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EPA NEW ENGLAND
OFFICE OF ECOSYSTEM PROTECTION
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FACT SHEET

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

PUBLIC NOTICE START AND END DATES:

PUBLIC NOTICE NUMBER:

CONTENTS: 19 pages including 3 Attachments A through C.

NPDES PERMIT NO.: NH0100331

NAME AND MAILING ADDRESS OF APPLICANT:

City of Concord, New Hampshire
41 Green Street
Concord, New Hampshire 03301

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Penacook Wastewater Treatment Facility
7 Penacook Street
Concord, New Hampshire 03301

The Town of Boscawen is a co-permittee for specific activities required by the permit, as set forth in Section IV.I. of this Fact Sheet and Section I.B, I.C., and I.D. of the draft permit. The responsible municipal department is:

Boscawen Board of Selectmen
116 North Main Street
Boscawen, New Hampshire 03303

RECEIVING WATER: Merrimack River (Hydrologic Basin Code: 01070002)

CLASSIFICATION: B

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

The Penacook Wastewater Treatment Facility (WWTF) is a publicly owned treatment works (POTW) owned and operated by the City of Concord, NH. The City applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its NPDES permit to discharge treated effluent into the Merrimack River. The facility collects and treats domestic and commercial wastewater from the Village of Penacook and portions of the Town of Boscawen, and also receives about 800 gallons per day of process wastewater from a metal finishing industry. The collection system consists entirely of separate sanitary sewers. The treatment plant has a design flow of 2.37 million gallons per day (mgd) and provides secondary treatment using sequencing batch reactors (SBRs).

Wastewater flows to the treatment plant by gravity where it is screened and degrittled, followed by biological treatment in the SBRs. SBRs are a batch treatment process which combines biological treatment and sedimentation in the same tank. In order to maintain appropriate treatment times in the SBRs during high flows, surge tanks are provided upstream of the SBRs. Treated effluent from the SBRs is discharged to equalization tanks, followed by disinfection in chlorine contact tanks. Disinfection is provided by sodium hypochlorite, which is injected into the flow equalization tank discharge. Treated effluent is discharged through a three port diffuser to the Merrimack River.

Waste activated sludge produced during treatment of the wastewater is pumped to aerated sludge storage tanks. Polymer may be added to the tank to increase sludge solids concentration. A decant system allows supernatant to be pumped back to the facility headworks. Thickened sludge from the sludge holding tanks is pumped to a tank truck that transports the material to the Hall Street WWTF for dewatering, stabilization, and reuse in a land application program.

The most recent permit was issued to the facility on July 14, 2000, and expired on September 14, 2005. This permit (hereafter referred to as the "existing permit") has been administratively extended as the applicant filed a complete application for permit reissuance within the prescribed time period as per 40 Code of Federal Regulations (CFR) §122.6.

The location of the treatment facility and the receiving water are shown in Attachment A.

II. Description of Discharge.

A quantitative description of significant effluent parameters based on discharge monitoring data submitted during the five year period from January 2000 to December 2005 are shown in Attachment B.

III. Limitations and Conditions.

The draft permit contains limitations for five-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, *Escherichia coli* (*E. Coli*) bacteria, Total Residual Chlorine (TRC), and Whole Effluent Toxicity (WET). It also contains monitoring requirements for flow,

ammonia nitrogen as nitrogen, hardness, and metals (aluminum, cadmium, chromium, copper, lead, nickel, and zinc). The effluent limitations and monitoring requirements are found in PART I of the draft NPDES permit. The basis for each limit and condition is discussed below in Section IV of this Fact Sheet.

IV. Permit Basis and Explanation of Effluent Limitations Derivation.

A. General Regulatory Background

Congress enacted the Clean Water Act (CWA), “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” CWA §101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into waters of the United States from any point source, except as authorized by specified permitting section of the CWA, one of which is Section 402. See CWA §§301(a), 402(a). Section 402 establishes one of the CWA’s principal permitting programs, the National Pollutant Discharge Elimination System (NPDES). Under this section of the CWA, EPA may “issue a permit for the discharge of any pollutant, or combination of pollutants” in accordance with certain conditions. See CWA §402(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. See CWA §402(a)(1)-(2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: “technology-based” limitations and “water quality based” limitations. See CWA §§ 301, 303, 304(b); 40 C.F.R. Parts 122, 125, and 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. See CWA §301(b). As a class, POTWs must meet limitations based on secondary treatment. CWA §301(b)(1)(B). Secondary treatment is expressed in terms of BOD₅, TSS, and pH. 40 C.F.R. Part 133.

