

**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

City of Westfield

is authorized to discharge from the facility located at

**Westfield Water Pollution Control Plant
149 Neck Road
Westfield, Massachusetts 01085**

to the receiving waters named

Westfield River

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

The Town of Southwick is a co-permittee for PART I.B. UNAUTHORIZED DISCHARGES, PART I.C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM, and PART I. D. ALTERNATIVE POWER SOURCE which include conditions regarding the operation and maintenance of the collection system owned and operated by the Town. The responsible Town authority is:

**Town of Southwick
454 College Highway
Southwick, MA 01077**

This permit shall become effective on December 1, 2009

This permit and the authorization to discharge expire at midnight, November 30, 2014.

This permit supersedes the permit issued on November 14, 2001.

This permit consists of Part I including effluent limitations and monitoring requirements, Part II including General Conditions and Definitions, and Attachments A (Toxicity Test Procedure), B (Industrial Pretreatment Annual Report), C (NPDES PERMIT SLUDGE COMPLIANCE GUIDANCE) and D (Report Summary).

Signed this 30th day of September, 2009

/S/ SIGNATURE ON FILE

Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

Director
Division of Watershed Management
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

Part I. A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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

Effluent Characteristics	Units	Discharge Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type ²
Flow ¹	mgd mgd	6.1 Report	***** *****	***** Report	Continuous Continuous	Recorder Recorder
BOD ₅ ³ (November 1 – May 31)	mg/l lbs/day	30 1530	45 2290	Report Report	2/week	24-hour composite ⁴ 24-hour composite
(June 1 –October 31)	mg/l lbs/day	20 1000	30 1500	Report Report	2/week	24-hour composite 24-hour composite
Total Suspended Solids ³ (November 1 – May 31)	mg/l lbs/day	30 1530	45 2290	Report Report	2/week	24-hour composite 24-hour composite
(June 1 –October 31)	mg/l lbs/day	20 1000	30 1500	Report Report	2/week	24-hour composite 24-hour composite
pH ⁵	su	6.5 – 8.3			1/day	Grab
<i>E. coli</i> ^{5,6} (April 1 – October 31)	cfu/100ml	126	*****	409	3/week	Grab
Total Residual Chlorine ^{7,8} (April 1 – October 31)	ug/l	55	*****	95	continuous	Recorder
Total Nitrogen ^{3,9}	mg/l lbs/day	Report Report	***** *****	Report Report	1/week 1/week	24-hour composite 24-hour composite

Part I A. 1. (Continued)

Effluent Characteristics	Units	Discharge Limitations			Monitoring Requirements	
		Average Monthly Report	Average Weekly *****	Maximum Daily Report	Measurement Frequency	Sample Type ²
Total Kjeldhal Nitrogen ³	mg/l	Report	*****	Report	1/week	24-hour composite
Ammonia Nitrogen as N ³ (November 1 – May 31) (June 1 – October 31)	mg/l mg/l	Report 3	***** 5	***** Report	1/week 1/week	24-hour composite
Nitrite-Nitrate Nitrogen ³	mg/l	Report	*****	Report	1/week	24-hour composite
Cadmium ¹⁰	ug/l	0.6	*****	3.1	1/month	24-hour composite
Copper, Total ¹¹ (December- March) (April - November)	ug/l ug/l	18.6 18.6	***** *****	22.5 22.5	1/month 1/week	24-hour composite 24-hour composite
Nickel, Total	ug/l	94	*****	Report	1/month	24-hour composite
Aluminum, Total ¹²	ug/l	435	*****	Report	1/week	24-hour composite
Total Phosphorus (April 1-October 31) (November 1 – March 31) ¹³	mg/l mg/l	0.46 1.0	***** *****	Report Report	1/week 1/month	24-hour composite 24-hour composite
Dissolved Orthophosphorus November 1 – March 31	mg/l	Report	*****	*****	1/month	24-hour composite
Whole Effluent Toxicity ^{14,15,16}	%	*****	*****	LC ₅₀ ≥ 100 C-NOEC ≥ 20	4/year	24-hour composite

Footnotes:

1. The average monthly flow limit is an annual average limit which shall be reported as a rolling average. The first value will be calculated using the monthly average flow for the first full month ending after the effective date of the permit and the eleven previous monthly average flows. Each subsequent month's DMR will report the annual average flow that is calculated from that month and the previous 11 months. In addition, report the actual average monthly flow and maximum daily flow for each month.
2. All sampling shall be representative of the influent and of the effluent that is discharged through outfall 001 to the Westfield River. A routine sampling program shall be developed in which samples are taken at the same location, same time, and same days of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable discharge monitoring report that is submitted to EPA. All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. All samples shall be 24-hour composites unless specified as a grab sample in 40 CFR §136.
3. Sampling required for influent and effluent.
4. 24-hour composite samples will consist of at least twenty four (24) grab samples taken during a consecutive 24-hour period (e.g. 7:00 am Monday to 7:00 am Tuesday) and combined proportional to flow.
5. Required for State Certification.
6. The average monthly limit for *E.coli* is expressed as geometric means.
7. The minimum level (ML) for Total Residual Chlorine (TRC) is defined as 20 ug/l using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G. One of these methods must be used to determine TRC. The ML is not the minimum level of detection, but rather the lowest point on the curve used to calibrate the test equipment for the pollutant of concern. If EPA approves a more sensitive method of analysis for TRC, the permit may be reopened to require the use of the new method with a corresponding lower ML. When reporting sample data at or below the ML, refer to the latest EPA Region NPDES Permit Program Instructions for the Discharge Monitoring Report Forms (DMRs).

The permittee shall collect and analyze at least one TRC grab sample per day. For every day that more than one sample is analyzed, the monthly DMR shall include an attachment documenting the individual grab sample results for that day, the date and time of each sample, the analytical method, and a summary of any operational modifications implemented in response to the sample results. This requirement applies to all samples taken, including screening level and process control samples. All test results utilizing an EPA approved analytical method shall be used in the calculation and reporting of the monthly average and

maximum daily data submitted on the DMR (see Part II. Section D.1.d.(2)).

8. The permittee shall report the average monthly and daily maximum discharge of TRC using data collected by the continuous TRC analyzer. The permittee shall collect and analyze, using an EPA approved method, a minimum of one grab sample per day for calibration purposes. The results of the grab samples and a comparison to the continuous analyzer reading, including the time of the grab samples, shall be included with the DMRs. Four continuous recording graphs (1/week) showing the full range of TRC results for each day shall be submitted with the monthly DMRs. Additionally, on an attachment to the DMRs, the permittee shall report for each day of the month, the daily average, daily instantaneous maximum, and the duration of time that the discharge concentration exceeded the maximum daily permit limit.
9. See **Part I.G. SPECIAL CONDITIONS** for requirements to evaluate and implement optimization of nitrogen removal.
10. The permittee shall use EPA approved method number 213.2 found in UNITED STATES ENVIRONMENTAL PROTECTION AGENCY Manual of Methods of Analysis of Water and Wastes. The permittee must achieve a quantification level equal to or less than the effluent limits, where feasible. Values below the quantification level may be reported as zero.
11. The minimum level (ML) for copper is defined as 3 ug/l. This value is the minimum level for copper using the Furnace Atomic Absorption analytical method (EPA Method 220.2). This method or other EPA-approved method with an equivalent or lower ML shall be used for effluent limitations less than 3 ug/l. Compliance/non-compliance will be determined based on the ML. Sampling results of 3 ug/l or less shall be reported as zero on the Discharge Monitoring Report.
12. The sample for aluminum shall be taken at the same time as a sample for phosphorus
13. The phosphorus limit shall be a report only requirement until November 1, 2011 at which time the seasonal 1.0 mg/l phosphorus limit shall become effective.
14. The permittee shall conduct chronic (and modified acute) toxicity tests 4 times per year. The permittee shall test the daphnid, *Ceriodaphnia dubia*, only. The tests must be performed in accordance with the Toxicity Test Procedure and Protocol (**Attachment A**) and the schedule in the following table.

Test Dates Second week in:	Submit Results by:	Test Species
February	March 31	Daphnid (<i>Ceriodaphnia dubia</i>)
May	June 30	
August	September 30	
November	December 31	

After submitting two years of WET test results, all of which demonstrate compliance with

the WET permit limits, the permittee may request a reduction in the WET testing requirements. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed.

15. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test Procedure and Protocol) Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs) which is sent to all permittees with their annual set of DMRs and may also be found on the EPA, Region I web site at <http://www.epa.gov/region1/enforcementandassistance/dmr2007.pdf>. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.
16. The LC₅₀ is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent shall cause no more than a 50% mortality rate. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The "20% or greater" limit is defined as a sample which is composed of 20% (or greater) effluent, the remainder being dilution water.

Part I. A. (continued)

2. Additional requirements

- a. The discharge shall not cause a violation of the water quality standards of the receiving waters.
- b. The discharge shall not cause objectionable discoloration of the receiving waters.
- c. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.
- e. The treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based

on monthly average values.

f. Sample results using EPA approved methods for any parameter above its required frequency must also be reported.

g. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.

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

i. The permittee shall operate the treatment plant to maximize the removal of BOD, TSS, and NH₃ during the period of November through May. This shall include maintaining nitrification to the extent feasible.

3. The WWTF must provide notice to the Director as soon as possible of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger in a primary industry category discharging process water; and

b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For purposes of this paragraph, notice shall include information on:

(i) the quantity and quality of effluent introduced into the POTW; and

(ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

4. Prohibitions Concerning Interference and Pass Through:

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

5. Toxics Control

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

b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may

be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

6. Numerical Effluent Limitations for Toxicants

EPA or the MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

B. UNAUTHORIZED DISCHARGES

The permit only authorizes discharges in accordance with the terms and conditions of this permit and only from the outfall listed in PART 1 A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) from any portion of the collection system owned and operated by the permittee or co-permittee are not authorized by this permit and shall be reported to **EPA and MassDEP** in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting). Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at <http://www.mass.gov/dep/water/approvals/surffms.htm#sso>.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions. The permittee and co-permittee shall meet the following conditions for those portions of the collection system which it owns and operates.

1. Maintenance Staff

Provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

2. Preventative Maintenance Program

Maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges.

3. Infiltration/Inflow Control

The permittee and co-permittee shall each develop and implement a plan to control

infiltration and inflow (I/I) to its own sewerage system. The plans shall be submitted to EPA and MassDEP **within six months of the effective date of this permit** (see page 1 of this permit for the effective date) and shall describe the permittee's and co-permittee's programs for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow. The plan shall include:

- i) An ongoing program to identify and remove sources of infiltration and inflow. The program shall include the necessary funding level and the source(s) of funding.
- ii) An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.
- iii) Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the system.
- iv) An educational public outreach program for all aspects of I/I control, particularly private inflow.

