

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

**FACT SHEET**

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

**NPDES NO:** MA0102431

**DATE OF PUBLIC NOTICE:**

**NAME AND ADDRESS OF APPLICANT:**

Board of Sewer Selectmen  
Town of Hardwick  
Hardwick – Wheelwright Water Pollution Control Facility  
P.O. Box 117  
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)

**LATITUDE:** 42°21' 14" N

**LONGITUDE:** 72° 08' 33" 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 Ware River.

The Hardwick – Wheelwright Water Pollution Control Facility (WPCF) serves approximately 160 people and is located in the village of Wheelwright. The 0.043 million gallons per day (mgd) secondary treatment facility secondary treatment facility consists of a bar rack, a comminutor, two aeration tanks with coarse bubble diffusers, and two clarifiers. Disinfection is accomplished

with a manually adjusted chlorinator using chlorine tablets. Sludge is pumped to a holding tank and trucked to the East Fitchburg Wastewater Treatment Plant for incineration. 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 recent monitoring data is shown in Attachment 1.

## **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**

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

Under Section 301(b)(1)(B) of the Clean Water Act (CWA), Publicly Owned Treatment Works (POTW's) were required to achieve effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth in 40 CFR Part 133 and include effluent limitations for biochemical oxygen demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), and pH. The "Average Monthly" and "Average Weekly" BOD<sub>5</sub> and TSS limitations are based on the requirements of 40 CFR §133.102. Numerical limitations for pH and fecal coliform are based on state certification requirements under Section 401(a)(1) of the CWA as described in 40 CFR §124.53 and state water quality standards in 314 CMR 4.05 (b) 3 and 4, respectively.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards, 314 CMR 4.00, include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless site specific criteria are established. The State will limit or prohibit discharges of pollutants to surface waters to assure that surface water quality standards of the receiving waters are protected and maintained.

The permit must also limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) which 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 [40 CFR §122.44(d)(1)]. An excursion occurs if the projected or actual instream 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.

Also note that according to the Clean Water Act Section 402(o) and EPA regulations at 40 CFR § 122.44(l), when a permit is reissued, effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards or conditions in the previous permit, unless certain exemption criteria are met. In addition, in accordance with regulations found at 40 CFR Section 131.12, Mass DEP has developed and adopted a statewide antidegradation policy to maintain and protect existing 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.

The limits in the draft permit are based upon information in the application, the existing permit, a site visit, discharge monitoring reports, and toxicity test results.

#### Waterbody Classification and Usage

The Ware River is classified as a Class B (Warm Water Fishery) waterbody. 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 *Chicopee River Basin 1998 Water Quality Assessment Report* (Report Number: 36-AC-2) indicates that the aquatic life use in the river segment receiving the Hardwick – Wheelright WPCF’s discharge is threatened due to effluent toxicity. The aesthetic use is supported for this segment with other uses not assessed. This river segment does not appear on the *Massachusetts Year 2002 Integrated List of Waters* [Clean Water Act, Section ‘303(d) list’] as requiring a Total Maximum Daily Loading (TMDL).

The limits in the draft permit are based on information in the application, the existing permit, discharge monitoring reports, and a site visit.

#### 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. The 7Q10 flow at the discharge was developed by obtaining the 7Q10 flow measured at the nearest USGS gaging station (Ware River at Gibbs Crossing; USGS Gage No. 01173500) and calculating a flow for the point of discharge in the same proportion as the respective drainage areas. An examination of the flow

data indicates that the 7Q10 of 22.37 cfs at the gage station used in the previous Fact Sheet is still valid. The resulting 7Q10 flow and dilution factor calculations are below.

Drainage Area @ outfall: 129 square miles  
 Drainage Area @ Gage Station: 197 square miles  
 7Q10 @ Gage Station: 22 cubic feet /second (cfs)  
 7Q10 @ outfall:  $129/197 \times 22 \text{ cfs} = 14.4 \text{ cfs}$   
 Design flow = 0.043 mgd ( 0.066 cfs).

Dilution Factor = (River 7Q10 @ Discharge + Design Flow) ÷ Design Flow  
 Dilution Factor =  $(14.4 \text{ cfs} + (0.066 \text{ cfs})) \div 0.066 \text{ cfs} = 219$

A similar calculation was done for the summer and winter 30Q10 flow and dilution factor which is used in calculating potential ammonia limits. These calculations are as follows.

