

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

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES PERMIT NO: **MA0024368**

NAME AND ADDRESS OF APPLICANT:

**Massachusetts Maritime Academy
101 Academy Drive
Buzzards Bay, MA 02532**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Massachusetts Maritime Academy
Wastewater Treatment Plant
Taylor Point
Buzzards Bay, MA 02532**

RECEIVING WATERS: **Cape Cod Canal/Buzzards Bay (MA-95)
USGS Hydrologic code: 01090002**

CLASSIFICATION: **Class – SB (with restricted Shellfishing)**

I. PROPOSED ACTION

The above named applicant has requested that the U.S. Environmental Protection Agency (EPA) reissue its NPDES permit to discharge into the Cape Cod Canal/Buzzards Bay, the designated receiving water. The facility is engaged in the collection and treatment of sanitary wastewater. The current permit was signed on February 20, 2001 and became effective sixty (60) days later. The permit expired on April 21, 2006. The proposed draft permit has a term of five (5) years from its effective date.

II. TYPE OF FACILITY AND DISCHARGE LOCATION

The existing wastewater treatment plant (WWTP) is an activated sludge wastewater treatment facility providing secondary wastewater treatment using sequencing batch reactors. The facility has a permitted average monthly flow of 0.077 million gallons per day (MGD) and discharges through Outfall 001. The permit also authorizes a periodic treated discharge from the Academy's swimming pool through Outfall 002. This outfall discharges approximately 10,000 gallons every 30 days. The entire pool (200,000 gallons) is drained infrequently (last done in 2006).

III. DESCRIPTION OF DISCHARGE

A quantitative description of the discharge in terms of significant effluent parameters based on recent discharge monitoring reports (DMRs), January 2005 through January 2010 is shown on Attachment A of this fact sheet.

IV. LIMITATIONS AND CONDITIONS

The effluent limitations and monitoring requirements may be found in the draft NPDES permit.

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. Process Description – Outfall 001

The Massachusetts Maritime Academy (MMA) treatment Facility receives wastewater flow from dormitories, classrooms, labs, laundry, gymnasium, and kitchen. The facility also receives wastewater from the training ship Enterprise. The collection system includes 2 lift stations. At the treatment facility, wastewater is either pumped to a 15,000 gallon equalization tank (and subsequently pumped to the treatment plant building), or pumped directly to the treatment plant building. In the treatment plant building, wastewater first flows through screening and grit removal facilities. Magnesium hydroxide is then added to increase alkalinity by a metering pump, followed by activated sludge treatment and clarification in sequencing batch reactors. Treated effluent is then discharged to a post equalization tank and pumped to rapid sand filters, followed by disinfection by ultraviolet light. The facility has maintained a chlorine disinfection and dechlorination system for use in the event of failure of the ultraviolet system. Finally, effluent is discharged to the Cape Cod Canal through Outfall 001.

Sludge is decanted to an aerated storage/digester tank. About 3,500 gallons of thickened sludge is removed from the sludge storage tank per week by a private septage hauler for disposal at the Wareham, MA WWTP (MA0101893).

Once or twice each year, 20 gallons of boiler blowdown is combined with the treated wastewater and discharged through outfall 001.

Process Description – Outfall 002

MMA's swimming pool has a capacity of 200,000 gallons. Approximately once per month, up to 10,000 gallons is released for chemical balancing. The concentration of total residual chlorine (TRC) is tested prior to release of pool water through Outfall 002. The pool water is treated with calcium thiosulfate to neutralize the chlorine before it is released. There may be rare occasions when the pool will need to be completely emptied for maintenance.

The draft permit requires the permittee to notify both EPA and Massachusetts Department of Environmental Protection (MassDEP) in advance of these events and to follow dechlorination procedures.

Dechlorination is accomplished by addition of calcium thiosulfate to the discharge as it passes through a weir box in the pool basement, where calcium thiosulfate is added with a squeeze bottle throughout the discharge. The mixing in the weir box and the detention time in the pipe have been found sufficient to reduce the chlorine residual to zero in the sample at the end of the outfall pipe.

See Attachment B for a Treatment Plant Process Diagram

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Overview of Federal and State Regulations

Under Section 301(b)(1) of the Clean Water Act ("CWA"), publicly owned treatment works (POTWs) must have achieved effluent limitations based upon Secondary Treatment by July 1, 1977. The secondary treatment requirements are set forth at 40 C.F.R. Part 133.102. In addition, Section 301(b)(1)(C) of the CWA requires 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.

Pursuant to 40 C.F.R. §122.44 (d), permittees must achieve water quality standards established under Section 303 of the Clean Water Act (CWA), including state narrative criteria for water quality. Additionally, under 40 C.F.R. § 122.44 (d)(1)(i), "Limitations must control all pollutants or pollutant parameters which the Director 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 state water quality standard." When determining whether a discharge causes, or has the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numeric criterion, the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution, and where appropriate, consider the dilution of the effluent in the receiving water.

2. Water Quality Standards and Existing Conditions

The MMA treatment facility discharges to segment MA95-14, the Cape Cod Canal. The Massachusetts Surface Water Quality Standards (314 CMR 4.06) classify the Canal segment of Buzzard's Bay as Class SB-Shellfishing (R).

SB waters are designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass.

Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas). These waters shall have consistently good aesthetic value. Shellfish beds and eelgrass beds are within one-quarter mile of this discharge. The shellfish beds are designated as Restricted by the Massachusetts Division of Marine Fisheries.

3. Available Dilution

Some water quality- based limitations are established using a calculated available dilution.

The point of discharge for Outfalls 001 and 002 into the Cape Cod Canal is subject to extremely large dilution (6,400:1)¹ as a result of the difference in tidal elevations at either end of the canal. The tidal ranges in Buzzards Bay and Cape Cod Bay are about 3.5 and 8.7 ft, respectively. The net discharge of water flows westward through the canal into Buzzards Bay during each tidal cycle. Computer modeling and thermal studies show that 4.5 billions gallons of water flows into Buzzards Bay that does not return through the canal back to Cape Cod Bay¹. The water in the canal is completely flushed in one and one half tidal cycles. The currents in the canal are up to 5.2 miles per hour. Modeling has demonstrated that tidal action in the two bays results in:

- 1) total flushing of the canal water occurring each day
- 2) new water fills the canal from Cape Cod Bay during east-to-west flow periods
- 3) and, canal water turbulence and thorough top to bottom mixing occurs throughout the year

4. Outfall 001 Effluent Limitations

Outfall 001, the discharge from the wastewater treatment facility, is located in the Cape Cod Canal, and consists of an eight inch diameter pipe with the invert at discharge, approximately 12 feet below Mean Low Water. The Cape Cod Canal contains a federal navigation channel which is currently maintained at a depth of approximately 25 to 32 feet.

