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),

Town of Hardwick
Board of Sewer Commissioners

is authorized to discharge from the facility located at:

Hardwick-Wheelright Water Pollution Control Facility
Pine Street
Wheelright, MA 01094

to receiving water named: **Ware River**

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

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature,

This permit and the authorization to discharge expire at midnight, five (5) years from last day of the month preceding the effective date.

This permit supersedes the permit issued on April 4, 2006.

This permit consists of 14 pages in Part I including effluent limitations, monitoring requirements, Attachment A (Toxicity Protocol), Attachment B (Summary of Report Submittal) and Part II including Standard Conditions and Definitions.

Signed this 6th day of November, 2012

/s/SIGNATURE ON FILE

Director Office of Ecosystem Protection Environmental Protection Agency Boston, MA	Director Massachusetts Wastewater Management Program 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 to the Ware River from outfall serial number 001. Such discharge shall be limited and monitored by the permittee as specified below.

Effluent Characteristic	Units	Discharge Limitation			Monitoring Requirement[1]	
		Average Monthly	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Flow[2] (annual average)	MGD	0.043	----	----	Continuous	Recorder
Flow[2]	MGD	Report	----	Report	Continuous	Recorder
BOD_5 [3]	mg/l lbs/day	30 11	45 16	Report	1/Week[3]	24 Hour Composite[4]
TSS[3]	mg/l lbs/day	30 11	45 16	Report	1/Week[3]	24 Hour Composite[4]
pH		(See Condition I.A.1.b. on Page 5)			1/Day	Grab
Total Phosphorus[10]	mg/l	1.0	----	Report	1/Week	24 Hour Composite[4]
Total Kjeldahl Nitrogen[9]	mg/l lbs/day	Report Report	---- ----	Report Report	1/Quarter	24 Hour Composite[4]
Total Nitrite Nitrogen[9]	mg/l lbs/day	Report Report	---- ----	Report Report	1/Quarter	24 Hour Composite[4]
Total Nitrate Nitrogen[9]	mg/l lbs/day	Report Report	---- ----	Report Report	1/Quarter	24 Hour Composite[4]
Total Ammonia Nitrogen[9]	mg/l lbs/day	Report Report	---- ----	Report Report	1/Quarter	24 Hour Composite[4]
Total Nitrogen[9]	mg/l lbs/day	Report Report	---- ----	Report Report	1/Quarter	24 Hour Composite[4]

Part I.A.1. continued						
Effluent Characteristic		**Discharge Limitation**			**Monitoring Requirement[1]**	
		Average Monthly	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
E. Coli Bacteria[5] (April 1-October 31)	cfu/100 ml	126	----	409	1/Week	Grab
Total Residual Chlorine[5, 6] (April 1-October 31)	mg/l	Report	----	1.0	2/Day	Grab
Total Recoverable Aluminum	µg/L	******	******	Report	1/Quarter	24-Hour Composite[4]
Total Recoverable Copper	µg/L	******	******	Report	1/Quarter	24-Hour Composite[4]
Whole Effluent Toxicity[7, 8, 9]	%	100			2/Year	24 Hour Composite[4]
Total Ammonia Nitrogen	mg/l	Report maximum daily, µg/l				
Total Residual Chlorine	µg/L	Report maximum daily, µg/l				
Total Cadmium	µg/L	Report maximum daily, µg/l				
Total Lead	µg/L	Report maximum daily, µg/l				
Total Copper	µg/L	Report maximum daily, µg/l				
Total Zinc	µg/L	Report maximum daily, µg/l				
Total Nickel	µg/L	Report maximum daily, µg/l				
Total Aluminum	µg/L	Report maximum daily, µg/l				

Footnotes:

1. All required effluent samples shall be collected prior to chlorination except for the chlorine residual and fecal coliform bacteria samples, which shall be taken after disinfection.

   Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP. All samples shall be tested using the analytical methods found in 40 CFR 136, or alternative methods approved by EPA in accordance with procedures in 40 CFR 136.

   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.

   The permittee shall include with the discharge monitoring reports the results of any additional testing done to that required herein, if it is conducted in accordance with EPA approved methods, consistent with the provisions of 40 CFR Section 122.41(l)(4)(ii)

2. Report annual average, monthly average, and maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the eleven previous months.

3. Sampling required for influent and effluent.

4. A 24-hour composite sample will consist of at least twenty four (24) grab samples taken during one consecutive 24 hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.

5. E. coli and total residual chlorine effluent limitations and monitoring requirements will be in effect from April 1-October 31. This is a State certification requirement. The monthly average limit for E. coli is expressed as a geometric mean. The weekly E. coli sample shall be collected at the same time a total residual chlorine sample is collected.

6. Sampling for TRC shall be twice per day except for weekends and holidays when sampling shall be once per day. When two samples are required, the first sample shall be taken at the beginning of the scheduled workday and the second sample shall be taken after noon. Reporting individual TRC daily results shall include: 1) individual sample result, 2) the time at which the sample was taken, and 3) the sampling date. This information for each sample shall be reported in an attachment to the monthly DMRs.

7. The LC_{50} 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 (no dilution water) shall cause no more than a 50% mortality rate.

8. The permittee shall conduct acute toxicity tests two times per year. The permittee shall test the daphnid, Ceriodaphnia dubia, only. Toxicity test samples shall be collected in May and August. Results are to be submitted by the 30th day of the month after the sample (i.e. June and September). See Permit **Attachment A**, Toxicity Test Procedure and Protocol.

9. 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 on the EPA, Region I web site at http://www.epa.gov/region1/enforcementandassistance/dmr.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. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

9. The individual phosphorus results, including the date each sample was taken, must be reported on an attachment to the DMR. Additionally, the dosing rate chemicals added for the purpose of phosphorus removal shall be reported for each day of the month.

Part I.A.1. (Continued)

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

b. The pH of the effluent shall not be less than 6.5 nor greater than 8.3 at any time.

c. The discharge shall not cause objectionable discoloration of the receiving water.

d. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.

e. The permittee's 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. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.

g. 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.

2. All POTWs must provide adequate notice to the Director of the following:

   a. Any new introduction of pollutants into that 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, adequate notice shall include information on:

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

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

3. Prohibitions Concerning Interference and Pass-Through:

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

4. 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.

