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

FACT SHEET

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

NPDES PERMIT NUMBER: MA0101508

PUBLIC NOTICE START AND END DATES: August 10, 2011 – September 8, 2011

NAME AND MAILING ADDRESS OF APPLICANT:

City of Chicopee
Department of Public Works
80 Medina Street
Chicopee, Massachusetts 01013

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Chicopee Water Pollution Control Facility
80 Medina Street
Chicopee, MA 01013

RECEIVING WATER(S): Connecticut River and Willimansett Brook (Connecticut River Basin), Chicopee River and Cooley Brook (Chicopee River Basin)

RECEIVING WATER CLASSIFICATION(S): Class B (all)

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant has applied to the U.S. Environmental Protection Agency for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving waters. The applicant is engaged in the collection and treatment of domestic and industrial wastewater. The discharges are from a secondary wastewater treatment facility to the Connecticut River (Outfall 010) and from eighteen Combined Sewer Overflows (CSOs) to the Connecticut and Chicopee Rivers and Willimansett Brook, as listed in Permit

Attachment B.[1] The newly constructed Jones Ferry CSO Treatment Facility discharges through CSO outfall 007 and is included in the authorization for that CSO outfall. The draft permit also authorizes the discharge of stormwater to Cooley Brook, from an oil/water separator taking drainage from a portion of the Westover Air Reserve Base (Outfall 011).

II. Description of Discharge

A quantitative description of the wastewater treatment plant discharge in terms of significant effluent parameters, based on the monthly discharge monitoring reports ("DMRs"), is shown in **Table 1**. The facility also experiences wet weather related bypasses, not authorized under the facility's permit, that are provided with seasonal primary treatment and disinfection. Monitoring data from the bypass treatment facility is reported pursuant to a 2006 Consent Decree (*United States v. City of Chicopee,* Consent Decree, D.Mass. No. 06-30121-MAP (July 2006)) in the form of monthly operating reports; monitoring results for 2009 are shown in **Table 2**.

The Jones Ferry CSO Treatment Facility, which commenced operation in July 2009, is monitored pursuant to the same Consent Decree; data for its first year of operation are shown in **Table 3**. Other CSO discharges are monitored only via block testing at the diversion structures to determine if the CSO has been activated; number of activations in 2009 is included in **Table 4**.

III. Receiving Water Description

The secondary treatment plant and the eight CSO outfalls on the Connecticut River discharge to segment 34-05 (Connecticut River, Holyoke Dam to state line) as defined by MassDEP. Massachusetts has classified the Connecticut River as a Class B Water (warm water fishery). 314 CMR 4.06 (Table 6). The Massachusetts Surface Water Quality Standards designate Class B Waters as having the following uses:

> 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. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value. . . .

314 CMR 4.05(3)(b). A warm water fishery is defined as "waters in which the maximum mean monthly temperature generally exceeds 68°F (20°C) during the summer months and are not capable of sustaining a year-round population of cold-water stenothermal aquatic life." 314 CMR 4.02. The *Connecticut River Watershed 2003 Water Quality Assessment Report* (MassDEP 2008) concluded that the primary contact use was impaired due to elevated E. coli

[1] Some CSOs discharge flow from more than one diversion structure. For these structures, the inventory convention is to use the outfall number, a decimal point, and then the number of the diversion structure. For example, CSO diversion structure 24.2 is a specific diversion structure discharging flow through outfall 024. CSO outfalls are denoted using a three digit number with no decimals (e.g. 007; 024).

bacteria, and the fish consumption use impaired due to PCBs in fish tissue. Other uses were assessed as supported. The Massachusetts Year 2008 Integrated List of Waters ("303(d) list") indicates that this segment of the Connecticut River is not attaining water quality standards, with impairments caused by priority organics, pathogens and suspended solids. CSO outfall 42 discharges to the Willimansett Brook, a small tributary to the Connecticut River. Willimansett Brook is a class B waterbody that has not been assessed.

An additional nine CSO outfalls discharge to the Chicopee River – three to segment 36-25, Chicopee Falls to confluence with the Chicopee River (outfalls 26, 27, 29, 31, 32A, 32B, 34 and 40) and one to segment 36-24, Wilbraham Pumping Station to Chicopee Falls (outfall 37). The Chicopee River is designated as a Class B Water/warm water fishery, with the same designated uses set forth above. 314 CMR 4.06 (Table 8); 4.05(3)(b). The *Chicopee River Watershed 2003 Water Quality Assessment Report* (MassDEP 2008) assessed segment 36-25 as impaired for primary and secondary contact uses due to elevated E. coli, with fish consumption not assessed and other uses supported. Segment 36-24 was assessed as supportive of all uses except fish consumption, which was not assessed. The 303(d) list indicates that both these segments are not attaining water quality standards for pathogens.

The Connecticut and Chicopee Rivers are identified in the MASWQS with a CSO qualifier, indicating that these waters "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). The relevant CSOs include not only Chicopee, but also Holyoke (upstream on the Connecticut River) and Springfield (upstream on the Chicopee River and downstream on the Connecticut River), *inter alia*.

Cooley Brook, which receives the discharge from stormwater outfall 011, is located in the Connecticut River watershed (segment 34-20) and is a Class B Water which has not been assessed. See 303(d)(list) at 60; *Connecticut River Watershed 2003 Water Quality Assessment Report* (MassDEP 2008) at 76. Designated uses are the same as for the Connecticut and Chicopee Rivers above.

IV. Limitations and Conditions

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

V. Permit Basis: Statutory and Regulatory Authority

The Clean Water Act (the "CWA") prohibits the discharge of pollutants to waters of the United States without an NPDES permit unless such a discharge is otherwise authorized by the Act. A NPDES permit is used to implement technology-based and water quality-based effluent limitations as well as other requirements including monitoring and reporting. This draft NPDES permit was developed in accordance with statutory and regulatory authorities established pursuant to the Act. The regulations governing the NPDES program are found in 40 CFR Parts 122, 124 and 125.

Under Section 301(b)(1)(B) of the CWA, Publicly Owned Treatment Works (POTWs) are required to achieve technology-based effluent limitations based upon secondary treatment. The secondary treatment requirements are set forth in 40 CFR Part 133 and define secondary treatment as an effluent achieving specific limitations for biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards, 314 CMR 4.00, include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site specific criteria is established. Massachusetts regulations similarly require that its permits contain limitations which are adequate to assure the attainment and maintenance of the water quality standards of the receiving waters as assigned in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00. See 314 CMR 3.11(3).

According to Clean Water Act Section 402(o) and federal regulations at 40 CFR § 122.44(1), when a permit is reissued, effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards or conditions in the previous permit, except under certain limited conditions.

VI. Explanation of the Permit's Effluent Limitation(s)

A. Facility Information

1. WPCF

The Chicopee Water Pollution Control Facility (WPCF) is a 15.5 million gallon per day (MGD) secondary wastewater treatment facility located in Chicopee, MA, serving a population of approximately 55,000 via a collection system that is approximately 50% combined sewers. Twenty industrial users contribute wastewater to the facility. The facility's process flow diagram is attached as Figure 1. Wastewater entering the plant passes through a bar screen, followed by an aerated grit chamber, eight rectangular primary clarifiers, and a Parshall flume for flow measurement. (Three comminutors, shown on Figure 1 after the aerated grit chamber, are being taken out of service.) Flow is then pumped to the secondary treatment facilities, which consists of two trains of UNOX pure oxygen activated sludge reactors, four secondary clarifiers, and chlorination facilities. Flow from the chlorine contact tanks normally discharges by gravity to the Connecticut River via outfall 010, a 200 foot long, 36" pipe discharging to the Connecticut River. During high river stages effluent flow is pumped through outfall 010 via a 32 MGD capacity pumping station.

The facility may receive up to 40 MGD in wet weather flows related to the combined sewer system. While all the flow receives primary treatment, the maximum capacity of the secondary treatment system is 25 MGD. When influent flow exceeds 25 MGD, up to 15 MGD is directed to a bypass with seasonal chlorination/dechlorination. The bypass effluent is blended with the secondary effluent prior to discharge through outfall 010. This bypass is considered an interim measure per the 2006 Consent Decree. Use of this bypass is governed solely by the terms of the

2006 Consent Decree, which establishes conditions, monitoring requirements and effluent limitations.

2. Jones Ferry CSO Treatment Facility

The Chicopee treatment works includes a newly constructed CSO Treatment Facility at Jones Ferry which discharges through outfall 007 to the Connecticut River. See Figure 2. The facility was designed to provide screening and year-round chlorination/dechlorination for up to 35.2 MGD. Flows exceeding the capacity of the treatment facility are diverted to discharge directly at outfall 007.

3. Collection System and CSOs

The Chicopee sewer collection system includes approximately 200 miles of pipe, approximately 50% of which is a combined sewer system collecting both sanitary wastewater and stormwater flows. CSOs occur at 28 diversion structures leading to eighteen outfalls, as shown in Figure 2. See section VIII for further discussion.

B. Derivation of Effluent Limits

1. Flow

The flow limit is based on the 15.5 MGD design flow of the secondary treatment plant and is an average annual limit calculated as a 12-month rolling average, consistent with the existing permit. The Draft Permit also contains a new reporting requirement for monthly average flow.

2. Conventional pollutants (BOD, TSS and pH)

Effluent concentration limits for biochemical oxygen demand (BOD) and total suspended solids (TSS) are technology-based standards based on the minimum level of effluent quality attainable by secondary treatment as set forth in 40 CFR §133.102. These provide for effluent limits of 30 mg/l (average monthly) and 45 mg/l (average weekly). Mass loads for BOD and TSS are calculated from the equation:

Load limit = (Concentration limit, mg/l) x (Design Flow, mgd) x (Conversion factor = 8.34)
Average monthly load limit = 30 x 15.5 x 8.34 = 3.878 lbs/day;
Maximum daily load limit = 45 x 15.5 x 8.34 = 5,817 lbs/day

There were six exceedances of the BOD weekly average and seven exceedances of the TSS weekly average during the period of 2008-2009. See Table 1.

Percent removal requirements are also included in the secondary treatment standards of §133.102, requiring that the average monthly percent removal for BOD and TSS be not less than 85%. However, combined sewer systems may receive case-by-case consideration under §133.103, which states:

> Treatment works subject to this part may not be capable of meeting the percentage removal requirements . . . during wet weather where the treatment works receive flows from combined sewers (i.e. sewers which are designed to transport both storm water and sanitary sewage). For such treatment works, the decision must be made on a case-by-case basis as to whether any attainable percentage removal level can be defined, and if so, what the level should be.

The current permit suspended the 85% removal requirement. The Draft Permit continues the suspension of that requirement based on the weak strength of the influent under both wet and dry conditions. (For example, in 2009 the average influent BOD concentration was 109 mg/l; average TSS concentration was 128 mg/l). EPA expects that sewer separation work to be performed in connection with the facility's CSO Long Term Control Plan, which will result in new sanitary sewer infrastructure in large portions of the City, will result in reduced inflow and infiltration ("I/I") to the system. To assess that expectation, the Draft Permit includes a requirement for the facility to evaluate the impact of planned CSO measures on I/I as part of its I/I reporting pursuant to Part I.D.3 of the draft permit.

Technology-based secondary treatment requirements for pH are a minimum of 6.0 and maximum of 9.0 SU. The Massachusetts SWQS set water quality criteria for pH with an allowable range from 6.5 to 8.3 SU. MassDEP generally requires that these criteria be met at the point of discharge, prior to dilution, as a state certification requirement. Prior to the issuance of the existing permit, MassDEP agreed to reduce the minimum pH effluent limit for the Chicopee discharge to 6.0 based on influent concentrations and the nature of the treatment system. MassDEP has concurred with the continuance of a minimum pH effluent limit of 6.0. EPA agrees that a minimum pH limit of 6.0 is sufficiently protective of water quality, given the evidence of acceptable pH levels currently in the Connecticut River (from 7.4-7.6; see 2003 Connecticut River WQA, page B21) and the available dilution. The pH effluent limit therefore remains the same as in the current permit, at 6.0 to 8.3 SU.

