

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

FACT SHEET

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

NPDES PERMIT NO.: **MA0101036**

NAME AND ADDRESS OF APPLICANT:

**Board of Selectmen
240 Smith Street
North Attleborough, MA 02760**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**North Attleborough WWTF
Cedar Road
North Attleborough, MA 02760**

NAME AND ADDRESS OF CO-PERMITTEE:

**Board of Selectmen
Plainville Town Hall
142 South Street, P.O. Box 1717
Plainville, MA 02762**

RECEIVING WATER: **Ten Mile River**

CLASSIFICATION: **B, warm water fishery**

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

The above named applicant has requested that the U.S. Environmental Protection Agency reissue its NPDES permit to discharge into the designated receiving waters. The permit application shows that the facility is engaged in collection and treatment of municipal and industrial wastewater from the Town of North Attleborough and the Town of Plainville. The Town of Plainville is included as a co-permittee for Section D (Unauthorized Discharges, Section E (Operation and Maintenance of the Sewer System), and Section F (Alternate Power Source) of the Draft Permit. See Part VI of this fact sheet (Operation and Maintenance) for a further discussion of these requirements.

II. Description of Discharge.

A quantitative description of the discharge in terms of significant effluent parameters based on recent monitoring data is shown in **Attachment A**.

III. Limitations and Conditions.

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

A. General Statutory and Regulatory Background

EPA is issuing this permit pursuant to Section 402(a) of the Clean Water Act. The Commonwealth of Massachusetts is also issuing this permit, except for certain limitations and conditions discussed below, pursuant to Massachusetts General Laws ch. 21, § 43 (2004).

The Clean Water Act (CWA) 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 CWA. 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 CWA 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.

EPA is required to consider technology and water quality-based requirements as well as those requirements and limitations included in the existing permit when developing the renewed permit's effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA. Secondary treatment technology guidelines (i.e. effluent limitations) for POTWs can be found at 40 CFR Part 133.

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. Compliance schedules to meet water quality based effluent limits may be included in permits only when the state's water quality standards clearly authorize such schedules and where the limits are established to meet a water quality standard that is either newly adopted, revised, or interpreted after July 1, 1977.

Section 301(b)(1)(C) of the CWA requires NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to comply with, among other

things, any applicable state or federal water quality standards. 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) numeric and narrative water quality criteria sufficient to protect the assigned designated use(s); and (3) antidegradation requirements to ensure that existing uses and high quality waters are protected and maintained.

EPA's regulation at 40 C.F.R. § 122.4(d) prohibits the issuance of an NPDES permit unless its conditions can "ensure compliance with the applicable water quality requirements of all affected States." As discussed below, both Massachusetts and Rhode Island are "affected states" in the context of this permit issuance, and both states' water quality standards are relevant to the permit limitations. Similarly, 40 C.F.R. § 122.44(d) requires EPA to impose conditions that achieve applicable water quality standards.

The Massachusetts Surface Water Quality Standards (314 CMR 4.00, February, 1996) establish designated uses of the State's waters, criteria to protect those uses, and an antidegradation provision to ensure that existing uses and high quality waters are protected and maintained. They also include requirements for the regulation and control of toxic constituents and specify that EPA's recommended water quality criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site specific criterion is established.

Rhode Island's Water Quality Standards (Regulation EVM 112-88.97-1, June 2000) also establish designated uses of the State's waters, criteria to protect those uses, and an antidegradation provision to ensure that existing uses and high quality waters are protected and maintained.

Section 401(a)(1) of the CWA forbids the issuance of a federal license for a discharge to waters of the United States unless the state where the discharge originates, in this case Massachusetts, either certifies that the discharge will comply with, among other things, state water quality standards, or waives certification. EPA's regulations at 40 CFR § 122.44(d)(3), §124.53 and §124.55 describe the manner in which NPDES permits must conform to conditions contained in state certifications. Section 401(a)(2) of the CWA and 40 CFR § 122.44(d)(4) require EPA to condition NPDES permits in a manner that will ensure compliance with the applicable water quality standards of a "downstream affected state," in this case Rhode Island. The statute directs EPA to consider the views of the downstream state concerning whether a discharge would result in violations of the state's water quality standards. If EPA agrees that a discharge would cause or contribute to such violations, EPA must condition the permit to ensure compliance with the water quality standards. If the downstream affected state believes that the permit fails to include such requirements, then it may appeal the permit (like any other interested person with proper standing).

Section 402(o) of the CWA provides, generally, 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. Unless certain limited exceptions are met, "backsliding" from effluent limitations contained in previously issued permits that were based on CWA §§ 301(b)(1)(C) or 303 is prohibited. EPA has also promulgated anti-backsliding regulations, which are found at 40 CFR § 122.44(l). Unless statutory and regulatory backsliding requirements are met, the limits in the reissued permit must be

at least as stringent as those in the previous permit.

B. Development of Water Quality-based Limits

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 concentration. Maximum daily limits are generally derived from the acute aquatic life criteria, and the average monthly limit is generally derived from the chronic aquatic life criteria. Chemical specific limits are established in accordance with 40 CFR §122.44(d) and §122.45(d).

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 criterion. An excursion occurs if the projected or actual in stream concentration exceeds the applicable criterion.

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit 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 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 Massachusetts Water Quality Standards [314CMR 4.03(3)], 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). Rhode Island's Water Quality Standards provide for a similar dilution calculation for freshwaters. See Rule 8.E.(2)(a).

C. Description of Treatment Facility and Receiving Water

The North Attleborough Wastewater Treatment Facility (WWTF) is a 4.61 MGD advanced wastewater treatment plant which treats municipal and industrial wastewater, septage, and infiltration/inflow from sewer systems serving the Town of North Attleborough and the Town of Plainville. The WWTF's unit operations include influent pumping, flow measurement, screening, grit removal, comminution, flash mixing, flocculation, primary sedimentation, intermediate pumping, two stage activated sludge with nitrification, sand filtration, chlorination, dechlorination, and sludge thickening. According to the permit application this facility serves a population of 26,000 in North Attleborough and 8,000 in Plainville, and also serves 13 significant industrial users (SIUs).