5. Numerical Effluent Limitations for Toxicants

   EPA or 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 permittee is authorized to discharge only in accordance with the terms and conditions of this

permit and only from the outfall listed in Part I A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) are not authorized by this permit and shall be reported to EPA and MassDEP in accordance with Section D.1.e. (1) of the Standard Conditions 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 Standard Conditions of Part II and the following terms and conditions. The permittee is required to complete the following activities for the collection system which it owns:

1. Maintenance Staff

   The permittee shall 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. Provisions to meet this requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

2. Preventive Maintenance Program

   The permittee shall maintain an ongoing preventive 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. Plans and programs to meet this requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

   The permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to control I/I shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

4. Collection System Mapping

   Within 30 months of the effective date of this permit, the permittee shall prepare a map of the sewer collection system it owns (see page 1 of this permit for the effective date). The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up to date and available for review

by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;
b. All combined sewer lines, related manholes, and catch basins;
c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);
d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;
e. All pump stations and force mains;
f. The wastewater treatment facility(ies);
g. All surface waters (labeled);
h. Other major appurtenances such as inverted siphons and air release valves;
i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;
j. The scale and a north arrow; and
k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System Operation and Maintenance Plan

The permittee shall develop and implement a Collection System Operation and Maintenance Plan.

a. Within six (6) months of the effective date of the permit, the permittee shall submit to EPA and MassDEP

(1) A description of the collection system management goals, staffing, information management, and legal authorities;
(2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and
(3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.8. below.

b. The full Collection System O & M Plan shall be completed, implemented and submitted to EPA and MassDEP within twenty four (24) months from the effective date of this permit. The Plan shall include:

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventive maintenance and monitoring program for the collection system;

(3) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;
(4) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(6) A description of the permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.
(8) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and MassDEP annually by March 31. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
d. A map with areas identified for investigation/action in the coming year;
e. If treatment plant flow has reached 80% of the design flow (0.034 MGD) based on the annual average flow during the reporting year, or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

7. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the

permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works[1] it owns and operates.

D. 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, including EPA regulations promulgated at 40 CFR Part 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to Section 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the permittee's sludge use and/or disposal practices, the permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge 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 requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or 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 40 CFR. Part 503 requirements including the following elements:

   a. General requirements
   b. Pollutant limitations
   c. Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   d. Management practices
   e. Record keeping
   f. Monitoring
   g. Reporting

   Which of the 40 C.F.R. Part 503 requirements apply to the permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the permittee to

1 As defined at 40 CFR §122.2, which references the definition at 40 CFR §403.3

assist it in determining the applicable requirements.[2]

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

Sampling of the sewage sludge shall use the procedures detailed in 40 CFR 503.8.

7. Under 40 CFR § 503.9(r), the permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the permittee contracts with *another* "person who prepares sewage sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR §503.7. If the ultimate use or disposal method is land application, the permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.

8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by **February 19** (*see also* "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted to the address contained in the reporting section of the permit. If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:

   a. Name and address of contractor(s) responsible for sludge preparation, use or disposal

   b. Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge.

E. MONITORING AND REPORTING

2 This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf

1. **For a period of one year from the effective date of the permit**, the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit discharge monitoring reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit**, the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting all DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

a. Submittal of Reports Using NetDMR

NetDMR is accessed from: http://www.epa.gov/netdmr. Within one year of the effective date of the Permit, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt out request").

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the MassDEP Monthly Operations and Maintenance Report, as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs (including Monthly Operation and Maintenance Reports) to MassDEP until further notice from MassDEP.

b. Submittal of NetDMR Opt Out Requests

Opt out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under the Permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt out request and such request is approved by EPA. All opt out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

And

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

c. Submittal of Reports in Hard Copy Form

Hard copy DMR submittals shall be completed and postmarked no later than the 15th day of the month following the completed reporting period. MassDEP Monthly Operation and Maintenance Reports shall be submitted as an attachment to the DMRs. Signed and dated originals of the DMRs, and all other reports required herein, shall be submitted to the appropriate State addresses and to the EPA address listed below:

U.S. Environmental Protection Agency
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

The State Agency addresses are:

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

And

Copies of toxicity tests only to:

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

F. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. 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 a 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.

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

FACT SHEET

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

NPDES NO: MA0102431

PUBLIC NOTICE START AND END DATES: December 9, 2011 – January 7, 2012

NAME AND ADDRESS OF APPLICANT:

Town of Hardwick
Board of Sewer Commissioners
Hardwick – Wheelwright Water Pollution Control Facility
P.O. Box 147
Gilbertville, MA 01301

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Hardwick – Wheelwright Water Pollution Control Facility
Pine Street
Wheelwright, Massachusetts 01094

RECEIVING WATER: Ware River (Segment MA 36-05)
(Chicopee River Basin)

CLASSIFICATION: B (Warm Water Fishery)

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 water, the Ware River. The facility is engaged in the collection and treatment of municipal wastewater. A figure showing the wastewater treatment facility and outfall location is included as **Attachment A.**

The Hardwick – Wheelwright Water Pollution Control Facility (WPCF) serves approximately 160 people and is located in the village of Wheelwright. The WPCF is a 0.043 MGD sequencing batch reactor plant that was commissioned in 2009 and consists of the following unit processes:

bar rack, comminutor, influent pump station, equalization tank, two 16,830 gallon sequencing batch reactors, one 16,830 gallon aerated sludge holding tank, venturi aeration system, sodium hypochlorite system for disinfection, and a chlorine contact tank. Sludge is pumped to a holding tank and trucked to the East Fitchburg Wastewater Treatment Plant for incineration. Approximately 10 dry metric tons of sludge is generated per year.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters from the discharge monitoring reports (DMRs) from January 2008 through August 2010 is shown in **Attachment B**.

III. Permit Limitations and Conditions.

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

Water-body Classification and Usage:

The Ware River is classified in the Massachusetts Surface Water Quality Standards (314 CMR 4.00) as a Class B-warm water fishery. Class B waters are designated as habitat for fish, other aquatic life, and wildlife including their reproduction, migration, growth, and other critical functions, and for primary and secondary contact recreation. Where designated, Class B waters 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.

Regulatory Basis for Effluent Limits

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Clean Water Act (CWA) (see 40 CFR 125 Subpart A). For a publicly owned treatment works (POTW), technology based requirements are effluent limitations based on secondary treatment as defined in 40 CFR Part 133.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to limits more stringent than technology-based limits where necessary to meet water quality standards. The Massachusetts Surface Water Quality Standards (314 CMR 4.00) include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site-specific criteria is established. The state will limit or prohibit discharge of pollutants to surface waters to assure that water quality of the receiving

waters are protected and maintained, or attained.

EPA regulations at 40 CFR 122.44(d) require that a 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 caused, 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 concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and where appropriate, the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the antibacksliding requirements of the CWA. Anti-backsliding provisions are found in Section 402(o) of the CWA and 40 CFR 122.44 (l) and require that limits in a reissued permit be at least as stringent as those in the previous permit, except under certain limited circumstances. Effluent limitations based on technology standards, water quality, and state certification requirements must all meet anti-backsliding provisions.

Receiving Water Flow and Dilution Factor

The 7Q10, or the 7-day mean stream low flow with a 10-year recurrence interval, is used to calculate water quality-based effluent limits in the draft permit. In the previous permit the 7Q10 flow of 14.4 cfs at the discharge was developed by obtaining the 7Q10 flow measured at the USGS gaging station (Ware River at Gibbs Crossing; USGS Gage No. 01173500, downstream of the Hardwick- Wheelwright outfall) and calculating a flow for the point of discharge in the same proportion as the respective drainage areas. EPA determined that this methodology produced a greater 7Q10 than actually occurs because regulation of flow upstream of Barre causes flow in the upper watershed to be less than is calculated using the method in the previous permit.

