AC3 as the reference location. As shown in Figure 4 of the fact sheet, this location is in a current eelgrass bed. The median total nitrogen concentration at AC3 between 2007 and 2012 was 0.35 mg/L, which will be the target concentration for this analysis. EPA notes that this value is consistent with TN concentration thresholds to protect eelgrass beds identified in other estuaries. Moreover, AC3 has the lowest *chlorophyll a* levels of any monitoring station in Aucoot Cove for which these data are available. The average *chlorophyll a* level at AC3 between 2007 and 2012 was 7.0 µg/L, still higher than the MassDEP/SMAST of 3-5 µg/L.

EPA has concluded that at existing levels, nitrogen in the Marion WPCF discharge has the reasonable potential to cause or contribute to water quality violations in Inner Aucoot Cove as discussed in Section IV.B.3 of the fact sheet. Inner Aucoot Cove is listed as impaired and requiring a TMDL for total nitrogen, dissolved oxygen, and nutrient/eutrophication biological indicators. Monitoring stations closest to the discharge, such as AC2 and AC7, are more impaired than stations further out in the cove. While the Marion WPCF has attained an impressive level of nitrogen removal from its discharge, its average effluent nitrogen concentration of 3.46 mg/l is still ten times higher than the concentration needed to support eelgrass in the cove.

<u>Finding</u>
EPA has determined that the draft permit has been conditioned in such a way so as to minimize any adverse impacts to EFH for the following reasons:

- This permit action does not constitute a new source of pollutants. It is the reissuance of an existing NPDES permit;
- The WPCF withdraws no water from the unnamed brook or Buzzards Bay; therefore, no life stages of EFH species are vulnerable to impingement or entrainment from this WPCF;
- A Final Pathogen TMDL has been approved for all waters in the Buzzards Bay watershed. The draft permit is consistent with the assumptions and requirements of the waste load allocation for the discharge;
- The draft permit is designed so that the discharge meets Massachusetts State Water Quality Standards;
- The draft permit contains water quality-based limits for total suspended solids, BOD_5, ammonia-nitrogen, total nitrogen, total phosphorus and total copper;
- The proposed water quality-based limits for nitrogen are designed to protect eelgrass in Aucoot Cove and Buzzards Bay;
- The draft permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts;
- The permit requires toxicity testing four times per year to ensure that the discharge does not present toxicity problems.

EPA believes that the conditions and limitations contained within the proposed permit adequately protect all aquatic life, including those with designated EFH in the receiving water, and that further mitigation is not warranted. If adverse impacts to EFH are detected as a result of this permit action, or if new information is received that changes the basis for these conclusions, EPA will contact NMFS Habitat Division.

Legend

- WWTP Influent Intake Point
- WWTP Influent Force Main
- WWTP Effluent Sewer Pipe
- Water Supply Wells