The Ten Mile River is an interstate water which has its headwaters in Plainville Massachusetts and flows through North Attleborough, Attleboro, and Seekonk, Massachusetts before entering Rhode Island in Pawtucket, flowing through East Providence, and ultimately discharging to the Seekonk

River.

The Ten Mile River in Massachusetts is designated by the Massachusetts Water Quality Standards as a Class B Warm Water Fishery. Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value. In warm water fisheries the temperature shall not exceed 83°F nor shall the rise in temperature due to a discharge exceed 5°F.

The Ten Mile River is listed on the Massachusetts Year 2004 Integrated List of Waters (which incorporates the CWA § 303(d) list) as a water that is impaired (not meeting water quality standards) and requires one or more Total Maximum Daily Loads (TMDL) to be prepared to reduce pollutant loadings into the River so that it can attain water quality standards. The segment of the Ten Mile River from the North Attleborough WWTP to the MA/RI border is listed as impaired due to unknown toxicity, metals, nutrients, organic enrichment/low DO, pathogens, and noxious aquatic plants. No TMDL has been completed nor is any underway.

The Ten Mile River in Rhode Island is designated by the Rhode Island Water Quality Regulations as a Class B1 water from the MA/RI border to the Newman Avenue Dam in East Providence, and a Class B water from the Newman Avenue Dam to the confluence with the Seekonk River. The Seekonk River is a marine water (seawater) designated as a Class SB{a}water.

Class B waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. They shall be suitable for compatible industrial process and cooling, hydropower, aquacultural uses, navigation, irrigation and other agricultural uses. These waters shall have good aesthetic value. A Class B1 water has the same designated uses as a Class B water, except that primary contact recreational uses may be impacted due to pathogens from approved wastewater discharges. Class SB waters are designated for primary and secondary contact recreational activities; shellfish harvesting for controlled relay and depuration; and fish and wildlife habitat. They shall be suitable for aquacultural uses, navigation, and industrial cooling. These waters shall have good aesthetic value. An “{a}” partial use restriction indicates a water which is likely to be impacted by combined sewer overflows in accordance with an approved CSO facilities plan; therefore primary contact recreational activities, shellfishing uses, and fish and wildlife habitat will likely be restricted.

The free flowing segments of the Ten Mile River in RI are listed on the State’s 2004 CWA § 303(d) List of Impaired Waters as waters needing a TMDL for copper, lead, and cadmium. Two impoundments are also listed. Turner Reservoir is listed for copper, lead, low DO, and phosphorus, and Omega Pond is listed for copper, lead and phosphorus.

The Seekonk River is listed on the State’s 2004 CWA § 303(d) List of Impaired Waters as a water with a TMDL underway for nutrients, low DO, and excess algal growth/chlorophyll(a). The TMDL has not been completed, but as is discussed in the Total Nitrogen section of this fact sheet, the State

has performed a physical model assessing the impacts of total nitrogen on non-attainment of water quality standards in the Seekonk River, Providence River and Upper Narragansett Bay and has recommended total nitrogen effluent limitations for POTWs discharging to these receiving waters.

D. Effluent Limits Development

The effluent limits on all of the pollutants discussed below, with the exception of total nitrogen, are established to ensure compliance with technology-based requirements and the Massachusetts Water Quality Standards. Since the applicable water quality criteria for Massachusetts are similar to, and in some cases more stringent than, the applicable water quality criteria for Rhode Island, the effluent limits also ensure compliance with Rhode Island Water Quality Standards. The limits and requirements on total nitrogen are established solely to ensure compliance with the Rhode Island Water Quality Standards. The Town will likely be unable to immediately comply with the limits proposed for nitrogen and phosphorus. EPA will work with the Town and its representatives to develop a schedule for the planning, design and construction of facilities that may be necessary to meet the specified limits. It is EPA's intent to begin this process as soon as possible.

Conventional Pollutants:

The effluent concentration limits for BOD and TSS are the same as those limits found in the previous permit, in accordance with anti-backsliding requirements. These limits were originally established in accordance with a 1975 waste load allocation for the Ten Mile River.

The flow limit has been established as an annual average limit. MassDEP adopted a policy establishing flow limits in POTW permits as an annual average in order to account for seasonal flow variations, particularly those associated with high flow and high groundwater which commonly occur in the spring time. See June 12, 2000, MADEP-DWM NPDES Permit Program Policies Related to Flow and Nutrients in NPDES Permits ("Flow Policy"). Consistent with the Flow Policy, the Agencies have imposed mass limits in order to maintain approximate overall pollutant loadings of BOD and TSS in the receiving water.

The numerical limitations for fecal coliform, pH, and dissolved oxygen are based on state certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR §124.53 and §124.55. These limitations are the same as in the existing permit and so are in accordance with antibacksliding requirements.

Phosphorus

The Massachusetts Water Quality Standards do not contain numerical criteria for total phosphorus. The criterion for nutrients is found at 314 CMR 4.05(5)(c), which states that nutrients "shall not exceed the site specific limits necessary to control accelerated or cultural eutrophication." The Massachusetts Water Quality Standards also require that "any existing point source discharges containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients." (314

CMR 4.04). The Massachusetts Department of Environmental Protection (MassDEP) has established that a monthly average total phosphorus limit of 0.2 mg/l represents highest and best practical treatment for POTWs.

EPA has produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria of Water (the Gold Book) recommends in-stream phosphorus concentrations of no greater than 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.

More recently, EPA has released “Ecoregional Nutrient Criteria,” established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published criteria represent conditions in waters in that ecoregion that are minimally impacted by human activities, and thus representative of water without cultural eutrophication. North Attleborough is within Ecoregion XIV, Eastern Coastal Plains. The total phosphorus criterion for this ecoregion, found in Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV, published in the December, 2000 is 24 ug/l (0.024 mg/l).

