

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND REGION
ONE CONGRESS STREET
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

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

NPDES PERMIT NO.: NH0101150

PUBLIC NOTICE START/FINISH DATE: July 14, 2006

PUBLIC NOTICE NUMBER: NH-016-06

NAME AND MAILING ADDRESS OF APPLICANT:

Swanzey Sewer Commission
P.O. Box 10009
Swanzey, New Hampshire 03446

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Swanzey Wastewater Treatment Plant
Denman Thompson Highway
Swanzey, New Hampshire 03446

RECEIVING WATER: Ashuelot River (Hydrologic Unit Code: 01080201)

CLASSIFICATION: B

I. Proposed Action, Type of Facility and Discharge Location

The Town of Swanzey (“Town” or “Permittee”) has applied to the U.S. Environmental Protection Agency (“EPA”) to reissue its National Pollution Discharge Elimination System (NPDES) permit to discharge treated effluent from the Swanzey Wastewater Treatment Plant (“Swanzey WWTP” or “Facility”) into the receiving water, the Ashuelot River. The Ashuelot River is used for fishing, boating, swimming and other primary contact recreation. The effluent does not discharge near a swimming beach area. The Facility collects and treats domestic and commercial wastewater from the Town of Swanzey. The Facility does not accept septage.

The Swanzey WWTP is designed as a 0.16 million gallon per day (“MGD”) aerated lagoon facility. Upon entering the Facility, the wastewater passes through a bar screen in order to remove larger

debris. The wastewater then flows sequentially through three lagoons. The effluent from the last lagoon flows through a chlorine contact chamber for disinfection, after which it discharges to the Ashuelot River.

The previous permit was issued on October 25, 1982, and expired on October 25, 1987. The expired permit ("Existing Permit") has been administratively continued pursuant to 40 Code of Federal Regulations (CFR) § 122.6 based on the Permittee's timely re-application for a new permit.

II. Description of Discharge

A quantitative description of the Facility's discharge represented by effluent monitoring data from January 2004 through September 2005 is shown in the attached Table One. The data was compiled from Discharge Monitoring Reports ("DMRs") that were submitted to EPA and the New Hampshire Department of Environmental Services, Water Division (NHDES). The draft NPDES permit ("Draft Permit") contains limitations for Carbonaceous Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids (TSS), pH, Total Residual Chlorine, *Escherichia coli* (E. coli), Total Phosphorus, and Whole Effluent Toxicity (WET).

III. Limitations and Conditions

Effluent limitations and monitoring requirements are found in PART I of the Draft Permit. The basis for each limit and condition is discussed in sections IV.D through IV.K of this Fact Sheet.

IV. Permit Basis and Explanation of Effluent Limitations Derivation

A. General Statutory and Regulatory Background

Congress enacted the Clean Water Act ("CWA" or "Act"), "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 the waters of the United States from any point source, except as authorized by specified permitting sections of the Act, 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 or NPDES. Under this section of the Act, 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 CFR 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 performance-based requirements based on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of BOD₅, TSS and pH. 40 C.F.R. Part 133.

Water quality-based effluent limits, on the other hand, 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 122.44(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 Management And Protection, Chapter 485A, Water Pollution and Waste Disposal Section 485-A. Hereinafter, New Hampshire's Surface Water Quality Regulations are referred to as the NH Standards.

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from the state's water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable in stream pollutant 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 criterion 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 criterion 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 CFR § 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 from the date the issued permit becomes effective. See 40 CFR § 125.3(a)(1). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit. The regulations governing EPA's NPDES permit program are generally found in 40 CFR Parts 122, 124, 125 and 136.

B. Development of Water Quality-based Limits

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

Reasonable Potential

In determining reasonable potential, EPA considers: (1) existing controls on point and nonpoint sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit application, monthly DMRs and State and Federal water quality reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in *Technical Support Document for Water Quality-based Toxics Controls*, March 1991, EPA/505/2-90-001 in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water. In accordance with New Hampshire regulations (RSA 485-A:8, VI, Env-Ws 1705.02), available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life and human health criteria for non-carcinogens, or the long-term harmonic mean flow for human health (carcinogens only) in the receiving water at the point just upstream of the outfall. Furthermore, 10 percent (%) of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01.

Anti-Backsliding

Section 402(o) of the CWA generally provides that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. EPA has also promulgated anti-backsliding regulations, which are found at 40 CFR §

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.

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 CFR. § 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 CFR. § 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 CFR § 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 CFR § 122.4(d) and 40 CFR § 122.44(d).

C. Development of Water Quality Based Effluent Limitations

Section 303(d) of the CWA requires states to identify waters within their boundaries for which technology-based effluent limitations are insufficiently stringent to implement applicable water quality standards. States are required to prepare Total Maximum Daily Load (TMDL) analyses for receiving waters listed on the 303(d) list. A TMDL is a scientific analysis which identifies the amount of a pollutant from point, nonpoint and background sources that may be discharged to a water quality-limited receiving water. Any pollutant loading above the TMDL will result in violation of the applicable water quality standards.

The State of New Hampshire's 2004 303(d) list of impaired waters identifies surface waters which do not currently meet state water quality standards (NHDES 2004). Segments of the Ashuelot River

have been identified as violating water quality standards for percent Dissolved Oxygen (DO) saturation, aluminum, pH, and *Escherichia coli*. A segment-by-segment list of impairments appears in Attachment A. The State conducted the sampling necessary to perform a TMDL on the segment of the Ashuelot River above the Keene Wastewater Treatment Plant to below the Swanzey Wastewater Treatment Plant in 2001 and 2002. This sampling showed that the segment is exhibiting cultural eutrophication, and that the Keene and Swanzey wastewater treatment plants are discharging significant quantities of nutrients to the river. The completion of the TMDL has been delayed several times, and the State does not now anticipate completing the TMDL until 2009.

In the absence of a TMDL, EPA is required to use available information to establish water quality-based limits when issuing NPDES permits for discharges to impaired waters. See generally, 40 CFR §122.44 (d). EPA has established water quality-based limits for total phosphorous using data collected by NHDES for the TMDL, applicable narrative state water quality standards, federal water quality criteria guidance and other relevant information discussed in the “Nutrients” section below. The EPA believes that the proposed limits represent the minimum levels of control necessary to achieve water quality standards.

While the permit will be issued for the normal five year term, it can be reopened and modified during its term under certain circumstances. A permit may be modified or revoked and reissued in accordance with 40 CFR § 122.62(a) (Causes for modification) or (b) (Causes for modification or revocation and reissuance). One basis for reopening and modifying the permit during its term is the receipt of information that was not available at the time of permit issuance and that would have justified application of different permit conditions (“New Information”). See 40 CFR §122.62(a)(2). New Information may include, but is not limited to, an applicable final Total Maximum Daily Load (“TMDL”); other relevant water quality data or studies provided by any party; and the results of ESA Section 7 consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service. In addition to constituting New Information, the outcome of the ESA Section 7 consultation may also satisfy the requirements of 40 CFR § 122.62(b)(1). A reopener provision reflecting the foregoing has been added to the permit.

Any modified permit resulting from the reopener must be consistent with applicable anti-backsliding provisions. See e.g., CWA §§ 402(o)(1), 303(d)(4)(A)(i), 402(o)(2)(B) (and final paragraph) and 40 CFR § 122.44(l).