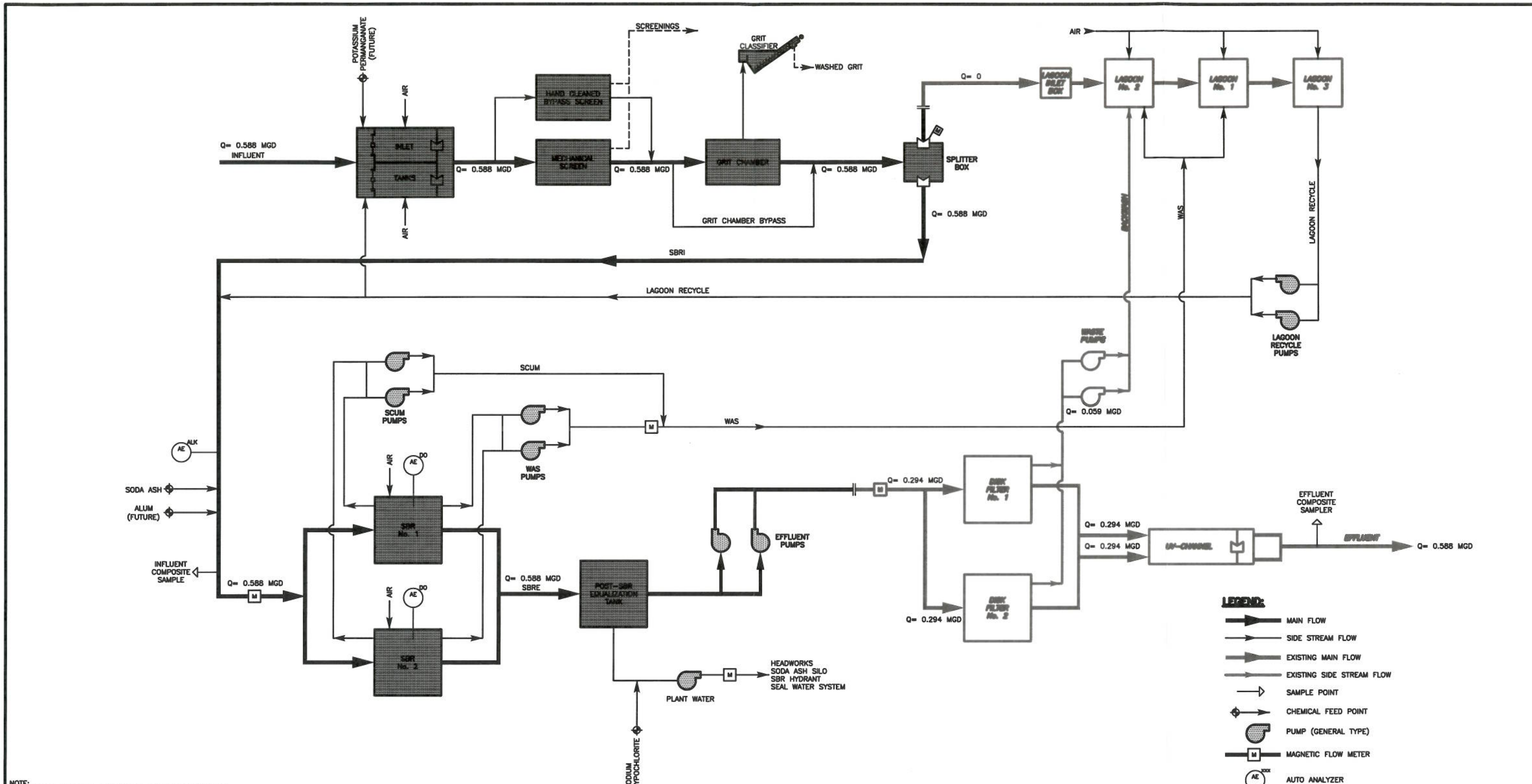
FIGURE 1

TOWN OF MARION, MASSACHUSETTS
WASTEWATER TREATMENT PLANT
LOCUS MAP

0 2,500 5,000 Feet

1 inch = 2,500 feet

C:\Documents and Settings\martindm\My Documents\CDM Projects\GIS & MODEL XREF\MXDs\Marion_II - (12-13-2010) 12/13/10 DMM



NOTE:
1. ENGINEERING POWER GENERATOR PROVIDES BACKUP FOR SYSTEM.
2. REDUNDANT UV LIGHT BANKS PROVIDED IN UV CHANNEL.