For this draft permit, the 7Q10 was calculated by adding the 7Q10 flow for the USGS gage upstream of Barre (USGS Gage No.01173000, Ware River at Intake Works Near Barre) to the flow generated by the watershed area between that gage and the Hardwick-Wheelwright discharge. The flow generated by the watershed was calculated using the watershed area at the Hardwick outfall downstream of USGS Gage No.01173000 and a flow factor determined by the difference in 7Q10 flows and watershed areas between the USGS Gage No. 01173500, downstream of Hardwick and the USGS Gage No, 01173000, upstream of Barre. The 7Q10 flows at the USGS gages were calculated using flow data collected over the past 30 years. The calculations are as follows:

7Q10 at USGS gage 01173000 (upstream of Barre) = 5.84 cubic feet per second (cfs)
Total watershed area upstream of gage = 96.3 square miles (sq mi)

Total Watershed Area at Hardwick-Wheelwright outfall = 129 square miles

Watershed area downstream of USGS Gage No. 01173000 = 129-96.3 = 32.7 sq mi.

7Q10 at USGS Gage No. 01173500 (downstream of Wheelwright) = 15.8 cfs
Total watershed area upstream of gage = 197sq mi

7Q10 at Wheelwright outfall = 7Q10 at USGS Gage No. 01173000 + {Drainage area at Wheelwright outfall downstream of USGS Gage No. 01173000 x [(7Q10 flow at USGS Gage No. 01173500 - 7Q10 Flow at USGS Gage No. 01173000) / (Watershed area at USGS Gage No. 01173500-Watershed area at USGS Gage No. 01173000)]}

= 5.84 cfs + {32.7 sq mi x [(15.8cfs-5.84 cfs)/(197 sq mi-96.3 sq mi)]} = 9.1 cfs

Design flow = 0.043 mgd = 0.066 cfs

Dilution Factor = {(River 7Q10 @ Discharge + Design Flow) Design Flow
= (9.1 cfs + 0.066 cfs)/0.066 cfs = 138.9.

FLOW

The design flow for this facility is 0.043 mgd. The monthly average flow varies from 0.012 mgd to 0.016 mgd, with an average value of 0.013 mgd.

BOD and TSS

Under Section 301(b)(1)(B) of the Clean Water Act (CWA), Publicly Owned Treatment Works (POTWs) were required to achieve effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) are set forth in 40 CFR Part 133. The 30-day average percent removal limit of at least 85% for BOD_5 and TSS is based on the requirements in 40 CFR '133.102. Monitoring will continue at the current frequency at one per week.

The mass limits calculations for BOD_5 and TSS are below.

mass limits	Flow x Concentration x Conversion Factor = lbs/day
average monthly	0.043 mgd x 30 mg/l x 8.34(lb)(l)/(mg)(million gal) = 11 lbs/day
average weekly	0.043 mgd x 45 mg/l x 8.34(lb)(l)/(mg)(million gal) = 16 lbs/day

The permittee is complying with BOD and TSS effluent permit limits.

pH

The limits are based on the pH criteria in the Massachusetts Surface Water Quality Standards. The minimum limit is 6.5 SU and the maximum limit is 8.3 SU. The permittee is complying

with pH effluent limits.

E. Coli

Limitations on E.coli bacteria replace the limitations on fecal coliform bacteria found in the current permit. The bacterial limits has been changed to conform to the Class B water quality criteria for bacteria found in the Massachusetts Water Quality Standards (314CMR 4.05(3)(b)4). Massachusetts adopted these new criteria on December 29, 2006, and they were approved by EPA on September 19, 2007. Accordingly, the monthly average and maximum daily E. coli limits are set at 126 cfu/100ml and 409 cfu/100 ml (this is the 90% distribution of the geometric mean of 126 cfu/100 ml) respectively in the draft permit.

The limits reflect the Class B water quality criteria. These are seasonal limits that apply from April 1 through October 31, the months in which primary and secondary contact recreation are expected to occur. The limits are based on state certification requirements under section 401 (a) (1) of the CWA, as described in 40 CFR 124.53 and 124.55

The permittee is complying with fecal coliform effluent limits and indicated that it believes it will comply with the new E. coli limits.

Chlorine

Total residual chlorine (TRC) water quality criteria are established in the *Quality Criteria for Water 1986* (the Gold Book) and the subsequent 2002 update and are adopted into the State Water Quality Standards. The instream criteria shall not exceed 11 ug/l for chronic toxicity and 19 ug/l for acute toxicity to protect aquatic life. Allowing for available dilution at the annual monthly average flow, the TRC permit limit calculations are shown below.

Chronic chlorine limit	11 ug/l * 138.9 = 1528 ug/l = 1.528 mg/l
Acute chlorine limit	19 ug/l * 138.9 = 2639 ug/l = 2.639 mg/l

The current permit includes a maximum daily limit of 1.0 mg/l, based on MassDEP's *Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (February 23, 1990). This limit will continue in the draft permit.

The permittee is complying with chlorine effluent permit limits.

Consistent with seasonal E.coli limits, the limitations and monitoring requirements for TRC are also seasonal. This is consistent with the limitation and monitoring requirements in the current permit.

In a letter dated March 18, 2011 the Town requested that the frequency of required TRC

sampling be reduced from two per day to one per day. The letter states that "the Town is hereby requesting the frequency of required Total Residual Chlorine analysis in the new NPDES permits for Wheelwright WWTP – NPDES MA0102431 be reduced to the level of once per day. This request is based on the improvements to the chemical addition systems at both treatment plants. The Wheelwright WWTP has gone through a complete upgrade which converted treatment from extended air to Sequencing Batch Reactor. The new plant includes an upgraded sodium hypochlorite system which doses sodium hypochlorite based on flow."

After review and consideration of the request, EPA has decided to reduce the TRC testing frequency from two per day to one per day.

Nitrogen

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

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

Basin	Baseline Loading1 (lbs/day)	TMDL Target2 (lbs/day)	Current Loading3 (lbs/day)
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

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.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met. In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA intends to include nitrogen-related conditions in permits for existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds. For facilities discharging loads equal to or greater than 35 lbs/day total nitrogen, permit conditions will require the optimization of nitrogen removal with the existing treatment technology. For existing facilities discharging less than 35 lbs/day, monitoring of nitrogen discharges will be required. This is consistent with the approach applied by the Connecticut Department of Environmental Protection, which applied a threshold of 20 lbs/day (equivalent in impact to a 35 lb/day threshold at facilities upstream in MA and NH) when imposing nitrogen controls on existing facilities. See Nitrogen Control for Small Sewage Facilities (CT DEP); General Permit for Nitrogen Discharges (CT DEP 2005).

The estimated current loading for the Hardwick-Wheelwright WWTP used in the above analysis was 1.03 lbs/day, based upon a total nitrogen concentration of 12.3 mg/l and the average flow of 0.01 MGD (12.3 mg/L * 0.01 MGD * 8.34), as indicated in the Facility's 2004 through 2005 DMRs. A review of the DMRs from May 2008 through August 2010 indicate that TKN varies between 0.24 lb/day to 3.1 lb/day with an average daily maximum value of 0.87 lb/day. Nitrite and nitrate varies between 0.2 lb/day to 1.4 lb/day with an average value of 0.59 lb/day. Therefore, total nitrogen varies between 0.7 lb/day to 3.1 lb/day with an average value of 1.46 lb/day (Refer to Attachment B for TKN and nitrite and nitrate monitoring results**).** These values are well below the threshold of 35 lbs/day, therefore, no optimization requirement has been included in the draft permit.

