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"),

University of Massachusetts Boston

is authorized to discharge from a facility located at

University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125

to receiving water named

Dorchester Bay
Boston Harbor Watershed

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

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

This Permit expires at midnight on [*five years from the last day of the month preceding the effective date*].

This Permit supersedes the Permit issued on June 15th, 2018.

This Permit consists of this **cover page**, **Part I**, and **Part II** (NPDES Part II Standard Conditions, April 2018).

Signed this day of

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

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

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge non-contact cooling water through Outfall Serial Number 001 to Dorchester Bay. The discharge shall be limited and monitored as specified below; the receiving water shall be monitored as specified below.

Effluent Characteristic	Effluent Limitations			Monitoring Requirements[1,2,3]	
	Average Monthly	Maximum Daily	Annual Average	Measurement Frequency[4]	Sample Type
Flow Rate[5]	17.2 MGD	18.4 MGD	12.9 MGD	Continuous	Flow Meter
Through-screen velocity	--	0.5 feet per second	--	Continuous	Calculation
pH[6]	6.5 - 8.5 S.U.		--	1/week	Grab
Effluent Temperature (Mean Daily)[7]	Report	80°F	--	Continuous	Meter
Effluent Temperature (Instantaneous)[7]	--	85°F	--	Continuous	Meter
Influent Temperature	Report	Report	--	Continuous	Meter
Rise in Temperature (low tide)[8]	--	10°F	--	1/day	Calculation
Rise in Temperature (mid-tide)[8]	--	11°F	--	1/day	Calculation
Rise in Temperature (high tide)[8]	--	12°F	--	1/day	Calculation

Footnotes:

1. Effluent samples shall yield data representative of the discharge. A routine sampling program shall be developed in which samples are taken at the discharge point to the receiving water. Changes in sampling location must be approved in writing by the Environmental Protection Agency Region 1 (EPA). The Permittee shall report the results to EPA and the State of any additional testing above that required herein, if testing is done in accordance with 40 CFR Part 136.

2. In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is "sufficiently sensitive" when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in

the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

3. When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L). For calculating and reporting the average monthly concentration when one or more values are not detected, assign a value of zero to all non-detects and report the average of all the results. The number of exceedances shall be enumerated for each parameter in the field provided on every Discharge Monitoring Report (DMR).

4. Measurement frequency of continuous is defined as the recording of flow or temperature at all times the Facility is operating. Measurement frequency of 1/week is defined as the sampling of one discharge event in each seven-day calendar week. Measurement frequency of 1/day is defined as the recording of one measurement for each 24-hour period. If no sample is collected during the measurement frequencies defined above, the Permittee must report an appropriate No Data Indicator Code.

5. Effluent flow shall be reported in million gallons per day (MGD). Annual average flow shall be recorded daily as a rolling annual average based on the previous 365 days. On the monthly DMR, the maximum value for the month shall be reported.

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

7. The maximum daily temperature limit of 80°F shall be based on the mean daily temperature over a twenty-four (24) hour period. The maximum daily temperature limit of 85°F is an instantaneous maximum not to be exceeded.

8. The rise in temperature is defined as the difference between the recorded instantaneous effluent temperature and the influent temperature. The rise in temperature shall not exceed 10°F at low tide, 11°F at mid-tide, and 12°F at high tide. The Permittee shall report the maximum rise in temperature for each tidal height in a 24-hour period based on continuous measurement of influent and effluent temperatures. Low and high tide shall be defined by the daily tide prediction at NOAA Boston Station ID Number 8443970. Mid-tide shall be defined as the tidal height approximately three (3) hours after low or high tide.

Part I.A. continued.

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

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

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

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

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

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

8. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify EPA as soon as they know or have reason to believe (40 CFR § 122.42):

   a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

      (1) 100 micrograms per liter (µg/L);
      (2) 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (mg/L) for antimony;
      (3) Five times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR § 122.21(g)(7); or
      (4) Any other notification level established by EPA in accordance with 40 CFR § 122.44(f) and State regulations.

   b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

      (1) 500 µg/L;
      (2) One mg/L for antimony;

(3) 10 times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR § 122.21(g)(7); or
(4) Any other notification level established by EPA in accordance with 40 CFR § 122.44(f) and State regulations.

c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.

B. UNAUTHORIZED DISCHARGES

1. This permit authorizes discharges only from the outfall listed in Part I.A.1, in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources are not authorized by this permit and shall be reported in accordance with Part D.1.e.(1) of the Standard Conditions of this permit (24-hour reporting).

C. CWIS BEST TECHNOLOGY AVAILABLE

1. The location, design, construction, and capacity of the Permittee's non-contact cooling water intake structure (CWIS) shall reflect the best technology available (BTA) for minimizing the adverse environmental impacts from impingement of aquatic organisms and entrainment of eggs and larvae. Nothing in this permit authorizes take for the purpose of compliance with the Endangered Species Act. In order to satisfy this BTA requirement, the permittee shall:

   a. Operate variable frequency drives (VFDs) on the Facility's seawater pumps in conjunction with a supplemental cooling tower to:

      i. Limit the maximum daily intake flow to 18.4 MGD, maximum monthly average flow to 17.2 MGD, and annual average daily flow to 12.9 MGD.

      ii. Limit the maximum through-screen velocity to no more than 0.5 feet per second. Monitoring of the through-screen velocity shall be as specified in Part I.A.1. of this Permit and shall be reported on the Facility's monthly DMRs.

   b. Rotate the traveling screen at the maximum rotation frequency recommended by the manufacturer, but not less than once per day, in order to minimize impingement duration. This requirement shall not apply to any period that the traveling screen is not in working order due to required maintenance.

   c. Operate the fish return trough that transports impinged fish and other aquatic organisms to Dorchester Bay avoiding vertical drops and sharp turns or angles. The end of the fish return trough shall be submerged at all times when the traveling screen is rotated at a location that minimizes the potential for re-impingement.

2. Any change in the location, design, or capacity of the intake structure outside of the specifications of this Permit must be approved in advance in writing by EPA and MassDEP

and may require a permit modification. The Permittee shall notify EPA and MassDEP of any such proposed change.

3. Unusual Impingement Event

   b. The Permittee shall visually inspect the traveling screen at the CWIS once every 24 hours for dead and live fish when circulating pumps are in operation. The Permittee shall begin the inspection at the start of screen rotation and continue for at least one full rotation of the screen. An "unusual impingement event" (UIE) is defined as any occasion on which the Permittee observes on the traveling screen, or estimates based on time-limited observations, 20 or more total fish within any 6-hour period. During the UIE, the Permittee shall rotate the traveling screen continuously until impingement decreases to three or fewer fish per hour.

   c. UIEs will be reported to EPA and MassDEP no later than 24 hours after the Permittee is aware of or has reason to believe a UIE has occurred as required in Part II.D.1.e. of this Permit. If the UIE is observed during weekend, holiday or evening periods, the Permittee shall notify EPA and MassDEP on the next business day.

   d. The Permittee shall prepare and submit a written report regarding such UIE within five business days to EPA and MassDEP at the addresses found in Parts I.F.3.b. and I.F.5., respectively, of this Permit. The oral and written reports shall include the following information:

      (1) An enumeration and recording of all dead fish by species. Report the species, size ranges (maximum and minimum length), and approximate number of organisms involved in the incident. In addition, a representative sample of 25% of fish specimens from each species, up to a maximum of 50 total fish specimens, shall be measured to the nearest centimeter total length.

      (2) The date and time of occurrence.

      (3) The determination or opinion of the Permittee as to the reason the incident occurred.

   e. In addition to EPA and MassDEP, the Permittee shall report UIEs to the Massachusetts Division of Marine Fisheries at the following address:

Division of Marine Fisheries
251 Causeway St, Suite 400
Boston, MA 02114
(617) 626-1520
marine.fish@mass.gov

D. SPECIAL CONDITIONS

There are no special conditions.

E. REPORTING REQUIREMENTS

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

1. Submittal of DMRs Using NetDMR

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

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this Permit, the Permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. 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 following the monitoring period), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the DMR following the particular report due date specified in this Permit.

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

   a. The following requests, reports, and information described in this Permit shall be submitted to the NPDES Applications Coordinator in EPA WD:

      (1) Transfer of Permit notice;
      (2) Request for changes in sampling location;
      (3) Request for pH Effluent Limitation Adjustment; and
      (4) Notification of Unusual Impingement Event.

   b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov or by hard copy mail to the following address:

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

4. Submittal of Reports in Hard Copy Form

   a. The following notifications and reports shall be signed and dated originals, submitted in hard copy, with a cover letter describing the submission:

      (1) Prior to December 21, 2020, written notifications required under Part II. Starting on December 21, 2020, such notifications must be done electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at https://cdx.epa.gov/.

   b. This information shall be submitted to EPA ECAD at the following address:

U.S. Environmental Protection Agency
Enforcement and Compliance Assurance Division
Water Compliance Section
5 Post Office Square, Suite 100 (04-SMR)
Boston, MA 02109-3912

5. State Reporting

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

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

6. Verbal Reports and Verbal Notifications

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

   b. Verbal reports and verbal notifications shall be made to EPA's Enforcement and Compliance Assurance Division at:

617-918-1510

   c. Verbal reports and verbal notifications shall be made to the State's Emergency Response at:

888-304-1133

F. STATE 401 CERTIFICATION CONDITIONS

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

2. The permittee shall conduct an annual diver inspection of the intake structure as long as this Permit is in effect. Within 60 days of each inspection, a report including photographs of the intake structure shall be provided to MassDEP as described in Part I.E.5.

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

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

A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

(1) Criminal Penalties

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

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

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

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

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

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

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

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

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

2. Permit Actions

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

condition.

3. Duty to Provide Information

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

4. Oil and Hazardous Substance Liability

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

5. Property Rights

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

6. Confidentiality of Information

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

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

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

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

7. Duty to Reapply

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

8. State Authorities

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

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

9. Other Laws

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

B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

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

c. Notice

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

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

d. *Prohibition of bypass.*

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

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

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

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

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

5. Upset

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

improper operation.

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

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

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

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

C. MONITORING REQUIREMENTS

1. Monitoring and Records

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

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

c. Records of monitoring information shall include:

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

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

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

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

2. Inspection and Entry

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

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

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

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

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

D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

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

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

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

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

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

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

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

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

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

e. *Twenty-four hour reporting.*

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

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

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

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

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

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

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

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

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

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

2. Signatory Requirement

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

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

3. Availability of Reports.

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

E. DEFINITIONS AND ABBREVIATIONS

1. General Definitions

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

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

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

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

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

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

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

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

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

Bypass see B.4.a.1 above.

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

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

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

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

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

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

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

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

Direct Discharge means the "discharge of a pollutant."

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

Discharge

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

Agency.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Municipality

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES means "National Pollutant Discharge Elimination System."

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

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

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

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

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

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

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

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

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

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

(a) Sewage from vessels; or

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Upset see B.5.a. above.

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

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

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

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

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

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

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

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

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

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

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

(f) The territorial sea; and

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

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

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

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

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

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

2. Commonly Used Abbreviations

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

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

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

FACT SHEET

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

NPDES PERMIT NUMBER: MA0040304

PUBLIC NOTICE START AND END DATES: 10/15/2020 – 11/16/2020

NAME AND MAILING ADDRESS OF APPLICANT:

University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125

RECEIVING WATER AND CLASSIFICATION:

Dorchester Bay (MA70-03)
Boston Harbor Watershed
Class SB (CSO)

SIC CODE: 8221 (Colleges, Universities, and Professional Schools)

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1.0 Proposed Action

University of Massachusetts Boston (the Permittee) has applied to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge from the University of Massachusetts Boston campus (the Facility) into Dorchester Bay.

The permit currently in effect was issued on February 7, 2013 (2013 Permit) and subsequently modified on June 15, 2018 (2018 Modified Permit). The 2018 Modified Permit expired on August 31, 2018. The Permittee filed an application for permit reissuance with EPA dated February 27, 2018, as required by 40 Code of Federal Regulations (CFR) § 122.6. Since the permit application was deemed timely and complete by EPA on April 18, 2018, the Facility's 2018 Modified Permit has been administratively continued pursuant to 40 CFR § 122.6 and § 122.21(d).

2.0 Statutory and Regulatory Authority

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

"Congress has vested in the Administrator [of EPA] broad discretion to establish conditions for NPDES permits" in order to achieve the statutory mandates of Section 301 and 402. *Arkansas v. Oklahoma,* 503 U.S. 91, 105 (1992). *See also* 40 CFR §§ 122.4(d), 122.44(d)(1), and 122.44(d)(5). CWA §§ 301 and 306 provide for two types of effluent limitations to be included in NPDES permits: "technology-based" effluent limitations (TBELs) and "water quality-based" effluent limitations (WQBELs). *See* CWA §§ 301 and 304(b); 40 CFR §§ 122, 125, and 131.

2.1 Technology-Based Requirements

Technology-based treatment requirements represent the minimum level of control that must be imposed under CWA §§ 301(b) and 402 to meet best practicable control technology currently available (BPT) for conventional pollutants and some metals, best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for toxic and non-conventional pollutants. *See* 40 CFR § 125 Subpart A.

Subpart A of 40 CFR Part 125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under § 301(b) of the CWA, including the application of EPA promulgated Effluent Limitation Guidelines (ELGs) and case-by-case determinations of effluent limitations under CWA § 402(a)(1). EPA promulgates New Source Performance Standards (NSPS) under CWA § 306 and 40 CFR § 401.12. *See also* 40 CFR §§ 122.2 (definition of "new source") and 122.29. Cooling water intake structure (CWIS) requirements under CWA § 316(b) are developed for new facilities in accordance with 40 CFR Part 125, Subpart I, while they are developed for existing facilities in accordance with 40 CFR Part 125 Subpart J.