By **March 31** the permittee and co-permittee shall submit an annual summary report of all actions taken to minimize I/I during the previous calendar year. The summary report shall, at a minimum, include:

- i) A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.
- ii) Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year.
- iii) A map with areas identified for I/I-related investigation/action in the coming year.
- iv) A calculation of the annual average I/I, the maximum month I/I for the reporting year.
- v) A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to PART 1. C. UNAUTHORIZED DISCHARGES of this permit.

D. ALTERNATIVE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment

works (as defined at 40 CFR §122.2).

E. PRETREATMENT

1. Industrial Pretreatment Program

a. The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the permittee's approved Pretreatment Program, and the General Pretreatment Regulations, 40 CFR 403. At a minimum, the permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

1. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.
2. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.
3. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.
4. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

b. The permittee shall provide the EPA and the MassDEP with an annual report describing the permittee's pretreatment program activities for the twelve month period ending 60 days prior to the due date in accordance with 403.12(i). The annual report shall

be consistent with the format described in **Attachment B** of this permit and shall be submitted no later than December 1 of each year.

c. The permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR 403.18(c).

d. The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR 405 et. seq.

e. The permittee must modify its pretreatment program to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the industrial pretreatment program. The permittee must provide EPA, in writing, within 120 days of

this permit's effective date proposed changes, if applicable, to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. The permittee will implement these proposed changes pending EPA Region I's approval under 40 CFR 403.18. This submission is separate and distinct from any local limits analysis submission described above.

f. On October 14, 2005 EPA published in the Federal Register final changes to the General Pretreatment Regulations. The final "Pretreatment Streamlining Rule" is designed to reduce the burden to industrial users and provide regulatory flexibility in technical and administrative requirements of industrial users and POTW's. Within 120 days of the effective date of this permit, the permittee must submit to EPA all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated Rule. To the extent that the POTW legal authority is not consistent with the required changes, they must be revised and submitted to EPA for review.

g. Within 60 days of the effective date of the permit, the permittee must submit an updated Sewer Use Ordinance to EPA for review and approval.

F. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.
2. The permittee shall comply with the more stringent of either the state or federal (40 CFR Part 503), requirements.
3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following use or disposal practices:
 - a. Land application - the use of sewage sludge to condition or fertilize the soil
 - b. Surface disposal - the placement of sewage sludge in a sludge-only landfill
 - c. Sewage sludge incineration in a sludge-only incinerator
4. The 40 CFR part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions also do not apply to facilities which do not dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons- reed beds), or are otherwise excluded under 40 CFR 503.6.
5. The permittee shall use and comply with the attached compliance guidance document to determine appropriate conditions. Appropriate conditions contain the following elements:

- General requirements
- Pollutant limitations
- Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
- Management practices
- Record keeping
- Monitoring
- Reporting

Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year:

<u>Dry metric tons/year</u>	<u>Monitoring Frequency</u>
less than 290	1/year
290 to less than 1500	1/quarter
1500 to less than 15000	6/year
15000 +	1/month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR 503.8.
8. The permittee shall submit an annual report containing the information specified in the guidance by **February 19**. Reports shall be submitted to the address contained in the reporting section of the permit. Sludge monitoring is not required by the permittee when the permittee is not responsible for the ultimate sludge disposal. The permittee must be assured that any third party contractor is in compliance with appropriate regulatory requirements. In such case, the permittee is required only to submit an annual report by February 19 containing the following information:

- Name and address of contractor responsible for sludge disposal
- Quantity of sludge in dry metric tons removed from the facility by the sludge contractor.

G. SPECIAL CONDITIONS

Within **one year of the effective date of the permit**, the permittee shall complete an evaluation of alternative methods of operating the existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report to EPA and MassDEP documenting this evaluation and

presenting a description of recommended operational changes. The methods to be evaluated include, but are 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. The permittee shall implement the recommended operational changes in order to maintain the existing mass discharge loading of total nitrogen. The annual average total nitrogen load from this facility (2004 – 2005) is estimated to be 643 lbs/day.

The permittee shall also submit an annual report to EPA and MassDEP, **by February 1 each year**, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year.

H. MONITORING AND REPORTING

1. Reporting

a. Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) postmarked **no later than the 15th day of the following month**.

b. Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director at the following addresses:

Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, MA 02114

c. Signed and dated Discharge Monitoring Report Forms and all other reports, excluding toxicity test reports, required by this permit shall be submitted to the State at:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection
Western Regional Office
436 Dwight Street
Springfield, MA 01103

d. Signed and dated Discharge Monitoring Reports and toxicity test reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, MA 01608

e. Signed and dated pretreatment reports required in Section 1.F. PRETREATMENT of this permit shall be submitted to:

EPA New England
Attn: Justin Pimpare
One Congress Street
Suite 1100 – CMU
Boston, MA 02113

and a copy of the Industrial Pretreatment Reports to the State at:

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention
Industrial Wastewater Program
One Winter Street
Boston, MA 02108

I. STATE PERMIT CONDITIONS

1. This discharge permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) under Federal and State law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MassDEP pursuant to M.G.L. Chap. 21, §43.
2. Each Agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of this permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of Federal law, this permit shall remain in full force and effect under State law as a permit issued by the Commonwealth of Massachusetts.

Attachment E

Report Summary

This Table is a summary of reports required to be submitted under this NPDES permit as an aid to the permittees. If there are any discrepancies between the permit and this summary, the permittees shall follow the permit requirements.

Required Report	Date Due	Submitted By:	Submitted To: *(see next page for key)
Discharge Monitoring Report (DMR)	Monthly, postmarked by the 15 th of the month following the monitoring month (e.g. the March DMR is due by April 15 th).	City of Westfield	1, 2, 3
Whole Effluent Toxicity (WET) Test Report (Part I.A.1)	March 31, June 30, September 30, and December 31 each year	City of Westfield	1, 2, 3
Pretreatment Annual Report (Part I.E.2.b.)	December 1 each year	City of Westfield	1,2,4
I/I Control Plan (Part I.C.3)	Within 6 months of permit effective date	City of Westfield Town of Southwick	1,2 1,2
I/I Annual Report (Part I.C.3)	March 31 each year	City of Westfield Town of Southwick	1,2 1,2
Updated Sewer Use Ordinance	Within 60 days of permit effective date	City of Westfield	1,2
Annual Sludge Report (Part I.F.8.)	February 19 each year	City of Westfield	1,2
Nitrogen Optimization Evaluation report (Part I.G.)	Within 180 days of permit effective date	City of Westfield	1,2
Nitrogen Removal Optimization Report (Part I.G.)	February 1 each year	City of Westfield	1,2

- * 1. Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, Massachusetts 02114

- 2. Massachusetts Department of Environmental Protection
Bureau of Resource Protection
Western Regional Office
436 Dwight Street
Springfield, MA 01103

- 3. Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, MA 01608

- 4. EPA New England
Attn: Justin Pimpare
One Congress Street
Suite 1100 - CMU
Boston, MA 02114

RESPONSE TO COMMENTS

NPDES PERMIT No. MA0101800 City of Westfield, Massachusetts

On August 25, 2008, the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) released a draft National Pollutant Discharge Elimination System (NPDES) permit for public notice and comment developed pursuant to an application from the City of Westfield, Massachusetts for the reissuance of its permit to discharge wastewater to the designated receiving water, the Westfield River. The public comment period for this draft permit ended on September 23, 2008. Comments were received from Mr. David Billups, Superintendent of the Westfield Water Pollution Control Plant, in a letter dated September 15, 2008, Mr. Henry Warchol in a letter dated September 21, 2008, Mr. Todd M. Brown, Vice President of Tighe & Bond, in a letter dated September 22, 2008, and Ms. Andrea F. Donlon, River Steward of the Connecticut River Watershed Council, in a letter dated September 23, 2008.

After a review of the comments received, EPA has made a final decision to issue the permit authorizing this discharge. The following are the comments and EPA's response to those comments, including changes that have been made to the final permit as a result of the comments. The comment letters are part of the administrative record and are paraphrased herein. A copy of the final permit is available online at http://www.epa.gov/region1/npdes/permits_listing_ma.html or may be obtained by writing or by calling Mark Malone, EPA Municipal NPDES Permits Program (CMP), 1 Congress Street, Suite 1100, Boston, MA 02114-2023; telephone: (617) 918-1619.

Comments received from Mr. David Billups, Superintendent of the Westfield Water Pollution Control Plant:

Comment A.1.

After a series of tests, the plant selected sodium aluminate for coagulation in order to comply with the current seasonal phosphorus limit. Because that limit is seasonal, no provisions were made to protect the stored chemical from freezing at 12 F. The draft permit contains a 1.0 mg/l phosphorus limit for the period from November through March which will require new facilities to properly store the chemical. This is extremely complicated as the entire plant lies in the floodway of the Westfield River. The City's position is that the implementation of the total phosphorus limit of 1.0 mg/l between November 1 and March 31 be eliminated or at least delayed until the proper storage facilities can be planned, designed, and constructed and that the phosphorus limit be a "report only" for that period.

Response A.1.

We consider the City's request reasonable and have given the permittee a period of two years to

comply with that permit requirement. The phosphorus limit for November 1 –March 31 will become effective on November 1, 2011. The monitoring requirements for November 1- March 31 will become effective upon the effective date of the permit.

Comment A.2.

The Pretreatment Limitations by Industrial Users report required by Part I.E.1. is unnecessary. The proposed update to the local limits was completed and submitted to EPA approximately 3 ½ years ago. Given that the proposed update to the local limits is under review by EPA, there is little point in preparing the evaluation report required by the draft permit.

Response A.2.

The Permittee submitted a Local Limits Evaluation to EPA in September 2005. Therefore, the permittee will not be required to perform any additional evaluation until EPA responds to the 2005 report. Part I.E.1., Limitations for Industrial Users, and Attachment B, Reassessment of Technically Based Industrial Discharge Limits, have been removed from the final permit.

Comment A.3.

Regarding Footnote 13 on page 6 of the Draft Permit, can the previous years worth of WET testing results be used toward the two years of results that demonstrate compliance to request a reduction in the WET testing requirements?

Response A.3.

Yes, as long as the two years of results are from the latest WET testing, the permittee may use the results of tests conducted under the current permit.

Comments received from Mr. Henry Warchol

Comment B.1.

As recorded in its permit, the Westfield WPCP is not required to monitor or record the nutrients being discharged into the river. These nutrients are feeding the noticeable accelerated algae growth at the fish ladder in West Springfield. (The commenter submitted related photographs of the Westfield River dated October 4, 2005, and August 22, 31, and September 2, 2008 in support of his comment). With increasing flows to the treatment plant and approved water depletions for proposed power plants, these nutrients need to be removed, not added, to the river. There is a need to accurately record and monitor all levels of discharges that are taking place in the river, especially the phosphates and nitrates that are accelerating the downstream algal growth.