The draft permit requires quarterly effluent monitoring of total Kjedahl nirogen, nitrate, nitrite and ammonia.

The agencies intend to annually update the estimate of all out-of-basin total nitrogen loads and may incorporate total nitrogen limits in future permit modifications or re-issuances as may be necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. There have been significant efforts by the New England Interstate Water Pollution Control Commission (NEIWPCC) work group and others since completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities.

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. Phosphorus interferes with water uses and reduces in-stream dissolved oxygen.

The Ware River downstream of the discharge is not listed on the *Massachusetts Year 2008 Integrated List of Waters* as impaired for nutrients or nutrient.

EPA has published national guidance documents that contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's Quality Criteria for Water 1986 (the Gold Book) recommends, to control eutrophication, that in-stream phosphorus concentrations should be less than 100 µg/l (0.100 mg/l) in streams or other flowing waters not discharging directly to lakes or impoundments.

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 Wheelwright Wastewater Treatment 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, 2000, and includes a total phosphorus criteria of 23.75 µg/l (0.024 mg/l).

Monitoring data collected during 2003 for the Chicopee River Watershed Water Quality Assessment,upstream of the discharge, shows concentrations of total phosphorus ranging from 0.015 to 0.10 mg/l with an average value of 0.05 mg/l.

The current permit requires effluent monitoring of total phosphorus. A review of the DMRs indicate that monthly average phosphorus varies between 0.98 mg/l to 8.7 mg/l with an average value of 3.47 mg/l. Refer to Attachment B for phosphorus monitoring results.

Reasonable Potential Analysis for Phosphorus

EPA did a Reasonable Potential Analysis to determine whether, at the current phosphorus effluent discharge, there is reasonable potential to cause or contribute to an exceedance of water quality criteria. EPA must take the upstream concentration of phosphorus into account when setting effluent limitations. The 2003 Chicopee River Watershed Water Quality Assessment presented ambient phosphorus concentrations for samples taken during April 2003 through August 2003 at Station WAIR (between the confluence of Pine Hill Brook and Broadmeadow Brook, Hardwick), upstream on the Ware River from the Wheelwright WWTP. During the low flow condition that year, the in-stream phosphorus concentration was 97.5 µg/l.

Reasonable Potential Analysis

$$C_r = \frac{Q_e C_e + Q_s C_s}{Q_r}$$

Q_e = effluent flow, i.e. facility design flow	= 0.043 MGD
C_e = effluent pollutant concentration	= 3.47 mg/l = 3470 µg/l
Q_s = 7Q10 flow of receiving water	= 9.1 cfs = 5.88 MGD
Cs = upstream concentration	= 97.5 µg/l
Q_r = receiving water flow = $Q_s + Q_e$	= 0.043 MGD + 5.88 MGD = 5.923 MGD
C_r = receiving water concentration	= 100 µg/l (water quality criterion)

$$C_r = \frac{(0.043 \text{MGD} \times 3470\ \mu g/l) + (5.88\ \text{MGD} \times 97.5 \mu g/l)}{5.923\ \text{MGD}}$$

$C_r = 122\ \mu g/l > 100\ \mu g/l$

Therefore, there is reasonable potential for the discharge to cause or contribute to an exceedance of a water quality criterion.

This analysis indicates that the discharge has the reasonable potential to cause or contribute to an exceedance of water quality standards. We note that the background concentration is data from a single day in 2003, which was prior to the upstream Barre wastewater treatment plant being required to achieve a monthly average total phosphorus limit of 1 mg/l. We would expect the reduced discharge from Barre to have resulted in a somewhat lower background concentration upstream of Wheelwright. We would further note that because of the high dilution factor, the calculated limit for the Wheelwright discharge is largely driven by how close the upstream concentration is to the 100 ug/l target concentration. For example, at a background concentration of 97.5 ug/l, the calculated effluent limit would be 0.44 mg/l, but if a 10 percent reduction in background concentration is assumed (88 ug/l), the calculated limit is about 1.74 mg/l (see example calculations below.

Effluent Limit Calculation (assuming 97.5 ug/l background)

$$C_e = \frac{Q_r C_r - Q_s C_s}{Q_e}$$

Q_e = effluent flow, i.e. facility design flow = 0.043 MGD
C_e = effluent pollutant concentration
Q_s = 7Q10 flow of receiving water = 9.1 cfs = 5.88 MGD
Cs = upstream concentration = 97.5 µg/l
Q_r = receiving water flow = $Q_s + Q_e$ = 0.043 MGD + 5.88 MGD = 5.923 MGD
C_r = receiving water concentration = 100 µg/l (water quality criterion)

$$C_e = \frac{(5.923\text{MGD} \times 100\mu\text{g/l}) - (5.88\ \text{MGD} \times 97.5\mu\text{g/l})}{0.043\text{MGD}}$$

C_e = 442 ug/l = 0.442 mg/l

Effluent Limit Calculation (assuming 88 ug/l background)

$$C_e = \frac{Q_r C_r - Q_s C_s}{Q_e}$$

Q_e = effluent flow, i.e. facility design flow = 0.043 MGD
C_e = effluent pollutant concentration
Q_s = 7Q10 flow of receiving water = 9.1 cfs = 5.88 MGD
Cs = upstream concentration = 88 µg/l
Q_r = receiving water flow = $Q_s + Q_e$ = 0.043 MGD + 5.88 MGD = 5.923 MGD
C_r = receiving water concentration = 100 µg/l (water quality criterion)

$$C_e = \frac{(5.923\text{MGD} \times 100\mu\text{g/l}) - (5.88\ \text{MGD} \times 88\mu\text{g/l})}{0.043\text{MGD}}$$

C_e = 1741 ug/l = 1.741 mg/l

In consideration of these factors, EPA has included a monthly average phosphorus limit of 1 mg/l in the draft permit. This limit will attain the target instream concentration of 100 ug/l at a background concentration of about 93 ug/l, only slightly less than the value used in the

reasonable potential calculation, and should be within the capability of the existing treatment facility with chemical addition.

Monitoring frequency is increased from one per month to one per week. Monitoring of dissolved ortho-phosphorus will continue at the current frequency of one per month.

Metals

Certain metals like copper, lead, cadmium and zinc can be toxic to aquatic life. EPA has evaluated (see below) the reasonable potential of these metals to cause or contribute to exceedances of water quality standards. Based on this evaluation, EPA has determined that there is no reasonable potential for these metals to cause or contribute to exceedances. The draft permit therefore does not include effluent limitations for these metals. These metals will continue to be monitored twice per year in conjunction with the WET test requirements.

Calculations of reasonable potential for copper, lead, zinc and cadmium:

EPA recommended criteria from National Recommended Water Quality Criteria: 2002 and a dilution factor of 139 has been used in the calculations. Dissolved metal criteria have been converted to total recoverable metals using the conversion factors recommended in the criteria document.