PLANT DESCRIPTION:
THE MARION WWTP IS A SEQUENCING BATCH REACTOR (SBR) TREATMENT PLANT. INFLUENT IS FIRST PROCESSED THROUGH TWO INLET TANKS, WHICH SERVE TO AERATE AND FRESHEN THE WASTEWATER. THE INFLUENT THEN PASSES THROUGH A BAR SCREEN AND VORTEX GRIT CHAMBER BEFORE EXITING THE HEADWORKS BUILDING TOWARD THE SBR PROCESS. REMOVED SCREENINGS AND GRIT ARE WASHED AND COMPACTED, AND BAGGED AND PLACED INTO A DUMPSTER ADJACENT TO THE BUILDING. INFREQUENTLY, THE INFLUENT FLOW RATE THROUGH THE HEADWORKS EXCEEDS THE PROCESS CAPACITY OF THE SBRS. AN OVERFLOW WEIR IS USED TO DIRECT THESE EXCESS FLOWS TO THE ORIGINAL LAGOON SYSTEM, WHICH IS USED FOR EQUALIZATION. THE LAGOON SYSTEM CONSISTS OF APPROXIMATELY 20 ACRES AND IS A CRITICAL PROCESS FOR OPERATION OF THE PLANT. THE PLANT WAS DESIGNED TO WORK TOGETHER WITH THE LAGOON SYSTEM. THE STAFF AT THE WWTP MONITOR THE LAGOONS CLOSELY AND WHEN NEEDED HAVE THE ABILITY TO ALSO DRAW WATER FROM THE LAGOONS AND RETURN IT THROUGH THE PLANT FOR ADDITIONAL TREATMENT. THE SBRS PROVIDE BIOCHEMICAL OXYGEN DEMAND (BOD) AND TOTAL SUSPENDED SOLIDS (TSS) REMOVAL, NITRIFICATION, AND DENITRIFICATION. THE SBRS ARE OPERATED IN A MANNER TO PROVIDE SUFFICIENT AEROBIC TIME (FOR BOD AND NITRIFICATION), ANOXIC MIX TIME (FOR DENITRIFICATION) AND SETTLING TIME PRIOR TO DECANT. OPERATION OF THE TWO SBRS IS COORDINATED SUCH THAT ONE REACTOR IS ALWAYS IN THE "FILL" PHASE OF THE PROCESS CYCLE. THE PLANT DOES NOT ALLOW FOR OPERATION OF ONE SBR TANK DURING PERIODS OF MAINTENANCE AND STILL BE ABLE TO MEET THE NPDES PERMIT DISCHARGE LIMITS. THIS UNDERSCORES THE NEED FOR THE LAGOON SYSTEM AS EQUALIZATION STORAGE AND DURING TIMES OF NEEDED MAINTENANCE. EFFLUENT FROM SBRS FLOWS TO AN EQUALIZATION TANK. THE TANK IS NECESSARY BECAUSE THE DECANT RATE FROM THE SBRS EXCEEDS THE PEAK CAPACITY OF THE DOWNSTREAM PROCESSES (DISK FILTERS AND UV DISINFECTION). EFFLUENT IS THEN PUMPED FROM THE EQUALIZATION TANK TO THE YARD PIPING THAT FEEDS THE DISK FILTERS. WASTE ACTIVATED SLUDGE (WAS) FROM THE SBRS IS PUMPED TO THE EXISTING LAGOONS AND THE LAGOONS ARE USED FOR WAS STABILIZATION. THE LAGOONS ARE PROVIDED WITH DIFFUSED AERATION TO AUGMENT THE SYSTEM'S ABILITY TO STABILIZE THE WAS, AND TO REDUCE NUISANCE ODORS. FINALLY, EFFLUENT IS TREATED THROUGH THE DISK FILTER PROCESS BEFORE FLOWING THROUGH THE UV SYSTEM FOR DISINFECTION. DISINFECTION EFFLUENT IS DISCHARGED TO EFFLUENT BROOK.