Water quality based effluent limits are designed to ensure that state water quality standards are met regardless of the decision made with respect to technology and economics in establishing technology based limitations. In particular, Section 301(b)(1)(C) requires achievement of, “any more stringent limitation, including those necessary to meet water quality standards....established pursuant to any state law or regulation....”. See 40 C.F.R. §§122.4(d), 122.44(d)(1) (providing that a permit must contain effluent limits as necessary to protect state water quality standards, “including state narrative criteria for water quality”) (emphasis added) and 122.45(d)(5) (providing in part that a permit incorporate any more stringent limits required by Section 301(b)(1)(C) of the CWA).

The CWA requires that states develop water quality standards for all water bodies within the state. CWA § 303. These standards have three parts: (1) one or more “designated uses” for each water body or water body segment in the state; (2) water quality “criteria”, consisting of numerical concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an antidegradation provision, focused on protecting high quality waters and protecting and maintaining water quality necessary to protect existing uses. CWA

§303(c)(2)(A); 40 C.F.R. §131.12. The limits and conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards.

The applicable New Hampshire water quality standards can be found in Surface Water Quality Regulations, Chapter Env-Ws 1700 *et seq.* See generally, Title 50, Water and Management and Protection, Chapter 485A, Water Pollution and Waste Disposal Section 485-A.

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from the state's water quality standards to develop permit limits, both the acute and chronic life criteria are used and expressed in terms of maximum allowable in stream pollutant concentrations. Acute aquatic life criteria are generally implemented through maximum daily limits and chronic aquatic life criteria are generally implemented through average monthly limits. Where a state has not established a numeric water quality criteria for a specific chemical pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: based on a "calculated numeric criteria for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use"; on a "case-by-case basis" using CWA Section 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an "indicator parameter". 40 C.F.R. §122.44(d)(1)(vi)(A-C).

All statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired. When technology-based effluent limits are included in a permit, compliance with those limitations is the date the issued permit becomes effective. See 40 C.F.R. §125.3(a)(1). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit. The regulations governing EPA's NPDES program are generally found in 40 CFR Parts 122, 124, 125, and 136.

B. Introduction

The permit must limit any pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality criterion, see 40 C.F.R. §122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

i. Reasonable Potential

In determining reasonable potential, EPA considers: 1) existing controls on point and non-point sources of pollution; 2) pollutant concentration and variability in the effluent and receiving water as determined from the permit's reissuance application, DMRs, and State and Federal Water Quality Reports; 3) sensitivity of the species to toxicity testing; 4) the statistical approach outlined in *Technical Support Document for Water Quality-Based Toxics Control*, March 1991,

EPA/502/2-90-001 in Section 3; and, where appropriate, 5) dilution of the effluent in the receiving water. In accordance with the New Hampshire statutes and administrative rules [RSA 485-A:8, VI, Env-Ws 1705], available dilution is based on a known or estimated value of the lowest average annual flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life or the mean annual flow for human health (carcinogens only) in the receiving water at the point just upstream of the outfall. Furthermore, 10 percent of the assimilative capacity of the receiving water is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations, Env-Ws 1705.01.

ii. Anti-Backsliding

Section 402(o) of the CWA generally provides that the effluent limitation of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. EPA has also promulgated anti-backsliding regulations which are found at 40 C.F.R. §122.44(l). Unless applicable anti-backsliding requirements are met, the limits and conditions in the reissued permit must be at least as stringent as those in the previous permit.

iii. State Certification

Section 401(a)(1) of the CWA requires all NPDES permit applicants to obtain a certification from the appropriate state agency stating that the permit will comply with all applicable federal effluent limitations and state water quality standards. See CWA §401(a)(1). The regulatory provisions pertaining to state certification provide that EPA may not issue a permit until a certification is granted or waived by the state in which the discharge originates. 40 C.F.R. §124.53(a). The regulations further provide that, "when certification is required...no final permit shall be issued...unless the final permit incorporates the requirements specified in the certification under §124.53(e)." 40 C.F.R. 124.55(a)(2). Section 124.53(e) in turn provides that the state certification shall include "any conditions more stringent than those in the draft permit which the state finds necessary" to assure compliance with, among other things, state water quality standards, see 40 C.F.R. §124.53(e)(2), and shall also include "[a] statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of state law, including water quality standards," see 40 C.F.R. §124.53(e)(3).