Response B.1.

The draft and final permits contain monitoring requirements and numerical phosphorus limits, and a requirement to report total nitrogen, TKN, ammonia nitrogen, and nitrite-nitrate nitrogen

concentrations. The permit also requires that the City optimize the removal of nitrogen from its effluent. EPA believes that these limitations and conditions are sufficient to ensure that the discharge does not cause or contribute to exceedances of water quality standards.

Comments received from Mr. Todd M. Brown, Vice President of Tighe & Bond.

Comment C.1.

The facts cited in the Fact Sheet indicate that the current limits have been effective in improving the water quality of the Westfield River. The referenced Westfield River Watershed 2001 Water Quality Assessment Report noted apparent improvements in the biological condition in the river downstream of the Westfield WPCP which appear to coincide with improvements at the facility. The Fact Sheet and permit do not take into account subsequent additional improvements at the plant completed in 2004. The Fact Sheet also noted that the 2006 303(d) list did not identify nutrients as a pollutant requiring a TMDL. It would appear that the river water quality has improved over that five year period indicating that the current limits have not led to any degradation of the river and may be contributing to the apparent water quality improvement from 2001 to 2006. Since a TMDL is not required for nutrients in this segment of the river, it does not seem necessary to impose a more stringent limit on a nutrient discharge from the WPCP.

Response C.1.

The *Final Massachusetts Year 2006 Integrated List of Waters* and the *Proposed Massachusetts Year 2008 Integrated List of Waters* both identify “noxious aquatic plants” as a pollutant requiring a TMDL for this segment (See *Comment B.1.* above.) In addition, the Environmental Appeals Board recently issued a major decision on nutrients (*In re City of Attleboro Department of Wastewater*, NPDES Appeal No. 08-08, 14 E.A.D. __ (EAB, September 15, 2009). In that decision, the Board found reasonable the Region’s attempt to reconcile unavoidable scientific uncertainty with its duty under the Clean Water Act to “ensure” compliance with water quality standards and validated the Region’s methodology of using EPA technical guidance and peer-reviewed literature for deriving numeric effluent limitations to implement narrative nutrient standards under 40 C.F.R. § 122.44(d)(1)(vi) in the absence of site-specific studies (or WLAs). As discussed above, plant growth supported by the phosphorus in the receiving water continues to be a concern in the segment downstream of the discharge. EPA believes that phosphorus discharged by the facility has the reasonable potential to cause or contribute to an exceedance of state water quality standards, and has retained the phosphorus limitations in the final permit. Similarly, the nitrogen monitoring and optimization requirements have also been retained in order to ensure that nitrogen loading at the Massachusetts/Connecticut state line does not exceed the allocation in the Long Island Sound TMDL.

Comment C.2.

Because the presence of algae was noted both above and below the treatment facility, there is no direct evidence that nutrients discharged by the WPCP contributed to the algal growth observed in the 2001 water quality assessment report.

Response C.2.

Massachusetts Surface Water Quality Standards at 314CMR 4.05(5)(c) require, among other things, that “all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses....” As described in the fact sheet, EPA used the Gold Book-recommended criterion of 0.1 mg/l to interpret narrative criteria in the state water quality standards. According to the DMR data of Attachment 1 of the Fact Sheet, the Westfield WPCP has a dilution factor of 5.0 and discharged 0.2 to 0.91 mg/l of phosphorus. Based on this information, calculations were made in the fact sheet that showed that the discharge has the reasonable potential **to cause or contribute** to exceed the Gold Book-recommended criterion, and that an effluent limitation of 0.46 mg/l was necessary to ensure that the Gold Book criterion was achieved.

Comment C.3.

The Westfield WPCP outfall is approximately 10 miles from the confluence of the Connecticut River. Because of its close proximity to the much larger Connecticut River, there is less of a need to consider winter limits because a significant portion of the dissolved soluble phosphorus will likely be carried to the Connecticut River before it is able to be utilized by the algae during the next growing season.

Response C.3.

The inclusion of the 1.0 mg/l phosphorus limit in the winter is to ensure that the phosphorus in the winter discharge is dissolved soluble phosphorus and not particulate phosphorus which can accumulate downstream in the impoundment located downstream between the discharge and the Connecticut River. Settled particulate phosphorus can be later used for algal growth when temperatures rise in the spring.

Comment C.4.

One of the recommendations in the 2001 Assessment Report is that an upstream/downstream evaluation of the benthic macroinvertebrate community in the Westfield River should be conducted during the next watershed survey to document any improvements associated with the improvements at the WPCP. We believe this study should be conducted prior to imposing more strict limits on the discharge, without knowing if such a limit will lead to any improvements in the water quality of the Westfield River.

Response C.4.

While an evaluation of the benthic macroinvertebrate community may, or may not, document improvements in that community, permit limitations are established to meet water quality standards using the best available information at the time of permit issuance (e.g. the 2001 Assessment Report).

Comment C.5.

Meeting the more stringent seasonal phosphorus limit will require the addition of 31 gallons of sodium aluminate per day. This is a significant cost in terms of purchasing as well as manufacturing and transporting. It will also lead to the discharge of excess sodium aluminate into the river. EPA should take into consideration the broader environmental impact, especially when the need for the lower limit is not well supported by the documentation.

Response C.5.

The rationale for the more stringent seasonal phosphorus limit has been explained in the Fact Sheet. We recognize the additional costs associated with meeting lower permit limitations; however, NPDES permits must be written so that the discharge does not cause or contribute to the exceedance of a water quality standard. The permittee is encouraged to investigate alternative methods of phosphorus removal in order to minimize potential secondary impacts of treatment and costs while meeting the permit limitations.

Comment C.6.

The more stringent phosphorus will generate an additional 2,200 gallons of sludge per day during the low-level phosphorus season resulting in 1.5 cubic yards of solids per day. Additional sludge will be produced during the winter with the implementation of the 1 mg/l phosphorus limit. The cost of disposing the additional 550 cubic yards of sludge at a landfill is significant and should be considered in the broader environmental impact.

Response C.6.

We acknowledge the additional costs associated with more stringent permit limitations. However, the permit limitations must be established so that the receiving waterbody meets its water quality standards. The removal of phosphorus from the treatment facility discharge and the proper disposal of the additional sludge results in a more beneficial environmental impact.

Comments received from Ms. Andrea F. Donlon, River Steward of the Connecticut River Watershed Council

Comment D.1.

The proposed maximum daily limit for E. coli bacteria in this permit is 409 cfu/100 ml. This limit is not consistent with the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, which states that no single sample shall exceed 235 colonies/100 ml. Nothing in the Fact Sheet explains the rationale for the maximum of 409 colonies/100 ml.

Response D.1.

The bacteria criteria in the State Surface Water Quality Standards are based on the EPA criteria originally published in 1986 and more recently included in the EPA bacteria ruling found in the

Federal Register (November 16, 2004: "Water Quality Standards for Coastal and Great Lakes Recreation Waters: Final Rule"). The E. coli SSM (single sample maximum) values are based on 4 classes of exposure with the upper 75% confidence level being the most stringent. EPA has published guidance that explains that NPDES permits limits set at the 75% upper confidence level for SSM it would, in fact, be more stringent than intended by the criteria and "could impart a level of protection much more stringent than intended by the 1986 bacteria criteria document." (EPA-823-F-06-013, September 2006, Water Quality Standards for Coastal Recreation Waters: Using Single Sample Maximum Values in State Water Quality Standards).

MassDEP views the use of the 90% upper confidence level (lightly used full body contact recreation) of 409 cfu/100 ml as appropriate for setting effluent bacteria levels in NPDES permits for this receiving water. The daily maximum E.coli bacteria limit for this permit has therefore been set at the 90% upper confidence level, as requested by MassDEP.

Comment D.2.

We are not sure why the draft permit does not establish seasonal limits for total residual chlorine and bacteria.

Response D.2.

The draft permit should have established seasonal limits for total residual chlorine and bacteria for the period of April 1 through October 31. The final permit corrects this omission.

Comment D.3.

The 2001 permit modification satisfied anti-backsliding requirements for BOD and TSS only for the months of June through October. The Fact Sheet stated that "EPA and MassDEP believed these limits would not result in significant degradation of the receiving water during this period due to high re-aeration rates and higher DO saturation concentrations in the lower river temperatures." There is no basis for seasonal limits compared to year-round limits. The higher TSS and BOD loadings under the expanded facility have the potential to exacerbate the turbidity impairment in this section in the river. We believe that the impairments already present in the river are a good argument for having year-round limits that are the same as what is currently proposed for June through October to undo the backsliding of the last permit modification and to improve the impaired status of the this river.

Response D.3.

EPA and MassDEP still believe that the findings made in the permit modification regarding antidegradation were valid. Specifically, the Agencies believe that higher river flows, re-aeration rates, and DO saturation concentrations, and the requirement in Part 1.A.2.i. of the permit that requires the permittee to operate the treatment plant to maximize the removal of BOD, TSS, and NH₃ and maintaining nitrification to the extent feasible during the period of November through May are sufficient to ensure that degradation of the of water quality will not

occur and uses will be maintained . Consequently, the BOD and TSS limits in the draft permit are retained in the final permit.

Comment D.4.

While the draft permit lowers the summer phosphorus limit to 0.46 mg/l is not protective enough. The physical evidence of a significant algal problem in this river segment described in the Fact Sheet suggests there is already too much phosphorus in the river. We think the permit should incorporate a phosphorus limit of 0.34 mg/l based upon the ecoregion criteria or a limit consistent with the most protective permit limits used elsewhere in Massachusetts (i.e. 0.1 to 0.2 mg/l). The presence of a dam downstream also means that this river has a different set of characteristics than a free-flowing river.

Response D.4.

EPA has decided to apply the Gold Book criterion because it was developed from an effects-based approach versus the reference conditions-based approach used to develop the ecoregion criteria. The effects-based approach is taken because it is more directly associated with an impairment to a designated use (e.g. fishing). The effects-based approach provides a threshold value above which water quality impairments are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. algal growth) associated with designated use impairments. Referenced-base values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions. The ecoregion number and other referenced-based numbers are growing season averages whereas the Gold Book criterion is a not to exceed limit applied to 7Q10 river flows. It is believed that the application of the more conservative Gold Book criterion will, on average, result in in-stream concentrations within the range of the referenced-based values.

Comment D.5.

Several Fact Sheets for NPDES permits in the Connecticut River watershed have included a table of the nitrogen loadings from the various dischargers. One example is Exhibit A “Nitrogen Loads” in the Erving #1 Fact Sheet. However, the Table fails to list Westfield as a source of nitrogen. Leaving Westfield off this Table seems to be a major omission. Why is Westfield not included in the Table?

Response D.5.

Westfield is in the Table and can be found on page 3 of Exhibit A for the Erving #1 Fact Sheet.