3. Settleable solids

The existing permit requires daily monitoring for settleable solids and requires reporting of the weekly average and maximum daily values for each month. EPA has not established a secondary treatment standard for settleable solids and there is no applicable water quality criteria; levels of settleable solids provide a measure of operational control for the facility. As this is an operational measure, EPA as a matter of policy no longer includes monitoring and reporting of settleable solids in NPDES permits. The draft permit eliminates this requirement.

4. Bacteria

The current permit includes bacteria limits on fecal coliform bacteria. Since issuance of the current permit, Massachusetts has promulgated, and EPA has approved, revised water quality standards for bacteria, which include Class B water quality criteria based on <u>Eschericia coli</u>, replacing fecal coliform. (see Massachusetts Surface Water Quality Standards, 314 CMR 4.05(3)(b)(4)).

The draft permit therefore includes water quality-based effluent limitations for E. coli bacteria, replacing the fecal coliform bacteria limits in the current permit. Pursuant to both MassDEP and EPA guidance, mixing zones for bacteria are not allowed, so the E. coli limits were not calculated using a dilution factor. E. coli limits in the draft permit are a monthly geometric mean of 126 cfu/100 ml mean and a maximum daily limit of 409 cfu/100 ml (this is the 90% distribution of the geometric mean of 126 cfu per 100 ml.)

Monitoring frequency remains the same as under the current permit at 1 per week.

5. Toxic Pollutants

a. Dilution Factor

Water quality based limitations are established with the use of a calculated available dilution factor. Title 314 CMR 4.03(3)(a) requires that effluent dilution be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, recorded over a 10 year recurrence interval. Additionally, the plant design flow is used to calculate available effluent dilution.

The secondary plant design flow is 15.5 MGD as stated in Section A.6.a of the permit application. The 2005 Fact Sheet, issued in connection with the existing permit, lists the 7Q10 flow of the Connecticut River as 1,235 MGD, or 1,910 cfs. While the exact derivation of this figure is no longer available, it is reasonably consistent with the published estimate of 1,891 cfs cited in the MassDEP *Connecticut River Basin 1998 Assessment Report*. Therefore EPA will continue to use a 7Q10 Flow of 1,235 MGD to calculate the dilution factor for this facility. This is calculated as follows:

$$\frac{\text{plant design flow} + \text{7Q10 river flow}}{\text{plant design flow}} = \frac{15.5\text{ MGD} + 1{,}235\text{ MGD}}{15.5\text{ MGD}} = 81$$

b. Total Residual Chlorine

Total Residual Chlorine (TRC) - The draft permit includes total residual chlorine limitations which are based on state water quality standards. Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. The water quality criteria established for chlorine are 19 ug/l daily maximum (Criterion Maximum Concentration) and 11 ug/l (Criterion Continuous Concentration) monthly average in the receiving water. Given a dilution factor of 81, the total residual chlorine limitations are calculated as follows:

Total Residual Chlorine Limitations based on criteria:

(acute criteria x dilution factor) = Acute (Maximum Daily Limit)
(19 ug/l x 81) = 1,539 ug/l = 1.5 mg/l

(chronic criteria x dilution) = Chronic (Monthly Average Limit)
(11 ug/l x 81) = 891 ug/l = 0.89 mg/l

In addition, MassDEP has determined that effluent concentrations of chlorine should not exceed 1.0 mg/l, even where dilution analysis may indicate a higher allowable concentration. See *Massachusetts Water Quality Standards Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (1990). Therefore, the monthly average TRC limit has been established as 0.89 mg/l, but the maximum daily TRC limit has been established as 1.0 mg/l. These limits remain unchanged from the current permit.

c. Aluminum and Other Metals

EPA reviewed analytical data submitted in connection with the Chicopee WET Reports to determine whether the facility discharges toxic metals. Data from samples of the effluent and receiving water for the period May 2007 through June 2010 are set forth in Table 5, along with the relevant water quality criteria for each parameter. To determine whether there is a reasonable potential for the discharge to cause or contribute to an exceedance of the water quality criteria, a mass balance equation was used to calculate the resulting receiving water concentration:

$$\text{Receiving water concentration } (C_r) = \frac{(C_d * Q_d + C_s * Q_s)}{(Q_d + Q_s)} \quad \text{; where}$$

C_d = 99th percentile of effluent concentration data
Q_d = Design flow of facility
C_s = Median concentration in Connecticut River
Q_s = 7Q10 streamflow in Connecticut River

The results are shown below for all metals detected in the effluent through the WET testing.

	Effluent data - 99th percentile (C_d)	Median of receiving water data (C_s)	Resulting receiving water concentration (Total recoverable)	Receiving water concentration (Dissolved)	Chronic criteria (Dissolved)	Acute criteria (Dissolved)
Al (ug/l)	171	110	110.8	110.8	87	750
Cu (ug/l)	30.6	4.0	4.3	4.1	4.8	5.7
Ni (ug/l)	44.4	3.4	3.9	3.9	22	139
Pb (ug/l)	4.7	ND	0.06	0.06	0.23	14.0
Zn (ug/l)	69.7	7.8	8.6	8.4	43	43

Of the metals tested, only aluminum is present in the effluent at levels that present a reasonable potential for exceedance of water quality criteria. Reported concentrations of aluminum in the effluent have been as high as 0.13 mg/l. A lognormal distribution fit to the effluent data indicates an expected 95th percentile concentration of 0.13 mg/l, compared to a chronic criterion of 0.087 mg/l and a 99th percentile concentration of 0.17 mg/l, compared to a chronic criterion of 0.75 mg/l. The receiving water does not provide dilution of aluminum discharges with respect to the chronic criterion, as the WET Reports show a median receiving water concentration of 0.11

mg/l, also above the chronic criterion. See Table 5. The resulting receiving concentration is therefore above the chronic criterion. The reported concentrations do not indicate a reasonable potential to exceed the acute water quality criterion for aluminum.

As the data demonstrate a reasonable potential to exceed the chronic water quality criteria for aluminum, an effluent limit must be set. 40 C.F.R. §122(d)(iii). As the receiving water does not provide dilution of aluminum discharges with respect to the chronic criterion, the average monthly effluent limit for aluminum is set at the criterion level of 0.087 mg/l. The high effluent concentrations appear to be related to the use of aluminum compounds for TSS control in the facility's treatment process. Therefore, the aluminum effluent limitation is in effect only during months when aluminum is used in the treatment process.

EPA's regulations allow a permit to specify a schedule of compliance leading to compliance with the Clean Water Act and regulations when appropriate. 40 CFR § 122.47(a). The Massachusetts Surface Water Quality Standards also allow for schedules of compliance in permits where appropriate. 314 CMR 4.03(1)(b). The purpose of a compliance schedule generally is to afford a permittee adequate time to comply with one or more permit requirements or limitations that are based on new, or newly interpreted or revised water quality standards.   In this case a schedule of compliance is appropriate in order that the permittee may determine the most effective source control measure and/or alternative treatment design that will allow it to continue to meet its TSS limit while also meeting the new aluminum limit. The regulations also provide that a compliance schedule of more than one year contain interim requirements no further than one year apart, 40 CFR § 122.47(a)(3), and report on its compliance or noncompliance within 14 days of each interim or final date of compliance.

For these reasons, the draft permit includes a compliance schedule for attaining the aluminum limit. The schedule includes milestones for a study to characterize sources and analyze alternatives for meeting the limit, completing design, and completing construction of necessary facilities. Specifically, the schedule requires that the study be initiated within one year of the permit effective date and completed within two years of the permit effective date; that design of an alternative treatment system, if indicated, be completed within three years of the permit effective date, and that construction of an alternative treatment system, if indicated, be completed within four years of the permit effective date. The permit limit shall go into effect four years from the effective date of the permit.

EPA also reviewed the Expanded Effluent Testing Data provided by the applicant in its application material, along with supporting documentation. None of reported pollutants were present in the discharge at levels that indicate a reasonable potential to cause exceedance of the relevant water quality criteria.

d. Whole Effluent Toxicity Testing

National studies conducted by the Environmental Protection Agency have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents and aromatic hydrocarbons among others. The Region's current policy is to include toxicity testing requirements in all municipal permits, while Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Based on the potential for toxicity resulting from domestic and industrial contributions, and in accordance with EPA regulation and policy, the draft permit includes acute toxicity limitations and monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784 (July 24, 1985); see also, EPA's Technical Support Document for Water Quality-Based Toxics Control). EPA Region I has developed a toxicity control policy which requires wastewater treatment facilities to perform toxicity bioassays on their effluents.

Pursuant to EPA Region I policy, and MADEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters, discharges having a dilution ratio between 20:1 and 100:1 require acute toxicity testing four times per year. The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in conjunction with pollutant specific control procedures to control the discharge of toxic pollutants.

The dilution factor for the Chicopee WPCD is 81:1. Accordingly, the permittee shall perform acute toxicity testing four times per year on the fathead minnow, *Pimephales promelas,* in accordance with **Attachment A** to the draft permit. Samples shall be collected in February, May, August and November, and the test reports shall be submitted prior to March 31, June 30, September 30 and December 31, respectively.

The results of whole effluent toxicity tests for the Chicopee WPCF for the period from January 2008 through December 2009 are shown in Table 1. No exceedances occurred during that period.

6. Nitrogen

It has been determined that excessive nitrogen loadings are causing significant water quality problems in Long Island Sound, including low dissolved oxygen. In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a Total Maximum Daily Load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation (WLA) for point sources and a Load Allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL. See TMDL--*A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound* (CT DEP 2000)

The baseline total nitrogen point source loadings estimated for the Connecticut, Housatonic, and

Thames River watersheds were 21,672 lbs/day, 3,286 lbs/day, and 1,253 lbs/day respectively (see table below). The estimated current point source total nitrogen loadings for the Connecticut, Housatonic, and Thames Rivers respectively are 13,836 lbs/day, 2,151 lbs/day, and 1,015 lbs/day, based on recent information and including all POTWs in the watershed. The following table summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings:

Basin	Baseline Loading[2] (lbs/day)	TMDL Target[3] (lbs/day)	Existing Loading[4] (lbs/day)
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

The overall TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met. In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA intends to include a permit condition for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that the aggregate 25 % reduction is maintained. Such a requirement has been included in the draft permit. EPA Region I-New England also intends to work with the State of Vermont to ensure that similar requirements are included in its discharge permits.

Specifically, the permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility in order to control total nitrogen levels, including, but not limited to, operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This evaluation is required to be completed and submitted to EPA and MassDEP within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The permit also requires implementation of optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen load from this facility (2004 – 2005) is estimated to be 1,618 lbs/day (see Table 6). The permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years.

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[2] Estimated loading from TMDL (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998).
[3] Reduction of 25% from baseline loading.
[4] Estimated current loading from 2004 – 2005 DMR data – see Table 6.

The agencies will periodically update the estimate of all out-of-basin total nitrogen loads and may incorporate total nitrogen limits in future permit modifications or reissuances as may be necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. There have been significant efforts by the New England Interstate Water Pollution Control Commission (NEIWPCC) work group and others since completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities. Although not a permit requirement, it is strongly recommended that any facilities planning that might be conducted for this facility should consider alternatives for further enhancing nitrogen reduction.

The draft permit continues the average monthly and maximum daily reporting requirements for total Kjeldahl nitrogen, nitrite, nitrate, ammonia and total nitrogen that are in the current permit, but increases the frequency from monthly to weekly monitoring in order to provide a baseline for assessing optimization of nitrogen removal.