The present permit has a monthly average limit of 1.0 mg/l and a daily maximum limit of 2.0 mg/l from May 1 to October 31. Effluent data from DMRs for the period May 2003 to April 2004 show a range of 0.6 to 1.1 mg/l of total phosphorus.

The impacts associated with the excessive loading of phosphorus are documented in the Ten Mile River Basin 1997 Water Quality Assessment Report published by MassDEP in March 2000, and in the RI 2004 303(d) List of Impaired Waters as discussed above. These include violations of the minimum dissolved oxygen criteria, dense filamentous algal cover in some shallow free flowing reaches of the river, and eutrophic conditions in downstream impoundments.

The current monthly average limit in the permit of 1.0 mg/l would be expected to significantly exceed the national guidance for in-stream phosphorus concentration due to the absence of any significant dilution under 7Q10 conditions. It is clear that the existing limits must be made more stringent to address the documented eutrophication problems in the receiving water. A monthly average total phosphorus limit of 0.2 mg/l has been established based on the “highest and best” practical treatment as defined by the MAWQS. This limit will be in effect seasonally, from April 1 to October 31. The application of the lower seasonal limit has been extended to the month of April in order to encompass the entire season when aquatic plant growth is active.

In addition to the seasonal total phosphorus limit of 0.2 mg/l, the permit contains a winter period total phosphorus limit of 1.0 mg/l for November through March. The winter period limitation on total phosphorus is necessary to ensure that the higher levels of phosphorus discharged in the winter period do not result in the accumulation of phosphorus in the downstream sediments. The limitation assumes that the vast majority of the phosphorus discharged will be in the dissolved fraction and that dissolved phosphorus will pass through the system and not accumulate in the sediments. A dissolved

orthophosphorous monitoring requirement has been included to verify the dissolved fraction. If future evaluations indicate that phosphorus may be accumulating in downstream sediments, the winter period phosphorus limit may be reduced in future permit actions.

If MassDEP adopts numeric nutrient criteria, a TMDL is completed, or additional water quality information shows that the phosphorus limits are not stringent enough to meet water quality standards, more stringent limits may be imposed.

In its report titled "Project Engineering Report - Supplement To Comprehensive Project Evaluation-North Attleborough Wastewater Treatment Facility", the Town has proposed an upgrade of the wastewater treatment plant which will achieve the proposed limit. The proposed phosphorus removal facilities include biological phosphorus removal followed by chemical-physical phosphorus removal with sand filtration. The estimated completion date for the entire five phase plant upgrade is April 2008; the estimated completion date of all facilities necessary to achieve the phosphorus limit is April 2007 (Phase IV).

Nitrogen

- Ammonia:

The permit limits ammonia-nitrogen in order to control both in-stream oxygen demand and the degree of toxicity associated with the discharge. For the period of May 1 - October 31, the permit limits ammonia nitrogen at the level in the previous permit. The period of November 1 - April 30 has limits to protect against in-stream toxicity to aquatic species and is also limited at the level in the previous permit.

The November through April limits in the previous permit were established in accordance with the EPA guidance document titled 1998 Update of Ambient Water Quality Criteria for Ammonia. This guidance document has been replaced with the 1999 Update of Ambient Water Quality Criteria for Ammonia, which includes less stringent criteria. EPA considered whether less stringent limits based on the 1999 criteria should be allowed. Although the current permit limits are stringent enough to ensure that the discharge does not result in an exceedance of instream ammonia toxicity or dissolved oxygen criteria, there is a concern that the receiving water's current nonattainment for toxicity and dissolved oxygen could be exacerbated by increased discharges of ammonia. Consequently, the current limits, which the permittee has demonstrated the ability to meet, are retained in this permit.

The limits in the draft permit for November through April are:

November - 7.0 mg/l monthly average.

December 1 - April 30 - 10.0 mg/l monthly average.

The limits for May through October are from the current permit. The limits are stringent enough to ensure that the discharge does not result in an exceedance of instream ammonia toxicity or dissolved

oxygen criteria.

The limit in the draft permit for May is 3.0 mg/l monthly average.

The limit in the draft permit for June through October is 1.0 mg/l monthly average.

- Total Nitrogen:

Upper Narragansett Bay, which includes the Providence and Seekonk Rivers, has suffered from severe cultural eutrophication for many years. This cultural eutrophication results in periodic low dissolved oxygen levels and associated fish kills. In addition, historic estimates of eel grass in Narragansett Bay ranged from 8,000 - 16,000 acres and current estimates of eel grass indicate that less than 100 acres remain. No eel grass remains in the upper two thirds of Narragansett Bay. Severe eutrophication is believed to be a significant contributor to the dramatic decline in eel grass (see Rhode Island Department of Environmental Management (DEM), February 1, 2005 report "Plan for Managing Nutrient Loadings to Rhode Island Waters")

Upper Narragansett Bay has a water quality classification of SB1. The designated uses include primary and secondary contact recreational activities and fish and wildlife habitat. Rhode Island Water Quality Standards Rule 8.B.(2)(c). Applicable criteria include the following:

“At a minimum, all waters shall be free of pollutants in concentrations or combinations or from anthropogenic activities subject to these regulations that:

- i. Adversely affect the composition of fish and wildlife;
- ii. Adversely affect the physical, chemical, or biological integrity of the habitat;
- iii. Interfere with the propagation of fish and wildlife;
- iv. Adversely alter the life cycle functions, uses, processes and activities of fish and wildlife....”, Rule 8.D.(1)

The dissolved oxygen shall be “not less than 5 mg/l at any place or time, except as naturally occurs. Normal seasonal and diurnal variations which result in *insitu* concentrations above 5.0 mg/l not associated with cultural eutrophication will be maintained in accordance with the Antidegradation Implementation Policy.” Table 2, Rule 8.D.(3)1.

There shall be no nutrients “in such concentration that would impair any usages specifically assigned to said Class, or cause undesirable or nuisance aquatic species associated with cultural eutrophication.” Nutrients “shall not exceed site-specific limits if deemed necessary by the Director to prevent or minimize accelerated or cultural eutrophication. Total phosphorus, nitrates and ammonia may be assigned site-specific permit limits based on reasonable Best Available Technologies.” Table 2, Rule 8.D.(3)10; see also Rule 8.D.(1)(d).