¹Draft environmental Impact Statement/Environmental Impact Report. Otis Air National Guard Base, Wastewater Treatment Facility, Appendix D, Cape Cod Canal Flow Dynamics, Air National Guard Bureau, Washington DC, 1989

Flow - The flow limit is based on the annual average design flow of the treatment plant, which is 0.077 mgd. The current permit average monthly flow limit is 0.14 mgd. The staff of the MMA have confirmed that 0.14 mgd is actually (100 gpm) the peak rate at which flow can be delivered from the sequencing batch reactors (SBRs) through the sand filters, rather than the long term average design flow of the plant. The draft permit limits the 12 month rolling average flow to 0.077 mgd. The permittee must also report the average monthly flow and maximum daily flow.

5. Conventional Pollutants

Biochemical Oxygen Demand (BOD₅) - The draft permit carries forward the average monthly and average weekly limits in the previous permit. The limits are based on the requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations include an average monthly BOD₅ concentration of 30 mg/l and an average weekly concentration of 45 mg/l. The draft permit also requires that the maximum daily concentration be reported. The BOD monitoring frequency is once per week.

Total Suspended Solids (TSS) - The draft permit carries forward the average monthly and average weekly limits in the previous permit. The limits are based on the requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations include an average monthly TSS concentration of 30 mg/l and an average weekly concentration of 45 mg/l. The draft permit also requires that the maximum daily concentration be reported. The monitoring frequency for TSS is once per week.

Eighty-Five Percent (85%) BOD₅ and TSS Removal Requirement - The provisions of 40 CFR §133.102(3) requires that the 30 day average percent removal for BOD and TSS be not less than 85%. These limits are maintained in the draft permit.

Settleable Solids – The settleable solids monitoring requirement is carried forward from the previous permit at the request of the MassDEP. It is an indicator of wastewater treatment efficiency

pH - The draft permit includes pH limitations based on state water quality standards, which are more restrictive than pH limitations set forth at 40 C.F.R. §133.102(c). Both Class SA and Class SB waters shall be in a range of 6.5 through 8.5 standard units and not more than 0.2 standard units outside of the normally occurring range (314 CMR 4.05). There shall be no change from background conditions that would impair any use assigned to this class. The monitoring frequency is once per day.

Fecal Coliform Bacteria - The draft permit includes bacteria limitations based on Massachusetts Surface Water Quality Standards 314 CMR 4.05 (4)(b)4. The Cape Cod Canal is classified as a Class SB water in the Massachusetts Surface Water Quality Standards, and is designated for shellfishing. Accordingly, the draft permit includes a monthly geometric mean fecal coliform limitation of 88 colony forming units (CFU) per 100 ml and a daily maximum limit of 260 CFU per 100 ml. The limits are in effect year-round.

Enterococci Bacteria -The Enterococci limits are based on State Water Quality Standards for Class SB waters (314 CMR 4.05(4)(b)). The Commonwealth of Massachusetts promulgated new bacteria criteria on December 29, 2006, in the Surface Water Quality Standards (314 CMR 4.00) for the protection of recreational uses (fecal coliform remains the criteria for protection of shellfishing use). These new bacteria criteria were approved by EPA on September 19, 2007. Consequently, the draft permit contains Enterococci limits.

The effluent limits are 35 cfu/100 ml geometric monthly mean and 276 cfu/100 ml maximum daily value (this is the 90% distribution of the geometric mean of 126 cfu/100 ml). Once per week sampling is required.

6. Non Conventional Pollutants

Total Residual Chlorine/Disinfection – The effluent is routinely disinfected by means of ultraviolet light (UV), which produces no residual chemicals. However, the facility is also equipped with a chlorination/dechlorination system provide emergency chlorination if the UV system, or if the sand filter is under repair. The plant has a flow pacing pump to feed chlorine solution to the sand filter inlet. The effluent is then dechlorinated to meet an effluent limit of 1.0 mg/l. The permit requires notification to EPA and MassDEP if emergency chlorination is used.

Nitrogen - Nitrogen is the primary nutrient controlling plant production in Buzzards Bay embayments. Some nitrogen input is essential for growth of phytoplankton (microscopic plants) and the animals they support. But too much nitrogen creates an overabundance of plant matter causing reduced water clarity and low oxygen conditions. According to the report of the *Comprehensive Conservation and Management Plan, Buzzards Bay Project, US EPA, Massachusetts Executive Office of Environmental Affairs, Public Draft dated May, 1990*, nitrogen loading is one of the most serious problems threatening many embayments in Buzzards Bay.

During February 1994, the Buzzards Bay Project published a draft report titled "A Buzzards Bay Embayment Subwater Evaluation: Establishing Priorities for Nitrogen Management Action. This report concluded that 62% of the nitrogen entering the bay comes from sewage treatment discharges.

Baywatchers, a partner of Coalition for Buzzards Bay, conducted water quality monitoring at Butler Cove. The eutrophic condition in the cove, as determined by

the Coalition, is "Poor to Fair". While there is no present indication that the discharge of nitrogen from the MMA WWTF is causing particular harm at this time, due largely to the outfall's location, and minimal nitrogen contribution (8.3 lbs/day-See calculations below). EPA expects that the need for nitrogen limits may be revisited in the future.

| | | |
|-------------------------|-------------------|--|
| Total Kjeldahl Nitrogen | 1.67 mg/l | Data averaged from Discharge Monitoring Report Data, received between: June 1, 2006 and August 31, 2009. |
| Total Nitrate | 35.92 mg/l | |
| Total Nitrite | 0.692 mg/l | |
| Total Nitrogen* | 38.28 mg/l | |

* Total nitrogen is the sum of Kjeldahl nitrogen, total nitrate, and total nitrite

The average monthly flow for the MMA Outfall 001 discharge is 0.026 mgd for the period from September 1, 2008 through August 31, 2009.

