

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA NEW ENGLAND
OFFICE OF ECOSYSTEM PROTECTION
ONE CONGRESS STREET
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BOSTON, MASSACHUSETTS 02114-2023**

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: Twenty-three (23) pages including four (4) Attachments A through D.

NPDES PERMIT NO.: NH0101168

NAME AND MAILING ADDRESS OF APPLICANT:

Meriden Village Water District
P.O. Box 84
Meriden, New Hampshire 03770-0084

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Facility Location

Meriden Village Wastewater Treatment Facility
90 Bonner Road
Meriden, New Hampshire 03770

Mailing Address

Meriden Village Water District
P.O. Box 84
Meriden, New Hampshire 03770-0084

RECEIVING WATER: Bloods Brook (Hydrologic Basin Code: 01080104)

CLASSIFICATION: Class B

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

The above named applicant has applied to the U.S. Environmental Protection Agency, New England Office (EPA-New England) for reissuance of its NPDES permit to discharge secondary treated wastewaters into the designated receiving water (Bloods Brook, a tributary to the Connecticut River). The facility collects and treats domestic (sanitary) and commercial wastewaters from Meriden Village in Plainfield, New Hampshire and discharges that treated effluent into the receiving water.

The plant is designed as a 0.08 million gallon per day (MGD) aerated facultative lagoon wastewater treatment facility. Treatment consists of a bar rack, three (3) aerated lagoons, and disinfection in a contact tank with sodium hypochlorite solution.

Meriden Village's existing permit was issued on April 15, 1983, and expired on May 15, 1988. That expired ("current") permit was administratively extended until a new permit could be issued since the applicant filed a complete application for permit reissuance within the prescribed time period as per 40 Code of Federal Regulations (CFR) Section 122.6.

The current permit authorizes discharge from Outfall 001 (Treatment Plant) year round and that discharge period will be continued in the draft permit. The location of the treatment facility, Outfall 001 and the receiving water are shown in **Attachment A** and their locations are unchanged from when the current permit was issued.

II. Description of Discharge.

A quantitative description of significant effluent parameters based on discharge-monitoring data collected for Outfall 001 during the 12-month period July 2000 through June 2001 is shown in **Attachment B**. Of the effluent characteristics listed in **Attachment B** and shown in the current permit, the draft permit contains limitations for five-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), Percent Removal of BOD₅ and TSS, pH, and Total Residual Chlorine (TRC), and monitoring requirement for Flow. In addition, effluent limitations for Total Coliform Bacteria in the current permit have been replaced with that for Escherichia coli bacteria (*E. Coli*) in the draft permit which are new (first time) limits for this facility. Effluent limitations for Settleable Solids in the current permit have not been carried forward into the draft permit while those for Whole Effluent Toxicity (WET) have been added to the draft permit and are new (first-time) limits for this facility.

III. Limitations and Conditions.

Effluent limitations, monitoring requirements, and any implementation schedule (if required) are found in PART I of the draft NPDES permit. The basis for each limit and condition is discussed in Section IV of this Fact Sheet.

IV. Permit Basis and Explanation of Effluent Limitations Derivation.

A. Background

The Clean Water Act (ACT) prohibits the discharge of pollutants to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit unless such a discharge is otherwise authorized by the ACT. The NPDES permit is the mechanism used to implement technology and water-quality based effluent limitations and other requirements including monitoring and reporting. The draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the ACT and any applicable State administrative rules. The regulations governing EPA's NPDES permit program are generally found in 40 CFR Parts 122, 124, 125 and 136. Many of these regulations consist primarily of management requirements common to all permits.

EPA is required to consider technology and water-quality based criteria in addition to the current permit conditions when developing permit limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the ACT (See 40 CFR Part 125, Subpart A). Secondary Treatment Technology guidelines (effluent limitations) represent the minimum level of control required for Publicly-Owned Treatment Works (POTW) and those guidelines can be found in 40 CFR Part 133.

In general, all statutory deadlines for meeting various technology-based guidelines (effluent limitations) established pursuant to the ACT have expired. For instance, compliance with POTW technology-based effluent limitations is, effectively, from date of permit issuance (40 CFR §125.3(a)(1)). Compliance schedules and deadlines not in accordance with the statutory provisions of the ACT can not be authorized by a NPDES permit.