D. Flow

The Swanzey WWTP design flow rate of 0.16 MGD is used to calculate the mass limits for Carbonaceous Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids (TSS) and Available Dilution as discussed below. If the effluent discharged for a period of ninety (90) consecutive days exceeds 80 percent of the 0.16 MGD design flow, (0.13 MGD), the Permittee must notify EPA and NHDES, and implement a program to maintain satisfactory treatment levels.

E. Conventional Pollutants

Under Section 301(b)(1)(B) of the CWA, POTWs must have achieved effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth at 40 CFR Part 133. Effluent limitations for monthly and weekly average Carbonaceous Biochemical Oxygen Demand (CBOD₅) and Total Suspended Solids (TSS) are based on requirements under Section 301(b)(1)(B) of the CWA and 40 CFR § 133.102. The limits for *Escherichia coli* bacteria as well as the pH range are based upon State Certification requirements for Publicly Owned Treatment Works (POTW) under Section 401(d) of the CWA, 40 CFR §§ 124.53 and 124.55, and water quality considerations.

Carbonaceous Biochemical Oxygen Demand (CBOD₅)

Biochemical Oxygen Demand (BOD) serves as a measure of the dissolved oxygen used by microorganisms in the biochemical oxidation of organic matter. BOD is used to determine the approximate quantity of oxygen that will be required to stabilize the organics (carbonaceous matter) present in waste. However, non-carbonaceous matter, in particular ammonia, is consumed by other groups of bacteria, which also use oxygen. During the process of nitrification, these specialized groups of bacteria oxidize ammonia to nitrite, and subsequently nitrate. Thus, when nitrification occurs in a BOD test, the oxygen demand appears to be higher because non-carbonaceous matter (ammonia) is consumed in addition to the carbonaceous matter. To eliminate the influence of nitrifying bacteria, the secondary treatment regulations in 40 CFR § 133.102(a)(4) allow the use of a Carbonaceous Biochemical Oxygen Demand (CBOD₅) limits in lieu of BOD₅ limits. The CBOD₅ limits are 5 mg/l lower than the BOD₅ limits.

Nitrification has been observed at the Swanzey WWTP. Therefore, CBOD₅ effluent limits are proposed in the Draft Permit to substitute for the BOD₅ limits in the Existing Permit. The CBOD₅ average monthly concentration limit will be 25 mg/l; the average weekly limit is 40 mg/l; and the daily maximum at 45 mg/l.

Total Suspended Solids (TSS)

Based on a review of DMRs between January 2004 through September 2005 (review period), TSS values ranged between 2 mg/l and 39 mg/l (n=21). The average maximum daily, weekly average and monthly average were, respectively, 17 mg/l (3.6 mg/l-39 mg/l; n=21), 17.4 mg/l - 39 mg/l; n=21) and 12 mg/l (2-28.1 mg/l; n=21) (See Table One). No violations of the TSS permit limits occurred during this review period.

CBOD₅ and TSS Mass Loading Calculations:

The Draft Permit also contains average monthly, average weekly and maximum daily mass-based

limits (lbs/day) for CBOD₅ and TSS. Mass-based limits are incorporated into the permit consistent with 40 CFR § 122.45(f). See also, NPDES Permit Writers' Manual at p. 76 (USEPA 1996).

Calculations of maximum allowable mass-based loads for average monthly CBOD₅ and TSS are based on the following equation:

$L = C \times DF \times 8.34$ where:

L = Maximum allowable load in lbs/day;

C = Maximum allowable effluent concentration for reporting period in mg/l;

DF = Design flow of facility in MGD; and

8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

CBOD₅ Average Monthly and Average Weekly Limits

[25] (Concentration limit) X 0.16 (design flow) X 8.345 (Conversion Factor) = 33.4 lbs/day

[40] (Concentration limit) X 0.16 (design flow) X 8.345 (Conversion Factor) = 53.4 lbs/day

[45] (Concentration limit) X 0.16 (design flow) X 8.345 (Conversion Factor) = 60.1 lbs/day

TSS Average Monthly and Average Weekly Limits

[30] (Concentration limit) X 0.16 (design flow) X 8.345 (Conversion Factor) = 40.1 lbs/day

[45] (Concentration limit) X 0.16 (design flow) X 8.345 (Conversion Factor) = 60.1 lbs/day

[50] (Concentration limit) X 0.16 (design flow) X 8.345 (Conversion Factor) = 66.8 lbs/day

Eighty-Five Percent CBOD₅ and TSS Removal Requirement - 40 CFR § 133.102(3) requires that the 30-day average percent removal for CBOD₅ and TSS be not less than 85%. These limits are maintained in the Draft Permit.

pH

Based on a review of the DMRs for the review period, the pH values ranged between 6.6 standard

units (SU) and 7.8 SU. No violations of the pH limit occurred during the review period.

The Draft Permit includes pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 C.F.R. §133.102(c). Class B waters shall be in a range of 6.5 through 8.0 SU, unless due to natural causes [Env-Ws 1703.18]. There shall be no change from background conditions that would impair any use assigned to this class. The monitoring frequency is once (1) per day.

Language has been added to the State Permit Conditions (PART I.D.1.a.) allowing for a change in pH limit(s) under certain conditions. Consistent with NHDES, *Procedures for a pH Adjustment Demonstration Project*, if the applicant can demonstrate to the satisfaction of NHDES that the instream pH standard will be protected when the discharge is outside the permitted range, then the applicant or NHDES may request in writing that the permit limits be modified by EPA to incorporate the results of the demonstration. The limit determined from the demonstration study as approved by the NHDES must satisfy all effluent requirements for this discharge category and comply with NH Standards amended on December 3, 1999. If the State approves results from a pH demonstration study, this permit's pH limit range can be relaxed. To account for the possibility of NHDES granting a formal approval changing the pH limit(s) to outside the 6.5 to 8.0 SU, EPA has added a provision to the Draft Permit which allows EPA to modify the pH limit(s) using a certified letter approach. This change will be allowed if it is demonstrated that the revised pH limit range does not alter the naturally occurring receiving water pH. See Part I.E.1. SPECIAL CONDITIONS of the Draft Permit. However, the pH limit range cannot be less restrictive than 6.0 - 9.0 S.U. found in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for the facility.

Escherichia coli

Effective August 31st 1991, revision of the State statutes changed the bacteria testing requirements for discharges to freshwater and saltwater receiving waters (NH RSA 485-A:8). This revision has resulted in the replacement of testing for Total Coliform with *Escherichia coli* bacteria in the Draft Permit.

The Draft Permit includes an average monthly limit, 126 colonies/100 ml, and maximum daily limit, 406 colonies/100ml, for Class B waters not designated as beach area. The calculation for compliance with the average monthly limit for *Escherichia coli* shall be determined by using the geometric mean. The basis for this limitation is found in New Hampshire's State statutes (N.H. RSA 485-A:8) and ENV-WS 1703.06, which requires bacteria criteria to be applied at the end of the wastewater treatment facility's discharge pipe.

During the review period, the maximum daily results for Total Coliform ranged between 14 col/100 ml and 215 col/100 ml (n=21). Given a Total Coliform maximum daily limit of 240 col/ml, no

violations occurred during the review period.