MMA's Total Nitrogen (TN) Discharge as Percentage of the TN in Bay

$$\frac{(\text{Ave. monthly plant flow})(\text{Conversion Factor})(\text{Ave. Monthly MMA TN discharge})}{1,000,000 \text{ gpd}}$$

= TN lbs

$$\frac{26,000 \text{ gpd} \times 8.34 \times 38.28 \text{ mg/l TN}}{1,000,000 \text{ gpd}} = 8.30 \text{ lbs TN}$$

MMA discharge as a % of total nitrogen load to Buzzards Bay

$$\frac{(\text{Plant TN Load})/(\text{2205 metric ton conversion}) \times 100\%}{(\text{Total Buzzards Bay N load as TN})}$$

(MMA discharge as a % of TN load to Buzzards Bay)

$$\frac{8.3 \text{ lbs}/2205}{2246} = 0.000017\%^2$$

The current permit includes monitoring requirements for total kjeldahl nitrogen (TKN), nitrate and nitrite. The draft permit requires continued monitoring and reporting of nitrogen compounds to help support the Massachusetts Estuaries Project and related TMDL activities. When studies are complete, the need for nitrogen effluent limits will be re-visited.

The Coalition for Buzzards Bay sampled for nitrogen in a number of locations in Buzzards Bay. The nearest sampling points were in Butler Cove, located

² Managing Anthropogenic Nitrogen Inputs To Coastal Embayments: Technical Basis and Evaluation of a Management Strategy Adopted for Buzzards Bay, J. E. Cost et al, September 24, 1999

northwest of Taylor Point. They are identified as BC1 and BC2. The tip of Taylor Point is located just beyond the lower portion of the map below.³

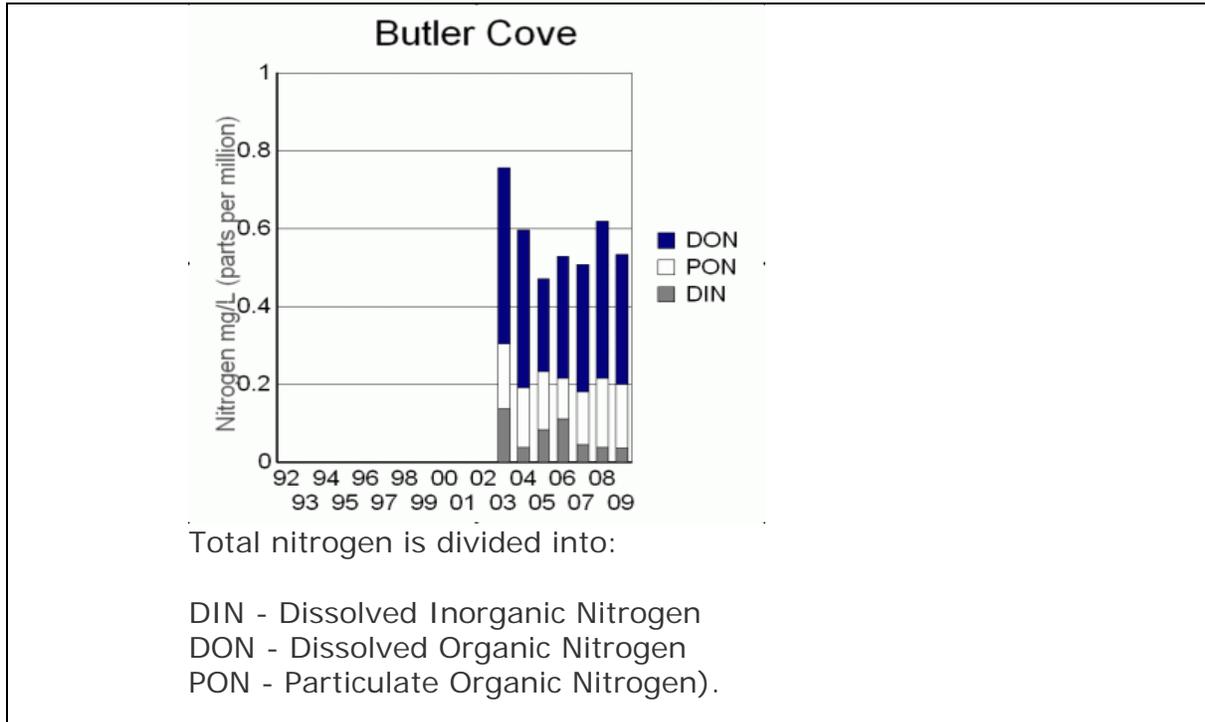


Results for total nitrogen (see next page), as well as those for chlorophyll and dissolved oxygen from samples taken in Butler Cove, show that excess nitrogen is causing utrophic conditions in embayments within Buzzards Bay.

Although MMA is a very small contributor to the overall nitrogen load to Buzzards Bay, nitrogen monitoring by the permittee will aid in establishing a total maximum daily load (TMDL) or wasteload allocation to insure protection to the most sensitive areas of the Bay. Nitrogen monitoring is being required under Section 308 of the CWA and 40 CFR §130.0(d).

³ The Coalition for Buzzards Bay, Interactive Water Quality Map:
<http://www.buzzbaywatcher.org/baywatcher/>

BC1-2 Sample Location (See Map)⁴



Whole Effluent Toxicity (WET) - Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include the following narrative statement that “All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife” and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria.

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. EPA recognizes that toxicity testing will also ensure that synergistic effects of pollutants in the discharge do not cause toxicity. Based on the potential for toxicity from domestic sources, the state narrative water quality criterion, the level of dilution at the discharge location, and in accordance with EPA national and regional policy, Massachusetts policy, and 40 C.F.R. § 122.44(d), the draft permit includes a whole effluent acute toxicity limit. (See also "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 49 Fed. Reg. 9016 March 9, 1984, EPA's "Technical Support Document for Water Quality-Based Toxics Control", September, 1991, and MassDEP's “Implementation Policy for the Control of Toxic Pollutants in Surface Waters”, February 23, 1990)

⁴The Coalition for Buzzards Bay, Interactive Water Quality Map:
<http://www.buzzbaywatcher.org/baywatcher/>

The LC₅₀ limit of $\geq 50\%$ is established pursuant to EPA/MassDEP policy for facilities with greater than 100:1 dilution.

Tests must be performed in accordance with the test protocols specified in **Permit Attachment A**.

As a condition of this permit, the testing requirements may be reduced if certain conditions are met. The permit provision anticipates that the permittee may wish to request a reduction in the WET testing. After four consecutive WET tests, demonstrating compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to the EPA seeking a review of toxicity test results. The EPA will review the test results and pertinent information to make a determination. The permittee is required to continue testing at the frequency and species specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA indicating a change in the permit conditions.