In general, ELGs for non-POTW facilities must be complied with as expeditiously as practicable but in no case later than three years after the date such limitations are established and in no case later than March 31, 1989. *See* 40 CFR § 125.3(a)(2). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by a NPDES permit. In the absence of published technology-based effluent guidelines, the permit writer is authorized under CWA § 402(a)(1)(B) to establish effluent limitations on a case-by-case basis using best professional judgment (BPJ).

2.2 Water Quality-Based Requirements

The CWA and federal regulations require that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water. This is necessary when less stringent TBELs would interfere with the attainment or maintenance of water quality criteria in the receiving water. *See* CWA § 301(b)(1)(C) and 40 CFR §§ 122.44(d)(1),122.44(d)(5), 125.84(e) and 125.94(i).

2.2.1 Water Quality Standards

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

As a matter of state law, state WQSs specify different water body classifications, each of which is associated with certain designated uses and numeric and narrative water quality criteria. When using chemical-specific numeric criteria to develop permit limitations, acute and chronic aquatic life criteria and human health criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. In general, aquatic-life acute criteria are considered applicable to daily time periods (maximum daily limit) and aquatic-life chronic criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific human health

criteria are typically based on lifetime chronic exposure and, therefore, are typically applicable to monthly average limits.

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

2.2.2 Antidegradation

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

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

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

2.2.3 Assessment and Listing of Waters and Total Maximum Daily Loads

The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. To meet this goal, the CWA requires states to develop information on the quality of their water resources and report this information to EPA, the U.S. Congress, and the public. To this end, EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both § 305(b) and § 303(d) of the CWA. The integrated list format allows states to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories: 1) unimpaired and not threatened for all designated uses; 2) unimpaired waters for some uses and not assessed for others; 3) insufficient information to make assessments for any uses; 4) impaired or threatened for one or more uses but

not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) impaired or threatened for one or more uses and requiring a TMDL.

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

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

2.2.4 Reasonable Potential

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

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

2.2.5 State Certification

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

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

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

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

2.3 Clean Water Act Section 316(a)

Heat is defined as a pollutant under Section 502(6) of the CWA. 33 U.S.C. § 1326(6). As with other pollutants, discharges of heat (or "thermal discharges") must, in general, satisfy both technology-based standards (specifically, the BAT standard) and any more stringent water quality-based requirements that may apply. Regarding water quality requirements, state WQSs may include numeric temperature criteria, as well as narrative criteria and designated uses, that apply to particular water body classifications and may necessitate restrictions on thermal discharges.

Section 316(a) of the CWA, 33 U.S.C. § 1326(a), provides, however, that thermal discharge limits less stringent than technology-based and/or water quality-based requirements may be authorized if the biological criteria of Section 316(a) are satisfied. The approval of less stringent thermal discharge limits under CWA § 316(a) is referred to as a "Section 316(a) variance." In addition, Massachusetts WQSs provide that:

> Alternative effluent limitations established in connection with a variance for a thermal discharge issued under 33 U.S.C. § 1251 (FWPCA, §316(a)) and 314 CMR 3.00 are in compliance with 314 CMR 4.00. As required by 33 U.S.C. § 1251 (FWPCA, § 316(a)) and 314 CMR 3.00, for permit and variance renewal, the applicant must demonstrate that

> alternative effluent limitations continue to comply with the variance standard for thermal discharges.

See 314 CMR 4.05(4)(b)(2)(c) for applicable WQS for Class SB waters. Therefore, thermal discharge limits set pursuant to a variance under CWA § 316(a) are deemed by the state to satisfy Massachusetts WQSs.

Thermal discharge variances, and the demonstration that an applicant must make to obtain one, are addressed in CWA § 316(a) and EPA regulations, including those promulgated at 40 CFR § 125, Subpart H. In essence, the applicant must demonstrate that alternative, less stringent effluent limitations, considering the cumulative impact of its thermal discharge together with all other significant impacts on the species affected, will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the water body receiving the thermal discharge (BIP). See 33 U.S.C. § 1326(a); 40 CFR §§ 125.73(a) and 125.73(c)(1)(i). An existing thermal discharger can perform either a predictive or retrospective analysis in an effort to demonstrate that the protection and propagation of the BIP will be assured under the proposed thermal discharge variance. If the applicant makes this demonstration to the satisfaction of EPA (or, if appropriate, the State), then the permitting authority may issue the permit with the requested alternative, variance-based thermal discharge limits. Conversely, if the demonstration does not adequately support the requested variance-based thermal discharge limits, the permitting authority shall deny the requested variance. In that case, the permitting authority shall either impose limits based on the otherwise applicable technology-based and water quality-based requirements or, at its discretion, impose alternative variance-based limits that the permit record demonstrates will assure the protection and propagation of the BIP.

2.4 Clean Water Act Section 316(b)

Technology-based NPDES permit requirements for CWISs are based on CWA § 316(b), 33 U.S.C. § 1326(b), which requires that:

> [a]ny standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

As with effluent discharge limits, CWIS requirements must also comply with any more stringent conditions that might be necessary to achieve compliance with any applicable State WQS. *See* 40 CFR § 125.84(3)

2.5 Effluent Flow Requirements

Generally, EPA uses effluent flow both to determine whether an NPDES permit needs certain effluent limitations and to calculate the effluent limitations themselves. EPA practice is to use effluent flow as a reasonable and important worst-case condition in EPA's reasonable potential and WQBEL calculations to ensure compliance with WQSs under CWA § 301(b)(1)(C). Should the effluent flow exceed the flow assumed in these calculations, the in-stream dilution would be

reduced and the calculated effluent limitations might not be sufficiently protective (i.e., might not meet WQSs). Further, pollutants that do not have the reasonable potential to exceed WQSs at a lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. In order to ensure that the assumptions underlying EPA's reasonable potential analyses and permit effluent limitation derivations remain sound for the duration of the permit, EPA may ensure the validity of its "worst-case" effluent flow assumptions through imposition of permit conditions for effluent flow.[1] In this regard, the effluent flow limitation is a component of WQBELs because the WQBELs are premised on a maximum level flow. The effluent flow limit is also necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs.

The limitation on effluent flow is within EPA's authority to condition a permit to carry out the objectives and satisfy the requirements of the CWA. *See* CWA §§ 402(a)(2) and 301(b)(1)(C); 40 CFR §§ 122.4(a) and (d), 122.43 and 122.44(d). A condition on the discharge designed to ensure the validity of EPA's WQBELs and reasonable potential calculations that account for "worst case" conditions is encompassed by the references to "condition" and "limitations" in CWA §§402 and 301 and the implementing regulations, as WQBELs are designed to assure compliance with applicable water quality regulations, including antidegradation requirements. Regulating the quantity of pollutants in the discharge through a restriction on the quantity of effluent is also consistent with the CWA.

In addition, as provided in Part II.B.1 of this permit and 40 CFR § 122.41(e), the Permittee is required to properly operate and maintain all facilities and systems of treatment and control. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Consequently, the effluent flow limit is a permit condition that relates to the Permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 CFR §§ 122.41(d), (e).

2.6 Monitoring and Reporting Requirements

2.6.1 Monitoring Requirements

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

The monitoring requirements included in this permit have been established to yield data representative of the Facility's discharges in accordance with CWA §§ 308(a) and 402(a)(2), and consistent with 40 CFR §§ 122.41(j), 122.43(a), 122.44(i) and 122.48. The Draft Permit specifies

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

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

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

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

2.6.2 Reporting Requirements

The Draft Permit requires the Permittee to report monitoring results obtained during each calendar month to EPA and the State electronically using NetDMR. The Permittee must submit a

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

Discharge Monitoring Report (DMR) for each calendar month no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool enabling regulated CWA permittees to submit DMRs electronically via a secure internet application to EPA through the Environmental Information Exchange Network. NetDMR has eliminated the need for participants to mail in paper forms to EPA under 40 CFR §§ 122.41 and 403.12. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/. Further information about NetDMR can be found on the EPA NetDMR support portal webpage.[4]

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

2.7 Standard Conditions

The Standard Conditions, included as Part II of the Draft Permit, are based on applicable regulations found in the Code of Federal Regulations. *See generally* 40 CFR Part 122.

2.8 Anti-backsliding

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

All proposed limitations in the Draft Permit are at least as stringent as limitations included in the 2018 Permit unless specific conditions exist to justify relaxation in accordance with CWA § 402(o) or § 303(d)(4). Discussion of any less stringent limitations and corresponding exceptions to anti-backsliding provisions is provided in the sections that follow.

3.0 Description of Facility and Discharge

3.1 Location and Type of Facility

The Facility is located on a 175-acre tract of land on Columbia Point peninsula in Boston's Dorchester Bay. A location map is provided in Figure 1. The Facility is a public educational institute which uses a non-contact cooling water (NCCW) system to cool campus buildings. NCCW is water that is used to reduce temperature and that does not come into direct contact with any raw material, intermediate product, waste product (other than heat), or finished product. Seawater is withdrawn from a CWIS located adjacent to Savin Hill Cove in the southwest of the

[4] https://netdmr.zendesk.com/hc/en-us

peninsula. Heat exchangers located in the pump house use this seawater to cool the condenser loop after which the heated NCCW is discharged via a single outfall located on the east of the peninsula in Dorchester Bay. A site plan is provided in Figure 2.

3.2 Location and Type of Discharge

The Permittee has requested authorization to discharge NCCW from Outfall 001 into Dorchester Bay. Outfall 001 is located at Latitude 42° 18' 41" Longitude -71° 02' 08" on the western bank of Dorchester Bay. The Facility's NCCW system is comprised of three separate piping systems using seawater, condenser water, and cooling water to meet the campus's cooling needs.

The Facility takes in seawater through a cooling water intake structure (CWIS) in Savin Hill Cove where it is transferred to an adjacent pump house. A cross-sectional and plan view of the intake tunnel and pump house are provided in Figures 3 and 4, respectively. Variable frequency drives (VFDs) are installed on the cooling water intake pumps to control intake flow based on cooling needs and water levels in Savin Hill Cove. A closed-loop condensing water system transports heat from the chillers in the Utility Plant to the Pump House. Four plate-and-frame heat exchangers located in the pump house use seawater to cool the condenser loop. After the NCCW passes through the heat exchangers, it is discharged through a single 42-inch diameter pipe. The pipe runs perpendicular to the shoreline for approximately 1800 feet before discharging through Outfall 001 into Dorchester Bay to the east of the intake. A schematic of water flow is provided in Figure 5. The NCCW discharge pipe also serves as fish return passage for any organisms impinged or entrained in the Facility's CWIS.

A quantitative description of the discharge in terms of effluent parameters, based on monitoring data submitted by the Permittee, including Discharge Monitoring Reports (DMRs), from June 2015 through May 2020, is provided in Appendix A of this Fact Sheet.

4.0 Description of Receiving Water and Dilution

4.1 Receiving Water

The Facility discharges to Dorchester Bay through Outfall 001. Dorchester Bay (MA70-03) is classified as Class SB, CSO in the Massachusetts WQSs, 314 Code of Massachusetts Regulations (CMR) 4.06(7). Class SB waters are described in the Commonwealth of Massachusetts Water Quality Standards (314 CMR 4.05(4)(b)) as follows: *"designated as habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to seagrass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally restricted Shellfish Areas). These waters shall have consistently good aesthetic value."*

The receiving water in the vicinity of the Facility is a tidal estuarine waterbody that is subject to semi-diurnal flows with a mean tidal range of approximately 9.5 feet. The area in the vicinity of the intake and discharge consists of intertidal shoreline (mainly rip rap), intertidal to subtidal

flats, dredged channels, and subtidal substrate. The area provides suitable habitat for common shellfish species, including soft-shelled clam, blue mussel, periwinkle, razor clam, slipper shell, mud dog whelk, and hermit crab. According to the Massachusetts Division of Marine Fisheries, shellfishing is currently prohibited in the vicinity of the discharge (Growing Area GBH3: Neponset River and Dorchester Bay)[5].

Dorchester Bay is listed in the *Massachusetts Year 2016 Integrated List of Waters* ("303(d) List") as Category 5 "Waters Requiring a TMDL.[6] The causes of impairment listed are *Enterococcus*, fecal coliform, other, PCB in fish tissue, total suspended solids (TSS) and turbidity. In October 2018, a pathogen TMDL for Dorchester Bay and adjacent water bodies was finalized by MassDEP[7]. To date, no other TMDLs have been finalized. The status of each designated use is presented in Table 1.

Table 1: Summary of Designated Uses and Listing Status

Designated Use	Status
Aquatic Life	Support on Alert Status
Aesthetics	Not Assessed
Primary Contact Recreation	Impaired
Secondary Contact Recreation	Support
Fish Consumption	Impaired

According to the *Boston Harbor 2004-2008 Water Quality Assessment Report*,[8] this water body segment is impaired for primary contact recreation and fish consumption uses, while it is designated as support for aquatic life and secondary contact recreation uses. Aesthetics usage has not been assessed. The NCCW discharge as regulated by the Draft Permit is not expected to contribute to these impairments.

5.0 Proposed Effluent Limitations and Conditions

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

5.1 Effluent Limitations and Monitoring Requirements

[5] Massachusetts Division of Marine Fisheries. Designated Shellfish Growing Area Map GHB3: Neponset River and Dorchester Bay. Updated on January 15, 2020. Accessed on May 15, 2020. http://www.massmarinefisheries.net/shellfish/dsga/GBH3.pdf.
[6] *Massachusetts Year 2016 Integrated List of Waters*. MassDEP Division of Watershed Management Watershed Planning Program, Worcester, Massachusetts; December 2015.
[7] *Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds.* MassDEP Division of Watershed Management, Worcester, Massachusetts; October 2018.
[8] Boston Harbor 2004-2008 Water Quality Assessment Report. MassDEP Division of Watershed Management, Worcester, Massachusetts; August, 2010, Report Number: 07-AC-2.