Additional relevant regulations include Rule 9.A. and B., which prohibit discharges of pollutants

which alone or in combination will likely result in violation of any water quality criterion or interfere with one or more existing or designated uses, and prohibit discharges that will further degrade waters which are already below the applicable water quality standards.

It is clear that eutrophication in Upper Narragansett Bay has reached a level where it is adversely affecting the composition of fish and wildlife; adversely affecting the physical, chemical, or biological integrity of the habitat; interfering with the propagation of fish and wildlife; adversely altering the activities of fish and wildlife; and causing dissolved oxygen to drop well below 5 mg/l. The effects of eutrophication, including algae blooms and fish kills, are also interfering with the designated uses of the water. Eutrophication has, therefore, reached a point where it is causing violations of water quality standards.

Excessive loadings of nitrogen have been identified as the cause of the eutrophication. This link has been clearly demonstrated by water quality data and by various studies and reports issued over the years. One key report, which summarizes and references many of the studies and reports, is titled “Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers” (DEM Report), and was completed by DEM in December 2004. This report analyzes both water quality data and information about major discharges to the Providence and Seekonk Rivers. The report, drawing in part on data developed in earlier studies, divides the rivers into segments and analyzes pollutant loadings and specific water quality impairments in each segment. Much of the data used in the analysis is from a 1995 - 1996 study by DEM Water Resources that consisted of measurements of nitrogen loadings from point source discharges and the five major tributaries to the Providence/Seekonk River system. The report also includes an analysis of data produced by a physical model of the Providence/Seekonk River system. That physical model was operated by the Marine Ecosystems Research Laboratory (MERL), and was part of an experiment to evaluate the impact of various levels of nutrient loading on the rivers and Narragansett Bay.

The Commonwealth of Massachusetts submitted detailed comments (February 11, 2005) on the DEM report, questioning the report’s evaluation of the nitrogen issue and the basis for nitrogen reductions. Rhode Island responded to those comments on June 27, 2005.

EPA has reviewed all of the available data, including the comments by Massachusetts on the DEM Report and Rhode Island’s responses. EPA has concluded that there is convincing evidence that excessive nitrogen loading is impairing the designated uses of the Seekonk and Providence Rivers and that wastewater facilities in Massachusetts contribute a significant portion of the nitrogen loading.

One key issue raised by Massachusetts is whether the impact of nitrogen discharges from Massachusetts POTW sources is significantly reduced by instream attenuation before the nitrogen reaches impaired portions of Upper Narragansett Bay. The DEM report estimates a 40% attenuation rate for the Ten Mile River. Even assuming this level of attenuation, substantial reductions in nitrogen discharges are needed to meet water quality standards. Moreover, part of this attenuation is due to phosphorus-driven eutrophication in the Ten Mile River (nitrogen attenuation increases as

eutrophication levels increase). Phosphorus discharges to the Ten Mile River are expected to be significantly lower during the term of this permit than they were during the 1995-96 period considered in the DEM Report, and the resulting decline in phosphorus-driven eutrophication should reduce the attenuation of nitrogen below the 40% level. Significant reductions in nitrogen discharges are, therefore, clearly necessary.

Another issue raised by Massachusetts is that there are inherent uncertainties in the conclusions of the DEM report due to its reliance on a physical model. EPA agrees that the use of the physical model does introduce uncertainty in determining the precise level of nitrogen control which will ultimately be needed in the river. Based on the available evidence, however, including the analysis of loadings included in the DEM report, EPA has concluded that the amount of nitrogen reduction needed to meet water quality standards will be at least as great as required by the proposed limit in this permit (described below). The uncertainties in the physical model may ultimately mean that additional nitrogen reductions are needed, but there is no realistic likelihood that water quality standards could be met with a less stringent nitrogen limit than the one proposed.

The predominate source of the nitrogen loading in Narragansett Bay is municipal wastewater treatment facilities in Rhode Island and in Massachusetts. The State of Rhode Island has recently reissued several Rhode Island Pollutant Discharge Elimination System (RIPDES) permits for POTWs which discharge to Upper Narragansett Bay and its tributaries. These permits include limitations on the discharge of total nitrogen, in order to address the cultural eutrophication in Upper Narragansett Bay. There are five municipal POTWs in Massachusetts which discharge nitrogen into tributaries of the Seekonk and Providence Rivers, including North Attleborough. EPA is responsible for issuing permits to these facilities, which as a group represent approximately 38% of the total nitrogen load to Upper Narragansett Bay, and approximately 73% of the total nitrogen load to the Seekonk River, which is the most severely impaired section of Upper Narragansett Bay. (These values are based on permitted flows and loadings, and an assumed effluent nitrogen concentration of 15 mg/l for POTWs without nitrogen permit limits or nitrogen control facilities.)

EPA recognizes that Upper Narragansett Bay and the rivers that discharge into it comprise a complex system, and, as noted above, that there are uncertainties associated with the physical model used in the MERL experiment. EPA has reviewed the available evidence, including the DEM report, in light of that uncertainty, and has concluded that the nitrogen limit proposed in this permit is necessary to meet Rhode Island Water Quality Standards.

In particular, based on the available evidence, EPA has concluded that, at a minimum, a seasonal reduction to no more than 8.0 mg/l is required at the North Attleborough facility in order to achieve water quality standards. Therefore, pursuant to §§ 301(1)(b)(1)(C) and 401(a)(2) of the CWA and 40 C.F.R. §§ 122.4(d) and 122.44(d), EPA has included in the draft permit a total nitrogen limit of 8 mg/l monthly average from May through October. Nitrogen discharged from May through October is believed to be the dominant source of available nitrogen in the Providence and Seekonk Rivers during the critical growing period (see DEM "Response to Comments Received on Proposed Permit Modifications for the Fields Point, Bucklin Point, Woonsocket and East Providence WWTFs"). EPA's draft permit also includes a treatment optimization requirement for November

through April, in order to maximize the nitrogen removal benefits. These nitrogen limits and requirements are contained only in EPA's NPDES permit. Massachusetts is not including these limits in its state-issued permit; the Massachusetts permit establishes limits that are necessary to protect Massachusetts waters only.