All effluent metals data are taken from the Toxicity Test Reports from the period May 2008 to August 2010.

The equation used is:

$C_r = (C_d * DF)/CF$

Where:

C_r = Allowable downstream receiving water concentration (total recoverable metal) –ug/l
C_d = Metal criteria (dissolved metal) – ug/l with hardness of 100 mg/l
DF = dilution factor
CF = conversion factor (dissolved metal to total recoverable metal)

Copper	Chronic	C = 9 x 139 / 0.96 = 1303 ug/l which is greater than the monthly average effluent concentration range of 25 - 52 ug/l. So, there is no reasonable potential
	Acute	C = 13 x 139 /0 .96 = 1882 ug/l which is greater than the maximum effluent concentration of 52 ug/l. So, there is no reasonable potential.

Lead	Chronic	C = 2.5 x 139/0.993 = 350 ug/l which is greater than the monthly average effluent concentration range of 1-20 ug/l. So, there is no reasonable potential.
	Acute	C = 65 x 139/0.993 = 9098 ug/l which is greater than the maximum effluent concentration of 20 ug/l. So, there is no reasonable potential.
Zinc	Chronic	C = 120 x 139 /0.986 = 16916 ug/l which is far greater than the monthly average effluent concentration range of 48 - 98 ug/l. So, there is no reasonable potential.
	Acute	C = 120 x 139/0.978 = 17055 ug/l which is far greater than the maximum effluent concentration of 98 ug/l. So, there is no reasonable potential.
Nickel	Chronic	C = 52 x 139 /0.997 = 7250 ug/l which is greater than the monthly average effluent concentration of 2 - 4 ug/l. So, there is no reasonable potential.
	Acute	C = 470 x 139/0.998 = 65460 ug/l which is far greater than the maximum effluent concentration of 4 ug/l. So, there is no reasonable potential.

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 and aromatic hydrocarbons, among others.

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

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in conjunction with pollutant- specific control procedures to control the discharge of toxic pollutants.

The current permit includes a LC50 limit of 100 percent and requires acute toxicity testing twice per year on the daphnid, *Ceriodaphnia dubia*. The same requirements will continue in the draft permit.

V. Sludge

Section 405(d) of the Clean Water Act requires that sludge conditions be included in all POTW permits. Technical sludge standards required by Section 405 of the Clean Water Act (CWA) were finalized on November 25, 1992 and were published on February 19, 1993. The regulations went into effect on March 21, 1993 (see 40 CFR part 503).

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

VI. Pretreatment

The permittee does not have any major industries contributing industrial wastewater to the WWTF. Pollutants introduced into POTWs by a non-domestic source shall not pass through the POTW or interfere with the operation or performance of the treatment works.

VII. Antidegradation

This draft permit is being reissued with an allowable wasteload identical to the current permit and no change in outfall location. The State of Massachusetts has indicated that there will be no lowering of water quality and no loss of existing water uses and that no additional anti-degradation review is warranted.

VIII. Essential Fish Habitat (EFH)

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 NMFS if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat.16 U.S.C. § 1855(b). The Amendments broadly define essential fish habitat 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. 50CFR.§ 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 fish species for which federal Fisheries Management

Plans exist. 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. The Ware River is not covered by the EFH designation for riverine systems. However, certain lifestages of Atlantic salmon (*Salmo salar*) may be present in this river as a result of historical stocking efforts.

Since Atlantic salmon may be present during one or more life stages within the encompassing area of the existing discharge site, a specific examination of potential impacts to this EFH species is included here. No "habitat area of particular concern" as defined under Section

The quantity of the discharge from the facility is at most 0.045 MGD;
The facility withdraws no water from the Ware River, so no life stages of Atlantic salmon are vulnerable to impingement or entrainment from this facility;
The discharge has a relatively high dilution factor of 139;
The permit requires toxicity testing two (2) times per year to ensure that the discharge does not present toxicity problems;
The permit contains water quality based limits for BOD, TSS, TRC, fecal coliform, and phosphorus;
The permit prohibits the discharge to cause any violation of state water quality standards.

EPA believes that the conditions and limitations contained within the draft permit adequately protect all aquatic life, including Atlantic salmon. Impacts associated with this facility have been minimized to the extent that no significant adverse impacts are expected. Further mitigation is not warranted. Should adverse impacts to EFH be detected as a result of this permit action, or if new information is received that changes the basis for EPA's conclusions, NMFS will be contacted and an EFH consultation will be re-initiated.

IX. Endangered Species

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical ("critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

The shortnose sturgeon (*Acipenser brevirostrum*) is an endangered species under the jurisdiction of NMFS which has been documented in the Connecticut River. The Hardwick-Wheelwright WPCF discharges to the Ware River, which is within the Connecticut River Watershed. However, this discharge is located approximately 23 miles upstream of the confluence with the Chicopee River. The Chicopee River feeds into the Connecticut River. There are obstructions to fish passage between the discharge and the mainstem of the Connecticut River. EPA has

determined that shortnose sturgeon are not present in the vicinity of the outfall from the Hardwick-Wheelwright WPCF and therefore a Section 7 consultation with NMFS is not required.

X. Sewer System Operation and Maintenance

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

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

Proper operation of collection systems is critical to prevent blockages and equipment failures that would cause overflows of the collection system (sanitary sewer overflows, or SSOs), and to limit the amount of non-wastewater flow entering the collection system (inflow and infiltration or I/I). I/I in a collection system can pose a significant environmental problem because it may displace wastewater flow and thereby cause, or contribute to causing, SSOs. Moreover, I/I could reduce the capacity and efficiency of the treatment plant and cause bypasses of secondary treatment. Therefore, reducing I/I will help to minimize any SSOs and maximize the flow receiving proper treatment at the treatment plant. There is presently estimated to be approximately 50 gpd of (I/I) in the sewer system. In its September 6, 2001 Infiltration and Inflow Policy, MassDEP specified that certain conditions related to I/I control be established in NPDES municipal permits

Therefore, specific permit conditions have been included in Part I.B, and I.C of the draft permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling infiltration and inflow to the extent necessary to prevent SSOs and I/I related-effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary. These requirements are intended to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment.

Several of the requirements in the draft permit are not included in the current permit, including collection system mapping, and preparation of a collection system operation and maintenance plan. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of the collection system and has included schedules for completing these requirements in the draft permit.