5. Outfall 002 Effluent Limits

Outfall pipe #2 discharges onto the riprap of the Cape Cod Canal. A pool discharge is always done at low slack tide, when the outfall pipe is accessible. Effluent samples are collected at this location.

Flow - Pool operations require this discharge once or twice per month for pool chemistry adjustment of alkalinity and hardness. The typical pool discharge flow is 8-10 thousand gallons. The pool is then re-filled using potable water. If the pool is completely drained, the total volume discharged is approximately 200,000 gallons. The last time the pool was emptied for repairs and maintenance was in October of 2006. The permit limit of 10,000 gallons per day (gpd) is for draw down and chemical addition. The permit allows for infrequent emptying of the entire pool (200,000 gallons) with monitoring of total residual chlorine, total copper, pH, and with prior approval by EPA and MassDEP.

Total Residual Chlorine (TRC) –Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. The water quality criteria established for chlorine are 13.0 ug/l daily maximum (Criterion Maximum Concentration) and 7.5 ug/l (Criterion Continuous Concentration) monthly average. Given a dilution factor far in excess of 6400 (the treatment plant dilution factor, calculated at a much higher discharge flow), water quality based total residual chlorine limitations would be in excess of 48 mg/l ($7.5 \text{ ug/l} * 6400 = 48 \text{ mg/l}$).

However, the MassDEP *Implementation Policy for the Control of Toxic Pollutants in Surface Waters (February 23, 1990)* requires that in order to protect waters from unnecessary discharge of chlorine, effluent limits for discharges with dilution factors greater 100 shall not exceed 1 mg/l. Therefore, the draft permit includes a maximum daily total residual chlorine limitation of 1 mg/l, based on the MassDEP policy. Both the limits and sampling frequency of 1/month are carried forward from the current permit.

Total Copper - Copper silver ionization is used in addition to chlorine to enhance disinfection in the pool. Copper-silver is often used to limit disinfection byproducts formation during chlorine disinfection. In some cases chlorine use can be reduced by 80%. Effluent copper data submitted by the permittee was reviewed to determine whether the discharge of copper has the reasonable potential to cause or contribute to an exceedance of water quality standards. A table of the measured copper concentrations is shown on the next page:

Total Copper Concentrations in mg/l

| Month | NODI | DAILY MX | Month | NODI | DAILY MX | Month | NODI | DAILY MX |
|------------|------|----------|------------|------|----------|------------|------|----------|
| 6/30/2006 | | .2 | 11/30/2007 | | .3 | 3/31/2009 | | .35 |
| 8/31/2006 | | .15 | 12/31/2007 | C* | | 4/30/2009 | 9* | |
| 9/30/2006 | | .25 | 1/31/2008 | | .2 | 5/31/2009 | C* | |
| 10/31/2006 | 9* | | 2/29/2008 | C* | | 6/30/2009 | | .2 |
| 11/30/2006 | | .2 | 3/31/2008 | 9* | | 7/31/2009 | | .3 |
| 12/31/2006 | | .15 | 4/30/2008 | | .3 | 8/31/2009 | | .4 |
| 1/31/2007 | | .2 | 5/31/2008 | 9* | | 9/30/2009 | 9* | |
| 2/28/2007 | 9* | | 6/30/2008 | | .3 | 10/31/2009 | 9* | |
| 3/31/2007 | 9* | | 7/31/2008 | | .3 | 11/30/2009 | | D-90** |
| 4/30/2007 | 9* | | 8/31/2008 | 9* | | 12/31/2009 | 9* | |
| 5/31/2007 | | .25 | 9/30/2008 | | .4 | 1/31/2010 | 9* | |
| 6/30/2007 | C* | | 10/31/2008 | 9* | | 2/28/2010 | | .4 |
| 7/31/2007 | 9* | | 11/30/2008 | | .2 | 3/31/2010 | | .3 |
| 8/31/2007 | | .3 | 12/31/2008 | 9* | | 4/30/2010 | 9* | |
| 9/30/2007 | | .3 | 1/31/2009 | 9* | | 5/31/2010 | | .4 |
| 10/31/2007 | 9* | | 2/28/2009 | | .3 | | | |

* NODI = No discharge occurred this month

** Missing DMR

The average total copper discharge is 277 ug/l or 0.28 mg/l and the maximum concentration is 400 ug/l or 0.4 mg/l.

The Criteria Maximum Concentration (CMC) or acute criteria for total copper is 4.8⁴ ug/l. The Criterion Continuous Concentration (CCC) or chronic criteria for total copper is 3.1⁵ ug/l.

Maximum effluent concentration/CCC = required dilution to meet criteria.

⁴This recommended water quality criterion was derived in Ambient Water Quality Criteria Saltwater Copper Addendum (Draft, April 14, 1995) and was promulgated in the Interim final National Toxics Rule (60 FR 22228-22237, May 4, 1995)

$400 \text{ ug/l} / 3.1 \text{ ug/l} = 129$

A dilution of 129 is sufficient to meet the chronic aquatic life criteria for total copper at the highest reported effluent concentration (based on zero background copper in the receiving water). As described previously, the dilution factor exceeds 6400.

The current permit limit of 0.5 mg/l as a maximum daily value shall be carried forward in this draft permit based on Section 402(o) of the CWA. See the discussion of anti-backsliding in Section IX of this Fact Sheet.

pH - The draft permit includes pH limitations which are required by state water quality standards. Class SB waters shall be in a range of 6.5 through 8.5 standard units and not more than 0.2 standard units outside of the normally occurring range (314 CMR 4.05 (4)(b)3.) There shall be no change from background conditions that would impair any use assigned to this class. The monitoring frequency is once per day

VI. OPERATION AND MAINTENANCE REQUIREMENTS

The permit standard conditions for “Proper Operation and Maintenance” are found at 40 CFR §122.41(e). These require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, the permittee has a “duty to mitigate” as stated in 40 CFR §122.41 (d). This requires the permittee to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment.

EPA and MassDEP have included specific operation and maintenance requirements for the wastewater treatment plant and collection system. These requirements may be found in Part I.D. of the permit and include requirements for adequate staffing, preventative maintenance, infiltration and inflow (I/I) control, and alternate power needed at pump stations.

Of these requirements, only the I/I control requirements apply specifically to the collection system. EPA and MassDEP have determined that an I/I removal program is an integral component to ensuring permit compliance. I/I is extraneous water entering the wastewater collection system through a variety of sources.

Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems.