Water-quality based limitations are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water-quality standards. See Section 301(b) (1)(C) of the ACT. A water-quality standard consists of three elements: (1) beneficial designated use or uses for a water body or a segment of a water body; (2) a numeric or narrative water-quality criteria sufficient to protect the assigned designated use(s); and (3) an antidegradation requirement to ensure that once a use is attained it will not be eroded. Receiving water requirements are established according to numerical and narrative standards in the state's water quality standards adopted under state law for each stream classification. When using chemical-specific numeric criteria to develop permit limits both the acute and chronic aquatic-life criteria, expressed in terms of maximum allowable in-stream pollutant concentration, are used. Acute aquatic-life criteria are considered applicable to daily time periods (maximum daily limit) and chronic aquatic-life criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific limits are allowed under 40 CFR 122.44 (d)(1) and are implemented under 40 CFR §122.45(d). In addition to the average weekly limit for POTWs under 40 CFR §122.45(d), the Region believes it's necessary to establish a maximum daily limit since the basis for the average weekly limit derives from the secondary treatment requirements for BOD₅

and TSS and is not directly related to achieving chemical specific water-quality standards for toxic pollutants which are based on an acute (short-term) and chronic (long-term) criteria. Given that, it would be impracticable to rely only on monthly or weekly average limits to ensure that Water Quality Standards for toxic pollutants are met. Therefore, the Region establishes maximum daily and average monthly limits for chemical specific toxic pollutants, such as Total Residual Chlorine. The POTW's design flow is used when deriving constituent limits for daily and monthly time periods as well as weekly periods where appropriate. Also, the dilution provided by the receiving water is factored into this process. Furthermore, narrative criteria from the state's water-quality standards are often used to limit toxicity in discharges where: (1) a specific pollutant can be identified as causing or contributing to the toxicity but the state has no numeric standard; or (2) toxicity cannot be traced to a specific pollutant.

The NPDES permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water-quality criterion. See CFR Section 122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion. In determining reasonable potential, EPA considers: (1) existing and planned controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit's reissuance application, Monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in **Technical Support Document for Water Quality-based Toxics Control, 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 statutes and administrative rules (50 R.S.A. §485-A:8, Env-Ws 1705.02), available dilution for discharges to freshwater receiving waters is based on a known or estimated value of the annual seven (7) consecutive-day mean low flow at the 10-year recurrence interval (7Q10) for aquatic life or the long-term harmonic mean flow for human health (carcinogens only) in the receiving water at the point just upstream of the discharge. Furthermore, 10 % 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. The current set of these Regulations, newly revised, were adopted on December 3, 1999, and became effective on December 10, 1999. Hereinafter, these New Hampshire's Surface Water Quality Regulations are referred to as the NH Standards.

The permit may not be renewed, reissued or modified with less stringent limitations or conditions than those conditions in the previous permit unless in compliance with the antibacksliding requirement of the ACT [See Sections 402(o) and 303(d)(4) of the ACT and 40 CFR §122.44(l)(1 and 2)]. EPA's antibacksliding provisions found in 40 CFR §122.44(l) prohibit the relaxation of permit limits, standards, and conditions unless certain conditions are met. Therefore, unless those conditions are met the limits in the reissued permit must be at least as stringent as those in the previous permit.

The ACT requires that EPA obtain state certification which states that all water-quality standards will be satisfied. The permit must conform to the conditions established pursuant to a State Certification under Section 401 of the ACT (40 CFR §124.53 and §124.55). EPA regulations pertaining to permit limits based upon water-quality standards and state requirements are contained in 40 CFR §122.44(d).

The conditions of the permit reflect the goal of the ACT and EPA to achieve and then to maintain water quality standards. To protect the existing quality of the State's receiving waters, the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) adopted Antidegradation requirements (Env-Ws 1708) in their NH Standards.

B. Conventional Pollutants

Effluent limitations in the draft permit for BOD₅ and TSS concentrations (average monthly, average weekly and maximum daily) and mass loadings (average monthly and average weekly) are based upon limits in the current permit in accordance with the antibacksliding requirements found in 40 CFR Section 122.44(1) for the permittee has been able to achieve consistent compliance with these limitations over the past year. In addition, average monthly and average weekly concentration-based limitations for BOD₅ and TSS are also based on requirements under Section 301(b)(1)(B) of the ACT as defined in 40 CFR Section 133.102(a) and (b), and maximum daily concentration-based limitations for BOD₅ and TSS are also based on State Certification Requirements.

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 average daily design flow of 0.08 MGD and the appropriate constituent concentration for the respective time period being limited. In addition to all the concentration limits for both these constituents, this draft permit also contains mass-based limits because the concentration limits, by themselves, are not sufficient to control the amount of mass discharged by this facility or to prevent this facility from discharging flows in excess of its design capacity. Furthermore, these allowable loads should ensure that this facility's treated effluent do not cause a violation of in-stream DO standards. Also, allowable loads for the maximum daily time period for BOD₅ and TSS are new to this facility and are based on State Certification Requirements because the concentrations on which they are based are also a State Certifiable condition. State certification requirements for POTWs are allowed under section 401(d) of the ACT, 40 CFR §§124.53 and 124.55.