However, when EPA reasonably believes that a state water quality standard requires a more stringent permit limitation than that reflected in a state certification, it has an independent duty under CWA §301(b)(1)(C) to include more stringent permit limitations. See 40 C.F.R. §§ 122.44(d)(1) and (5). It should be noted that under CWA §401, EPA's duty to defer to considerations of state law is intended to prevent EPA from relaxing any requirements, limitations, or conditions imposed by state law. Therefore, "[a] State may not condition or deny a certification on the grounds that state law allows a less stringent permit condition." 40 C.F.R. §124.55(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." Id. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. §122.4(d) and 40 C.F.R. §122.44(d).

C. Flow

The existing permit was written for a conventional secondary treatment facility with a design flow of 4.2 mgd; treatment included primary clarification, aeration, and secondary clarification prior to disinfection. In March 2005, the City completed construction of sequencing batch reactors (SBRs), which replaced the conventional secondary treatment facility. The SBRs occupy one third of the old aeration tank capacity, with the remaining capacity not in use at this time. The primary clarifiers were converted to surge flow storage tanks and the secondary clarifiers were converted to flow equalization tanks. The SBRs are designed for a flow of 2.37 mgd. In accordance with 40 CFR 122.45(b), POTW effluent limits must be based on a plant's actual design flow, which in this case is 2.37 mgd.

D. Conventional Pollutants

i. Five-Day Biological Oxygen Demand (BOD₅) and Total Suspended Solids (TSS)

The average monthly and average weekly concentration-based limits for BOD₅ and TSS are based on requirements under Section 301(b)(1)(B) of the CWA as defined for Secondary Treatment Standards in 40 CFR Section 133.102(a) and (b). The average monthly and average weekly mass-based limits for BOD₅ and TSS corresponding to the respective concentration-based limits in the draft permit are based on 40 CFR Section 122.45(f) which requires the Agency to apply these Secondary Treatment Standards (concentration-based) as mass-based limits.

Average monthly, average weekly and maximum daily allowable mass-based (load) limitations for BOD₅ and TSS shown in the draft permit are based on the POTW's daily design flow of 2.37 MGD and the appropriate constituent concentration for the respective time period being limited. See Attachment C for the equation used to calculate each of these mass-based limits

The percent removal limits for BOD₅ and of TSS are based on the requirements of 40 CFR Section 133.102 (a) (3) and (b)(3), respectively.

The concentration effluent limits and the percent removal limits for BOD₅ and TSS in the draft permit are the same as the limits in the existing permit. The mass based limits have changed in accordance with the lowering of the design from from 4.2 to 2.37 MGD. The limits are consistent with anitbacksliding provisions found in 40 CFR §122.44(l).

ii. *Escherichia coli*

The effluent limits are based on Class B water quality standards established by the State of New Hampshire in RSA 485-A:8.II. The average monthly limit for *Escherichia coli* is determined by calculating the geometric mean. The monitoring frequency for *E. Coli* in the draft permit is 3/week and samples for compliance monitoring must be taken concurrently with samples for total residual chlorine.

iii. pH

The pH limit of 6.5 – 8.0 S.U. in the draft permit remain unchanged from the existing permit. Language under State Permit Conditions (PART I.D.1.a.) allows for a change in the pH limit under certain conditions. A change would be considered if the applicant can demonstrate to the satisfaction of NHDES-WD that the pH standard of the receiving water will be protected when the discharge is outside the permitted range, then the applicant or NHDES-WD may request (in writing) that the permit limits be modified by EPA to incorporate the results of the demonstration. Anticipating the situation where NHDES-WD grants a formal approval changing the pH limit to outside 6.5 to 8.0 Standard Units (S.U.), EPA has added a provision to the draft permit (see SPECIAL CONDITIONS section). That provision will allow EPA to modify the pH limit using a certified letter approach. This change will be allowed only if it is demonstrated that the revised pH limit range does not alter the naturally occurring receiving water pH. However, the pH limit range cannot be less restrictive than 6.0 to 9.0 S.U. found in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 C.F.R. Part 133) for the facility.

E. Available Dilution and Nonconventional and Toxic Pollutants

Water-quality based limits for specific toxic pollutants such as chlorine, ammonia, metals, etc. are determined from chemical-specific numeric criteria derived from extensive scientific studies. EPA-recommended criteria for specific toxic pollutants are known as the “Gold Book Criteria” which EPA summarized and published in Quality Criteria for Water, 1986, EPA 440/5-86-001 (as amended). The State of New Hampshire adopted these “Gold Book Criteria”, with certain exceptions, and included them as part of the State’s Surface Water Quality Regulations adopted on December 3, 1999. EPA-New England uses these pollutant-specific criteria, along with available dilution in the receiving water, to determine effluent limitations for these pollutants.

i. Available Dilution

The dilution factor is an estimate of the dilution afforded the POTW’s effluent by the receiving water. The dilution factor used to calculate the water quality-based effluent limitations in the existing permit was 92.9, based on a POTW design of 4.2 mgd. The dilution factor applicable to the draft permit using a design flow of 2.37 mgd is 164.