FIGURE 2

TOWN OF MARION, MASSACHUSETTS
NPDES PERMIT RENEWAL

PROCESS FLOW DIAGRAM

FORM 2S, PART A.6

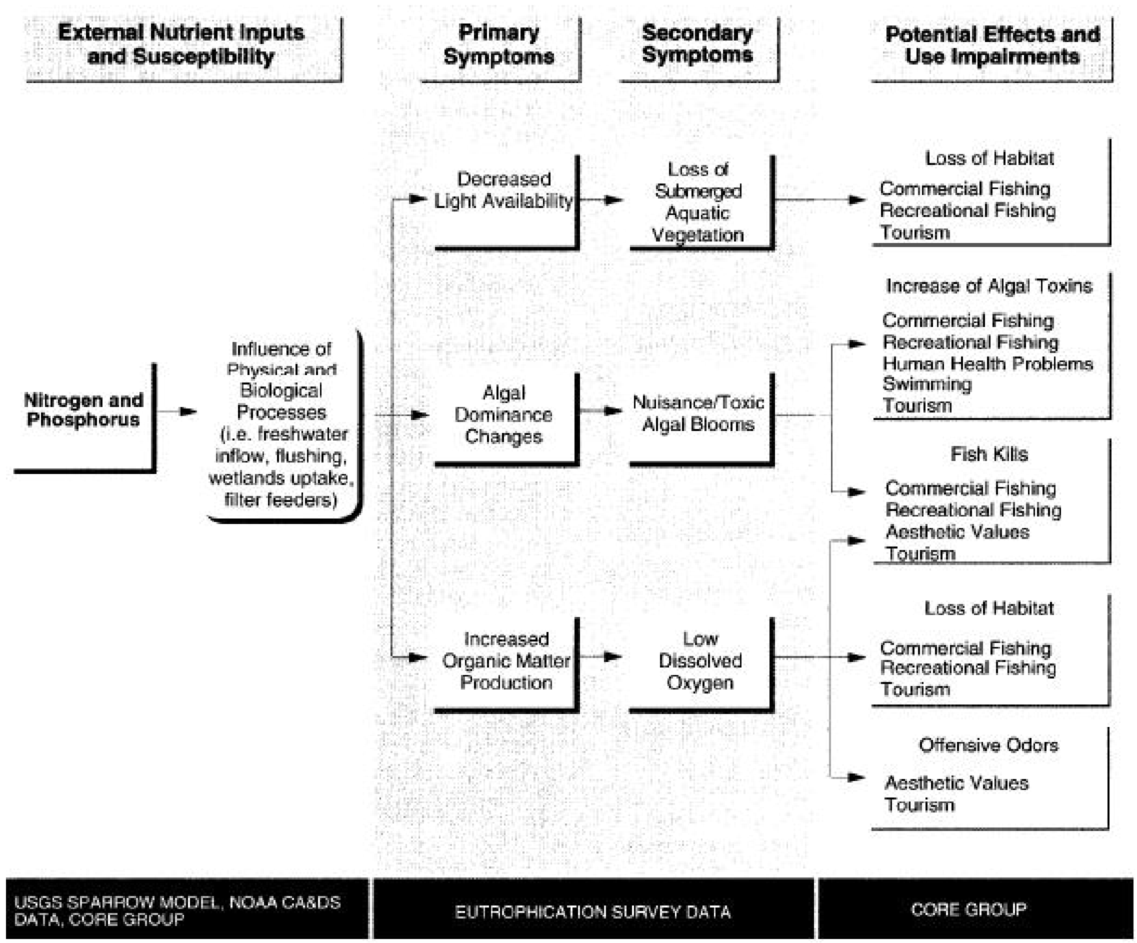


Figure 3. Eutrophication Flow Chart.