XI. 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 effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the state pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

XII. Public Comment Period, Public Hearing, And Procedures For Final Decision

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and a supporting material for their arguments in full by the close of the public comment period, to Suprokash Sarker, U.S. EPA, MA Office of Ecosystem Protection, 5 Post Office Square, Suite 100 , Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing to EPA and MassDEP for a public hearing to consider the draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston Office. Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XIII. EPA Contact

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

Suprokash Sarker, P.E.
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U.S. Environmental Protection Agency
5 Post Office Square, Suite 100 (OEP 6-1)
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Date

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

List of Attachments:

A - Facility Location
B - DMR Data

Attachment - A

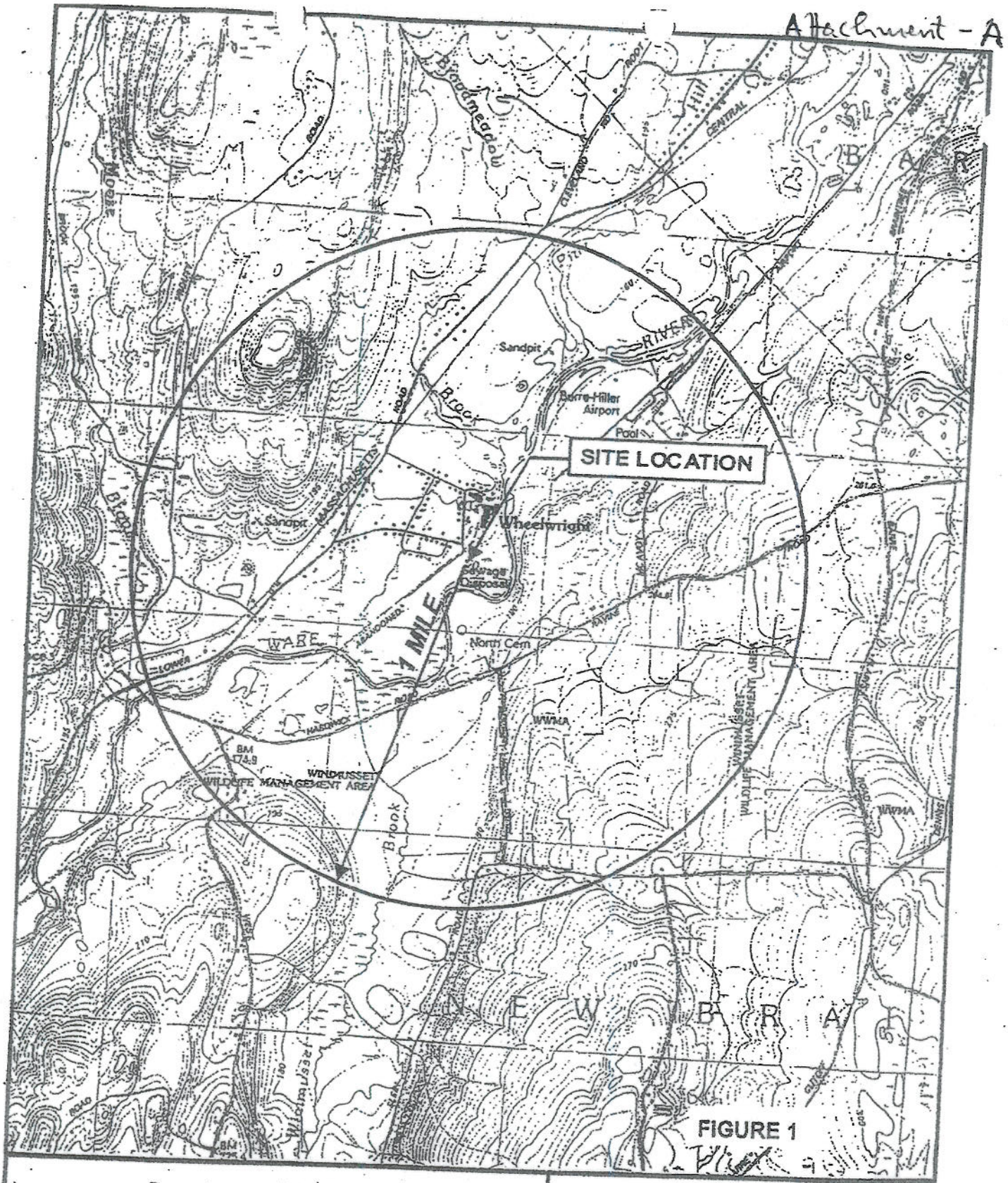
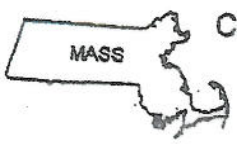
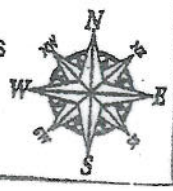


FIGURE 1

Based upon USGS topographic map for North Brookfield Quadrangle Published 1982

Contour Interval 3 Meters





SITE LOCUS

WHEELWRIGHT WPCF
HARDWICK, MASSACHUSETTS

Tighe&Bond

SCALE: 1:25000

JUNE 2000

MA0102431

Attachment B **Hardwick – Wheelright WWTF**

Summary of Required Report Submittals*

Required Report	**Date Due**	**Submitted By:**	**Submitted To: ** (see next page for key)**
Discharge Monitoring Report (DMR)	Monthly, postmarked by the 15th of the month following the monitoring month (e.g. the March DMR is due by April 15th.	Town of Hardwick-Wheelright	1, 2
Whole Effluent Toxicity (WET)Test Report (Part I.A.1)	June 30 and September 30 of each year	Town of Hardwick-Wheelright	1, 2, 3
Annual Sludge Report (Part I.D.8.)	February 19 each year	Town of Hardwick-Wheelright	1,2
Collection System Mapping (Part I.C.4)	Within 30 months of effective date	Town of Hardwick-Wheelright	Available for review
Collection System O & M Plan (Part I.C.5)	Within 24 months of effective date	Town of Hardwick-Wheelright	1,2
Collection System Summary Report (Part I.C.6)	By March 31 of each year	Town of Hardwick-Wheelright	1,2

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

**The addresses are for the submittal of hard copies. When the permittee begins reporting using NetDMR, submittal of hard copies of many of the required reports will not be necessary. See permit conditions for details.

1. Environmental Protection Agency
   Water Technical Unit (OES04-SMR)
   5 Post Office Square – Suite 100
   Boston, Massachusetts 02109 - 3912

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
   Surface Water Discharge Permit Program
   627 Main Street, 2nd Floor
   Worcester, Massachusetts 01608

RESPONSE TO COMMENTS – NOVEMBER 1, 2012
REISSUANCE OF NPDES PERMIT NO. MA0102431
HARDWICK-WHEELWRIGHT WATER POLLUTION CONTROL FACILITY
HARDWICK, MASSACHUSETTS

From December 9, 2011 through January 7, 2012 the U.S. Environmental Protection Agency (EPA-New England) and the Massachusetts Department of Environmental Protection (MassDEP) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Hardwick-Wheelwright Water Pollution Control Facility.

EPA-New England and MassDEP received comments from the Connecticut River Watershed Council (dated January 5, 2011). The following are joint responses to those comments, prepared by EPA-New England and MassDEP, and descriptions of any changes made to the draft permit as a result of those comments.

After a review of the comments received, EPA and MassDEP have made a final decision to issue this permit authorizing these discharges. The final permit is substantially identical to the draft permit that was available for public comment. Although EPA's decision-making process has benefitted from the various comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit. EPA did, however, make certain clarifications and minor changes in response to comments. The analyses underlying these changes are explained in the responses to individual comments that follow and are reflected in the final permit. A summary of the changes made in the final permit are listed below. Where applicable, relevant sections of the response document where these changes have been discussed have been included in parentheses at the end of each change.