The dilution factor for the draft permit was calculated using the plant's design flow of 2.37 mgd, an estimate of the 7Q10 low flow of 664.5 cfs in the Merrimack River at the treatment plant's outfall, and 90 percent of the Assimilative Capacity Reserve (saving 10 percent for future needs in accordance with NH Regulation Env-Ws 1705.01).

The value of the 7Q10 flow at the outfall for the existing and draft permit was calculated by summing the 7Q10 flows from the two nearest U.S. Geological Survey (Survey) gaging stations above the outfall (Merrimack River and Contoocook River), multiplying the summed flow by a ratio of the cumulative drainage area and the interim drainage area, and finally adding the sum of the gaged flows to the prorated flow. See Attachment C for the calculations of 7Q10 flow and the dilution factor.

ii. Total Residual Chlorine

The New Hampshire water quality standards specify the chronic and acute aquatic-life criterion for chlorine at 0.011 mg/l and 0.019 mg/l, respectively, for freshwater; and 0.0075 mg/l and 0.013 mg/l, respectively, for marine water. Chlorine and chlorine compounds, such as “organo-chlorines”, produced by the chlorination of wastewater can be extremely toxic to aquatic life. Section 101(a)(3) of the Act, and New Hampshire standards at Env-Ws 1703.21(a) prohibit the discharge of toxic pollutants in toxic amounts. Therefore, to reduce the potential for the formation of chlorinated compounds during the wastewater disinfection process and to be protective of the States’ narrative standards, EPA-New England has, historically, established a maximum Total Residual Chlorine (TRC) limitation of 1.0 mg/l for both the average monthly and the maximum daily limitations. These limitations may be more stringent, after considering the available dilution, than the limits determined using the States’ numeric water quality criteria. In this situation, the 1.0 mg/L maximum limit for both average monthly and maximum daily effluent limits are more stringent than the 1.80 and 3.12 mg/L limits that would be allowed based on available dilution and the NH Standards for chronic and acute aquatic-life criteria of 0.011 and 0.019 mg/L. The equations and example calculations to determine the TRC limits are in Attachment C of the Fact Sheet.

iii. Other Pollutants

The permittee provided expanded effluent testing results (based on 4 samples) for toxics in the discharge from outfall 001 as part of its permit application. The concentrations of these pollutants were compared to the Water Quality Criteria for Toxic Substances listed in New Hampshire’s Surface Water Quality Regulations (and accounting for dilution). This comparison indicated that there were no additional pollutants that showed reasonable potential to cause or contribute to exceedances of water quality standards and for which permit limits should be established.

F. Whole Effluent Toxicity (WET)

EPA’s **Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991**, recommends using an “integrated strategy” containing both pollutant (chemical) specific approaches and whole effluent (biological) toxicity approaches to control toxic pollutants in effluent discharges from entering the nation’s waterways. EPA-New England adopted this “integrated strategy” on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect aquatic life and human health. Pollutant-specific approaches such as those in the Gold Book and State regulations address individual chemicals, whereas, Whole Effluent Toxicity (WET) approaches evaluate interactions between pollutants, thus rendering an “overall” or “aggregate” toxicity assessment of the effluent. Furthermore, WET measures the “additivity” and/or “antagonistic” effects of individual chemical pollutants which pollutant specific approaches do not, thus the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through this process.

New Hampshire law states that, "all surface waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life;...." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-Ws 1730.21(a)(1)). The federal NPDES regulations at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when a discharge has a "reasonable potential" to cause or contribute to an excursion above the State's narrative criterion for toxicity. Furthermore, results of these toxicity tests will demonstrate compliance of the POTW's discharge with the "no toxic provision of the NH Standards."

Accordingly, to fully implement the "integrated strategy" and to protect the "no toxic provision of the NH Standards," EPA-New England requires toxicity testing in all municipal permits with the type of toxicity test(s) (acute and/or chronic) and effluent limitation(s) (LC50 and/or C-NOEC) based on the available dilution as shown in the Toxicity Strategy for Municipal Permits (Attachment D).