The State and Federal regulations, data regarding discharge characteristics, and data regarding ambient characteristics described above, were used during the effluent limitations' development process. Discharge data is included in Appendix A.

5.1.1 Effluent Flow

The Facility's 2018 Permit limits the discharge to a monthly average flow rate of 17.2 MGD, a daily maximum flow rate of 18.4 MGD and an annual rolling average flow rate of 12.9 MGD. From June 2015 through May 2020, effluent flow has ranged from no flow – because the pump house was turned off – to 31.5 MGD (Appendix A). The annual rolling average flow rate has ranged from 4.9 MGD to 12.2 MGD, with a median annual rolling average value of 6.55 MGD. During the reporting period above, there were four daily maximum and one monthly average permit limit exceedances for flow, with no annual rolling average permit limit exceedances. In attachments to the data submissions for the exceedances, the Permittee indicated the following reasons for the increased flows: historically high air temperature during the month, increased cooling load due to the opening of a new residence hall, a lack of available condenser water led to increased water withdrawals, and potential flow meter miscalibration.

The Permittee met their flow limits during the majority of the permit term. In addition, these flow limitations are in place to ensure compliance with both thermal discharge limitations and CWIS BTA requirements. Therefore, the Draft Permit maintains all three flow limits as well as continuous monitoring with a flow meter.

5.1.2 pH

The hydrogen-ion concentration in an aqueous solution is represented by the pH using a logarithmic scale of 0 to 14 standard units (S.U.). Solutions with pH 7.0 S.U. are neutral, while those with pH less than 7.0 S.U. are acidic and those with pH greater than 7.0 S.U. are basic. Discharges with pH values markedly different from the receiving water pH can have a detrimental effect on the environment. Sudden pH changes can kill aquatic life. pH can also have an indirect effect on the toxicity of other pollutants in the water.

From June 2015 through May 2020, pH has ranged from 6.8 to 8.5 S.U. (Appendix A). The Draft Permit requires a pH range of 6.5 to 8.5 S.U., monitored weekly by grab samples when the Facility is discharging. The pH limitations are based on the State WQSs for Coastal and Marine Water, Class SB at 314 CMR 4.05(4)(b)3, which require that the pH of the receiving water be in the range of 6.5 to 8.5 S.U. These limitations are based on CWA § 301(b)(1)(C) and 40 CFR § 122.44(d).

5.1.3 Temperature

Section 502(6) of the Clean Water Act defines heat as a "pollutant." *See* 33 U.S.C. § 1362(6). Water temperature affects the metabolic and reproductive activities of aquatic organisms and can determine which fish and macroinvertebrate species can survive in a given water body. Certain cold-blooded species cannot regulate their body temperature through physiological means, so their body temperature reflects the temperature of the water they inhabit. Rapid increases or

decreases in ambient water temperature can directly affect aquatic life, particularly fish. Ambient water temperature can indirectly affect aquatic life by influencing water quality parameters such as dissolved oxygen, by which the solubility of oxygen decreases as water temperature increases.

In developing temperature limits for the discharge of NCCW from Outfall 001, EPA considered applicable water quality-based requirements, technology-based requirements, the variance-based limits in the 2018 Modified Permit, and the Permittee's request for a renewal of its previous variance-based limits.

Water-Quality Based Limits

The state waterbody classification for Dorchester Bay is Class SB. The WQSs at 314 CMR 4.05(4)(b)(2)(a) require that the instream water temperature, "shall not exceed 85°F (29.4°C) nor a maximum daily mean of 80°F (26.7°C), and the rise in temperature due to a discharge shall not exceed 1.5°F (0.8°C) during the summer months (July through September) nor 4°F (2.2°C) during the winter months (October through June)." In addition, state WQSs permit alternative effluent limitations established in connection with a CWA 316(a) variance, *see* 314 CMR 4.05(4)(b)(2)(c). The 2018 Permit included WQBELs for daily mean and instantaneous maximum temperature of 80°F and 85°F, respectively.

At the Facility, temperature is continuously monitored at the intake and discharge by sensors installed during Spring 2010. From June 2015 through May 2020, the maximum daily mean effluent temperature for a given month ranged from 29°F to 69°F and the instantaneous maximum effluent temperature for a given month ranged from 42.9°F to 82.9°F. Neither temperature metric exceeded the applicable state WQSs. The Draft Permit maintains the water quality-based mean daily and instantaneous maximum monthly effluent temperature limits of 80°F and 85°F, respectively.

CWA Section 316(a) Variance

According to CWA Section 316(a), as codified at 40 CFR 125 Subpart H, thermal discharge effluent limitations in permits may be less stringent than those required by applicable standards and limitations if the discharger demonstrates that such effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife (BIP) in and on the water body receiving the thermal discharge. This demonstration must show that the requested alternative effluent limitation, considering the cumulative impact of its thermal discharge together with all other significant impacts on the species affected, will assure the protection and propagation of the BIP in and on the body of water into which the discharge is made.

The 2018 Permit granted the Facility a variance from the WQS for rise in temperature at the discharge point under Section 316(a) of the CWA. As explained above, WQSs at 314 CMR 4.05(4)(b)(2)(a) require that "the rise in temperature due to a discharge shall not exceed 1.5°F (0.8°C) during the summer months (July through September) nor 4°F (2.2°C) during the winter months (October through June)." The variance allowed for rises in temperature in the receiving

water of up to 10-12°F, dependent on tides. From June 2015 through May 2020, the rise in temperature at the discharge point was greater than 10°F during four different months. In the Facility's 2018 permit renewal application, the Permittee requested a renewal of the variance. In support of the variance request, the Permittee resubmitted their 2011 Cornell Mixing Zone Expert System (CORMIX) modeling results showing the predicted extent of the thermal plume associated with their discharge. A summary of those results and EPA's assessment of the thermal discharge given Facility information and historical temperature data are discussed below.

Massachusetts WQSs at 314 CMR 4.03(2) allow for mixing zones in which a limited area or volume of a waterbody may fail to meet specific water quality criteria under certain conditions. During previous permit development in 2011, in support of the Permittee's variance request, the Permittee performed a mixing zone study to demonstrate where the change in temperature at the boundaries of the thermal plume (i.e., mixing zone) would be equal to 1.5°F while inside the plume the effluent temperature differential would remain below a given level dependent on tides (12°F for high tide, 11°F for mid-tide, and 10°F for low tide). The Permittee used CORMIX to estimate the size of the thermal plume at the estimated temperature differential under worst-case conditions (maximum tide-variable pump rate) and average case conditions (average tide-variable pump rate) (see Table 2). The model predicts that the thermal discharge at a maximum temperature differential (difference between effluent and influent temperature) will exceed the criteria for rise in temperature during summer months over a limited area.

Table 2: Predicted size of the thermal plume at the point where the temperature is equal to a rise in temperature of 1.5°F and the near-field region (NFR) under worst-case and average pump rates.

Tide	Pump Rate (gpm)	Change in Temp (°F)	Plume Length when Temperature = 1.5°F (ft)	Plume Half-width when Temperature = 1.5°F (ft)	NFR Length (ft)	NFR Half-width (ft)
Worst-case Conditions						
High	19,756	12	50.0	6.3	57.3	7.4
Mid	15,696	11	363.8	22.9	1217.3	40.0
Low	11,547	10	868.8	76.6	670.3	20.1
Average-case Conditions						
High	8,162	6.5	31.5*	7.1*	301.2	6.8
Mid	8,162	6.7	116.7	8.2	416.4	14.6
Low	7,621	7.1	306.0	10.8	370.0	11.9

*The discharge flow will experience instabilities with full vertical mixing in the near-field region. Plume dimensions when the temperature meets water quality standards cannot be accurately predicted.

At high and mid-tide, the predicted plume is expected to meet the 1.5°F rise in temperature within the near-field region of the outfall at both worst- and average-case conditions (Table 2). As defined by CORMIX, the near-field region is a zone in the receiving water with strong initial mixing dominated by the initial jet characteristics of momentum flux, buoyancy flux, and outfall geometry. In this CORMIX simulation, the worst-case pump rates (19,756 gpm and 15,656 gpm at high- and mid-tide, respectively) are higher than the maximum daily pump rates allowed in the

Draft Permit (12,778 gpm). Therefore, under permitted operating conditions, i.e., discharges less than or equal to the flow limitations, the size of thermal plumes should be smaller than those predicted by the worst-case simulations.

At low-tide, the predicted plume will meet the 1.5°F rise in temperature within the near-field region of the outfall under average-case conditions but not worst-case conditions (Table 2). The worst-case plume dimensions at low tide, at a maximum pumping rate and delta temperature (11,547 gpm and 10°F), are estimated at 868.8 ft in length and 153 ft in width. The outfall discharges into open water at the end of the peninsula at Columbia Point (Fig. 2). The relatively small plume from the Facility is not expected to impair fish movement in the stretch of water between Columbia Point and the nearest landmasses Squantum Point and Thompson Island since the distance to these landmasses is 25,000 feet and the plume dimensions are orders of magnitude smaller. Based on the modeling results, the Permittee has demonstrated that during high, mid-, and low tide the thermal plume from the Facility is limited in size and will not impede fish movement or interfere with the designated or existing uses of Dorchester Bay.

At low slack spring tide (the time of the greatest range between high and low tide), the mudflats in front of the discharge southeast of Columbia Point become exposed, leaving a narrow, shallow channel (75 ft wide by 2 ft deep) between the exposed flats and the shoreline. According to the CORMIX simulation, the thermal plume contacts the mudflats before the WQS of a 1.5°F rise in temperature is met. The temperature in the shallow channel is likely to exceed the WQS over the limited slack tide period (approximately 30 minutes). The low slack spring tide scenario likely represents the worst-case condition for the thermal plume. However, the duration of slack tide is short, the spatial extent of the plume is limited to the channel, and the spring tide occurs only twice per lunar cycle (following the new and full moons). Given that the worst-case spring tide conditions are infrequent and last only a short period, the resulting thermal plume is not likely to interfere with the designated or existing uses of Dorchester Bay.

As part of the 2018 Permit, the Permittee measured effluent and influent temperature. While not directly comparable to modeling results, these data do provide information on the magnitude of temperature increases and compliance with 2018 Permit limitations. From June 2015 through May 2020, mean daily and instantaneous maximum effluent temperature never exceeded the permit limitations of 80°F and 85°F, respectively. Over this time period, the maximum mean daily temperature of the discharge was 69°F in August 2016 and the maximum instantaneous temperature was 82.9°F in July 2016. The temperature differential between the effluent and influent was as high as 13.3°F, with four separate months in 2016 having temperature increases greater than 10°F. No other month saw a daily temperature differential above 10°F. It is unclear from the Permittee's DMRs what the tidal stage was when the temperature differential rose above 10°F.

In assessing thermal impacts related to the effluent, EPA also considered the ecological conditions at the point of discharge. The habitat at the outfall is intertidal to shallow subtidal mud and sand/shell flats that can be exposed during low tide. The organisms that reside there, including shellfish, polychaete worms, and crustaceans, must be able to withstand periodic exposure to thermal extremes (e.g. when mudflats are exposed or at very shallow water depths).

As a result, the resident organisms at the location of the outfall are likely to survive moderate temperature increases (10°F to 12°F) where the instantaneous maximum and daily average temperatures remain protective (85°F and 80°F, respectively). EPA is satisfied that the temperature limits in the Draft Permit will protect the BIP because the instantaneous maximum and mean daily temperatures must meet WQSs, which will avoid chronic exposure to high temperatures, resident invertebrate species are biologically capable of withstanding temperature extremes, and the rise in temperature will result in thermal plumes that are sufficiently small to allow fish species to avoid exposure.

EPA maintains that the thermal plumes under a range of tides and operating conditions are unlikely to interfere with the migration or movement of aquatic life or create nuisance conditions or otherwise interfere with the designated or existing uses of Dorchester Bay. Therefore, EPA carries forward the thermal variance for rise in temperature at the point of discharge from Outfall 001. The Draft Permit limits the rise in temperature to 10°F at low tide, 11°F at mid tide, and 12°F at high tide and requires reporting rise in temperature separately for each tidal stage in the discharge monitoring reports. The relatively small thermal plumes (compared to the size of Dorchester Bay) ensure that fish are able to escape thermal impacts from the heated effluent. In addition, immobile invertebrates exposed to the plume during the limited slack tide period are likely to have high thermal tolerance or otherwise be able to adapt to periodic temperature extremes (e.g., by burrowing), given that the mudflats in the discharge area are generally shallow or exposed during low tides. EPA concludes that the rise in temperature limits in the Draft Permit will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the waterbody receiving the thermal discharge.

Technology-Based Limits

EPA has not promulgated technology-based National Effluent Guidelines for the discharge of NCCW from colleges or universities at this time. In the absence of applicable ELGs, the permit writer is authorized under Section 402(a)(1)(B) of the CWA and 40 CFR 125.3 to establish technology-based temperature limits by applying the BAT standard on a case-by-case, BPJ basis in consideration of (i) the appropriate technology for the category or class of point sources of which the applicant is a member, based upon all available information; and (ii) any unique factors relating to the applicant (see 40 CFR 125.3(c)(2)). In this case, replacing the existing seawater cooling system in its entirety with a closed-cycle cooling system would eliminate the discharge of NCCW (because the closed-cycle system would operate using freshwater) and, therefore, any potential thermal impacts. However, EPA has concluded, based on CORMIX analysis provided by the Permittee and considering the aquatic community present at the discharge location, that the discharge of NCCW at the permitted limits will meet water quality standards (for maximum and mean daily temperature) or assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in Dorchester Bay (for rise in temperature). The temperature limits in the Draft Permit are based on a variance from technology-based temperature limits because the installation and operation of a full scale closed-cycle cooling system at the Facility would be more stringent than necessary for the protection of aquatic life.