A copy of the final permit may be obtained by writing or calling Robin Johnson, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1045. Copies may also be obtained from the EPA Region 1 web site at http://www.epa.gov/region1/npdes/index.html.

Summary of Changes

1. In Section I.E and Attachment B to the draft permit (Summary of Required Report Submittals), there were references to nitrogen optimization reports. These references were inadvertently included in the draft permit, which had no nitrogen optimization requirements. These references have been removed from the final permit.

2. The sampling frequency for total residual chlorine was restored to twice per day, except for weekends and holidays, when the required sampling frequency will be once per day. A footnote explaining sampling frequency on weekends and holidays was added to the final permit (see table on page 3 and footnote 6, page 4 of the final permit). See Response A4, page 3 for a discussion of this change.

3. The sampling requirement for orthophosphate was removed from the permit. This sampling requirement is included when the winter total phosphorus limit is higher than the summer phosphorus limit, to ensure that most phosphorus discharged in the winter is dissolved orthophosphate and will leave the river system rather than accumulating in the sediments. In this case, the winter and summer phosphorus limits are the same, therefore, orthophosphate monitoring is unnecessary.

4. As part of the semiannual WET test, the final permit requires reporting of total residual chlorine and certain metals in the 100% effluent sample on the DMR. These are parameters that the permittee already measures and reports as part of the WET test. The requirement to report the parameters on the DMR will add these data to the compliance database and facilitate reasonable potential analyses for future permits (see page 3 of the final permit).

5. The final permit requires aluminum and copper sampling once per quarter. This requirement was added following a reevaluation of the reasonable potential for either metal in the discharge to cause or contribute to an exceedance of water quality standards. The reevaluation determined that based on the existing effluent data the discharge did not have the reasonable potential to cause or contribute to an exceedance, so no aluminum or copper limit is included in the final permit. EPA determined, however, that additional data should be collected to confirm this determination (See Part B, Other Issues).

A. COMMENTS FROM THE CONNECTICUT RIVER WATERSHED COUNCIL

COMMENT A1:

According to the Fact Sheet, the Hardwick-Wheelwright WPCF is a 0.043 mgd (million gallons/day) sequencing batch reactor plant. The average flow is 0.013 mgd. Approximately 50 gpd flow is infiltration and inflow (I/I), which is very low.

RESPONSE A1:

The comment does not request a change to the permit. It is now part of the public record.

COMMENT A2:

Most current permits contain the pH limit (6.5 to 8.3) right in the effluent table, rather than citing Condition I.A.1.b on page 5. We recommend that the pH limit be inserted here for increased clarity.

RESPONSE A2:

The pH limit range has been added to the permit limit table on Page 2.

COMMENT A3:

CRWC supports the inclusion of a new permit limit for total phosphorus, and increased frequency in monitoring of total phosphorus from once per month to once per week and nitrogen compounds from twice per year to once per quarter.

RESPONSE A3:

The comment does not request a change to the permit. It is now part of the public record.

COMMENT A4:

EPA's ECHO database indicates that the maximum total residual chlorine limit was exceeded in June 2011. Therefore, CRWC does not think it's appropriate to reduce the sampling frequency from twice per day to once per day until the facility demonstrates an ability to stay within the permit limits.

RESPONSE A4:

At the time the Fact Sheet was written, the permittee had been in compliance with the chlorine effluent limit of 1.0 mg/l daily maximum for the previous two years. In addition to the June 2011 exceedance of 1.47 mg/l referenced in the comment, there was an additional exceedance of the chlorine limit in August 2011, when the daily maximum was 2.2 mg/l.

Monitoring frequency is determined on a case-by-case basis. EPA's Permit Writers' Manual advises that monitoring frequency should be established to ensure that there is sufficient data to characterize effluent quality and to detect events of noncompliance[1], and also advises the permit writer to consider effluent variability, design capacity, treatment method, compliance history, cost of monitoring relative to the permittee's capabilities, location of the discharge and the nature of the pollutants[2].

EPA's "Interim Guidance for Performance-based Reduction of NPDES Permit Monitoring Frequencies"[3] sets forth guidance on how to best implement reduction in reporting and monitoring based on historical performance. The guidance details specific entry criteria for participation which are outlined below:

1. Facility Enforcement History
    a. Criminal Actions (all environmental statutes)
    b. Civil Judicial Actions (Clean Water Act/NPDES)
    c. Administrative Actions (Clean Water Act/NPDES)
2. Parameter-by-Parameter Compliance

[1] EPA, 2010, "NPDES Permit Writers' Manual, p 8-5.
[2] *Ibid.*
[3] EPA, 1996, "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies".

a. Significant Noncompliance for Parameters under Consideration
b. Any Effluent Violations of Selected Parameters

3. Parameter-by-Parameter Performance History
4. Residency Criteria for Continued Participation

Region 1 has used this guidance to evaluate the proposed reduction of Hardwick-Wheelwright's monitoring frequency for total residual chlorine (TRC).

Hardwick-Wheelwright has a seasonal TRC limit of 1.0 mg/L that is in effect from April through October each year. From April 2010 through October 2011, there were two exceedances of the daily maximum TRC limit. The facility is a 0.043 MGD secondary wastewater treatment facility currently operating at about 41% of capacity.

Other violations at the facility include eight violations of TSS limits, six violations of the fecal coliform limit, one violation of the minimum pH limit, one violation of the weekly average BOD_5 limit, and one WET test limit violation.

Facility Enforcement History

Based on a review of EPA Region 1's records, there have been no enforcement actions against the facility.

Parameter-by-Parameter Compliance

The second criterion is "Parameter-By-Parameter Compliance" which requires a facility to not *have had any Significant Noncompliance (SNC) violations for the parameters which monitoring/reporting reductions are being considered during the last two years and,…may not have had any effluent violation of selected (critical) parameters during the last year.*

The effluent violations noted above were compared to EPA's Significant Noncompliance (SNC) criteria and it was determined that the violations constituted an SNC violation. This SNC, which occurred during 2011, means that Hardwick-Wheelwright is not eligible for a reduction in TRC monitoring frequency at this time.

EPA also considered the relationship between chlorine dosing and bacteria. Hardwick-Wheelwright has violated the monthly geometric average and maximum daily fecal coliform limits six times in the past 2 years. It may be expected that the facility will increase chlorine dosage to address these exceedances. It seems prudent to maintain the current twice per day sampling frequency to assist the facility in TRC optimization and to minimize the risk of TRC violations as the facility works to comply with the *E. coli* limit in the final permit. Based on the above, EPA will keep the total residual chlorine monitoring frequency at twice per day in the final permit.

B. OTHER ISSUES

In its comments on the Draft Permit for Barre WWTP, the Town of Barre brought to EPA's attention that the methods EPA used to determine reasonable potential for copper and aluminum for the Barre WWTP differed from the methods used for Hardwick-

Wheelwright, in that the analysis for Hardwick Wheelwright did not consider the concentrations of those metals already in the receiving water. Based on these comments EPA decided to reevaluate its analysis of the need for limitations on these metals in the Hardwick-Wheelwright permit, considering the receiving water concentration, since this method is more in accordance with EPA permit guidance, including the *NPDES Permit Writers' Manual* and the *Technical Support Document for Water Quality-Based Toxics Control*.