The existing permit contains a WET testing requirement of twice per year with an LC50 limit of 100%. Because the dilution factor has increased from 92.9 to 164, the LC50 limit in the draft permit is greater than or equal to 50%. WET testing is still required twice per year. The greater than or equal to 50% limit means that a sample of 50% effluent shall have no greater than a 50% mortality rate. The permittee is required to collect and test effluent samples twice per year during calendar quarters ending June 30th and September 30th (changed from existing permit) using two species, *Ceriodaphnia dubia* (*Daphnia*) and *Pimephales promelas* (Fathead Minnow).

The WET limits in the draft permit include conditions to allow EPA-New England to modify, or alternatively, revoke and reissue to incorporate additional toxicity testing requirements, including chemical specific limits, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 CFR §122.62(a)(2).

Alternately, if a permittee has consistently demonstrated on a maximum daily basis that its discharge, based on data for the most recent one-year period, or four sampling events, whichever yields the greater time period, causes no acute and chronic toxicity, the permitted limits will be considered eligible for a reduced frequency of toxicity testing. This reduction in testing frequency is evaluated on a case-by-case basis. Accordingly, a special condition has been carried forward from the existing permit into the draft permit that allows for a reduced frequency of WET testing using a certified letter from EPA-New England. This permit provision anticipates the time when the permittee requests a reduction in WET testing that is approvable by both EPA-New England and the NHDES-WD. As previously stated, EPA-New England's current policy is that after completion of a minimum of four consecutive WET tests all of which must be valid tests and must demonstrate compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to EPA-New England seeking a review of the toxicity test results. EPA-New England's policy is to reduce the frequency of toxicity testing to no less than one (one-species) test per year. The permittee is required to continue testing at the frequency specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA-New England indicating a change in the permit

condition. This special condition does not negate the permittee's right to request a permit modification at any time prior to the permit expiration.

This draft permit, as in the existing permit, requires the permittee to continue reporting selected parameters from the chemical analysis of the WET tests' 100 percent effluent sample. Specifically, hardness, total ammonia nitrogen as nitrogen, and total recoverable aluminum, cadmium, copper, chromium, lead, nickel and zinc are to be reported on the appropriate DMR for entry into EPA's data base. EPA-New England does not consider these reporting requirements an unnecessary burden as reporting these constituents is already required with the submission of each toxicity testing report.

G. Sludge

Section 405(d) of the Clean Water Act (CWA) requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge which is land applied, disposed of in a surface disposal unit, or fired in a sewage sludge incinerator is subject to Part 503 technical and to State Env-Ws 800 standards. Part 503 regulations have a self-implementing provision, however, the CWA requires implementation through permits. Domestic sludge which is disposed of in municipal solid waste landfills are in compliance with Part 503 regulations provided the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 CFR Part 258.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA-New England has included with the draft permit a 72-page document entitled "EPA Region I NPDES Permit Sludge Compliance Guidance, November 1999" for use by the permittee in determining the appropriate sludge conditions for the chosen method of sewage sludge use or disposal practices.

The permittee is required to submit an annual report to EPA-New England and NHDES- WD, by February 19th each year, containing the information specified in the Sludge Compliance Guidance document for their chosen method of sewage sludge use or disposal practices. All sludges generated at the Penacook facility are hauled as a thickened sludge (in liquid form) to the City of Concord's Hall Street Wastewater Treatment Plant for treatment and disposal. At Concord's Hall Street facility the sludge is dewatered, amended and lime-stabilized (to pH > 12) in a thermo-blender, and pasteurized to produce a finished biosolid that is land applied. The City of Concord identified Resource Management Inc. of Ashland, NH, as the company that land applies the sludge at 10 sites providing nutrients for feed crops (i.e., hay, corn silage or grain).

H. Industrial Users (Pretreatment Program)

The permittee is not required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR §403 and Section 307 of the Act. However, the draft permit contains conditions that are necessary to allow EPA and NHDES-WD to ensure that pollutants from industrial users will not pass through the facility and cause water quality standards violations and/or sludge use and disposal difficulties or cause interference with the

operation of the treatment facility. The permittee is required to notify EPA and NHDES-WD whenever a process wastewater discharge to the facility from a primary industrial category (see 40 CFR §122 Appendix A for list) is planned or if there is any substantial change in the volume or character of pollutants being discharged into the facility by a source that was discharging at the time of issuance of the permit. The permit also contains the requirements to: 1) report to EPA and NHDES-WD the name(s) of all Industrial Users subject to Categorical Pretreatment Standards (see 40 CFR §403 Appendix C for list) who commence discharge to the POTW after the effective date of the finally issued permit, and 2) submit copies of Baseline Monitoring Reports and other pretreatment reports submitted by industrial users to EPA and NHDES-WD.