Comment D.6.

Because of the need to reduce nitrogen in Long Island Sound, we think the new nitrogen reporting requirements should be stronger and Part G of the draft permit should give a better

sense of the timeline for nitrogen reduction implementation.

Response D.6.

The nitrogen monitoring requirements have been increased from 1/month in the current permit to 1/week. Because the 25% reduction in the baseline loadings of the TMDL is already being met, as explained in the Fact Sheet, EPA has determined that at this time it is not necessary to require further reductions in nitrogen discharges from Massachusetts POTWs.

Comment D.7.

Page B17 of the 2001 Westfield River Water Quality Assessment described the segment of the Westfield River immediately downstream of the wastewater treatment plant outfall as follows: "Various types of green algae covered virtually all the stream bottom in the sampling reach. In addition to the luxuriant algal growth, an abundance of sewage fungus was noted along the margins of the reach. The smell of treated sewage was quite strong here, and in-stream turbidity was obvious. Bank and riparian habitat quality was excellent at WR06A." Then on page 18 it states, "Most notable among the benthic metrics for WR06A was the EPT Index, which was greatly reduced (by more than half) compared to WR06B due to the displacement of EPTs by chironomids (EPT/Chironomidae metric score=2). That DWM biologists were able to closely bracket the Westfield WWTP discharge with both the macroinvertebrate test station and control station suggests biological impairment at WR06A can be at least partially attributed to discharge effects, as was concluded by DEP following the 1996 biosurvey here (Szal 1998)." See report online at <http://www.mass.gov/dep/water/resources/32wqarap.pdf>. This report was published in 2005, and was not yet available during the previous permit updates. CRWC feels this description is a good rationale for stricter limits on nutrients, TSS, and BOD.

Response D.7.

The draft and final permits do contain more stringent limits for nutrients. Based on information currently available, EPA does not believe that more stringent limits on BOD and TSS, Are warranted. Consequently, the permit limitations for BOD and TSS remain the same in the final permit.

Comment D.8.

Should the proposed Pioneer Valley Energy Center (PVEC) be built (MEPA No. 14151), it will contribute 230,000 gallons per day (gpd) on an average day to the Westfield sewer system, with a maximum discharge of 280,000 gpd. Based on Attachment 3 to the Fact Sheet, it appears PVEC will become the Westfield WPCF's biggest industrial discharger, and will use 13% of its permitted capacity. There is no daily maximum limit on the flow in the permit, and coupled with a monthly limit based on annual averaging can create a situation where a plant near or even at capacity can put off planning because it takes a long time for the data to show that the plant is nearing capacity.

Response D.8.

Part I. A. 2. h. of the permit requires that if the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions. In addition, the permit also requires the reporting of the actual average monthly flow in addition to the annual average monthly flow limit. These requirements should ensure that proper planning occurs in a timely fashion and violations of the design capacity of the facility are avoided. In addition, pursuant to 40 CFR 122.41(l)(1)(i), notification must be made of any alteration or addition that results in a significant change in the nature or an increase in the discharge of pollutants.

Sewer Connection permits are required under 314 CMR 7.00 for industrial discharges greater than 15,000 gallons per day (gpd) and additional requirements are required for discharges greater than 50,000 gpd (see 314 CMR. 7.05). The permits are issued by the MassDEP regional office in Springfield, MA. The related regulations can be found at <http://www.mass.gov/dep/service/regulations/314cmr07.pdf>.

Comment D.9.

The Fact Sheet gives a dilution factor of 5.0 on page 5 of the Fact Sheet. Most Fact Sheets for NPDES permits provide a calculation that shows the basis for the dilution factor, but this one did not. What was the basis for the calculation? We are surprised that the expanded plant would have the same dilution factor as the plant before expansion.

Response D.9.

As explained in the Fact Sheet, the current permit used a dilution factor of 5.0 established by the dye study and modeling performed for the Final Environmental Impact Report for the expanded facility. The calculated dilution factor for the previous 4.0 mgd treatment facility was 10.7.

Comment D.10.

The Fact Sheet explains that dilution is calculated using a 7Q10 of 37.8 cfs. Should the proposed Russell Biomass plant be built upstream, EPA should be aware that there may be a need to re-open the permit to recalculate the 7Q10 taking into account Russell Biomass's withdrawal from the Westfield River. Effluent limits would also need to be recalculated based on a revised smaller 7Q10.

Response D.10.

As noted by the commenter, the proposed Russell Biomass plant has not yet been built. Consequently, no adjustment in the draft permit limits is necessary at this time. In addition, the difference in water volume between the withdrawal from and discharge to the Westfield River from that plant is estimated to be 0.56 mgd or 0.87 cfs. This represents only about 2% of the 7Q10 flow used in the dilution factor calculation for the Westfield draft permit. Should that

facility be constructed during the term of this permit, the permit limits may be modified in accordance with 40 CFR §122.62 (2) or at the next permit reissuance.

Comment D.11.

Page 6 of the Fact Sheet refers to an 85% removal requirement for BOD and TSS. We could not find it in the permit.

Response D.11.

The 85% removal requirement can be found in Part I.A.2.e.

Comment D.12.

Attachment 1 showing DMR data did not include pH or bacteria data. Looking at EPA's online database ECHO, it appears that Westfield may not have even submitted that information. Is there an explanation?

Response D.12.

The amount of DMR data submitted is quite voluminous and is not presented in its entirety within the Fact Sheet for practical reasons. The available Discharge Monitoring Report (DMR) data is examined in the development of the permit limitations, requirements, and conditions. Data in support of new permit limits or conditions is normally included in the Fact Sheet. Any additional data presented in the Fact Sheet for informational purposes is at the discretion of the permit writer.

There have been technical issues, some of which have not yet been resolved, regarding the new, NPDES permit data management system which may have resulted in some data not appearing in the ECHO database.

Comment D.13.

Attachment 1 to the Fact Sheet indicates that this facility has shown violations of many permit limits over the last couple of years. What has been the ecological effect of all of these violations?

Response D.13

EPA does not have sufficient information to assess ecological effects of the permit violations. Water quality assessments which include physical, chemical, and biological sampling are conducted only periodically by the State. The last Water Quality Assessment Report for the Westfield River was completed in 2001. While the last water quality survey was conducted in 2006, the next water quality assessment report is likely in 2011.

Comment D.14

In 2006, ECHO records show that a pretreatment audit showed "deficiencies observed." Please explain what has been done to fix the pretreatment deficiencies and the permit limit violations (other than the new permit limits and parameters in the draft permit).

Response D.14

The last pretreatment audit was done in 2002. The deficiency noted in ECHO with respect to pretreatment in 2006 was related to a late annual pretreatment report. The report was submitted late but was received and contained sufficient information; therefore, there are no current issues with respect to pretreatment.

Regarding the effluent limitation violations, there have been no EPA or MassDEP enforcement actions issued for exceedances of the limitations as the violations are considered relatively minor and are given a lower priority than SNC violations.

Comment D.15.

The fish studies conducted by Metcalf & Eddy demonstrated that a small proportion of spawning shad may pass above the Westfield outfall, even though shad may tend to prefer downstream spawning areas. Because there is no way of knowing whether any fish that passed upstream of the outfall actually swam through the mixing zone, we would say that the study was unable to draw any conclusions about the mixing zone of the outfall.

Response D.15.

The purpose of the fish passage study required by Part I.A.8. of the current permit was to determine the effect of the treatment plant discharge on fish migration. Consequently, it was less important to determine whether any fish actually passed through the mixing zone as it was to determine whether the discharge posed an actual barrier to the fish migration. Based on the information gathered in the study, it does not.

Please note the following administrative change in the final permit.

The State is now requiring the immediate implementation of *E. coli* permit limits in the final permit in order to receive water quality certification rather than the one-year implementation schedule in the Draft Permit. Consequently, the permit limits for fecal coliform have been removed and the revisions to the *E. coli* permit limits can be found in the Effluent Limitations and Monitoring Requirements and the related Footnote 6.

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
1 CONGRESS STREET
SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023**

FACT SHEET

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

NPDES NO: MA 0101800

NAME AND ADDRESS OF PERMITTEE:

City of Westfield
59 Court Street
Westfield, MA 01085

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Westfield Water Pollution Control Plant
149 Neck Road
Westfield, Massachusetts 01085

NAME AND ADDRESS OF CO-PERMITTEE:

The Town of Southwick is co-permittee for specific activities required by the permit, as set forth in Section VI. of this Fact Sheet and Sections I.B., I.C., and I.D. of the Draft Permit. The responsible municipal department is:

Board of Selectmen
454 College Highway
Southwick, MA 01072

RECEIVING WATER: Westfield River (Segment MA 32-05)

CLASSIFICATION: B (Warm Water Fishery)

LATITUDE: 47° 07' 02" N

LONGITUDE: 72° 43' 56" W

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

The above named applicant has requested that the U.S. Environmental Protection Agency reissue its NPDES permit to discharge into the designated receiving waters. The Westfield Water Pollution Control Plant (WPCP) collects and treats municipal and industrial wastewater from the City of Westfield and the Town of Southwick. The populations served are approximately 40,000 and 8,000, respectively. The permit modification issued in November, 2001 allowed for the expansion of the treatment facilities to a design flow of 6.1 mgd. The Westfield WPCP initiated operation of the expanded facilities in January, 2005. The treatment facility consists of headworks, grit removal, primary clarification, aeration basins, final clarification, chlorination using sodium hypochlorite, and dechlorination using sodium bisulfite. Phosphorus removal is achieved with the addition of sodium aluminate. The location of the facility is shown in Figure 1.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on monitoring data collected since the expansion of the facility is shown in Attachment 1. The new limits for copper, cadmium, and nickel in the current permit did not take effect until January, 2007, two years after the completion of the expanded facilities.

III. Permit limitations and Conditions

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

A. General Statutory and Regulatory Background

EPA is issuing this permit pursuant to Section 402(a) of the Clean Water Act. The Commonwealth of Massachusetts is also issuing this permit pursuant to Massachusetts General Laws ch. 21, § 43 (2004).

The Clean Water (CWA) prohibits the discharge of pollutants to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to implement technology and water quality-based effluent limitations and other requirements including monitoring and reporting. The draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and any applicable State administrative rules. The regulations governing EPA's NPDES permit program are generally found in 40 CFR Parts 122, 124 and 125; Part 133 contains the secondary treatment requirements.

EPA is required to consider technology and water quality-based requirements as well as those requirements and limitations included in the existing permit when developing the renewed permit's effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 CFR 125

Subpart A) to meet Best Practicable Control Technology (BCT) for conventional pollutants, and Best Available Technology Economically Available (BAT) for toxic pollutants. Technology-based limitations for publicly-owned treatment works are found at 40 CFR Part 133 – Secondary Treatment Regulations.

All statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired. When technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective (see 40 CFR §125.3(a)(1)). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit. Compliance schedules to meet water quality based effluent limits may be included in permits only when the state's water quality standards clearly authorize such schedules and where the limits are established to meet a water quality standard that is either newly adopted, revised, or interpreted after July 1, 1977.

Section 301(b)(1)(C) of the CWA requires NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to comply with, among other things, any applicable state or federal water quality standards. A water quality standard consists of three elements: (1) beneficial designated use or uses for a water body or a segment of a water body; (2) numeric and narrative water quality criteria sufficient to protect the assigned designated use(s); and (3) antidegradation requirements to ensure that existing uses and high quality waters are protected and maintained.

The Massachusetts Surface Water Quality Standards (314 CMR 4.00, February, 1996) establish designated uses of the State's waters, criteria to protect those uses, and an antidegradation provision to ensure that existing uses and high quality waters are protected and maintained. They also include requirements for the regulation and control of toxic constituents and specify that EPA's recommended water quality criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site specific criterion is established.

Section 402(o) of the CWA provides, generally, that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. Unless certain limited exceptions are met, "backsliding" from effluent limitations contained in previously issued permits that were based on CWA §§ 301(b)(1)(C) or 303 is prohibited. EPA has promulgated anti-backsliding regulations, which are found at 40 CFR § 122.44(l). Unless statutory and regulatory backsliding requirements are met, the limits in the reissued permit must be at least as stringent as those in the previous permit.

In addition, in accordance with regulations found at 40 CFR Section 131.12, MassDEP has developed and adopted a statewide antidegradation policy to maintain and protect in-stream water quality. The Massachusetts Antidegradation Provisions are found at Title 314 CMR 4.04. No lowering of water quality is allowed, except in accordance with the antidegradation provisions.

Section 401(a)(1) of the CWA forbids the issuance of a federal license for a discharge to waters of the United States unless the state where the discharge originates either certifies that the discharge will comply with, among other things, state water quality standards, or waives certification. EPA's regulations at 40 CFR § 122.44(d)(3), §124.53 and §124.55 describe the

manner in which NPDES permits must conform to conditions contained in state certifications.

B. Development of Water Quality-based Limits

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from the state's water quality standards to develop permit limits both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable in-stream pollutant concentration. Maximum daily limits are generally derived from the acute aquatic life criteria, and the average monthly limit is generally derived from the chronic aquatic life criteria. Chemical specific limits are established in accordance with 40 CFR §122.44(d) and §122.45(d).

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality criterion. An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit application, monthly discharge monitoring reports (DMRs), and State and Federal water quality reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in *Technical Support Document for Water Quality-based Toxics Controls*, March 1991, EPA/505/2-90-001 in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water. In accordance with Massachusetts Water Quality Standards [314CMR 4.03(3)(a)], available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10).

Waterbody Classification and Usage

The Westfield River is classified as a Class B waterbody by the Massachusetts Department of Environmental Protection (MassDEP). The Massachusetts Surface Water Quality Standards (314 CMR 4.05(3)(b)) state that Class B waters shall have the following designated uses:

"These waters are designated as habitat for fish, other aquatic life and wildlife, 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."

The *Westfield River Watershed 2001 Water Quality Assessment Report* indicates that the river segment to which the Westfield WPCP discharges is assessed as impaired for aquatic life and aesthetics possibly due to the discharge from municipal separate storm sewer systems. Other uses were not assessed. The *Proposed Massachusetts Year 2008 Integrated List of Waters* [Clean Water Act, Section '303(d) list'] shows that this segment is not attaining water quality standards due to unknown causes, taste, odor and color, noxious aquatic plants, and turbidity.

Flow and Dilution Factor

Massachusetts Water Quality Standards require that for rivers and streams, water quality criteria must be applied at the 7-day mean stream low flow with a 10-year recurrence interval (7Q10). See 314 CMR 4.03(3)(a). The 7Q10 is usually based upon data from USGS gaging stations and is used to calculate the dilution factor and the resulting water quality-based effluent limits in the draft permit. The dilution factor for the Westfield WPCP based upon the 7Q10 data from the USGS gaging station (Westfield River Near Westfield, MA., MA0118350) would be about 7.0. However, the current permit used a dilution factor of 5.0 established by the dye study and modeling performed for the Final Environmental Impact Report for the expanded facilities. The dilution factor is based on available dilution in the zone of passage at the second island downstream of the discharge and a river flow of 37.8 cfs. The same dilution factor (5.0) will be used in the calculations for the draft permit.

BOD and TSS

Under Section 301(b)(1)(B) of the Clean Water Act (CWA), Publicly Owned Treatment Works (POTWs) must have achieved effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth in 40 CFR Part 133. The regulations describe the secondary treatment requirements for biochemical oxygen demand (BOD₅), Total Suspended Solids (TSS), and pH. The average monthly and average weekly concentration limits for BOD₅ and TSS are 30 mg/l and 45 mg/l, respectively, as set forth in 40 CFR §133.102. Including mass limits for these parameters is consistent with 40 CFR § 122.45 (f)(1) and (2).

The 2001 permit modification established seasonal limits for BOD and TSS for the expanded facility in order to satisfy antidegradation requirements. For the period of low flow from June 1 to October 31 the permit established mass limits based upon the mass discharged under the previous design flow of 4.0 mgd and concentration limits based upon the new design flow. The mass and concentration limits are calculated as follows:

$$\begin{aligned} \text{Average monthly mass} &= 4.0 \text{ mgd} \times 8.34 \text{ (conversion factor)} \times 30 \text{ mg/l} = 1000 \text{ lbs/day} \\ \text{Average monthly concentration} &= 1000 \text{ lbs/day} \div (6.1 \text{ mgd} \times 8.34) = 20 \text{ mg/l} \end{aligned}$$

$$\begin{aligned} \text{Average weekly mass} &= 4.0 \text{ mgd} \times 8.34 \times 45 \text{ mg/l} = 1500 \text{ lbs/day} \\ \text{Average weekly concentration} &= 1500 \text{ lbs/day} \div (6.1 \text{ mgd} \times 8.34) = 30 \text{ mg/l} \end{aligned}$$

According to the Final Environmental Impact Report the 20 mg/l monthly average limit for BOD is necessary to maintain in-stream dissolved oxygen levels.

For the period from November 1 to May 31, the current permit established concentration limits based upon the secondary treatment requirements and the mass limits based upon those concentrations and the increased design flow. Those calculations are as follows:

$$\begin{aligned} \text{Average monthly mass} &= 6.1 \text{ mgd} \times 8.34 \times 30 \text{ mg/l} = 1530 \text{ lbs/day} \\ \text{Average weekly mass} &= 6.1 \text{ mgd} \times 8.34 \times 45 \text{ mg/l} = 2290 \text{ lbs/day} \end{aligned}$$

EPA and MassDEP believed that these limits would not result in significant degradation of the

receiving water during this period due to higher re-aeration rates and higher DO saturation concentrations in the lower river temperatures. As in the current permit, this draft permit requires the permittee to operate the treatment facility at full efficiency during this period in order to minimize any lowering of water quality.

The 30-day average percent removal limit of at least 85% for BOD₅ and TSS is based on the requirements in 40 CFR §133.102.

pH, Fecal Coliform and *E. coli*

These limitations are based upon the Massachusetts state certification requirements under Section (401) (a) (1) of the Clean Water Act, as defined in 40 CFR§124.53 and water quality standards. State water quality standards allow for the seasonal application of bacteria criteria during non-bathing season at the discretion of the MassDEP, allowing for seasonal disinfection when appropriate. See 314 CMR 4.05(3)(b)(4).

The limitations for pH and fecal coliform are based upon water quality considerations and the Massachusetts state certification requirements under Section (401) (a) (1) of the Clean Water Act, as defined in 40 CFR §124.53 and water quality standards

On December 29, 2006 the State approved Water Quality Standards which includes a revision to the bacteria criteria, changing its Class B criteria from fecal coliform to *E. coli*. EPA approved this revision to the State water quality standards on September 19, 2007. Consequently, the draft permit contains *E. coli* limits that will become effective one year after the effective date of the permit. For the first year, there is a *report-only* requirement for *E. coli* as an adjustment period for the facility. The draft permit contains a fecal coliform limit as an interim limit during that first year, after which it will expire.

Nitrogen

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.

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. The following table summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings:

Basin	Baseline Loading ¹ lbs/day	TMDL Target ² lbs/day	Current Loading ³ lbs/day
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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

1. Estimated loading from TMDL, (see Appendix 3 to CT DEP “Report on Nitrogen Loads to Long Island Sound”, April 1998)
2. Reduction of 25% from baseline loading
3. Estimated current loading from 2004 – 2005 DMR data – detailed summary attached as Exhibit A.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met, and the overall loading from MA, NH and VT wastewater treatment plants discharging to the Connecticut River watershed has been reduced by about 36 percent.

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 this permit. EPA 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 643 lbs/day based upon DMR data. 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.

The agencies will annually 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. To assist in this effort, larger POTWs are being required to monitor Total Nitrogen once per week.

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.

Ammonia

Because ammonia can impact the dissolved oxygen concentration of the receiving water and can be toxic at elevated levels, EPA and the MassDEP are concerned about ammonia levels impacting the receiving water especially during the summer months. The *1999 Update of Ambient Water Quality Criteria for Ammonia* establishes in-stream criteria dependent upon the pH and temperature of the receiving water. The criteria is multiplied by the 30Q10 dilution factor as recommended in the Federal Register, Volume 64, No. 245, on December 22, 1999 to generate an average monthly concentration limit. Using a chronic criteria of 3.78 mg/l based upon a pH of 7.2 and a temperature of 20° C from WET sampling data, the chronic ammonia limit calculation is shown below.

$$\begin{aligned} 30Q10 \text{ Dilution Factor} \times \text{chronic criteria} &= \text{average monthly ammonia limit} \\ 11.9 \times 3.78 \text{ mg/l} &= 45 \text{ mg/l} \end{aligned}$$

This is less stringent than that in the current permit which is based upon the dye study and modeling in the FEIR. Consequently, the ammonia limits remain the same as in the current permit.

Toxic Pollutants

Relatively low concentrations of trace metals in receiving waters can be toxic to resident aquatic life species. EPA is required to limit any pollutant that is, or may be discharged at a level that caused, or has reasonable potential to cause, or contributes to an excursion above any water quality criterion. See 40 CFR 122.44(d)(1)(vi). Effluent metals data submitted with toxicity tests results and discharge monitoring reports were reviewed to determine if any of the metals in the discharge have the potential to exceed aquatic life criteria in the Westfield River.