VII. Outfall 011

Outfall 011 discharges stormwater from an area of the Westover Air Reserve Base/Westover Metropolitan Airport that is treated through an oil/water separator prior to discharge. As operator of the outfall and oil/water separator, the City of Chicopee is required under the existing permit to visually inspect the outfall on a quarterly basis and perform routine maintenance on an annual basis. These inspections were not required to occur during wet weather and have generally not occurred during wet weather, due to the need for the City to arrange for access to the outfall in advance with the Air Reserve. The quarterly inspections have consistently shown no dry weather flow, little to no oil accumulation in the separator and small sediment accumulations well within the capacity of the system. Maintenance has been limited to cleaning the sediment sump approximately every five years.

The inclusion of an offsite stormwater outfall in a POTW NPDES permit is unusual. Outfall 011 is not a CSO, but is a stormwater discharge that is part of the City of Chicopee’s municipal separate storm sewer system (MS4), receiving a stormwater discharge from an industrial facility (airport). Therefore EPA is reconsidering the permit requirements in light of the requirements of the applicable industrial and MS4 stormwater permits.

Stormwater discharges from airports are governed under the Multi-Sector General Permit for Industrial Activities, Sector S – Air Transportation Facilities (the “MSGP”). The MSGP applies to discharges to MS4 systems (such as to Outfall 011) as well as discharges directly to receiving waters. Under the Multi-Sector General Permit, airport operators must conduct quarterly wet weather visual assessments of stormwater samples, including visual inspection of the sample for water quality characteristics (color; odor; clarity; floating solids; settled solids; suspended solids; foam; oil sheen; and other obvious indicators of stormwater pollution). MSGP §4.2.1 (EPA 2009). The MSGP also requires that airport operators have a Stormwater Pollution Prevention Plan (SWPPP) that includes spill prevention and response procedures.

Discharges from small MS4s such as Chicopee are governed by the NPDES General Permit for Stormwater Discharges from Small MS4s (2003) (http://www.epa.gov/region1/npdes/permits/permit_final_ms4.pdf), to the extent that the MS4 system is located in an urbanized area. Outfall 011 is outside the urbanized area of Chicopee and is therefore not directly subject to the Small MS4 GP. See *NPDES Phase II Stormwater Program Automatically Designated MS4 Areas - Chicopee, Massachusetts*, http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/Chicopee.pdf. However, EPA believes that the MS4 General Permit requirements are persuasive regarding the appropriate requirements for inspection and maintenance of Outfall 011. The current small MS4 permit requires that MS4s develop schedules for maintenance of stormwater structures, while the draft General Permits for Stormwater Discharges from Small MS4s in Massachusetts Interstate, Merrimack and South Coastal Watersheds requires annual inspection of structural stormwater BMPs such as oil/water separators. See Part 2.4.7.1.d.vii.

Based on the above, it is EPA's conclusion that (1) the airport operator(s) have an independent requirement under the MSGP to perform quarterly visual wet weather assessments of the discharge to the MS4 at Outfall 011 (along with other MSGP permit requirements); (2) as the only discharge to the City's oil/water separator is from the airport drainage system, the quarterly visual assessment of wet weather discharges to the MS4 under the MSGP will be far more effective than the quarterly dry weather inspections currently performed by the City of Chicopee in identifying any stormwater pollution issues; (3) the inspection history of this outfall indicates no water quality concerns requiring additional monitoring or inspections; and (4) the City of Chicopee's responsibility as owner of the oil/water separator and Outfall 011 is adequately met by an annual inspection requirement. Therefore the draft permit requires annual inspections and cleaning of the oil/water separator based on inspection results or no less than every five years.

VII. Industrial Pretreatment Program

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR Part 122.44(j), 40 CFR Part 403 and section 307 of the Act. The Permittee's pretreatment program received EPA approval on September 28, 1990 and, as a result, appropriate pretreatment program requirements were incorporated into the previous permit which is consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

The Federal Pretreatment Regulations in 40 CFR Part 403 were amended in October 1988, July 1990 and again in October 2005. Those amendments established new requirements for implementation of pretreatment programs. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with current Federal Regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

Lastly, the permittee must continue to submit, annually, **by March 1**, a pretreatment report detailing the activities of the program over its pretreatment reporting period of January 1st to December 31st.

In addition to the requirements described above, the draft permit requires the permittee to submit to EPA in writing, within 120 days of the permit's effective date, a description of proposed changes, if applicable, to the permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the draft permit to ensure that the pretreatment program is consistent and up-to-date with all pretreatment requirements in effect.

VIII. Combined Sewer Overflows

A. Chicopee's Combined Sewer System

More than half of Chicopee's sewer collection system consists of combined sewers that convey both sanitary sewage and stormwater runoff during rain events. During wet weather, the combined flow exceeds the capacity of the interceptor sewers and the wastewater treatment plant, and a portion of the combined flow is discharged to the Connecticut and Chicopee Rivers through the City's combined sewer overflows (CSOs). CSOs have been identified as a significant source of pollution to the Connecticut and Chicopee Rivers. See 2003 Connecticut River WQA; 2003 Chicopee River WQA.

The City currently has 28 active CSO diversion structures in its system, leading to eighteen CSO outfalls where the CSOs discharge to receiving waters. Figure 1; Table 4. This is a reduction from the previous permit, which identified 34 CSO diversion structures and 22 CSO outfalls. Since the last permitting action CSOs 001, 025, 033 and 043, and CSO diversion structure 32.6, have been eliminated in conjunction with Phase I of the City's Draft Long Term Control Plan (2001) and the 2006 Consent Order. These projects, along with the construction of the Jones Ferry Treatment Facility, have reduced the volume of untreated CSO discharges by 265 MGD to the current level of 220 MGD. *Final Long-Term CSO Control Plan and Environmental Impact Report for City of Chicopee* (Submitted April 2009).[5]

While the City has achieved significant reduction in CSO discharges, the remaining discharges are still substantial. The Final Long Term Control Plan has not yet been approved by EPA, but a summary is provided here for informational purposes. As currently proposed, the final plan would involve a 20-year, $153.4 million dollar plan including partial and total sewer separation alternatives and one direct connection (of combined sewers not experiencing CSOs), to be completed in 8 phases ending in 2026. This set of proposed projects would eliminate all CSOs with the exception of CSO 007, the discharge location of the new Jones Ferry CSO Treatment Facility. The Final LTCP recommends deferring consideration of the complete separation of the drainage area served by the Jones Ferry facility until after completion of the 20 year plan, in

[5] EPA notes that the Final LTCP contains CSO identification numbers that are in some instances different from the CSO numbering under the current permit. For example, CSO 043 (1165 Montgomery Street) is referred to in the Final LTCP as CSO #4.2. *Final LTCP and EIR* at 2-5. This Fact Sheet and the Draft Permit use the permit numbering scheme.

order to allow an evaluation of whether complete separation is necessary to eliminate CSO 007.

The City has begun work on Phase 2 projects pursuant to a Notice of Project Change submitted in February 2009. The Phase 2 projects include (1) Chicopee Falls sewer separation (Area 31/32/1), (2) Upper Granby Road area sewer separation (part of Area 8) and (3) McKinstry Avenue/Lorraine Street sewer separation (part of Area 7.1). The Phase 2 projects are expected to abate an estimated 18% of the total remaining annual CSO volume. *Final LTCP and EIR* at 10-2.

B. Regulatory Framework

CSOs are point sources subject to NPDES permit requirements for both water-quality based and technology-based requirements but are not subject to the secondary treatment regulations applicable to publicly owned treatment works in accordance with 40 CFR §133.103(a).

As noted above, Section 301(b)(1)(C) of the Clean Water Act of 1977 mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Water Quality Act Amendments of 1987 (WQA).

The framework for compliance with Clean Water Act requirements for CSOs is set forth in EPA's National CSO Control Policy, 59 Fed. Reg. 18688 (1994). It sets the following objectives:

1) To ensure that if the CSO discharges occur, they are only as a result of wet weather;
2) 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
3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

The CSO Control Policy also established as a matter of national policy the minimum BCT/BAT controls that represent the BPJ of the agency on a consistent, national basis. These are the "nine minimum controls" defined in the CSO Control Policy and set forth in the Draft Permit Part 1.e.1.a (1) through (9): (1) proper operation and maintenance of the sewer system and the CSOs, (2) maximum use of the collection system for storage, (3) review pretreatment programs to assure that CSO impacts are minimized, (4) maximization of flow to the POTW for treatment, (5) prohibition of dry weather overflows, (6) control of solid and floatable materials in CSOs, (7) pollution prevention programs, (8) public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts, and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls. Massachusetts has established similar requirements for CSO permits. MassDEP, *Guidance for Abatement of Pollution from CSO Discharges* (1997).

C. Permit Requirements

In accordance with the National CSO Control Policy, the draft permit contains the following conditions for CSO discharges:

> (i) Dry weather discharges from CSO outfalls are prohibited. Dry weather discharges must be immediately reported to EPA and MassDEP.
>
> (ii) During wet weather, the discharges must not cause any exceedance of water quality standards. Wet weather discharges must be monitored and reported as specified in the permit.
>
> (iii) The permittee shall meet the technology-based nine minimum controls, set forth above, complying with the implementation levels as set forth in Part I.E.2 of the draft permit.
>
> (iv) The permittee shall submit updated documentation on its implementation of the Nine Minimum Controls within 6 months of the effective date of the permit, and shall provide an annual report on monitoring results from CSO discharges and the status of CSO abatement projects by April 30 of each year.

In addition, the permittee's operation of the Jones Ferry CSO Treatment Facility is subject to additional technology-based effluent limitations and monitoring requirements. The CSO Treatment Facility represents an enhancement of the Nine Minimum Controls, allowing greater use of the system for storage (control #2) and return of the flow to the POTW for treatment (control #3), removal of floatables and some solid materials (control #6), and reduction of bacteria through disinfection (and the related control of chlorine discharges) (control # 7). EPA has determined additional BCT/BAT effluent limitations using its best professional judgment (BPJ) that are consistent with the design parameters for this facility as set forth in the 2006 Consent Order. These effluent limitations are:

Fecal coliform:	200 cfu/100 ml average monthly 400 cfu/100 ml maximum daily
Total Residual Chlorine:	0.89 mg/l average monthly; 1.0 mg/l maximum daily

In making this determination EPA considered the factors identified in 40 C.F.R § 125.3(d), including the cost and benefits of the facility (analyzed in connection with the development of the city's CSO control plan); the newness of the facility, the fact that the facility was engineered to meet the design parameters, and the demonstrated ability of the facility's process to meet the limitations based on effluent data from the first year of operation (Table 2). The permit also requires that the permittee conduct concurrent monitoring for E. coli until August 2011 consistent with the 2006 Consent Order, and provide a report setting forth the side by side fecal coliform and E. coli results along with an assessment of analytical methods used for E. coli, by November 2011.

The draft permit also requires reporting of flow (including treated flow, untreated flow diverted from the facility, and flow to the treatment plant), BOD, TSS, pH, Whole Effluent Toxicity, TKN, Nitrate, Nitrite and Ammonia. In order to allow a determination of whether the facility is meeting the design goal of reducing untreated discharges to no more than 4 per year in a typical year, the draft permit requires that the annual report include a comparison of annual precipitation to that in a "typical" year as assumed in the modeling of the CSO system and an assessment of whether the volume and frequency of untreated CSO discharges from CSO 007 is consistent with the assumptions underlying the Long Term CSO Control Plan.

IX. Sludge Conditions

The Chicopee WPCF generates approximately 1,700 dry metric tons of sludge annually. The sludge is thickened then dewatered using either a belt filter press or centrifuge. The facility contracts with New England Organics for sludge disposal. The majority of sludge is fired in a sewage sludge incinerator (Naugatuck or Synagro-Waterbury) with the remainder disposed of in a municipal solid waste landfill.