Significant I/I in a collection system may displace sanitary flow reducing the capacity and the efficiency of the treatment works and may cause bypasses of secondary

treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

The permittee shall develop an I/I removal program commensurate with the severity of the I/I in the collection system. Where portions of the collection system have little I/I, the control program will logically be scaled down

The MassDEP has stated that inclusion of the I/I conditions in the draft permit shall be a standard State Certification requirement under Section 401 of the Clean Water Act and 40 CFR §124.55(b).

VII. SLUDGE INFORMATION AND REQUIREMENTS

The MMA sludge (3,500 gallons) is trucked to the Wareham POTW (NPDES Permit No. MA0101893), approximately once per week. The yearly total is approximately 182,000 gallons.

Section 405(d) of the Clean Water Act (CWA) requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations, found at 40 CFR Part 503, regulate the use and disposal of domestic sludge that is land applied, disposed in a surface disposal unit, or fired in a sewage sludge incinerator. Part 503 regulations have a self-implementing provision; however, the CWA requires implementation through permits.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards and the 40 CFR Part 503 regulations. In addition, EPA Region I has prepared a 72-page document entitled "EPA Region I NPDES Permit Sludge Compliance Guidance, November 1999" for use by the permittee in determining the appropriate sludge conditions for the chosen method of sewage sludge use or disposal practices. This guidance document is available upon request from EPA Region 1 and may also be found at:
<http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf>

The permittee is required to submit an annual report to EPA and MassDEP by **February 19th** of each year, containing the information specified in the Sludge Compliance Guidance Document attached to the draft permit for the permittee's chosen method of sludge disposal.

VIII. PRETREATMENT

Pollutants introduced into POTWs by a nondomestic source shall not pass through the POTW or interfere with the operation or performance of the treatment.

IX. ANTI-BACKSLIDING

Section 402(o) of the CWA generally provides that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. EPA has also promulgated anti-backsliding regulations which are found at 40 C.F.R. § 122.44(l). Unless applicable anti-backsliding requirements are met, the limits and conditions in the reissued permit must be at least as stringent as those in the previous permit.

X. ANTI-DEGRADATION

The Massachusetts Anti-degradation Policy is found at Title 314 CMR 4.04. All existing uses of Buzzards Bay must be protected. This draft permit is being reissued with discharge limits as or more stringent than the current permit with the same parameter coverage. There is no change in outfall locations.

XI. UNAUTHORIZED DISCHARGES

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

Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at <http://www.mass.gov/dep/water/approvals/surffms.htm#sso>.

XII. ESSENTIAL FISH HABITAT

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

The Amendments broadly define "essential fish habitat" (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 which 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), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. *Id.*

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. §1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

Please Fact Sheet Attachment D for a list of EFH species found in the vicinity of the discharges.

It is EPA's opinion that the operation of this facility, as governed by this permit action, is not likely to adversely affect the species of concern or its habitat for the following reasons:

- This is a re-issuance of an existing permit.
- The discharge is from a 0.077 mgd WWTF, receiving an advanced level of treatment through post secondary treatment rapid sand filtration.
- Effluent is discharged into the Cape Cod Canal with an estimated dilution ratio of 6400:1.
- Acute toxicity tests will be conducted on Mysidopsis bahia once each year.
- There is no discharge of cooling water.
- The principle discharge flow limit has been reduced from 0.14 mgd to 0.077 mgd.as a rolling average monthly flow.
- The permit will prohibit any violation of state water quality standards.

EPA is coordinating a review of this finding with NMFS through the Draft Permit and Fact Sheet and further consultation is not required.

XIII. ENDANGERED PSECIES ACT (ESA)

The U.S. Environmental Protection Agency - Region I, New England (EPA) is preparing to reissue the National Pollutant Discharge Elimination System (NPDES) permit to the Massachusetts Maritime Academy in Buzzards Bay, Massachusetts, located on the northern shore of the Cape Cod Canal, at Taylor Point.

As the federal agency charged with authorizing the discharge from this facility, EPA, as part of its consultation responsibilities under section 7 (a)(2) of the Endangered Species Act (ESA) for potential impacts to federally listed species, is seeking written concurrence from the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) on this determination. In this particular case, several endangered species under the jurisdiction of NOAA Fisheries may potentially be affected by the reissuance. It is EPA's opinion, however, that the location and operation of this facility, as governed by the Draft Permit, are not likely to adversely affect the species of concern.

The marine species shown in the Table below are listed as threatened or endangered and may be found in the vicinity of this facility. In making its assessment, EPA has consulted general profiles and descriptions of these species.

Endangered/Threatened Marine Mammal Species Found in the Vicinity of MMA⁶

| Marine Mammal | Species | Threatened or Endangered |
|----------------------|-------------------------------|---------------------------------|
| Loggerhead Turtle | <i>Caretta caretta</i> | Threatened |
| Kemp's Ridley Turtle | <i>Leipdochelys kempii</i> | Endangered |
| Hawksbill Turtle | <i>Eretmochelys imbricata</i> | Endangered |
| Leatherback Turtle | <i>Dermochelys coriacea</i> | Endangered |
| Green Turtle | <i>Chelonia mydas</i> | Endangered/Threatened |
| Northern Right Whale | <i>Eubalaena glacialis</i> | Endangered |
| Humpback Whale | <i>megaptera novaeangliae</i> | Endangered |

The Cape Cod Canal connects Cape Cod Bay to Buzzards Bay and may be used for transport by various species of marine organisms, including sea turtles, seals and other marine mammals.

Based upon the factors discussed (Section XII), EPA believes that there will be no significant adverse environmental impact to the endangered species that migrate through or inhabit areas in the vicinity of MMA.

Therefore, EPA believes that this permit action does not warrant a formal consultation under section 7 of the ESA. EPA will engage in informal consultation with NOAA Fisheries to determine whether formal consultation will be needed.

XIV. COASTAL ZONE MANAGEMENT (CZM) CONSISTENCY REVIEW

40 CFR § 122.49 (d) states: *The Coastal Zone Management Act, 16 U.S.C. 1451 et seq. section 307(c) of the Act and implementing regulations (15 CFR part 930) prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State Coastal Zone Management program, and the State or its designated agency concurs with the certification (or the Secretary of Commerce overrides the State's nonconcurrence).*

The discharge is within the defined CZM boundaries. The permittee has submitted a letter to the Massachusetts Coastal Zone Management Program stating its activity complies with the policies of the Massachusetts approved coastal management program and will be conducted in a manner consistent with such policies. CZM shall review the draft permit and the permit will only be issued after CZM certification.