Dissolved Oxygen (DO)

Dissolved oxygen measures averaged 11.1 mg/l (n=21) in the effluent during the review period. The requirement in the Existing Permit to monitor DO once/day has been retained in the Draft Permit given that below the Swanzey WWTP, at Station 14-ASH, violations of NH DES water quality criterion of DO content of at least 75% of saturation (Env-Ws 1703.07 (c)) occurred. See page 16 for details. Also, a TMDL is being drafted to address DO impairments in the Ashuelot River, and this information would be important to determine whether the Swanzey WWTP is contributing to the DO impairments. The Draft Permit requires that DO monitoring occur prior to 8:00 AM to ensure that the most critical period (i.e., when DO concentrations are typically lowest) is represented.

F. Non-Conventional and Toxic Pollutants

Water quality-based limits for specific toxic pollutants such as ammonia, metals, etc. are determined from numeric chemical-specific criteria derived from extensive scientific studies. EPA has summarized and published specific toxic pollutants and their associated toxicity criteria in *Quality Criteria for Water*, 1986, EPA 440/5-86-001 as amended, commonly known as the federal "Gold Book." Each criterion consists of two values: an acute aquatic-life criterion to protect against short-term effects, such as death, and a chronic aquatic-life criterion to protect against long-term effects, such as poor reproduction or impaired growth. New Hampshire adopted these "Gold Book" criteria, with certain exceptions and included them as part of the NH Standards adopted on December 10, 1999. EPA uses these pollutant-specific criteria along with available dilution in the receiving water to determine a specific pollutant's draft permit limit. Available dilution is discussed in the next subheading.

7Q10 Flow

The 7Q10 is the lowest observed mean river flow for 7 consecutive days recorded over a 10-year recurrence interval. See Env-Ws 1702.44. For rivers and streams, NH Standards requires that 7Q10 flow be used to represent the critical hydrologic condition at which water quality criteria must be met. See Env-Ws 1705.02(d). The estimated 7Q10 flow of 31.5 cfs (20.4 MGD) was provided by the NHDES (NHDES 2000).

Available Dilution

Water quality-based limitations are established with the use of a calculated available dilution. Available dilution (also referred to as dilution factor) in the receiving water was determined to be 115. A dilution factor is calculated using a treatment plant's design flow, the 7Q10 low flow in the receiving water at the treatment plant's outfall, and a State of New Hampshire dictated 10% set aside

or reserve. The State reserves 10% of the assimilative capacity of the receiving water for future uses is pursuant to RSA 485-A:13,I.(a). See the dilution factor calculation below.

Given:

Facility design flow = 0.16 MGD or 0.2475 cubic feet per second (cfs).
7Q10 flow = 31.5 cfs
10% Reserve (0.9)

$$\frac{\text{River flow (7Q10)} + \text{Plant Design Flow} \times \text{Reserve}}{\text{Plant Design Flow}} = \text{Dilution Factor}$$

Then,

$$\frac{31.5 \text{ cfs} + 0.2475 \text{ cfs}}{0.2475 \text{ cfs}} \times 0.9 = 115.45 \text{ rounded to } 115$$

Total Residual Chlorine

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 CWA and State law N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-Ws 1703.21 (a) prohibits the discharge of toxic pollutants in toxic amounts. Therefore, to reduce the potential for the formation of chlorinated compounds during the wastewater disinfection process, EPA has established a limitation of 1.0 mg/l for average monthly and maximum daily Total Residual Chlorine (TRC). For Swanzey, these limitations are more stringent than the State's Surface Water Regulations would allow after factoring available dilution. For instance, applying the acute criterion (19 ug/l) the maximum daily limit would be as follows;

Monthly average and daily maximum effluent limitations calculated using NH water quality criteria are shown below :

Given:

Chronic Criterion = 11 ug/l = .011 mg/l
Acute Criterion = 19 ug/l = 0.19 mg/l
Dilution factor = 115

Monthly Average Limit = (Chronic Criterion) (Dilution Factor) = (0.011 mg/l)(115) = 1.26 mg/l
Maximum Daily Limit = (Acute Criterion) (Dilution Factor) = (0.19 mg/l)(115) = 2.19 mg/l

Calculation of receiving water concentrations using dilution factors is based on an assumption of complete mixing. In this instance, EPA does not believe that use of the dilution factor yields

sufficiently protective effluent limits. See 40 CFR 122.44(d)(1)(ii) (providing EPA with discretion to use dilution when determining reasonable potential to violate criteria only "where appropriate"). Chlorine and chlorine compounds can be extremely toxic to aquatic life. See USEPA 1986 and Metcalf & Eddy 1991. Because mixing of the discharge with the receiving water is not instantaneous and because of the presence of sensitive aquatic life in the receiving water, EPA believes a more stringent limit is necessary to ensure that there is no mortality within the mixing zone. See Env-Ws 1707.02 (g). Therefore, EPA has included a maximum daily limit of 1 mg/l. This limit is easily achievable by a well designed and operated chlorine disinfection system, without the need to dechlorinate.

Nutrients

Phosphorous and other nutrients (i.e., nitrogen) promote the growth of nuisance algae and rooted aquatic plants. Typically, elevated levels of nutrients will cause excessive algal and/or plant growth resulting in reduced water clarity and poor aesthetic quality. Through respiration, and the decomposition of dead plant matter, excessive algae and plant growth can reduce in-stream dissolved oxygen concentrations to levels that could negatively impact aquatic life and/or produce strong unpleasant odors.

EPA has produced several guidance documents which contain recommended total phosphorous criteria for receiving waters. The 1986 Quality Criteria of Water (Gold Book) recommends in-stream phosphorous concentrations of 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly to lakes or impoundments, and 0.025 mg/l within the lake or reservoir.

In December 2000, EPA released "Ecoregional Nutrient Criteria" (USEPA 2000), which was established as part of an effort to reduce problems associated with excess nutrients in water bodies located within specific areas of the country. The published criteria represent conditions in waters within each specific ecoregion which are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. Swanze is within Ecoregion VIII, *Nutrient Poor Largely Glaciated Upper Midwest and Northeast*. Recommended criteria for this eco-region is a Total Phosphorous criterion of 10 ug/l (0.010 mg/l) and chlorophyll *a* criteria of 0.63 ug/l (0.0063 mg/l). These recommended criteria are found in the *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII* (USEPA 2001).

More recently, Mitchell, Liebman, Ramseyer, and Card (in draft 2004), in conjunction with the New England States, developed potential nutrient criteria for rivers and streams in New England. Using several river examples representative of typical conditions for New England streams and rivers, they investigated several approaches for the development of river and stream nutrient criteria that would be dually protective of designated uses in both upstream reaches and downstream impoundments.

Based on this investigation an instream total phosphorous concentration of 0.020-0.022 mg/l was identified as protective of designated uses for New England rivers and streams. The development of this New England-wide total phosphorous concentration was based on more recent data than the National Ecoregional nutrient criteria, and has been subject to quality assurance measures. Additionally, the development of the New England-wide concentration included reference conditions for waters presumed to be protective of designated uses.

