

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND - REGION I  
FIVE 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: MA0100625**

**NAME AND ADDRESS OF APPLICANT:**

**The City of Gloucester  
City Hall  
9 Dale Avenue  
Gloucester, MA 01930**

**NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:**

**Gloucester Water Pollution Control Facility  
Essex Avenue (West of Western Avenue)  
Gloucester, Massachusetts 01930**

<b>OUTFALL</b>	<b>RECEIVING WATERS</b>	<b>BASIN</b>	<b>CLASS</b>
Outfall 001	Massachusetts Bay	USGS HUC Code – 01090001	Class SA
5 CSOs	Gloucester Harbor	North Coastal Basin – MA93-18	Class SB

**Fact Sheet Attachments:**

- A-DMR Data and Violations
- B-Location Maps
- C-Treatment Plant Schematic
- D- Summary of Required Report Submittals

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## **I. PROPOSED ACTION**

The City of Gloucester, Massachusetts (Gloucester, City or permittee) has applied to the U.S. Environmental Protection Agency (EPA or the Agency) for reissuance of its NPDES permit authorizing pollutant discharges from the Gloucester Water Pollution Control Facility (WPCF) to the above-specified receiving waters pursuant to a Clean Water Act (CWA) Section 301(h) waiver (*i.e.*, a waiver from secondary treatment standards), 33 U.S.C. § 1311(h). *See also* 40 CFR Part 125, Subpart G). EPA intends to deny this waiver request and issue a permit with secondary treatment-based limits. This “tentative denial” is discussed in more detail in the accompanying “Tentative 301(h) Denial Decision” document.

The current permit was signed on August 28, 2001, became effective on October 27, 2001, and expired on October 27, 2006. The permittee applied for renewal of its permit and Section 301(h) waiver on May 26, 2006. The current permit has been administratively continued under the provisions of 40 CFR §122.6.

The upgrade from primary to secondary treatment at the WPCF will require extensive planning and design, and will also require the commitment of significant financial resources. EPA and the Massachusetts Department of Environmental Protection (MassDEP) are moving forward with this draft permit and fact sheet fully recognizing that permit modifications may be necessary as the City moves through its planning process. For example, the treatment plant design flow may change with the upgrade to secondary treatment. EPA and MassDEP will need to work with the City to establish compliance schedules for the treatment plant upgrade and interim limits applicable prior to its completion. This Fact Sheet underscores areas where more complete information may result in changes to the permit.

## **II. DESCRIPTION OF DISCHARGE**

Quantitative descriptions of the WPCF’s discharge in terms of significant effluent parameters based on discharge monitoring reports (DMRs) for January 1, 2006, though May 31, 2010 may be found in Fact Sheet, Attachment A.

## **III. LIMITATIONS AND CONDITIONS**

The effluent limits and monitoring and other requirements proposed by EPA and MassDEP are set forth in the draft NPDES permit issued together with this Fact Sheet.

**IV. BASIS OF PERMIT'S EFFLUENT LIMITS AND OTHER REQUIREMENTS**

**A. DISCHARGE LOCATIONS**

<b>Outfall</b>	<b>Description of Discharge</b>	<b>Outfall Location/Receiving Water</b>
001	Treatment Plant Effluent	Massachusetts Bay
002	Combined Sewer Overflow (CSO)	Mansfield Street Drain Gloucester Harbor
004	Combined Sewer Overflow (CSO)	Rogers Street CSO Harbor Cove
005	Combined Sewer Overflow (CSO)	Main Street CSO Gloucester Inner Harbor
006	Combined Sewer Overflow (CSO)	East Main Street CSO Gloucester Inner Harbor
006A	Combined Sewer Overflow (CSO)	East Main Street CSO Gloucester Inner Harbor

The treatment plant and Gloucester collection system are owned by the City and are currently operated under contract by Viola Water Inc. The City, not the contract operator, has been named the permittee for the treatment plant and combined sewer overflow (CSO) discharges. This approach is consistent with the current permit and is also consistent with permits for other contract-operated publicly owned treatment works (POTWs) (*i.e.*, public sewage treatment plants) in the EPA Region.

**B. EXISTING FACILITY PROCESS DESCRIPTION**

General

The City has reported in prior applications that the WPCF was designed for an average daily flow rate of 7.24 million gallons per day (mgd) and a peak flow rate of 15 mgd. The facility is currently authorized to discharge a 12-month rolling average flow of 5.15 mgd. The current permitted flow limit, which is lower than the design flow, was initially established in the June 26, 1985 permit reissuance and has remained unchanged in the permit renewals since that time.

The existing treatment facility was put into service in 1984. It employs preliminary treatment, chemically enhanced primary treatment and disinfection, and discharges its treated effluent into Massachusetts Bay through a 14,869-foot ocean outfall. The outfall was extended to its current location in 1991. See Location Map Attachment B1.

### Collection System

The wastewater collection system conveying flow to the Gloucester treatment plant includes sewers in the City of Gloucester and the Towns of Essex and Rockport. The system consists of both sanitary sewers and combined sewers. Sanitary sewers, which convey wastewater from homes and commercial/industrial sources comprise about 95 percent of the collections system. Combined sewers, which convey the same wastewater components as sanitary sewers, but also convey stormwater, comprise about five percent of the collection system. All of the combined sewers in the collections system are within the City of Gloucester. The following table shows the type of system and the population served within each municipality.

City/Town	Population served by WWTP	Collection System
Gloucester	24,000	Combined
Essex	1,800	Separate
Rockport	450 (Seasonal [peak])	Separate
<b>Total<sup>1</sup></b>	<b>26,250</b>	

Wastewater is conveyed to the treatment plant through an interceptor sewer crossing under the Annisquam River through a double-barreled siphon, which then discharges to a 36-inch gravity sewer along Essex Avenue. This gravity sewer line then runs to the treatment plant.

### Treatment Plant

Sewage enters the treatment plant through a manhole outside the grit chamber building equipped with a flow meter. A 36-inch sewer connects this manhole to two aerated grit tanks.

The treatment plant also receives eleven million gallons per year of trucked waste consisting of commercial and residential holding tank wastes from Gloucester and Essex, septage from Gloucester and Essex, Gloucester STEP (septic tank effluent pump) system septage, and industrial sludge. These wastes are added at various points in the treatment plant process. Septage is typically discharged to the septage wet well and processed through the plant's sludge treatment facilities. Holding tank wastes, which are less concentrated than septage, are typically added directly to the aerated grit chambers, but due to ongoing construction these wastes are also currently being added to the septage wet well.

The aerated grit chamber effluent flows into the raw sewage pumping wet well at the Headworks Building, where two screw pumps lift the flow to the comminutor channels, where two comminutors shred rags and debris contained in the flow stream.

<sup>1</sup> NPDES Permit Application, Form 2A, Section A-4 at:2 (May 26, 2006). *But see id.* 301(h) Renewal Application Table 3 at 7 (listing total population served by WPCF in 2005 as 42,450).

Flow is then conveyed by gravity to two primary clarifiers. In 1993, chemically enhanced primary treatment (CEPT) using ferric chloride and polymer was implemented to improve the removal of oil and grease, BOD and TSS.

Clarifier effluent is metered using a Parshall flume and then discharged to two chlorine contact tanks for disinfection. The contact tank effluent is then de-chlorinated and routed to the effluent diversion structure where the 24-hour composite sampler is located. The original design concept was that plant effluent would flow by gravity through the diversion structure and into the outfall during low tides, while it would be diverted to the effluent pumping station for pumping during high tides. Currently, the plant effluent flows over a weir in the diversion structure to the effluent pumping station at all times. The effluent pumps transport the final effluent through the 36-inch diameter, 14,869-foot long outfall to a discharge point 5,250 feet offshore of Dog Bar Breakwater (Eastern Point) into Massachusetts Bay. The outfall is equipped with a multi-port diffuser located at a depth of 90 feet below mean low water. *See Figure B2 for the outfall location.*

#### Sludge treatment

Sludge treatment consists of two gravity thickeners followed by a belt filter press. Sludge is then trucked off site for disposal.

### C. ENFORCEMENT HISTORY AND COMPLIANCE SCHEDULES

#### Enforcement History

In April 1992, the United States, the Commonwealth of Massachusetts (“State”) and Gloucester entered into a Consent Decree that addressed numerous wastewater issues and required the City to proceed with CSO abatement planning. Implementation of the CSO control plan was delayed while direct sewage discharges in the North Gloucester area were addressed.

In September 2005, the United States, the State and Gloucester entered into a modified consent decree (“2005 MCD”) which included a CSO abatement schedule and a requirement to complete a supplemental environmental project that the State requested. The 2005 MCD superseded the April 1992 Consent Decree.

In addition to the 2005 MCD, from 2006 to the present, the State and the City have entered into a series of Administrative Consent Orders with proposed penalties (ACOP). ACOPs in 2006, 2007, 2008, and 2009 address dry-weather CSOs, permit effluent violations, bypasses of untreated wastewater at the treatment plant and sewage pump stations, and other issues.

The ACOP-NE-06-1N002, dated March 22, 2006, required the City to develop a Comprehensive Plant Evaluation (“CPE”), and to develop and implement an Emergency Response Plan (“ERP”) for the treatment plant, pump stations, and wastewater collection system.

Another Order, ACOP-NE-06-1N0008, dated February 9, 2007, superseded the above consent

order and required the City to develop and submit a revised ERP, and to submit and, upon approval, implement a final CPE.

Finally, ACOP-NE-07-1N021, dated May 28, 2007, required the City to develop plans and specifications for the treatment plant improvements recommended by the CPE, construct these improvements in accordance with the schedule contained in the ACOP, and design and construct an improved regulator structure at CSO Number 002.

The City has missed a number of the scheduled milestones contained in these orders.

### Compliance Schedules

The 2005 MCD contains a compliance schedule requiring the completion of certain CSO abatement projects by specified dates, including completion of the Washington Street Drain by September 2007, and completion of the Upper and Lower 002 areas by June 2009.

Construction of the Washington Street Drain was substantially completed on time, but its use was delayed due to a number of sanitary sewage sources tied into upstream storm drains. This resulted in delays in the 002 separation work. In particular, it remains for the City to accurately characterize all of the conditions that cause overflows, and to implement sufficient controls to prevent overflows during dry weather.

Finally, the 2005 MCD also required completion of sewer separation in the 005 area by June 2011, and in the 006 area by June 2012, with all CSO-related projects completed no later than the end of 2014. The City has proposed revisiting the 005 and 006 separation projects, which would delay their completion, but has committed to meeting the 2014 deadline for eliminating all CSOs.

## D. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

### 1. Overview of Federal Regulations

Under Section 301(b)(1)(B) of the CWA, 33 U.S.C. § 1311(b)(1)(B), POTWs are required to achieve effluent limitations based upon "secondary treatment" by July 1, 1977, unless granted a waiver pursuant to Section 301(h), 33 U.S.C. § 1311(h). Secondary treatment requirements are set forth at 40 C.F.R. Part 133.