⁶ NOAA Fisheries, 2005, <http://www.nmfs.noaa.gov/pr/species/turtles/#species>, National Marine Fisheries Service, and CCCSTSL, 2005. <http://www.cccturtle.org/contents.htm>. Caribbean Conservation Corporation & Sea Turtle Survival League.

XV. MONITORING AND REPORTING

The permittee is obliged to monitor and report sampling results to EPA and the MassDEP within the time specified in the permit. The effluent monitoring requirements have been established to yield data representative of the discharge by the authority under Section 308(a) of the CWA in accordance with 40 CFR 122.441(j), 122.44, and 122.48.

The remaining general conditions of the permit are based primarily on the NPDES regulations 40 CFR 122 through 125 and consist primarily of management requirements common to all permits.

XVI. STATE PERMIT CONDITIONS

The NPDES Permit is issued jointly by the U. S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the MassDEP Commissioner.

XVII. GENERAL CONDITIONS

The general conditions of the permit are based on 40 CFR Parts 122, Subparts A and D and 40 CFR 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

XVIII. STATE CERTIFICATION REQUIREMENTS

The staff of the Massachusetts Department of Environmental Protection ("MassDEP") has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects that the draft permit will be certified.

IXX. PUBLIC COMMENT PERIOD AND PROCEDURES FOR FINAL DECISION

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection, Municipal Permits Branch, 5 Post Office Square, Suite 100 – Mail Code OEP06-1, Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. Public hearings may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates a significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

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

XX. EPA CONTACT

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

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Kathleen.Keohane@state.ma.us

Date: August 23, 2010

Stephen S. Perkins, Director *
Office of Ecosystem Protection
U.S. Environmental Protection Agency

- Please address all comments to Doug Corb and Kathleen Keohane at the addresses above

Permit Limits with DMR Violation Data Attachment A

MA0024368 MASSACHUSETTS MARITIME ACADEMY

OUTFALL 001 - Wastewater

| Month | Flow .14 Mgal/d | Flow Mon Mgal/d | BOD5 30 mg/L | BOD5 Mon. mg/L | TSS 30 mg/L | TSS Mon. mg/L | Fecal Coliform 100 MPN/100mL | pH 6.5 SU | pH 8.5 SU | BOD5 % Removal 85 % | TSS % Removal 85 % | Nitrate Nitrogen Mon. mg/L | Nitrite Nitrogen Mon. mg/L |
|----------------|--------------------|--------------------|-----------------|-------------------|----------------|------------------|------------------------------------|--------------|--------------|---------------------------|--------------------------|----------------------------------|----------------------------------|
| MP Date | MO AVG | DAILY MX | MO AVG | DAILY MX | MO AVG | DAILY MX | MO GEO | MIN | MAX | MO AV MN | MO AV MN | MO AVG | MO AVG |
| 1/31/2008 | .009 | .027 | 12. | 37. | 6. | 10. | . | 6. | 7.8 | 92. | 97. | | |
| 2/29/2008 | .008 | .027 | 9. | 17. | 3. | 6. | 1. | 6.7 | 7.9 | 95. | 99. | | |
| 3/31/2008 | .03 | .048 | 11. | 19. | 16. | 34. | 2. | 6.9 | 7.5 | 95. | 94. | 41. | .85 |
| 4/30/2008 | .03 | .05 | 6. | 11. | 7. | 12. | . | 6.9 | 7.4 | 98. | 98. | | |
| 5/31/2008 | .031 | .049 | 4. | 6. | 5. | 11. | . | 6.8 | 7.4 | 99. | 98. | 34. | .05 |
| 6/30/2008 | .024 | .049 | 3. | 4. | 4. | 5. | . | 6.9 | 7.4 | 98. | 98. | | |
| 7/31/2008 | .023 | .041 | 4. | 5. | 23. | 134. | 3. | 6.9 | 7.4 | 98. | 99. | | |
| 8/31/2008 | .023 | .058 | 3. | 4. | 3. | 4. | . | 6.7 | 7.4 | 98. | 99. | | |
| 9/30/2008 | .04 | .073 | 3. | 3. | 3. | 3. | . | 7. | 7.4 | 99. | 99. | 40. | .1 |
| 10/31/2008 | .036 | .055 | 2. | 3. | 4. | 4. | 2. | 6.9 | 7.3 | 99. | 99. | | |
| 11/30/2008 | .03 | .056 | 11. | 54. | 38. | 279. | . | 6.8 | 7.3 | 96. | 87. | 58. | . |
| 12/31/2008 | .024 | .07 | 2. | 3. | 2. | 3. | . | 6.7 | 7.5 | 99. | 99. | | |
| 1/31/2009 | .009 | .029 | 5. | 9. | 3. | 4. | 1. | 6.6 | 9.2 | 97. | 98. | | |
| 2/28/2009 | .007 | .016 | 3. | 4. | 3. | 3. | . | 6.9 | 7.5 | 97. | 98. | 36. | .13 |
| 3/31/2009 | .036 | .061 | 39. | 77. | 65. | 143. | 2. | 6.6 | 7.2 | 89. | 79. | | |
| 4/30/2009 | .036 | .056 | 17. | 33. | 43. | 156. | 1. | 6.5 | 7.3 | 95. | 86. | 32. | .06 |
| 5/31/2009 | .031 | .06 | 6. | 9. | 7. | 18. | . | 6.5 | 7.3 | 99. | 98. | | |
| 6/30/2009 | .025 | .049 | 6. | 12. | 4. | 7. | . | 6.9 | 7.6 | 98. | 99. | | |
| 7/31/2009 | .017 | .031 | 5. | 7. | 3. | 4. | . | 6.8 | 7.4 | 97. | 99. | | |
| 8/31/2009 | .023 | .058 | 3. | 5. | 2. | 2. | 1. | 6.5 | 7.6 | 98. | 99. | 33. | .33 |
| 9/30/2009 | .035 | .053 | 3. | 4. | 2. | 2. | . | 6.5 | 7.9 | 99. | 99. | | |
| 10/31/2009 | .037 | .062 | 2. | 4. | 2. | 2. | . | 6.8 | 7.4 | 99. | 99. | | |
| 11/30/2009 | | | | | | | | | | | | | |
| 12/31/2009 | .025 | .052 | 3. | 4. | 3. | 3. | . | 6.8 | 7.9 | 99. | 99. | | |
| 1/31/2010 | .009 | .035 | 3. | 4. | 3. | 4. | . | 6.7 | 7.7 | 98. | 99. | | |
| Average | 0.03 | 0.05 | 6.65 | 13.09 | 10.78 | 36.65 | 0.57 | 6.75 | 7.56 | 97.35 | 96.57 | 39.14 | 0.22 |