DEM has, in partnership with several research and academic institutions in Rhode Island, established an extensive monitoring network in order to provide the data necessary to evaluate compliance with water quality standards upon implementation of the recommended nitrogen reductions (see (DEM), February 1, 2005 report "Plan for Managing Nutrient Loadings to Rhode Island Waters"). It is possible that this monitoring will demonstrate that additional pollutant reductions are ultimately needed to meet water quality standards. EPA therefore strongly recommends that treatment facility upgrades implemented in order to achieve the 8.0 mg/l total nitrogen limit be compatible with alternatives for further reducing the nitrogen level in the discharge.

Toxic Pollutants

- Chlorine

Chlorine and chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. The effluent limits for average monthly and maximum daily total residual chlorine (TRC) were developed using the chronic and acute TRC criteria defined in the EPA Quality Criteria for Water, 1986 (the "Gold Book"), as adopted by the Massachusetts Department of Environmental Protection (MassDEP) into the state water quality standards.

The criteria state that the average TRC in the receiving water should not exceed 11 ug/l for chronic toxicity protection and 19 ug/l for acute toxicity protection. The effluent limits are set at the criteria due to the lack of dilution in the receiving water. See Attachment B for the dilution factors.

The average monthly and maximum daily TRC limits are below the analytical detection limit for this pollutant. In these situations, EPA, Region I is following guidance set forth in the Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991, page 111, which recommends "... that the compliance level be defined in the permit as the minimum level (ML)." EPA has defined the ML as "the level at which the entire analytical system shall give recognizable signal and acceptable calibration points." The minimum level for TRC is 0.020 mg/l or 20 ug/l, and is defined as such in the draft permit. Therefore, compliance/non-compliance determinations will be based on the Minimum Level (ML). This ML value of 20 ug/l may be reduced by permit modification as more sensitive test methods are approved by the EPA and the MassDEP.

The permit also includes a requirement that the chlorination and dechlorination systems include alarms for indicating system interruptions or malfunctions and that interruptions or malfunctions be reported with the monthly compliance reports. This requirement is intended to supplement the grab sampling requirements for chlorine and bacteria and is a recognition of the limitations of a grab

sampling program for determining consistent compliance with permit limits. In the future, continuous monitoring of effluent chlorine levels may be required.

- Metals and Cyanide:

The limitations in the current permit are taken from the Ten Mile River Basin 1984 Water Quality Program and NPDES Permit Development Final Report (MADEP). These recommended limits were considered to satisfy water quality concerns based on “Clean Water” or background levels in the receiving water. However, the studies conducted in the mid-1980's are not consistent with current policies and guidance relative to developing site specific metals criteria, and the downstream segments continue to be listed in nonattainment of water quality standards for metals despite attainment of the effluent limitations. Accordingly, limitations were calculated using the EPA recommended water quality criteria found in National Recommended Water Quality Criteria 2002. These limits have been used in the draft permit where a reasonable potential analyses shows that limits are necessary and where these limits are more stringent than the existing limits.

For chromium and nickel, the data indicate that there is no reasonable potential to cause or contribute to a violation of water quality standards since the reported data is well below the effluent limitations that would be necessary to ensure compliance with water quality standards. The routine monitoring requirements have therefore been deleted, although chromium and nickel analyses must continue to be performed in conjunction with whole effluent toxicity testing. This is consistent with the antibacksliding requirements of Clean Water Act sections 402(o) and 303(d)(4)(B).

For cyanide and cadmium, the discharge data submitted by the facility and presented in **Attachment A**, shows that the discharge for these pollutants has been consistently reported below the minimum level. (The ML is defined in EPA's Technical Support Document for Water Quality-Based Toxics Control as “the level at which the entire analytical system shall give recognizable signal and acceptable calibration points”. The minimum level (ML) for cyanide associated with the method specified in the permit is 20 ug/l and for cadmium is 1 ug/l. However, because the calculated water quality limits for cyanide and cadmium are significantly below the respective MLs, EPA cannot be certain that there is no reasonable potential for the discharge of these pollutants to cause or contribute to a violation of water quality standards. Since the calculated monthly average and maximum daily cyanide limits are higher than the monthly average and maximum daily limits in the current permit, the current permit limits have been maintained in accordance with antibacksliding requirements. An analytical method with a lower ML (10 ug/l) has been specified. Cadmium limits have been established using National Recommended Water Quality Criteria and specifying an analytical method with an ML of 0.5 ug/l. The calculations are as follows:

Cyanide:

Chronic Criteria = 5.2 ug/l

Acute Criteria = 22 ug/l

Dilution Factor (DF) = 1.06 (see Attachment B for dilution calculations)

Monthly Average Limit = (chronic criteria)(dilution factor) = (5.2 ug/l)(1.06) = 5.5 ug/l

$$\text{Daily Maximum Limit} = (\text{acute criteria})(\text{dilution factor}) = (22 \text{ ug/l})(1.06) = 23.3 \text{ ug/l}$$

Cadmium

$$\text{Hardness} = 100 \text{ mg/l}$$

$$\text{Chronic Criteria} = 0.3 \text{ ug/l}$$

$$\text{Acute Criteria} = 2.1 \text{ ug/l}$$

$$\text{Dilution Factor (DF)} = 1.06 \text{ (see Attachment B for dilution calculations)}$$

$$\text{Monthly Average Limit} = (\text{chronic criteria})(\text{dilution factor}) = (0.3 \text{ ug/l})(1.06) = 0.3 \text{ ug/l}$$

$$\text{Daily Maximum Limit} = (\text{acute criteria})(\text{dilution factor}) = (2.1 \text{ ug/l})(1.06) = 2.2 \text{ ug/l}$$