In addition, under Section 301(b)(1)(C) of the CWA, 33 U.S.C. § 1311(b)(1)(C), a POTW must also comply with any more stringent requirement necessary to satisfy, among other things, state water quality standards applicable to the water body receiving the discharge. State water quality standards under the CWA consist of three elements: (1) the "designated uses" of the water body, such as for public water supply, recreation, propagation of fish, or aquaculture; (2) numeric and narrative "criteria" which specify, respectively, either the amount of particular pollutants authorized to occur in the water body or conditions that are allowed to occur in the water body; and (3) an antidegradation policy designed to protect existing uses and high quality waters. *See* 33 U.S.C. § 1313(c)(2)(A); 40 C.F.R. §§ 130.3, 130.10(d)(4), 131.6, 131.10, 131.11 and 131.12.

Under 40 C.F.R. §122.44(d)(1), discharges authorized by NPDES permits must satisfy limits needed to achieve water quality standards established under Section 303 of the CWA, including state narrative criteria for water quality. *See also* 40 C.F.R. § 122.4(d). Additionally, under 40 C.F.R. § 122.44(d)(1)(i), "[l]imitations 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." In determining whether a discharge causes, has the reasonable potential to cause, or contributes, to an in-stream excursion above a narrative or numeric criterion, EPA must 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. *Id.* § 122.44(d)(1)(ii).

In addition, the CWA's "anti-backsliding" provisions, *see* 33 U.S.C. §1342(o) and 40 C.F.R. § 122.44(l), generally preclude an NPDES permit from being renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit. The statute and regulations do, however, specify certain exceptions to the general anti-backsliding prohibition. *See* 33 U.S.C. § 1342(o)(2), 40 C.F.R. § 122.44(l)(2)(i).

## 2. Requirements of Massachusetts Water Quality Standards and Other State Laws

### Treatment Plant Outfall

The WPCF's outfall is located in Massachusetts Bay, which the Commonwealth has designated as a Class SA water, with a qualifier<sup>2</sup> of "shellfishing." 314 CMR § 4.06, Table 23. The MSWQS specify that SA waters are:

designated as an excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, excellent habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting without depuration (Approved and Conditionally Approved Shellfish Areas). These waters shall have excellent aesthetic value.

314 CMR 4.05(4)(a). The MSWQS also specify a variety of criteria applicable to SA waters, such as standards for dissolved oxygen, bacteria and other constituents or conditions. *See id.* *See also* 314 CMR 4.05(5).

Not only does the outfall of the WPCF discharge to SA waters, but the waters receiving the discharge also lie within the boundaries of the North Shore Ocean Sanctuary, as established by the Massachusetts Ocean Sanctuaries Act ("MOSA"). M.G.L. c. 132A § 12A, et seq. (2009).

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<sup>2</sup> Under the MSWQS, a qualifier "indicates special considerations and uses applicable to the segment that may affect the application of criteria or antidegradation provisions of 314 CMR 4.00." 314 CMR § 4.06(1)(d).

MOSA generally prohibits discharges of municipal wastes to ocean sanctuaries. *Id.* § 15(4). This prohibition does not, however, apply to the WPCF because the statute allows discharges to the North Shore Ocean Sanctuary from municipal wastewater treatment facilities whose construction commenced, or for which a construction grant was awarded, prior to 1978, and which also meet certain other conditions. *Id.* § 16.

### Combined Sewer Overflows

Gloucester's CSOs discharge to various locations in Gloucester Harbor, which the Commonwealth has designated as a Class SB water body, with qualifiers of "shellfishing" and "CSO." 314 CMR 4.06, Table 23. The MSWQS provide that Class SB waters:

... are designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas). These waters shall have consistently good aesthetic value.

314 CMR 4.05(4)(b). As with SA waters, there are a variety of numeric and narrative water quality criteria that apply to SB waters. These criteria are set forth in 314 CMR 4.05(4)(b) and (5). Waters with the CSO qualifier "are identified as impacted by the discharge of combined sewer overflows; however, a long term control plan has not been approved or fully implemented for the CSO discharges." 314 CMR 4.06(1)(d)(10). This means that there are remaining impacts from CSOs that are not yet resolved.

### 3. Water Quality Attainment

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In furtherance of 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. Section 303(d) of the statute requires states, territories, and authorized tribes to identify waters within their boundaries for which the CWA's technology-based and other controls are not stringent enough to implement the applicable water quality standards. 33 U.S.C. § 1313(d). For such waters, the state shall establish the total maximum daily load (TMDL) of particular pollutants necessary to implement applicable water quality standards. 33 U.S.C. § 1313(d)(1)(A), (C).

CWA Sections 305(b) and 314 require states, territories, and authorized tribes to provide biennial reports to EPA on the condition of waters within their boundaries. 33 U.S.C. §§ 1315(b), 1324. Since 2001, EPA has recommended that states, territories, and authorized tribes submit an "integrated report" that satisfies the requirements of Sections 305(b) and Section 303(d). [2002 Integrated Water Quality Monitoring and Assessment Report Guidance (Nov. 19, 2001).] States choosing this option may list each water body or segment in one of the following five categories:

- Category 1: All designated uses are supported, no use is threatened;  
 Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported;  
 Category 3: There is insufficient available data and/or information to make a use support determination;  
 Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed;  
 Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.

[Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d), 305(b), and 314 of the Clean Water Act at 47 (July 29, 2005).]

The Massachusetts Year 2008 Integrated List of Waters, Part 2, lists Gloucester Harbor (Segment MA93-18) as a Category 5 water (waters requiring a TMDL). The pollutants requiring a TMDL are: Combined Biota/Habitat Bioassessments, Dissolved oxygen saturation, and Fecal Coliform.

GLOUCESTER HARBOR (SEGMENT MA93-18) Use Summary<sup>3</sup>

Designated Uses		Status
Aquatic Life		<p><b>IMPAIRED</b> 0.25 mi<sup>2</sup> Inner Harbor            Causes: Degraded biota/habitat conditions, anoxic sediments (low DO)            Sources: Changes in ordinary stratification and bottom water hypoxia/anoxia, changes in tidal circulation/flushing, combined sewer overflows, discharges from municipal separate storm sewer systems (MS4), and dredging for navigational channels</p> <p>SUPPORT 2.07 mi<sup>2</sup> Outer Harbor</p>
Fish Consumption		NOT ASSESSED
Shellfish Harvesting		<p><b>IMPAIRED</b>            Causes: Elevated fecal coliform bacteria            Sources: Combined sewer overflows, discharges from municipal separate storm sewer systems (MS4)</p>
Primary Contact		<p>NOT ASSESSED 0.25 mi<sup>2</sup> Inner Harbor*            SUPPORT 2.07 mi<sup>2</sup> Outer Harbor*</p>
Secondary Contact		<p>NOT ASSESSED 0.25 mi<sup>2</sup> Inner Harbor*            SUPPORT 2.07 mi<sup>2</sup> Outer Harbor</p>
Aesthetics		<p>NOT ASSESSED 0.25 mi<sup>2</sup> Inner Harbor*            SUPPORT 2.07 mi<sup>2</sup> Outer Harbor</p>

<sup>3</sup> North Shore Coastal Watersheds, 2002 Water Quality Assessment report Prepared by: Massachusetts Department of Environmental Protection, Division of Watershed Management, Report Number: 93-AC-2, March 2007

The inner area of Gloucester Harbor is not assessed for the *Recreational* and *Aesthetics* uses. The outer Gloucester Harbor area is assessed as support for the *Primary Contact Recreational Use* since the four beaches were open for the majority of the three bathing seasons between 2002 and 2004. However, this use is identified with an Alert Status since one of the four beaches was posted for 20 days in 2004. This lengthy beach closure, combined with the presence of CSO and stormwater discharges into the harbor, are of concern.

The point of discharge for outfall 001 in Massachusetts Bay is outside the sphere of influence of other dischargers and significant non-point sources of pollution. EPA conducted a literature search of available water quality information for the segment of Mass. Bay in the area of the outfall, other than that required by the current permit. The biomonitoring conducted on behalf of Gloucester as required by the current permit is the most relevant data available. The EPA Region I Administrator's tentative decision to deny continuance of the waiver from secondary treatment, details non-attainment of water quality criteria for whole effluent toxicity, oil and grease, total petroleum hydrocarbons, and bacteria.

#### 4. Effluent Limitations Derivation

Flow - The flow limit in the currently effective permit is 5.15 mgd, calculated as a 12-month rolling average. Although the City had reported in previous permit applications that the design flow of the facility was 7.24 MGD, the lower flow was maintained in the permit pursuant to CWA 301(h)(8) and 40 CFR Part 125.67, which prohibit new or substantially increased discharges of pollutants above those specified in the permit.

If, as proposed, the 301(h) waiver application is denied, then the permittee will need to make major changes to the WPCF to achieve secondary treatment. The new construction would afford the permittee an opportunity to increase the permitted flow from 5.15 mgd to match the primary design flow of 7.24. *See* 40 CFR §122.45(b)(i). The permitted flow limit has therefore been increased to 7.24 mgd, the design flow of the existing facility according to the Permit Application Form 2A, Part A, 4.6.

The draft permit includes a condition that the flow limit for the discharge will remain at 5.15 MGD until such time as a flow increase to 7.24 MGD is: 1) deemed appropriate by a state antidegradation review, 314 CMR 4.04, 2) is supported by a comprehensive wastewater management plan (CWMP), 301 CMR 11.00, 3) is supported by a Massachusetts Environmental Policy Act (MEPA) review, M.G.L. c. 30 § 61, *et seq.*, and 4) the City has obtained a Massachusetts Ocean Sanctuaries Act variance authorizing the increased discharge, M.G.L. c. 132A § 12A, *et seq.* 5) and the City has completed construction of the secondary facilities.

As explained in Section VII (Antidegradation) of this Fact Sheet, even with an increase in the facility's flow, the change from primary to secondary treatment will result in an overall decrease of pollutants discharged, therefore satisfying antidegradation requirements.

Flow is to be measured continuously. The permittee shall report the annual average monthly flow using the 12-month rolling average method (*See* Permit Footnote 2). The average monthly and maximum daily flows are also required to be reported.

### Available Dilution

The Gloucester outfall is equipped with a diffuser to enhance dilution of the effluent. The diffuser is made up of 10 vertical risers evenly spaced over the last 61 meters (200 ft) of the outfall pipe. Prior to installation of the diffuser, the City's consultant, Tetra Tech, Inc., produced a draft report entitled "Evaluation of the City of Gloucester Initial Dilutions for Proposed 1995 Flows and Effluent Characteristics and Modified Outfall Design", (November 1989). The report discussed dilution modeling performed using UMERGE and ULINE. No models runs were made at the actual design flow of the treatment facility (7.24 mgd) However, a flow of 7.24 falls between the wet and dry weather flows of 6.3 mgd and 10 mgd, which predicted dilution ratios of 65:1 and 59:1 respectively. For this Fact Sheet a dilution ratio of 64:1 has been used, which is the interpolated value between the two flow scenarios.