The New Hampshire Surface Water Quality Regulations contain a narrative criterion which states that phosphorous contained in effluent shall not impair a water body's designated use. Specifically, Env-Ws 1703.14(b) states that, "Class B waters shall contain no phosphorous or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring." Env-Ws 1703.14(c) further states that, "Existing discharges containing either phosphorous or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorous or nitrogen to ensure attainment and maintenance of water quality standards." Cultural eutrophication is defined in Env-Ws 1702.15 as, "... the human- induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen." Although numeric nutrient criteria have not yet been developed in New Hampshire, a total phosphorous concentration of 0.05 mg/l is considered by the NHDES as a level of concern (NHVRAP & NHDES 2002, 2003, and 2005).

As noted earlier, Section 303(d) of the CWA requires states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such, require the development of total maximum daily loads (TMDL). Impaired water quality conditions persist in the Ashuelot River and have resulted in its listing in the State of New Hampshire's *Final List of Threatened or Impaired Waters That Require a TMDL* (NHDES 2004), formerly referred to as the 303(d) list. Aquatic life use is not supported in segments of the Ashuelot River due to dissolved oxygen saturation. A TMDL was scheduled to be developed for dissolved oxygen saturation in 2007, but has been extended until 2009. During the summers of 2001 and 2002, NHDES collected water samples from the Ashuelot River for the development of the TMDL. This data, and data from the NHDES OneStop Data Retrieval Site, were used as the basis for developing the total phosphorous limit in the Draft Permit.

Instream Sampling in the Asheulot River: Total Phosphorus and Chlorophyll *a*

The segment of the Asheulot River between Keene and Swanzey is at particular risk of eutrophication given the rivers morphology and the existing sources of phosphorous within it (i.e., Keene and Swanzey WWTPs). The first 30 miles of the Ashuelot River drops quickly at a rate of 37 feet per mile. However, the river has a particularly low gradient through Keene, Swanzey and Winchester. For example, the gradient from the Colony Mill dam in Keene to the Homestead Dam in West Swanzey is approximately 12 feet over 8.7 miles (VHB 2005). This translates to an average of 1.4 feet per mile, which is considered quite flat, especially when compared to the upper portions of the watershed (VHB 2005). Given the low gradient and known point sources of phosphorous, the Ashuelot River is at considerable risk for eutrophication.

During 2001 and 2002, the NH DES sampled the Ashuelot River to collect data for the TMDL. The river was sampled on August 16, 23, 29, 2001, and on August 28, 2002. A summary of pertinent data obtained during the sampling is presented below in Table Three. The data represents samples taken from the two treatment facilities in the study area, Keene and Swanzey, and from the Ashuelot River upstream and downstream of these facilities. A map showing the location of the treatment facilities and the location of the Ashuelot River sampling sites is included in Figure One (see attached locus map). The sampling stations are numbered sequentially from upstream to downstream, with the upstream stations having the higher numbers. Station 2- Sba is a sampling station on the South Branch of the Ashuelot River, which discharges to the main branch just downstream of Station 16B - Ash.

Table Two

Station*	Ortho Phosphorus (mg/l)				Total Phosphorous (mg/l)				Chlorophyll <i>a</i> (ug/l)			
	2001			2002	2001			2002	2001			2002
	8/16	8/23	8/29	8/28	8/16	8/23	8/29	8/28	8/16	8/23	8/29	8/28
16D-Ash	0.031	<0.005	<0.005	<0.01	0.018	0.014	0.016	0.022	1.97	2.16	3.44	1.91
Keene WWTF	3.053	3.68	2.89	3.72	3.44	3.4	3.25	3.72	1.38	1.66	1.78	NA
16B-Ash	0.638	0.102	0.898	1.06	0.644	0.125	0.955	1.132	2.3	2.89	3.65	2.97
2-Sba	0.047	0.005	0.005	<0.01	0.023	0.017	0.02	0.015	3.23	2.13	2.73	2.2
16-Ash	0.145	0.241	0.246	0.245	0.16	0.271	0.287	0.268	3.44	1.8	3.84	NA
15E-Ash	0.187	0.231	0.257	0.196	0.203	0.265	0.31	0.235	4.72	10.3	6.04	3.97
15-Ash	0.179	0.169	0.206	0.209	0.197	0.197	0.265	0.263	7.09	11.4	10.43	4.93
14T-Ash	0.181	0.161	0.201	0.21	0.193	0.192	0.244	0.29	4.31	5.83	6.92	6.23
Swanzey WWTP	4.153	4.64	4.95	5.67	4.65	4.65	5.69	5.517	250.8	114	237.6	7.65
14-Ash	0.12	0.117	0.136	0.141	0.158	0.18	0.277	0.213	7.83	16.3	69.64	13.64
12-Ash	0.112	0.085	0.116	0.097	0.123	0.123	0.191	0.143	5.76	3.82	23.77	19.02

Except at stations located above the Keene WWTF and on the South Branch of the Ashuelot River (Stations 16D-Ash and 2-Sba, respectively), the data in Table Three illustrates that total phosphorous concentrations at all sampling stations on the mainstem exceed all the Gold Book recommended criteria (0.02 mg/l, 0.05 mg/l, 0.10 mg/l), New England-wide recommended criteria (0.020 mg/l - 0.022 mg/l), Ecoregion criterion (0.010 mg/l), and the NHDES level of concern (0.05 mg/l)

As discussed above, while phosphorous is often used as a causal indicator of eutrophication because its presence results in plant growth, chlorophyll *a* and dissolved oxygen are response indicators

(USEPA 2000; Chapra 1997; Thomann & Mueller 1987). Measures of chlorophyll *a* in surface waters may be correlated with the amount of suspended algae (“phytoplankton”). The recommended total chlorophyll *a* criteria for Ecoregion VIII, *Nutrient Poor Largely Glaciated Upper Midwest and Northeast* is 0.63 ug/l. This value can be found in the *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII*, EPA 822-B-01-015, December, 2001.

As illustrated in Table Three, chlorophyll *a* data exceed the recommended National Ecoregion chlorophyll *a* criterion (0.63 ug/l) at all stations. To demonstrate, the range of instream chlorophyll *a*, excluding the WWTP’s, is 1.97 ug/l - 69.64 ug/l. Overall, there is a general increase in the concentration of chlorophyll *a* moving downstream. Although the available chlorophyll *a* data set for the Ashuelot River is limited by the number of sampling events, the data are useful for evaluating whether algal blooms occurred and providing general insight into the trophic status of the Ashuelot River.

Table Four provides a summary from the literature of the trophic status for fresh water systems as characterized by mean chlorophyll *a*. Although, the data for chlorophyll *a* measures in the Ashuelot River are based on single samples, a comparison of these values with those in Table 4 serves to generally demonstrate that eutrophic conditions exist in the Ashuelot River, in particular downstream of the West Swanzey WWTP. Also, during water quality surveys conducted in August of 2001 and 2002, total chlorophyll *a* concentrations increased with distance downstream, and were highest downstream of the West Swanzey WWTP. Based on the values presented in Table Four, the Ashuelot River would be considered, at a minimum, mesotrophic and, thus at risk for eutrophication, and eutrophic.