5.2 Cooling Water Intake Structure, CWA Section 316(b)

Section 316(b) of the CWA addresses the adverse environmental impact of cooling water intake structures (CWIS) at facilities requiring NPDES permits. The principal adverse environmental impacts typically associated with CWISs evaluated by EPA are the entrainment of fish eggs, larvae, and other small forms of aquatic life through the plant's cooling system, and the impingement of fish and other larger forms of aquatic life on the intake screens (See 79 FR 48303).

Entrainment of organisms occurs when a facility withdraws water into the CWIS from an adjacent water body. Fish eggs, larvae, and other planktonic organisms in the water are typically small enough to pass through intake screens and become entrained along with the cooling water within the facility (See 76 FR 22197). As a result, the organisms are subjected to death or damage due to high velocity and pressure, increased temperature, and chemical anti-biofouling agents (See 79 FR 48318). The number of organisms entrained is dependent upon the volume and velocity of cooling water flow through the plant and the concentration of organisms in the source water body that are small enough to pass through the CWIS screens (See 79 FR 48321 n. 37). The extent of entrainment can be affected by the intake structure's location, the biological community in the water body, the characteristics of any intake screening system or other entrainment reduction equipment used by the facility, and by season.

Impingement of organisms occurs when a facility draws water through its CWIS and organisms too large to pass through the screens are unable to swim away and become trapped against the screens and other parts of the intake structure. Impinged organisms may be killed, injured or weakened, depending on the nature and capacity of the plant's filter screen configuration, cleaning and backwashing operations, and fish return system used to return organisms back to the source water. In some cases, contact with screens or other equipment can cause an organism to lose its protective slime and/or scales, or suffer other injuries, which may result in delayed mortality (See 66 FR 65263). The quantity of organisms impinged is a function of the intake structure's location and depth, the velocity of water drawn to the entrance of the intake structure (approach velocity) and through the screens (through-screen velocity), the seasonal abundance of various species of fish, and the size of various fish relative to the size of the mesh in any intake barrier system (e.g., screens).

Entrainment and impingement can kill large numbers of aquatic organisms, which can have immediate and direct effects on the population size and age distribution of the affected species. In some cases, losses of fish from impingement and entrainment may contribute to diminished populations of local species of commercial and/or recreational importance, biologically important local forage species, and local threatened or endangered species (See 79 Fed. Reg. at 48318-21). In effect, CWISs can degrade the quality of aquatic habitat by adding to the ecosystem a significant anthropogenic source of mortality to resident organisms. The resulting losses of particular species could alter a wide range of aquatic ecosystem functions and services at the community level, including disrupting predator-prey relationships, ecological niches, and food webs. Mortality from long-term impingement and entrainment could lead to reductions in local community biodiversity, decrease ecosystem resistance and resilience (i.e., the ability to resist and recover from disturbance, both from anthropogenic impacts and natural variability),

and contribute to overall degradation of the aquatic environment. In addition to considering these adverse impacts directly, their effects as cumulative impacts or stressors in conjunction with other existing stressors on the species are also considered.

5.2.1 Technology-based Requirements

During the issuance or reissuance of a NPDES permit, EPA is required to evaluate or re-evaluate compliance with applicable standards, including the technology standard specified in Section 316(b) of the CWA for cooling water intake structures. Section 316(b) requires that:

> [a]ny standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

33 U.S.C. § 1326(b). The operation of CWISs can cause or contribute to a variety of adverse environmental effects, such as killing or injuring fish larvae and eggs entrained in the water withdrawn from a water body and sent through a facility's cooling system, or by killing or injuring fish and other organisms by impinging them against the intake structure's screens. The effects of impingement and entrainment are referred to as adverse environmental impacts (See 79 FR 48303). CWA § 316(b) applies if a point source discharger seeks to withdraw cooling water from a water of the United States through a CWIS.

On August 15, 2014, EPA published *National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities; Final Rule* (Final Rule)[9]. For existing facilities, the Final Rule codified BTA requirements to reduce impingement and entrainment of fish and other aquatic organisms at CWISs at existing facilities with a design intake flow (DIF) greater than 2 MGD and use at least 25 percent of the water withdrawn exclusively for cooling purposes. 40 CFR § 125.91. The 2014 Final Rule established BTA standards for impingement mortality (40 CFR § 125.94(c)) and site-specific entrainment requirements (40 CFR § 124.94(d)). The Final Rule, which became effective on October 14, 2014, applies to this permit because the Facility withdraws more than 2 MGD from waters of the United States and uses at least 25 percent of that withdrawal exclusively for cooling purposes.

With regard to controlling impingement mortality, the standard in the 2014 Final Rule is based on modified traveling screens with fish returns, but the Rule provides for a number of other compliance alternatives that are equivalent or better in performance than this standard, including measures or technologies that reduce the through-screen intake velocity to a maximum of 0.5 feet per second (fps). 40 CFR § 125.92(s) (definition); 40 CFR § 125.94(c)(1), (2), (3), (5); 79 Fed. Reg. at 48,329. However, rather than specify a single technology or standard, the Final Rule requires a facility to choose from a number of alternatives for complying with the BTA standard

[9] EPA. *National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities; Final Rule*. August 15, 2014. F.R. Vol 79 No. 158.

for impingement mortality. Three of the compliance pathways are based on pre-approved technologies: a closed-cycle recirculating system (See 40 CFR § 125.94(c)(1)), a CWIS with a design maximum through-screen intake velocity of 0.5 feet per second (fps) (§ 125.94(c)(2)), and an existing offshore velocity cap (§ 125.94(c)(4)). Three compliance pathways offer a streamlined approach to compliance which require the permittee to demonstrate that the technology (or combination of technologies) represents BTA performance under the conditions at the facility: a CWIS with an actual maximum through-screen intake velocity of 0.5 fps (§ 125.94(c)(3)), modified traveling screens (§ 125.94(c)(5)), and a system or combination of technologies whose demonstrated performance is the BTA for impingement reduction at the site (§ 125.94(c)(6)). The seventh alternative allows a facility to demonstrate compliance with the numeric impingement mortality performance standard through biological monitoring (§ 125.94(c)(7)). The regulations also have a number of additional provisions that pertain to specific issues concerning impingement, such as fragile species, de minimis effects and more (§§ 125.94(c)(9), (10), (11) and (12)). Consequently, a permittee may choose to comply with the BTA standard for impingement mortality by employing a properly designed, built, and operated modified traveling screen as defined at § 125.92(s) or one of six alternative methods of compliance.

For entrainment, EPA did not identify any single technology or group of technology controls as available and feasible for establishing national performance standards for entrainment. Instead, 40 CFR § 125.94(d) stipulates that BTA standards for minimizing entrainment at existing facilities are determined by EPA for each intake on a site-specific basis and must reflect the maximum reduction in entrainment warranted considering the relevant factors at 40 CFR § 125.98(f)(2), including:

(i) Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base);
(ii) Impact of changes in particulate emissions or other pollutants associated with entrainment technologies;
(iii) Land availability inasmuch as it relates to the feasibility of entrainment technology;
(iv) Remaining useful plant life; and
(v) Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

The Final Rule also establishes factors that may be considered when establishing site-specific entrainment requirements, including: entrainment impacts of the waterbody, thermal discharge impacts, credit for flow reductions associated with unit retirements, impacts of controls on reliability of energy delivery, impacts on water consumption, and availability of alternative sources of water. Id. § 125.98(f)(3). EPA must justify the rejection of any entrainment control technologies or measures that perform better than the selected technologies or measures.

5.2.2 State Water Quality Standards

In addition to satisfying technology-based requirements, NPDES permit limits for CWISs must also satisfy any more stringent provisions of State WQSs or other state legal requirements that may apply, as well as any applicable conditions of a state certification under CWA § 401. See CWA §§ 301(b)(1)(C), 401(a)(1), 401(d), 510; 40 C.F.R. §§ 122.4(d), 122.44(d). See also 40 CFR § 125.84(e). This means that permit conditions for CWISs must satisfy numeric and narrative water quality criteria and protect designated uses that may apply from the state's WQSs.

The CWA authorizes states to devise WQSs on the effects of CWISs and to impose more stringent water pollution control standards than those dictated by federal technology standards.[10] The United States Supreme Court has held that once the CWA § 401 state certification process has been triggered by the existence of a discharge, then the certification may impose conditions and limitations on the activity as a whole, not merely on the discharge, to the extent that such conditions are needed to ensure compliance with State WQSs or other applicable requirements of state law.[11]

With respect to cooling water withdrawals, both sections 301(b)(1)(C) and 401 grants EPA the authority to ensure that such withdrawals are consistent with state WQSs, because the permit must assure that the overall "activity" associated with a discharge will not violate applicable WQSs. *See PUD No. 1*, 511 U.S. at 711-12 (Section 401 certification); *Riverkeeper I*, 358 F.3d at 200- 202; *In re Dominion Energy Brayton Point, LLC*, 12 E.A.D. 490, 619-41 (EAB 2006). Therefore, in EPA-issued NPDES permits, limits addressing CWISs must satisfy: (1) the BTA standard of CWA § 316(b); (2) applicable state water quality requirements; and (3) any applicable conditions of a state certification under CWA § 401. The standards that are most stringent ultimately determine the Final Permit limits.

Massachusetts interprets its WQSs as being applicable to cooling water withdrawals. Though the standard for Class SB waters, such as Dorchester Bay, does not include any specific numeric criteria that apply to cooling water intakes, it is nevertheless clear that MassDEP must impose the conditions it concludes are necessary to protect the designated uses of the channel, including that it provide good quality habitat for fish and other aquatic life and be a recreational fishing resource. See 314 CMR 4.05(4)(b). In addition, 314 CMR 4.05(1) of the Massachusetts WQSs

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[10] The regulation governing the development of WQSs notes that "[a]s recognized by section 510 of the Clean Water Act, States may develop water qualtiy standards more stringent than required by this regulation." 40 § CFR 131.4(a). The Supreme Court has cited this regulation in support of the view that states could adopt water quality requirements more stringent than federal requirements. *PUD No. 1 of Jefferson County v. Wash. Dep't of Ecology*, 511 U.S. 700, 705 (1994). *See also* 33 U.S.C. § 1370; 40 C.F.R. § 125.80(d). *See also* 40 C.F.R. § 125.80(d); *Riverkeeper, Inc. v. U.S. Environmental Protection Agency*, 358 F.3d 174, 200-201 (2d Cir. 2004) ("*Riverkeeper I*").

[11] *PUD No. 1*, 511 U.S. at 711-12. holds that "in setting discharge conditions to achieve WQS, a state can and should take account of the effects of other aspects of the activity that may affect the discharge conditions that will be needed to attain WQS. The text [of CWA § 401d)] refers to the compliance of the applicant, not the discharge. Section 401(d) thus allows the State to impose "other limitations" on the project in general to assure compliance with various provisions of the Clean Water Act and with "any other appropriate requirement of State law." For example, a state could impose certification conditions related to CWISs on a permit for a facility with a discharge, if those conditions were necessary to assure compliance with a requirement of state law, such as to protect a designated use under state WQS. See id. at 713 (holding that § 401 certification may impose conditions necessary to comply with designated uses).

provides that each water classification "is identified by the most sensitive, and therefore governing, water uses to be achieved and protected." This means that where a classification lists several uses, permit requirements must be sufficient to protect the most sensitive use. Finally, 314 CMR 4.05(4)(b)(2)(d) for Class SB waters states "in the case of a cooling water intake structure (CWIS) regulated by EPA under 33 USC § 1251 (FWPCA, §316(b)), the Department has the authority under 33 USC § 1251 (FWPCA, §401), M.G.L. c. 21, §§ 26 through 53 and 314 CMR 3.00 to condition the CWIS to assure compliance of the withdrawal activity with 314 CMR 4.00, including, but not limited to, compliance with narrative and numerical criteria and protection of existing and designated uses."

In summary, the Massachusetts WQSs apply to CWISs and the Draft Permit requirements must be sufficient to ensure that the Facility's CWIS neither causes nor contributes to violations of the WQSs and satisfy the terms of the state's water quality certification under § CWA 401. EPA anticipates that MassDEP will provide such certification before the issuance of the Final Permit.

5.2.3 Current Technology and Permit Requirements

The CWIS is located at Latitude 42º 18' 44", Longitude -71º 02' 78" and is composed of an intake tunnel, baffle wall, and trash rack leading to a traveling screen and the cooling water pump house. A cross-sectional and plan view of the intake tunnel and pump house are provided in Figure 3 and 4, respectively. The intake tunnel extends perpendicularly from Columbia Point Peninsula into Savin Hill Cove and is fully submerged even under lower low tide. A baffle wall, half the height of the intake tunnel, acts to partially exclude sediment, debris and benthic organisms from entering. Behind the baffle wall, a trash rack extends across the entire vertical surface area of the intake tunnel. Further along the intake tunnel, at the entrance to the pump house, is a traveling water screen that is rotated and inspected daily, with any fish or debris impinged on the screen removed by a high-pressure spray wash. Fish impinged on the traveling water screen are moved to the NCCW discharge pipe that travels approximately 1800-feet underground before discharging to Dorchester Bay through Outfall 001. The intake pumps are located at the back of the pumphouse. There are four pumps with VFDs installed, three with pump capacities of 10.8 MGD and one with a capacity of 5.4 MGD, for a combined maximum flow rate capacity of 37.8 MGD. The pumps are programmed to operate at a through-screen velocity less than 0.5 feet per second under all hydrologic conditions; in order to maintain that limit, flow must be restricted to less than 13.0 MGD at mean lower-low water and less than 18.4 MGD at mean higher-high water. EPA calculates that at mean lower-low water the through-screen velocity could be as high as 1.45 feet per second if not regulated as designed, while at mean higher-high water it could be as high as 1.03 feet per second.