### Oil and Grease and Total Petroleum Hydrocarbons (TPH)

#### *Background*

The term "oil and grease" refers to a group of pollutants consisting of extractable materials made up of relatively non-volatile hydrocarbons, vegetable oils, animal fats, waxes, soaps, greases, and related materials. Oil and grease may produce a visible sheen on water at a concentration of 15 mg/l.<sup>4</sup> At higher concentrations, oil and grease also can suffocate fish larvae and coat the gills of fish. In addition, petroleum compounds found in oil and grease can exhibit toxicity at concentrations as low as 1 ug/l. At concentrations as low as 1-10 ug/l, petroleum may cause tainting of oysters and other shellfish. "Total petroleum hydrocarbons" (TPH), is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil.

#### *History*

Prior to 1991, Gloucester discharged to Gloucester Harbor, which is a Class SB water. 314 CMR 4.06, Table 23. The average monthly oil and grease limit of 15 mg/l in the 1985 permit was, therefore, based on the narrative criterion for Class SB waters, which provides that "[t]hese waters 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." 314 CMR 4.05(b)(7). In 1991, the WPCF's outfall was extended to its current location in Massachusetts Bay, thereby making the Class SA standard for oil and grease applicable to the discharge. The MSWQS provide that Class SA waters, "...shall be free from oil and grease and petrochemicals." 314 CMR § 4.05(4)(a)(7).

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<sup>4</sup> Quality Criteria for Water, 1986, EPA 440/5-86-001

When the WPCF's permit was renewed in 2001, monitoring data indicated that, "most of the oil & grease in the discharge is in the form of food based oils and grease and a small portion is attributable to total petroleum hydrocarbons (TPH)." Response to Public Comments for Final NPDES Permit for WPCF at (Page) 4, comment No. 8 (Aug. 2001). Based on this information, the limit for oil and grease in the permit was increased to an average monthly concentration of 25 mg/l (inappropriately for Class SA waters), and an average monthly limit on TPH of 5.0 mg/L was added to the permit. *Id.*

More recent monitoring data for oil and grease and TPH show that the WPCF's discharge has consistently met the 25 mg/l limit monthly average oil and grease limit, but has violated the 5 mg/l TPH limit nine times out of the last 48 sampling events (see following table with violations in bold). This data, produced using new test methods, indicates that the original assumption behind the 25 mg/l permit limit for oil and grease was incorrect and that the WPCF's effluent contains more petroleum than was in evidence when the oil and grease limit was increased to 25 mg/l.<sup>5</sup>

Discharge Monitoring Report Data					
Date	TPH (mg/l)	O & G (mg/l)	Date	TPH (mg/l)	O & G (mg/l)
1/31/2006	<b>7.5*</b>	<b>10.0</b>	1/31/2008	0.5	<b>9.0</b>
2/28/2006	<b>9.8</b>	<b>14.1</b>	2/29/2008	0.0	<b>11.</b>
3/31/2006	<b>6.5</b>	<b>23.0</b>	3/31/2008	5.0	<b>8.0</b>
4/30/2006	<b>6.4</b>	<b>17.0</b>	4/30/2008	1.4	<b>8.0</b>
5/31/2006	0.8	<b>11.0</b>	5/31/2008	1.6	<b>10.0</b>
6/30/2006	<b>5.2</b>	<b>11.0</b>	6/30/2008	0.9	<b>10.0</b>
7/31/2006	0.8	<b>18.0</b>	7/31/2008	1.4	<b>10.9</b>
8/31/2006	3.5	<b>24.0</b>	8/31/2008	2.6	<b>9.7</b>
9/30/2006	5.0	<b>21.7</b>	9/30/2008	2.0	<b>9.2</b>
10/31/2006	4.8	<b>21.6</b>	10/31/2008	0.7	<b>8.4</b>
11/30/2006	<b>7.3</b>	<b>10.0</b>	11/30/2008	2.3	<b>9.4</b>
12/31/2006	4.9	<b>14.0</b>	12/31/2008	1.2	<b>8.6</b>
1/31/2007	3.8	<b>12.0</b>	1/31/2009	1.8	<b>14.</b>
2/28/2007	<b>6.5</b>	<b>24.8</b>	2/28/2009	<b>6.8</b>	<b>14.5</b>
3/31/2007	<b>9.1</b>	<b>13.</b>	3/31/2009	3.6	<b>16.5</b>
4/30/2007	1.1	<b>12.0</b>	4/30/2009	1.0	<b>8.6</b>
5/31/2007	0.0	<b>10.0</b>	5/31/2009	1.6	<b>7.5</b>
6/30/2007	1.4	<b>9.0</b>	6/30/2009	2.3	<b>7.4</b>
7/31/2007	0.7	<b>8.0</b>	7/31/2009	2.6	<b>10.8</b>

<sup>5</sup> The discrepancy between the 2000 monitoring data and the subsequent Discharge Monitoring Report data may be due in part to a change in test methods. Prior to 2001, the permittee employed EPA test methods 413.2 and 418.1, both of which employ the ozone-depleting substance CFC-113 as the extraction solvent. However, in 1999 EPA approved an alternative method for oil and grease analysis, EPA Method 1664A, to reduce dependency on CFC-113 (Method 1664A uses n-hexane as an extraction solvent). 64 FR 26315 (May 14, 1999). The 2001 Permit, therefore required use of Method 1664 for the oil and grease analysis. 2001 Permit, footnote 5. Method 1664 is more efficient for measuring low volatility petroleum oil than EPA method 413.2, so the apparent increase in TPH may be at least partially due to the change in test methods.

8/31/2007	5.0	<b>16.0</b>	8/31/2009	1.4	<b>7.3</b>
9/30/2007	1.2	<b>9.8</b>	9/30/2009	2.4	<b>12.4</b>
10/31/2007	3.9	<b>11.2</b>	10/31/2009	2.6	<b>17.4</b>
11/30/2007	1.1	<b>11.7</b>	11/30/2009	1.0	<b>19.8</b>
12/31/2007	2.1	<b>10.0</b>	12/31/2009	3.8	<b>20.2</b>

\*TPH and oil and grease concentration data in bold exceeds the draft compliance ML of 5.0 mg/l.

### Limit Derivation

As noted above, the MSWQS require that Class SA waters, “. . . be free from oil and grease and petrochemicals.” 314 CMR § 4.05(4)(a)(7). EPA interprets this narrative criterion to require that there shall be no measurable oil and grease present in the receiving waters.

The Discharge Monitoring Report data shown in the table above demonstrate that the treatment plant discharge contains measurable quantities of oil and grease and, therefore, has the reasonable potential to exceed the “free from oil and grease and petrochemicals” criterion. 40 C.F.R. § 122.44(d)(1)(i)&(ii).

In order to ensure compliance with this criterion, the draft permit requires that the permittee have no detectable discharge of oil and grease or TPH. Compliance shall be measured at the minimum level (of detection) for the EPA approved test methods. See EPA Technical Support Document For Water Quality-Based Toxics Control, EPA/505/2-90-001, (March 1991) at 111 (“For most NPDES permitting situations EPA recommends that the compliance level be defined in the permit as the minimum level (ML)”) The ML is the lowest point on the curve used to calibrate the test equipment for the pollutant of concern. *Id.* The oil and grease and TPH ML is 5 mg/l using EPA Method 1664A. 64 Fed. Reg. 26315, 26322 (May 14, 1999).

Both oil and grease and TPH shall be tested using EPA Method 1664A (Standard Method 5520 B). If EPA approves methods under 40 CFR Part 136 for either, oil and grease or TPH that have a ML lower than 5 mg/l, the permittee is required to use the improved method.

### OUTFALL 001 - CONVENTIONAL POLLUTANTS

Biochemical Oxygen Demand (BOD<sub>5</sub>) and Total Suspended Solids (TSS) - POTWs that are not granted variances pursuant to 301(h) of the CWA are subject to the secondary treatment requirements set forth at 40 CFR 133. For both BOD<sub>5</sub> and TSS, the minimum level of effluent quality that must be attained by secondary treatment is defined as an average monthly concentration of 30 mg/l, an average weekly concentration of 45 mg/l, and a 30-day average percent removal of not less than 85%. 40 CFR § 133.102. The draft permit contains concentration limits consistent with these values. In addition, the draft permit also contains average monthly and average weekly BOD<sub>5</sub> and TSS mass limits (lbs per day), as required by CFR 122.45(f). These mass limits are based on the 7.24 mgd design flow, and were calculated using the following equation:

$$L = C \times PF \times 8.34:$$

- L = Maximum allowable load in lbs/day.
- C = Maximum allowable effluent concentration for reporting period in mg/l.  
 Reporting periods are average monthly and weekly and daily maximum.
- PF = Permitted flow of facility in mgd.
- 8.34 = Factor to convert effluent concentration in mg/l and design flow in mgd to lbs/day.

(Concentration limit) [45] X 8.34 (Constant) X 7.24 (Permitted flow) = 2717 lbs/day

(Concentration limit) [30] X 8.34 (Constant) X 7.24 (Permitted flow) = 1811 lbs/day

Although the draft permit authorizes an increase in the discharge flow limit, the significant reduction in the concentration limits for BOD<sub>5</sub> and TSS due to the denial of the 301(h) waiver will result in an overall reduction in the discharge of these pollutants. As shown in the table below, the authorized monthly average mass discharge of BOD<sub>5</sub> and TSS will be reduced by 83 percent and 70 percent, respectively.

Parameter	Primary Treatment at 5.15 mgd		Secondary Treatment at 7.24 mgd		Concentration Reduction (Percent)	Mass Reduction (Percent)
	Average Monthly (mg/l)	Average Monthly (lbs/day)	Average Monthly (mg/l)	Average Monthly (lbs/day)		
BOD <sub>5</sub>	245	10,520	30	1811	88	83
TSS	140	6,010	30	1811	79	70

**pH** - The draft permit includes a minimum pH limit of 6.5 and a maximum limit of 8.5 standards units. These limits are based on the water quality criteria for Class SA waters set forth in the MSWQS (314 CMR 4.05(4)(a)(3)) which state that:

*pH shall be in the range of 6.5 through 8.5 standard units and not more than 0.2 standard units outside of the natural background range. There shall be no change from natural background conditions that would impair any use assigned to this Class.*

These pH requirements are more stringent than those required on a technology basis under 40 C.F.R. 133.102(c).

**Fecal Coliform Bacteria** - The MSWQS (314 CMR § 4.05(4)(a)(4)) require that in SA waters designated for shellfishing:

... fecal coliform shall not exceed a geometric mean Most Probable Number (MPN) of 14 organisms per 100 ml, nor shall more than 10% of the samples exceed a MPN of 28 per 100 ml, or other values of equivalent protection based on sampling and analytical methods used by the Massachusetts Division of Marine Fisheries and approved by the National Shellfish Sanitation Program in the latest revision of the *Guide for the Control of Molluscan Shellfish*.

Historically, MassDEP has required that bacteria limits be applied “end-of-pipe” (*i.e.*, at the point of discharge) with no allowance for dilution. In addition, the Massachusetts Surface Water Quality Standards Implementation Policy for Mixing Zones (1993) prohibits the use of mixing zones in shellfish harvest waters, “unless it is affirmatively demonstrated that the mixing zone does not encompass important shellfish harvest areas and will not adversely diminish the established population of shellfish in the segment.” Such a demonstration has not been made here.