See Attachment C for equation used to calculate each of these mass-based limits. As an example, the Average Monthly BOD₅ load of 20.0 lbs/day is based on the average monthly BOD₅ concentration of 30 mg/l, the facility's average daily design flow of 0.08 MGD, and a conversion factor of 8.345 to convert mg/l and MGD to lbs/day.

Percent removal of BOD₅ and of TSS is based upon limits in the current permit in accordance with the antibacksliding requirements found in 40 CFR Section 122.44. In addition, percent removal of BOD₅ and TSS is also a requirement of 40 CFR Section 133.102 (a) (3) and (b)(3), respectively.

Section 303(d)(1) of the ACT requires each State to identify waters for which secondary or technology-based effluent limitations (40 CFR Part 133 for POTWs) are not stringent enough to meet water quality standards and, for those waters identified, establish a Total Maximum Daily Load (TMDL). Over the past several years, the EPA has been sued in Federal Court by Environmental Groups to require timely development of the TMDL for pollutants identified as causing surface waters to exceed water quality standards. These rivers, streams, ponds, etc. (surface waters of the United States) are identified in various states under Section 303(d) of the ACT. Pollutants of concern are listed as well as the particular impaired segment. The EPA has responded to the courts by developing a 13 year plan to have the states finish development of TMDL's for all impaired waters in the United States. The states are currently required to update the 303(d) list every two (2) years with the next one due October 1, 2002; however, the two year time interval may be changed to a greater interval in the near future. The development of a TMDL for any surface water requires extensive sampling and analysis, evaluation of the health and diversity of aquatic organisms, planned future uses, and mathematical modeling which will include all point and non-point source loadings in the impaired water body.

Presently, Bloods Brook is not listed on the State's latest 303(d) list dated June 30, 1998, and the State believes the effluent limitations and conditions in this draft permit are sufficient to protect this discharge from violating NH Standards in the receiving water. However, because Bloods Brook has limited available dilution (see section on Available Dilution that follows) to assimilate Meriden Village's treated effluent that, by itself, is sufficient cause for concern, particularly if the plant wishes to expand or other treatment works desire NPDES discharge permits to Bloods Brook. Therefore, Bloods Brook may have reasonable potential for future impairment of the State's dissolved-oxygen standard thus the potential for future listing under Section 303(d) with the accompanying TMDL requirement. Accordingly, a Reopener Clause has been added to the draft permit (Part I, Section E) to allow the Agency to modify, or alternatively, revoke and reissue if, in the future, an analysis of a TMDL or any other water-quality study of Bloods Brook performed by NHDES-WD and/or EPA-New England demonstrates the need for more stringent pollutant limits. Results from these study (s) will serve as the basis for additional permit limit(s) such as phosphorus, ammonia and/or dissolved oxygen, and possibly could include more stringent limit(s) for those pollutants currently limited, such as CBOD₅/BOD₅ and TSS. Any of these additional limits could be expressed in terms of concentration and/or mass where appropriate. Because available dilution, which is based on the facility's design flow, an estimate of the receiving water's 7Q10 flow, and the State's 10 % reserve capacity rule, is an integral part of any TMDL or other water-quality effort, any revision to available dilution may result in revision(s) to current limit(s) based on that dilution, such as Total Residual Chlorine and Whole Effluent Toxicity (See sections on Total Residual Chlorine and Whole Effluent Toxicity that follows). Results from a TMDL or other water-quality study, not available at permit reissuance, are considered "New Information" and the permit may be modified as provided in 40 CFR Section 122.62 (a)(2).

Effluent limitations for Total Coliform bacteria are limited in the current permit. Effective August 31, 1991, revision of State statutes changed the bacteria testing requirements for discharges to freshwater and saltwater receiving waters (N.H. RSA 485-A:8). This has resulted in the replacement

of testing for Total Coliform with testing for Escherichia coli bacteria in the draft permit. There are two sets of Escherichia coli bacteria limits in the State's Statutes (N.H. RSA 485-A:85): one for beach areas, and one for non-designated beach areas. Because no designated beaches exist in the vicinity of the outfall, the non-designated beach area limit was implemented in this draft permit. Historically, the NHDES-WD, has required bacteria and pH limits to be satisfied at end-of-pipe with no allowance for dilution. Therefore, the limit for Escherichia coli bacteria is based upon State Certification Requirements. Calculation for compliance with the Average Monthly limit for Escherichia coli shall be determined by using the geometric mean. The original basis for this limitation is found in New Hampshire's State statutes (N.H. RSA 485-A:8) and State certification requirements for POTWs under section 401(d) of the CWA, 40 CFR §§124.53 and 124.55.

The limits (range) in pH are based upon limits in the current permit in accordance with the antibacksliding requirements found in 40 CFR §122.44(1) since the permittee has been able to achieve consistent compliance with these limits. Historically, the NHDES-WD has required pH limits to be satisfied at end-of-pipe with no allowance for dilution. Therefore, in addition to the antibacksliding requirement, these limitations are based on State certification requirements for POTWs under section 401(d) of the ACT, 40 CFR §§124.53 and 124.55.