OUTFALL 001 - Wastewater

Whole Effluent Toxicity - Mysid Shrimp

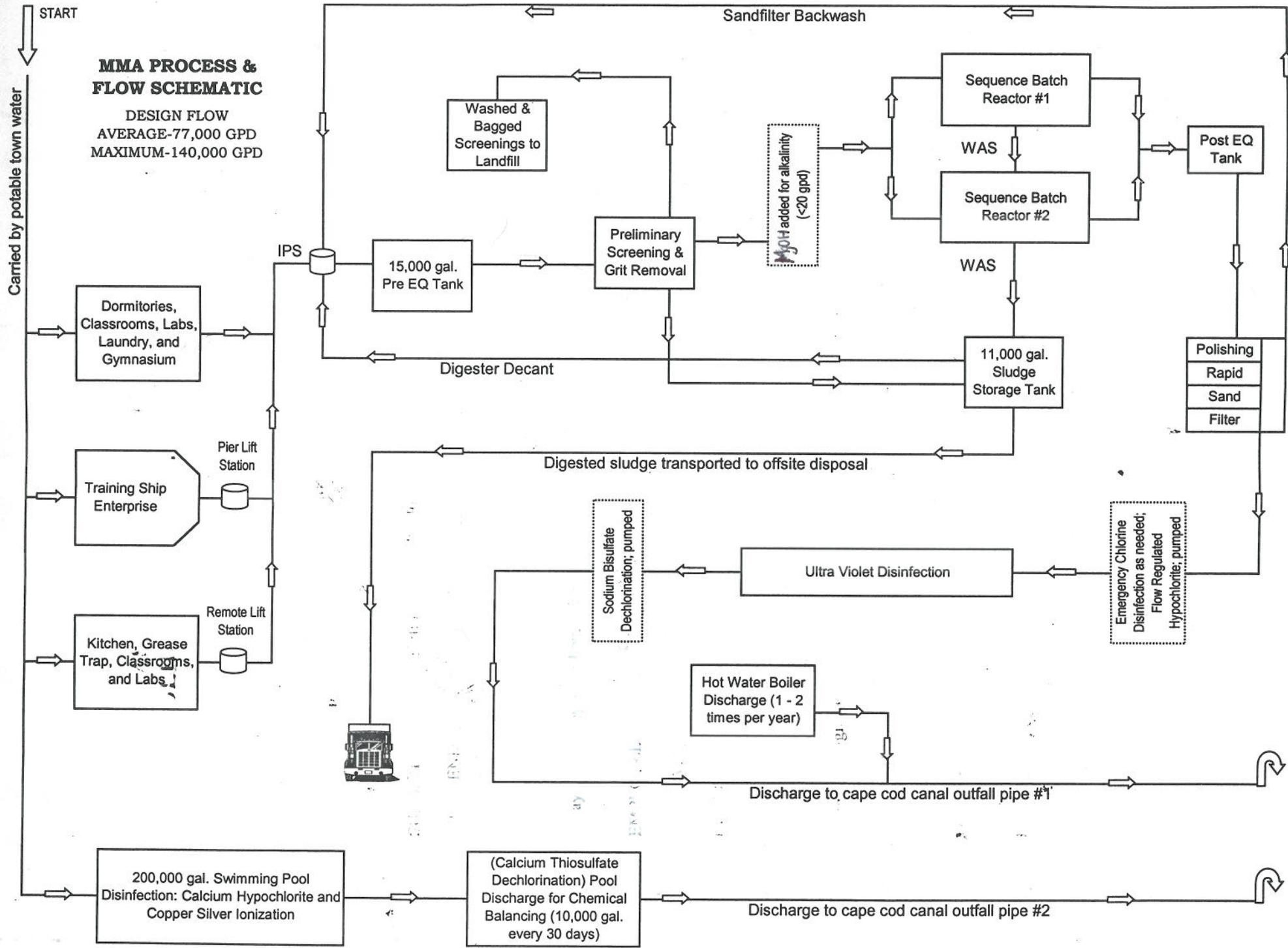
LC50 50 %

| MP Date | DAILY MN |
|-----------|----------|
| 6/30/2005 | 100. |
| 6/30/2006 | 100. |
| 6/30/2007 | 100. |
| 6/30/2008 | 100. |
| 6/30/2009 | 100. |

MA0024368 MASSACHUSETTS MARITIME ACADEMY

OUTFALL 002 - Pool Water

| Month | Flow 10000 gal/d | Total Copper .5 mg/L | pH 6.5 SU | pH 8.5 SU | No Discharge |
|----------------|---------------------|----------------------------|--------------|--------------|-----------------|
| MP Date | DAILY MX | DAILY MX | MIN | MAX | |
| 1/31/2008 | 8600. | .2 | 7.7 | 7.7 | |
| 2/29/2008 | | | | | * |
| 3/31/2008 | | | | | * |
| 4/30/2008 | 7432. | .3 | 7.8 | 7.8 | |
| 5/31/2008 | | | | | * |
| 6/30/2008 | 7500. | .3 | 7.8 | 7.8 | |
| 7/31/2008 | 7200. | .3 | 7.8 | 7.8 | |
| 8/31/2008 | | | | | * |
| 9/30/2008 | 7726. | .4 | 7.7 | 7.7 | |
| 10/31/2008 | | | | | * |
| 11/30/2008 | 8000. | .2 | 7.6 | 7.6 | |
| 12/31/2008 | | | | | * |
| 1/31/2009 | | | | | * |
| 2/28/2009 | 6000. | .3 | 7.7 | 7.7 | |
| 3/31/2009 | 6000. | .35 | 7.6 | 7.6 | |
| 4/30/2009 | | | | | * |
| 5/31/2009 | | | | | * |
| 6/30/2009 | 7600. | .2 | 7.7 | 7.7 | |
| 7/31/2009 | 12230. | .3 | 7.8 | 7.8 | |
| 8/31/2009 | 28500. | .4 | 7.7 | 7.7 | |
| 9/30/2009 | | | | | * |
| 10/31/2009 | | | | | * |
| 11/30/2009 | | | | | * |
| 12/31/2009 | | | | | * |
| 1/31/2010 | | | | | * |
| Average | 13582.5 | 0.3 | 7.7 | 7.7 | |