Further support for exercising caution when considering the possibility of a mixing zone for bacteria is found in a November 12, 2008, memorandum prepared by EPA’s Office of Science and Technology regarding initial zones of dilution for bacteria in rivers and streams designated for primary contact recreation. The memorandum concluded that “...we cannot envision a circumstance where discharges that elevate bacteria levels beyond criteria can be viewed as protective of the primary recreation use in fresh flowing waters like rivers and streams.”<sup>6</sup> While this conclusion was with regard to mixing zones in fresh water, the principles on which it was based – that people recreating in, or downstream of, a zone of initial dilution in which criteria for bacteria are exceeded will be exposed to greater risk of acute gastrointestinal illness—is also applicable to marine waters.

Therefore, in order to ensure compliance with water quality standards, the proposed limits in the draft permit are 14 colony forming units (CFU)/100 ml for the average monthly (geometric mean) limit and 28 CFU/100 ml for the maximum daily limit.

The permit allows the use of approved analytical methods that measure either CFU (membrane filter methods) or most probable number MPN (most probable number methods).<sup>7</sup> Sampling is required three times per week.

Enterococci Bacteria - In 2006, MassDEP revised the bacteria criteria for coastal and inland waters designated for primary contact recreation from a fecal coliform-based standard to an enterococci-based standard. The current MSWQS for Class SA Waters provide that:

at bathing beaches as defined by the Massachusetts Department of Public Health in 105 CMR 445.010, no single enterococci sample taken during the bathing season shall exceed 104 colonies per 100 ml, and the geometric mean of the five most recent samples taken within the same bathing season shall not exceed a geometric mean of 35 enterococci colonies per 100 ml.

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<sup>6</sup> Ephraim S. King, Director, Office of Science and Technology, U.S. EPA Memo to Walter Spratlin, Director, Water, Wetlands and Pesticides, U.S. EPA, RE: Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation, November 12, 2008, p 2.

<sup>7</sup> Under the CFU method, coliform colonies are grown on filter paper that is used to strain effluent. The method provides a direct visual measure of coliform counts. Under the MPN method, gasses expelled by coliform colonies are collected in fermentation tubes. The number of tubes testing positively (gas is collected) or negatively (no gas is collected) is interpreted statistically to yield the most probable number.

In non bathing beach waters and bathing beach waters during the non bathing season, no single enterococci sample shall exceed 104 colonies per 100 ml and the geometric mean of all samples taken within the most recent six months typically based on a minimum of five samples shall not exceed 35 enterococci colonies per 100 ml.

314 CMR 4.05(4)(a)(4). Massachusetts Department of Public Health regulations provide that "Bathing Beach means the land where access to the bathing water is provided" and "Bathing Water means fresh or salt water adjacent to any public bathing beach or semi- public bathing beach at the location where it is used for bathing and swimming purposes." 105 CMR 445.010.

The WPCF outfall lies offshore and is not considered adjacent to a bathing beach. Therefore, it is subject to the "non bathing beach limits" for enterococci.

MassDEP views the use of the 90% upper confidence level (lightly used full body contact recreation) of 276 cfu/100ml as appropriate for setting the maximum daily limit for enterococci in the draft permit.

Therefore, EPA has established monthly average (geometric mean) effluent limit of 35 cfu/100ml and daily maximum effluent limit of 276 cfu/100ml for enterococci in the draft permit in order to ensure that the discharge does not cause or contribute to exceedances of Massachusetts Surface Water Quality Standards found at 314 CMR 4.05 (4)(a)(4)(b).

The draft permit also includes a requirement that the enterococci samples shall be taken at the same time as the daily total residual chlorine sample is collected. Sampling is required three times per week.

#### OUTFALL 001 - NON-CONVENTIONAL POLLUTANTS

Total Residual Chlorine (TRC) - Chlorine and chlorine compounds produced by the chlorination of wastewater can be toxic to aquatic life. In the MSWQS, 314 CMR 4.05(5)(e), MassDEP has adopted the numeric aquatic life criteria for total residual chlorine (TRC) of 7.5 ug/l (chronic) and 13 ug/l (acute) that EPA recommends in *National Recommended Water Quality Criteria: 2002* ("2002 NRWQC") at 22, The following are calculations of water quality based chlorine limits:

Acute Chlorine Salt Water Criteria = 13 ug/l

Chronic Chlorine Salt Water Criteria = 7.5 ug/l

(acute criteria \* dilution factor) = Acute (Maximum Daily)  
 $13 \text{ ug/l} \times 64 = 832 \text{ ug/l}/1000 = \mathbf{0.83 \text{ mg/l Maximum Daily}}$ .

(chronic criteria \* dilution factor) = Chronic (Average Monthly)  
 $7.5 \text{ ug/l} \times 64 = 480 \text{ ug/l} / 1 \times 1000 = \mathbf{0.48 \text{ mg/l Average Monthly}}$

Prior to the treatment plant initiating dechlorination, the 14,869 foot outfall provided additional disinfection contact time. Because Gloucester samples for TRC prior to the effluent entering the outfall, the current permit allows the sample to be held for a period of time equivalent to the travel time in the outfall before it must be analyzed. The permittee calculated the time of travel of the effluent through the outfall at various flows. At the outfall maximum flow rate of 15 mgd, the time of travel is 80 minutes, therefore, the current permit allows for a maximum TRC sample holding time of 80 minutes.

The draft permit requires the permittee to reduce the holding time of TRC samples to 15 minutes. See 40 CFR §136.3 (Table II). Gloucester now uses sulfite to dechlorinate the effluent prior to it entering the outfall pipe. The reaction of the sulfite dechlorinating agent is almost instantaneous. If the sulfite dosing is correct, all chlorine will be neutralized and there will be little if any detectable TRC after 15 minutes. The additional holding time beyond 15 minutes is no longer necessary. The frequency of TRC sampling remains 3 times per day.

The permittee is required to have an alarm system to warn of a chlorination system malfunction. This is a best management practice (BMP), and is being required under authority of 40 CFR § 122.44(k)(4).

Priority Pollutant Scan - The current permit requires an annual priority pollutant scan for 126 parameters. A review of past scans demonstrates an absence of reasonable potential for the priority pollutants to cause or contribute to an exceedance of state water quality criteria. Based on an absence of "reasonable potential", the current annual priority pollutant scan requirement is not carried forward in the draft permit.

Biological and Receiving Water Quality Monitoring - POTWs with a waiver from secondary treatment requirements under CWA § 301(h) are required to conduct biological and receiving water quality monitoring under 40 CFR §125.63(b) and 40 CFR §125.63(c), respectively. Past biological and receiving water quality monitoring data does not indicate any significant changes to the biota outside the zone of initial dilution. With the required upgrade to secondary treatment, these monitoring requirements need not continue. As a result, the draft permit does not require ambient biological or water quality monitoring.

Whole Effluent Toxicity - National studies conducted by the EPA have demonstrated that industrial and domestic sources contribute toxic constituents, such as metals, chlorinated solvents, aromatic hydrocarbons, and others, to POTWs. The impacts of such complex mixtures are often difficult to assess. Therefore, the overall or combined toxicity of several constituents in a single effluent can only be accurately examined by whole effluent toxicity (WET) testing.

Furthermore, 40 CFR 122.44(d) requires WET limits in NPDES permits when the permittee has a "reasonable potential" to cause an excursion above the applicable water quality standard(s) for toxicity. In this case, the MSWQS contain a narrative toxicity criterion which states that "[a]ll surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife." 314 CMR 4.05(5)(e). WET testing can be used to determine compliance with this water quality criterion.

EPA's *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, March 1991, recommends using an "integrated strategy" containing toxicity testing on both a pollutant-specific (chemical) basis and a whole effluent (biological) basis. EPA-New England adopted this "integrated strategy" on July 1, 1991.

These approaches are designed to protect aquatic life and human health. Pollutant-specific approaches such as those in the Gold Book and State regulations assess the effects of individual chemicals, whereas the WET testing approach evaluates the interactions between the various pollutants in a particular effluent, thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. In other words, WET testing can reveal the additive, antagonistic, and/or synergistic effects of combining various pollutants in an effluent. In addition, WET testing can reveal the presence of previously unidentified toxic pollutants. Pollutant-specific analysis does not provide these benefits. As a result, both approaches to toxicity testing are needed.

The WPCF's current permit requires quarterly two-species WET testing. The WPCF conducted 46 WET tests (23 for each test organism) during the period of December 1, 2003 through December 31, 2009. The effluent exceeded the end-of-pipe WET limit of 1 toxicity unit (TU)<sup>8</sup> in 20 out of 23 tests for Inland Silverside, and 17 out of 23 tests for Mysid Shrimp. On average, the facility's WET levels were 3.5 TU (26 % effluent) for Inland Silverside and 1.9 TU (53 percent effluent) for Mysid Shrimp during this time. These results show that the WPCF's current discharge has a reasonable potential to violate the State's narrative toxicity criterion.

The WET limit in the current permit and in the draft permit is based on MassDEP's "Implementation Policy for the Control of Toxic Pollutants in Surface Waters", February 23, 1990. This policy requires LC50 effluent limitations of 1 TU<sup>9</sup> for discharges with dilution factors between 20 and 100 and also requires a sampling frequency of 4 tests per year. Since the estimated dilution provided for the WPCF's discharge is 64:1, the draft permit includes an LC 50 limits of 100 percent and requires the permittee to conduct four acute WET tests per year. The tests use two aquatic species, mysid shrimp (*Mysidopsis bahia* or *Americamysis bahia*) and inland silverside (*Menidia beryllina*) in a definitive 48-hour test. The tests must be performed in accordance with the test procedures and protocols specified in **Permit Attachment A**. Results of these toxicity tests will demonstrate whether the discharge is complying with the toxicity-related provisions of the CWA and State Water Quality Standards.

The draft permit requires WET testing to be conducted four times a year, but after submitting a minimum of four consecutive, valid WET tests, all of which demonstrate compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to EPA and MassDEP seeking a reduction (though not the elimination) of WET testing. In response, EPA and MassDEP will review the test results and other pertinent information and then make a determination.

The permittee is required to continue testing at the frequency specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA

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<sup>8</sup> A toxicity unit (TU) is calculated by dividing 100 by the LC50 expressed as percent effluent. Therefore, one TU is equal to an LC50 of 100 percent effluent.

indicating a change in the permit conditions. See Draft Permit Part I.A.1 footnote 9. This special condition does not negate the permittee's right to request a permit modification at any time prior to the permit expiration.

## V. INDUSTRIAL PRETREATMENT PROGRAM

The permittee is required to administer a pretreatment program based on the requirements of 40 CFR §122.44(j), 40 CFR §403 and CWA Section 307. The Gloucester pretreatment program received EPA approval on December 10, 1983, and as a result, appropriate pretreatment program requirements were incorporated into the previous permit commensurate with that approval and Federal Pretreatment Regulations in effect when the permit was issued.

The draft permit also requires the permittee to provide to EPA in writing, **within 120 days of the permittee's effective date**, a technical report analyzing the adequacy of existing local limits and whether any additional local limits are needed.