For copper and aluminum, limitations and monitoring requirements have been retained in the draft permit, and for zinc and lead, limitations and monitoring requirements have been included in the draft permit, because the discharge data indicate that the discharge has a reasonable potential to cause or contribute to a violation of water quality standards for these pollutants. As described above, limits were calculated using National Recommended Water Quality Criteria, as required by the Massachusetts Water Quality Standards, at 314 CMR. § 4.05(5)(e). If the recalculated value was more stringent than the existing limit, it was used. If the existing limit was more stringent it was used, consistent with the antibacksliding requirements of CWA § 402(o). The receiving water has been identified on the Massachusetts and Rhode Island § 303(d) lists as being in nonattainment for metals, and establishing less stringent limits would not comply with the exception to the antibacksliding prohibition provided by CWA §§ 402(o)(1) and 303(d)(4). Furthermore, none of the other antibacksliding exceptions in § 402(o)(2) applies. The calculated limits are as follows:

Copper

$$\text{Hardness} = 100 \text{ mg/l}$$

$$\text{Chronic Criteria (total recoverable)} = 9.3 \text{ ug/l}$$

$$\text{Acute Criteria (total recoverable)} = 14.0 \text{ ug/l}$$

$$\text{Dilution Factor} = 1.06 \text{ (see Attachment B for calculations)}$$

$$\begin{aligned} \text{Monthly Average Limit} &= (\text{chronic criteria})(\text{dilution factor}) \\ &= (9.3 \text{ ug/l})(1.06) = 9.9 \text{ ug/l} \end{aligned}$$

$$\begin{aligned} \text{Daily Maximum Limit} &= (\text{acute criteria})(\text{dilution factor}) \\ &= (14.0 \text{ ug/l})(1.06) = 14.8 \text{ ug/l} \end{aligned}$$

Aluminum

$$\text{Chronic Criteria} = 87 \text{ ug/l}$$

$$\text{Acute Criteria} = 750 \text{ ug/l}$$

$$\text{Dilution Factor (DF)} = 1.06 \text{ (see Attachment B for dilution calculations)}$$

$$\text{Monthly Average Limit} = (\text{chronic criteria})(\text{dilution factor}) = (87 \text{ ug/l})(1.06) = 92 \text{ ug/l}$$

$$\text{Daily Maximum Limit} = (\text{acute criteria})(\text{dilution factor}) = (750 \text{ ug/l})(1.06) = 795 \text{ ug/l}$$

Since the calculated daily maximum limit is higher than the daily maximum limit in the current permit, the current permit limit has been maintained in accordance with antidegradation requirements.

Zinc

$$\text{Hardness} = 100 \text{ mg/l}$$

$$\text{Chronic Criteria (total recoverable)} = 119.8 \text{ ug/l}$$

$$\text{Acute Criteria (total recoverable)} = 119.8 \text{ ug/l}$$

$$\text{Dilution Factor} = 1.06 \text{ (see Attachment B for calculations)}$$

$$\begin{aligned} \text{Monthly Average Limit} &= (\text{chronic criteria})(\text{dilution factor}) \\ &= (119.8 \text{ ug/l})(1.06) = 127.0 \text{ ug/l} \end{aligned}$$

$$\begin{aligned} \text{Daily Maximum Limit} &= (\text{acute criteria})(\text{dilution factor}) \\ &= (119.8 \text{ ug/l})(1.06) = 127.0 \text{ ug/l} \end{aligned}$$

Lead

$$\text{Hardness} = 100 \text{ mg/l}$$

$$\text{Chronic Criteria (total recoverable)} = 3.2 \text{ ug/l}$$

$$\text{Acute Criteria (total recoverable)} = 81.6 \text{ ug/l}$$

$$\text{Dilution Factor} = 1.06 \text{ (see Attachment B for calculations)}$$

$$\begin{aligned} \text{Monthly Average Limit} &= (\text{chronic criteria})(\text{dilution factor}) \\ &= (3.2 \text{ ug/l})(1.06) = 3.4 \text{ ug/l} \end{aligned}$$

$$\begin{aligned} \text{Daily Maximum Limit} &= (\text{acute criteria})(\text{dilution factor}) \\ &= (81.6 \text{ ug/l})(1.06) = 86.5 \text{ ug/l} \end{aligned}$$

For iron, the reported effluent iron concentrations range from 62 ug/l to 182 ug/l (see Attachment A). The chronic water quality criterion is 1,000 ug/l; there is no acute criterion. Since the reported effluent concentrations are significantly less than the criteria, there is no reasonable potential for the discharge of iron to cause or contribute to a violation of water quality standards, and a limit has not been included in the permit. Effluent monitoring has been dropped from the permit.

While both Massachusetts and Rhode Island water quality criteria for metals are based on dissolved metals, national guidance recommends that permit limits be based on total recoverable metals and not dissolved metals. Consequently, it is necessary to apply a translator in order to develop a total recoverable permit limit from a dissolved criteria. The translator reflects how a discharge partitions between the particulate and dissolved phases after mixing with the receiving water. In the absence of site specific data on how a particular discharge partitions in the receiving water, a default assumption that the translator is equivalent to the inverse of the conversion factor (the conversion

factor converts a criteria based on total metals to a criteria based on dissolved metals) is used in accordance with the EPA Metals Translator Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (EPA-823-B-96-007).

The permit specifies the Furnace Atomic Absorption (AA) method for measuring lead, copper and cadmium. These determinations were made from the minimum levels (MLs) that this method provides for each parameter. EPA's definition of the ML is given here again as "the level at which the entire analytical system shall give recognizable signal and acceptable calibration points". For any of these metals, any effluent value less than its corresponding ML shall be recorded as zero.

- Whole Effluent Toxicity:

Massachusetts' Water Quality Standards contain a narrative toxicity criterion which states that "All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife." 314 CMR 4.05(5)(e).

National studies conducted by the EPA have demonstrated that industrial and domestic sources contribute toxic constituents, such as metals, chlorinated solvents, aromatic hydrocarbons, and others to POTWs. The impacts of such complex mixtures are often difficult to assess. Therefore, the toxicity of several constituents in a single effluent can only be accurately examined by whole effluent toxicity (WET) testing. Furthermore, 40 CFR 122.44 (d) requires WET limits in NPDES permits when the permittee has a "reasonable potential" to cause toxicity.