The 2013 Permit was issued prior to the Final Rule; therefore, EPA made a determination on the BTA to meet the requirements of CWA § 316(b) using BPJ on a site-specific basis. The BPJ determination used the general procedure for setting effluent limitations on a site-specific BPJ basis by considering the following factors: (1) age of the equipment and facilities involved, (2) the process employed, (3) the engineering aspects of applying various control techniques, (4) process changes, (5) cost, and (6) non-water quality environmental impacts (including energy issues). *See e.g.*, 33 U.S.C. §§ 1311(b)(2)(A) and 1314(b)(2); 40 CFR § 125.3(d)(3). Ultimately, the BPJ determination was based on the "objectives of the Act and § 316(b)," mainly the

minimization of environmental impacts from CWISs, restoring and maintaining the physical and biological integrity of the Nation's waters, achieving, wherever attainable, water quality providing for the protection and propagation of fish, shellfish and wildlife, and providing for recreation, in and on the water. *See* 33 U.S.C. §§ 1251(a)(1) and (2), 1326(b).

The 2013 Permit's determination on BTA to minimize adverse environmental impacts from impingement of aquatic organisms and entrainment of eggs and larvae stipulated the following requirements: (1) installation of variable frequency drives to limit AIF and keep the maximum through-screen velocity below 0.5 feet per second; (2) rotation of the traveling screen at the maximum rotation frequency recommended by the manufacturer; (3) installation and operation of a new fish return trough to transport impinged aquatic organisms to Dorchester Bay in a separate trough from the NCCW discharge pipe; and (4) evaluation of the feasibility of operating the Facility's supplemental cooling tower year round. See the 2013 Permit for the detailed BTA requirements.

The 2013 Permit established a compliance schedule, allowing the Permittee to conduct two years of impingement monitoring to study the feasibility of installing a new fish return trough that would meet all of the requirements of Part I.D.1.c of the permit, and to assess the impact of alternative fish return trough designs. After completion of the study and biological monitoring, the Permittee was required to either provide a proposed design and schedule for construction of a new fish return trough or request modification of the permit condition and explain why it is not feasible to construct and operate a fish return trough in compliance with Part I.D.1.c of the permit. On July 31, 2017, the Permittee submitted its report on the feasibility and impact of a new fish return trough as well as a request for modification of the 2013 Permit. EPA concluded from the new data that the existing fish return trough provided sufficient protection of impinged fish transported fish back to Dorchester Bay. The 2013 Permit was subsequently modified in 2018, removing the condition to install a new fish return trough. A full review of the report can be found in the Statement of Basis to the 2018 Modified Permit.

In 2015, the Facility began operation of a supplementary cooling tower located on top of the campus's newly built Integrated Sciences Complex (ISC). According to the Permittee, the supplementary cooling tower has allowed the Facility to reduce cooling water intake withdrawals from the Savin Hill Cove seawater NCCW system during peak demand periods. In 2018, the Permittee provided EPA with a report on the optimal use of the two cooling water systems to reduce energy and water use as well as carbon dioxide emissions. The report explored multiple scenarios representing different use-combinations of the supplementary cooling tower and seawater NCCW system. The study was limited by the fact that the seawater NCCW system was not running at its "optimal design efficiency." Unbeknownst to the Permittee until the study was conducted, the seawater NCCW system's temperature differential had dropped to 4.8ºF, when it was designed to operate at 10ºF (operating at the higher differential requires less pumping energy).

From their analysis, the Permittee concluded that supplying cooling needs primarily from a more efficient seawater NCCW system and supplemented by the ISC cooling tower is the most environmentally beneficial option available. Their conclusion is supported by the facts that when running at the intended temperature differential the seawater system uses over 30% less energy

per cooling ton than it was running at; and that the ISC system requires a significant supply of freshwater, ~35 million gallons, when running at full capacity. While EPA finds that the available data is limited in drawing any firm conclusions on the optimal use of the two systems to reduce resource demand and emissions, EPA concurs that the use of the ISC system in conjunction with the seawater system will reduce resource demands relative to not using the supplementary cooling tower at all.

5.2.4 Impingement and Entrainment at the Facility

Impingement monitoring was conducted between May 2015 and April 2018 at the Facility's CWIS. The traveling screen where fish are impinged was retrofitted with a diversion sampler to collect impinged fish during sampling periods. Sampling was conducted three times per week during one of the three daily 15-minute screen wash and rotation events, representing different stages of the diurnal tidal cycle. Once inside the collection tank, fish were identified as either alive, injured or dead. Collection tank water was at the same elevated temperature as the discharged NCCW to Dorchester Bay. Species identification and counts were conducted along with calculations of impingement rates based on flow through the CWIS for a given time period.

A summary of impinged species sampling data is provided in Table 3. In total, 21 species of fish were impinged at the Facility's CWIS during monitoring events. The dominant impinged species were Winter Flounder (*Pseudopleuronectes americanus*), followed by Grubby (*Myoxocephalus aenaeus*) and Striped Killifish (*Fundulus majalis*). Winter Flounder made up 45-88% of all impinged individuals during the three separate sampling seasons, while Grubby comprised as much as 23% of all species in the last year of impingement sampling. No federal- or state-listed endangered species were impinged. During the three years of the impingement study, 7,794 total impinged individuals were observed. Monthly impingement rates (the number of individuals impinged per million gallons (MG) of intake water) were 1.65 fish/MG in 2015-2016, 0.41 fish/MG in 2016-2017, and 1.32 fish/MG in 2017-2018. The initial survival rate (the survival rate at the time of collection) was 91% for all impinged individuals, while the 96-hour survival rate (which excludes fish that were initially dead) was 86% for the 3-year sample period. In addition, 2,428 impinged invertebrates were observed during sampling events, excluding green crabs.[12]

Table 3: 2015-2017 Impinged Species Sampling Summary

	2015	**2016**	**2017**
Total Number of Impinged Species	15	10	10
Dominant Impinged Fish Species (% of Total) [# of Fish]	Winter Flounder (79%) [4,244]	Winter Flounder (88%) [1,305]	Winter Flounder (45%) [387]

[12] Green crabs are an invasive species with demonstrated adverse ecological and economic impacts in Massachusetts estuaries. Although the green crab is not one of the excluded species in the definition of "all life stages of fish and shellfish" in the Final Rule, the permitting authority can exclude other nuisance species from the definition. *See* 40 C.F.R. § 125.92(b). For the Draft Permit, EPA does not consider the loss of green crabs an adverse environmental impact and has excluded green crab from the estimates of impingement.

2nd Most Impinged Fish Species (% of Total) [# of Fish]	Grubby (12%) [601]	Grubby (3%) [45]	Grubby (23%) [200]
Monthly Impingement Rates in Fish per million gallons (MG)	1.65 fish/MG	0.41 fish/MG	1.32 fish/MG
Dominant Impinged Invertebrate Species {Number impinged out of total impinged invertebrates}	Spider Crabs {276 of 325}	Spider Crabs {530 of 699}	Sand Shrimp {1,028 of 1,404}

In addition to impingement sampling, the Permittee conducted three entrainment sampling studies as part of the 2013 Permit. The 2013 Permit required sampling from February 15th through July 31st and the Permittee conducted their studies from May to October in 2015, from February to July in 2016, and from May to July in 2017. The 2015 and 2017 sampling events were delayed to May due to maintenance of the intake screen; during those time periods the pump was turned off. The inconsistency in sampling time periods makes data less readily comparable for certain species, like Winter Flounder, which spawn in late winter/early spring; delayed sampling in 2015 and 2017 may have underrepresented these species relative to 2016. At minimum, EPA compared entrainment data from the three months sampling occurred during the three-year period: May, June, and July.

Entrainment sampling was conducted in conjunction with impingement sampling during the same three weekly timeslots. Sampling could not be conducted at the outfall due to the volume and turbulence at the discharge point and the fact that the discharge pipe remains submerged at most tidal stages. Instead, water was withdrawn directly from the CWIS at the pump house, prior to traveling through the campus's NCCW system. Samples were filtered by a 0.333-mm or 0.202-mm mesh plankton net at volumes of approximately 100 m^3, collected over a 2-hour window. The contents of the net were transferred to a sampling jar and preserved with 10% formalin before being sent to a laboratory for biological identification. Entrained individuals were counted and grouped by life stages and species (or broader taxa when consistent identification during early life stages was unachievable). From the data the Permittee calculated daily entrainment estimates and performed an adult equivalent analysis based on actual and permitted intake flow. Adult equivalent analysis is a method for expressing entrainment (or impingement) losses as an equivalent number of individuals at one life stage.[13] A summary of entrained species sampling data is provided in Table 4.

[13] Goodyear, C. P. 1978. Entrainment impact estimates using the equivalent adult approach. United States Fish and Wildlife Service, FWS/OBS-78/65, Ann Arbor, MI.

Table 4: 2015-2018 Entrainment Monitoring Summary

	2015	2016	2017
Total Fish Eggs Entrained	3.51 million	14.94 million	4.26 million
Total Fish Larvae Entrained	2.94 million	1.64 million	1.92 million
Numerically Dominant Species of Fish Eggs Entrained (Number of Equivalent Adults, based on Actual Flow)	Cunner (86); Fourbeard Rockling (62)	Cunner (19,527)	Cunner (65); Fourbeard Rockling (63)
Numerically Dominant Species of Fish Larvae Entrained (Number of Equivalent Adults, based on Actual Flow)	Northern Pipefish (13,280); Winter Flounder (2,272); Rainbow Smelt (1,164)	Northern Pipefish (7,697); Grubby (2,134); Rainbow Smelt (887)	Northern Pipefish (11,310); Rainbow Smelt (1,132); Winter Flounder (686); Silversides (475)
Equivalent Adults from Entrained Fish Eggs, Larvae and Juveniles (actual flow)	21,351	31,746	13,913
Equivalent Adults from Entrained Fish Eggs, Larvae and Juveniles (permitted flow)	29,049	51,985	19,852

Over the three-year sampling period, 34 different taxa of fish eggs, larvae, and juveniles were identified. None of the fish entrained at the Facility are federally listed as threatened or endangered. The group Tautog-Cunner-Yellowtail Flounder (the labridae-Limanda group) comprised the majority of eggs entrained during all three sampling years. This group comprised 84% of the entrained eggs in 2015, 94% in 2016 and 85% in 2017. Other numerically dominant groups over the three monitoring periods included the Rockling-Hake-Butterfish group and Windowpane. Entrainment of larval fish was more evenly distributed with the numerically dominant species spread across Winter Flounder, Silversides, Grubby, Northern Pipefish and Rainbow Smelt. Summer months where Facility intake is greatest corresponded to increased numbers of entrained larvae. The Permittee posited that some of the variance in abundance between the different entrained species and groups can be explained by the timing and duration of sampling periods, e.g., the final sampling season was the shortest and took place mostly during the summer.

The effectiveness of Facility technology at minimizing the adverse environmental impacts associated with impingement and entrainment is discussed further below.

5.2.5 BTA for Impingement

The Permittee has demonstrated the ability to meet BTA standards for impingement using technology and practices currently employed at (and permitted for) the Facility. For impingement, the Draft Permit maintains the requirement to operate the traveling screens at a maximum through-screen velocity of 0.5 fps, originally established in the 2013 Permit based on BPJ in the absence of national categorical standards. The requirement to operate the screens at a

maximum through-screen velocity of 0.5 fps is also in compliance with the current BTA standard at 40 CFR § 125.94(c)(3) (0.5 Feet Per Second Through-Screen Actual Velocity). The installation in 2014 of VFDs has allowed the Facility to adjust pump speeds based on campus cooling needs and water levels in Savin Hill Cove.

In order to demonstrate compliance with this BTA standard for impingement, the Permittee is required to report the maximum daily through screen velocity in feet per second (measured perpendicular to the screen mesh) every month. This maximum velocity must be achieved under all tidal conditions and during periods of maximum head loss across the traveling screen, except for brief periods in order to maintain the integrity of the CWIS, e.g., during periods of backwashing the screen face. In addition, the Draft Permit maintains the 2018 Permit requirement to visually inspect the travelling screen daily, as well as the requirement to report any unusual impingement events. These requirements are based on the monitoring requirements for impingement mortality found at 40 CFR §§ 125.96(a) and (e) and their inclusion is supported by the finding that anywhere from 0.41 to 1.64 fish are impinged per million gallons of water withdrawn.

5.2.6 BTA for Entrainment

The 2013 Permit established BTA standards using BPJ in the absence of national categorical standards. Those standards include the operation of VFDs to restrict water withdrawals below pump design capacity, a through-screen velocity of less than 0.5 fps, and biological monitoring. Current regulations for entrainment allow EPA to establish BTA standards on a site-specific basis, *see* 40 CFR § 125.98(f). In developing the Draft Permit, EPA reassessed the BTA standards established previously and options for alternative technologies that could reduce entrainment at the Facility, following the guidance found at 40 CFR § 125.98(f)(2). Alternative technologies considered were closed-cycle cooling (CCC) and wedgewire screens. CCC is one of the most effective means of reducing entrainment because it dramatically reduces the volume of cooling water required. Wedgewire screens are also often considered in BTA assessments for entrainment as their small diameter openings (typically less than 3 mm) prevent a significant proportion of organisms from entering the CWIS. Wedgewire screens in combination with a reduced through-screen velocity may achieve significant reductions in entrainment mortality. Following a discussion of environmental impacts using current technology, the following paragraphs step through the considerations described at 40 CFR §125.98(f)(2)(i)-(v).