In addition, the limits for pH are based on State Certification Requirements and RSA 485-A.8.1, which states "The pH range for said (Class B) waters shall be 6.5 to 8.0 except when due to natural causes." The effluent limitations for the pH limit in the draft permit remains basically unchanged from the current permit except for the phrase that allows modification of the pH limit (range). The language in PART I.A.1.a. of the current permit, "or as a result of the approved treatment processes," has been replaced with language detailing a scenario for which a change in pH range would be considered. See STATE PERMIT CONDITIONS. PART I.F.1.a. A change would be considered if the applicant can demonstrate to the satisfaction of NHDES-WD that the in-stream pH standard 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-New England to incorporate the results of the demonstration.

Anticipating the situation where NHDES-WD grants a formal approval changing the pH limit(s) to outside the 6.5 to 8.0 Standard Units (S.U.), EPA-New England has added a provision to this draft permit (See SPECIAL CONDITIONS section). That provision will allow EPA-New England to modify the pH limit(s) using a certified letter approach. See STATE PERMIT CONDITIONS in 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.

If the State approves results from a pH demonstration study, this permit's pH limit range can be relaxed in accordance with 40 CFR 122.44(1)(2)(i)(B) because it will be based on new information not available at the time of this permit's issuance. This new information includes results from the pH demonstration study that justifies the application of a less stringent effluent limitation. EPA-New England anticipates that the limit determined from the demonstration study as approved by the

NHDES-WD will satisfy all effluent requirements for this discharge category and will comply with NH Standards.

Settleable Solids (SS) was limited in the current permit as a State Certification Requirement, but will not be limited in the draft permit. The State no longer certifies that limitation because the SS limitation test yields uncertain results. Furthermore, EPA and the State view SS as a "process-control parameter" rather than as an effluent limitation. TSS is a more appropriate measure of the solids content discharging to the receiving water; therefore, SS was not included in the draft permit. This is considered neither an antibacksliding nor an antidegradation issue.

C. 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. The specific toxic pollutants and their associated toxicity criteria are popularly 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 recently revised 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 (See section on available dilution next) to determine a specific pollutant's draft permit limit, such as the fast acting toxicant chlorine, ammonia, metals, etc.

Available Dilution

Available dilution of the receiving water is determined using the facility's design flow and the 7Q10 flow of the receiving water just above the facility's outfall. The available dilution is reduced by 10 percent to account for the State's reserve capacity rule. The State's requirement to reserve 10 percent of the Assimilative Capacity of the receiving water for future needs is pursuant to New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01 and was first included with the State's Surface Water Quality Regulations beginning with the April 1990 revisions. Inclusion of the State's reserve capacity rule is new to this draft permit for it was not included in the current permit.

Frequently, an exact value of the 7Q10 flow at the outfall is not available; therefore, other methods are utilized such as determining an estimated 7Q10 flow(s) from gaged location(s) either on the receiving water or on nearby river(s) thought to have similar hydrologic characteristics as the receiving water, or regression equations such as the "Dingman Equation" that uses drainage area, mean basin elevation and percent of stratified drift to total drainage area. For Meriden Village's outfall on Bloods Brook, the "Dingman Equation" regression equation was used by NHDES-WD to develop an estimated 7Q10 value of 0.49 cubic feet per second (CFS). See Attachment C for "Dingman Equation" including the various inputs for that equation's three (3) variables.

In summary, available dilution (also referred to as dilution factor) in the receiving water was determined to be 4.5 using the plant's design flow of 0.08 MGD, an estimated 7Q10 low flow of 0.49 CFS in Bloods Brook just above the treatment plant's outfall, and a 10 percent reserve of assimilative capacity for future needs in New Hampshire streams. See Attachment C for equation used to

determine available dilution.

Total Residual Chlorine

Total Residual Chlorine (TRC) limits in the draft permit have been set to reflect the facility's current design flow (0.08 MGD) and NH Standards; therefore, these effluent limits are far more stringent than those established in the current permit. These average monthly and maximum daily limits are based on the acute and chronic aquatic-life criteria in the NH Standards (Env-Ws 1703.21, Table 1703.1) multiplied by the available dilution (4.5) in the receiving water. The TRC's chronic criterion is 0.011 mg/l, whereas, the acute criterion is 0.019 mg/l. A few years ago, EPA-New England changed its chlorine policy to no longer allow the chronic derived value be shown as a "maximum daily" limit as in the current permit, but instead be shown as an appropriate "average monthly" limit. Consequently, in this draft permit, the chronic derived value of 0.050 mg/l is shown as an "average monthly" limit, and the acute derived value of 0.086 mg/l is shown as a "maximum daily" limit. See Attachment C for equation used to calculate water-quality based limits for TRC.