The low dilution factor calculated for the receiving water at the North Attleborough treatment plant's outfall contributes to a "reasonable potential" that the discharge could cause an excursion of the no toxics provision in the State's regulations. Inclusion of the whole effluent toxicity limit in the draft permit will ensure compliance with the State's narrative water quality criterion of "no toxics in toxic amounts". Therefore, based on the potential for toxicity, water quality standards, and available dilution, the draft permit includes chronic and acute whole effluent toxicity limitations and monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784- July 24, 1985. See also EPA's Technical Support Document for Water Quality-Based Toxics Control, EPA/505/1-90-001.) Attachment B contains the calculation for chronic whole effluent toxicity, which is based on available dilution.

The Chronic No Observed Effect Concentration (C-NOEC) limitation in the draft permit prohibits chronic adverse effects (e.g., on survival, growth, and reproduction) when aquatic organisms are exposed to the POTW discharges at the calculated available dilution. The LC50 limitations prohibits acute effects (lethality), to more than 50% of the test organisms when exposed to undiluted POTW effluent for 48 hours.

The draft permit calls for modified acute and chronic toxicity tests using one specie, the Ceriodaphnia dubia. These tests shall be conducted four times per year. Toxicity tests will be conducted on the second Tuesday of the months of February, May, August, and November. See the Toxicity Testing Protocol in Attachment A of the draft permit for a more complete description of the testing requirements. The test results shall be submitted by the last day of the month following

the test.

E. Other Monitoring Requirements.

The effluent monitoring requirements have been specified in accordance with 40 CFR 122.41(j), 122.44 (i) and 122.48 to yield data representative of the discharge.

V. Pretreatment Program.

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR Section 122.44 (j), 40 CFR Section 403 and Section 307 of the Act. The Town of North Attleborough's pretreatment program received EPA approval on September 30, 1985 and, as a result, appropriate pretreatment program requirements were incorporated into the current permit which were consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

In the reissued permit, activities that the permittee must address if applicable include, but are not limited to, the following: (1) implement and enforce specific effluent limits (technically-based local limits); (2) revise the local sewer-user ordinance or regulation to be consistent with federal regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices. Lastly, the permittee must continue to submit, annually by March 1st, a pretreatment report detailing the

VI. 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, permittees have a "duty to mitigate" pursuant to 40 CFR §122.41(d). This requires the permittees 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.D, I.E, and I.F of the Draft Permit. These requirements include: reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, developing and maintaining an inflow and infiltration (I/I) control program, and maintaining alternate power

where necessary.

Because Plainville owns and operates a collection system that discharges to North Attleborough's treatment plant, this municipality has been included as a co-permittee for the specific permit requirements discussed in the paragraph above.

The MassDEP has stated that inclusion of the I/I conditions in the draft permit shall be a standard State Certification requirement under Section 401 of the Clean Water Act and 40 CFR §124.55(b).

VII. Sludge Conditions

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. 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 sludge which is disposed of in a municipal solid waste landfill is in compliance with Part 503 regulations provided that the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 C.F.R. Part 258.

The draft permit requires that sewage sludge use and disposal practices meet Section 405(d) Technical Standards of the CWA. In addition, the EPA Region I – NPDES Permit Sludge Compliance Guidance document dated November 4, 1999 is available for use by the permittee in determining its appropriate sludge conditions for its chosen method of sludge disposal.

The North Attleborough facility generates sludge consisting of municipal and industrial waste and sends it out for disposal. The draft permit requires that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA New England has included with the draft permit a 72-page *Sludge Compliance Guidance* document for use by the permittee in determining their appropriate sludge conditions for their chosen method of sludge disposal.

The permittee is also required to submit to EPA an annual report containing the information specified in the *Sludge Compliance Guidance* document for the permittee's chosen method of sludge disposal.

VIII. State Certification Requirements.

The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the State pursuant to CWA § 401(a)(1) and 40 CFR § 124.53 and expects that the draft permit will be certified. EPA also expects that Rhode Island will be commenting on the permit pursuant to its authorities under CWA § 401(a)(2).

IX. Public Comment Period, Public Hearing, and Procedures for Final Decision.

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full before the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection “CMP”, Region 1, 1 Congress Street, Suite 1100, Boston, MA 02114-2023. Any person, prior to such date, may submit a request in writing to EPA and the state agency for a public hearing to consider the draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing.

A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA’s Boston office. Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

X. EPA Contact.

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

David Pincumbe
Municipal Permits Branch (CMP)
Office Of Ecosystem Protection
US Environmental Protection Agency
Congress Street, Suite 1100
Boston, MA 02114-2023
Tele: (617) 918-1695

Paul Hogan, Chief
Surface Water Permit Program
Division of Watershed Management
Department of Environmental Protection
627 Main Street, Second Floor
Worcester, MA 01608
Tele: (508) 767-2796