In addition, the permittee is required to develop and submit to EPA a Maximum Allowable Industrial Headworks Loading (MAIHL) for Oil and Grease **within 120 days of the effective date of the permit**.

The City shall also operate a "fats, oil, and grease" (FOG) program as a portion of the pretreatment program. FOG programs educate private and commercial sewer users about practices to eliminate fats, oils and grease at the source, rather than introducing FOG to the collection system. Local ordinances may require the utilization of grease interception devices at all commercial food service operations. It is important that the levels of fats, oil and grease being conveyed to a sewage treatment plant be properly controlled. At the treatment works, grease can partially block the screens and may affect the scum draw-off systems. Moreover, in the secondary treatment phase, grease can accumulate into grease balls that appear in the secondary clarifier. If a large amount of grease is present in the final sludge, it could foul sludge pumps and pipe work, place a shock load on sludge digesting microorganisms, and reduce the overall efficiency of the digestion process resulting in lower quality effluent discharges from the treatment plant. The FOG program is required as a Best Management Practice (BMP) under 40 CFR § 122.44(k)(4).

The permittee must submit to EPA all required modifications in order to be consistent with the provisions of the October 14, 2005 promulgation of the Streamlining Rule

The permittee must continue to submit, **annually on March 1**, a pretreatment report detailing the activities of the program for the twelve month period ending 60 days prior to the due date.

## **VI. CONDITIONS ADDRESSING THE SEWER SYSTEM**

As described above, an extensive sewer system collects sewage from Gloucester and parts of Essex and Rockport and conveys it for treatment to the WPCF. As also described above, the sewer system largely consists of "separate sewers," but also includes some "combined sewers."

Separate sewer systems are intended only to carry wastewater (sanitary and commercial/industrial) and are kept separate from the sewers carrying stormwater, whereas sewers in a combined system carry both wastewater and stormwater.

One problem posed by combined sewer systems is that when it rains, they must suddenly carry larger (and sometimes much larger) flows made up of mixed stormwater and wastewater. Combined systems are typically designed with overflow points (i.e., "combined sewer overflows" or CSOs) to discharge the mixed stormwater/wastewater when the flow in the system exceeds its hydraulic capacity. In this regard, combined systems are intended to have overflow discharges during wet weather. Combined systems may also in some cases experience dry weather overflows. Dry weather overflows are not, in theory, intended. In either case, whether a dry weather or a wet weather CSO discharge, some portion of the wastewater does not receive treatment at the sewage treatment plant.

Such discharges of stormwater/wastewater to waterways can harm the environment and public health and lead to related problems, such as shellfish bed closures and beach closures. As indicated above, the Gloucester sewer system has five designated CSOs.

Sanitary systems should theoretically avoid the problem of overflows because they are typically designed to carry the full volume of wastewater (and only wastewater) produced by the system to the treatment plant. That said, sanitary systems can also have overflows ("sanitary system overflows" or SSOs) under certain circumstances. As with CSOs, the wastewater in an SSO discharge is not treated at the sewage treatment plant and can harm the environment and public health.

For both combined and sanitary sewer systems, if water is allowed to enter the system that the system was not designed to handle, the increased volume of water could cause CSOs or SSOs. Alternatively, it could cause backups in the sewer systems. Moreover, even if the larger volumes of water in the system are all conveyed to the sewage treatment plant, the excess influent could undermine the effectiveness of the treatment plant and cause violations of effluent limits.

The draft permit contains a number of conditions pertaining to the sewer system generally, and to CSOs and SSOs, in particular. In general, these conditions are intended to protect the environment and public health by minimizing wastewater discharges as a result of CSOs and SSOs and, as a result, maximizing the proportion of the system's wastewater that is conveyed to the WPCF for treatment and discharge. These sewer system-related conditions are discussed in the next section.

### Sewer System Operation and Maintenance

EPA regulations set forth a standard condition for "Proper Operation and Maintenance" that is included in all NPDES permits. *See* 40 CFR § 122.41(e). This condition is specified in Part II.B.1 (General Conditions) of the draft permit and it requires the proper operation and maintenance of all wastewater treatment systems and related facilities installed or used to achieve permit conditions.

EPA regulations also specify a standard condition to be included in all NPDES permits that specifically imposes on permittees a "duty to mitigate." *See* 40 CFR § 122.41(d). This condition is specified in Part II.B.3 of the draft permit and it requires permittees to take all reasonable steps – which in some cases may include operations and maintenance work - to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment.

More specifically, the draft permit includes requirements for the permittee to properly operate and maintain its collection system, including control of infiltration and inflow<sup>10</sup> (I/I) in its separate sewer system. These requirements are intended to minimize the occurrence of permit violations with a reasonable likelihood of adversely affecting human health or the environment.

I/I in a collection system can pose a significant environmental problem because it may displace wastewater flow and thereby cause, or contribute to causing, CSOs and SSOs. Moreover, I/I could reduce the capacity and efficiency of the treatment works and cause bypasses of secondary treatment. Therefore, reducing I/I should help to minimize any CSOs and SSOs and maximize the flow receiving proper treatment at the treatment plant.

There is presently estimated to be approximately 2,780,000 gpd of (I/I) in the sewer system.<sup>11</sup> This I/I is largely attributable to the combined portion of the collection system.

Gloucester's draft permit requires, through appropriate agreements that the towns of Essex and Rockport develop and implement infiltration and inflow control plans sufficient to ensure that high flows in separate sewers do not cause or contribute to a violation of the Gloucester effluent limitations, or cause overflows from Gloucester's collection system.

MassDEP has stated that the inclusion in NPDES permits of I/I control conditions is a standard State Certification requirement under Section 401 of the CWA and 40 CFR § 124.55(b).

### Combined Sewer Requirements

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<sup>10</sup> "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 stormwater systems.

<sup>11</sup> Page 7, May 26, 2006 Permit Application

As discussed previously, CSOs are overflows from a combined sewer system that are discharged into receiving waters before reaching the headworks of a POTW. CSOs typically occur during precipitation events when the flow in the combined sewer system exceeds interceptor or regulator capacity. CSOs are distinguished from bypasses, which are “intentional diversions of waste streams from any portion of a treatment facility” (40 CFR 122.41(m)). Flows in combined sewers can be classified as dry weather flow or wet weather flow. Dry weather flow is made up of domestic, commercial, and industrial wastewater and groundwater infiltration with no contribution from stormwater runoff or stormwater-induced infiltration, whereas wet weather flow includes wastewater from all these sources and stormwater flow, including snowmelt.

CSOs are subject to the non-POTW technology-based effluent standard specified at Section 301(b)(1)(A) of the Clean Water Act, rather than the POTW technology-based requirements found in Section 301(b)(1)(B). *See* Combined Sewer Overflow (CSO) Control Policy, 59 FR 18688, 18689 (Apr. 19, 1994) (“CSO Policy”). In accordance with Section 301(b)(1)(C) of the CWA, CSOs are also subject to any more stringent requirements necessary to comply with water quality standards. *Id.*

EPA’s CSO Policy includes the following goals:

- To ensure that CSO discharges occur, if at all, only as a result of wet weather;
- To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the CWA and applicable federal and state water quality standards; and
- To minimize adverse impacts to water quality, aquatic biota, and human health from wet weather flows.

59 FR at 18689. To achieve these goals, the CSO Policy recommends that technology-based limitations be developed using best professional judgment (BPJ) and further recommends that permit limitations consist of at least the following nine minimum requirements:

1. Properly operate, and implement a regular maintenance program for, the sewer system and the CSOs;
2. Maximize use of the collection system for storage of combined flows;
3. Review and, as needed, modify pretreatment requirements to assure CSO impacts are minimized;
4. Maximize the flow conveyed to the POTW for treatment;
5. Prohibit CSOs during dry weather;
6. Control solid and floatable material in CSOs;
7. Implement a pollution prevention program;
8. Notify the public of CSO occurrences and their impacts; and
9. Implement a monitoring program to effectively characterize CSO impacts and the efficacy of CSO control.

The CSO Policy also recommends that combined sewer systems develop and implement long-term CSO control plans that will ultimately produce compliance with CWA requirements.

In 2001, Congress added Section 402(q) to the CWA to specifically address CSOs by stating that “Each permit, order, or decree issued pursuant to this Act after the date of enactment of this subsection for a discharge from a municipal combined storm and sanitary sewer shall conform to the Combined Sewer Overflow Control Policy signed by the Administrator on April 11, 1994.”

The technology-based CSO conditions in the draft permit, which require, among other things, that the permittee continue to implement the Nine Minimum Controls and to comply with water quality standards, are consistent with the National CSO Control Policy, as well as with the 2005 MCD. Specific permit requirements related to the nine minimum controls are that Gloucester submit to EPA and MassDEP an updated High Flow Management Plan within **one year of the effective date of the permit**, a prohibition of dry weather discharges from CSOs.

The draft permit requires the permittee to submit an annual report, **by March 1**, summarizing its implementation of the nine minimum controls during the previous calendar year. This report shall include:

- A summary of any dry weather overflows that occurred during the year, including the location, date, estimated duration and estimated flow volume, and a description of measures taken to stop and eliminate the dry weather overflows.
- A summary of CSO activations that occurred at each CSO during the year, including the date, estimated duration and estimated flow volume.
- A certification that the previous year’s inspections have been conducted and records maintained.

As also mentioned above, the I/I reduction requirements in the permit for separate systems should also help to minimize CSO discharges.

The draft permit also establishes narrative water quality-based limitations for CSOs, requiring that CSO discharges shall not cause or contribute to exceedances of water quality standards.

As detailed above, since 1992, EPA and/or MassDEP have entered into a number of enforcement settlement agreements with the City of Gloucester that called for the City to take steps to plan for and undertake CSO abatement projects. In September of 1996, the permittee submitted documentation for the Nine Minimum Controls. In addition, as discussed above, the permittee is also currently subject to a September 2005, Modified Consent Decree (2005 MCD) that requires the City to implement a number of CSO abatement measures. The abatement measures consists of sewer separation projects, which will significantly reduce flows to the treatment plant during wet weather.

### Separate Sewer Requirements

As described above, part of the sewer system that conveys wastewater to the WPCF is made up of separate sewers. This includes parts of Gloucester’s sewer system as well as the portions of the Essex and Rockport sewer systems that contribute wastewater to the WPCF.

As explained above, one potential cause of SSOs is I/I to a separate sewer system. The I/I control provisions of the permit discussed above are intended to, among other things, help minimize or eliminate all SSOs. Furthermore, the draft permit expressly does not authorize any SSO discharges.

## **VII. UNAUTHORIZED DISCHARGES and BYPASSES**

The draft permit prohibits unauthorized discharges and bypasses (i.e. intentional diversion of waste streams from any portion of the treatment facility) and requires that any such discharges be reported to EPA and MassDEP within 24 hours.

## **VIII. SLUDGE INFORMATION AND REQUIREMENTS**

The Gloucester WPCF produces approximately 3032 dry metric tons of sewage sludge each year. The facility's sludge treatment processes include two gravity thickeners and a belt filter press. Sludge currently processed by the treatment plant includes: primary sludge from the treatment plant's primary clarifiers and sludge trucked to the plant, including STEP (septic tank effluent pump) septage, general septage and industrial sludge. The treatment plant also has a septage wet well for receiving and storing trucked sludges, and a sludge storage tank for storing thickened sludge prior to dewatering. Dewatered sludge is currently trucked off-site to New England Organics in Unity, Maine, where it is blended with sawdust, pasteurized and prepared as compost.