I. Operation and Maintenance

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

Similarly, a permittee has a “duty to mitigate” pursuant to 40 C.F.R. § 122.41(d), which requires the permittee to “take all reasonable steps to minimize or prevent any discharge in violations of the permit which has a reasonable likelihood of adversely affecting human health or the environment.”

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

J. Antidegradation

This draft permit is being reissued with allowable wasteloads and parameter coverages which are different than the current permit and with no change in outfall location. The reason for changes from the current permit to the draft permit are due to a lower design flow of the treatment plant and a resulting higher dilution factor. The State of New Hampshire has indicated that there is no lowering of water quality and no loss of existing water uses and that no additional antidegradation review is warranted at this time.

K. Additional Requirements and Conditions

In the draft permit, compliance monitoring frequency and sample type for Flow, BOD₅, TSS, pH, TRC, and Escherichia coli bacteria are consistent with the latest version of EPA/NHDES-WD’s Effluent Monitoring Guidance (EMG) mutually agreed upon and first implemented in March

1993 and last revised on July 19, 1999. In addition, the WET test monitoring requirements are consistent with EPA-New England's Municipal Toxicity Policy. It is the intent of EPA-New England and NHDES-WD to establish minimum monitoring frequencies in all NPDES permits that (1) are reasonable from environmental and human health perspective; and, (2) are in accordance with the EMG. The effluent monitoring requirements in the draft permit have been established to yield data representative of the discharge under the authority of Section 308(a) of the CWA in accordance with 40 CFR §122.41(j), §122.44(i) and §122.48. The remaining conditions of the permit are based on the NPDES regulations 40 CFR, Parts 122 through 125, and consist primarily of management requirements common to all permits.

L. Essential Fish Habitat and Endangered Species

i. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104267), established a new requirement to describe and identify (designate) "essential fish habitat" (EFH) in each federal fishery management plan. Only species managed under a federal fishery management plan are covered. Fishery Management Councils determine which area will be designated as EFH. The Councils have prepared written descriptions and maps of EFH, and include them in fishery management plans or their amendments. EFH designations for New England were approved by the Secretary of Commerce on March 3, 1999.

The 1996 Sustainable Fisheries Act broadly defined EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Waters include aquatic areas and their associated physical, chemical, and biological properties. Substrate includes sediment, hard bottom, and structures underlying the waters. Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle. Adversely affect means any impact which reduces the quality and/or quantity of EFH. Adverse impacts may include direct (i.e. contamination, physical disruption), indirect (i.e. loss of prey), site specific or habitat wide impacts including individual, cumulative, or synergistic consequences of actions.

According to the National Marine Fisheries Service (NMFS), the Sugar River is EFH for Atlantic salmon (*Salmo salar*). According to the New Hampshire Department of Fish and Game, Atlantic salmon are stocked further upstream in the Merrimack River watershed but not in this area. This stretch of the river is using primarily for downstream passage. Adult Atlantic salmon returning to the river from the ocean do not make it up this far because they are trapped at a dam in Lawrence, Massachusetts. Adult brood stock Atlantic salmon are stocked in the Merrimack River above the Penacook WWTF

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

- The permit requires twice per year toxicity testing to ensure that the discharge does

- not present toxicity problems.
- The dilution factor has increased from 92.9 to 164 since the design flow for the treatment facility has reduced from 4.2 mgd to 2.37 mgd.
 - The permit prohibits the discharge to cause a violation of state water quality standards.

EPA believes the draft permit adequately protects EFH and therefore additional mitigation is not warranted. NMFS will be notified and an EFH consultation will be reinitiated if adverse impacts to EFH are detected as a result of this permit action or if new information is received that changes the basis for these conclusions.

ii. Endangered Species

The Endangered Species Act (16 U.S.C. 1451 et seq), Section 7, requires the EPA to ensure, in consultation with the U.S. Fish and Wildlife Service (USFWS) and/or NMFS, as appropriate, that any action authorized by EPA is not likely to jeopardize the continued existence of any endangered or threatened species, or adversely affect its critical habitat.

EPA believes that the authorized discharge from this facility is not likely to adversely affect and federally listed species or their habitats. EPA is informally consulting with USFWS to confirm this determination.

V. State Certification Requirements.

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either 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 or waives its right to certify as set forth in 40 CFR §124.53.