Based on this new analysis, no limits have been added to the final permit for aluminum or copper. The detailed analysis is presented below.

Aluminum

Aluminum, in the form of alum or other compounds, is a commonly used chemical additive in wastewater treatment to remove phosphorus. The release of aluminum into the environment can result in levels that are highly toxic to aquatic life. The Massachusetts Water Quality Standards establish that for toxic pollutants not otherwise listed in 314 CMR 4.00, the *National Recommended Water Quality Criteria*: *2002* (US EPA 2002 [EPA-822-R-02-047]) are the allowable receiving water concentration of the affected receiving water (see 314 CMR 4.05(5)(e)). The freshwater aluminum aquatic life criteria in the *National Recommended Criteria* are a chronic criterion of 87 µg/L and an acute criterion of 750 µg/L.

Table 1. Aluminum concentrations in Hardwick-Wheelwright WPCF effluent and in the Ware River upstream of the WPCF discharge based on toxicity tests.

Date	Effluent, µg/L	Ware River, µg/L
5/14/2008	24	96
8/13/2008	78	291
5/12/2009	45	110
8/12/2009	36	107
5/12/2010	41	172
8/11/2010	33	65

As Table 1 above shows, aluminum concentrations in the Ware River usually exceed the chronic criterion of 87 µg/L. However, the effluent data shows that the aluminum concentration in the Hardwick-Wheelwright discharge is less aluminum than the chronic criterion. (A statistical analysis of the effluent data was not done because there are too few data points to reliably determine the statistical distribution of the data.)

Because the effluent concentration of aluminum is less than the applicable criteria, there is no reasonable potential for the discharge to cause or contribute to an exceedance of the criteria. Therefore a limit is not required. Because of the limited available data, EPA has added a quarterly effluent monitoring requirement to better characterize effluent aluminum concentrations in order to confirm the finding of no reasonable potential.

Copper

Copper is an abundant naturally occurring trace element in the earth's crust that is also found in surface waters. Copper is a micronutrient at low concentrations and is essential to virtually all plants and animals. At higher concentrations copper can become toxic to aquatic life.

The *National Recommended Water Quality Criteria*: *2002* (US EPA 2002 [EPA-822-R-02-047]) includes copper criteria for the protection of aquatic life. These criteria are hardness-based. Hardness data used to calculate the copper criteria below are from Hardwick-Wheelwright's Whole Effluent Toxicity (WET) test reports from 2008 through 2010. The hardness values used in this calculation are the median hardness values measured in the treatment plant discharge and the upstream receiving water during this period. Hardness data used to calculate the criteria are shown below.

Table 3. Hardness in Hardwick-Wheelwright WPCF effluent and upstream of discharge in the Ware River.

Date	Effluent, mg/L	Ware River, mg/L
5/14/2008	83.2	12.89
8/13/2008	42.4	12.12
5/12/2009	92.6	13.12
8/12/2009	127.3	17
5/12/2010	58	14
8/11/2010	106.5	17.9
Median	87.9	13.56

Hardness Analysis

$$Q_rC_r = Q_dC_d + Q_sC_s$$

Where

C_r	=	Concentration below outfall		
Q_d	=	Discharge flow	=	0.066 cfs
C_d	=	Discharge concentration	=	87.9 mg/l
Q_s	=	Upstream flow	=	9.1 cfs
C_s	=	Upstream concentration	=	13.6 mg/l
Q_r	=	Streamflow below outfall (effluent + upstream)	=	9.166 cfs

Therefore,

$$C_r = \frac{(0.066 \text{ cfs} \times 89.7 \text{ mg/L}) + (9.1 \text{ cfs} \times 13.6 \text{ mg/L})}{9.166 \text{ MGD}}$$

$$= 14.1 \text{ mg/l}$$

1. Acute Criteria (Total Recoverable) = $\exp\{m_a [\ln(h)] + b_a\}$ = **2.21 µg/l**

Where:

m_a = Pollutant-specific coefficient = 0.9422
b_a = Pollutant-specific coefficient = -1.700
ln = Natural logarithm
h = hardness of the receiving water = 14.1 mg/l

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2. Chronic Criteria (Total Recoverable) = $\exp\{m_c [\ln(h)] + b_c\}$ = **1.75 µg/l**

Where:

m_c = Pollutant-specific coefficient = 0.8545
b_c = Pollutant-specific coefficient = -1.702
ln = Natural logarithm
h = hardness of the receiving water = 14.1 mg/l

Table 2. Copper concentrations in Hardwick-Wheelwright WPCF and in the Ware River upstream of the WPCF discharge.

Date	Effluent µg/L	Ware River, µg/L
5/14/2008	52	<1
8/13/2008	49	1
5/12/2009	25	1

8/12/2009	30	1
5/12/2010	41	1
8/11/2010	25	2
Median	**35.5**	**1**

EPA used information from the WET tests, shown in Table 2 above, to perform a Reasonable Potential Analysis to determine the potential for discharges of copper from Hardwick-Wheelwright to cause or contribute to an excursion above water quality criteria. Because the of the small sample size, EPA did not use statistics to project the maximum discharge concentration. Instead, this analysis used the maximum measured discharge concentration of 52 µg/L.

Background conditions in the Ware River were determined from the median of the WET chemistry dilution water samples from 2008 through 2010. The projected pollutant levels were then inserted into a steady-state mixing equation to determine if the discharge could cause or contribute to an excursion from water quality criteria under critical conditions.

As shown in the box below, the maximum copper effluent concentration of 52 µg/L results in a downstream receiving water concentration of 1.37 µg/L, below both the acute criterion of 2.21 µg/L and the chronic criterion of 1.75 µg/L. Therefore, there is no reasonable potential for the discharge to cause or contribute to an excursion of either the acute or chronic water quality standards for copper.

Reasonable Potential Analysis for Copper – Acute and Chronic

$$Q_rC_r = Q_dC_d + Q_sC_s$$

Where

C_r	=	Concentration below outfall		
Q_d	=	Discharge flow	=	0.066 cfs
C_d	=	Discharge concentration	=	52 µg/L
Q_s	=	Upstream flow	=	9.1cfs
C_s	=	Upstream concentration	=	1 µg/l
Q_r	=	Streamflow below outfall (effluent + upstream)	=	9.166 cfs

Therefore,

$$C_r = \frac{(0.066 \text{ cfs} \times 52 \text{ µg/L}) + (9.1 \text{ cfs} \times 1 \text{ µg/L})}{9.166 \text{ cfs}}$$

= **1.37** < 2.21 µg/L (acute criterion) and 1.75 ug/l (chronic criterion)

Therefore, there is **NO reasonable potential** for the discharge to cause or contribute to an excursion from the acute or chronic water quality criterion for copper.

The final permit does not contain copper limits because the discharge of copper does not have the reasonable potential to cause or contribute to an exceedance of copper criteria in the Ware River. Because of the limited available data, EPA has added a quarterly effluent monitoring requirement to better characterize effluent copper concentrations in order to confirm the finding of no reasonable potential.