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

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards and the 40 CFR Part 503 regulations. In addition, EPA Region I has developed 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 on EPA's website at http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf.

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

X. 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 EPA's action or proposed action that it funds, permits, or undertakes, 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. Anadromous Atlantic salmon (*Salmo Salar*) is the only managed species believed to be present during one or more lifestages within the area which encompasses the discharge site. Although the last remnant stock of Atlantic salmon indigenous to the Connecticut River was believed to have been extirpated over 200 years ago, an active effort has been underway throughout the Connecticut River system since 1967 to restore this historic run (HG&E/MMWEC, 1997). Atlantic salmon may pass in the vicinity of the discharge either on the migration of juveniles downstream to Long Island Sound or on the return of adults to upstream areas. The area of the discharge on the river mainstem is not suitable for spawning, which is likely to occur in tributaries were the appropriate gravel or cobble riffle substrate can be found.

EPA has concluded that the limits and conditions contained in this draft permit minimize adverse effects to Atlantic Salmon EFH for the following reasons:

- This is a reissuance of an existing permit;
- The dilution factor (81) is high;
- The Connecticut River is over 800 feet wide in the vicinity of the discharge, providing a large zone of passage for migrating Atlantic salmon that is unaffected by the discharge;
- WPCF limits specifically protective of aquatic organisms have been established for chlorine, based on EPA water quality criteria;
- The facility withdraws no water from the Connecticut River, the Chicopee River, Willimansett Brook or Cooley Brook, so no life stages of Atlantic salmon are vulnerable to impingement or entrainment from this facility;
- Acute toxicity tests will be conducted four times per year to ensure that the discharge does not present toxicity problems;
- CSO discharges have been significantly reduced in accordance with permit requirements;
- Enhanced treatment of CSO discharges from regulator 7.1, Jones Ferry CSO Treatment Facility, includes dechlorination of the effluent;
- The draft permit prohibits the discharge of pollutants or combination of pollutants in toxic amounts;
- The effluent limitations and conditions in the draft permit were developed to be protective of all aquatic life; and
- The draft permit prohibits violations of the state water quality standards.

EPA believes that the draft permit limits adequately protect Atlantic Salmon EFH, and therefore additional mitigation is not warranted. If adverse impacts to EFH are detected as a result of this permit action, or if new information is received that changes the basis for our conclusion, NOAA Fisheries will be notified and an EFH consultation will be initiated.

XI. Endangered Species Act

A. Introduction

Section 7(a) of the Endangered Species Act (ESA) of 1973, as amended (the “Act”), grants authority to and imposes requirements upon federal agencies regarding endangered or threatened species of fish, wildlife, or plants (“listed species”) and the habitats of such species that have been designated as critical (“critical habitat”).

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

Based on EPA’s assessment, the only endangered species potentially influenced by the reissuance of this permit is the shortnose sturgeon (*Acipenser brevirostrum*). It is EPA’s preliminary determination that the operation of this facility and the discharge from the CSO outfalls, as governed by the permit action, is not likely to adversely affect the species of concern. It is our position that this permit action does not warrant a formal consultation under Section 7 of the ESA. The reasoning to support this position follows.

B. Chicopee Facility

The Chicopee WPCF is a 15.5 MGD secondary wastewater treatment facility serving a population of approximately 55,000. The pure oxygen activated sludge treatment plant treats sanitary and industrial wastewater. The collection system is about 50% separate and 50% combined sewers. There are eighteen CSO outfalls, eight on the Connecticut River, nine on the Chicopee River, and one on Willimansett Brook, a tributary to the Connecticut River. The WPCF is located on the east bank of the Chicopee River, approximately five miles downstream from the Holyoke Dam.

The Connecticut and Chicopee Rivers are classified as Class B (warm water fishery) waters in the Massachusetts Surface Water Quality Standards. Their uses include habitat for fish, other aquatic life and wildlife and for primary (e.g., swimming) and secondary (e.g., fishing and boating) contact recreation. See 314 CMR 4. 05(3)(b) and 4.06 (Table 12). Such waters must have consistently good aesthetic value. Both rivers have been designated as impaired for pathogens due to CSO discharges; the Connecticut River has also been designated as impaired due to PCBs and suspended solids. Willimansett Brook is a Class B water that has not been assessed.

C. Shortnose Sturgeon Information

Update information presented in this section on the life history and known habitat of shortnose sturgeon in the Connecticut River was obtained from, among other sources, "The Connecticut River IBI Electrofishing NMFS Biological Opinion, Connecticut and Merrimack River Bioassessment Studies" (NMFS BO, July 30, 2009) and the Draft Endangered Species Act Section 7 Consultation Biological Opinion (BO) for the Holyoke Hydroelectric Project (Federal Energy Regulatory Commission (FERC) Permit #2004), issued to FERC by NOAA Fisheries on January 27, 2005 (NMFS BO 2005). Information dealing with the potential effects of pollutants on shortnose sturgeon was obtained from, among other sources, a detailed ESA response letter from NMFS to EPA regarding the Montague WPCF, dated September 10, 2008 (Montague Letter).

Information gathered from a variety of sources confirms the presence of shortnose sturgeon in the Connecticut River. Known concentration and spawning areas are located either upstream of the Chicopee WPCF discharge, near the Holyoke Dam, or at locations significantly downstream of the discharge (the closest at Agawam, MA, more than five miles downstream). The Connecticut River is over 800 feet wide in the vicinity of the discharge. Combined with the observation that shortnose sturgeon in this river have been generally found in the deep river channel, this indicates that migrating shortnose sturgeon will encounter a large zone of passage that is unaffected by the discharge.

The population of endangered shortnose sturgeon in the Connecticut River is largely divided by the Holyoke Dam, although limited successful downstream passage does occur. Modifications to the dam are currently ongoing to ensure the safe and successful upstream and downstream passage of fish, including shortnose sturgeon, at the Dam (Montague Letter). The Holyoke Dam separates shortnose sturgeon in the Connecticut River into an upriver group (above the Dam) and a lower river group that occurs below the Dam to Long Island Sound. The abundance of the upriver group has been estimated by mark-recapture techniques using Carlin tagging (Taubert 1980) and PIT tagging (Kynard unpublished data). Estimates of total adult abundance calculated in the early 1980s range from 297 to 516 in the upriver population to 800 in the lower river population. Population estimates conducted in the l990s indicated populations in the same range. The total upriver population estimates ranged from 297 to 714 adult shortnose sturgeon, and the size of the spawning population was estimated at 47 and 98 for the years 1992 and 1993 respectively.

The lower Connecticut River population estimate for sturgeon >50 cm TL was based on a Carlin and PIT tag study from 1991 to 1993. A mean value of 875 adult shortnose sturgeon was estimated by these studies. Savoy estimated that the lower river population may be as high as 1000 individuals, based on tagging studies from 1988-2002. It has been cautioned that these numbers may overestimate the abundance of the lower river group because the sampled area is not completely closed to downstream migration of upriver fish (Kynard 1997). Other estimates of the total adult population in the Connecticut River have reached 1200 (Kynard 1998) and based on Savoy's recent numbers the total population may be as high as 1400 fish (Montague Letter). Regardless of the actual number of shortnose sturgeon in the river, the effective breeding population consists of only the upriver population, as no lower river fish are successfully passed upstream at the present time. This effective breeding population is estimated at approximately 400 fish (NMFS BO 2009).

Several areas of the river have been identified as concentration areas. In the downriver segment, a concentration area is located in Agawam, MA which is thought to provide summer feeding and over-wintering habitat. As discussed above, this concentration area may be the closest to the outfalls regulated by the Chicopee WPCF and CSO draft permit. The Agawam concentration area is judged to be more than five miles downstream from the outfalls. Other concentration areas for foraging and over wintering are located in Hartford, Connecticut, at the Head of Tide (Buckley and Kynard 1985) and in the vicinity of Portland, Connecticut (CTDEP 1992). Shortnose sturgeon also make seasonal movements into the estuary, presumably to forage (Buckley and Kynard 1985; Savoy in press). Above the Dam, there are also several concentration areas. During summer, shortnose sturgeon congregate near Deerfield (NMFS BO). Shortnose sturgeon that use the habitat in this area most likely to move into the Deerfield River. Many shortnose sturgeon overwinter at Whitmore.

Two areas above Holyoke Dam, near Montague, have more consistently been found to provide spawning habitat for shortnose sturgeon. This spawning habitat is located at river km 190-192 and is the most upstream area of use. It is located just downstream of the species' historical limit in the Connecticut River at Turners Falls (river km 198). Across the latitudinal range of the species, spawning adults typically travel to approximately river km 200 or further upstream where spawning generally occurs at the uppermost point of migration within a river (Kynard 1997; NMFS 1998). The Montague sites have been verified as spawning areas based on successful capture of sturgeon eggs and larvae in 1993, 1994, and 1995, that were 190 times the number of fertilized eggs and 10 times the number of embryos found in the Holyoke site (Vinogradov 1997). In seven years of study (1993-1999), limited successful spawning, as indicated by capture of embryos or late stage eggs, occurred only once (1995) at Holyoke Dam (Vinogradov 1997; Kynard et al. 1999c). Using this same measure, successful spawning occurred at Montague during 4 of 7 years. Both Montague and Holyoke sites have been altered by hydroelectric dam activities, but all information suggests that females spawn successfully at Montague, not at Holyoke Dam. Thus, it appears that most, if not all, recruitment to the population comes from spawning in the upriver segment (NMFS BO).

The effects of the Holyoke Project on the shortnose sturgeon's ability to migrate in the Connecticut River have likely adversely affected the shortnose sturgeon's likelihood of surviving in the river. An extensive evaluation of shortnose sturgeon rangewide revealed that shortnose sturgeon above Holyoke Dam have the slowest growth rate of any surveyed (Taubert 1980, Kynard 1997) while shortnose sturgeon in the lower Connecticut River have a high condition factor and general robustness (Savoy, in press). This suggests that there are growth advantages associated with foraging in the lower river or at the fresh-and salt-water interface. There are four documented foraging sites downstream of the Holyoke Dam, while only one exists upstream. The presence of the Holyoke Dam has likely resulted in depressed juvenile and adult growth due to inability to take advantage of the increased productivity of the fresh/salt water interface. This likely has negatively impacted the survival of the Connecticut River population of shortnose sturgeon and impeded recovery. This has also likely made the spawning periodicity of females greater (NMFS BO 2005).

No shortnose sturgeon spawning activity is thought to occur in the Chicopee River. While no part of the Chicopee River has been characterized as a concentration area for shortnose sturgeon, these fish have been documented in the Chicopee River. Based on the observed behavior of shortnose sturgeon in the Connecticut River, any shortnose sturgeon entering the Chicopee River will likely be traveling in the deeper, channelized portion of the river as they forage for food. This behavior makes it less likely that SNS would come in direct contact with the discharge from the Chicopee River CSO outfalls. In addition, these fish would not be expected to be found in a shallow, smaller body of water such as Willimansett Brook.

D. Pollutant Discharges Permitted

The draft permit has been developed to ensure that discharges will not cause or contribute to violations of the Massachusetts Water Quality Standards (WQS) in the Connecticut River. The Massachusetts WQS include turbidity, dissolved oxygen and other standards to protect aquatic life and incorporate EPA's aquatic life criteria for toxic pollutants unless a site specific criterion is established, which were designed to be protective of the most sensitive aquatic species nationwide. EPA has further reviewed the discharges and effluent limits to ensure that they are specifically protective of the shortnose sturgeon. Specific pollutants, criteria and effluent limits are discussed below.