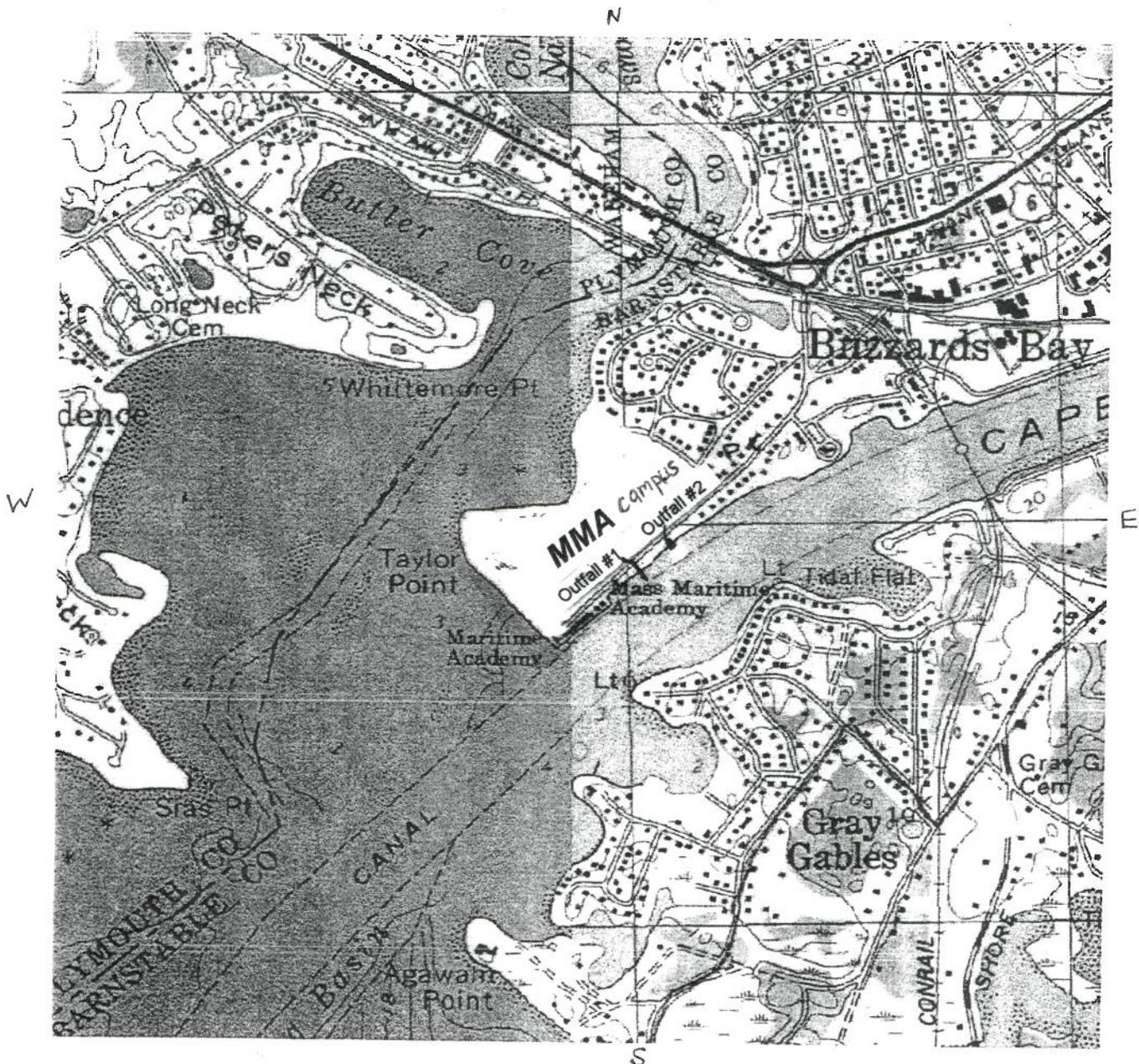


Permit No. MA0024368

OUTFALL #1- Latitude $41^{\circ} - 44\text{min W}$
Longitude $70^{\circ} - 37\text{min W}$
#2 - same

Masachusetts Maritime Academy

Location of permitted Outfalls #1 and #2



Tide in Cape Cod Canal changes every 6 hours:
WEST -Outgoing tide EAST - Incoming tide

Fact Sheet Attachment D

EFH Species in Buzzards Bay, Massachusetts

10 x 10 latitude and longitude squares included in this bay (southeast corner boundaries): 4140/7030; 4140/7040; 4130/7030; 4130/7040; 4130/7050; 4130/7100; 4120/7040; 4120/7050; 4120/7100

The following is a list of the EFH species and applicable life stage(s) for the area that includes Atlantic Ocean waters around Buzzards Bay, MA.

| Species | Eggs | Larvae | Juveniles | Adults | Spawning Adults |
|---|------|--------|-----------|--------|-----------------|
| Atlantic cod (<i>Gadus morhua</i>) | S | S | S | S | |
| haddock (<i>Melanogrammus aeglefinus</i>) | S | S | | | |
| red hake (<i>Urophycis chuss</i>) | | S | M,S | M,S | S |
| winter flounder (<i>Pleuronectes americanus</i>) | M,S | M,S | M,S | M,S | M,S |
| windowpane flounder (<i>Scophthalmus aquosus</i>) | M,S | M,S | M,S | M,S | M,S |
| American plaice (<i>Hippoglossoides platessoides</i>) | | | M,S | M,S | |
| Atlantic sea herring (<i>Clupea harengus</i>) | | | M,S | M,S | |
| bluefish (<i>Pomatomus saltatrix</i>) | | | M,S | M,S | |
| Atlantic butterfish (<i>Peprilus triacanthus</i>) | S | S | M,S | M,S | |
| Atlantic mackerel (<i>Scomber scombrus</i>) | S | | | S | |
| summer flounder (<i>Paralichthys dentatus</i>) | | M,S | M,S | M,S | |
| scup (<i>Stenotomus chrysops</i>) | M,S | S | S | S | |
| black sea bass (<i>Centropristus striata</i>) | S | S | S | S | |
| king mackerel (<i>Scomberomorus cavalla</i>) | X | X | X | X | |
| Spanish mackerel (<i>Scomberomorus maculatus</i>) | X | X | X | X | |
| cobia (<i>Rachycentron canadum</i>) | X | X | X | X | |