Pursuant to section 405(d) of the CWA, EPA developed technical regulations governing the use and disposal of sewage sludge. These regulations are found at 40 CFR Part 503 (the Part 503 Regulations) and apply to any facility engaged in the treatment of domestic sewage. The Part 503 Regulations contain some provisions that apply generally, and others that apply only to particular methods of sewage sludge management or disposal.

The sludge management requirements of the Part 503 regulations are directly enforceable, but NPDES permits issued to POTWs must also include conditions that implement the Part 503 Regulations. *See* 33 U.S.C. §§ 1345(e) and (f)(1); 40 C.F.R. § 503.3.

Accordingly, the sludge conditions in the draft permit are intended to ensure that sewage sludge use and disposal practices meet the 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>

If the permittee later changes its method(s) of sludge management method changes, the permittee must notify EPA and MassDEP. The permit will continue to require compliance with the Part 503 Regulations but some of the specific provisions of those regulations that apply would change based on the change in sludge management method.

In addition, as stated in the permit, the permittee must comply with all applicable requirements of both federal and state law governing sewage sludge management, use and disposal, and where both federal and state law and/or regulations apply but impose different requirements, the permittee must comply with the most stringent of the applicable requirements. See 33 U.S.C. §§ 1345(d)(5), 1370; 40 C.F.R. § 503.5(b)

**IX. 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 Fisheries Services (NOAA Fisheries) if an action or proposed action funded, permitted, or undertaken by EPA may adversely impact any essential fish habitat (EFH). The Amendments broadly define essential fish habitat as waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. §1802 (10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 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.

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

The following is a list of managed species believed to be present during one or more life stages within the areas encompassing the WPCF’s discharge outfall and its CSOs. No “habitat areas of particular concern”, as defined under §600.815(a)(9) of the Magnuson-Stevens Act, have been designated for these areas.

**Summary of Essential Fish Habitat (EFH) Designation**

**10' x 10' Square Coordinates:**

Boundary	North	East	South	West
Coordinate	42° 40.0' N	70° 40.0' W	42° 30.0' N	70° 50.0' W

**Square Description (i.e. habitat, landmarks, coastline markers):** Waters within the square within the Atlantic Ocean within Massachusetts Bay around western Cape Ann affecting the following: Manchester, MA., Manchester Bay, Bakers Island, Great Misery Island, Annisquam, MA. and Annisquam River, Essex, MA., Essex Bay and Essex River, West Gloucester Harbor, western Gloucester, MA., Cross Island, southern Hog Island, and Kettle Island. Features also affected include: eastern Salem Sound, Manchester Harbor, Gales Pt., Beverly Farms, MA., Childrens I., Childrens I. Channel, Salem Channel, Newcomb Ledge, Halfway Rock, Cole Ridge, Middle Ground, Kettle Ledge, Burnham Rocks, Saturday Night Ledge, Great Egg Rock, Eagle Head, Town Head, Coolidge Pt., Magnolia, MA., and Normas Woe Cove.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod ( <i>Gadus morhua</i> )	X	X	X	X
haddock ( <i>Melanogrammus aeglefinus</i> )	X	X	X	
pollock ( <i>Pollachius virens</i> )	X	X	X	X
whiting ( <i>Merluccius bilinearis</i> )	X	X	X	X
red hake ( <i>Urophycis chuss</i> )	X	X	X	X
white hake ( <i>Urophycis tenuis</i> )	X	X	X	X
Redfish ( <i>Sebastes fasciatus</i> )	n/a	X	X	X
Winter flounder ( <i>Pleuronectes americanus</i> )	X	X	X	X
yellowtail flounder ( <i>Pleuronectes ferruginea</i> )	X	X	X	X
windowpane flounder ( <i>Scopthalmus aquosus</i> )	X	X	X	X
American plaice ( <i>Hippoglossoides platessoides</i> )	X	X	X	X
ocean pout ( <i>Macrozoarces americanus</i> )	X	X	X	X
Atlantic halibut ( <i>Hippoglossus hippoglossus</i> )	X	X	X	X
Atlantic sea scallop ( <i>Placopecten magellanicus</i> )	X	X	X	X
Atlantic sea herring ( <i>Clupea harengus</i> )		X	X	X
bluefish ( <i>Pomatomus saltatrix</i> )			X	X
long finned squid ( <i>Loligo pealei</i> )	n/a	n/a	X	X
short finned squid ( <i>Illex illecebrosus</i> )	n/a	n/a	X	X
Atlantic butterfish ( <i>Peprilus triacanthus</i> )	X	X	X	X
Atlantic mackerel ( <i>Scomber scombrus</i> )	X	X	X	X
summer flounder ( <i>Paralichthys dentatus</i> )				X
scup ( <i>Stenotomus chrysops</i> )	n/a	n/a	X	X
black sea bass ( <i>Centropristus striata</i> )	n/a			X
surf clam ( <i>Spisula solidissima</i> )	n/a	n/a	X	X
ocean quahog ( <i>Artica islandica</i> )	n/a	n/a		
spiny dogfish ( <i>Squalus acanthias</i> )	n/a	n/a		
bluefin tuna ( <i>Thunnus thynnus</i> )			X	X

The effluent limitations and other permit requirements identified in this fact sheet are designed to be protective of all aquatic species, including those with designated EFH. EPA has determined that a formal EFH consultation with NOAA Fisheries is not required because the proposed discharges will not adversely affect EFH. Furthermore, issuance of the permit proposed by EPA will impose substantially more stringent effluent limits than are in the current permit and will reduce the discharge of contaminants to the waters of Massachusetts Bay from the WPCF.

Furthermore, compliance with the permit's requirements will result in reduced CSO and SSO discharges. Thus, the permit will lead to water quality improvements in the designated EFH areas affected by the operations of the permittee's sewer system and treatment plant.

Finally, EPA will submit the draft permit to NOAA Fisheries for review and comment so that it will be informed of EPA's EFH determination and can comment to EPA on the subject as it deems appropriate.

## **X. ENDANGERED SPECIES ACT (ESA)**

The Endangered Species Act of 1973, as amended (ESA), imposes requirements on Federal agencies related to the potential effects of their actions on endangered or threatened species of fish, wildlife, or plants (listed species) and their designated "critical habitat."

Section 7 of the ESA requires, in general, that Federal agencies insure that any actions they authorize, fund, or carry out, in the United States or upon the high seas, are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated "critical habitat" for those species. Federal agencies carry out their responsibilities under the ESA in consultation with, and assisted by, the Departments of Interior (DOI) and/or Commerce (DOC), depending on the species involved. The United States Fish & Wildlife Service (USFWS) of the DOI administers Section 7 consultations for freshwater species, while the National Oceanic and Atmospheric Administration (NOAA) of DOC does so for marine species and anadromous fish.

The federal action being considered in this case is EPA's proposed issuance of a new NPDES permit to the City of Gloucester. The new permit is intended to replace the existing NPDES permit in governing wastewater discharges from the City's WPCF and various CSOs, as discussed above. The WPCF was in the past granted a waiver from the CWA's secondary treatment requirements. As a result, the waiver is reflected in the existing NPDES permit conditions and the WPCF currently only employs preliminary treatment, chemically enhanced primary treatment and disinfection.

The WPCF discharges treated effluent into Massachusetts Bay through a 14,869-foot ocean outfall made up of a 36-inch diameter pipe with a multi-port diffuser. The discharge point is approximately 5,250 feet offshore of Dog Bar Breakwater (Eastern Point) at a depth of 90 feet below mean low water. Based on the facility's maximum design flow, this results in an estimated worst case effective discharge dilution, of approximately 64 parts ambient seawater to 1 part effluent. The actual dilution will often be greater because the WPCF's discharge flow volume is often less than the design flow. The permittee also owns and operates 5 CSOs that discharge in and around Gloucester Harbor and are regulated by the permit.

In applying for renewal of its NPDES permit, Gloucester asked that EPA renew the City's waiver from secondary treatment requirements pursuant to section 301(h) of the CWA. EPA currently intends, however, to deny this request and, instead, to issue a permit with limits based on secondary treatment.

The proposed new permit limits are detailed in the draft permit and are discussed in this Fact Sheet. These limits are also substantially more stringent than the limits in the current permit. EPA's proposed denial of the City's request for a renewal of the § 301(h) variance is discussed in more detail in the accompanying "Tentative 301(h) Denial Decision" document.

In addition to imposing secondary treatment requirements, the new permit also proposes, among other things, to limit discharge flow, to require WET testing, to impose limits on discharge levels of total residual chlorine, toxicity, pH, Oil and Grease, total petroleum hydrocarbons, fecal coliform bacteria, enterococci, and other pollutants, and to prohibit dry weather CSO and SSO discharges and limit wet weather CSO discharges. The permit will also require substantial discharge monitoring and reporting.

As the federal agency charged with authorizing the discharges from this facility, EPA has reviewed available information and determined that a number of federally listed species inhabit (seasonally) waters in the broad general area of the relevant discharges and further analysis is necessary with regard to these species.

The species in question are as follows: fish (shortnose sturgeon - endangered); mammals (whales: North Atlantic Right, Humpback, Fin, Sei, Sperm, Blue - all endangered); reptiles (sea turtles: Kemp's Ridley, Leatherback, Green - all endangered; Loggerhead - Threatened but proposed for listing as endangered). As discussed below, while some of these species are unlikely to be present in the areas affected by the discharges authorized by the permit, others may well occur in such areas on an intermittent basis during certain seasons. No designated critical habitat for any of these listed species lies within the areas impacted by either the WPCF discharge outfall or the CSOs.

NOAA administers the ESA for all of the above-listed species. Because certain of these species may be affected by the discharges authorized by the proposed permit, EPA must consult with NOAA under Section 7 of the ESA. EPA has evaluated the potential impacts of the permit action on these species. On the basis of this evaluation, which is discussed below, EPA's preliminary determination is that this action "is not likely to adversely affect listed species or critical habitat."<sup>12</sup> 16 C.F.R. § 402.13(a). As a result, EPA will in a separate letter request NOAA's written concurrence with EPA's determination conclusion in order to complete the consultation with NOAA on an "informal" basis. *See* 16 C.F.R. § 402.13(a). If NOAA does not concur, then "formal consultation" will be necessary.

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<sup>12</sup> A project can be considered "unlikely to adversely affect" a listed species "when direct or indirect effects of the proposed project on listed species are expected to be discountable, insignificant or completely beneficial." August 20, 2009, Letter from Patricia A. Kurkul, Regional Administrator, NOAA, National Marine Fisheries Service, Northeast Region, to Melville P. Cote, EPA Region 1 ("NOAA's August 20, 2009, Rockport Consultation Letter") (addressing ESA issues concerning EPA's proposed NPDES permit for the Rockport, MA, POTW).