1. Total Suspended Solids

TSS can affect aquatic life directly by killing them or reducing growth rate or resistance to disease, by preventing the successful development of fish eggs and larvae, by modifying natural movements and migration, and by reducing the abundance of available food (EPA 1976). These effects are caused by TSS decreasing light penetration and by burial of the benthos. Eggs and larvae are most vulnerable to increases in solids.

The draft permit proposes the same TSS concentration limitations at the WPCF as in the existing permit. The average monthly and average weekly limits are based on the secondary treatment requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f) and are a monthly average TSS concentration of 30 mg/l, and a weekly average concentration of 45 mg/l.

Studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations of 580mg/L to 700,000mg/L depending on species. Sublethal effects have been observed at substantially lower turbidity levels. For example, prey consumption was significantly lower for striped bass larvae tested at concentrations of 200 and 500 mg/L compared to larvae exposed to 0 and 75 mg/L (Breitburg 1988 in Burton l993). Studies with striped bass adults showed that pre-spawners did not avoid concentrations of 954 to 1,920 mg/L to reach spawning sites (Summerfelt and Moiser 1976 and Combs 1979 in Burton l993). While there have been no directed studies on the effects of TSS on shortnose sturgeon, shortnose sturgeon juveniles and adults are often documented in turbid water. Dadswell (1984) reports that shortnose sturgeon are more active under lowered light conditions, such as those in turbid waters. (Montague Letter) As such, shortnose sturgeon are assumed to be as least as tolerant to suspended sediment as other estuarine fish such as striped bass.

As noted above, shortnose sturgeon eggs and larvae are less tolerant to sediment levels than juveniles and adults. Several studies have examined the effects of suspended solids on fish larvae. Observations in the Delaware River indicated that larval populations may be negatively affected when suspended material settles out of the water column (Hastings 1983). Larval survival studies conducted by Auld and Schubel (1978) showed that striped bass larvae tolerated 50 mg/l and 100 mg/l suspended sediment concentrations and that survival was significantly reduced at 1000 mg/L. According to Wilber and Clarke (2001), hatching is delayed for striped bass and white perch eggs exposed for one day to sediment concentrations of 800 and 1000 mg/L, respectively (Montague Letter).

In a study on the effects of suspended sediment on white perch and striped bass eggs and larvae performed by the ACOE (Morgan et al. 1973), researchers found that sediment began to adhere to the eggs when sediment levels of over 1000 parts per million (ppm) were reached. No adverse effects to demersal eggs and larvae have been documented at levels at or below 50 mg/L (Montague Letter). This is above the highest level authorized for the WPCF by this permit. Based on this information, it is likely that the discharge of sediment from the WPCF in the concentrations allowed by the draft permit will have an insignificant effect on shortnose sturgeon.

2. Biological Oxygen Demand

The biological oxygen demand (BOD) water test is used to determine how much oxygen is being used by aerobic microorganisms in the water to decompose organic matter. If these aerobic bacteria are using too much of the dissolved oxygen in the water, then there will not be enough available for the fish, insects, and other organisms that rely on oxygen. BOD has the potential to affect dissolved oxygen (DO) concentrations in the vicinity of and downstream from a wastewater treatment facility's outfall.

The draft permit for the WPCF proposes the same BOD_5 concentration limits as in the current permit, which are based on the secondary treatment requirements set forth at 40 CFR 133.102 (a)(1), (2), (4) and 40 CFR 122.45 (f). The secondary treatment limitations are a monthly average BOD_5 concentration of 30 mg/l and a weekly average concentration of 45 mg/l. EPA has determined that these effluent limits are sufficient to ensure that discharges from this facility do not cause an excursion below the Massachusetts water quality standard, which requires that Class B waters attain a minimum DO saturation of 5.0 mg/l. EPA also notes that discharges from the WPCF have consistently high DO concentrations due to the pure oxygen activated sludge treatment process used by the facility, further mitigating any impacts on DO levels in the Connecticut River from this facility. Shortnose sturgeon are known to be adversely affected by DO levels below 5 mg/l (Jenkins et al. 1994, Niklitschek 2001), the same threshold established in the Massachusetts WQS. As such, the BOD criteria are protective of shortnose sturgeon found in the Connecticut River.

3. pH

The draft permit requires that the discharge maintain a pH of 6.0 – 8.3. A pH of 6.0 – 9.0 is harmless to most marine organisms (Ausperger 2004) and is within the normal range of pH for freshwater. MassDEP water quality assessment reports indicate that pH levels in the Connecticut River are well within this range (from 7.4-7.6; see 2003 Connecticut River WQA, page B21). As such, no adverse effects to shortnose sturgeon are likely to occur as a result of the discharge of water of this pH into the Connecticut River.

4. Escherichia coli Bacteria

E. coli bacteria are indicators of the presence of fecal wastes from warm-blooded animals. The primary concern regarding elevated levels of these bacteria is for human health and exposure to pathogen-contaminated recreational waters. Fecal bacteria are not known to be toxic to aquatic life. E. coli limits are therefore designed to ensure compliance with human health criteria and are seasonal, corresponding to the recreational use season, consistent with the Massachusetts WQS.

5. Chlorine

Based on the design flow of the WPCF and the dilution calculations, EPA has determined that a monthly average limit of 0.89 mg/l and a daily maximum limit of 1.5 mg/l of Total Residual Chlorine (TRC) would assure that the facility did not exceed the chronic and acute TRC standards (0.011 ug/l and 0.019 ug/l respectively). The calculated daily maximum limit was further reduced to 1.0 mg/l pursuant to MassDEP policy to minimize discharges of chlorine while achieving effective bacteria treatment.

There are a number of studies that have examined the effects of TRC (Post 1987; Buckley 1976; EPA 1986) on fish; however, no directed studies that have examined the effects of TRC on shortnose sturgeon. The EPA has set the Criteria Maximum Concentration (CMC or acute criteria; defined in 40 CFR 131.36 as equals the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (up to 96 hours) without deleterious effects) at 0.019 mg/L, based on an analysis of exposure of 33 freshwater species in 28 genera (EPA 1986) where acute effect values ranged from 28 ug/L for *Daphia magna* to 710 ug/L for the threespine stickleback. The CMC is set well below the minimum effect values observed in any species tested. As the water quality criteria levels have been set to be protective of even the most sensitive of the 33 freshwater species tested, it is reasonable to assume that the criteria are also protective of shortnose sturgeon.

The anticipated TRC levels in the Connecticut River satisfy the EPA's ambient water quality criteria and are lower than TRC levels known to effect aquatic life. As such, the discharge of the permitted concentrations of TRC is likely to have an insignificant effect on shortnose sturgeon.

6. Nitrogen

DO levels in the Long Island Sound estuary, approximately 75 miles downstream, have been determined to be impacted by nitrogen discharges from wastewater treatment plants on the

Connecticut River and other tributaries. A TMDL has been developed that includes, *inter alia*, a Waste Load Allocation for Massachusetts, New Hampshire and Vermont wastewater facilities discharging to those receiving waters that is design to achieve the DO criteria. That WLA is currently being met, and the draft permit contains conditions to ensure that the WLA continues to be met by requiring optimization of nitrogen removal, in order to ensure that nitrogen loads do not increase over the 2004-2005 baseline of 1,618 lbs/day.

7. Other toxic pollutants

As discussed fully in Part B.5.c of this fact sheet, EPA reviewed extensive analytical data submitted with the facility's NPDES permit application, the WPCF WET Reports and additional material submitted by the facility in response to EPA's requests for additional information to determine whether the facility discharges toxic pollutants in amounts that have a reasonable potential to cause or contribute to water quality violations. These data included expanded effluent testing data for over one hundred pollutants, including metals, VOCs and other toxic pollutants, and representing a total of over one thousand analyses. The WPCF WET Reports provide additional analyses of potentially toxic metals and include analyses of receiving water samples, allowing the facility's contribution to be assessed in the context of ambient conditions.

Of the pollutants analyzed, all but five either were not detected or were present at levels well below the relevant water quality criteria. For the five pollutants, all metals, detected in the discharge at levels requiring additional analysis, the maximum expected receiving water concentration was calculated. This was based on a mass balance equation using the 99^{th} percentile of a lognormal distribution of the effluent samples and the median receiving water concentration.

Of these, only aluminum is present in the discharge at levels that have a reasonable potential to cause or contribute to an exceedance of the water quality criteria. Reported concentrations of aluminum in the effluent have been as high as 0.13 mg/l. A lognormal distribution fit to the effluent data indicates a 95^{th} percentile concentration of 0.13 ug/l, compared to a chronic criterion of 0.087 mg/l. The median receiving water concentration, upstream of the outfall, is 0.11 mg/l, also above the chronic criterion. See Table 5. As the receiving water does not provide any dilution of aluminum discharges with respect to the chronic criterion, the average monthly effluent limit for aluminum was set at the criterion level of 0.087 mg/l.

Very few toxicity tests have been conducted with shortnose sturgeon. In the absence of species-specific chronic and acute toxicity data, EPA has identified the EPA aquatic life criteria and Massachusetts site specific criteria (for copper) as the best available scientific information in this case. The draft permit is designed to ensure that the WPCF discharge will not cause or contribute to conditions exceeding these criteria in the Connecticut River and, in the case of aluminum, requires that the facility discharge concentrations be lower than ambient conditions in the Connecticut River. As such, the discharge of the permitted concentrations is likely to have an insignificant effect on shortnose sturgeon.

8. Whole Effluent Toxicity

In addition to analysis of specific toxic pollutants, EPA and MassDEP as a matter of policy include effluent limitations and monitoring requirements for toxicity bioassays (Whole Effluent Toxicity testing) in wastewater treatment facility permits. The principal advantages of such biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. The draft permit therefore requires acute toxicity testing four times per year on the fathead minnow, *Pimephales promelas*, to ensure that the discharge does not present toxicity problems.

9. CSO Discharges

CSO discharges from the facility have been substantially reduced under the existing permit and associated enforcement orders, and reductions will continue under the draft permit. To date the volume of untreated CSO discharges has been cut by more than half; an estimated 18% of the remaining CSO volume will be eliminated in connection with ongoing sewer separation projects. CSO discharges are also subject to specific conditions under the draft permit, including a prohibition on dry weather discharges from CSO outfalls, a requirement that CSO discharges shall not cause any exceedance of water quality standards, compliance with technology-based Nine Minimum Controls, described in Part VIII of this Fact Sheet, and reporting on compliance with the Nine Minimum Controls, monitoring of CSO discharges and the status of CSO abatement projects.

The draft permit also includes effluent limitations and monitoring conditions for the Jones Ferry CSO Treatment facility, which provides screening, limited solids removal, disinfection and dechlorination of CSO discharges to outfall 7.1, as well as providing storage for smaller CSO flows that can then be sent to the WPCF for secondary treatment. The effluent limitations are technology-based BCT/BAT effluent limitations using EPA's best professional judgment (BPJ) that are consistent with the design parameters for this facility as set forth in the 2006 Consent Order. They are:

Fecal coliform:	200 cfu/100 ml average monthly 400 cfu/100 ml maximum daily
Total Residual Chlorine:	0.89 mg/l average monthly; 1.0 mg/l maximum daily

The draft permit also requires reporting of flow, BOD, TSS, pH, Whole Effluent Toxicity and nitrogen parameters.

The CSO requirements included in the draft permit are expected to improve the overall aquatic habitat for all species in the Connecticut River, including shortnose sturgeon, during wet weather events.

E. Finding

Based on the above analysis of the location of the discharge, the permit limits and the water quality effects of the permit action, EPA has made the preliminary determination that the proposed reissuance of the NPDES permit for this facility is not likely to adversely affect shortnose sturgeon. Therefore EPA has judged that a formal consultation pursuant to Section 7 of the ESA is not required. EPA is seeking concurrence from NMFS regarding this determination through the information in this fact sheet as well as a letter under separate cover.