Legend

2013 Eelgrass

BBC Sampling stations

1 inch = 833 feet

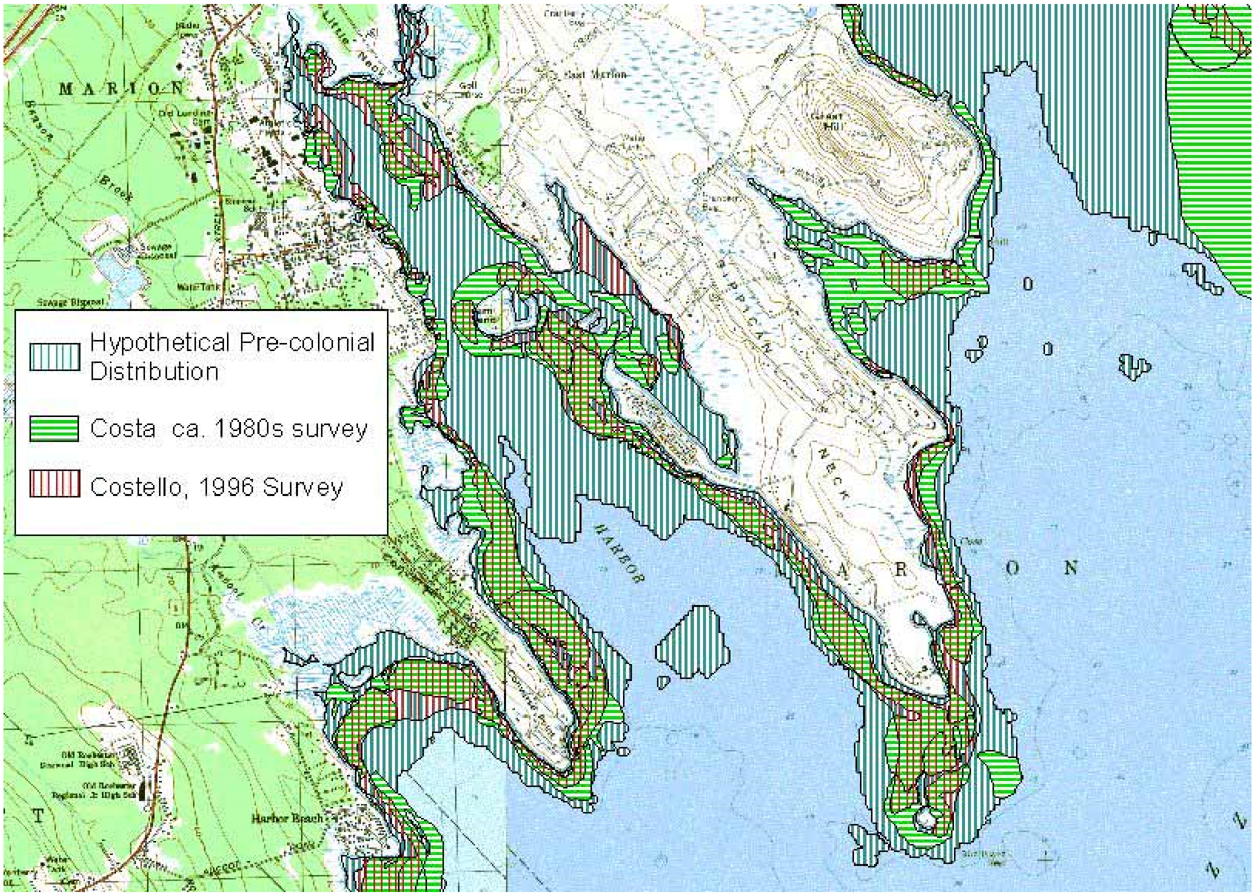
N

Figure 4
2013 Eelgrass Coverage in Aucoot Cove

Eelgrass coverage layer is maintained by the MassDEP Wetlands Conservancy Program. For additional information on the MassDEP Eelgrass Mapping Project, visit: http://www.mass.gov/eea/agencies/massdep/water/watersheds/eelgrass-mapping-project.html.
BBC = Buzzards Bay Coalition

EPA

Figure 5. Comparison between the Costa 1980s, DEP's 1996, and the hypothetical pre-colonial distribution of eelgrass around Marion, MA.



Source: Buzzards Bay National Estuary Program.

http://buzzardsbay.org/eelgrass-historical.htm

From the website:

Hypothetical Eelgrass Distribution during the Colonial Period

For the 2003 Coalition State of the Bay report we estimated eelgrass cover circa 1600. This is a speculative exercise, but it was worthwhile to imagine the potential distribution of eelgrass in Buzzards Bay without human impacts such as nitrogen loading, increased water turbidity associated with urban runoff, resuspension of sediments from boat traffic, and other human disturbances.

Eelgrass distribution is largely dependent upon water transparency. This is evident in the clear waters of offshore areas of Cape Cod and Islands, where eelgrass often grows between 20 and 30 feet MLW, and deeper depths of eelgrass beds have been recorded by divers. In less polluted and better flushed harbors and coves, eelgrass beds can still be found to depths between eight and twelve feet. In contrast, in most polluted embayments, eelgrass, if present at all, may only grow to depths of 6 feet MLW or often much less.

These patterns of growth became the basis of assumed eelgrass distribution in pristine conditions. Using the depth of growth of eelgrass in clean waters, we can speculate what eelgrass abundance in Buzzards Bay may have once been, and a hypothetical historical eelgrass habitat in Buzzards Bay can be postulated. Such hypotheses can even be tested using sediment cores because Costa (1988, 1989) and others have shown that the remains of eelgrass seed coats (tests) are a valuable biostratigraphical marker that remain in the sediments of many bays and harbors, possibly for many centuries. For example, no eelgrass has been found in inner Apponagansett Bay (Dartmouth) for decades, but sediment cores show eelgrass was abundant for centuries based on assumed rates of sedimentation (Costa, 1988a).

For the estimation of eelgrass cover in 1600, the following two assumptions were made. For upper Buzzards Bay (roughly a line drawn from North Falmouth to Mattapoisett), we assumed eelgrass grew to 12 ft. MLW. For the lower half Buzzards Bay, we assumed eelgrass grew down to 20 feet MLW.

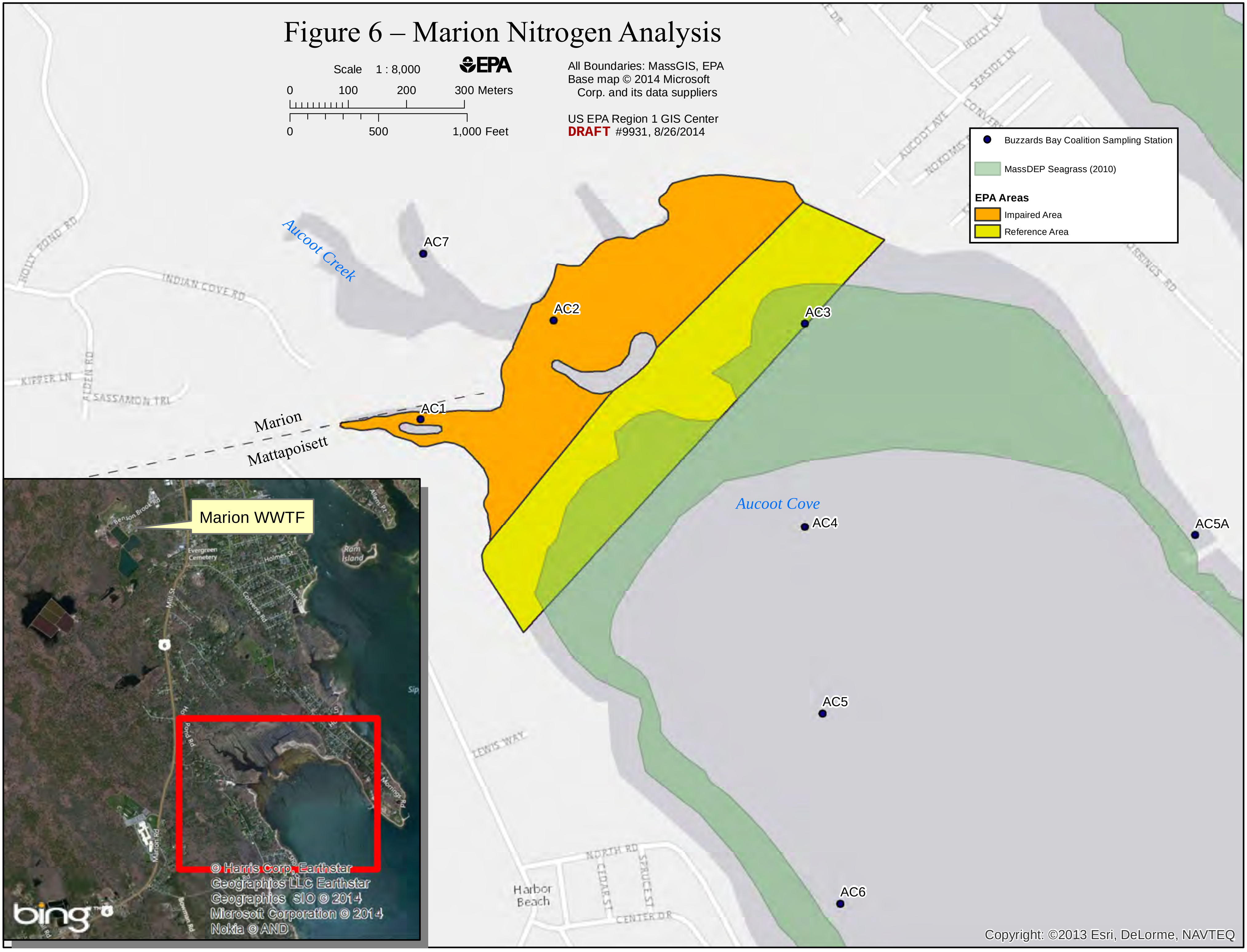


Figure 6 – Marion Nitrogen Analysis
Scale 1 : 8,000
0 100 200 300 Meters
0 500 1,000 Feet
EPA
All Boundaries: MassGIS, EPA
Base map © 2014 Microsoft Corp. and its data suppliers
US EPA Region 1 GIS Center
DRAFT #9931, 8/26/2014
Buzzards Bay Coalition Sampling Station
MassDEP Seagrass (2010)
EPA Areas
Impaired Area
Reference Area
Aucoot Creek
Aucoot Cove
AC1
AC2
AC3
AC4
AC5
AC5A
AC6
AC7
Marion
Mattapoisett
Harbor Beach
Marion WWTF
© Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2014 Microsoft Corporation © 2014 Nokia © AND
bing
Copyright: ©2013 Esri, DeLorme, NAVTEQ

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1
OFFICE OF ECOSYSTEM PROTECTION
5 POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02109

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO WATERS OF THE UNITED STATES UNDER SECTIONS 301 AND 402 OF THE CLEAN WATER ACT, AS AMENDED, AND SECTIONS 27 AND 43 OF THE MASSACHUSETTS CLEAN WATERS ACT, AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE CLEAN WATER ACT.

DATE OF NOTICE: **December 3, 2014 – January 2, 2015**

PERMIT NUMBER: **MA0100030**

PUBLIC NOTICE NUMBER: MA003-14

NAME AND MAILING ADDRESS OF APPLICANT:

Paul Dawson
Town of Marion
50 Benson Brook Road
Marion, MA 02738

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Marion Water Pollution Control Facility
50 Benson Brook Road
Marion, Massachusetts 02738

RECEIVING WATER: Unnamed Brook to Aucoot Cove (Class B)
HUC12: 010900020305

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) have cooperated in the development of a draft permit for the Marion WPCF, which discharges treated domestic wastewater. Sludge from this facility is stored in on-site sewage lagoons. The effluent limits and permit conditions imposed have been drafted to assure compliance with the Clean Water Act, 33 U.S.C. sections 1251 et seq., the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53, 314 CMR 3.00, and State Surface Water Quality Standards at 314 CMR 4.00. EPA has requested that the State certify this draft permit pursuant to Section 401 of the Clean Water Act and expects that the draft permit will be certified.

INFORMATION ABOUT THE DRAFT PERMIT:

The draft permit and explanatory fact sheet may be obtained at no cost at http://www.epa.gov/region1/npdes/draft_permits_listing_ma.html or by contacting:

Robin Johnson
U.S. Environmental Protection Agency – Region 1
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1045

The administrative record containing all documents relating to this draft permit including all data submitted by the applicant may be inspected at the EPA Boston office mentioned above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by **January 2, 2015** to the address listed above. Any person, prior to such date, may submit a request in writing to EPA and MassDEP for a public hearing to consider this draft permit. 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 whenever 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 at EPA's Boston office.

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 forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

DAVID FERRIS, DIRECTOR
MASSACHUSETTS WASTEWATER MANAGEMENT PROGRAM
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

KEN MORAFF, DIRECTOR
OFFICE OF ECOSYSTEM PROTECTION
EPA-REGION 1

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1
OFFICE OF ECOSYSTEM PROTECTION
5 POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02109

JOINT **EXTENSION OF A PUBLIC NOTICE** OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO WATERS OF THE UNITED STATES UNDER SECTIONS 301 AND 402 OF THE CLEAN WATER ACT, AS AMENDED, AND SECTIONS 27 AND 43 OF THE MASSACHUSETTS CLEAN WATERS ACT, AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE CLEAN WATER ACT.

REASON FOR EXTENDING THE PUBLIC NOTICE:

This Public Notice is hereby extended (40 C.F.R. §124.10) because the original public notice occurred during the holiday season.

DATES OF ORIGINAL NOTICE PERIOD: 12/03/2014 – 01/02/2015

DATES OF EXTENDED NOTICE PERIOD: 01/02/2015 – 02/02/2015

PERMIT NUMBER: **MA0100030**

PUBLIC NOTICE NUMBER: MA-004-15

NAME AND MAILING ADDRESS OF APPLICANT:

Paul Dawson
Town of Marion
50 Benson Brook Road
Marion, Massachusetts 02738

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Marion Water Pollution Control Facility
50 Benson Brook Road
Marion, Massachusetts 02738

INFORMATION ABOUT THE DRAFT PERMIT:

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PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by **February 2, 2015** to the address listed above. Any person, prior to such date, may submit a request in writing to EPA and MassDEP for a public hearing to consider this draft permit. 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 whenever 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 at EPA's Boston office.

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 forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

DAVID FERRIS, DIRECTOR MASSACHUSETTS WASTEWATER MANAGEMENT PROGRAM MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	KEN MORAFF, DIRECTOR OFFICE OF ECOSYSTEM PROTECTION EPA-REGION 1