### Discussion of ESA Listed Species in the Vicinity of the Outfall

Fish - The only listed species of fish that might conceivably be found in the general area of the discharges to be authorized by the new Gloucester NPDES permit is the shortnose sturgeon. An anadromous species of fish, the shortnose sturgeon is present in many large rivers in the Northeast (Dadswell, Et Al., 1984). The closest known population to the Gloucester discharges, however, is in the Merrimack River (Kiefer and Kynard, 1989).

The only record of this species in Massachusetts Bay is recorded in Bigelow and Schroeder (1953) as having been taken at Rockport, Massachusetts. Therefore, shortnose sturgeons are unlikely to be present in either the area of the WPCF outfall or the area of the permittee's CSOs.<sup>13</sup>

After considering the relevant information, EPA's preliminary determination is that the proposed permitting action is unlikely to have an adverse effect on the shortnose sturgeon or its critical habitat. First, there is no designated critical habitat for shortnose sturgeon in the area of any of the discharges covered by the new permit. Second, as explained above, shortnose sturgeons are unlikely to occur in the areas affected by any of the discharges to be authorized by the proposed permit. Third, any shortnose sturgeon that did occur in the area of the discharges would be anomalous and would likely be only a short-term, transient visitor to the area. Fourth, the shortnose sturgeon is primarily a benthic species, whereas the WPCF's discharge plume is positively buoyant and has limited, if any, direct contact with the bottom. Therefore, even if a sturgeon was in the area of the outfall, it would be especially unlikely to have any significant contact with the City's pollutant discharges. Fifth, the WPCF's outfall discharges at a depth of 90 feet and uses a multi-port diffuser, achieving a high dilution factor of 64:1. Indeed, this is a worst case value based on the WPCF's design flow (as opposed to actual flow, which is less), so dilutions will typically be even higher. All of these factors should contribute to precluding any marine organisms, including any shortnose sturgeon, from coming into contact with a concentrated discharge plume.

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<sup>13</sup> In its Biological Opinion concerning licensing of the Neptune offshore Liquefied Natural Gas import terminal, which lies about 12 miles southeast of Gloucester, NOAA stated the following:

In Massachusetts, the federally endangered shortnose sturgeon (*Acipenser brevirostrum*) is only known to occur in the Merrimack and Connecticut Rivers (NMFS 1998a), neither of which are in the vicinity of the buoy locations. As such, shortnose sturgeon are not likely to be present in the action area and will not be considered further in this BO.

National Marine Fisheries Service, Endangered Species Act Section 7 Consultation, Biological Opinion, Issuance of License to Neptune LNG by MARAD to construct, own, and operate an LNG deepwater port (Jan. 12, 2007) ("2007 NOAA BO for Neptune"), p. 21. In a letter regarding prior CSO abatement work by Gloucester, NOAA stated that "[w]hile several species of endangered and threatened whales and sea turtles are known to occur in the coastal waters of Massachusetts, no federally listed or proposed threatened or endangered species and/or critical habitat for listed species under the jurisdiction of the National Marine Fisheries Service (NOAA Fisheries) are known to exist in Gloucester Harbor." December 9, 2004, letter from Mary A. Colligan, Assistant Regional Administrator for Protected Resources, National Marine Fisheries Service, Northeast Region, to Aaron Weieneth, Metcalf & Eddy ("NOAA's December 2004 Gloucester CSO Letter"). Furthermore, NOAA did not include the shortnose sturgeon as a species that might be present in its review of EPA's proposed NPDES permit for Rockport, MA. See NOAA's August 20, 2009, Rockport Consultation Letter.

Finally, the draft permit not only proposes protective new effluent limits based on secondary treatment, but it also proposes to include many other protective requirements. These include the following: limits mandating low discharge flow volumes; conditions requiring WET testing and imposing limits on discharge toxicity, TRC, Oil & Grease, TPHs, fecal coliform bacteria, and enterococci; prohibitions against SSOs and dry weather CSOs; conditions requiring minimization of wet weather pollutant discharges from CSOs, and implementation of programs to minimize the introduction of fats, oils and grease into the collection system. Therefore, under the new permit, the quality of discharges from the POTW will be substantially improved, the occurrence of SSO and CSO discharges should be reduced, and the quality of any CSO discharges that do occur should be improved.

Mammals – Whales - A number of whale species listed as endangered are or may be present in marine waters offshore of Gloucester. *See* 2007 NOAA BO for Neptune at 20-21. *See also* Jeffreys Ledge Information Page (found at <http://www.jeffreysledge.org>) (c. Whale Center of New England) (Jeffreys Ledge Information Page). Indeed, the City of Gloucester is home to an active commercial whale watch fleet. *See* 2007 NOAA BO for Neptune at 69.

Still, endangered whales would typically be expected to be found in waters relatively far offshore, such as in the areas of the Stellwagen Bank National Marine Sanctuary or Jeffreys Ledge,<sup>14</sup> or even farther offshore. *See* 2007 NOAA BO for Neptune at 84. Endangered species of whale that seasonally appear in some numbers in and around Stellwagen Bank and Jeffreys Ledge include the Humpback whale, the Fin whale, and the North Atlantic Right whale. *See* 2007 NOAA BO for Neptune at 25, 29-30, 32, 84. *See also* NOAA's August 20, 2009, Rockport Consultation Letter at 2. The waters around Stellwagen Bank and Jeffreys Ledge are important feeding grounds for these species because upwelling in these areas tends to produce abundant food supplies. Other endangered species of whale that could potentially be found in the waters of Stellwagen Bank and Jeffreys Ledge include the Sei, Blue and Sperm whales. These species, however, would be far less common because of their preference for either deeper water (Sperm and Sei whales) or more northern waters (Blue whales). *See* 2007 NOAA BO for Neptune at 34-41, 84. *See also* NOAA's August 20, 2009, Rockport Consultation Letter at 2; Jeffreys Ledge Information Page (separate pages on North Atlantic Right, Humpback, Fin, Sei, Blue and Sperm whales).

Looking closer to shore, it is unlikely that any of the above-discussed whale species would be present in Gloucester Harbor and, therefore, these species will be unaffected by the City's CSOs. *See* NOAA's December 2004 Gloucester CSO Letter ("no federally listed or proposed threatened or endangered species and/or critical habitat for listed species under the jurisdiction of the National Marine Fisheries Service (NOAA Fisheries) are known to exist in Gloucester Harbor."). Furthermore, with regard to the waters off of Dog Bar Breakwater (Eastern Point) in the vicinity of the POTW discharge, it is unlikely that Sei, Sperm, Blue or Fin whales would be present in these waters because of their preference for deeper and/or more northerly waters.

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<sup>14</sup> The Stellwagen Bank NMS encompasses a southeastern portion of Jeffrey's Ledge. *See Map of Gerry E. Studds Stellwagen Bank National Marine Sanctuary* (found at <http://sanctuaries.noaa.gov/pgallery/atlasmaps/sb.html>). *See also* Jeffreys Ledge Information Page.

See 2007 NOAA BO for Neptune at 34-41, 84. See also NOAA's August 20, 2009, Rockport Consultation Letter at 2. Therefore, these species should also be unaffected by the WPCF discharge.

With regard to Humpback and North Atlantic Right whales, while these species are typically found farther offshore, such as around Stellwagen Bank, they are known to venture into nearer-shore waters on occasion. In such cases, the whales are most likely transient visitors on their way to another destination, such as an offshore feeding ground. See 2007 NOAA BO for Neptune at 84. See also NOAA's August 20, 2009, Rockport Consultation Letter at 2.

Having considered the relevant information, EPA's preliminary determination is that the proposed permit action is unlikely to adversely affect any of the endangered whale species at issue here because (a) none are likely to occur in the vicinity of the CSOs, (b) Fin, Sei, Sperm and Blue whales are also unlikely to occur in the vicinity of the POTW discharge, (c) individual North Atlantic Right and Humpback whales may come into the vicinity of the POTW discharge, but these species are only present in Massachusetts Bay on a seasonal basis and would be unlikely to enter waters near the POTW discharge on other than a temporary basis, most likely while transiting the area, and (d) the treatment and other controls required to meet the stringent limits of the proposed permit, coupled with the outfall's location, depth and use of a diffuser, should preclude any adverse effects upon whales, their prey or their habitat.

As discussed above, the draft permit not only proposes protective new effluent limits based on secondary treatment, but it also proposes to include many other protective requirements, such as the following: strict limits on discharge flow volume, conditions requiring WET testing and limits on discharge toxicity, TRC, Oil & Grease, TPHs, fecal coliform bacteria, and enterococci; prohibitions against SSOs and dry weather CSOs; and conditions requiring minimization of wet weather CSO discharges. Moreover, new treatment facilities designed to meet secondary treatment limits should operate with greater reliability than the existing primary treatment facilities and help to reduce CSO discharges. In addition, neither whales nor their prey will come into contact with a concentrated discharge plume because the POTW outfall discharges at a depth of 90 feet using a multi-port diffuser to achieve a high dilution factor of 64:1. Indeed, as explained above, this dilution will typically be even higher than this worst case value.

Reptiles – Turtles - The following listed species of sea turtle are known to occur in the waters of Massachusetts Bay: Kemp's Ridley, Green, Leatherback (all endangered), Loggerhead (listed as threatened but recently proposed for listing as endangered).<sup>15</sup> See NOAA Website at - <http://www.nmfs.noaa.gov/pr/species/turtles/>; and at [http://www.nmfs.noaa.gov/pr/pdfs/species/turtle\\_loggerhead\\_proposed\\_dps.pdf](http://www.nmfs.noaa.gov/pr/pdfs/species/turtle_loggerhead_proposed_dps.pdf)." As explained below, however, EPA's preliminary determination is that the proposed permit action is unlikely to adversely affect any of these listed species of sea turtle.

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<sup>15</sup> Hawksbill sea turtles would not be expected to be present in the area of the discharges covered by the proposed NPDES permit. See 2007 NOAA BO for Neptune, at 21.

Each of these sea turtle species has a wide range and tends to occupy a different type of habitat during different stages of its life history. In connection with its review of EPA's proposed NPDES permit for the Town of Rockport, MA, POTW, NOAA explained that:

Four species of federally threatened or endangered sea turtles under the jurisdiction of NMFS maybe found seasonally in the coastal waters of Massachusetts, typically when water temperatures are higher than 15°C. The highest concentrations of sea turtles are normally present from June – October.

The sea turtles in northeastern nearshore waters are typically small juveniles with the most abundant being the federally threatened loggerhead (*Caretta caretta*), followed by the federally endangered Kemp's ridley (*Lepidochelys kempi*). Federally endangered green sea turtles (*Chelonia mydas*) also occur in these waters. The three species of chelonid turtles found in the Northeast remain very briefly in open ocean waters, spending most of their time during the summer months in harbors and estuarine waters. The Federally endangered leatherback sea turtles (*Dermochelys coriacea*) may also be found in the waters of Massachusetts during the warmer months, however this species is unlikely to occur in the action area for this project as it is typically found in deeper, more offshore waters.