Reinitiation of consultation will take place: (a) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (c) if a new species is listed or critical habitat is designated that may be affected by the identified action.

XII. State Certification Requirements

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection certifies that the effluent limitations included in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects the draft permit will be certified.

XIII. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the 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 Susan Murphy, U.S. Environmental Protection Agency, 5 Post Office Square, Suite 100 (OEP06-1), Boston, MA 02109. Any person prior to such date may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

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

XIV. EPA Contact

Requests for additional information or questions concerning the draft permit may be addressed Monday through Friday, between the hours of 9:00 a.m. and 5:00 p.m., to :

Susan Murphy
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109
Telephone: (617) 918-1534 Fax: (617) 918-0534
Email: murphy.susan@epa.gov

Kathleen Keohane
Massachusetts Department of Environmental Protection
627 Main Street, 2nd Floor
Worcester, MA 01608
Telephone: (508)-767-2856 Fax: (508) 791-4131
Email: Kathleen.Keohane@state.ma.us

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

August 1, 2011

Attachments: Figure 1. Process Flow Diagram

Figure 2. Facility and Outfall Location Map
Table 1. Two Year Facility DMR Data
Table 2. Bypass Events in 2009
Table 3. Jones Ferry CSO Treatment Facility Monitoring Data
Table 4. CSO Activations
Table 5. Metals Effluent Data and Criteria Calculations
Table 6. Nitrogen Loads – NH, VT, MA Discharges to CT River Watershed

Chicopee Water Pollution Control District
NPDES # MA0101508

Figure 1
Process Flow Diagram

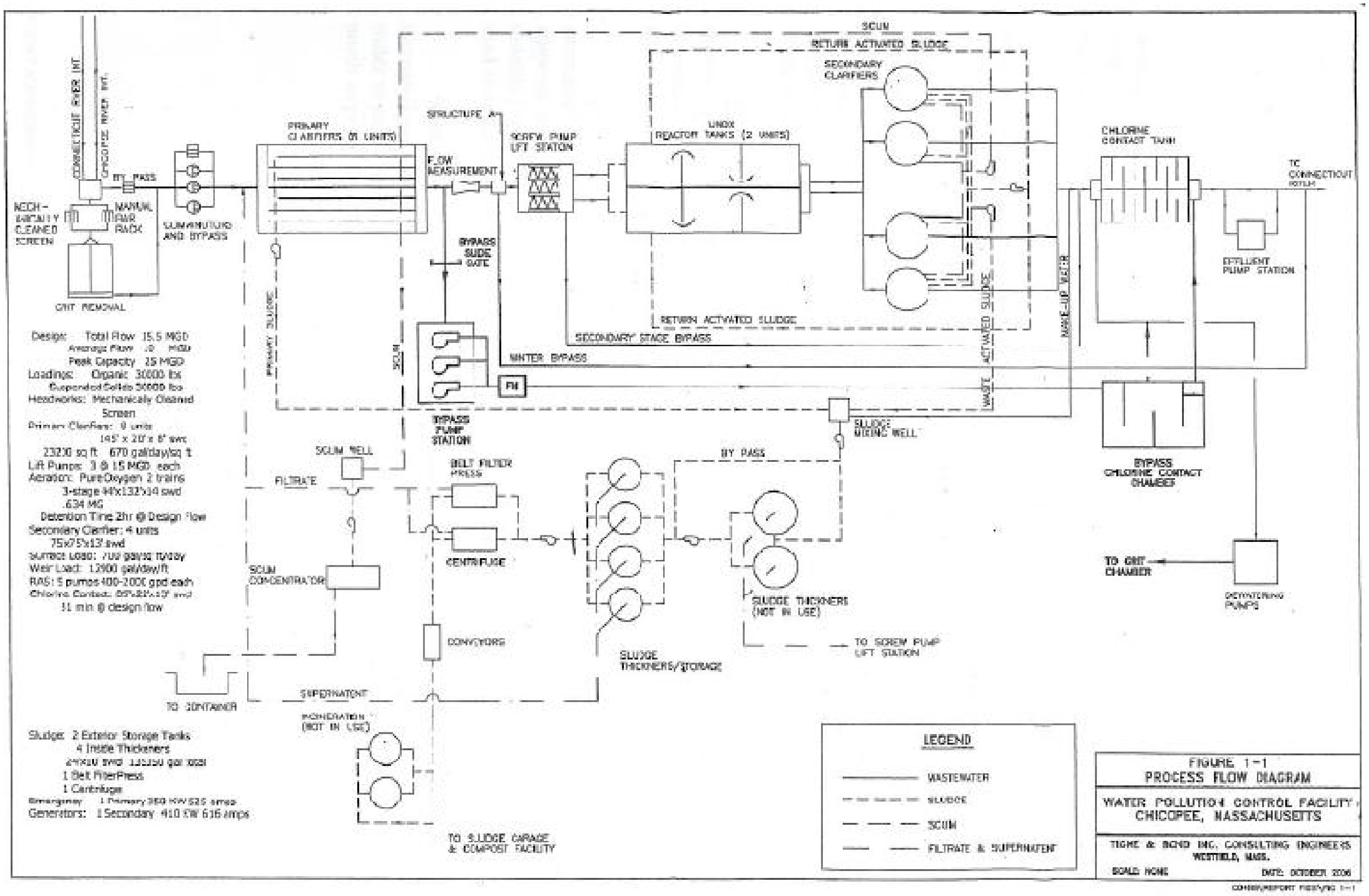
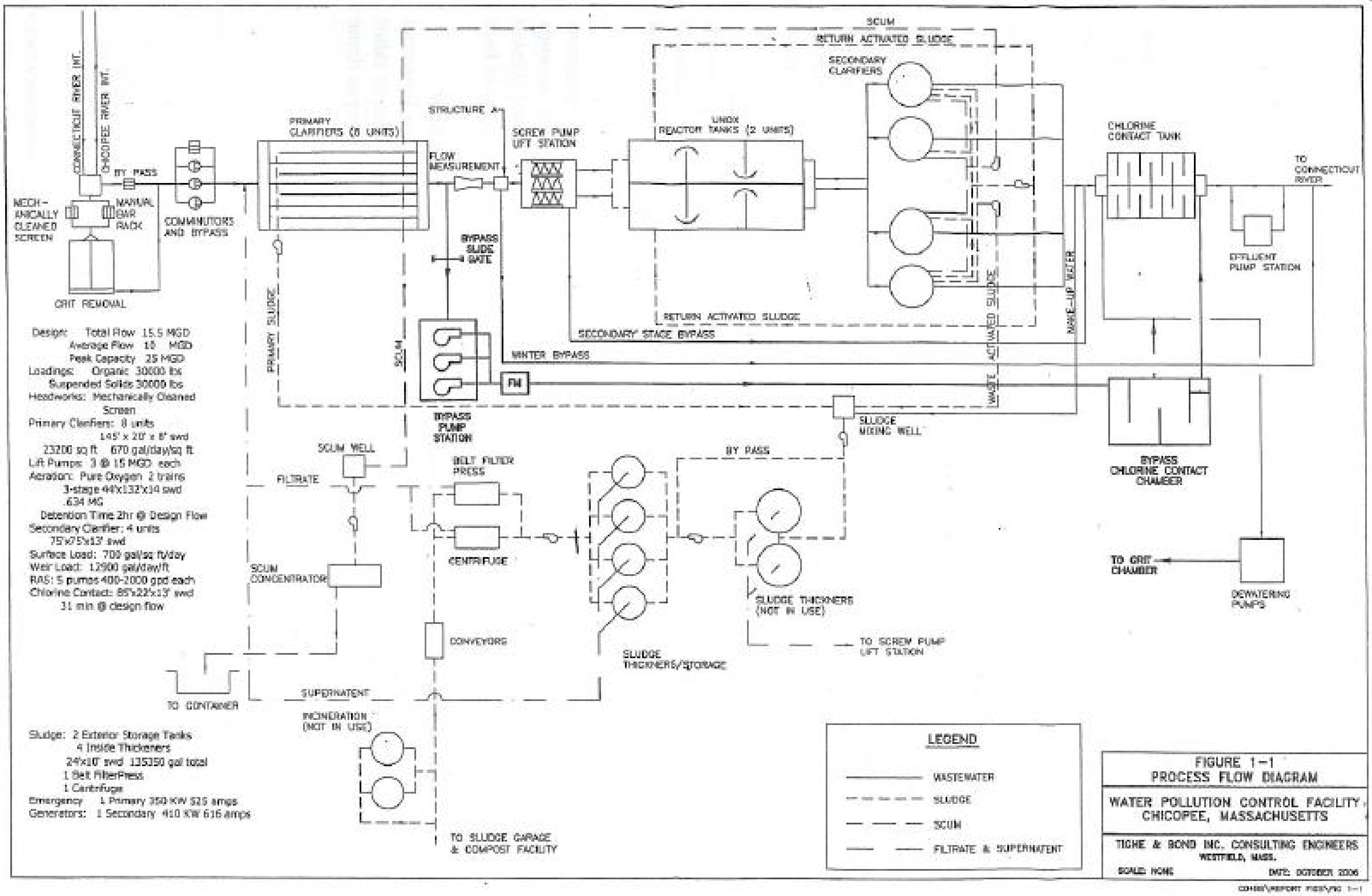


Figure 2. Chicopee WPCF Process Flow Diagram



Chicopee Water Pollution Control District
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Table 1 (page 1 of 2)
Two year facility DMR Data

	Flow (MGD)		BOD (mg/l)		TSS (mg/l)		Settleable solids (ml/l)		pH	
	12mo avg	daily max	mo avg	wkly avg	mo avg	wkly avg	wk avg	daily max	min	max
Effluent Limit:	15.5	Report	30	45	30	45	30	45	6.5	8.3
Sampling Frequency:	CONTINUOUS		5/week		5/week		5/week		5/week	
January 2008	8.6	14.4	28	43	22	42	0.14	0.3	6.01	7
February	9.1	29.8	24	41	26	107	0.09	0.3	6.59	7.11
March	9.5	25.4	19	27	17	42	0.09	0.3	6.51	7.1
April	9.35	20.7	16	26	13	27	0.12	0.3	6.51	7.1
May	9.3	16.3	20	58	14	48	0.05	0.05	6.6	7.1
June	9.34	12.2	12	22	10	19	0.09	0.3	6.5	6.92
July	9.5	18	13	22	15	31	0.05	0.2	6.54	7
August	9.95	18.2	16	30	17	30	0.67	4	6.59	6.97
September	10.4	18.4	13	19	15	32	0.07	0.2	6.49	7.31
October	10.7	15.8	10	25	14	25	0.05	0.05	6.5	6.98
November	11	10	18	28	18	29	0.07	0.2	6.5	6.9
December	11.5	27.4	23	47	24	59	0.13	0.3	6.65	7.1
January 2009	11.7	16.4	24	70	30	99	0.3	1.3	6.45	6.91
February	11.3	13.9	21	46	20	47	0.89	3	6.5	6.98
March	10.9	15.3	19	71	23	103	0.56	2.5	6.5	6.8
April	10.8	15.3	16	31	14	28	0.05	0.05	6.55	6.81
May	10.7	13.6	19	36	19	37	0.05	0.1	6.5	6.8
June	10.8	22.4	19	66	20	38	0.05	0.05	6.23	7.3
July	10.9	18.5	11	17	11	24	0.05	0.05	6.43	7.24
August	10.7	14.9	15	23	14	28	0.07	0.2	6.42	7.01
September	10.34	14.2	15	35	14	27	0.11	0.5	6.54	7.06
October	10.17	16.9	13	33	16	32	0.05	0.05	6.2	6.9
November	10.1	17	17	34	15	36	0.05	0.05	6.5	6.95
December	9.76	15.3	17	37	17	48	0.07	0.05	6.52	6.94
							0.05	0.05		
Average:	10.27		17.4		17.4		0.2	0.6		
Maximum:		30	28	71		107	0.89	4	6.01	7.31