Summer 30Q10 @ gage station = 27.1 cfs	Winter 30Q10 @ gage station = 54.8 cfs
Summer 30 Q10 @ outfall = 17.7 cfs	Winter 30Q10 @ outfall = 35.9 cfs
Dil. Factor = $(17.7 + 0.066 \text{ cfs}) \div 0.066 \text{ cfs} = 269$	Dil. Factor = $(35.9 + 0.66) \div 0.066 = 545$

### BOD and TSS

Under Section 301(b)(1)(B) of the Clean Water Act (CWA), Publicly Owned Treatment Works (POTW's) were required to achieve effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements for biochemical oxygen demand (BOD<sub>5</sub>) 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<sub>5</sub> and TSS is based on the requirements in 40 CFR §133.102.

The mass limits calculations for BOD<sub>5</sub> and TSS are below.

<u>mass limits</u>	<u>Flow x Concentration x Conversion Factor = lbs/day</u>
average monthly	$0.043 \text{ mgd} \times 30 \text{ mg/l} \times 8.34(\text{lb})(\text{l})/(\text{mg})(\text{million gal}) = 11 \text{ lbs/day}$
average weekly	$0.043 \text{ mgd} \times 45 \text{ mg/l} \times 8.34(\text{lb})(\text{l})/(\text{mg})(\text{million gal}) = 16 \text{ lbs/day}$

### pH and Fecal Coliform

The limitations for pH and fecal coliform 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.

### 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	$11 \text{ ug/l} * 219 = 2409 \text{ ug/l} = 2.41 \text{ mg/l}$
Acute chlorine limit	$19 \text{ ug/l} * 219 = 4161 \text{ ug/l} = 4.16 \text{ mg/l}$

The current permit set the average monthly chlorine limit of 0.5 mg/l and a maximum daily limit of 1.0 mg/l based on previous limits and “good operational practices”.

However, the discharge monitoring data in Attachment 1 shows violations of the average monthly and daily maximum fecal coliform limits and one violation of the average monthly chlorine limit. The Massachusetts Implementation Policy for the Control of Toxic Pollutants in Surface Waters stipulates that the maximum effluent concentration of chlorine shall not exceed 1.0 mg/l for discharges with dilution factors greater than 100. Consequently, the permit maintains the maximum daily limit of 1.0 mg/l in compliance with that policy and eliminates the average monthly chlorine limit. This will allow the facility the operational flexibility to meet the fecal coliform limits while complying with the State policy on the discharge of toxic pollutants. The elimination of the average monthly chlorine limit is permissible under the anti-backsliding exceptions of 40CFR 122.44(l) where a technical mistake or mistaken interpretation of the law was made in issuing a permit. The elimination of the monthly average will not cause any degradation of the receiving water given the high dilution factor and the maximum daily limit of 1 mg/l.

The months of the year during which the limits are in effect are at the discretion of the MA DEP. Because chlorine and chlorine compounds can be extremely toxic to aquatic life, it is preferable to limit the discharge of chlorine to the receiving water to those months when primary and secondary contact recreational activities may occur. Consequently, the draft permit has seasonal chlorine limits for the period from April through October.

### Nitrogen

Ammonia nitrogen can negatively impact dissolved oxygen levels in the receiving water and also be toxic to aquatic life at elevated levels. The *1999 Update of Ambient Water Quality Criteria for Ammonia* established instream criteria for toxicity dependent upon the pH and temperature of the receiving water. The Federal Register, Volume 64, No. 245 published on December 22, 1999, recommended a 30Q10 flow to generate the average monthly concentration limits.

For the summer months, a pH of 6.7 and an estimated temperature of 24° C are used to determine the instream criteria and the summer permit limit is calculated as follows.

$$3.5 \text{ mg/l (instream criteria)} * 269 \text{ (30Q10 dilution factor)} = 942 \text{ mg/l}$$

For the winter months, a pH of 6.7 and an estimated temperature of 0° C are used to determine the instream criteria and the winter permit limit is calculated as follows.

$$6.44 \text{ mg/l (instream criteria)} * 545 \text{ (30Q10 dilution factor)} = 3510 \text{ mg/l}$$

Since a secondary treatment plant typically discharges 15 – 20 mg/l of ammonia, there is no reasonable potential to exceed the water quality criteria and no need for an ammonia limit.