Table 3. Freshwater System Trophic Status Based on Mean Chlorophyll *a* *

Trophic Status	Wetzel (2001)	Ryding and Rast (1989)	Smith (1998)	Novotny and Olem (1994)
Eutrophic	>10 ug/l	6.7 - 31 ug/l	-----	>10 ug/l
Mesotrophic	2- 15 ug/l	3 - 7.4 ug/l	3.5 - 9 ug/l	4 - 10 ug/l
Oligotrophic	0.3 - 3 ug/l	0.8 - 3.4 ug/l	-----	< 4 ug/l

*Adapted from USEPA 2003

The monitoring data show that the Swanzey WWTP discharges high concentrations of chlorophyll *a* to the Ashuelot River. The high chlorophyll *a* concentrations in the Facility’s effluent are due to the wastewater treatment technology used at the facility, a lagoon system, which promotes algal growth to a much greater extent than other technologies, such as activated sludge. In addition to providing nutrients that contribute to algal growth, the West Swanzey WWTP discharge may be providing a seed population of algae to the Ashuelot River which potentially helps algal blooms become established further downstream.

Another indication of eutrophication in the Ashuelot River is the macrophyte and periphyton growth observed downstream of the Swanzev WWTP discharge. In late August 2001, at sampling Station 14-ASH (located approximately 1.5-2.0 miles downstream of the WWTP) and Station 12-ASH (located approximately 3-4 miles downstream of the WWTP), phytoplankton was observed to be 10% to 15% and 100% cover, respectively. Additionally, periphyton growth was observed to be 80% cover at Station 12-ASH (NHDES 2001).

Dissolved oxygen data were reviewed at the NHDES OneStop Data Retrieval site for the percent saturation in the Ashuelot River. Supersaturation (DO concentrations >100 % of the theoretical concentration at the observed temperature) can occur under conditions of excessive algae/plant growth which produce oxygen during photosynthesis (Thomann and Mueller 1987). Hence, the supersaturation can be indicative of eutrophic conditions. Data from 1992, 1993, 2001, and 2002 were provided for Stations 12 and 14, located below the Swanzev WWTP. The average percent saturation for DO was 91.95% with a range of 68.5% to 120% (n=11). Data from TMDL sampling on August 22 and 23, 2001 for Station 14-ASH, indicated supersaturated conditions with maximum DO recordings of 101.21mg/l and 108.20 mg/l. Although the data are limited, they indicate that supersaturation occurs and serve as another indicator of eutrophic conditions in the Ashuelot River.

Furthermore, below the Swanzev WWTP, at Station 14-ASH, violations of NH DES water quality criterion of DO content of at least 75% of saturation (Env-Ws 1703.07 (c)) occurred. On August 22, 23, and 24, 2001 there were violations of the DO content of at least 75% saturation with range between 63.9% to 74.7%. In particular, the continuous monitoring data from NH DES indicated that violation of the DO content of 75% saturation began at 10:30PM August 22, 2001 and lasted until August 23, 2001 at 2:30 PM.

Eutrophic conditions have also been noted by the Ashuelot River Local Advisory Committee (ARLAC). In the *Ashuelot River Corridor Management Plan* (ARLAC 2001, with the assistance of the NHDES), a number of issues are presented, which include eutrophic conditions and low dissolved oxygen during summer low flow conditions, and phosphorous loading from the Keene WWTP. The management goals in this plan recognize the need for reducing nutrient and chemical pollutant loads from the Keene WWTP (ARLAC 2001).

Conclusion: Proposed Total Phosphorus Limit

Based on the discussion above, it has been demonstrated that effluent discharged from the Swanzev WWTP contributes to the eutrophic conditions and impairment of the Ashuelot River. Thus, based on the New Hampshire narrative criteria, which requires the removal of phosphorous from discharges which encourage cultural eutrophication, the draft permit imposes a summer effluent limit of 1.0 mg/l for total phosphorus from April 1st to October 31. See Env-Ws Section 1703.14(c).

An estimate of the existing instream contribution of total phosphorus concentration from the Swanzev WWTP discharge is 0.043 mg/l, assuming an effluent total phosphorus concentration of

5 mg/l and a dilution factor of 115 (5 mg/l divided by the dilution factor (115) equals approximately 0.043 mg/l instream total phosphorus). This is the expected concentration due to the Swanzey discharge alone and does not include the background concentration, which averaged about 0.23 mg/l in the August 2001/2002 sampling (see Table 2). If the current background concentration is added to the Swanzey contribution, the expected instream concentration would be about 0.27 mg/l which far exceeds all recommended water quality criteria. While significant reductions in background concentration would be expected when Keene achieves its permit limit of 0.2 mg/l, the background concentration would have to be less than 0.061 mg/l before the receiving water would achieve even the Gold Book criteria of 0.1 mg/l at West Swanzey's current effluent concentration.

EPA has decided to apply the Gold Book criterion rather than the more stringent eco-region criteria, given that it was developed from an effects-based approach, versus the eco-region criteria that were developed on the basis of reference conditions. The effects-based approach is taken because it is often more directly associated with an impairment to a designated use (i.e. fishing, swimming). The effects-based approach provides a threshold value above which adverse effects (i.e., water quality impairments) are likely to occur. It applies empirical observations of a causal variable (i.e, phosphorus) and a response variable (i.e., chlorophyll *a*) associated with designated use impairments. Reference-based values are statistically derived from a comparison within a population of rivers in the same eco-region class. They are a quantitative set of river characteristics (physical, chemical and biological) that represent minimally impacted conditions.

Assuming that the background concentration of total phosphorous will be about 0.1 mg/l after the Keene Wastewater Treatment Plant (WWTP) achieves an effluent limit of 0.2 mg/l, a West Swanzey effluent limitation of 1 mg/l would result in an instream concentration of about 0.109 mg/l, only slightly above Gold Book criteria. Therefore, the permit includes an effluent limit for total phosphorous. It has been assumed that whatever treatment technology is provided for phosphorus control will also significantly reduce the discharge of chlorophyll. If the Keene WWTP does not achieve a total phosphorus limit of 0.2 mg/l, and/or the necessary instream results are not achieved, the Swanzey WWTP permit may be modified or revoked and reissued, in accordance with 40 CFR § 122.62(a) or (b), to account for higher background conditions, which would ultimately result in a lower total phosphorus limit for the Swanzey WWTP. See Draft Permit, Part I, Section I (Reopener Clause).

Phosphorus monitoring is required during the winter period, November 31st to March 31st . Monitoring phosphorous during the cold weather months is necessary to evaluate the potential for higher winter period phosphorus loadings to accumulate in downstream sediments, which could be subsequently released during the warm weather growing season. Monitoring during this period is necessary to determine whether a winter limit will be required. A monitoring requirement for orthophosphorous has been included for the winter period in order to determine the dissolved fraction of the total phosphorus being discharged. The greater the dissolved fraction, the lower the potential for accumulation of phosphorus in the sediments.

Ammonia as Nitrogen (NH₃-N)

Swanzey's updated NPDES permit application tested for Ammonia as Nitrogen (NH₃-N). The test showed an elevated level 35.0 mg/l of Ammonia (as N).