The EPA-recommended approach to set and measure compliance with water quality standards is to use dissolved metals, because dissolved metals more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metal. Most toxicity to aquatic organisms is by adsorption or uptake across the gills which occurs only with metal in dissolved form. When toxicity tests were originally conducted to develop EPA's Section 304(a) metals criteria, the concentrations were expressed as total metals. Subsequent testing determined the percent of the total metals that is dissolved in the water column. The calculations that follow use

the freshwater conversion factors to calculate the dissolved acute and chronic water quality criteria for metals (EPA National Recommended Water Quality Criteria:2002, Appendix A).

However, the regulations in 40 CFR 122.45(c) require that the permit limits be based on total recoverable metals and not dissolved metals. The chemical differences between the effluent and the receiving water may cause changes in the partitioning between dissolved and particulate forms of

metals. As the effluent mixes with the receiving water, adsorbed metals from the discharge may dissolve in the water column. In this case, measuring dissolved metals would underestimate the impact on the receiving water, and an additional calculation, using a site-specific translator would determine total metal criteria. Based on EPA's Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (EPA-823-B-96-007), the conversion factor is equivalent to the translator if site-specific studies for partitioning have not been conducted. The total recoverable effluent limit has been determined by dividing the dissolved criteria by the conversion factor in lieu of a translator.

The current permit established the permit limitations for cadmium, copper, and nickel in the manner described below. These limits were established based on the reasonable potential for the discharge of the metal to cause or contribute to an exceedance of the in-stream criteria and were calculated using the dilution factor of the expanded 6.1 mgd facility and the applicable water quality criteria. Those limits took effect in January, 2007.

Cadmium

Using cadmium as an example calculation and using a hardness of 30 mg/l for the receiving water (used in the current permit and in line with recent analyses of WET test diluent waters) and a conversion factor (CF) to convert recoverable to dissolved cadmium, the chronic and acute criteria calculations for the State water quality standards are as follows.

$$\begin{array}{ll} \text{Chronic criteria} & e^{(0.7409 \cdot \ln 30) + (-4.715)} * [1.101672 - (\ln 30 * 0.041838)(CF)] = 0.11 \text{ ug/l} \\ \text{Acute criteria} & e^{(1.0166 \cdot \ln 30) + (-3.924)} * [1.136672 - (\ln 30 * 0.041838)(CF)] = 0.62 \text{ ug/l} \end{array}$$

As discussed above, EPA regulation 40 CFR §122.45(c) *Metals* requires that all permit effluent limitations for a metal be expressed in terms of "total recoverable metal". Thus, the cadmium limits are derived by multiplying the criteria by the dilution factor and dividing by a conversion factor. The calculations are shown below.

$$\begin{array}{ll} \text{Chronic cadmium limit} & 0.11 \text{ ug/l} * 5.0 \div [1.101672 - (\ln 30 * 0.041838)(CF)] = 0.6 \text{ ug/l} \\ \text{Acute cadmium limit} & 0.62 \text{ ug/l} * 5.0 \div [1.136672 - (\ln 30 * 0.041838)(CF)] = 3.1 \text{ ug/l} \end{array}$$

These are the same limits in the current permit and they are retained in the draft permit.

Nickel

The nickel limits are calculated in the similar manner. An examination of available data indicates that the discharge has a reasonable potential to cause or contribute to an exceedance in the chronic in-stream criteria but not the acute in-stream criteria. Consequently, the draft permit retains the current permit limit of 94 ug/l for the average monthly limit and report only for the maximum daily limit.

Copper

Using the Gold Book criteria, the current monthly average monthly and maximum daily copper limits, as calculated in the manner above, are 16.7 ug/l and 22.5 ug/l, respectively. However,

the Massachusetts Surface Water Quality Standards were revised in December 2006 to include site-specific criteria for copper that were developed in instances where national criteria are invalid due to site-specific physical, chemical, or biological considerations, and do not exceed the safe exposure levels determined by toxicity testing [314 CMR 4.05(5)(e) Table 28]. On March 26, 2007, EPA approved an acute criterion of 25.7 ug/l and a chronic criterion of 18.1 ug/l for dissolved copper in the lower stretch of the Westfield River to which the Westfield WPCP discharges.

MassDEP prepared *Protocol For and Determination of Site Specific Copper Criteria for Ambient Waters in Massachusetts* (the Site Specific Protocol) in conjunction with the new criteria. In this document MassDEP states that “While site-specific copper criteria are being established, prudence dictates that loads of copper and other metals be minimized. This, in part, is because possible impacts on sediment quality and toxicity remain an open question. Therefore, as part of the site-specific criteria, all reasonable efforts to minimize the loads of metals, and copper in this case, are part of the criteria revision protocol. So, the Department will develop copper limits on a case-by-case basis. Each determination will be based not only on the adjusted concentration resulting from the appropriate multiplier but will reflect the demonstrated level of copper reduction routinely achievable at the facility in order to minimize copper loads and thereby reduce accumulation in the sediment.”

Antibacksliding requirements found at Clean Water Act (CWA) 402(o) and 40 CFR 122.44(l) generally prohibit relaxation of effluent limits. Water quality-based limits can only be relaxed if one of the exceptions found at CWA 402(o)(2) is met or if the requirements of CWA 303(d)(4) are met.

CWA 303(d)(4) requires that a determination be made whether the receiving water is attaining the applicable water quality standard. If the water is in attainment of the standard, a relaxation of the limit would be allowed subject to the state antidegradation policy. If the receiving water is not in attainment of the applicable standard, the existing limit must be based on a wasteload allocation or a total maximum daily load (TMDL) and the relaxed limit is only allowed if attainment of water quality standards is ensured.

First, we calculated the limits that would be necessary to ensure that the receiving water would be in attainment of the new criteria. These limits are calculated using the equation below.

$$Q_r C_r = Q_d C_d + Q_s C_s$$

Where:

Q_r = receiving water flow downstream of the discharge ($Q_r = 7Q_{10} + Q_d = 47.2$ cfs)

C_r = site specific copper criteria

Q_d = design flow of the discharge (9.44 cfs)

C_d = copper concentration in the discharge

Q_s = receiving water flow upstream of the discharge (37.8 cfs)

C_s = copper concentration in the receiving water upstream of the discharge

The upstream copper concentrations (2.3 ug/l average and 6.0 ug/l maximum) were obtained from WET test dilution water samples. The downstream copper concentrations are set at the chronic and acute criterion converted to total dissolved copper as described above. The conversion factor for copper is 0.96 and results in total copper criteria of 18.9 ug/l for the average monthly and 23.2 ug/l for the maximum daily. The facility copper limits using the site-specific criteria are calculated as shown below.

$$Q_r C_r = Q_d C_d + Q_s C_s$$

$$C_d = (Q_r C_r - Q_s C_s) \div Q_d$$

$$C_d = ((47.2 \text{ cfs} * 18.9 \text{ ug/l}) - (37.8 \text{ cfs} * 2.3 \text{ ug/l})) \div 9.44 \text{ cfs}$$

$$C_d = (892 - 87) \div 9.44 = 85 \text{ ug/l average monthly}$$

Similarly, the maximum daily limit is calculated.

$$C_d = (Q_r C_r - Q_s C_s) \div Q_d$$

$$C_d = ((47.2 \text{ cfs} * 23.2 \text{ ug/l}) - (37.8 \text{ cfs} * 6.0 \text{ ug/l})) \div 9.44 \text{ cfs}$$

$$C_d = (1095 - 227) \div 9.44 = 92 \text{ ug/l maximum daily}$$

In each case the calculated limit is greater than the limit in the current permit. However pursuant to the State's antidegradation policy and the Site Specific Protocol, the new limit will not be based entirely on these calculations, but must also consider current limits and the demonstrated level of copper reduction routinely achievable at the facility in order to minimize copper loads and thereby reduce its accumulation in the sediment.

Therefore, the effluent copper data of individual samples provided by the permittee from January through October, 2007 was reviewed in order to best characterize the performance of the facility. January 2007 was chosen as the start date because that is when the most stringent copper limits became effective. Only monthly data with at least 4 samples was considered. In order to capture the statistical variation in the data, EPA referred to the Appendix E – TSD Lognormal

Distribution and Permit Limit Derivations in the Technical Support Document for Water Quality-based Toxics Control, March 1991, EPA/505/2-90-001.

The guidance recommends using the 95th percentile for calculating the average monthly limit and the 99th percentile of actual data for calculating the maximum daily limit. Based on these calculations, the average monthly limit would be 18.6 ug/l and the maximum daily limit would be 19.8 ug/l. See Attachment 2.

A comparison of the current permit limits, permit limits based upon the new site-specific criteria, and the past performance of the facility is shown in the table below.

	<u>Average Monthly (ug/l)</u>	<u>Maximum Daily (ug/l)</u>
Current permit limits	16.7	22.5
Site-specific criteria limits	85	92
Performance	18.6	19.8

The draft permit has an average monthly limit of 18.6 ug/l based upon the performance of the facility. It is more stringent than the limit based upon the site-specific criteria and less stringent than the current permit limit in accordance with the antidegradation policy as explained above. The draft permit retains the current maximum daily limit of 22.5 ug/l because that limit is more stringent than the limit based upon the site-specific criteria and the even more stringent performance-based limit would penalize the permittee for operating in compliance with its current permit limits.

Aluminum

Aluminum is not hardness dependent and that limit is calculated directly from the dilution factor and the water quality criteria as follows:

Chronic criteria	$87.0 * 5.0 = 435 \text{ ug/l}$
Acute criteria	$750.0 * 5.0 = 3,750 \text{ ug/l}$

Considering the DMR data and the increased use of sodium aluminate to meet a more stringent phosphorus limit, there is a reasonable potential to exceed the chronic water quality criteria. Therefore, the permit now includes an aluminum monthly average limit of 435 ug/l and increases monitoring to once per week. The DMR data indicates that there is no reasonable potential to exceed the acute water quality criteria; so the permit shall maintain a maximum daily reporting only requirement.

Total Residual Chlorine

Total Residual Chlorine limitations and monitoring requirements are in effect during the same period as bacteria limits, because chlorine is only added as a disinfectant. The months of the year during which the limits are in effect are at the discretion of the MassDEP. Because chlorine and chlorine compounds can be extremely toxic to aquatic life, the permittee is required to limit the discharge of chlorine to the receiving water to only those months when primary and secondary contact recreational activities may occur.

Total Residual Chlorine (TRC) water quality criteria are established in the Gold Book and the subsequent 2002 update and are adopted into the State Water Quality Standards. The in-stream criteria shall not exceed 11 ug/l for chronic toxicity and 19 ug/l for acute toxicity to protect aquatic life. Based upon the dilution factor of 5.0, the TRC permit limit calculations are shown below.

Chronic chlorine limit	$11 \text{ ug/l} * 5.0 \text{ (dilution factor)} = 55 \text{ ug/l}$
Acute chlorine limit	$19 \text{ ug/l} * 5.0 \text{ (dilution factor)} = 95 \text{ ug/l}$

These are the same limits as in the current permit. To verify consistent compliance with the TRC limits, continuous monitoring for TRC is required in the draft permit. A daily grab sample is also required to verify the calibration of the continuous meter.