State water quality standards contain three major elements: Beneficial uses; Water Quality Criteria; and an Antidegradation Policy, all of which are part of the State's Water-Quality Certification under Section 401 of the Act. The only exception to this is that sludge conditions/requirements are not part of the Section 401 State Certification. The staff of the NHDES-WD has reviewed the draft permit and advised EPA-New England that the limitations are adequate to protect water quality. EPA-New England has requested permit certification by the State and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and §124.55.

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

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to:

Dan Arsenault
NPDES Permit Program for Municipal Permits
U.S. Environmental Protection Agency
One Congress Street, Suite 1100 (Mail Code: CPE)
Boston, Massachusetts 02114-2023
Telephone No.: (617) 918-1562
FAX No.: (617) 918-1505

Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-New England and the State Agency. 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-New England'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.

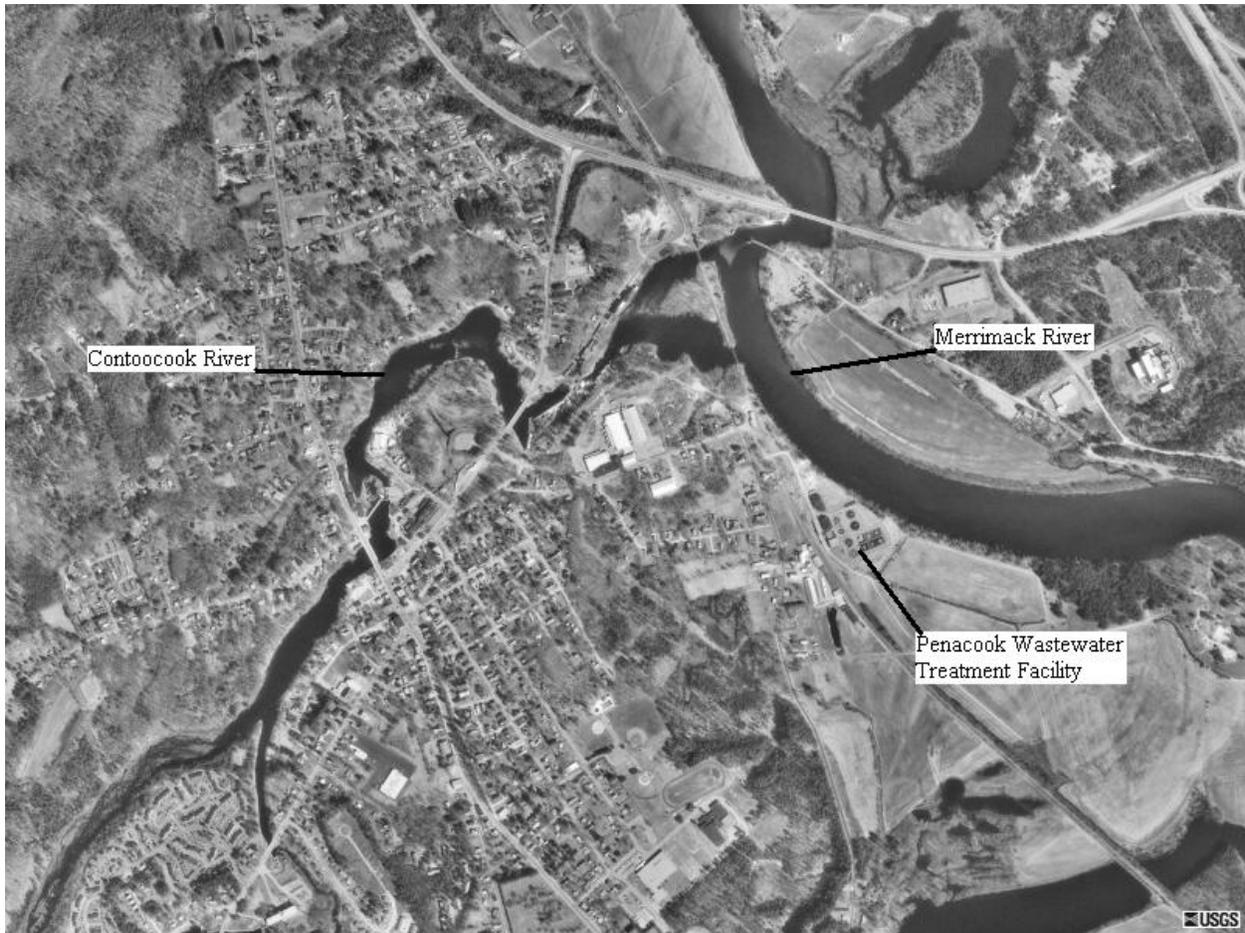
Additional information concerning the draft permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays.