Elevated ammonia levels present two distinct environmental threats. First, short-term acute effects of high levels of ammonia will cause death of aquatic organisms. Long-term chronic effects of an elevated average ammonia levels will cause reproductive or growth difficulties. Secondly, high levels of ammonia can catalyze the growth of nitrifying bacteria. Nitrification caused by the bacteria breaks down ammonia and combines the freed nitrogen with oxygen to produce nitrites which are further metabolized by bacteria to nitrates. If the WWTP's effluent is discharged with high ammonia levels, the nitrification induced by the ammonia can cause the dissolved oxygen levels of the receiving water to drop because oxygen is taken out of solution from the receiving water to form the nitrogen compounds. For example, the oxygen required to oxidize ammonia is approximately 4.3 mg oxygen/mg ammonium-nitrogen (Metcalf & Eddy, 1991).

Based on the preceding discussion, EPA considers it appropriate that the West Swanzey WWTP monitor the effluent Ammonia (as N) levels. Ammonia (as N) monitoring will provide EPA with sufficient data to decide whether the Swanzey WWTP will require an Ammonia limit at a later date. The Ammonia monitoring applies from May 1st - September 30th.

G. Whole Effluent Toxicity

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 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, the whole effluent toxicity (WET) approach evaluates interactions between pollutants thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "Additive" 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's Water Quality Standards state that, "all 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 1703.21(a)]. 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. Given the current absence of toxicity testing, inclusion of the whole effluent toxicity limit in the draft permit will demonstrate the compliance/non-compliance with both the CWA's and the State's narrative water quality criterion of "no toxics in toxic amounts".

The Draft Permit requires the Permittee to perform one acute toxicity test per year using two species. The two species are Daphnid (*Ceriodaphnia dubia*) and Fathead Minnow (*Pimephales promelas*). The draft permit contains an LC50 limit of 50 percent effluent concentration. The LC50 is defined as the percentage of effluent lethal to 50% of the test organisms during a specific length of time.

One WET test shall be performed each calendar year. The first test shall be collected and the test completed within 60-days of the issued permit becoming effective. Results are to be submitted to EPA and NHDES-WD within 30-days of completing the test. In the succeeding calendar years, one WET test shall be conducted in the month of August, and submitted with the September DMR, which is due by October 15th.

If toxicity is found, monitoring frequency and testing requirements may be increased. The permit may also be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements or chemical specific limits. These actions will occur if the Regional Administrator determines the NH Standards are not adequately enforced and users of the waterways are not adequately protected during the remaining life of the permit. Results of these toxicity tests are considered "new information not available at permit development"; therefore, the permitting authority is allowed to use this information to modify an issued permit under authority in 40 CFR §122.62(a)(2).

This Draft Permit requires the reporting of selected parameters determined from the chemical analysis of the WET tests 100% effluent samples. Specifically, parameters for the constituents of ammonia nitrogen as nitrogen, hardness, and total recoverable aluminum, cadmium, copper, chromium, lead, nickel, and zinc are to be reported on the appropriate Discharge Monitoring Reports for entry into the EPA's Permit Compliance Systems Data Base. EPA New England does not consider reporting these requirements an unnecessary burden as the reporting these constituents is required with the submission of each toxicity report (See Draft Permit, **ATTACHMENT A**, page A-8).

H. Sludge

Section 405(d) of the CWA requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. The proposed

Draft Permit contains conditions intended to implement Section 405(d) which are not in the Existing Permit. Conditions include: required compliance by the statutory deadlines; required notifications for any planned changes in sludge use or disposal practices; causes for modification of the permit; and specific conditions relative to the Permittee's method of sludge disposal. In addition, the draft permit has been conditioned such that EPA and NHDES-WD are notified 180 days prior to a change in the sludge use or disposal method employed at permit reissuance. If the Permittee has performed any of the appropriate sewage sludge monitoring results for parameters associated with the new disposal method(s) chosen including pollutants, pathogens and vectors, that information should be included with the notification.

Domestic sludge which is land applied; disposed of in a surface disposal unit; or fired in a sewage sludge incinerator are subject to Part 503 technical standards. Part 503 regulations have a self-implementing provision, however, the CWA requires implementation through permits. Domestic sludges which are 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.

Swanzy's POTW is an aerated lagoon system. Lagoon system are designed to have their sludge removed about every 20 years. Since the lagoons at this facility were cleaned of sludge in 2002, it will be some twenty years before another sludge removal is anticipated.

I. Industrial Users

The Permittee is presently not required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR §§ 403 and 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 Draft 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 as amended) pursuant to 40 CFR §403.6 and 40 CFR Chapter I, Subchapter N (Parts 405-415, 417-436, 439-440, 443,446-447, 454-455, 457-461, 463-469, and 471 as amended) and/or New Hampshire Pretreatment Standards (ENV-Ws 904) who commence discharge to the POTW after the effective date of the finally issued permit, and (2) submit to EPA and NHDES-WD copies of Baseline Monitoring Reports and other pretreatment reports submitted by industrial users.

J. Essential Fish Habitat and Endangered Species

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 areas 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 essential fish habitat 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 affects 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 New Hampshire Fish and Game Department (NHFGD), the stocking of Atlantic salmon fry occurs in three tributaries well upstream from the West Swanzey WWTP. NHFGD estimates there are approximately 4,087 units of suitable Atlantic salmon rearing habitat upstream from the West Swanzey WWTP. One rearing unit equals a 100 square-yard area. There are no areas in close proximity to, or downstream from, the West Swanzey WWTP on the Ashuelot River that are stocked, and future stocking efforts will likely remain focused on upstream areas. There are three hydroelectric dams on the lower Ashuelot River with the closest dam located just upstream from the plant in West Swanzey.

While this segment of the Ashuelot River is not considered to be spawning or rearing habitat for Atlantic salmon, migrating smolts will pass by the WWTP as they move downstream on their seaward migration. Based on recent annual fall surveys, NHFGD estimates that approximately 5,470 smolts will migrate past the plant. In addition to Atlantic salmon, pre-spawn adult blueback herring (*Alosa aestivalis*) and American shad (*Alosa sapidissima*) are stocked in this general vicinity given the suitable habitat for juveniles of those species. Finally, the availability of forage and overall habitat value in the Ashuelot River, below the WWTP, is also suitable for adult trout and as such, this stretch is stocked annually with rainbow (*Salmo gairdneri*) and brown trout (*Salmo trutta*).

The conditions, limitations (including new numeric limits for chlorine), and monitoring requirements contained in this permit are designed to be protective of all sensitive aquatic species in the Ashuelot

River. Accordingly, it is EPA's opinion that adverse impacts to Atlantic salmon EFH have been minimized to the extent they are negligible, and not additional mitigation is warranted. If adverse affects to EFH do occur as a result of this permit action, or if new information changes the basis for this conclusion, then NMFS will be notified and consultation will be re-initiated.

Endangered Species

Section 7 of the Endangered Species Act (16 USC 1531 et seq) and implementing regulations (50 CFR part 402) require 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. See also, 40 CFR 122.49(c).