Chicopee Water Pollution Control District
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Table 1 (page 2 of 2)
Two year facility DMR Data

	fecal coliform (cfu/100 ml)		TRC (mg/l)		Whole Effluent Toxicity	NH3 (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TKN (mg/l)	Total N
	mo avg	daily max	mo avg	daily max	LC50 %	mo avg	mo avg	mo avg	mo avg	mo avg
	200	400	0.89	1	≥100	Report	Report	Report	Report	(Calculated)
Sampling Frequency:	1/week		3/day		4/year	1/month	1/month	1/month	1/month	(Calculated)
January 2008						14	0.4	0.1	21	21.5
February					≥100	9	1.5	0.1	17	18.6
March						6.65	2.1	0.1	11.5	13.7
April	0.74	1	0.6	0.79		2.8	1	0.2	15	16.2
May	1.4	10	0.56	0.85	≥100	10	0.2	0.1	20	20.3
June	2.6	9	0.56	0.69		13	0.1	0.1	20	20.2
July	2.75	21	0.53	0.86		10	0.28	0.03	24	24.31
August	7.03	29	0.52	0.81	≥100	7.6	0.53	0.52	11	12.05
September	3.56	10	0.59	0.79		6.4	0.71	0.11	10	10.82
October	2.8	5	0.61	0.76		15	0.11	0.04	21	21.15
November					≥100	15	0.19	0.26	23	23.45
December						8.2	1.2	0.12	12	13.32
January 2009						12	0.91	0.09	17	18
February					≥100	15	0.53	0.06	23	23.59
March						9	1.2	0.06	15	16.26
April	0.74	1	0.59	0.84		14	0.28	0.07	26	26.35
May	1.4	10	0.57	0.78	≥100	14	0.42	0.14	22	22.56
June	2.6	9	0.57	0.81		16	0.49	0.03	31	31.52
July	2.75	21	0.59	0.78		16	0.1	0.04	24	24.14
August	7.03	29	0.79	0.77	≥100	8	0.16	0.35	9.3	9.81
September	3.56	10	0.56	0.77		14	0.35	0.28	25	25.63
October	2.8	5	0.59	0.79		17	0.45	0.24	24	24.69
November					≥100	14	1.2	0.16	21	22.36
December						14	0.47	0.05	20	20.52
Average:	2.98		0.59			11.69	0.62	0.14	19.28	20.04
Maximum:		29.00		0.86						

Table 2. Bypass Events in 2009

Date	Flow	fecal coliform		e. Coli		Total Residual Chlorine	pH	BOD	TSS	Whole Effluent Toxicity
	MGD	cfu/100 ml		cfu/100 ml		mg/l	SU	mg/l	mg/l	LC50 %
		Event avg	Event max	Event avg	Event max					
2/22/2009	0.11									
3/8/09	0.22									
4/3/09	0.69					0.83	7.21			
4/6/2009	0.95	<1	<1	46.5	50	0.07	7.18	66	66	
4/20/2009	0.33									
4/21/2009	0.13		1		13	0.58	6.77			
5/6/09	2.09	45.5	108	64.75	90	0.08	7.1	66	101	71.4%
5/7/09	0.01									
5/16/09	0.05									
6/11/09	2.61	22	75	0.75	3	0.25	7.06	46	68	
6/13/09	1.28					0.15	7.03		41	
6/14/09	0.35									
6/15/09	0.13									
6/18/2009	3.3		3			0.1	7.19			
6/27/2009	0.18									
7/1/2009[1]	1.34	1.5	3	1.5	3	0.23	6.45	13	69	
7/3/2009	0.03									
7/7/2009	0.05									
7/11/2009	1.51		53			0.07	6.96			
7/17/2009	1.5		<1		20	0.1	6.76			
7/21/2009	4.29		<1		5	0.48	6.96			
7/23/2009	3.46									
7/24/2009[2]	0.59		<1		35	0.26	6.78			
7/25/2009[2]			<1		35	0.25	6.79			
7/26/2009[2]			4		68	0.47	6.86			
7/27/2009	0.01									
7/29/2009	0.16									
7/31/2009	2.26		25		113	0.25	7.19			
8/21/2009	1.29	7	13	40	60	0.38	6.85	85	88	
8/22/2009	0.7	1.5	2	14.5	18	0.23	6.95			
8/23/2009	0.08									
8/28/2009	1.34	43.5	80	83.5	110	0.07	6.7			
8/29/2009	0.1		16		70	0.5	6.87			
9/26/2009	0.05									
9/27/2009	0.12									
Missing monthly op rep for October 09										
11/14/2009	0.24									
11/19/2009	0.28									
11/20/2009	0.03									
None in December 2009										

[1] Bypass flow reported on 7/1/09 while monitoring data reported for 7/2/09.

[2] Bypass flow reported on 7/23 and 7/24/09 while monitoring data reported for 7/24, 7/25 and 7/26/09.

Table 3. Jones Ferry CSO Treatment Facility Monitoring Data

		Flows (MGD)										
Date	Precip (in)	Flow I (into facility)	Flow C (to WWTP)	Flow B (Untreated)	Flow A (Treated at CSO Facility)	Duration of Flow A (hours)	Fecal Coliform (cfu/100 ml)	TRC (mg/l)	pH min	BOD (mg/l)	TSS (mg/l)	Whole Effluent Toxicity (LC50)
8/21/2009	1.2	1.29		0	1.29	2.3	3.6	0.38	6.85	85	88	
8/22/2009	0.8	0.7		0	0.58	2.2	1.4	0.23	6.95			
8/23/2009	0.4	0.08	0.2	0								
8/28/2009	1.25	1.34		0	1.24	5.9		0.07	6.7			
8/29/2009	0.36	0.1	0.2	0				0.5	6.87			
10/3/2009	0.8	1.13	0.2	0	0.93	4.8	9.9	0	6.5		62	
10/24/2009	1.3	1.72	0.2	0	1.52	2.9	30	0.05	6.9	43	96.36	> 100
10/28/2009	1.05	2.11	0.2	0	1.91	5.2	0	0.23	7			
11/14/2009	1.5	2.97	0.8	0	2.17	6.38	31.8	0.08	5.96			
11/20/2009	0.55	1.14	0.4	0	0.74	3.23	4.4	0.15				
12/2/2009	1.1	2.75	0.4	0	2.35	5.6	5.8	0.03	5.41			
12/13/2009	0.8	1.15	0.4	0	0.75	0.75	10	0.3	7.15			
12/26/2009	0.2	4.8	0	0	4.4	4.4	25	0	6.1			
12/27/2009	0.17	1.49	0.4	0	1.09	1.09	1	0.23	5.9			
1/18/2010	1.3	0.86	0.4	0	0.46	1.24	1.6	0.23	7.11			
1/25/2010	1.5	8.5	0.4	0	8.1	6.89	13.2	0.08	6.31			
2/24/2010	0.6	2.45	0.4	0	2.05	6.5	11.4	0.04	6.08	75	235	> 100
2/25/2010	1.25	7.46	0.4	0	7.06	16.55	13.2	0.1	5.96			
3/13/2010	0.72	0.63	0.4	0	0.23	2.71	4.8	0.15	6.32			
3/22/2010	1.4	3.25	0	0	3.09	5.59	2.2	0.1	5.47			
3/23/2010	0.05	0.24	0.4	0	0	1.62	1	0.15	5.03			
3/28/2010	1	0.72	0	0	0.72	4.26	1	0.13	6.05			
3/29/2010	1.3	3.07	0	0	3.07	12.88	5	0.11	5.82			
3/30/2010	1.5	4.45	0.4	0	4.05	17.45	1	0.13	5.62			
5/8/2010	0.6	6.72	0.4	0	2.32	5.53	3.1	0.08	6.15			
5/13/2010	0.27	0.453	0.4	0	0.053	0.75						
5/27/2010	0.45	0.053	0.053	0	0	1.3	1	0.08	6.35			
5/29/2010	0.02	1.59	0.4	0	1.19	1.81	1	0.45	6			
6/4/2010		2.42	0.4	0.13	2.15	2.32						
6/10/2010		0.4	0.4	0	0	0.98						
6/12/2010		0.4	0.4	0	0	1.06						
6/13/2010		3.54	0.4	0.1	3.04	2.93						
6/24/2010		0.32	0.32	0	0	1.27						
*missing July data												
8/5/2010	0.8	3.02	0.4	0.2	2.62	2.55	10.6	0.15	5.96			
8/9/2010	0.55	1.57	0.4	0	1.17	1.83	1	0	5.77			
8/16/2010	0.4	1.07	0.4	0	0.67	2.2	8.7	0.3	5.99			
8/22/2010	1.8	2.43	0.4	0	2.03	4.5	21.7	0.18	6			

Chicopee Water Pollution Control Facility
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Table 4
CSO Activations

	CSO #	Location	Overflow Type	Pipe size (in)	Activations in 2009	Annual Overflow Volume (Typical Year)	Proposed Phase	Outfall
Connecticut	3	Power Line ROW S of James St	Leaping Weir	30	54	18.12	6	3
	4	Riverview Pumping Station	Diversion Weir	21	36	27.32	4	4
	5	Leslie St Pumping Station	Diversion Weir	36	46	3.4	7	5
	6	Call St Pumping Station	Diversion Weir	60	66	37.15	3	6
	7.1	Jones Ferry Rd Pumping Station	CSO Treatment Facility	rect	53	13.27	2 (partial)	7
	7.2	Jones Ferry Rd Pumping Station	Mechanical regulator	36	38	0.92	6	7
	8	Easement S of Jones Ferry Rd P.S.	Mechanical regulator	48	19	included in 7.1	2 (partial)/8	8
	9	Paderewski St Pumping Station	Diversion Weir	60	45	3.48	7	9
	24.2	Leonard St and West St	Leaping Weir	24	81	7.9	5	24
	24.3	Exchange St and Bullens St	Leaping Weir	18	45	0.01	8	24
	24.4	Exchange St and Depot St	Leaping Weir	50x36 arch	78	8.7	5	24
	24.5	Front and Depot St Area	Leaping Weir	44x32 arch	80	18.89	5	24
Chicopee	26.1	Bell St and Front St	High Outlet	12	30	0.06	8	26
	27.1	Parking Lot, Topors Garage, Front St	Leaping Weir	46x30 arch	47	5.5	6	27
	27.2	West End of Riverview Terrace	Diversion Weir	10	20	0.09	8	27
	29	Chicopee Electric Light West	Leaping Weir	18	76	0.25	3	29
	31.1	Chicopee Electric Light South	Leaping Weir	18	51	28.62	2	31
	31.3	Easement NW of Front St	Leaping Weir	48	91			31
	32.1	Grove St and Oak St	Diversion Weir	18	48	7.67		32A
	32.2	Walnut St and Broadway	Leaping Weir	15	61	5.14	5	32A
	32.3	Broadway and Belcher St	Leaping Weir	18	57	0.21	8	32B
	32.4	Maple St and Belcher St	Leaping Weir	12	40	0.14	7	32B
	32.5	Church St and Walnut St	Diversion Weir	18	42	0.04	8	32A
	34.1	Grattan St and Hearthstone Terrace	Mechanical regulator	20	50	4.67	6	34
	34.2	Hearthstone Terrace # 44	High Outlet	10	23	0.13	8	34
	34.3	Montgomery St @ Deady Memorial Bridge	Diversion Weir/Stop Logs	30	31	26.78	3	34
	37	East Main St # 227	Leaping Weir	24	46	0.24	7	37
	40	Chicopee St, manhole #11	High Outlet	30	1*	unknown		40
W	42	Robert's Pond	Leaping Weir	10		0.7		42