Phosphorus

State water quality standards require any existing point source discharge containing nutrient in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients. The 2006 303(d) list did not identify nutrients as a pollutant requiring a TMDL in this segment. However, the *Westfield River Watershed 2001 Water Quality Assessment Report* noted the presence of green filamentous algae, *Ulothrix zonata*, above and below the wastewater treatment facility.

EPA has published national guidance documents which contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's *Quality Criteria for Water 1986* (the Gold Book) recommends, in order to control eutrophication, that in-stream phosphorus concentrations should be less than 100 ug/l (0.100 mg/l) in streams or other flowing waters not discharging directly to lakes or impoundments. Using the 7Q10 flow, the design flow of the facility, the in-stream Gold Book criteria, and an in-stream phosphorus concentration of 0.01 mg/l from the 2001 Assessment Report (Station ID W0807), the phosphorus limit is calculated using the same equation from above.

$$\begin{aligned} C_d &= [(Q_r C_r) - (Q_s C_s)] \div Q_d \\ &= [(47.2 \text{ cfs} * 0.1 \text{ mg/l}) - (37.8 \text{ cfs} * 0.01 \text{ mg/l})] \div 9.44 \text{ cfs} \\ &= [4.72 - 0.38] \div 9.44 = 0.46 \text{ mg/l} \end{aligned}$$

More recently, EPA released Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published ecoregion-specific criteria represent conditions in waters minimally impacted by human activities, and thus representative of water without cultural eutrophication. The Westfield Water Pollution Control Plant is within Ecoregion XIV, Eastern Coastal Plain, Northeastern Coastal Zone. Recommended criteria for this ecoregion is found in *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV*, published in December, 2001, and includes a total phosphorus criteria of 23.75 ug/l (0.024 mg/l). Because the ecoregion criteria was established from monitoring conducted over a period of time, the criteria will also be applied over a period of time. The criteria will be applied to the monthly average flow for the 3 lowest-flow months in the summer (i.e. July, August, and September). The mean monthly flow at the discharge is determined by using the same ratio as the ratio of the 7Q10 flow at the discharge to the 7Q10 flow at the metering station. This results in an average monthly flow of 212.43 cfs for the receiving stream. Using the combined flow of the receiving stream and the discharge (212.43 cfs + 9.44 cfs = 222 cfs), the ecoregion criteria, the in-stream phosphorus concentration of the receiving water, and the design flow of the treatment facility, the phosphorus limit would be:

$$\begin{aligned} C_d &= [(Q_r C_r) - (Q_s C_s)] \div Q_d \\ &= [(222 \text{ cfs} * 0.024 \text{ mg/l}) - (212 \text{ cfs} * 0.01 \text{ mg/l})] \div 9.44 \text{ cfs} \\ &= [5.33 - 2.12] \div 9.44 = 0.34 \text{ mg/l} \end{aligned}$$

Because this segment of the Westfield River is not on the State's 303(d) list as requiring a TMDL for nutrients and because the calculated Gold Book limit and ecoregion limit are nearly the same, the draft permit establishes a seasonal phosphorus limit of 0.46 mg/l. This limit

extends from April through October to correspond to the full algal growing season.

Phosphorus discharged during the colder months can accumulate downstream. This phosphorus can be released during warmer water temperatures and contribute to algal growth. Therefore, the draft permit establishes a 1.0 mg/l phosphorus limit for the period of November through March. The permit also includes a reporting requirement for dissolved orthophosphate during the winter season to help determine what portion of the phosphorus being discharged is soluble and less likely to settle out in the receiving water.

If the State adopts numerical criteria for phosphorus or if additional data indicates the need for more stringent limits, EPA and MassDEP may reopen the permit and modify the phosphorus numerical limits.

Whole Effluent Toxicity

National studies conducted by the Environmental Protection Agency have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons, and other constituents. Additionally, as previously discussed, the POTW receives significant amounts of industrial wastewater which may contain toxic constituents. 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, the low level of dilution at the discharge location, water quality standards and in accordance with EPA regulation and policy, the draft permit includes acute and chronic effluent 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); and EPA's Technical Support Document for Water Quality-Based Toxics Control). 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.

Pursuant to EPA Region 1 policy, and MassDEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters February 23, 1990, discharges having a dilution ratio less than 10:1 require acute toxicity testing four times per year with an LC₅₀ equal to 100%. Also in accordance with that policy, the chronic (C-NOEC) whole effluent toxicity limit of 1.A.1. is calculated using the instream waste concentration (IWC) of the WWTF effluent. The IWC is the inverse of the dilution.

$$IWC = 1 \div 5.0 * 100\% = 20\%$$

This limit will be protective of ambient criteria since higher effluent flow will only occur when river flows are also much higher. The limit is established at critical low flow of the receiving

water at which time effluent flows will be significantly lower than the permitted flow. Because WET monitoring is required during specific weeks, the potential for monitoring toxicity only during low flow periods is eliminated.

The EPA and the MassDEP have a policy that these agencies will consider reducing the species requirement in the toxicity tests from two to one if the effluents show no chronic effects to the test organisms after an extended period of testing. Based upon a past data review, the current permit required testing for the daphnid, *Ceriodaphnia dubia*, only. This draft permit retains that same testing requirement.

V. 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. In the Statement of Basis for the current permit modification, EPA and MassDEP determined that a formal EFH consultation with the NMFS was not required because the proposed discharge would meet Gold Book criteria and State Water Quality Standards.

During the public comment period for that permit modification, the Massachusetts Division of Fisheries & Wildlife raised concerns about the salmon and other fish species, such as American shad and sea lamprey, which could be affected by the Westfield WPCP discharge. The Commonwealth of Massachusetts in cooperation with the US Fish and Wildlife Service and the states of Connecticut, New Hampshire, and Vermont has been working to restore Atlantic salmon to the Connecticut River and its tributaries. The Massachusetts Division of Fisheries & Wildlife stocks salmon fry into the Westfield River and its tributaries. This results in salmon smolts which must pass the Westfield WPCP discharge during their migration to the sea. Returning adult salmon must also pass the discharge. Consequently, the permit modification required the permittee to conduct a fish passage study to determine the effects of the discharge upon this zone of passage.

The permittee conducted two studies, *Report on Westfield River Fish Passage Study* (September, 2002 and September, 2004). These studies concluded that the Westfield WPCP discharge did not represent a barrier to the fish migration. Upon review of these studies, EPA and the Division of Fisheries and Wildlife concurred with that conclusion.

Because the proposed discharge would meet Gold Book criteria and State Water Quality Standards and the fish passage studies concluded that there are no effects of the discharge upon the zone of passage, EPA and MassDEP have determined that a formal EFH consultation with the NMFS is not required.

VI. Endangered Species Act (ESA)

Under Section 7 of the Endangered Species Act, federal agencies are required to ensure that any action they conduct, authorize, or fund is not likely to jeopardize the continued existence of a federally listed species, or result in the adverse modification of critical habitat. EPA has initiated informal consultation with both NOAA Fisheries and the United State Fish and Wildlife Service (USFWS) concerning listed species under their purviews. Listed species in the Hampden County area include shortnose sturgeon (*Acipenser brevirostrom*) for NOAA Fisheries), and the small whorled pogonia, *Isotria medeoloides*, for USFWS.

EPA believes the authorized discharge from this facility is not likely to adversely affect any federally-listed species, or their habitats. This preliminary determination is based on the location of the outfall, and the reasons provided in the EFH discussion (Section V. of this Fact Sheet). EPA is seeking concurrence with this opinion from NOAA Fisheries and USFWS through the informal ESA consultation process.

VII. Operation and Maintenance

Regulations regarding proper operation and maintenance are found at 40 CFR § 122.41(e). These regulations require "that the permittee shall at all times operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit." The treatment plant and collection system are included in the definition "facilities and systems of treatment and control" and are therefore subject to proper operation and maintenance requirements.

Similarly, permittees have a 'duty to mitigate' as stated in 40 CFR §122.41 (d). This requires the permittees to "take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment."

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.B., I.C. and I.D. of the draft permit. These requirements include reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary.

Because the Town of Southwick owns and operates a collection system that discharges to the Westfield treatment works, the Town has been included as co-permittee for the specific permit requirements discussed in the paragraph above.

VIII. Sludge

Section 405(d) of the CWA requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge which is land applied, disposed of in a surface disposal unit, or fired in a sewage sludge incinerator are subject to Part 503 technical standards. Part 503 regulations have a self-implementing provision, however, the CWA requires implementation through permits. Domestic sludge which is disposed of in a municipal solid waste landfill is in compliance with Part 503 regulations provided that the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 C.F.R. Part 258.

The draft permit requires that sewage sludge use and disposal practices meet Section 405(d) Technical Standards of the CWA. In addition, the EPA Region I – NPDES Permit Sludge Compliance Guidance document dated November 4, 1999. This document is included with the draft permit for use by the permittee in determining their appropriate sludge conditions for their chosen method of sludge disposal. The permittee is required to submit to EPA and to MassDEP annually, by February 19th, the various sludge reporting requirements as specified in the guidance document for the chosen method of sludge disposal.

The permittee generates about 4,626 dry metric tons of sludge per year. The sludge is transported by a contractor and disposed in a landfill.

IX. Pretreatment Program

There are four Significant Industrial Users (SIUs) discharging to the Westfield WPCP. These dischargers are listed in Attachment 3.

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR Part 403 and section 307 of the Act. The Permittee's pretreatment program received EPA approval on January 19, 1984. As a result, appropriate pretreatment program requirements were incorporated into the previous permits which were consistent with that approval and federal pretreatment regulations in effect when the permits were issued.

The Federal Pretreatment Regulations in 40 CFR Part 403 were amended in October 1988, and again in July 1990. 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.

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

The Permit requires the permittee to submit to EPA, within 120 days of the permit's effective date, all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated Rule. To the extent the Permittee's legal authority is not consistent with the required changes they must be revised and submitted to EPA for review.

X. State Certification Requirements

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

XI. Comment Period 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 the contacts listed below. 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 (30) 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.

Permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

XII. EPA and MassDEP Contacts

Additional information concerning the draft permit may be obtained between the hours of 9-5,

Monday through Friday from:

Mark Malone (CPM)
Municipal Permits Branch
U.S. EPA
One Congress Street - Suite 1100
Boston, MA 02114-2023
TEL. (617) 918-1619
FAX: (617) 918-2064

email: malone.mark@epa.gov

Paul Hogan
MA Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, MA
TEL: (508) 767-2796
FAX: (508) 791-4131

paul.hogan@state.ma.us

Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. EPA

Westfield WPCP
NPDES Permit No. MA0101800

Attachment 1

	Flow		BOD	TSS	Cl		NH3		Phos	Cu	Ni	Al	LC ₅₀	CNOEC
	<u>ave mon</u> ¹	<u>max daily</u>	<u>ave mon</u>	<u>ave mon</u>	<u>ave mon</u>	<u>max daily</u>	<u>mo ave</u>	<u>ave week</u>	<u>ave mon</u>	<u>mo ave</u>	<u>mo ave</u>	<u>mo ave</u>		
Limits	6.1	Report	30	30	55	95	Report			35	200		100%	≥20
Seasonal			20	20			3	5	1					
Effective 1/1/07										16.7	94	report		
	mgd	mgd	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	%	%
Oct. 2007	3.74	3.94	4.6	6.1	10	30	1	2.5	0.2	8.2	9.7	109		
Sept.	3.76	4	4.8	4.6	10	30	0.52	1.3	0.7	8.13	8.5	276		
August	3.74	3.92	3.2	3.9	13	40	0.35	0.35	0.85	8	84	303		
July	3.71	5.46	3.8	4.5	16	50	0.14	0.14	0.91	8.3	8.7	0		
June	3.691	4.682	9.1	6.6	19	50	2.1	5.5	0.59	9.3	7.8	560	>100	>100
May	3.761	5.393	12.6	4.6	16	70	6	5.5		14		34		
Apr. ²														
Mar.	3.56	5.56	8.5	9.3	****	****	17	****	****	9.6	55	72	>100	25
Feb.	3.51	3.29	15.5	10.9	****	****	13	****	****	17	16	97		
Jan.	3.659	4.213	13.2	7.2	****	****	5.4	****	****	14	14	190		
Dec. 2006	3.825	4.386	17.6	10.4	****	****	10.3	****	****	29.7	23	117		
Nov.	3.875	5.742	13.3	9.3	****	****	3.02	****	****	81	10	264		
Oct.	3.878	5.412	10.4	5	43	390	2.1	3.6		10	7	278		
Sept.	4.057	3.332	8.2	5.6	26	200	8.4	11	0.34	3.9	24	355	>100	>100
Aug.	4.048	3.389	6.4	5.6	25	130	9.1	17	0.45		16	140		
July	4.037	4.334	4.3	4.5	73	1820	5.5	7.3	0.23	16.3	11	310		
June	4.022	5.15	5.9	5.1	20	90	9	9	0.53	21.7	12	330	71	50
May	3.961	5.881	10.5	9.7	19	60	13.1	****	****	28	12	90		
Apr.	3.974	4.565	10.1	8.5	20	50	16.8	****	****	20	83	0		
Mar.	3.62	4.133	12.1	8.3	****	****	7.7	****	****	28	12	69	>100	25
Feb.	4.154	6.632	7.5	5.3	****	****	5.8	****	****	0	150	0		
Jan.	4.069	8.396	9.8	6.4	****	****	2	****	****	92	58			
Dec. 2005	3.934	5.2	8	6	****	****	0.97	****	****	17	44	0	>100	>100
Nov.	3.896	5.737	7.3	6.3	****	****	5.3	****	****	11	48	0		
Oct.	3.79	9.222	3.6	6.1	63	420	0.34	2.2	1.4	0	0	0		

**** No reporting required

1 Rolling annual average

2 Data not available

Cu - Westfield (Lognormal distribution, ND)

Daily Maximum Limit Derivation (some measurements < detection limit)

Detection Limit** =	5.0
$u_y = \text{Avg of Nat. Log of daily Discharge (mg/L)} =$	2.19964
$\sum (y_i - u)^2 =$	3.06063
k = number of daily samples =	30
r = number of non-detects =	3
$\sigma_y^2 = \text{estimated variance} = (\sum[(y_i - u_y)^2]) / (k-r-1) =$	0.11772
$\sigma_y = \text{standard deviation} = \text{square root } \sigma_y^2 =$	0.34310
$\delta = \text{number of nondetect values/number of samples} =$	0.10000
$z = \text{z-score}[(0.99-\delta)/(1-\delta)] =$	z-score of 0.98889
	= 2.286586

(from z-score calculator at <http://www.fourmilab.ch/rpkp/experiments/analysis/zCalc.html>)

$$\text{Daily Max Limit} = \exp(u_y + z\text{-score} * \sigma_y)$$

$$\text{Daily Max Limit} = 19.77 \text{ ug/l}$$

(Log normal distribution, 99th percentile)

Average Monthly Limit Derivation (some measurements < detection limit)

Number of samples per month***, n =	4.00
$E(x) = \text{Daily Avg} = \delta D + (1-\delta) \exp(u_y + 0.5 \sigma_y^2) =$	9.11180
$V(x) = \text{Daily Variance} = (1-\delta) \exp(2u_y + \sigma_y^2) [\exp(\sigma_y^2) - (1-\delta)] + \delta(1-\delta) D [D - 2 \exp(u_y + 0.5 \sigma_y^2)] =$	12.17283
$A = V(x) / [n(E(x) - \delta^n D)^2] =$	0.333985312
$B = -[\delta^n D^2 (1-\delta^n)] / (E(x) - \delta^n D)^2 =$	-3.01117E-05
$C = (2\delta^n D) / (E(x) - \delta^n D)$	0.000109754
$\sigma_n^2 = \text{Monthly Average variance} = \ln\{(1-\delta^n)[1+A+B+C]\}$	0.28813

$$\sigma_n = \text{Monthly Average standard deviation} = \sigma_n^2 \wedge (0.5) = 0.53678$$

$$u_n = \text{n-day monthly average} = \ln[(E(x) - \delta^n D) / (1 - \delta^n)] - 0.5 \sigma_n^2 = 2.06555$$

$$z = \text{z-score}[(0.95 - \delta) / (1 - \delta)] = \text{z-score of } 0.94444$$

$$= 1.593179$$

$$\text{Monthly Average Limit} = \exp(u_n + z\text{-score} * \sigma_n)$$

$$\text{Monthly Avg Limit} = 18.55 \text{ ug/l}$$

(Log normal distribution, 95th percentile of average monthly values)

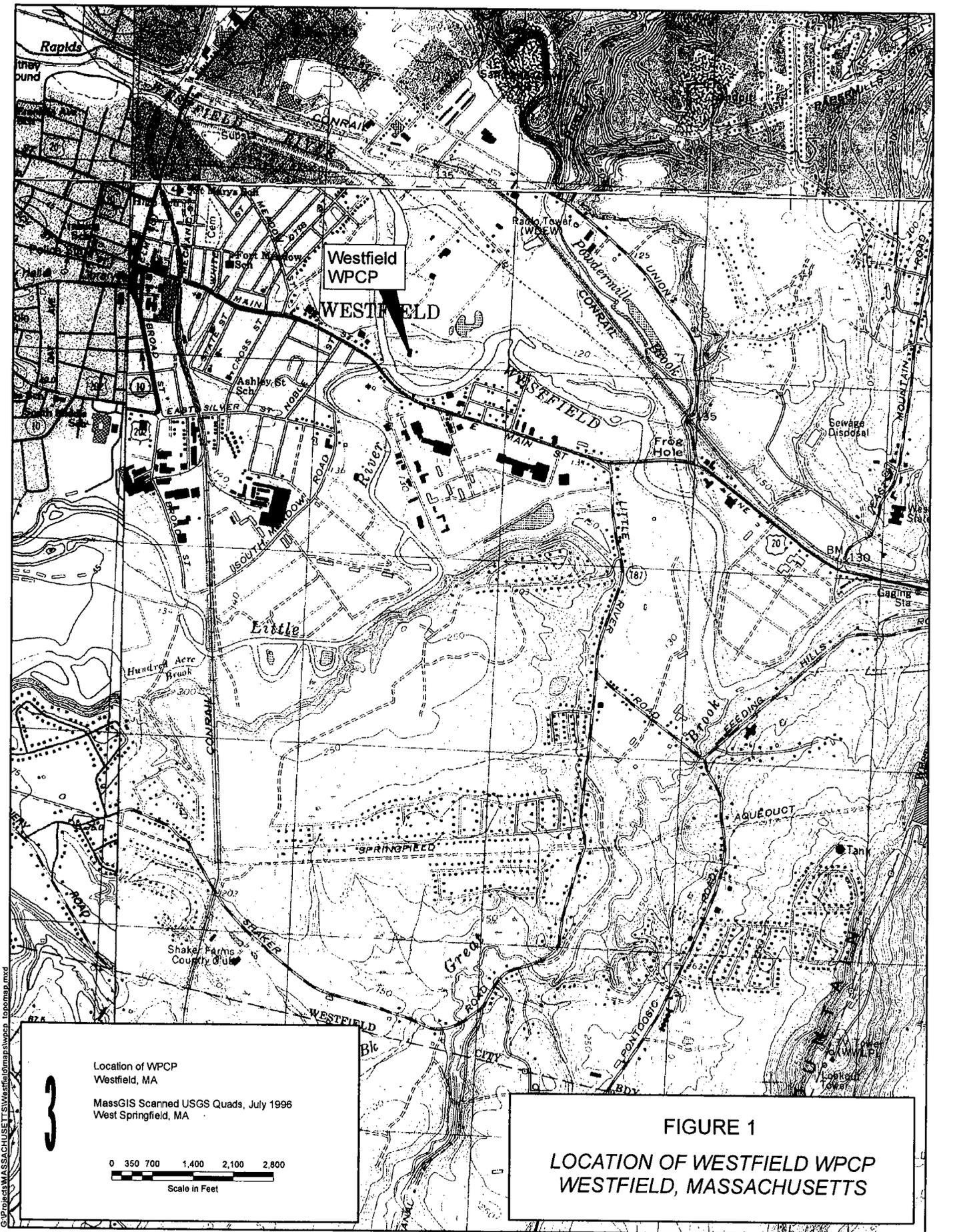
**Assumed detection limit = 5.0, which was the detection limit for the majority of the tests which returned ND.

*** Assumed number of samples per month = 4 since this was the minimum sample number per month.

Attachment 3

**Westfield WPCP
Significant Industrial Users**

<u>Significant Industrial User</u>	<u>Industrial Process</u>	<u>Process Wastewater Rate</u>
Westfield Electroplating	Electroplating	35,000 gpd
MESTEK	Metal finishing	36,000 gpd
Savage Arms	Gun Manufacturing	25,000 gpd
Micro Abrasives Corp.	Abrasives mfr.	55,000 gpd



Westfield
WPCP

WESTFIELD

3
 Location of WPCP
 Westfield, MA
 MassGIS Scanned USGS Quads, July 1996
 West Springfield, MA

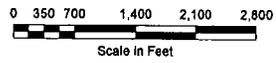


FIGURE 1
LOCATION OF WESTFIELD WPCP
WESTFIELD, MASSACHUSETTS

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