However, the Long Island Sound Comprehensive Conservation and Management Plan (CCMP) identifies excessive discharges of nitrogen from sewage treatment plants as the primary cause of low dissolved oxygen levels in the Sound. This condition is the most serious water quality impairment in the Sound and reduces the viable habitat to support fish. The EPA is presently requiring total nitrogen monitoring for all facilities which ultimately discharge to Long Island Sound. The development of nitrogen loadings of all tributaries to the Sound will be part of the Agency's approach to establish a nitrogen control strategy. To this end, the permit requires semiannual reporting of total nitrogen as Kjeldahl nitrogen and nitrite and nitrate nitrogen.

The information submitted by the permittee will help establish a database of nitrogen loadings which can be used to assess the impact of nitrogen loadings to Long Island Sound.

### 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 instream dissolved oxygen.

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 dilution factor of 223 and the Gold Book criteria, the phosphorus limit would be:

$$219 * 100 \text{ ug/l} = 21,900 \text{ ug/l} = 21.9 \text{ mg/l}$$

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 Hardwick-Wheelwright Water Pollution Control Facility 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).

Using the ecoregion criteria, the phosphorus limit would be:

$$219 * 24 \text{ ug/l} = 5,256 \text{ ug/l} = 5.3 \text{ mg/l}$$

The Hardwick-Wheelwright facility will occasionally discharge phosphorus in excess of the ecoregion criteria as indicated in Attachment 1. Other facilities discharging to the Ware River have a 1 mg/l phosphorus limit. Data from the *Chicopee River Basin 1998 Water Quality Assessment Report* indicates downstream phosphorus concentrations in the Ware River of 0.04 to

0.08 mg/l which are greater than the water quality criteria. Also, there are two downstream impoundments, Diamond International Impoundment on the Ware River and Red Bridge impoundment on the Chicopee River, which are potentially affected by the year-round accumulation of phosphorus. The accumulated phosphorus can be released during warmer water temperatures and contribute to algal growth.

The calculated loading from the Hardwick-Wheelwright facility based upon the design flow and the ecoregion criteria is less than 2 lbs/day ( $0.043 \text{ mgd} * 5.3 \text{ mg/l} * 8.34 = 1.9 \text{ lbs/day}$ ). The actual flow is presently only about 1/3 the design flow. Rather than imposing a phosphorus limit on this relatively small facility, the total phosphorus loadings from the Town of Hardwick's two wastewater treatment facilities will be considered in the development of the phosphorus limit for the other facility, the Hardwick-Gilbertville Water Pollution Control Facility (NPDES No. MA0100102). This permit will continue to require the reporting of phosphorus concentrations. However, the monitoring period will be year-round due to the accumulation concerns at the downstream impoundments as discussed above. In addition, the permit requires testing for dissolved orthophosphorus so that the settleable fraction of the total phosphorus can be determined. If additional data or the completion of a Total Maximum Daily Loading (TMDL) indicates the need for more stringent limits, EPA and DEP may exercise the reopener clause of Part I B. 4 of this permit and modify the permit to include numerical limits.

The data in Attachment 1 indicates phosphorus concentrations in this facility's discharge higher than that normally expected from a conventional secondary treatment plant. So while, this draft permit does not impose any phosphorus limits, the permittee is strongly encouraged to take steps to identify and minimize sources of phosphorus in anticipation of possible limits in the future.

### 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. The Region's current policy is to include toxicity testing requirements in all municipal permits, while Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

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

Pursuant to EPA Region 1 policy, and Mass DEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters, discharges having a dilution ratio greater than 100:1 require acute toxicity testing two times per year. As in the current permit, the permittee shall test the daphnid, *Ceriodaphnia dubia*, only.

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.

If the toxicity test results achieve the criteria established in Footnote 8 of the draft permit (i.e. 4 consecutive tests and a minimum of 2 years), EPA will consider a reduction in the WET testing requirements.

## **V. Sludge**

The draft permit prohibits sludge discharges through the outfall. Section 405(d) of the CWA requires that sludge conditions be included in all POTW permits. As a POTW, the permittee is subject to 40 CFR Part 503. However, the permittee's practice of contracting out the sludge disposal is not regulated by the National Sewage Sludge Program. If the permittee changes to a method of sludge disposal that is regulated, then the permittee must comply with the requirements of 40 CFR Part 503.

## **VI. 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. The Ware River is not covered by the EFH designation for riverine systems and thus EPA has determined that a formal EFH consultation with the NMFS is not required.

## **VII. State Certification Requirements**

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection (Mass DEP) certifies that the effluent limitations included in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The MA DEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality and continue to meet the requirements of the antidegradation policy. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects the draft permit will be certified.

## **VIII. Comment Period and Procedures the Final Decision**

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.

## **IX. Contacts**

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

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