EPA is currently engaged in consultation with USFWS regarding the dwarf wedge mussel (*Alasmidonta heterodon*), which resides in multiple locations in the Ashuelot River. Freshwater mussel communities have been sited downstream of the West Swanzey WWTP effluent discharge. In a August 2003 report titled, *Freshwater Mussels of the Ashuelot River*, submitted to the USFWS the authors, Ethan Nedeau and Sean Werle, found very suitable habitat and abundant mussels at Site 17, located just upstream of the West Swanzey WWTP. Suitable habitat was observed at Site 18, located 2.5-3.0 miles downstream of the WWTP, although somewhat sandy, and supported abundant mussels. Although abundant mussels were observed at Sites 17 and 18, dwarf wedge mussels were not found. The authors indicated that the dwarf wedge mussel likely exists at Site 18 (below the WWTP) at extremely low densities, and that more surveys should be conducted in this area.

Currently, the service has not requested that EPA include any additional requirements or conditions to the Draft Permit. While EPA is proceeding with the permit reissuance process at this time, EPA may decide that changes to the permit are warranted based on the results of the consultation when it is completed. A reopener provision stating that the permit may be modified or revoked and reissued based on the results of ESA Section 7 consultation with the USFWS has, therefore, been included in the permit.

H. Operation and Maintenance

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

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

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

K. Additional Requirements and Conditions

The effluent monitoring requirements have been established to yield data representative of the discharge pursuant to CWA § Section 308(a) and 40 CFR §§ 122.41(j), 122.44(i) and 122.48. This monitoring frequency is also consistent with EPA/NHDES-WD Effluent Monitoring Guidance, which was mutually agreed upon by the two agencies and implemented in July 19, 1999. The Monitoring Guidance is intended to that certain minimum monitoring frequencies are included in all NPDES permits at permit modification and/or reissuance.

Monitoring requirements have been added for WET, *Escherichia coli*, Ammonia as Nitrogen and Total Phosphorus. The sample type for TSS and the biochemical oxygen demand parameter (CBOD) have been changed from an eight hour composite to a grab because lagoon systems have consistent flows and therefore, a grab sample is representative of the discharge. Monitoring requirements for Total Coliform have been eliminated as a result of a 1991 revision to the bacteria testing requirements as discussed in the *Escherichia coli* section above. Monitoring requirements for Dissolved Oxygen, Total Residual Chlorine, and pH have been retained from the Existing Permit. As explained in the Whole Effluent Toxicity section, section IV.G., the annual WET testing frequency is new to the Swanzey WWTP permit (see following table).

Parameter	Existing Permit		Draft Permit	
	Sampling Frequency	Sample Type	Sampling Frequency	Sample Type
Flow	Continuous	Recorder	Continuous	Recorder
BOD ₅	1/Week	8- Hr. Composite	Changed to CBOD₅	
CBOD ₅	-----	-----	1/Week	Grab
TSS	1/Week	8 Hr. Composite	1/Week	Grab

Total Coliform	1/Week	Grab	Eliminated	Eliminated
<u>Escherichia coli</u>	-----	-----	2Week	Grab
Dissolved Oxygen	Daily	Grab	Daily	Grab
Total Residual Chlorine	Daily	Grab	Daily	Grab
Total Phosphorous	-----	-----	1/Week	Grab
Ammonia as Nitrogen	-----	-----	2/Month	Grab
pH	Daily	Grab	Daily	Grab
WET	-----	-----	1/Year	Grab

V. Antidegradation

This draft permit is being reissued with effluent limitations more stringent than those in the existing permit and no change in the outfall location. Since the State of New Hampshire has indicated there will be no lowering of water quality and no loss of existing uses, no additional antidegradation review is warranted.

VI. 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 and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate NH Standards or waives its right to certify as set forth in 40 CFR §124.53.

Upon public noticing of the draft permit, EPA is formally requesting that the State's certifying authority make a written determination concerning certification. The State will be deemed to have waived its right to certify unless certification is received within 60 days of receipt of this request.

The NHDES-WD is the certifying authority. EPA has discussed this draft permit with the Staff of the Wastewater Engineering Bureau and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§ 124.53 and 124.55.

The State's certification should include the specific conditions necessary to assure compliance with applicable provisions of the Clean Water Act Sections 208(e), 301, 302, 303, 306 and 307 and with appropriate requirements of State law. In addition, the State should provide 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. Since the State's certification is provided prior to permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition. These less stringent conditions may be established by EPA during the permit issuance process based on information received following the public noticing. If the State believes that any conditions more stringent than those contained in the draft permit are necessary to meet the requirements of either the CWA or State law, the State should include such conditions and, in each case, cite the CWA or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. The only exception to this is the sludge conditions/requirements implementing Section 405(d) of the CWA are not subject to the Section 401 State Certification requirements. Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures of 40 CFR Part 124.

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 CFR § 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 CFR § 122.4 (d) and 40 CFR § 122.44(d).

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

All persons, including applicants, who wish to comment on any condition of the Draft Permit 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:

Jeanne M. Voorhees
U.S. Environmental Protection Agency
1 Congress Street
Suite 1100 (Mailcode CMP)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1295
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 and the NHDES. Such requests shall state the nature of the issue proposed 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 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. Permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

Information concerning the Draft Permit may be obtained from the contact person named above between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays.

Date

Linda M. Murphy, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

Table 1. Outfall 001 Effluent Characteristics Based on Average Monthly Data

Date	Flow (MGD)		BOD ₅ (mg/l)			BOD ₅ % Removal	TSS (mg/l)			TSS % Removal	Total Coliform (colonies/ml)	Total Residual Chlorine (mg/l)			pH (su)	
	Daily Average	Daily Maximum	Monthly Average	Weekly Average	Maximum Daily	Monthly Average	Monthly Average	Weekly Average	Maximum Daily	Monthly Average	Maximum Daily	Monthly Average	Weekly Average	Maximum Daily	Minimum	Maximum
Existing Limits	Report	Report	30	45	50	85	30	45	50	85	240				6.5	8.0
Sept. 2005	0.0739	0.0857	23.3	31.8	31.8	93	2.0	3.6	3.6	99	127	0.91	1.02	1.42	7.1	7.3
Aug. 2005	0.0747	0.1096	19.2	28.2	28.2	94	2.1	4.0	4.0	99	185	0.93	1.02	1.43	7.1	7.4
July 2005	0.0780	0.1100	22.7	26.2	26.2	94	2.2	4.4	4.4	99	80	0.9	1.1	1.3	7.1	7.3
June 2005	0.0804	0.1307	18.8	18.1	19.6	95	3.8	6.0	6.0	99	94	0.8	1.2	1.5	7.1	7.3
May 2005	0.0831	0.0986	18.9	21.3	21.3	94	6.2	9.6	9.6	98	120	1.28	1.80	1.95	7.1	7.3
Apr. 2005	0.041	0.1283	14.2	17.8	17.8	95	14.8	21.6	21.6	96	120	0.41	0.60	1.07	6.9	7.6
Mar. 2005	0.0895	0.1354	16.7	18.6	18.6	96	13.1	19.2	19.2	97	66	0.33	0.53	0.68	6.9	7.2
Feb. 2005	0.08374	0.11937	17.4	20.8	20.8	95	23.5	26.8	26.8	92	14	0.52	0.57	0.75	6.8	7.2
Jan. 2005	0.0875	0.1322	16.3	20.6	20.6	95	16.6	24.0	24.0	96	215	0.58	0.66	1.18	7.0	7.3
Dec. 2004	0.0847	0.1098	5.7	6.5	6.5	98	5.8	11.6	11.6	98	47	0.34	0.34	0.45	6.6	7.3
Nov. 2004	0.0768	0.0961	4.2	6.1	6.1	99	7.0	12.0	12.0	97	19	0.63	0.84	0.97	6.8	7.3
Oct. 2004	0.0746	0.0966	11.3	15	15	97	7.0	10.8	10.4	97	111	0.88	1.1	1.07	7.0	7.1

Date	Flow (MGD)		BOD ₅ (mg/l)			BOD ₅ % Removal	TSS (mg/l)			TSS % Removal	Total Coliform (colonies/ml)	Total Residual Chlorine (mg/l)			pH (su)	
	Daily Average	Daily Maximum	Monthly Average	Weekly Average	Maximum Daily	Monthly Average	Monthly Average	Weekly Average	Maximum Daily	Monthly Average	Maximum Daily	Monthly Average	Weekly Average	Maximum Daily	Minimum	Maximum
Existing Limits	Report	Report	30	45	50	85	30	45	50	85	240				6.5	8.0
Sept. 2004	0.0827	0.1668	12.3	14.9	14.9	96	7.5	10.8	10.8	98	144	1.10	1.2	1.52	6.8	7.2
Aug. 2004	0.0813	0.1417	7.8	7.8	7.8	97	8.5	11.2	11.2	98	189	0.73	0.89	1.43	6.7	7.2
July 2004	0.0773	0.1451	9.7	11.3	11.3	96	6.6	15.6	15.6	97	122	0.65	0.73	0.95	6.7	7.1
June 2004	0.0834	0.0996	10.1	11.6	11.6	96	14.5	29.2	29.2	93	133	0.88	1.13	1.91	6.7	7.2
May 2004	0.0926	0.1423	7.3	9.9	9.9	97	20.5	28.4	28.4	93	91	0.79	1.03	1.29	7.0	7.4
Apr. 2004	0.0775	0.1162	7.8	11.4	11.4	97	28.1	39	39	87	53	0.59	1.10	1.14	7.2	7.7
Mar. 2004	0.0481	0.08992	16.5	19.8	19.8	94	27.3	32.4	32.4	92	89	0.84	1.41	2.20	6.76	7.58
Feb. 2004	0.0449	0.05572	18.0	21	21	93	18.8	27.2	27.2	91	30	0.79	0.93	1.09	7.1	7.5
Jan. 2004	0.0533	0.0663	9.8	11.8	11.8	97	16.2	18.4	18.4	91	28	0.79	0.87	1.04	7.4	7.8
Maximum	0.0926	0.1668	23	31.8	31.8	99	28.1	39	39	99	215	1.3	1.8	2.2	7.4	7.8
Minimum	0.041	0.05572	4.2	6.1	6.1	93	2	3.6	3.6	87	14	0.3	0.34	0.45	6.6	7.1
Average	0.07472	0.113143	14	16.7	16.8	93	12	17.42	17	93.0	98.90476	0.7	0.956	1.25	6.95	7.35

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ATTACHMENT A

The State of New Hampshire's 2004 303(d) list of impaired waters identifies surface waters which do not currently meet state water quality standards (NHDES 2004). Numerous segments of the Ashuelot River upstream and downstream of the Swanzey WWTP are identified as violating water quality standards. The following is a short summary of the segments upstream and downstream of the Keene and Swanzey POTW discharges.

Assessment Unit NHRIV802010301-11 is a 2.57 segment of the Ashuelot River beginning upstream of the Keene discharge and extending downstream of the Keene discharge to the confluence with the South Branch of the Ashuelot River.

Aquatic Life - Not Supporting and requiring a TMDL. Causes/suspected sources are listed as DO saturation/municipal(urbanized high density area), and pH/unknown.

Drinking Water After Adequate Treatment - Not Assessed

Fish Consumption- Not Supporting and requiring a TMDL. Cause/suspected source is mercury/atmospheric deposition.

Primary Contact Recreation - Insufficient Information

Secondary Contact Recreation - Not Assessed

Wildlife - Not Assessed.

Assessment Unit NHRIV802010401-15 is a 3.89 mile segment that begins at the confluence of the South Branch of the Ashuelot River and ends at the beginning of segment NHIMP802010401-01. There are no NPDES outfalls discharging directly into this segment.

Aquatic Life - Not supporting and requiring a TMDL. Causes/suspected sources are listed as aluminum/unknown, Benthic-Macroinvertebrate/unknown, Bioassessment (stream) /unknown, and pH/unknown. The segment is also listed as impaired based on habitat assessments/unknown.

Drinking Water After Adequate Treatment - Not Assessed

Fish Consumption- Not Supporting and requiring a TMDL. Cause/suspected source is mercury/atmospheric deposition.

Primary Contact Recreation- Not supporting and requiring a TMDL. Cause/suspected source is Echerichia coli/unknown.

Secondary Contact Recreation - Fully Supporting

Wildlife - Not Assessed

Assessment Unit NHIMP802010401-01 is a 45 acre impoundment, formed by the Homestead Woolen Mills Dam, begins at NHRIV802010401-15 and ends at the beginning of segment NHRIV802010401-16. There are no NPDES outfalls discharging directly to this segment.

Aquatic Life - Insufficient Information.

Drinking Water After Adequate Treatment - Not Assessed

Fish Consumption- Not Supporting and requiring a TMDL. Cause/suspected source is mercury/atmospheric deposition.

Primary Contact Recreation- Insufficient Information

Secondary Contact Recreation - Fully Supporting

Wildlife - Not Assessed

Assessment Unit NHRIV802010401-16 is a 0.39 mile segment that that begins at the end of NHIMP802010401-01 and ends at the beginning of segment NHRIV802010401-17. There are no NPDES outfalls discharging directly to this segment.

Aquatic Life - Not Supporting and requiring a TMDL. Cause/suspected source is pH/unknown.

Drinking Water After Adequate Treatment - Not Assessed

Fish Consumption- Not Supporting and requiring a TMDL. Cause/suspected source is mercury/atmospheric deposition.

Primary Contact Recreation- Insufficient Information

Secondary Contact Recreation - Not Assessed

Wildlife - Not Assessed

Assessment Unit NHRIV802010401-17 is a 0.7 mile segment that begins at the end of NHRIV802010401-16 and ends at the beginning of segment NHRIV802010401-19. The Swanzey POTW discharges to this segment.

Aquatic Life - Not Assessed

Drinking Water After Adequate Treatment - Not Assessed

Fish Consumption- Not Supporting and requiring a TMDL. Cause/suspected source is mercury/atmospheric deposition.

Primary Contact Recreation- Not Assessed

Secondary Contact Recreation - Not Assessed

Wildlife - Not Assessed

Assessment Unit NHRIV802010401-19 is a 9.31 mile segment that begins at the end of NHRIV802010401-17. There are no NPDES outfalls discharging directly to this segment.

Aquatic Life - Not Supporting and requiring a TMDL. Cause/suspected source is pH/unknown. Also listed as non supporting due to non native plants/unknown source.

Drinking Water After Adequate Treatment - Not Assessed

Fish Consumption- Not Supporting and requiring a TMDL. Cause/suspected source is mercury/atmospheric deposition.

Primary Contact Recreation- Not Assessed

Secondary Contact Recreation - Not Assessed

Wildlife - Not Assessed