June , 2006
Date

Linda M. Murphy, Director
Office of Ecosystem Protection

Attachment A
Effluent Data

Month	Flow (MGD)	BOD (mg/l)		TSS (mg/l)		Ammonia (mg/l)		Total Nitrogen (mg/l)	Phosphorus (mg/l)		Fecal Coliform (CFU/100ml)		DO (mg/l)	WET ceriodaphnia (% effluent)	
		ave	max	ave	max	ave	max		max	ave	max	ave		max	ave
Jan 03	5.14	29.3	82.4	20.1	39.9	5		9		1.80	4	33	6.6		
Feb 03	4.13	19.0	30.2	10.9	40.4	7		19		1.20	5	115	6.1	100	100
Mar 03	3.07	13.3	14.8	6.0	11.0	4		12		2.50	11	178	6.1		
Apr 03	4.85	12.8	30.8	6.7	13.2	2		7		1.10	2	100	6.3		
May 03	6.13	4.4	9.8	5.1	10.2	0		17.2	1.0	1.2	1	5	7.9	>100	100
June 03	4.36	5.0	9.1	4.8	12.9	0.3	0.6	9	0.7	0.8	1	7	6.2		
July 03	3.90	5.3	8.0	5.2	11.6	0.5	1.5	8.4	0.7	1.0	3	3	6.2		
Aug 03	3.96	4.5	7.5	4.1	5.8	0.3	1.7	10	0.6	0.0	2	29	6.6	100	100
Sept 03	3.52	4.2	7.7	4.7	14.5	0.2	0.4	11	0.9	1.0	1	4	6.0		
Oct 03	3.60	4.3	7.8	6.5	11.8			16	0.8	1.0	3	53	7.0		
Nov 03	3.92	7.8	12.6	8.2	14.4	1		8		2.1	7	105	7.0	>100	100
Dec 03	5.79	21.5	86.2	17.3	86.8	4		13		1.9	10	11200	4.4		
Jan 04	4.41	10.7	14.5	5.1	10.4	6		10		1.9	2	88	5.8		
Feb 04	3.51	9.1	10.8	2.9	4.8	8		16		2.1	2	73	6.4	100	100
Mar 04	3.47	8.2	11.4	2.4	3.7	8		19		2.0	1	0?	6.2		
Apr 04	6.55	15.6	57.6	19.5	139.7	1		6		1.0	5	5200	5.2		
May 04	4.19	9.1	29.5	11.0	106.0	0		6	1.10	1.3	2	18	6.8	>100	100

Effluent Data

Month	Flow (MGD)	BOD (mg/l)		TSS (mg/l)		Ammonia (mg/l)		Total Nitrogen (mg/l)	Phosphorus (mg/l)		Fecal Coliform (CFU/100ml)		DO (mg/l)	WET ceriodaphnia (% effluent)	
		ave	max	ave	max	ave	max		ave	max	ave	max		LC50	NOEC
June 04	3.11	4.9	8.7	5.8	15.0	0.2	0.6	9	0.9	1.1	1	4	6.9		
July 04	2.80	3.2	4.3	3.1	5.0	0.1	0.3	9.6	0.9	1.1	2	3	6.8		
Aug 04	3.05	3.8	4.6	3.0	6.6	0.0	0.1	10	0.8	1.0	1	5	6.4	100	100
Sept 04	3.09	3.5	4.6	3.3	5.3	0.0	0.0	10	0.8	1.1	4	25	6.5		
Oct 04	3.12	2.5	3.6	1.7	2.5			8.4	0.7	0.7	2	3	6.4		
Nov 04	3.11	2.9	4.8	2.2	6.0	0.2		8		0.7	2	6	6.6	100	100
Dec 04	4.69	4.2	6.9	2.8	3.9	0.4		2		1.4	9	43	7.9		
Limits															
5/1-5/31	4.61	5.0	15.0	7.0	15.0	3	---	---	1	2	200	400	6.0	100	94
6/1-10/31	4.61	5.0	15.0	7.0	15.0	1	2	---	1	2	200	400	6.0	100	94
11/1-11/30	4.61	15.0	30.0	15.0	30.0	7	---	---	---	---	200	400	6.0	100	94
12/1-4/30	4.61	15.0	30.0	15.0	30.0	10	---	---	---	---	200	400	6.0	100	94

Effluent Data

Month	Al (ug/l)		Cu (ug/l)		CN (ug/l)		Ni (ug/l)	Zn (ug/l)	Cr (ug/l)	Cd (ug/l)
	ave	max	ave	max	ave	max	max	max	max	max
Feb 03	614	614	104	104	0	0				
Mar 03	83	83	25	25	0	0	0	23	0	0
Apr 03	179	179	17	17	0	0				
May 03	101	101	82	82	0	0	0	25	0	0
June 03	398	398	34	34	0	0				
July 03	332	332	60	60	0	0	0	48	0	0
Aug 03	111	111	28	28	0	0				
Sept 03	99	99	47	47	0	0	0	31	0	0
Oct 03	293	293	29	29	0	0				
Nov 03	205	205	33	33	0	0	0	35	0	0
Dec 03	92	92	20	20	0	0				
Jan 04	36	72	23	23	0	0	0	31	0	0
Feb 04	65	65	0	0	0	0				
Mar 04	0	0	6	12	0	0	0	40	0	0
Apr 04	85	85	19	19	0	0				
May 04	115	115	32	32	0	0	0	42	0	0
June 04	524	524	48	48	0	0				
July 04	80	80	38	38	0	0	0	41	0	0
Aug 04	84	84	21	21	0	0				
Sept 04	83	83	27	27	0	0	0	36	0	0
Oct 04	0	0	0	0	0	0				
Nov 04	128	128	18	18	0	0	0	67	0	0
Dec 04	0	0	0	0	0	0				
Ave	149		30		0					
Limits	140	140	20	20	5	22	---	---	---	---

July 03, Fe=182 ug/l, Pb= 13 ug/l

July 04, Fe= 62 ug/l, Pb= 3 ug/l

ATTACHMENT - B
NPDES Permit No. MA0101036
North Attleborough, Massachusetts

Dilution calculations:

Design flow of the plant : 4.61 mgd = 7.14 cfs

Drainage Area Considered: 10.76 square miles

7Q10 flow factor : 0.043 cfs/square miles

Calculated 7Q10 : 0.463 cfs

Dilution Factor: $\frac{Q_r + Q_e}{Q_e}$

Q_r = Receiving water flow = 7Q10 = 0.463 cfs

Q_e = Effluent flow = design flow = 7.14 cfs

dilution Factor = 1.06

LC50 \geq 100%

1/Dilution factor X 100 = 94% (Receiving Water Concentration)

NOEC \geq RWC

NOEC \geq 94%

30Q10 flow factor = 7Q10 x 2.37 (based upon US Geological Survey flow gage records)

Ratio = 30Q10/7Q10 = 3.06/1.29 = 2.37 (for period of November-May)

30Q10 flow = 1.1 cfs