See also NOAA's August 20, 2009, Rockport Consultation Letter at 3. Thus, while all four species of sea turtle could potentially be present in the waters in the vicinity of the WPCF's discharge, the leatherback is particularly unlikely to be present because it favors deeper, more offshore waters. A more detailed discussion of each of these four species is presented below.

#### *Loggerhead Sea Turtle*

In the Atlantic Ocean, the loggerhead turtle's range extends from Newfoundland to as far south as Argentina. See NOAA Website at - <http://www.nmfs.noaa.gov/pr/species/turtles/>. More specifically, the loggerhead's range includes the area of the Atlantic in the vicinity of the discharges covered by the proposed NPDES permit. Although more common in waters south of this area, the northern reach of the loggerhead's foraging range extends into the Gulf of Maine during the summer (warmer water) months. See 2007 NOAA BO for Neptune at 44. Loggerheads can appear in the Gulf of Maine as early as June, with "the large majority leav[ing] the Gulf of Maine by mid-September," though some may remain into late fall. *Id.* Their presence or absence from an area is influenced by, among other things, water temperature. *Id.*

Some data suggests that loggerheads are most common in waters "from 22 to 49 meters deep" – a depth range encompassing the depth of the Gloucester WPCF outfall – but they can inhabit areas "from the beach to waters beyond the continental shelf." *Id.*<sup>16</sup> Somewhere between the ages of 7 and 12 years, oceanic juveniles are thought to migrate to nearshore coastal areas (neritic zone) where they continue maturing until adulthood. See NOAA Website at: <http://www.nmfs.noaa.gov/pr/species/turtles/>.

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<sup>16</sup> NOAA has also noted that "Loggerhead sea turtles are a cosmopolitan species, found in temperate and subtropical waters and inhabiting pelagic waters, continental shelves, bays, estuaries and lagoons." 2007 NOAA BO for Neptune at 43,

On its website, NOAA explains that:

[i]n addition to providing critically important habitat for juveniles, the neritic zone also provides crucial foraging habitat, inter-nesting habitat, and migratory habitat for adult loggerheads in the western North Atlantic. To a large extent, these habitats overlap with the juvenile stage, the exception being most of the bays, sounds, and estuaries along the Atlantic and Gulf coasts of the U.S. from Massachusetts to Texas, which are infrequently used by adults. ...

The predomina[nt] foraging areas for western North Atlantic adult loggerheads are found throughout the relatively shallow continental shelf waters of the U.S., Bahamas, Cuba, and the Yucatán Peninsula, Mexico.

#### *Leatherback Sea Turtle*

Leatherback sea turtles have a particularly wide range and can tolerate relatively low water temperatures. *See* 2007 NOAA BO for Neptune at 50. Leatherbacks inhabit waters as far north as Gloucester and beyond. *See id.* at 52. After nesting, female leatherbacks migrate from tropical waters to more temperate latitudes which support high densities of their jellyfish prey in the summer. *Id.* While they “are predominantly a pelagic species ...”, [l]eatherbacks may come into shallow waters if there is an abundance of jellyfish nearshore.”

*Id.* at 53. *See also* <http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm>. Thus, leatherbacks are unlikely to be found in the area of the discharges covered by the permit, because they would typically be expected to be found in waters well offshore of those areas. *See* NOAA’s August 20, 2009, Rockport Consultation Letter at 3.

#### *Kemp's Ridley Sea Turtle*

The range of the Kemp's Ridley sea turtle extends northward from the Gulf of Mexico to New England along the Atlantic seaboard of the United States. *See* <http://www.nmfs.noaa.gov/pr/species/turtles/kempstridley.htm>. Adult Kemp's Ridley turtles “primarily occupy ‘neritic’ habitats,” *id.*, and “[t]heir diet consists mainly of swimming crabs, but may also include fish, jellyfish, and an array of mollusks.” *Id.* Thus, Kemp’s Ridley turtles could be present in the vicinity of the discharges covered by the proposed permit.

#### *Green Sea Turtle*

The range of Green sea turtles in the western Atlantic Ocean extends (from as far south as Argentina) to the waters of Massachusetts. *See* 2007 NOAA BO for Neptune at 59. Juvenile Green sea turtles occupy pelagic habitat, but when they reach a certain length the juveniles leave these habitats and “enter benthic foraging areas, shifting to a chiefly herbivorous diet but may also consume jellyfish, salps, and sponges.” *Id.* at 58. Thus, Green turtles could occur in the vicinity of the discharges covered by the proposed permit.

Finding - EPA’s preliminary determination is that the proposed new NPDES permit for Gloucester is unlikely to adversely affect any listed species of sea turtle, and will not affect any of their designated critical habitats.

To begin with, no critical habitat will be affected because none has been designated in the vicinity of the areas affected by the POTW and CSO discharges. Furthermore, none of the above-discussed species of sea turtle are expected to occur in Gloucester Harbor. *See* NOAA's December 2004 Gloucester CSO Letter ("no federally listed or proposed threatened or endangered species and/or critical habitat for listed species under the jurisdiction of the National Marine Fisheries Service (NOAA Fisheries) are known to exist in Gloucester Harbor.").

In addition, EPA has three additional important reasons for concluding that the species are not likely to be adversely affected by the proposed permit action. First, the permit contains environmentally protective conditions that should preclude adverse effects on sea turtles. More specifically, the new treatment facilities and other controls required to meet the proposed permit's stringent requirements, coupled with the City's relatively small discharge volume and the substantial dilution afforded the discharge as a result of the location of the WPCF's outfall and its use of a diffuser, should preclude adverse effects upon sea turtles, their food sources, or their habitat.<sup>17</sup>

As discussed above, the draft permit not only proposes protective new effluent limits based on secondary treatment, but it also proposes to include many other protective requirements, such as the following: strict limits on discharge flow volume, conditions requiring WET testing and limits on discharge toxicity, TRC, Oil & Grease, TPHs, fecal coliform bacteria, and enterococci; prohibitions against SSOs and dry weather CSOs; and conditions requiring minimization of wet weather CSO discharges. Furthermore, the permit prohibits the discharge of floatables from the POTW and requires that any such discharges from CSOs be minimized. This should prevent the discharge of the type of plastics (and possibly other material) that sea turtles ingest at times, seemingly mistaking the materials for their foods. *See* 2007 NOAA BO for Neptune at 126. Moreover, new treatment facilities designed to meet secondary treatment limits should both operate with greater reliability than the existing primary treatment facilities and help to reduce CSO discharges.

Second, given that the POTW outfall discharges at a depth of 90 feet using a multi-port diffuser to achieve a high dilution factor of 64:1 (and typically even more), neither sea turtles nor their food sources would come into contact with a concentrated discharge plume. Indeed, except for leatherbacks, which are unlikely to be in the area, the turtles in question here are primarily benthic feeders and monitoring data for the current discharge has shown no significant effects on the benthic community. This reflects the fact that the discharge is positively buoyant and has little or no contact with the bottom.

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<sup>17</sup> While EPA is proposing that the new permit contain environmentally protective conditions, the Agency also notes that in its 2007 NOAA BO for Neptune, at 126, NOAA explained that:

[t]urtles are relatively hardy species and are not easily affected by changes in water quality or increased suspension of sediments in the water column. However, if these changes persist, they can cause habitat degradation or destruction, eventually leading to foraging difficulties, which may in turn lead to long term avoidance or complete abandonment of the polluted area by the affected species (Ruben and Morreale 1999).

Third, while individuals of the various species could be seasonally present in the areas around the POTW and CSO discharges, they would not be expected to be present in large numbers or for lengthy periods of time. They would, instead, be more likely to be occasional, solitary, transient visitors. *See* NOAA's December 2004 Gloucester CSO Letter ("no federally listed or proposed threatened or endangered species and/or critical habitat for listed species under the jurisdiction of the National Marine Fisheries Service (NOAA Fisheries) are known to exist in Gloucester Harbor."). Leatherback turtles primarily inhabit offshore pelagic environments. *See* NOAA's August 20, 2009, Rockport Consultation Letter at 3.

The other listed species discussed here might visit the affected near-shore waters, but still would only be expected to venture into this area on a temporary basis during the warmer months. It seems unlikely that this area represents particularly good turtle habitat given the relatively cold water temperatures off of Cape Ann. Again, however, even if sea turtles do occasionally forage in proximity to the outfall, it is EPA's preliminary determination that they are not likely to be adversely affected by the discharges.

## **XI. ANTIDegradation**

In accordance with regulations found at 40 CFR Section 131.12, MassDEP has developed and adopted a statewide antidegradation policy to maintain and protect existing ambient water quality. The Massachusetts Antidegradation Policy is found at Title 314 CMR 4.04. No lowering of water quality is allowed, except in accordance with the antidegradation policy. All existing uses of the Massachusetts Bay and Gloucester Harbor must be protected.

The antidegradation requirements of the Massachusetts Surface Water Quality Standards will be satisfied here, because the proposed permit will result in improved water quality in the area of the POTW and CSO discharges. The treatment upgrade to secondary will result in a net decrease in all currently permitted pollutants loads even as the annual average flow limit increases from 5.15 mgd to 7.24 mgd. The BOD<sub>5</sub> average monthly loading limit will decrease by 83%, from 10,520 lb/day to 1,811 lbs/day. TSS average monthly loading limit will decrease by 70%, from 6,010 lb/day to 1,811 lbs/day. EPA anticipates that the effluent total residual chlorine load will be significantly lower as a result of a much lower chlorine demand resulting from the reduction of both suspended solids (TSS) and organic load (BOD<sub>5</sub>). In other words, with lower TSS and BOD<sub>5</sub> levels, less chlorine will be needed to disinfect the effluent. The permittee will have far greater control over TRC when secondary treatment is in place. The more efficient use of chlorine will allow reduced use of dechlorinating chemicals as well. Oil and grease, as well as total petroleum hydrocarbons, are also expected to be reduced to below detectable concentrations by the additional treatment. Water quality will be improved as a result of compliance with permit conditions prohibiting SSOs and dry weather CSOs, and other conditions designed to minimize both the pollutants in any wet weather CSO discharges and the frequency with which such discharges occur.

## **XII. 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 Sections 308(a) and 402(a)(2) of the CWA in accordance with 40 CFR §§ 122.44 and 122.48.

## **XIII. COASTAL ZONE MANAGEMENT (CZM) CONSISTENCY REVIEW**

EPA regulations explain that:

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).

40 CFR §122.49 (d). The discharge at issue here is within the defined CZM boundaries. The permittee has submitted a letter to the Massachusetts Coastal Zone Management Program stating that its activities comply with the enforceable policies of the approved Massachusetts coastal management program and will be conducted in a manner consistent with such policies. The state will review the draft permit and a final permit will only be issued after CZM concurs with the permittee's certification.

## **XIV. 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.

## **XV. GENERAL CONDITIONS**

The 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 CERTIFICATION REQUIREMENTS**

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving waters certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

## **XVII. COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISIONS**

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 Doug Corb, 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 MassDEP. 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 C.F.R. § 124.12 are satisfied. In reaching a final decision on the Draft Permit, the EPA 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 any public hearings, if such hearings are held, the EPA 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.

Within 30 days following the notice of the Final Permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. § 124.19.

## **XVIII. 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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Date: September 1, 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