Date:

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

ATTACHMENT A

Location of Penacook Wastewater Treatment Facility



* Aerial photo taken April 12, 1998. Photo obtained from www.terraserver.microsoft.com.

ATTACHMENT B**EFFLUENT CHARACTERISTICS AT OUTFALL 001**

The following effluent characteristics were derived from analysis of discharge-monitoring data collected from Outfall 001 during the five year period January 2000 through December 2005. Data were extracted from the monthly Discharge Monitoring Reports submitted by the Penacook Wastewater Treatment Facility. The effluent values characterize treated sanitary and commercial wastewaters discharged from this facility.

Parameter	Average of Monthly Averages	Range of Monthly Averages	Maximum Daily¹
Effluent Flow (mgd)	0.58	0.28-1.08	4.0
Effluent BOD ₅ (mg/l)	7.36	2.0 – 25.0	46.0
Effluent BOD ₅ (lb/day)	34.22	5.0 - 155.29	487.5
Effluent TSS (mg/l)	4.56	1.0 – 16.0	40.0
Effluent TSS (lb/day)	21.14	3.42 - 83.32	888
Effluent pH (s.u.)	---	6.54 - 7.7	---
Total Residual Chlorine	0.47	0.29 – 0.67	1.11
<i>Range of WET Test Results</i>			
	Ceriodaphnia dubia	Pimephales promelas	
LC50 (% Effluent)	44% - 100%	100%-100%	

ATTACHMENT C
CALCULATIONS OF MASS-BASED LIMITS

Calculations of maximum allowable loads for average monthly BOD₅ and TSS are based on the following equation.

$$L = 8.345 * Q * C$$

Where:

L = Maximum allowable load, in lbs/day, rounded to nearest 1 lbs/day.

C = Maximum allowable effluent concentration for average monthly reporting period, in mg/L.

Q_{PDF} = Treatment plant's design flow, in MGD

8.345 = Factor to convert effluent concentration, in mg/L, and plant's design flow, in MGD, to lbs/day.

DERIVATION OF 7Q10 LOW-FLOW AT OUTFALL 001

$$Q_{001} = \frac{(Q_{Merrimack} + Q_{Contoocook})}{(DA_{Merrimack} + DA_{Contoocook})} (DA_{AreaBetween}) + Q_{Merrimack} + Q_{Contoocook}$$

where:

Q₀₀₁ = Estimated 7Q10 flow at Outfall 001, in cubic feet per second (cfs)

Q_{Merrimack} = 7Q10 flow of Merrimack River gage, in cfs

Q_{Contoocook} = 7Q10 flow of Contoocook River gage, in cfs

DA_{Merrimack} = Drainage area associated with the gaged portion of the Merrimack

DA_{Contoocook} = Drainage area associated with the gaged portion of the Contoocook

DA_{Between} = Drainage area of area between gaged watersheds and Outfall 001; and

Where:

Merrimack River gage at Franklin Junction, NH;

U.S. Geological Survey No. 01081500;

Drainage Area: 1507 mi²

7Q10 = 550.62 cfs

Period of Record: 1906 – 1978.

Contoocook River gage at Penacook, NH;

U.S. Geological Survey No. 01088000;

Drainage Area: 766 mi²

7Q10 = 94.03 cfs

Period of Record: 1930 - 1977.

$$Q_{001} = \frac{(550.62cfs + 94.03cfs)}{(1507 + 766)mi^2} (70mi^2) + 550.62cfs + 94.03cfs = 664.5cfs$$

DILUTION FACTOR

Equation used to calculate available dilution factor at Outfall 001:

$$DilutionFactor = \frac{(Q_{001}) + (Q_{PDF} \times 1.547)}{Q_{PDF} \times 1.547} \times 0.9$$

where:

- Q₀₀₁ = Estimated 7Q10 flow at Outfall 001, in cfs;
- Q_{PDF} = Treatment plant's design flow, in mgd;
- 1.547 = Factor to convert mgd to cfs
- 0.9 = Factor to reserve 10% of river's assimilative capacity.

WATER-QUALITY BASED LIMIT

Equation used to calculate Average Monthly and Maximum Daily Total Residual Chlorine limits, of applicable:

$$\text{Chlorine Limit} = \text{Dilution Factor} \times \text{Water Quality Criteria}$$

Where Water Quality Criteria for chlorine are:

- 0.011 = Chronic Aquatic-Life Criteria, mg/L
- 0.019 = Acute Aquatic-Life Criteria, mg/L