Millions of fish eggs and larvae are entrained annually at the Facility. Figures 6a and 6b show average-monthly entrainment totals for fish eggs and larvae, respectively, under different flow conditions during the entrainment sampling months of May, June, and July. “Actual Flow” numbers represent the total observed number of individuals entrained during that month’s sampling, “Permitted Flow” numbers represent the total number of individuals entrained for a given month if water withdrawals were at the maximum daily flow rate of 18.4 MGD, and “Design Flow” represents the total number of individuals entrained for a given month if water withdrawals were at the maximum design capacity of the pumps (37.8 MGD). The first two were provided by the Permittee in their entrainment sampling reports and the last was calculated by EPA by multiplying by the ratio of design flow to actual flow.

The use of VFDs to regulate flow has led on average to a 54% reduction in entrained organisms relative to the Facility running their pumps at their design flow capacity.[14] In addition, actual entrainment was about 21% lower than if the Facility were running the pumps at the permitted flow limit at all times. Figures 6a and 6b visualize these reductions averaged across the three years for May, June, and July, where entrainment at design flow (green line) is almost twice that of permitted flow (red line). The percent reductions achieved by operating the pumps at or below permitted limits have demonstrated to EPA that the use of VFDs are essential to minimizing the adverse environmental impact of entrainment at the Facility; and that optimizing the pumping flow rates to keep water withdrawals below permitted limits can further reduce that impact.

EPA evaluated additional technologies for entrainment, specifically CCC and wedgewire screens. A CCC system like the Permittee's supplemental cooling tower that uses 100% potable water would remove the need for any seawater withdrawal and in turn eliminate all entrainment losses. Wedgewire screens with a fine enough mesh size could exclude most fish eggs and larvae; however, contact with the screens could damage sensitive membranes and result in mortality. Some combination of these technologies could also be a BTA option; the Facility currently is permitted this way operating the VFDs in conjunction with its supplemental cooling tower.

In assessing the environmental impacts of alternative technologies beyond the number of entrained organisms and changes in water quality, EPA has relied on information provided in the Permittee's 2018 Cooling Tower Study as well as conclusions drawn from the 2013 Permit's fact sheet. Converting the Facility entirely to CCC would eliminate entrainment by eliminating seawater withdrawals. However, there are significant tradeoffs in this reconfiguration of the campus's cooling system, primarily related to increased energy use, CO_2 emissions, and water withdrawals. The Permittee estimates that greenhouse gas emissions would increase significantly if the supplemental cooling tower were to be the primary mechanism for cooling the Facility's condenser system; 4545 tons of CO_2 would be emitted annually if the Facility were to use the cooling tower (a CCC system) as the primary source of cooling compared to 3,305 tons of CO_2 using the Facility's current cooling water approach. Based on these projections, EPA and the Permittee expect that installation of another CCC system to replace the seawater system and supplement the ISC cooling tower would lead to even greater greenhouse gas emissions. Since estimates of greenhouse gas emissions made by the Permittee are directly related to energy use, energy use by the Facility would see a similar increase if CCC were the sole cooling mechanism at the Facility. Lastly, conversion to CCC would require millions of additional gallons of potable water use. Resource demand would increase significantly if the Facility were to rely solely on CCC; the significant cost increases related to installing CCC are explored later on.

Land availability is the third factor EPA can consider in evaluating BTA for entrainment, see 40 CFR §125.98(f)(2)(iii). Land availability is one of the primary limiting factors in modifying the Facility's intake structure. Savin Hill Cove and Dorchester Bay are generally shallow and there is little evidence that an alternative location for the Facility's CWIS would minimize entrainment any more than the current location in a dredged channel. In addition, installation of wedgewire

[14] This percent reduction and the proceeding percent reduction were calculated as the average percent reduction in entrainment of fish eggs and larvae during May, June, and July from the three annual sampling studies.

screens in the vicinity of the current intake would likely interfere with recreational boating in Savin Hill Cove, Savin Hill Yacht Club and the campus's own boat dock are directly adjacent to the CWIS. Modifications to the Facility's current intake appear to be infeasible without significantly compromising current use of Savin Hill Cove; however, the construction of a CCC system on campus could be feasible, as demonstrated by the construction and operation of the ISC cooling tower in 2015.

The Facility is not expected to be close to the end of its useful plant life. Installation of new buildings over the last decade has shown that the Facility is continuing to expand. Water withdrawals and discharges have continued over the last five years, with no significant downward or upward trends in flow even with this expansion. Maintaining limitations on water withdrawals through the discharge limitations in the Draft Permit will ensure that continued expansion doesn't see a corresponding increase in entrainment or impingement.

Lastly, in evaluating alternative technologies, EPA must consider, "Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision." *See* §125.98(f)(2)(v). A major consequence of converting the Facility to a fully-CCC system is the capital expenditure required. The 2013 Permit's fact sheet estimates that such a system would require an initial installation cost of $5.6 million and continued annual operations and maintenance costs of $125,000, not accounting for the costs of a supply of municipal water. The Permittee has made clear that building such a system would lead to significant increases in campus noise levels and be disruptive to surrounding academic buildings and an adjacent library. The disruption caused by a tall industrial system next to the campus's Harbor Walk is also not aligned with the campus's master plan.

Given the above considerations, EPA has determined that the consequences of alternative technologies outweigh the benefits in entrainment reductions. A new CCC system would eliminate entrainment but would require millions of dollars in installation and maintenance costs and lead to increased energy and water use. Wedgewire screens or alternative intake designs, if the Facility could feasibly install such technologies, could interfere with designated uses in Savin Hill Cove, and it is uncertain how much they would reduce entrainment relative to current technology. In contrast, the current technology is in place and requires no additional construction. VFDs that can restrict flow based on demand and hydrologic conditions in Savin Hill Cove have already reduced annual entrainment of fish eggs and larvae by 54% on average. Therefore, EPA concludes that BTA for minimizing entrainment at the Facility continues to be optimizing the operation of VFDs to reduce flow in conjunction with operation of a supplemental cooling tower to reduce cooling water demand.

5.3 Special Conditions

There are no special conditions.

6.0 Federal Permitting Requirements

6.1 Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority to and imposes requirements on Federal agencies regarding endangered or threatened species of fish, wildlife, or plants (listed species) and any habitat of such species that has been designated as critical under the ESA (i.e., "critical habitat").

Section 7(a)(2) of the ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to ensure that any action it authorizes, funds or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) administers Section 7 consultations for marine and anadromous species.

The Federal action being considered in this case is EPA's proposed NPDES permit for the Facility's discharge of pollutants and withdrawals of water for cooling purposes. The Draft Permit is intended to replace the 2018 Modified Permit in governing the Facility. As the federal agency charged with authorizing the discharge from this Facility, EPA determines potential impacts to federally listed species, and initiates consultation with the Services, when required under § 7(a)(2) of the ESA. In addition, EPA transmitted the permit application to NOAA Fisheries and USFWS for a 60-day review prior to public notice of the Draft Permit in accordance with 40 CFR § 125.98(h).

EPA has reviewed the federal endangered or threatened species of fish, wildlife, and plants in the action area to determine if EPA's proposed NPDES permit could potentially impact any such listed species. Two federally listed threatened or endangered species have been identified in the vicinity of the action area.[15] The northern long-eared bat (*Myotis septentrionalis*), was identified as "statewide" and the piping plover (*Charadrium melodus) with a range along the entire U.S. Atlantic coastline*. According to the USFWS, the northern long-eared bat is found in "winter – mines and caves, summer – wide variety of forested habitats" And the piping plover is found along east coast shorelines. These species are not aquatic. Therefore, the proposed permit action will have no direct or indirect effect on this listed species.

Regarding protected species under the jurisdiction of NOAA Fisheries, several anadromous and marine species and life stages likely overlap the action area of the Facility. Subadult and adult life stages of Atlantic sturgeon (*Acipenser oxyrinchus*), adult shortnose sturgeon (*Acipenser brevirostrom*), adult and juvenile life stages of the following sea turtles - leatherback sea turtles (*Dermochelys coriacea*), loggerhead sea turtles (*Caretta caretta*), Kemp's ridley sea turtles (*Lepidochelys kempii*), green sea turtles (*Chelonia mydas*); adult and juvenile life stages of the North Atlantic right whales (*Eubalaena glacialis*) and fin whales (*Balaenoptera physalus*) are all expected to be present in Massachusetts coastal waters but are unlikely to overlap the action area

[15] See [for USFWS at https://ecos.fws.gov/ipac/] and/or [for NMFS at https://www.greateratlantic.fisheries.noaa.gov/protected/section7/index.html]

of the discharge at the inshore Dorchester Bay outfall or Savin Hill Cove intake locations.[16] Certain of these protected species life stages are likely to be present in the vicinity of the discharge from this Facility.

On the basis of the evaluation, which indicates that the distribution of these species makes the probability of exposure highly unlikely, EPA determined that this action will not affect the relevant life stages of the NOAA Fisheries listed species above

The Draft Permit establishes effluent limitations to be sufficiently stringent to assure that State WQSs will be met, including for protection of aquatic life. Therefore, EPA finds that adoption of the proposed permit will have no effect on any federally listed threatened or endangered species or its critical habitat, and consultation with NOAA Fisheries or USFWS under Section 7 of the ESA is not required. Re-initiation of consultation will take place: (a) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (c) if a new species is listed or critical habitat is designated that may be affected by the identified action.

6.2 Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (*see* 16 U.S.C. § 1801 *et seq*., 1998), EPA is required to consult with the NOAA Fisheries if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat". 16 U.S.C. § 1855(b).

The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". 16 U.S.C. § 1802(10). "Adverse impact" means any impact that reduces the quality and/or quantity of EFH. 50 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), or site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EFH is only designated for fish species for which federal Fisheries Management Plans exist.[16] *See* 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 Federal action being considered in this case is EPA's proposed NPDES permit for the UMASS Facility, which discharges through Outfall 001 into Dorchester Bay. The Draft Permit is intended to replace the 2018 Permit in governing the Facility.

[16] See §7 resources for NMFS at https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27

A review of the relevant essential fish habitat information provided by NOAA Fisheries[17] indicates that the outfall exists within designated EFH for 24 federally managed species. The EFH species and life stages are listed in Table 5.

Table 5. EFH Species and Life Stages in the Vicinity of UMass Outfall 001

EFH Species	Lifestage(s) Found at Location
Atlantic Wolffish	ALL
Winter Flounder	Eggs, Juvenile, Larvae/Adult
Little Skate	Juvenile, Adult
Ocean Pout	Adult, Juvenile
Atlantic Herring	Juvenile, Adult, Larvae
Atlantic Cod	Larvae, Adult, Juvenile, Eggs
Pollock	Juvenile, Eggs, Larvae
Red Hake	Adult, Eggs/Larvae/Juvenile
Silver Hake	Eggs/Larvae, Adult
Yellowtail Flounder	Adult, Juvenile, Larvae, Eggs
White Hake	Larvae, Adult, Eggs, Juvenile
Windowpane Flounder	Adult, Larvae, Eggs, Juvenile
Winter Skate	Adult, Juvenile
American Plaice	Adult, Juvenile, Larvae, Eggs
Thorny Skate	Juvenile
Northern Shortfin Squid	Adult
Longfin Inshore Squid	Juvenile, Adult
Atlantic Mackerel	Eggs, Larvae, Juvenile, Adult
Bluefish	Adult, Juvenile
Atlantic Butterfish	Eggs, Larvae, Adult
Spiny Dogfish	Sub-Adult Female, Adult Male, Adult Female
Atlantic Surfclam	Juvenile, Adult
Scup	Juvenile
Summer Flounder	Adult
Black Sea Bass	Adult

EPA's Finding of all Potential Impacts to EFH Species

- This Draft Permit action does not constitute a new source of pollutants. It is the reissuance of an existing NPDES permit;
- The effluent discharged consists of non-contact cooling water that does not come into direct contact with any raw material, intermediate product, waste product or finished product. It is only exposed to heat prior to discharge;

[17] NOAA EFH Mapper available at http://www.habitat.noaa.gov/protection/efh/efhmapper/

- A maximum daily flow limit of 18.4 MGD will be implemented year-round in order to allow predicted mixing with the receiving water;
- Discharge limits have been proposed for pH and temperature, in order to meet state water quality standards;
- The Draft Permit prohibits the discharge of pollutants or combination of pollutants in toxic amounts;
- The effluent limitations and conditions in the Draft Permit were developed to be protective of all aquatic life; and
- The Draft Permit prohibits violations of the state water quality standards.

EPA believes that the conditions and limitations contained within the Draft Permit adequately protect all aquatic life, including those species with designated EFH in the receiving water, as well as the Habitat Area of Particular Concern. Further mitigation is not warranted. Should adverse impacts to EFH be detected as a result of this permit action, or if new information is received that changes the basis for EPA's conclusions, NOAA Fisheries will be contacted and an EFH consultation will be re-initiated.

In addition to this Fact Sheet and the Draft Permit, information to support EPA's finding is included in a letter under separate cover that will be sent to the NOAA Fisheries Habitat Division after the public comment period has begun.

7.0 Public Comments, Hearing Requests, and Permit Appeals

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to:

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Prior to the close of the public comment period, any person may submit a written request to EPA for a public hearing to consider the Draft Permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held if the criteria stated in 40 CFR § 124.12 are satisfied. In reaching a final decision on the Draft Permit, EPA will respond to all significant comments in a Response to Comments document attached to the Final Permit and make these responses available to the public at EPA's Boston office and on EPA's website.