Chicopee Water Pollution Control Facility
NPDES Permit No. MA 0101508

Table 5
Metals Effluent Data and Criteria Calculations

	Effluent Analytical Data (ug/l)							Receiving Water Analytical Data (ug/l)						
	Hardness	**Al**	**Cd[1]**	**Cu**	**Ni**	**Pb[1]**	**Zn**	**Hardness**	**Al**	**Cd[1]**	**Cu**	**Ni**	**Pb[1]**	**Zn**
5/9/2007	61	30	< 1	16	9	< 1	28	26	180		1.3	<1	< 1	11
8/8/2007	52	98	< 2	16	30	< 2	42	44	120		3.6	< 2	< 2	3.5
8/29/2007	72	71	< 2	7.7	28	< 2	17	64	<50		<2	< 2	< 2	7.6
9/19/2007	56	<50	< 2	10	6.3	< 2	30	52	500		12	< 2	< 2	9.2
11/14/2007	36	< 50	< 2	< 2	< 2	< 2	29	36	53		< 2	< 2	< 2	4.6
2/13/2008	68	84	< 2	11	3.6	< 2	57	28	120		< 2	< 2	< 2	7
5/14/2008	60	100	< 2	10	4.8	< 2	39	36						
8/13/2008	68	86	< 2	8.4	3.6	< 2	17	24	230		10	< 2	< 50	8.4
11/13/2008	52	< 50	< 2	16	4.6	< 2	36	20	< 50		8	< 2	< 2	8
2/11/2009	48	130	< 2	15	3.8	< 2	47	40	< 50		3.3	< 2	< 2	3.4
5/13/2009	72	< 50	< 2	8.5	3.4	3.8	25	28	110		4.3	3.4	< 2	12
8/12/2009	56	< 50	< 2	6.8	3	< 2	18	40	83		5.5	< 2	< 2	11
2/10/2010	60	100	< 2	8.8	25	< 2	32	36	94		< 2	< 2	< 2	2.2
6/3/2010		< 50	< 2	7	5.6	< 2	20		94		3.1	< 2	< 2	4.2
6/23/2010		86	<5	9.1	<5	<5	32		88		2.2	< 1	< 1	56
Median	60	86	ND	10	4.8	ND	30	36	110		4.0	3.4	ND	7.8
99th percentile		171	ND	30.6	44.4	4.7	69.7							
Chronic Criterion[3]		87	0.41	5.7	22	0.23	43							
Acute Criterion[3]		750	0.70	4.8	139	14.0	43							

[1] Non-detects noted as " < [minimum detection level]"

[2] Samples at or below minimum detection level (MDL) are assumed to be at MDL in calculating average

[3] Criteria for Cd, Cu, Ni, Pb and Zn are hardness dependent and calculated using the formulas set forth in the *National Recommended Water Quality Criteria 2002* (EPA 2002) at a hardness of 36, based on the median hardness of effluent and receiving water combined proportional to design flow and 7Q10 flow.

Nitrogen Loads

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
NEW HAMPSHIRE					
Bethlehem Village District	NH0100501	0.340	0.220	19.600	35.962
Charlestown WWTF	NH0100765	1.100	0.360	19.600	58.847
Claremont WWTF	NH0101257	3.890	1.610	14.060	188.789
Colebrook WWTF	NH0100315	0.450	0.230	19.600	37.597
Groveton WWTF	NH0100226	0.370	0.290	19.600	47.405
Hanover WWTF	NH0100099	2.300	1.440	30.000	360.288
Hinsdale WWTF	NH0100382	0.300	0.300	19.600	49.039
Keene WWTF	NH0100790	6.000	3.910	12.700	414.139
Lancaster POTW	NH0100145	1.200	1.080	8.860	79.804
Lebanon WWTF	NH0100366	3.180	1.980	19.060	314.742
Lisbon WWTF	NH0100421	0.320	0.146	19.600	23.866
Littleton WWTF	NH0100153	1.500	0.880	10.060	73.832
Newport WWTF	NH0100200	1.300	0.700	19.600	114.425
Northumberland Village WPCF	NH0101206	0.060	0.060	19.600	9.808
Sunapee WPCF	NH0100544	0.640	0.380	15.500	49.123
Swanzey WWTP	NH0101150	0.167	0.090	19.600	14.712
Troy WWTF	NH0101052	0.265	0.060	19.600	9.808
Wasau Paper (industrial facility)	NH0001562		5.300	4.400	194.489
Whitefield WWTF	NH0100510	0.185	0.140	19.600	22.885
Winchester WWTP	NH0100404	0.280	0.240	19.600	39.231
Woodsville Fire District	NH0100978	0.330	0.230	16.060	30.806
New Hampshire Total		**24.177**	**19.646**		**2169.596**

VERMONT					
Bellows Falls	VT0100013	1.405	0.610	21.060	107.141
Bethel	VT0100048	0.125	0.120	19.600	19.616
Bradford	VT0100803	0.145	0.140	19.600	22.885
Brattleboro	VT0100064	3.005	1.640	20.060	274.373
Bridgewater	VT0100846	0.045	0.040	19.600	6.539
Canaan	VT0100625	0.185	0.180	19.600	29.424
Cavendish	VT0100862	0.155	0.150	19.600	24.520
Chelsea	VT0100943	0.065	0.060	19.600	9.808
Chester	VT0100081	0.185	0.180	19.600	29.424
Danville	VT0100633	0.065	0.060	19.600	9.808
Lunenberg	VT0101061	0.085	0.080	19.600	13.077
Hartford	VT0100978	0.305	0.300	19.600	49.039
Ludlow	VT0100145	0.705	0.360	15.500	46.537
Lyndon	VT0100595	0.755	0.750	19.600	122.598
Putney	VT0100277	0.085	0.080	19.600	13.077
Randolph	VT0100285	0.405	0.400	19.600	65.386
Readsboro	VT0100731	0.755	0.750	19.600	122.598
Royalton	VT0100854	0.075	0.070	19.600	11.442
St. Johnsbury	VT0100579	1.600	1.140	12.060	114.662

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
Saxtons River	VT0100609	0.105	0.100	19.600	16.346
Sherburne Fire Dist.	VT0101141	0.305	0.300	19.600	49.039
Woodstock WWTP	VT0100749	0.055	0.050	19.600	8.173
Springfield	VT0100374	2.200	1.250	12.060	125.726
Hartford	VT0101010	1.225	0.970	30.060	243.179
Whitingham	VT0101109	0.015	0.010	19.600	1.635
Whitingham Jacksonville	VT0101044	0.055	0.050	19.600	8.173
Cold Brook Fire Dist.	VT0101214	0.055	0.050	19.600	8.173
Wilmington	VT0100706	0.145	0.140	19.600	22.885
Windsor	VT0100919	1.135	0.450	19.600	73.559
Windsor-Weston	VT0100447	0.025	0.020	19.600	3.269
Woodstock WTP	VT0100757	0.455	0.450	19.600	73.559
Woodstock-Taftsville	VT0100765	0.015	0.010	19.600	1.635
Vermont Totals		**15.940**	**10.960**		**1727.302**

MASSACHUSETTS					
Amherst	MA0100218	7.100	4.280	14.100	503.302
Athol	MA0100005	1.750	1.390	17.200	199.393
Barre	MA0103152	0.300	0.290	26.400	63.851
Belchertown	MA0102148	1.000	0.410	12.700	43.426
Charlemont	MA0103101	0.050	0.030	19.600	4.904
Chicopee	MA0101508	15.500	10.000	19.400	1617.960
Easthampton	MA0101478	3.800	3.020	19.600	493.661
Erving #1	MA0101516	1.020	0.320	29.300	78.196
Erving #2	MA0101052	2.700	1.800	3.200	48.038
Erving #3	MA0102776	0.010	0.010	19.600	1.635
Gardner	MA0100994	5.000	3.700	14.600	450.527
Greenfield	MA0101214	3.200	3.770	13.600	427.608
Hadley	MA0100099	0.540	0.320	25.900	69.122
Hardwick G	MA0100102	0.230	0.140	14.600	17.047
Hardwick W	MA0102431	0.040	0.010	12.300	1.026
Hatfield	MA0101290	0.500	0.220	15.600	28.623
Holyoke	MA0101630	17.500	9.700	8.600	695.723
Huntington	MA0101265	0.200	0.120	19.600	19.616
Monroe	MA0100188	0.020	0.010	19.600	1.635
Montague	MA0100137	1.830	1.600	12.900	172.138
N Brookfield	MA0101061	0.760	0.620	23.100	119.445
Northampton	MA0101818	8.600	4.400	22.100	810.982
Northfield	MA0100200	0.280	0.240	16.800	33.627
Northfield School	MA0032573	0.450	0.100	19.600	16.346
Old Deerfield	MA0101940	0.250	0.180	9.200	13.811
Orange	MA0101257	1.100	1.200	8.600	86.069
Palmer	MA0101168	5.600	2.400	18.800	376.301
Royalston	MA0100161	0.040	0.070	19.600	11.442
Russell	MA0100960	0.240	0.160	19.600	26.154
Shelburne Falls	MA0101044	0.250	0.220	16.900	31.008
South Deerfield	MA0101648	0.850	0.700	7.900	46.120
South Hadley	MA0100455	4.200	3.300	28.800	792.634
Spencer	MA0100919	1.080	0.560	13.600	63.517
Springfield	MA0103331	67.000	45.400	4.300	1628.135
Sunderland	MA0101079	0.500	0.190	8.700	13.786
Templeton	MA0100340	2.800	0.400	26.400	88.070

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
Ware	MA0100889	1.000	0.740	9.400	58.013
Warren	MA0101567	1.500	0.530	14.100	62.325
Westfield	MA0101800	6.100	3.780	20.400	643.114
Winchendon	MA0100862	1.100	0.610	15.500	78.855
Woronoco Village	MA0103233	0.020	0.010	19.600	1.635
Massachusetts Totals		**166.010**	**106.950**		**9938.820**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 13,836 lbs/day
MA (41 facilities) = 9,939 lbs/day (72%)
VT (32 facilities) = 1,727 lbs/day (12%)
NH (21 facilities) = 2170 lbs/day (16%)
TMDL Baseline Load = 21,672 lbs/day

TMDL Allocation = 16,254 lbs/day (25% reduction)

MA Discharges to Housatonic River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					
Crane	MA0000671		3.100	8.200	212.003
Great Barrington	MA0101524	3.200	2.600	17.000	368.628
Lee	MA0100153	1.000	0.870	14.500	105.209
Lenox	MA0100935	1.190	0.790	11.800	77.745
Mead Laurel Mill	MA0001716		1.500	6.400	80.064
Mead Willow Mill	MA0001848		1.100	4.600	42.200
Pittsfield	MA0101681	17.000	12.000	12.400	1240.992
Stockbridge	MA0101087	0.300	0.240	11.100	22.218
West Stockbridge	MA0103110	0.076	0.018	15.500	2.327
Massachusetts Totals			**22.218**		**2151.386**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 2151.386 lbs/day

TMDL Baseline Load = 3,286 lbs/day
TMDL Allocation = 2,464 lbs/day (25% reduction)

MA Discharges to Thames River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					
Charlton	MA0101141	0.450	0.200	12.700	21.184
Leicester	MA0101796	0.350	0.290	15.500	37.488
Oxford	MA0100170	0.500	0.230	15.500	29.732
Southbridge	MA0100901	3.770	2.900	15.500	374.883
Sturbridge	MA0100421	0.750	0.600	10.400	52.042
Webster	MA0100439	6.000	3.440	17.400	499.199
Massachusetts Totals		**11.820**	**7.660**		**1014.528**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 1014.528 lbs/day

TMDL Baseline Load = 1,253 lbs/day

TMDL Allocation = 939 lbs/day (25% reduction)