The "average monthly" permitted TRC limit of 0.05 mg/l is at the analytical detection limit for this pollutant. In accordance with EPA's **Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991**, page 111, EPA New England is defining the compliance level in the permit as the minimum level (ML). The ML for TRC established by EPA-New England's Quality Assurance Office in memorandum dated April 30, 1992, is 0.050 mg/l or 50 ug/l.

Therefore, the limit at which compliance/non-compliance determinations will be based is the Minimum Level (ML) which is defined as 0.050 mg/l for TRC and this value may be reduced by permit modification as more sensitive test methods are approved by EPA. Any value below 0.050 mg/l shall be reported as zero until written notice is received by certified mail from EPA-New England indicating some value other than zero is to be reported for TRC's ML of 0.050 mg/l (i.e., between zero and 0.049 mg/l).

Should the permittee decide to use ultraviolet light in place of chlorination for disinfection in its wastewater treatment process the TRC limit and monitoring requirement would only be necessary when it is used as a back-up disinfection method. If chlorine is not used during any particular month, then the permittee shall use the code "C" in the appropriate column of the monthly DMR form to indicate no chlorine was discharged.

D. 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 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.

EPA-New England's current policy 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 (See Attachment D). That policy (Attachment D) is for major permittees, however, the applicable toxicity policy for minor POTWs (less than 1.0 MGD design flow) is identical to that shown in Attachment D except that the monitoring frequency is reduced to annual testing for available dilutions above 20:1. Even though Meriden Village is considered a minor POTW, its dilution factor of 4.5:1 is considerably less than 20:1; therefore, its monitoring frequency for WET testing is set at 1/Quarter.

Based on the above toxicity discussions, the draft permit is conditioned to require the permittee to perform annually, four (4) chronic and modified acute toxicity tests using two (2) species per test during calendar quarters ending March 31st, June 30th, September 30th, and December 31st and to meet an acute LC50 limit of 100 percent effluent concentration and a chronic C-NOEC limit of equal to or greater than 22.2 % effluent concentration. The two (2) species used in these toxicity tests are Daphnid (Ceriodaphnia dubia) and Fathead Minnow (Pimephales promelas).

The LC50 is defined as the percentage of effluent that would be lethal to 50 % of the test organisms during an exposure of 48 hours. Therefore, a 100 % limit means that a sample of 100 % effluent shall have no greater than a 50 % mortality rate in that effluent sample. Whereas, C-NOEC (Chronic-No Observed Effect Concentration) is defined as the **highest** concentration to which aquatic test organisms are exposed in a life cycle or partial life cycle test, which causes no adverse effect on

growth, survival or reproduction at a specific time of observation as determined from hypothesis testing where the tests results (growth, survival and/or reproduction) exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the draft permit requires the permittee to report the lowest concentration where there is no observable effect. See the draft permit's **ATTACHMENT A (VII. TOXICITY TEST DATA ANALYSIS)** on page A-9 for additional clarification in selecting appropriate C-NOEC value. The modified acute toxicity test required in the draft permit is measured 48 hours into the chronic test. Toxicity test results are to be submitted by the 15th day of the month following the end of the quarter sampled. For example, test results of the third calendar quarter (July-September) are to be submitted with the DMR for September due to EPA-New England and NHDES-WD by October 15th.

This draft permit requires reporting of selected parameters determined from the chemical analysis of the WET tests 100 percent effluent sample. Specifically, hardness, total ammonia 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 Permit Compliance System'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.

The WET limits in the draft permit have been conditioned 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 at 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 is added to 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.

E. Sludge

Section 405(d) of the ACT 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 sludges which are land applied, disposed of in a surface disposal unit, or fired in a sewage sludge incinerator are subject to Part 503 technical and to State Env-Ws 800 standards. Part 503 regulations have a self-implementing provision, however, the ACT 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.

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

The permittee is also 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.

The permittee's long-standing sludge practices are not to accept septage for treatment and to let sludge accumulate on the bottom of its lagoons for ultimate disposal later either when a sufficient amount has accumulated or that accumulation begins to interfere with the production of an acceptable effluent. To date, sludge has not been removed from these lagoons; however, the Water District anticipates its removal within the next three years with the type of disposal to be determined at time of removal.

F. Industrial Users

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 §307 of the ACT. However, the draft permit contains conditions that are necessary to allow EPA-New England and NHDES-WD to insure 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-New England 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-New England and NHDES-WD the name(s) of all industrial users subject to Categorical Pretreatment Standards under 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 permit, and (2) submit copies of Baseline Monitoring Reports and other pretreatment reports submitted by industrial users to EPA-New England and NHDES-WD.

G. Antidegradation

This draft permit is being reissued with allowable wasteloads and parameter coverages identical or more stringent than those in the current permit and no change in outfall location. 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.

H. Additional Requirements and Conditions

The effluent monitoring requirements in the draft permit and shown in Table 1 below have been established to yield data representative of the discharge under the authority of Section 308(a) of the ACT in accordance with 40 CFR §§ 122.41(j), 122.44(i) and 122.48. In the draft permit, compliance monitoring frequency and sample type for Flow, BOD₅, TSS, pH, TRC and Escherichia coli bacteria have been established in accordance 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 have been set according to EPA-New England's Municipal Toxicity Policy. See Table 1 below for a comparison of sampling frequencies and sample types in the current versus draft permits.

It's the intent of EPA and NHDES-WD to establish minimum monitoring frequencies in all NPDES permits at permit modification and/or reissuances in accordance with this Effluent Monitoring Guidance that make sense from both an environmental and human health perspective.

Table 1. Sampling Frequencies and Sample Types in the Current and Draft Permits.
(Changes to current permit are highlighted under draft Permit.)

PARAMETER	CURRENT PERMIT		DRAFT PERMIT	
	Sampling Frequency	Sample Type	Sampling Frequency	Sample Type
Flow	Continuous	Report Max/Min	Continuous	Recorder
BOD ₅	2/Month	8-Hour Composite	1/Week	Grab
TSS	2/Month	8-Hour Composite	1/Week	Grab
Percent Removal of BOD ₅ and of TSS	1/Month	8-Hr. Composite for both influent and effluent	2/Month	24-Hr. Composite for influent; Grab for effluent
pH	1/Day	Grab	1/Day	Grab
TRC	1/Day	Grab	1/Day	Grab
Total Coliform	2/Month	Grab	Not Required-- (Switched to <u>Escherichia coli</u>)	Not Required-- (Switched to <u>Escherichia coli</u>)
<u>Escherichia coli</u>	Not Required	Not Required	2/Week	Grab
Settleable Solids	1/Day	Grab	Eliminated	Eliminated
WET Test: Toxicity Ammonia NH ₃ -N Hardness Tr Aluminum Tr Cadmium Tr Chromium Tr Copper Tr Lead Tr Nickel Tr Zinc	Not Required	Not Required	All Parameters 1/Quarter	Grab

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 ACT 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.

V. Essential Fish Habitat.

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.(1998)), EPA is required to consult with the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b). The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. § 1802(10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 50 CFR § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

EFH is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

Description of Proposed Action

The above named applicant has applied to EPA-New England for reissuance of its NPDES permit to discharge secondary treated wastewaters into the designated receiving water (Bloods Brook, a tributary to the Connecticut River). The facility collects and treats domestic (sanitary) and commercial wastewaters from Meriden Village in Plainfield, New Hampshire and discharges that treated effluent into the receiving water. The currently effective permit was developed based on a design flow of 0.08 MGD for this treatment facility and that design flow has been carried forward unchanged into the draft permit. Meriden Village's current permit was issued on April 15, 1983, and expired on May 15, 1988, and has been administratively extended, due to a timely filing of a complete application, until a new permit can be issued.

EFH Species

Bloods Brook is a tributary of Connecticut River, and as such is designated EFH for Atlantic salmon (*Salmo salar*). According to the New Hampshire Fish and Game Department (NHF&GD), the lower five (5) miles of Bloods Brook is stocked yearly with approximately 35,000 Atlantic salmon fry beginning from essentially the first bridge on Brooks Road that crosses Bloods Brook (near the Connecticut River) to just below the covered bridge on Colby Hill Road in the Mill Hollow section of Plainfield. That covered bridge is located approximately 0.5 river miles below the outfall from the treatment works. This entire reach runs parallel to and adjacent to Brooks Road, and according to the NHF&GD, has exceptional habitat for Atlantic salmon. In addition, various segments of the Brook are stocked yearly with around 800 yearling (8 to 11 inches long) brook trout (*Salvelinus fontinalis*) and the headwaters of Bloods Brook watershed likely has populations of wild brook trout.

Analysis of Effects

The dilution factor for this discharge has been calculated to be 4.5 : 1. Due to the low available dilution of the receiving water, the draft permit requires an average monthly numeric limit for TRC of 0.05 mg/l, a twenty-fold decrease in the current permit's limit of 1.0 mg/l. As a result of this new (more stringent) chlorine limit, the facility will need to de-chlorinate their effluent prior to discharge, thus eliminating any potential adverse effects on aquatic organisms associated with chlorine toxicity. In lieu of de-chlorination, the facility could decide to use ultraviolet light for disinfection purposes, thus the TRC limit and monitoring requirement would only be necessary when it is used as a back-up disinfection method. In addition, the draft permit requires quarterly chronic WET testing to assess if the effluent is causing adverse effects to sensitive aquatic test species along with monitoring of the effluent for the presence of toxic pollutants, including ammonia and selected metals such as copper. If the results of the WET testing demonstrate toxicity to test species, or if monitoring for other toxic pollutants in the effluent reveal the presence of such pollutants in toxic amounts, then the permit may be modified to include numeric limits on pollutants of concern.

EPA-New England's Opinion of Probable Impacts

The quality of juvenile Atlantic salmon habitat in Bloods Brook will likely improve by the more stringent chlorine limits, WET testing, and the comprehensive toxic pollutant monitoring associated with the re-issuance of this permit. If EPA-New England concludes that a permit modification is necessary, based on the results of effluent monitoring for toxicity, the presence of toxic pollutants, or exceedances of NH Standards, EPA-New England will reinitiate consultation with NMFS.

Mitigation

The EPA-New England considers the conditions in this draft permit to be adequately protective of EFH, and, therefore, does not consider further mitigation to be 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 the State's Surface Water Quality Regulations or waives its right to certify as set forth in 40 CFR §124.53.

Upon public noticing of the draft permit, EPA-New England 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-New England has discussed this draft permit with

the staff of the Water Division 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 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 certification is provided prior to permit issuance, failure to provide this statement for any condition waives the right to certify or object to any less stringent condition which may be established by EPA-New England during the permit issuance process following public noticing as a result of information received during that 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 ACT or State law, the State should include such conditions and, in each case, cite the ACT 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 sludge conditions implementing section 405(d) of the ACT are not subject to the 401 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.

VII. 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: Mr. Roger A. Janson, Associate Director Surface Water Programs, U.S. Environmental Protection Agency, One Congress Street, Suite 1100 (Mail Code: CWQ), Boston, Massachusetts 02114-2023. 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 (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-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.

VIII. EPA/State Contacts.

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 from:

**Mr. Frederick B. Gay, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
NPDES Permits Unit
One Congress Street
Suite 1100, Mail Code: CPE
Boston, Massachusetts 02114-2023
Telephone No.: (617) 918-1297
FAX No.: (617) 918-0297**

_____ **Linda M. Murphy, Director**
Date: **Office of Ecosystem Protection**
U.S. Environmental Protection Agency

Attachments:

- A - Map - not available electronically
- B - Effluent Characteristics - attached
- C - Calculations - attached
- D - Municipal Toxicity Strategy - attached

ATTACHMENT B

CONCENTRATIONS OF SELECTED EFFLUENT CHARACTERISTICS AT OUTFALL 001

The following selected effluent characteristics were derived from analysis of discharge-monitoring data collected for Outfall 001 during the 12-month period July 2000 through June 2001. These values were extracted from monthly Discharge Monitoring Reports (calendar month reporting period) submitted by the Meriden Village Wastewater Treatment Facility. They represent an effluent composed of treated domestic (sanitary) and commercial wastewater discharged from this facility and gives an indication of this treatment works ability to meet its current permit limits. To fully understand the statistics presented in the table below, the reader should be thoroughly familiar with the definitions of average monthly, average weekly and maximum daily in Part II, General Conditions and Definitions, on pages 13, 14 and 18, respectively. In the table, some range values were rounded for ease of presentation.

Effluent Characteristic	Average of Average Monthly ¹	Range of Average Monthly	Average of Average Weekly ¹	Range of Average Weekly	Average of Maximum Daily ¹	Range of Maximum Daily
Flow (gpd)	26,200	16,000-72,000	--	--	52,100	30,800-114,000
BOD ₅ (lbs/day)	4.0	0.6-11.4	4.7	0.6-12.6	--	--
BOD ₅ (mg/l)	17.0	3-34	19.7	3-44	19.7	3-44
BOD ₅ (Percent Removal)	94.5	87.0-99.0	--	--	--	--
TSS (lbs/day)	3.8	0.7-15.6	4.5	0.7-18.6	--	--
TSS (mg/l)	14.7	5-26	17.2	5-31	17.2	5-31
TSS (Percent Removal)	94.7	82.0-98.0	--	--	--	--
pH (Standard Units)	--	--	--	--	--	6.3-8.2
Total Coliform Bacteria (Organisms/100 ml)	18.8	<1-79	34.1	<1-149	34.1	<1-149
TRC (mg/l)	--	--	--	--	1.0	0.5-1.9
Settleable Solids (ml/l)	--	--	0.05	<0.1-<0.1	0.05	<0.1-<0.1

1. Any value qualified with a less than sign was halved prior to computation.

ATTACHMENT C

Maximum Allowable Loads

Equation used to calculate mass limits for BOD₅ and TSS where:

$$L = C * Q_{PDF} * 8.345$$

L = Maximum allowable load, in lbs/day.

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

Reporting

periods are average monthly, average weekly and maximum daily.

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.

Available Dilution Factor

"Dingman Equation" for 7Q10 Flow at Outfall 001

Equation 12 of "S. Lawrence Dingman & Stephen C. Lawlor, Estimating Low-Flow Quantiles from Drainage-Basin Characteristics in New Hampshire and Vermont, Journal of the American Water Resources Association, Vol. 32, No. 2, April 1995." Equation 12 in the original journal article was corrected by S. Lawrence Dingman in a letter dated June 19, 2000, to Dr. Christopher Lant, Editor, Journal of the American Water Resources Association. The correction changed the minus to a plus sign in the equation just prior to the stratified drift (D) term.

The corrected equation for 7Q10 flow is as follows:

$$7Q10 = 10^x \text{ where } x = 1.25\log_{10}A + 0.0004Y + 1.49D - 2.22$$

and:

$$7Q10 = CFS.$$

A = drainage area, square miles (mi²); or 12.7 mi² to Outfall 001.

Y = mean basin elevation, feet (ft); or 1,280 ft to Outfall 001.

D = ratio of stratified drift* to total drainage area, decimal percent; or 0.015 to Outfall 001.

*Stratified drift areas taken from Ground-Water Availability Maps published at a scale of 1:125,000 by U.S. Geological Survey in 1975, 1976 and 1977 for New Hampshire.

ATTACHMENT C (Continued)

Dilution Factor Equation at Outfall 001.

$$DF = \frac{(Q_{001}) + (Q_{PDF} \times 1.547)}{Q_{PDF} \times 1.547} \times 0.90$$

where:

- DF = Dilution Factor
- Q₀₀₁ = 7Q10 flow at Outfall 001, in CFS.
- 0.90 = Factor to reserve 10 percent assimilative capacity.
- Q_{PDF} = Treatment plant's design flow, in MGD.
- 1.547 = Factor to convert MGD to CFS.

Water-Quality Criteria Based Limits Calculation for Total Residual Chlorine

Equation used to calculate Average Monthly and Maximum Daily limits for Total Residual Chlorine (TRC). Use acute aquatic-life criterion for computing "Maximum Daily" limit and chronic aquatic-life criterion for computing "Average Monthly" limit.

$$TRC\ Limit = Dilution\ Factor * Aquatic-Life\ Water-Quality\ Criteria$$

where:

- TRC = mg/l.
- DF = Dilution Factor from equation above which equals 4.5.
- 0.011 = Dissolved Chronic Aquatic-Life Water-Quality Criterion, in mg/l.
- 0.019 = Dissolved Acute Aquatic-Life Water-Quality Criterion, in mg/l.

C-NOEC Toxicity Limit

Equation used to calculate WET's C-NOEC limit which is set equal to or greater than the Receiving Water Concentration. See Attachment D.

$$RCW = \frac{1}{DF} \times 100$$

where:

- RCW = Receiving Water Concentration, in percent.
- DF = Dilution Factor from equation above which equals 4.5.
- 100 = Factor to convert reciprocal to a percent.

**ATTACHMENT D
TOXICITY STRATEGY FOR MUNICIPAL PERMITS**

	HIGH RISK	MED-HIGH RISK	MED-LOW RISK
LOW RISK			
DILUTION FACTOR	<10:1	10.1-20:1	20.1-100:1
SAMPLING EVENTS PER YEAR	4(1/3 MONTHS)	4(1/3 MONTHS)	4(1/3 MONTHS)
TOXICITY TESTS: FRESH WATER MARINE WATER	CHRONIC ¹ CHRONIC & ACUTE	CHRONIC ¹ CHRONIC & ACUTE	ACUTE ACUTE
NUMBER OF SPECIES: FRESH WATER MARINE WATER	2 3	2 3	2 2
PERMIT LIMITS	LC50=100% C-NOEC ² >=RWC ³	LC50=100%	LC50=100%
TEST SPECIES: FRESH WATER MARINE WATER	DAPHNID ¹ (<i>Ceriodaphnia dubia</i> or <i>Daphnia pulex</i>) FATHEAD MINNOW ¹ (<i>Pimephales promelas</i>) INLAND SILVERSIDE ¹ (<i>Menidia beryllina</i>) MYSID SHRIMP (<i>Mysidopsis bahia</i>) SEA URCHIN (<i>Arbacia punctulata</i>)	DAPHNID (<i>Ceriodaphnia dubia</i>) DAPHNIA (<i>Daphnia pulex</i>) FATHEAD MINNOW (<i>Pimephales promelas</i>) INLAND SILVERSIDE (<i>Menidia beryllina</i>) MYSID SHRIMP (<i>Mysidopsis bahia</i>)	

¹ 7-DAY CHRONIC/MODIFIED ACUTE.

² C-NOEC IS CHRONIC NO OBSERVED EFFECT CONCENTRATION.

³ RWC IS RECEIVING WATER CONCENTRATION, IN PERCENT, AS DETERMINED FROM DIVIDING ONE BY THE DILUTION FACTOR ALL TIMES 100.