Following the close of the comment period, and after any public hearings, if such hearings are held, EPA will issue a Final Permit decision, forward a copy of the final decision to the applicant, and provide a copy or notice of availability of the final decision to each person who

submitted written comments or requested notice. Within 30 days after EPA serves notice of the issuance of the Final Permit decision, an appeal of the federal NPDES permit may be commenced by filing a petition for review of the permit with the Clerk of EPA's Environmental Appeals Board in accordance with the procedures at 40 CFR § 124.19.

8.0 Administrative Record

The administrative record on which this Draft Permit is based may be accessed at EPA's Boston office by appointment, Monday through Friday, excluding holidays from Nathan Chien, EPA Region 1, 5 Post Office Square, Suite-100 (06-1), Boston, MA 02109-3912, or via email to chien.nathan@epa.gov.

October 15, 2020
Date

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

Figures

Figure 1: Location Map

Figure 2: Site Plan

Figure 3: Cooling Water Intake Structure – Cross-sectional View

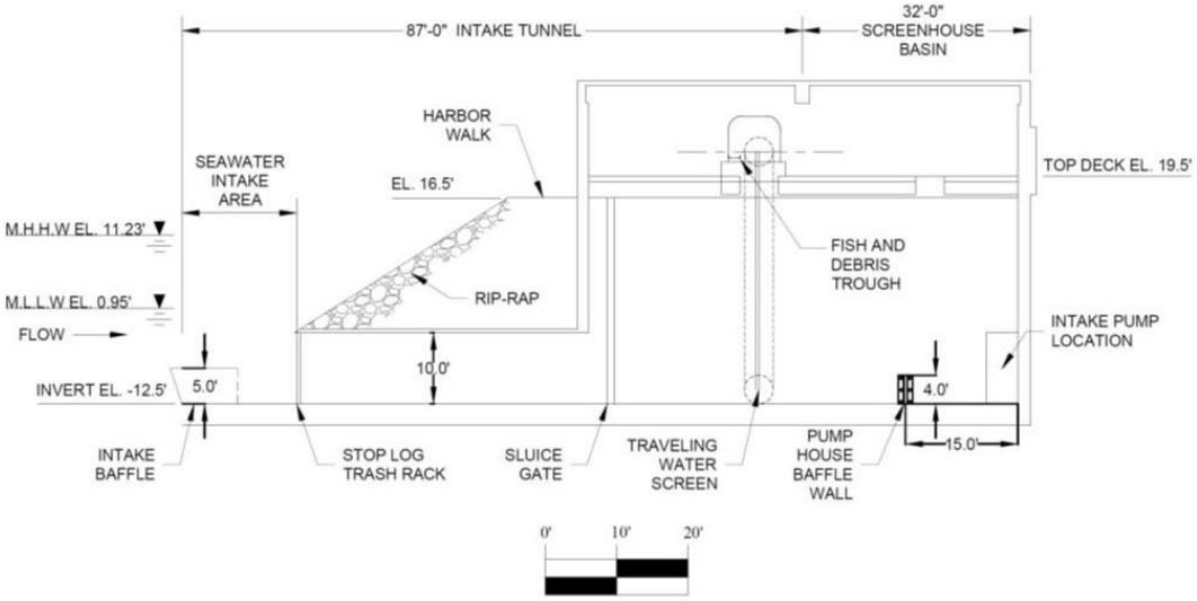


Figure 4: Cooling Water Intake Structure – Plan View

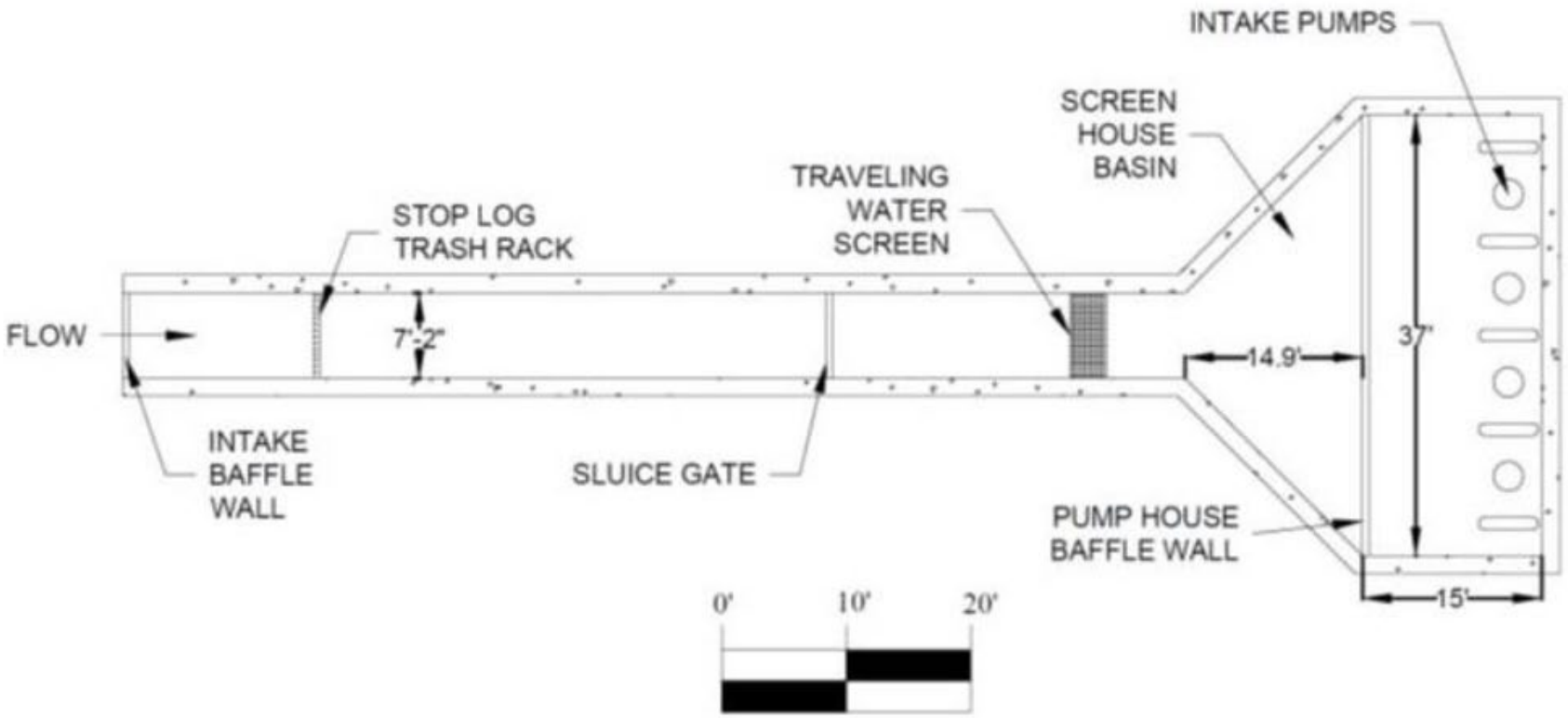


Figure 5. Water Flow Diagram

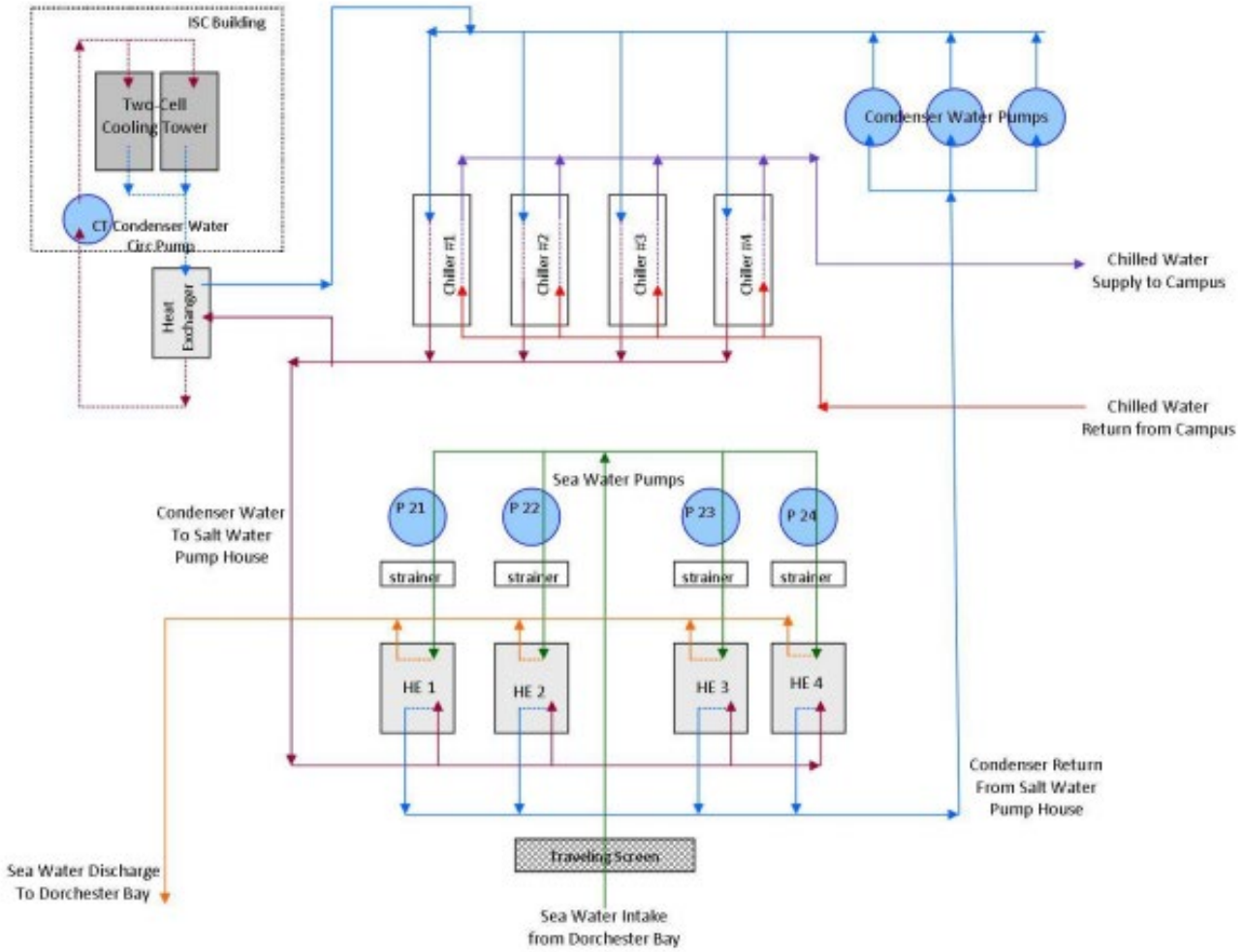
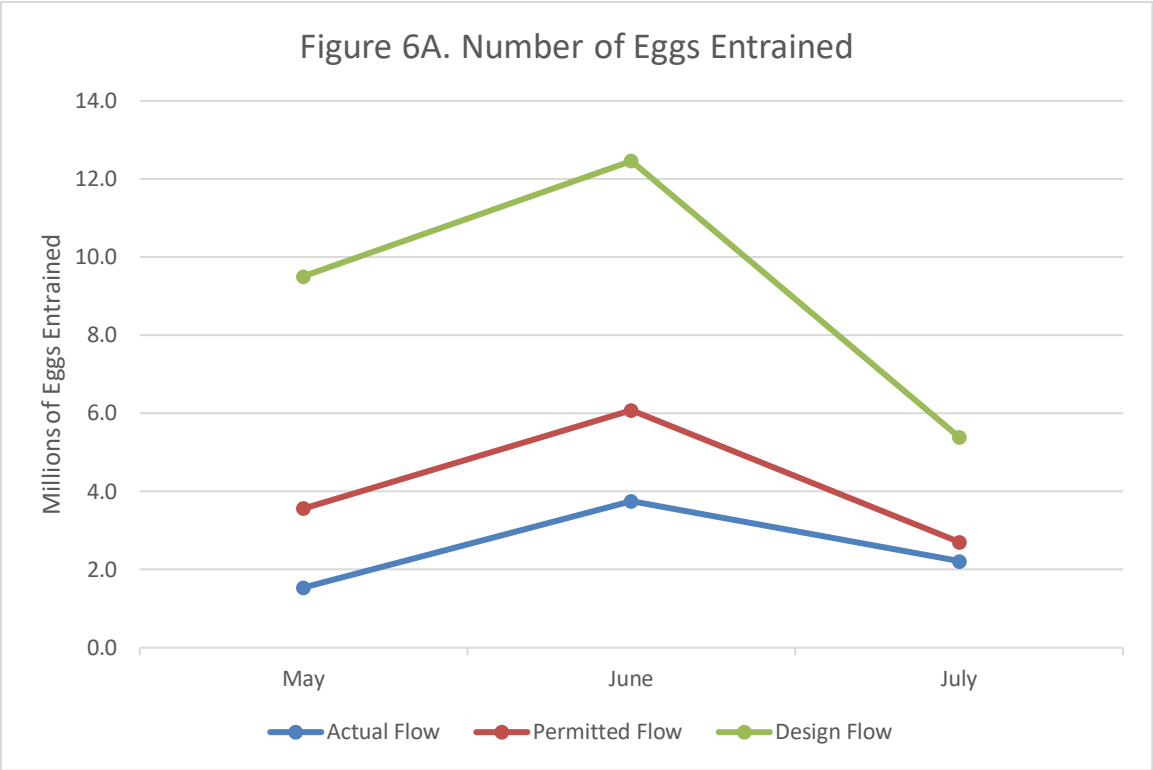
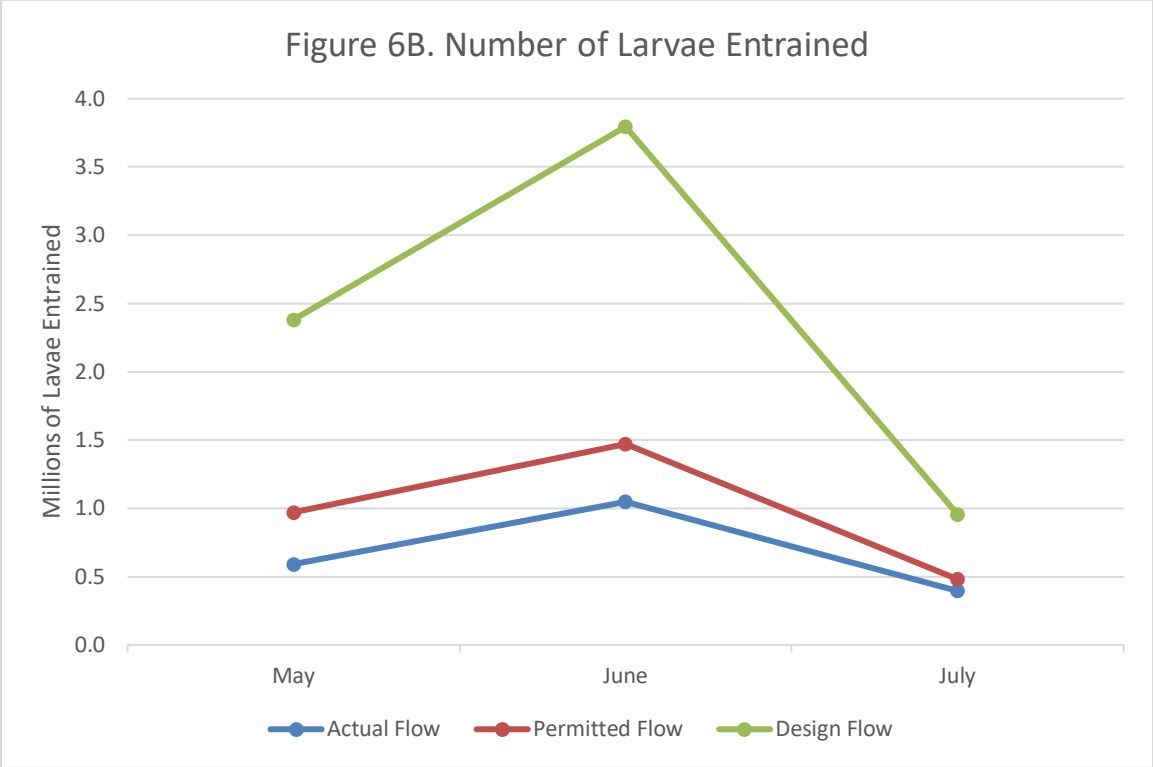


Figure 6. Egg and Larvae Entrainment Under Different Flow Intake Scenarios





Appendices

Appendix A: Discharge Monitoring Data

UNIVERSITY OF MASSACHUSETTS BOSTON
Outfall Serial Number 001
Monthly Effluent Monitoring

Parameter	Flow rate	Flow rate	Flow rate	pH	pH	Effluent Temperature (°F)	Mean Daily Effluent Temperature (°F)	Instantaneous Maximum Effluent Temperature (°F)	Temperature Increase (°F)
	Monthly Avg	Daily Max	Annual Rolling Avg	Min.	Max.	Monthly Avg	Max.	Max.	Max.
Units	**MGD**	**MGD**	**MGD**	**SU**	**SU**	**deg F**	**deg F**	**deg F**	**deg F**
Effluent Limit	**17.2**	**18.4**	**12.9**	**6.5**	**8.5**	**Report**	**80**	**85**	**Report**
Minimum	**0**	**0.1**	**4.9**	**6.8**	**7**	**33.6**	**29**	**42.9**	**0**
Maximum	**22.6**	**31.5**	**12.2**	**7.9**	**8.5**	**75.1**	**69**	**82.9**	**13.3**
Median	**4.6**	**10.3**	**6.55**	**7.7**	**7.9**	**52.25**	**43.9**	**65.15**	**5.85**
No. of Violations	**1**	**4**	**0**	**0**	**0**	**N/A**	**0**	**0**	**N/A**
Monitoring Period End Date									
6/30/2015	10.4	13.4	4.9	7.2	7.7	63.1	53.3	74.8	5.6
7/31/2015	15.1	16.8	5.3	7.1	7.7	72.5	67.7	80.1	4.4
8/31/2015	16.1	17	5.3	7	7	71.3	66.6	78.9	4.6
9/30/2015	16.4	17.3	6.1	7.6	7.9	70.6	63.8	79.4	4.3
10/31/2015	5.2	16.1	6.1	7.8	8	57.3	50.8	67.6	2.5
11/30/2015	4.4	11.1	6.3	7.6	7.8	51.9	44.1	62.9	7.4
12/31/2015	1.7	7.2	6	7.9	8	48.8	42.2	69	4.3
1/31/2016	3.7	3.9	7.9	7.8	8.2	39.5	34.1	46	2.8
2/29/2016	3.4	6.8	7.6	7.8	8.1	39.6	33.6	47.6	4.6

3/31/2016	4.5	9.5	11.3	7.9	8.2	45.5	42.1	49.7	6.2
4/30/2016	3	5.1	11.8	7.8	8.1	47.4	40.5	59.8	2.5
5/31/2016	6.2	15.3	11.6	6.8	8.1	55.6	49.2	70.6	4.6
6/30/2016	11.9	15.2	11.8	7.1	8.1	68.2	60.9	77.6	8.2
7/31/2016	16.6	16.6	11.7	7.1	8.3	72.6	64.1	82.9	11.5
8/31/2016	16.6	16.6	7.8	6.8	8	75.1	69	81.8	11.3
9/30/2016	16.6	16.6	11.7	7.5	8.5	71.3	61.9	78.1	9.1
10/31/2016	16.6	16.6	11.7	7.6	8.1	60.9	51.9	72.2	13.3
11/30/2016	16.6	16.6	12.2	7.6	8.1	49.5	43.7	62.5	10.7
12/31/2016	9	16.6	10.4	7.8	8.1	42.7	34.6	63	8.3
1/31/2017	0.3	1.7	10.1	7.8	8.1	39.1	32	48.8	0
2/28/2017	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: 2	NODI: 2	NODI: 2	NODI: C
3/31/2017	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
4/30/2017	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
5/31/2017	4.7	12.2	9.1	7.1	8.2	55.7	49.5	64.3	5.8
6/30/2017	10	16.1	8.9	7.7	7.7	63	55.1	74.9	8.2
7/31/2017	14.2	16	8.7	7.7	8.5	67.5	58.2	78.1	6.1
8/31/2017	12.4	17.2	8.4	7.1	7.6	70.6	63.5	79.2	7.2
9/30/2017	10.9	14.5	7.9	7.7	7.9	68.3	61.9	76.5	6.8
10/31/2017	7.3	14.9	7.1	7.7	7.8	64	56.6	70.6	6.2
11/30/2017	2.4	4.9	5.9	7.6	7.9	48.4	42.6	63.5	5.9
12/31/2017	1.9	2.3	5.3	7.7	7.9	38.9	30.8	46.5	0.7
1/31/2018	0	0.1	5.3	7.7	7.9	33.6	29	53.5	9.4
2/28/2018	1.9	3.3	5.5	7.6	7.9	37.8	31.8	55.6	7.3
3/31/2018	1.6	5	5.6	7.7	7.9	40.8	36.2	53.5	8.7
4/30/2018	2.8	5	5.9	7.7	7.9	47.3	39.9	55.6	9.6
5/31/2018	4.7	8.1	5.9	7.7	8.2	59.7	47.5	70.6	7.9
6/30/2018	7.7	17.9	5.7	7.7	7.9	66.5	56.7	76.6	6.5

7/31/2018	16	18	5.8	7.7	8.2	72.7	61	82.9	6.6
8/31/2018	**22.6**	**31.5**	6.7	7.7	8.3	73	63.6	78.1	6
9/30/2018	13.7	**28.3**	6.9	7.7	7.9	70.8	60.8	79.7	6.2
10/31/2018	3.6	12.8	6.6	7.7	7.9	58.2	49.2	69.5	5.3
11/30/2018	1.2	4.6	6.5	7.8	7.9	47.3	39.3	64.1	5.4
12/31/2018	0.7	1.1	6.4	7.8	7.8	46	42.5	59.8	2.5
1/31/2019	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
2/28/2019	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
3/31/2019	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
4/30/2019	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
5/31/2019	6.5	7.8	9	7.7	7.8	63.3	51.8	68.5	8
6/30/2019	8.4	14.9	7.5	7.7	7.9	65.3	55.5	74	6.7
7/31/2019	16.2	**22.5**	8.7	7.7	7.9	73.1	64.2	81.5	6.6
8/31/2019	17.1	**23.6**	9.9	7.7	7.9	69.2	58.7	75.2	5.6
9/30/2019	12.2	17	10.5	7.7	7.9	69.4	61.5	75.8	6.1
10/31/2019	8.4	15.6	10.5	7.7	7.9	63.1	53.8	72.5	9.5
11/30/2019	3.3	8.6	8.3	7.7	7.8	52.6	39.7	66	9.2
12/31/2019	1.3	1.7	7.7	7.7	7.8	40.2	36.6	42.9	0.3
1/31/2020	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
2/29/2020	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
3/31/2020	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
4/30/2020	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C
5/31/2020	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C	NODI: C

Notes:

MGD = million gallons per day
SU = Standard Units
deg F = degrees fahrenheit
0 = parameter not detected
NODI: C = no discharge
NA = not applicable

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1 (EPA)
WATER DIVISION
5 POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02109

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP)
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

EPA PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO WATERS OF THE UNITED STATES UNDER SECTION 402 OF THE CLEAN WATER ACT (CWA), AS AMENDED, AND MASSDEP PUBLIC NOTICE OF EPA REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE CWA.

PUBLIC NOTICE PERIOD: **10/15/2020 – 11/16/2020**

PERMIT NUMBER: **MA0040304**

PUBLIC NOTICE NUMBER: **MA-002-21**

NAME AND MAILING ADDRESS OF APPLICANT:

University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125

RECEIVING WATER AND CLASSIFICATION:

Dorchester Bay (Class SB)

PREPARATION OF THE DRAFT PERMIT AND EPA REQUEST FOR CWA § 401 CERTIFICATION:

EPA is issuing for public notice and comment the Draft NPDES Permit for the University of Massachusetts Boston facility, which discharges non-contact cooling water. The effluent limits and permit conditions imposed have been drafted pursuant to, and assure compliance with, the CWA, including EPA-approved State Surface Water Quality Standards at 314 CMR 4.00. MassDEP cooperated with EPA in the development of the Draft NPDES Permit. MassDEP retains independent authority under State law to issue a separate Surface Water Discharge Permit for the discharge, not the subject of this notice, under the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53.

In addition, EPA has requested that MassDEP grant or deny certification of this Draft Permit pursuant to Section 401 of the CWA and implementing regulations. Under federal regulations governing the NPDES program at 40 Code of Federal Regulations (CFR) § 124.53(e), state certification shall contain conditions that are necessary to assure compliance with the applicable provisions of CWA sections 208(e), 301, 302, 303, 306, and 307 and with appropriate requirements of State law, including any conditions more stringent than those in the Draft Permit that MassDEP finds necessary to meet these requirements. In addition, MassDEP may provide a statement of the extent to which each condition of the Draft Permit can be made less stringent without violating the requirements of State law.

INFORMATION ABOUT THE DRAFT PERMIT:

The Draft Permit and explanatory Fact Sheet may be obtained at no cost at https://www.epa.gov/npdes-permits/massachusetts-draft-individual-npdes-permits or by contacting:

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U.S. Environmental Protection Agency – Region 1
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Boston, MA 02109-3912
Telephone: (617) 918-1649
Chien.Nathan@epa.gov

Following U.S. Centers for Disease Control and Prevention (CDC) and U.S. Office of Personnel Management (OPM) guidance and specific state guidelines impacting our regional offices, EPA's workforce has been directed to telework to help prevent transmission of the coronavirus. While in this workforce telework status, there are practical limitations on the ability of Agency personnel to allow the public to review the administrative record in person at the EPA Boston office. However, any electronically available documents that are part of the administrative record can be requested from the EPA contact above.

PUBLIC COMMENT AND REQUESTS FOR PUBLIC HEARINGS:

All persons, including applicants, who believe any condition of this Draft Permit is inappropriate must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by November 16, 2020**,** which is the close of the public comment period. Comments, including those pertaining to EPA's request for CWA § 401 certification, should be submitted to the EPA contact at the address or email listed above. Upon the close of the public comment period, EPA will make all comments available to MassDEP.

Any person, prior to the close of the public comment period, may submit a request in writing to EPA for a public hearing on the Draft Permit under 40 CFR § 124.10. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice if the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this Draft Permit, the Regional Administrator will respond to all significant comments and make the responses available to the public.

Due to the COVID-19 National Emergency, if comments are submitted in hard copy form, please also email a copy to the EPA contact above.

FINAL PERMIT DECISION:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and notify the applicant and each person who has submitted written comments or requested notice.

KEN MORAFF, DIRECTOR
WATER DIVISION
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY – REGION 1

LEALDON LANGLEY, DIRECTOR
DIVISION OF WATERSHED MGMT
MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION