AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §1251 et seq.; the "CWA"),

The Town of Hanover, New Hampshire

is authorized to discharge from the Wastewater Treatment Plant located at

121 South Main Street
Hanover, New Hampshire 03755

to receiving waters named

Connecticut River

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein including, but not limited to, conditions requiring the proper operation and maintenance of the Hanover collection system.

The City of Lebanon is a co-permittee for Part B., Unauthorized Discharges; and Part C., Operation and Maintenance, which includes conditions regarding the operation and maintenance of the collection systems owned and operated by the City. The responsible City Department is

City of Lebanon
Department of Public Works
193 Dartmouth College Highway
Lebanon, NH 03766

This permit will become effective on the first day of the calendar month immediately following sixty days after signature.*

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on February 9, 2006.

This permit consists of **Part I (**14 pages including effluent limitations and monitoring requirements); **Attachment A** (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages); **Attachment B** (Summary of Required Report Submittals); and **Part II (**25 pages including NPDES Part II Standard Conditions).

Signed this day of

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Ken Moraff, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency (EPA)
Region 1
Boston, Massachusetts

PART I
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated domestic and industrial wastewater from outfall serial number 001A to the Connecticut River. Such discharges shall be limited and monitored by the permittee, as specified below. Samples taken in compliance with the monitoring requirements specified below shall be taken at a location that provides a representative analysis of the discharge.

Effluent Characteristic	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow; mgd	Report	---	Report	Continuous Recorder[1]	
$CBOD_5$; mg/l (lbs/day)	25 (480)	40 (767)	45 (863)	2/Week[2]	24 Hour Composite
TSS; mg/l (lbs/day)	30 (575)	45 (863)	50 (959)	2/Week[2]	24 Hour Composite
pH Range[3]; Standard Units	6.0 – 8.0			1/Day	Grab
Total Residual Chlorine[4,6]; mg/l	1.0	---	1.0	1/Day	Grab
Escherichia coli[4,5]; Colonies/100 ml	126	---	406	3/Week	Grab
March 1 – September 30 Total Kjeldahl Nitrogen[8] mg/L (lbs/day) Total Nitrate + Nitrite Nitrogen[8], mg/L (lbs/day) Total Nitrogen, mg/L[7,8] (lbs/day)	Report (Report) [8]	---	Report (Report)	1/Week	24-Hour Composite
October 1 – February 28 Total Kjeldahl Nitrogen[8] mg/L (lbs/day) Total Nitrate + Nitrite Nitrogen[8], mg/L (lbs/day) Total Nitrogen, mg/L[7,8] (lbs/day)	Report (Report) [8]	---	Report (Report)	1/Month	24-Hour Composite
Total Recoverable Aluminum, µg/L	Report	---	Report	1/Month	24 Hour Composite
Whole Effluent Toxicity LC50 [9,10,11]; Percent	50			1/Year	24 Hour Composite
Hardness[12]; mg/l	---	---	Report	1/Year	24 Hour Composite
Ammonia Nitrogen as N[12]; mg/l	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Aluminum[12]; µg/L	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Cadmium[12]; µg/L	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Copper[12] µg/L	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Lead[12]; µg/L	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Nickel[12]; µg/L	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Zinc[12]; µg/L	---	---	Report	1/Year	24 Hour Composite

FOOTNOTES

1. The effluent flow shall be continuously measured and recorded using a flow meter and totalizer.

2. Effluent sampling frequency. The influent shall be sampled twice per month using 24-hour composite samples.

3. State certification requirement.

4. Monitoring for *Escherichia coli* bacteria (as described in footnote (5) below) shall be conducted concurrently with the daily monitoring for total residual chlorine (TRC) (as described in footnote (6) below).

5. The average monthly value for *Escherichia coli* shall be calculated as a geometric mean. *Escherichia coli* shall be tested using an approved method as specified in 40 Code of Federal Regulations (CFR) Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

6. Total residual chlorine shall be measured using any one of the following three methods listed in 40 CFR Part 136:
   a. Amperometric direct.
   b. DPD-FAS.
   c. Spectrophotometric, DPD.

7. See Part I.F.1, Special Conditions, for optimization and annual reporting requirements concerning nitrogen removal.

8. Total kjeldahl nitrogen, nitrite nitrogen, and nitrate nitrogen samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen (total nitrogen = total kjeldahl nitrogen + total nitrate/nitrite nitrogen).

   The total nitrogen loading values reported each month shall be calculated as follows: Calculate daily loads of total nitrogen (lbs/day) for each day that nitrogen sampling takes place. Loading (lbs/day) = total nitrogen concentration (mg/l) * daily flow (millions of gallons (MG)) * 8.34. The average monthly loading shall be the average of the daily loading results.

9. LC50 (lethal concentration 50 percent) is the concentration of wastewater causing mortality to 50 % of the test organisms. Therefore, a 50 % limit means that a sample of 50 % effluent shall cause no greater than a 50 % mortality rate in that effluent sample.

10. The permittee shall conduct 48-hour static acute toxicity tests on effluent samples following the February 2011 USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol (**Attachment A**). The two species for these tests are the Daphnids (*Ceriodaphnia dubia*) and the Fathead Minnow (*Pimephales promelas*). Toxicity test samples shall be collected and tests completed once per year during the calendar quarter ending September 30th. Toxicity test results are to be submitted by November 15th.

11. This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits such as for metals, 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 Section 122.62(a)(2).

12. For each whole effluent toxicity test the permittee shall report on the appropriate discharge monitoring report, (DMR), the concentrations of the hardness, ammonia nitrogen as nitrogen, total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A** on page 7 of 8, or as amended. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report. Testing of aluminum and ammonia in the 100 percent effluent sample will count toward the sampling requirement for these constituents listed in Table I.A.1.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge shall be adequately treated to insure that the surface water remains free from pollutants in concentrations or combinations that settle to form harmful deposits, float as foam, debris, scum or other visible pollutants. It shall be adequately treated to ensure that the surface waters remain free from pollutants which produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses.

4. The permittee's treatment facility shall maintain a minimum monthly average of 85 percent removal of both $CBOD_5$ and TSS. The percent removal shall be calculated using the average monthly influent and effluent concentrations.

5. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the 2.3 mgd design flow (1.84 mgd), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

6. The permittee shall not discharge into the receiving water any pollutant or combination of pollutants in toxic amounts.

7. All POTWs must provide adequate notice to both EPA-New England and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) of the following:

   a. Any new introduction of pollutants into the POTW from an indirect discharger in a primary industry category (see 40 CFR §122 Appendix A as amended) discharging process water; and

   b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

   c. For purposes of this paragraph, adequate notice shall include information on:

      (1) the quantity and quality of effluent introduced into the facility; and

(2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the facility.

8. Limitations for Industrial Users

a. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

b. The permittee shall submit to EPA and NHDES-WD the name of any Industrial User (IU) 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) who commences discharge to the POTW after the effective date of this permit.

This reporting requirement also applies to any other IU who discharges an average of 25,000 gallons per day or more of process wastewater into the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW; or is designated as such by the Control Authority as defined in 40 CFR § 403.12(a) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 CFR § 403.8(f)(6)).

c. In the event that the permittee receives reports (baseline monitoring reports, 90-day compliance reports, periodic reports on continued compliance, etc.) from 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), the permittee shall forward all copies of these reports within ninety (90) days of their receipt to EPA and NHDES-WD.

B. UNAUTHORIZED DISCHARGES

The permit only authorizes discharges in accordance with the terms and conditions of this permit and only from the Outfall listed in Part I.A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported to EPA and NHDES in accordance with Part II, Section D.1.e. of the General Requirements of this permit (twenty four hour reporting).

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions. The permittee and each co-permittee are required to complete the following activities for the collection system which they own.

1. Maintenance Staff

The permittee and each co-permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. This requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

2. Preventative Maintenance Program

The permittee and each co-permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. This requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

The permittee and each co-permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to control I/I shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

4. Collection System Mapping

Within 30 months of the effective date of this permit, the permittee and each co-permittee shall prepare a map of the sewer collection system it owns (see page 1 of this permit for the effective date). The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up to date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;
b. All combined sewer lines, related manholes, and catch basins;
c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combined manholes);
d. All outfalls, including the treatment plant outfall(s), CSOs, combined manholes, and any known or suspected SSOs;
e. All pump stations and force mains;
f. The wastewater treatment facility(ies);
g. All surface waters (labeled);
h. Other major appurtenances such as inverted siphons and air release valves;
i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;
j. The scale and a north arrow; and
k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System Operation and Maintenance Plan

The permittee and each co-permittee shall develop and implement a Collection System Operation and Maintenance Plan.

a. **Within six (6) months of the effective date of the permit**, the permittee and each co-permittee shall submit to EPA and NHDES

(1) A description of the collection system management goals, staffing, information management, and legal authorities;
(2) A description of the overall condition of the collection system including a list of recent studies and construction activities; and
(3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.7. below.

b. The full Collection System O & M Plan shall be submitted to EPA and NPDES and implemented **within twenty four (24) months from the effective date of this permit**. The Plan shall include:

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventative maintenance and monitoring program for the collection system;
(3) Sufficient staffing to properly operate and maintain the sanitary sewer collection system;
(4) Sufficient funding and the source(s) of funding for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including combined manholes, a description of the cause of the identified overflows and back-ups, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(6) A description of the municipality's program for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.

6. Annual Reporting Requirement

The permittee and each co-permittee must submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and NHDES **annually by April 15th**. The first annual report is due the first April 15th following submittal of the collection system O&M Plan required by Part I.C.5.b. of this permit. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
d. A map with areas identified for investigation/action in the coming year;
e. If treatment plant flow has reached 80% of the 2.3 mgd design flow (1.84 mgd) based on the daily flow for three consecutive months or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and

f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the permittee shall provide an alternate power source with which to sufficiently operate the wastewater facility, as defined at 40 C.F.R. § 122.2, which references the definition at 40 C.F.R. § 403.3(o). Wastewater facility is defined by RSA 485A:2.XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge.

E. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal & state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state (Env-Ws 800) or federal (40 CFR Part 503) requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following use or disposal practices.

   a. Land application - the use of sewage sludge to condition or fertilize the soil.
   b. Surface disposal - the placement of sewage sludge in a sludge only landfill.
   c. Sewage sludge incineration in a sludge only incinerator.

4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions do not apply to facilities which do not dispose of sewage sludge during the life of the permit, but rather treat the sludge (lagoons-reed beds), or are otherwise excluded under 40 CFR Section 503.6.

5. The permittee shall use and comply with the NPDES Permit Sludge Compliance Guidance, November 1999, to determine appropriate conditions. This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf . Appropriate conditions contain the following elements.

   - General requirements
   - Pollutant limitations
   - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   - Management practices
   - Record keeping
   - Monitoring
   - Reporting

   Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction

reduction for the permittee's chosen sewage sludge use or disposal practices at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year.

• less than 290	1/Year
• 290 to less than 1,500	1/Quarter
• 1,500 to less than 15,000	6/Year
• 15,000 plus	1/Month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR Section 503.8.

8. The permittee shall submit an annual report containing the information specified in the attached Sludge Compliance Guidance document. Reports are **due annually by March 15th**. Reports shall be submitted to both addresses (EPA-New England and NHDES-WD) contained in the reporting section of the permit.

F. SPECIAL CONDITIONS

1. Nitrogen Optimization

The permittee shall optimize its facility to maintain the mass discharge of total nitrogen less than the existing annual discharge load. The annual average total nitrogen load from this facility (2004-2005) is estimated to be **360 lbs/day.**

The permittee shall submit an annual report to EPA and NHDES-WD, by **February 15th** of each year that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year.

2. pH Limit Adjustment

The permittee may submit a written request to the EPA-New England requesting a change in the permitted pH limit range to be not less restrictive than 6.0 to 9.0 Standard Units found in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for this facility. The permittee's written request must include the State's approval letter containing an original signature (no copies). The State's letter shall state that the permittee has demonstrated to the State's satisfaction that as long as discharges to the receiving water from a specific outfall are within a specific numeric pH range the naturally occurring receiving water pH will be unaltered. That letter must specify for each outfall the associated numeric pH limit range. Until written notice is received by certified mail from the EPA-New England indicating the pH limit range has been changed, the permittee is required to meet the permitted pH limit range in the respective permit.

G. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the NHDES within the time specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information

and provide notices in the manner described in this section.

1. Submittal of DMRs and the Use of NetDMR

Beginning the effective date of the permit the permittee must submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and NHDES no later than the 15th day of the month following the completed reporting period. For a period of six months from the effective date of the permit, the permittee may submit its monthly monitoring data in DMRs to EPA and NHDES either in hard copy form, as described in Part I.G.5, or in DMRs electronically submitted using NetDMR. NetDMR is a web-based tool that allows permittees to electronically submit DMRs and other required reports via a secure internet connection. NetDMR is accessed from: http://www.epa.gov/netdmr. Beginning no later than six months after the effective date of the permit, the permittee shall begin reporting monthly monitoring data using NetDMR, unless, in accordance with Part I.G.7, the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs. The permittee must continue to use the NetDMR after the permittee begins to do so. When a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs to EPA or NHDES.

2. Submittal of Reports as NetDMR Attachments

After the permittee begins submitting DMR reports to EPA and NHDES electronically using NetDMR, the permittee shall electronically submit all reports to EPA and NHDES as NetDMR attachments rather than as hard copies, unless otherwise specified in this permit. (See Part I.G.6. for more information on state reporting.) Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the particular report due date specified in this permit.

3. Submittal of Pre-treatment Related Reports (for permittees with a pretreatment program)

All reports and information required of the permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Office of Ecosystem Protection's Pretreatment Coordinator in Region 1 EPA's Office of Ecosystem Protection (OEP). These requests, reports and notices include:

a. Annual Pretreatment Reports,
b. Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,
c. Revisions to Industrial Discharge Limits,
d. Report describing Pretreatment Program activities, and
e. Proposed changes to a Pretreatment Program

This information shall be submitted to EPA/OEP as a hard copy at the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. Submittal of Requests and Reports to EPA/OEP

The following requests, reports, and information described in this permit shall be submitted to the EPA/OEP NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

a. Transfer of Permit notice
b. Request for changes in sampling location
c. Request for reduction in testing frequency
d. Request for Reduction in WET Testing Requirement
e. Report on unacceptable dilution water / request for alternative dilution water for WET testing
f. Change in location, design or capacity of outfall

These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP NPDES Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

5. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to EPA.

a. Written notifications required under Part II
b. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
c. Collection System Operation and Maintenance Plan (from co-permittee)
d. Report on annual activities related to O&M Plan (from co-permittee)
e. Reports and DMRs submitted prior to the use of NetDMR

This information shall be submitted to EPA/OES at the following address:

U.S. Environmental Protection Agency
Office or Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

6. State Reporting

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.F.3, I.F.4, and I.F.5 also shall be submitted to the State at the following addresses:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95

Concord, New Hampshire 03302-0095

7. Submittal of NetDMR Opt-Out Requests

NetDMR opt-out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under this permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt-out request and such request is approved by EPA. All opt-out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

And

Attn: Compliance Supervisor
New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

8. Verbal Reports and Verbal Notifications

Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to NHDES. This includes verbal reports and notifications which require reporting within 24 hours. (As examples, see Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.) Verbal reports and verbal notifications shall be made to EPA's Office of Environmental Stewardship at:

U.S. Environmental Protection Agency
Office of Environmental Stewardship
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912
617-918-1510

H. STATE PERMIT CONDITIONS

1. The permittee shall not at any time, either alone or in conjunction with any person or persons, cause directly or indirectly the discharge of waste into the said receiving water unless it has been treated in such a manner as will not lower the legislated water quality classification or interfere with the uses assigned to said water by the New Hampshire Legislature (RSA 485-A:12).

2. This NPDES discharge permit is issued by EPA under federal and state law. Upon final issuance by EPA, the New Hampshire Department of Environmental Services-Water Division (NHDES-WD) may adopt this permit, including all terms and conditions, as a state permit pursuant to RSA 485-A:13.

3. EPA shall have the right to enforce the terms and conditions of this permit pursuant to federal law and NHDES-WD shall have the right to enforce the permit pursuant to state law, if the permit is adopted. Any modification, suspension, or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of the permit as issued by the other agency.

4. Pursuant to New Hampshire Statute RSA 485-A13,I(c), any person responsible for a bypass or upset at a *wastewater facility* shall give immediate notice of a bypass or upset to all public or privately owned water systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge regardless of whether or not it is on the same receiving water or on another surface water to which the receiving water is tributary. Wastewater facility is defined at RSA 485-A:2XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge. The permittee shall maintain a list of persons, and their telephone numbers, who are to be notified immediately by telephone. In addition, written notification, which shall be postmarked within 3 days of the bypass or upset, shall be sent to such persons.

5. Pursuant to New Hampshire Code of Administrative Rules, Env-Wq 703.07(a):

   a. Any person proposing to construct or modify any of the following shall submit an application for a sewer connection permit to the department:

      (1) Any extension of a collector or interceptor, whether public or private, regardless of flow;

      (2) Any wastewater connection or other discharge in excess of 5,000 gpd (gallons per day);

      (3) Any wastewater connection or other discharge to a WWTP operating in excess of 80 percent design flow capacity based on actual average flow for 3 consecutive months;

      (4) Any industrial wastewater connection or change in existing discharge of industrial wastewater, regardless of quality or quantity; and

      (5) Any sewage pumping station greater than 50 gpm (gallons per minute) or serving more than one building.

6. For each new or increased discharge of industrial waste to the POTW, the permittee shall submit, in accordance with Env-Wq 305.10(a) an “Industrial Wastewater Discharge Request.” The “Industrial Wastewater Discharge Request” shall be prepared in accordance with Env-Wq 305.10(c).

7. Pursuant to Env-Wq 305.21, at a frequency no less than every five years, the permittee shall submit to NHDES:

   a. A copy of its current sewer use ordinance if it has been revised without NHDES approval subsequent to any previous submittal to the department or a certification that no changes have been made.

b. A current list of all significant indirect dischargers to the POTW. At a minimum, the list shall include for each significant indirect discharger, its name and address, the name and daytime telephone number of a contact person, products manufactured, industrial processes used, existing pretreatment processes, and discharge permit status.

c. A list of all permitted indirect dischargers; and

d. A certification that the municipality is strictly enforcing its sewer use ordinance and all discharge permits it has issued.

8. In addition to submitting DMRs, monitoring results shall also be summarized for each calendar month and reported on separate Monthly Operations Report Form(s) (MORs) postmarked or submitted electronically using NetDMR no later than the 15th day of the month following the completed reporting period. Signed and dated MORs, which are not submitted electronically using NetDMR shall be submitted to:

New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

USEPA REGION 1 FRESHWATER ACUTE
TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcement/water/dmr.html *for further important details on alternate dilution water substitution requests.*

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 ± 1^{o}C or 25 ± 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	≥ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

		series.
16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration	40
11.	Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012.

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

Attachment B

Summary of Reports Required by NPDES Permit No. NH0100170[1]

Report	Date Due	Submit Report to EPA at:[2]	Submit Report to State at:[2]
Discharge Monitoring Report (DMR) (Part I)	Monthly, by the 15th day of the following month.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
WET Test Report (Part I.A.1.)	The 15th day of the month following the end of the calendar quarter sampled.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Nine Minimum Controls Program Update (Part I.B.1.)	One-time submission, due within 12 months of the effective date	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

Attachment B (Continued)

Report	Date Due	Submit Report to EPA at[2]:	Submit Report to State at[2]:
Nine Minimum Controls Annual Report (Part I.B.4.)	Annually, by March 1st	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Sludge Report (Part I.H.)	Annually, by February 19th	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Collection System Map (Part I.E.4.)	Within 30 months of the effective date of the permit.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Collection System O&M Plan (Part I.E.5.)	Within 6 months of the effective date of the permit. Full plan due within 24 months from the effective date.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

Attachment B (Continued)

Report	Date Due	Submit Report to EPA at[2]:	Submit Report to State at[2]:
Collection O&M Plan Annual Report (Part I.E.6.)	Annually, by March 31st.	Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Reassessment of Technically Based Industrial Discharge Limits	Within 90 days of the effective date of the permit.	Justin Pimpare Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
. Pretreatment Program Annual Report (Part I.G.)	Annually, by March 1st	Justin Pimpare Environmental Protection Agency P.O. Box 8127 Boston, Massachusetts 02114	
Pretreatment Program Update (Part I.G.)	Within 180 days of the effective date of the permit	Justin Pimpare Environmental Protection Agency Water Technical Unit (SEW) P.O. Box 8127 Boston, Massachusetts 02114	

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

Attachment B (Continued)

Report	Date Due	Submit Report to EPA at[2]:	Submit Report to State at[2]:
Sewer Use Ordinance, List of all significant indirect dischargers , List of all permitted indirect (Part I.G.8)	No less than every 5 years.	NA	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095
Monthly Operating Report Forms (MORs) (Part I.I.9.)	Monthly, by the 15th day of the following month.	NA	New Hampshire Department of Environmental Services Water Division Wastewater Engineering Bureau P.O. Box 95 Concord, New Hampshire 03302-0095

[1]This table is a summary of the reports required to be submitted under this NPDES permit, and is included in the permit to serve as an aide to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.
[2]See Part I. for electronic (NetDMR) reporting requirements

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete “Duty to Comply” regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or permittee;
(2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).

c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly 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 this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. Upset

a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(4) The permittee complied with any remedial measures required under B.3. above.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by

imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. Planned Changes. The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. Anticipated noncompliance. The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. Transfers. This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. Twenty-four hour reporting.

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.

h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and Federal standards and limitations to which a “discharge”, a “sewage sludge use or disposal practice”, or a related activity is subject to, including “effluent limitations”, water quality standards, standards of performance, toxic effluent standards or prohibitions, “best management practices”, pretreatment standards, and “standards for sewage sludge use and disposal” under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in "approved States", including any approved modifications or revisions.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" measured during the calendar week divided by the number of "daily discharges" measured during the week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source", or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See "Point Source" definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States", the waters of the "contiguous zone", or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise "effluent limitations".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program".

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants";

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source"; and

(d) Which has never received a finally effective NPDES permit for discharges at that "site".

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants", the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System".

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a "POTW".

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly Owned Treatment Works (POTW) means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary Industry Category means any industry which is not a "primary industry category".

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

(i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
(ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
(iii) are pollutants for which EPA has published acute or chronic water quality criteria.

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of "sludge use or disposal practices" any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a "treatment works treating domestic sewage", where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

Waste Pile means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Industrial wastewater is wastewater generated in a commercial or industrial process.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

Municipality means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I – NEW ENGLAND
5 POST OFFICE SQUARE – SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

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

NPDES PERMIT No.: **NH0100099**

PUBLIC NOTICE START AND END DATES: **August 8, 2014 – September 21, 2014**

NAME AND ADDRESS OF APPLICANT:

Town of Hanover
Attn: Kevin MacLean
P.O. Box 483
Hanover, New Hampshire 03755

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Town of Hanover Water Reclamation Facility
121 South Main Street
Hanover, New Hampshire 03755

The City of Lebanon is a co-permittee for specific activities required by this permit. See Section VIII of this Fact Sheet and Section 1.B. and 1.C. of the draft permit. The responsible City Department is

City of Lebanon
Department of Public Works
193 Dartmouth College Highway
Lebanon, NH 03766

RECEIVING WATER: **Connecticut River (Segment ID: NHLAK801040402-03)**

CLASSIFICATION: **B**

TABLE OF CONTENTS

Tables

Figures

Appendices

I. PROPOSED ACTION, TYPE OF FACILITY, AND DISCHARGE LOCATION

The Town of Hanover Water Reclamation Facility (WRF) has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge treated effluent into the designated receiving water, the Connecticut River. The Hanover Water Reclamation Facility's discharge is currently authorized under the POTW general permit (GP) that was issued on September 14, 2005 and expired in September 23, 2011 (the 2005 POTW GP). Coverage under this permit was granted on February 9, 2006. By letter dated March 19, 2010, EPA informed the Town that it would administratively continue coverage for the Hanover Water Reclamation Facility under the 2005 POTW GP until the reissuance of a new POTW GP.

The new POTW GP was issued on July 6, 2011 (the 2011 POTW GP). However, this general permit includes a condition that precludes coverage for the Hanover discharge. Specifically, the 2011 POTW GP does not allow coverage for facilities discharging more than 35 pounds per day of total nitrogen, and discharge data submitted by the Town of Hanover in its notice of intent (NOI) for coverage under the 2011 POTW GP shows that the total nitrogen discharge load exceeds this amount. Thus, the facility is not eligible for coverage under the 2011 POTW GP and applied for an individual permit. Coverage under expired 2005 POTW GP will continue until the individual permit becomes effective.

The Hanover Water Reclamation Facility (WRF) provides activated sludge secondary treatment of sanitary wastewater for a population of approximately 9,000 residents in Hanover and 2,000 residents in Lebanon. The Hanover population includes approximately 6,000 students at Dartmouth College. There are also four significant industrial users with local limits that contribute wastewater to the WRF. None of the significant industrial users are subject to federal categorical pretreatment standards.

The facility has a design flow of 2.3 million gallons per day (mgd). Wastewater is first screened and degritted, followed by primary clarification, activated sludge biological treatment, secondary clarification, chlorine disinfection, and sodium bisulfite dechlorination. Effluent is discharged to the Connecticut River. The location of the WWTF and a process flow diagram are shown in Figures 1 and 2, respectively. The geographic coordinates of discharge outfall 001A are listed below:

Outfall No.	Description of Discharge	Outfall Location
001A	Secondary Wastewater Effluent	43º41'47.997"N / 72º18'0.179"W

The collection system consists entirely of separate sanitary sewers. During the current permit term, there were twelve reported sanitary sewer overflows (SSOs). A variety of factors caused the SSOs, including pump station failure (especially Pump Station 5 near Girl Brook), sewer obstructions, and miscommunications with the dispatcher. Hanover received American Recovery and Reinvestment Act (ARRA) funds to upgrade Pump Station 5 and completed the work in December 2010. Hanover is also phasing out use of the dispatcher to field sewer alarms, and plans to route these incidents directly to the WRF instead.

II. DESCRIPTION OF THE DISCHARGE

A quantitative description of the discharge in terms of significant effluent parameters based on 2009-2013 monitoring data can be found in **Appendix A**.

III. LIMITATIONS AND CONDITIONS

The draft permit contains effluent limitations for five-day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), pH, total residual chlorine (TRC), *Escherichia coli (E. coli),* total recoverable aluminum, and whole effluent toxicity (WET). In addition, the draft permit contains monitoring requirements for flow, total Kjeldahl nitrogen, total nitrate and nitrite, total ammonia nitrogen, total nitrogen, hardness, cadmium, copper, lead, nickel, and zinc. The effluent limitations and monitoring requirements may be found in Part I of the draft NPDES permit.

The basis for each limitation and monitoring requirement found in the draft permit is discussed further in this fact sheet.

IV. STATUTORY AND REGULATORY AUTHORITY

A. General Statutory and Regulatory Background

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

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. See CWA §§ 301, NPDES Permit No. NH0101052 Page 4 of 40 303, 304(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant-reducing technology available and economically achievable for the type of facility being permitted. See CWA § 301(b). As a class, POTWs must meet performance-based requirements based on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of $CBOD_5$, TSS, and pH. (see 40 C.F.R. Part 133.)

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

The CWA requires that states develop water quality standards for all water bodies within the state (CWA § 303). These standards have three parts: (1) one or more "designated uses" for each water body or water body segment in the state; (2) water quality "criteria," consisting of numerical concentrations and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an antidegradation provision, focused on protecting high quality waters and protecting and maintaining water quality necessary to protect existing uses. CWA § 303(c)(2)(A); 40 C.F.R. § 131.12. The limits and conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards.

The applicable New Hampshire water quality standards can be found in Surface Water Quality Regulations, Chapter Env-Wq 1700 et seq. See generally, Title 50, Water Management and Protection, Chapter 485A, Water Pollution and Waste Disposal Section 485-A. Hereinafter, New Hampshire's Surface Water Quality Regulations are referred to as the NH Standards.

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

All statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired. When technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. See 40 C.F.R. § 125.3(a)(1). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit.

The regulations governing EPA's NPDES permit program are generally found in 40 C.F.R. Parts 122, 124, 125 and 136.

B. Development of Water Quality-based Limits

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality standard, including narrative water quality criteria. See 40 C.F.R. §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 controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water

as determined from the permit 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 New Hampshire water quality standards (RSA 485-A:8,VI, Env-Wq 1705.02) available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life and human health criteria for non-carcinogens, or the long-term harmonic mean flow for human health (carcinogens only) in the receiving water. Available dilution for tidal waters is based on conditions that result in dilution that is exceeded 99 percent of the time. Furthermore, for all waters, 10 percent (%) of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations Env-Wq 1705.01.

C. Anti-backsliding

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

D. State Certification

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

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

to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. § 122.4 (d) and 40 C.F.R. § 122.44(d)

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMIT DERIVATION

A. Design Flow

The Hanover WRF has a design flow of 2.3 mgd, which was used in the calculation of the available dilution as well as the water quality-based effluent limitations for total residual chlorine, and whole effluent toxicity. It was also used to calculate the mass-based limits for $CBOD_5$ and TSS, which were included in accordance with the requirements found at 40 CFR §122.45(b).

The 2005 POTW GP requires reporting of the average monthly flow and maximum daily flow for each month. The average monthly flow from September 2009 through August 2013 ranged from 0.91 mgd to 1.97 mgd.

The draft permit maintains the requirement in the current permit for the permittee to submit to EPA and NHDES a projection of loadings, a program for maintaining satisfactory treatment levels, and plans for facility improvements whenever the effluent flow exceeds 80 percent of the facility's design flow capacity (or 1.84 mgd) for three consecutive months. The draft permit also maintains the average monthly and maximum daily flow reporting requirements found in the current permit.

B. Conventional pollutants

1. *Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)*

The $CBOD_5$ limits from the 2005 POTW GP are: 25 mg/L as a monthly average, 40 mg/L as a weekly average, and 45 mg/L as a daily maximum; $CBOD_5$ loading limits of 480 lbs/day as a monthly average, 767 lbs/day as a weekly average, and 863 lbs/day as a daily maximum; and a monthly average percent $CBOD_5$ removal no less than 85%.

From September 2009 through August 2013, there were no permit exceedances of the $CBOD_5$ limit, with the reported values much less than the permit limits.

The draft permit maintains the same $CBOD_5$ limits as in the 2005 POTW GP, which are consistent with the secondary treatment requirements found at 40 CFR 133.102(a)(4)(i-iii). The monitoring frequency in the draft permit is twice per week.

2. *Total Suspended Solids (TSS)*

The TSS limits from the 2005 POTW GP are: 30 mg/L as a monthly average, 45 mg/L as a weekly average, and 50 mg/L as a daily maximum; TSS loading limits of 575 lbs/day as a monthly average, 863 lbs/day as a weekly average, and 959 lbs/day as a daily maximum; and a monthly average percent TSS removal of no less than 85%.

From September 2009 through August 2013, there were no permit exceedances of the TSS limit, with the reported values much less than the permit limits (see Appendix A).

The draft permit maintains the same TSS limits as in the 2005 POTW GP, which are consistent with secondary treatment requirements found at 40 CFR 133.102(b). The monitoring frequency in the draft permit is twice per week.

3. *pH*

The 2005 POTW GP includes a pH limit range of 6.0 s.u. to 9.0 s.u. (standard units). Effluent monitoring data submitted by the permittee from September 2009 through August 2013 indicates that the pH has been within this range. These limits are less stringent than typically included in individual permits, which for Class B waters are typically set at 6.5 – 8.0 s.u., equivalent to the state water quality criteria found at RSA 485-A:8 II, which require that "The pH range for said (Class B) waters shall be 6.5-8.0 except when due to natural causes.", unless site study is done that supports a relaxed limit. The alternate limits in the 2005 GP were available because of the high dilution necessary to qualify for coverage and because the receiving water segment was not listed as impaired for pH.

In preparing the draft permit, EPA initially told the Town that the draft permit would include limits of 6.5-8.0 s.u. unless a site-specific study was done that supported relaxed limits. The Town performed a site-specific study and NHDES approved relaxed limits of 6.0 - 8.0 s.u. on April 5, 2013. However, following that approval, EPA became aware that the receiving water is currently listed as impaired for pH, which would typically make limits less stringent than 6.5 – 8.0 unavailable, because discharges outside of this range would contribute to exceedances of the water quality criteria. However, since the time of the listing 69 more samples were collected with a pH range of 6.69 – 7.5 s.u., with a median of 7.2 s.u. The only data collected that shows the pH outside the 6.5-8.0 s.u. range, are two data points from 2000, 6.04 s.u. and 6.16 s.u. Based on these data EPA included a pH range of 6.0-8.0 s.u., consistent with the site specific study. The permittee shall continue to monitor the pH of the effluent once per day.

4. *Escherichia coli (E. coli)*

The limitations for *E. coli* in the draft permit are a geometric monthly mean (average monthly limit) of 126 colony forming units per 100 milliliters (cfu/ml) and a maximum daily limit of 406 cfu/100 ml, which are based on the water quality standards for Class B waters (non-designated beach areas) found at RSA 485-A:8 II. From September 2009 through August 2013, the reported levels were well below permit limits. These *E. coli* limits are the same as those in the current permit, and so are consistent with the antibacksliding requirements of 40 CFR § 122.44(l).

The draft permit also requires *E. coli* samples to be collected concurrently with total residual chlorine samples. The monitoring frequency in the draft permit is three times per week.

C. Available Dilution, Non-conventional and Toxic Pollutants

Water quality-based effluent limitations for specific toxic pollutants are based on numeric chemical-specific criteria derived from extensive scientific studies. The EPA has summarized and published toxicity criteria for specific toxic pollutants in the *Quality Criteria for Water* (USEPA 1986 [EPA440/5-86-001]), commonly referred to as the "Gold Book". The Gold Book includes acute aquatic life criteria (to protect against the effects of short-term exposure, such as death) and chronic aquatic life criteria (to protect against the effects of long-term exposure, such as impaired growth). The State of New Hampshire adopted the Gold Book criteria (with certain exceptions) into the State's Surface Water Quality Regulations, which were readopted effective May 21, 2008.

EPA uses the pollutant-specific criteria contained within the state standards along with the available dilution in the receiving water in the development of water quality-based effluent limitations.

1. Available Dilution

In accordance with New Hampshire's Water Quality Standards (RSA 485-A:8 VI, Env-Wq 1705.02), the 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 flow). The receiving water 7Q10 is used for aquatic life and human health criteria for non-carcinogens, while the long-term harmonic mean flow is used for human health (for carcinogens only) (see Env-Wq 1702.44). Furthermore, ten percent of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations (Env-Wq 1705.01).

An exact value of the 7Q10 flow at the outfall is not available. The Connecticut River's flow was estimated by taking the 7Q10 flow from U.S. Geological survey (USGS) gaging station (streamflow measuring site) at West Lebanon, NH (01144500), and subtracting incoming 7Q10 flow to the Connecticut River from the White River at West Hartford, VT (USGS station 01144000). The West Lebanon gage is two miles below the Hanover WRF outfall. The White River joins with the Connecticut River between the Hanover outfall and the West Lebanon gage. The drainage basin (DA) for the Hanover WRF outfall is roughly equal to the drainage basin for the Lebanon gage minus the drainage area for the White River, as shown below. The resulting subtraction gives an approximate 7Q10 flow of 678 mgd for the Connecticut River's flow at the Hanover outfall. The State has reserved 10 percent of the assimilative capacity of the receiving water for future uses pursuant to RSA 485-A:13,I.(a) and Env-Wq 1705.01.

Drainage Area at the Hanover WRF outfall = 3,368 square miles
Drainage Area at the Lebanon USGS Gage = 4,092 square miles
Drainage Area at the mouth of the White River = 712 square miles
(source: USGS Streamstats)

DA at the Lebanon gage - DA of the White River = 4,092 sq mi – 712 sq mi = 3,380 sq mi
DA at the Hanover WRF Outfall = 3,368 sq mi.

This is roughly equal to 3,380 sq mi, the difference between the Lebanon gage drainage area and the White River drainage area. Thus, subtracting the flow of the White River from the Lebanon gage provides a good approximation of the 7Q10 flow at the Hanover WRF outfall.

7Q10 at the Lebanon USGS Gage = 1,049 cfs
7Q10 at the White River Gage = 87 cfs

7Q10 at Lebanon USGS Gage – 7Q10 at the USGS White River gage = 7Q10 at the Hanover WRF outfall

1,049 cfs – 87 cfs = 962 cfs (622 mgd) This is the 7Q10 downstream of the Hanover WRF outfall.

The available dilution (also referred to as the dilution factor) in the receiving water was determined to be 243. This calculation is based on using the plant's design flow 2.3 mgd (3.6 cfs), an estimate of the 7Q10 low flow in the Connecticut River nearest to the treatment plant's outfall

of 622 mgd (962 cfs), and a State of New Hampshire prescribed minimum 10% set aside or reserve.

Equation used to calculate dilution factor at Outfall 001A:
Hanover WRF design flow = 2.3 mgd = 3.6 cfs
Estimate of 7Q10 at Hanover WRF = 622 mgd = 962 cfs
0.9 = Factor to reserve 10% assimilative capacity in the Connecticut River

$$\text{Dilution Factor} = \frac{\text{Downstream 7Q10}}{\text{Design Flow}} \times 0.9$$

Dilution Factor = [(622 mgd) /2.3 mgd] x 0.9 = **243**

2. Total Residual Chlorine (TRC)

The chronic and acute aquatic life criteria for total residual chlorine specified in the New Hampshire water quality standards are 11 µg/l and 19 µg/l, respectively (see Env-Wq. 1703.21, Table 1703.1). These criteria result in average monthly and maximum daily concentrations limits of 2.7 mg/l and 4.6 mg/l, respectively. These values were determined by rearranging the following mass balance equation to solve for the discharge concentration, with the downstream concentration set equal to the water quality criterion.

$$Q_d C_d + Q_S C_S = Q_r C_r$$

Rearranged as:

$$C_d = (Q_r C_r * 0.9 - Q_S C_S)/Q_d$$

Where:

C_d= Effluent limit
C_r = Downstream TRC concentration (Equal to the acute and chronic criteria of 19 µg/l and 11 µg/l, respectively)
Q_d = effluent flow (design flow = 2.3 mgd = 3.6 cfs)
C_d= resultant effluent TRC concentration (i.e., limit)
Q_S = upstream 7Q10 flow (962 cfs – 3.6 cfs = 958 cfs)
C_S = upstream concentration (assumed to be 0 because TRC evaporates rapidly from surface water)
Q_r = downstream 7Q10 flow (962 cfs)
0.9 = Factor to reserve 10% of the assimilative capacity of the receiving water

However, chlorine and chlorine compounds, such as “organo-chlorines”, produced by the chlorination of wastewater can be extremely toxic to aquatic life. Section 101(a)(3) of the Act, and New Hampshire standards at Env-Ws 1703.21(a) prohibit the discharge of toxic pollutants in toxic amounts. Therefore, to reduce the potential for the formation of chlorinated compounds during the wastewater disinfection process and to be protective of the States’ narrative standards, EPA Region 1 has, historically, established a *maximum* TRC limitation of 1.0 mg/L for both the average monthly and the maximum daily limitations. In this situation, the 1.0 mg/L maximum limit for both average monthly and maximum daily effluent limits are more stringent than the 2.7 and 4.6 mg/L limits that would be allowed based on available dilution and the NH Standards for chronic and acute aquatic-life criteria of 0.011 and 0.019 mg/L. Hence, TRC monthly average and daily

maximum limits of **1.0 mg/L** are carried forward in the draft permit as a grab sample to be monitored once per day.

3. Total Nitrogen

Excessive nitrogen loadings are causing significant water quality problems in Long Island Sound, including low dissolved oxygen. In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a total maximum daily load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a waste load allocation (WLA) for point sources and a load allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL.

Please note, the aggregate 25% reduction has already been achieved through nitrogen optimization efforts; therefore no reductions below the 2005 baseline levels are needed at this time. The intent of nitrogen monitoring and optimization is to ensure that the 25% reduction is maintained.

The baseline total nitrogen point source loadings estimated for the Connecticut, Housatonic, and Thames River watersheds were 21,672 lbs/day, 3,286 lbs/day, and 1,253 lbs/day respectively (see table below). The estimated current point source total nitrogen loadings for the Connecticut, Housatonic, and Thames Rivers respectively are 13,836 lbs/day, 2,151 lbs/day, and 1,015 lbs/day, based on recent information and including all POTWs in the watershed. Table 1 summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings.

Table 1. Baseline Nitrogen Loadings used in the Long Island Sound TMDL.

Basin	Baseline Loading[1]	TMDL Target[2]	Current Loading[3]
	(lbs/day)	(lbs/day)	(lbs/day)
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

The estimated loading for the Hanover WRF used in the above analysis was 360 lbs/day, based on a total nitrogen concentration of 30 mg/l and the average flow of 1.44 mgd (360 lbs/day = 30 mg/L *1.44 mgd * 8.34 conversion factor), as indicated in the Facility's 2004 through 2005 DMRs. A review of the effluent data from July 2011 through June 2013 shows that recent total nitrogen discharges have been less than this estimate. Specifically, the 12- month average from July 2011 through June 2012 was 226 lbs/day total nitrogen and the 12- month average from July 2012 through June 2013 was 208 lbs/day (see Appendix B).

[1] Estimated loading from TMDL (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998).
[2] 25% reduction
[3] Estimated current loading from 2004 – 2005 DMR data.

To ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25% reduction over baseline loadings, EPA intends to include a permit condition for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic, and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that their aggregate 25% reduction target loading is maintained. Such a requirement has been included in this permit. EPA is also requiring the State of Vermont to include similar requirements in its discharge permits.

Specifically, the permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility to control total nitrogen levels, including, but not limited to, operational changes designed to enhance nitrification (seasonal and year-round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This evaluation is required to be completed and submitted to EPA and NHDES within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The permit also requires implementation of optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load (i.e. 360 lbs/day). The permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years. To better monitor the nitrogen removal in this optimization level, the draft permit requires total nitrogen monitoring once per week from March through September of each year, and once per month from October through February. The annual average target loading for the Hanover WRF is 360 lbs/day as an annual average from January through December of each year.

The agencies will annually update the estimate of all out-of-basin total nitrogen loads and may incorporate total nitrogen limits in future permit modifications or reissuances as necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. There have been significant efforts by the New England Water Pollution Control Commission (NEIWPCC) work group and others since completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities. Although not a permit requirement, EPA strongly recommends that permittees consider alternatives for further enhancing nitrogen reduction in their facility planning.

4. Total Phosphorus

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

The New Hampshire Surface Water Quality Regulations contain a narrative criterion that states that phosphorus contained in effluent shall not impair a water body's designated use. Specifically, Env-Ws 1703.14(b) states that, "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring."

Env-Ws 1703.14(c), further states that, "Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards." Cultural eutrophication is defined in Env-Ws 1702.15 as, "… the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen."

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

In December 2000, EPA released "Ecoregional Nutrient Criteria" (USEPA 2000), which was established as part of an effort to reduce problems associated with excess nutrients in water bodies located within specific areas of the country. The published criteria represent conditions in waters within each specific ecoregion which are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. The Connecticut River near Hanover is located in Ecoregion VIII, Nutrient Poor Largely Glaciated Upper Midwest and Northeast. Recommended criteria for this ecoregion are a total phosphorus concentration of 10 μg/L (0.01 mg/l) and a chlorophyll a concentration of 0.63 μg/L (0.00063 mg/l). These recommended criteria are found in Ambient Water Quality Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII (USEPA 2001).

More recently, Mitchell, Liebman, Ramseyer, and Card (in draft 2004), in conjunction with the New England States, developed a potential nutrient criteria for rivers and streams in New England. Using several river examples representative of typical conditions for New England, they investigated several approaches for the development of river and stream nutrient criteria that would be dually protective of designated uses in both upstream reaches and downstream impoundments. Based on this investigation an instream total phosphorus concentration of 0.020 – 0.022 mg/l was identified as protective of designated uses for New England rivers and streams. The development of the New England-wide total phosphorus concentration was based on more recent data than the National Ecoregional nutrient criteria, and has been subject to quality assurance measures. Additionally, the development of the New England-wide concentration included reference conditions for waters presumed to be protective of designated uses.

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

The permit reissuance application indicates that the highest phosphorus concentration in the discharge is 2.4 mg/L, based on 3 samples. When setting an effluent limit, EPA takes into account

the concentration of the pollutant upstream of the discharge and the available dilution in the receiving water. In this case, the dilution factor in the Connecticut River is quite high (243:1), and data indicate that the median total phosphorus concentration of four samples taken from the Connecticut River upstream of the discharge is 0.026 mg/L.

To determine whether the effluent has the reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for phosphorus, the following mass balance is used to project in-stream phosphorus concentrations downstream from the discharge.

$$Q_d C_d + Q_S C_S = Q_r C_r$$

Where

Q_d = effluent flow (design flow = 2.3 mgd = 3.6 cfs)
C_d = effluent phosphorus concentration in mg/L (highest concentration = 2.4 mg/L = 2,400 µg/L)
Q_s = 7Q10 stream flow upstream (962 cfs – 3.6 cfs = 958 cfs)
C_s = median upstream phosphorus concentration (0.026 mg/l)
Q_r = 7Q10 stream flow downstream, after discharge (962 cfs)
C_r = downstream pollutant concentration (Gold Book target: 100 µg/L)

rewritten as:

$$C_r = \frac{Q_d C_d + Q_S C_S}{Q_r}$$

Table 2. Phosphorus Reasonable Potential Analysis

Q_d	C_d	Q_s	C_s Median	Q_r	C_r	Criteria *0.9	Reasonable Potential
cfs	µg/l	cfs	µg/l	cfs	µg/l	µg/l	C_r > Criteria?
3.6	2400	958	26	962	35	90	no

The calculations above show that the expected receiving water phosphorus concentration downstream of the discharge is 35 µg/L, significantly less than 90% of the Gold Book-recommended criteria. Therefore, there is no reasonable potential for the Hanover WRF discharge to cause or contribute to an exceedance of the state water quality standards, and the draft permit does not include an effluent phosphorus limit.

5. Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit effluent toxic metal concentrations where the discharge has the reasonable potential to cause or contribute to aquatic life impairment. An evaluation of the facility's effluent metals concentration from February 2008 to July 2013 (n=7) was used to determine reasonable potential for toxicity caused by aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Metals may be present in both dissolved and particulate forms in the water column. However, extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column. This conclusion is widely accepted by the scientific community both within and outside of EPA (Water

Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-005a]. Also see http://water.epa.gov/scitech/swguidance/standards/handbook/chapter03.cfm#section6. As a result, water quality criteria are established in terms of dissolved metals.

However, regulations at 40 CFR 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals. This accounts for the potential for a transition from the particulate to dissolved form as the effluent mixes with the receiving water (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]).

For metals with hardness-based water quality criteria, the criteria were determined using the equations in NH standards Env-Wq 1703.24, using the appropriate factors for the individual metals found in the NH Standards (see table below). The downstream hardness was calculated to be 37 mg/l as $CaCO_3$, using a mass balance equation with the design flow, the receiving water 7Q10, an upstream median hardness of 37 mg/l as $CaCO_3$, and an effluent median hardness of 76 mg/l as $CaCO_3$.

Table 3. Water Quality Criteria for Metals

Metal	Parameters		Total Recoverable Criteria			
	ma	ba	mc	bc	Acute Criteria (CMC) (µg/L)	Chronic Criteria (CCC) (µg/L)
Aluminum	—	—	—	—	750	87
Cadmium	1.128	-3.6876	0.7852	-2.715	1.472	1.128
Chromium III	0.819	3.7256	0.819	0.6848	798.67	38.17
Copper	0.9422	-1.7000	0.8545	-1.702	5.49	3.99
Lead	1.273	-1.46	1.273	-4.705	23.03	0.90
Nickel	0.846	2.255	0.846	0.0584	202.32	22.49
Zinc	0.8473	0.884	0.8473	0.884	51.60	51.60

*Acute Criteria (CMC) = exp{ma*ln(hardness)+ba}
**Chronic Criteria (CCC) = exp{mc*ln(hardness)+bc}

To determine whether the effluent has the reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for each metal, the following mass balance is used to project in-stream metal concentrations downstream from the discharge.

$$Q_d C_d + Q_S C_S = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_d C_d + Q_S C_S}{Q_r}$$

where:

Q_d = facility's design flow (2.3 mgd = 3.6 cfs)
C_d = maximum effluent concentration
Q_s = upstream 7Q10 flow ($Q_r - Q_d$ = 962 – 3.6 cfs = 958 cfs)
C_s = median upstream concentration
Q_r = downstream 7Q10 flow (962 cfs)
C_r = resultant downstream concentration

Reasonable potential is then determined by comparing this resultant downstream concentration (for both acute and chronic conditions) with the criteria for each metal multiplied by the factor 0.9 to reserve 10% assimilative capacity. If there is reasonable potential (for either acute or chronic conditions), the appropriate limit is then calculated by rearranging the above mass balance to solve for the effluent concentration (C_d) using the criterion times 0.9 as the resultant downstream concentration (C_r). See the table below for the results of this analysis with respect to aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Table 4. Upstream Metals Concentrations.

	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date	NH3	Hardness	Al	Cd	Cr	Cu	Pb	Ni	Zn
2/22/2008	<0.1	32	99	--	--	<2	<0.5	<3	4
7/29/2008	<0.1	32	160	--	--	<2	1	<2	15
7/23/2009	<0.1	37	100	<0.5	--	<2	<0.5	<2	9
7/29/2010	<0.1	39	71	<0.5	<2	2	<0.5	<2	5
7/8/2011	<0.1	37	81	<0.5	<2	<2	<0.5	<2	<2
7/25/2012	<0.1	38	50	<0.5	<2	4	<0.5	<2	<2
July 2013	<0.1	43	1600	<0.5	3	5	2	3	7
median	0	37	99	0	0	0	0	0	5

Note that '<' indicates that the parameter was not detected in the sample. For the purposes of calculating a median value for the data set, these non-detects were assumed to be 0.

As indicated in the table on the next page, based on the maximum measured effluent concentrations and median upstream concentrations, there is no reasonable potential (for either acute or chronic conditions) that the discharge of cadmium, chromium, copper, nickel, lead or zinc will cause or contribute to an exceedance of the applicable water quality criteria.

Table 5. Metals Reasonable Potential Analysis.

Metal	Qd	Cd[1] (maximum observed)	Qs	Cs[2] (Median)	Qr	Cr = (QdCd+QsCs)/ Q_r	Criteria * 0.9		Reasonable Potential	Limit = (QrCr*0.9-QsCs)/Qd	
	cfs	µg/L	cfs	µg/L	cfs	µg/L	Acute (µg/L)	Chronic (µg/L)	Cr > Criteria * 0.9	Acute (µg/L)	Chronic (µg/L)
Aluminum	3.6	90	958	99	962	99	675	78.3	Y (Chronic only)	N/A	87[3]
Cadmium		0		0		0	1.32	1.02	N	N/A	N/A
Chromium		0		0		0	718.80	34.36	N	N/A	N/A
Copper		14		0		0.05	4.94	3.59	N	N/A	N/A
Lead		1		0		0.004	20.72	0.81	N	N/A	N/A
Nickel		3		0		0.01	182.09	20.24	N	N/A	N/A
Zinc		56		5		5.2	46.44	46.44	N	N/A	N/A

1 Values calculated using toxicity measurements from the 2008-2013 Whole Effluent Toxicity (WET) testing (see Appendix A).
2 Median upstream data taken from WET testing on the Connecticut River just upstream of the Hanover WRF
3 Since the median upstream aluminum concentration is above the chronic criterion, the discharge has reasonable potential to cause or contribute to an exceedance of water quality standards. Hence, the limit is set at the chronic criterion.

However, there is reasonable potential for aluminum to cause or contribute to an excursion from the chronic water quality criterion. Typically a limit would be calculated by solving for the maximum allowable effluent concentration (C_d) in mass balance equation, with the receiving water concentration set to 90% of the water quality criterion (Cr), along with the median upstream concentration (C_s), design flow (Q_d), and 7Q10 flows (Q_s and Q_r). However, because the upstream concentration is already higher than the chronic aluminum criterion, the draft permit proposes a monthly average effluent limit equal to the chronic aluminum criterion (87 µg/l). The monitoring frequency will be twice per month.

Because of the effluent metals data set was small (i.e, less than 10), EPA performed an additional statistical analysis to determine whether increased sampling should be included to ensure a more robust data set for the next permit issuance. Using a method from the *Technical Support Document for Water Quality-based Toxics Control* (TSD), EPA calculated a projected upper bound for each effluent metal concentration based on the maximum measured concentration multiplied by a reasonable potential multiplication factor found in the TSD, Table 3-2. See Appendix C for the details of this statistical derivation. The resulting effluent concentration for each metal was put into the same mass balance described above and compared to the respective criteria. This is summarized in the table below.

Table 6. Mass Balance to Determine if Increased Sampling Should be Required.

Metal	n	RPMF	C_d Maximum	Projected 95th Percentile	C_r[1]	Additional Sampling Required? (i.e., C_r > 0.9*Criteria?)	
	--	--	µg/l	µg/l	µg/l	Acute	Chronic
Aluminum	7	2.0	90	180	99	N	NA – limit already set
Cadmium	7	2.0	0	0	0	N	N
Chromium	7	2.0	0	0	0	N	N
Copper	7	2.0	14	28	0.1	N	N
Lead	7	2.0	1	2	0.007	N	N
Nickel	7	2.0	3	6	0.02	N	N
Zinc	7	2.0	56	112	5.4	N	N

1. Resultant Cr using the mass balance equation with the design flow, 7Q10 flow, median upstream concentration, and the upper bound effluent concentration (i.e., C_d max * RPMF)

As shown, the upper bound of the effluent data (as opposed to the maximum measured concentration) indicates that only aluminum poses a concern at this time. The draft permit proposes that Hanover continue to sample the other metals once each year in conjunction with whole effluent toxicity testing.

6. Whole Effluent Toxicity (WET)

EPA's *Technical Support Document for Water Quality Based Toxics Control* (USEPA 1991 [EPA/505/290-001]) 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 Region 1 adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect both aquatic life and human health. Pollutant-specific approaches such as those found 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 "additive" and/or "antagonistic" effects of individual chemical pollutants, which pollutant-specific approaches do not; thus, the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through this process.

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts and New Hampshire law states that, "all waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life; ...." (NH RSA 485-A:8, VI and NH Code of Administrative Rules, Part Env-Wq 1703.21). The federal NPDES regulations found at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when reasonable potential exists for a discharge to cause or contribute to an excursion above state narrative criteria for toxicity. Furthermore, the results of toxicity tests may be used to demonstrate compliance with the "no toxics in toxics amounts" requirement found in both the CWA and in the State of New Hampshire's regulations.

The current policy of EPA Region 1 is to require toxicity testing in all NPDES permits issued to POTWs with dilution factors of less than 1000. The type of whole effluent toxicity test(s) (acute and/or chronic) and the effluent limitation(s) required by the permit are based on the available dilution in the receiving water at the point of discharge. NPDES permits issued to municipal dischargers (i.e., POTWs) having a dilution factor greater than 100 (as is the case with the Hanover WRF) include an acute (LC_{50}) WET limit and require that WET tests be conducted using the daphnid, *Ceriodaphnia dubia* (*C. dubia*) and the fathead minnow, *Pimephales promelas* (*P. promelas*) as the test organisms. The acute limit (LC_{50}) is the percentage of effluent in a sample that must not cause more than a 50 % mortality rate in the test organisms. An LC_{50} limit of $\geq$ 50 % means that a sample comprised of 50 % effluent shall not cause mortality to more than 50 % of the test organisms.

The 2005 POTW General Permit authorization required that WET testing be conducted twice each year using the daphnid, *Ceriodaphnia dubia* (*C. dubia*) and the fathead minnow, *Pimephales promelas* (*P. promelas*) as the test organisms and required that the $LC_{50} \geq 50$ % effluent. In December 2007, the Town of Hanover requested a reduction in WET test frequency, citing compliance with the limit in the four most recent WET tests. In a letter dated July 8, 2008, EPA granted this request. Since that date, the WET test frequency has been once per year, to be conducted in the calendar quarter ending September 30 of each year. There have been no exceedances of the acute toxicity limit from 2008 through 2013, with the lowest LC50 concentration being 70.7% effluent, observed in 2011 with *C. dubia*.

The draft permit carries forward the LC_{50} limit of $\geq$ 50 %. The permittee shall conduct WET testing once annually, during the calendar quarter ending September 30. The test results must be submitted to EPA and NHDES no later than the 15th day following the end of the quarter.

VI. SLUDGE

Section 405(d) of the Clean Water Act (CWA) requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge that is land applied, disposed in a surface disposal unit, or fired in a sewage sludge incinerator is subject to federal Part 503 technical and to State Env-Wq 800 standards. Part 503 regulations have a self-implementing provision; however, the CWA requires implementation through permits.

The Hanover WRF generates 215 dry metric tons of sludge annually. It treats the sludge by mesothermic anaerobic digestion and centrifuge dewatering, then transports it to the Lebanon Solid Waste and Recycling Facility for final disposal. Domestic sludge that is disposed of in

municipal solid waste landfills complies with Part 503 regulations provided the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 CFR Part 258.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA-New England has prepared 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. This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf. The permittee is required to submit an annual report to EPA-New England and NHDES-WD, by February 19th each year, containing the information specified in the Sludge Compliance Guidance document for their chosen method of sewage sludge use or disposal practices.

VII. INDUSTRIAL USERS

The permittee is presently not required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR §403 and Section 307 of the CWA. However, the draft permit contains conditions that are necessary to allow EPA and the State of New Hampshire to ensure that pollutants from industrial users will not pass through the facility and cause violations of water quality standards in the receiving water, sludge use and disposal difficulties or cause interference with the operation of the treatment facility. The permittee is required to notify EPA and the State of New Hampshire whenever a process wastewater discharge to the facility from a primary industrial category is planned, (see 40 CFR §122 Appendix A for list) 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 requires the permittee to: (1) report to EPA and NHDES 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) who commence discharge to the POTW after the effective date of the permit, and (2) submit to EPA and NHDES copies of Baseline Monitoring Reports and other pretreatment reports submitted by industrial users.

VIII. 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 the collection system are included in the definition of "facilities and systems of treatment and control" and are therefore subject to the proper operation and maintenance requirements of 40 CFR § 122.41(e).

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

General requirements for proper operation and maintenance and mitigation have been included in Part II of the draft permit. Specific permit conditions have also been included in Parts I.B, C, and D. of the draft permit. These requirements include mapping of the wastewater collection system,

reporting of unauthorized discharges (including sanitary sewer overflows (SSOs)), maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration (I/I) to the extent necessary to prevent SSOs and I/I-related effluent violations at the wastewater treatment plant, and for maintaining alternate power where necessary.

Flow from the City of Lebanon, New Hampshire comprises 30% of the influent flow to the Hanover WRF. Therefore, the draft permit proposes to add the City of Lebanon as a co-permittee subject to the Operation and Maintenance and Unauthorized Discharges requirements for those parts of the Hanover WRF collection system that it operates. See Parts I.B. and I.C. of the draft permit.

IX. 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 Services (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. § 1802(10)).

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)). "Adverse 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 or actions.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b)(a)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. The Atlantic salmon (*Salmo salar)* is the only managed species believed to be present during one or more life stages in the area where the Hanover WRF discharge outfall is located (in the Connecticut River).

EPA has determined that the draft permit has been conditioned in such a way so as to minimize any adverse impacts on Atlantic salmon EFH for the following reasons:

- This permit action is a reissuance of an existing NPDES permit;
- The discharge has a very large dilution factor, calculated at 243, using the 7Q10 river flow of the Connecticut River;
- The Connecticut River is approximately 375 feet wide in the vicinity of the Hanover WRF. This width, combined with the large dilution factor, provide a large zone of passage for migrating Atlantic salmon that is unaffected by the discharge;
- EPA's evaluation indicates that there is no reasonable potential for the discharge to cause or contribute to an excursion above water quality criteria for zinc, nickel, cadmium, chromium, lead, or copper, as the concentrations of these metals in the effluent were well below the maximum allowable concentrations that may be present in the discharge;
- The draft permit contains an aluminum limit of 87 µg/L;
- Acute Whole Effluent Toxicity tests shall be conducted once per year using the daphnid, *Ceriodaphnia dubia* (*C. dubia*) and the fathead minnow, *Pimephales promelas* (*P. promelas*) to document that the effluent meets water quality criteria and does not present toxicity problems;

- Chlorine presents a threat to this species. The average monthly and maximum daily limitations for total residual chlorine of 1.0 mg/l have been maintained in the draft permit. These limits for chlorine are more stringent than those which would be necessary based on state water quality criteria;
- Excessive nutrients also present a threat to this species. There is a requirement for the facility to be operated in such a way that discharges of total nitrogen are minimized. The TMDL target of a 25% aggregate reduction from baseline nitrogen loadings is currently being met in the Connecticut River, and the overall loading from MA, NH and VT wastewater treatment plants discharging to the watershed has been reduced by about 36%;
- The facility withdraws no water from the Connecticut River, so no life stage of the Atlantic salmon is vulnerable to impingement or entrainment from this facility;
- The draft permit prohibits the discharge from violating state water quality standards;
- The draft permit prohibits the discharge of pollutants or combination of pollutants in toxic amounts;
- The effluent limitations and conditions in the draft permit were developed to be protective of all aquatic life.

EPA believes that the conditions and limitations contained within the draft permit adequately protect all aquatic life, including the species with designated EFH in the receiving water, and that further mitigation is not warranted. Should adverse impacts to EFH be detected as a result of this permit action, or if new information is received that changes the basis for EPA's conclusions, NMFS will be contacted and an EFH consultation will be reinitiated.

As the federal agency charged with authorizing the discharge from this facility, EPA has submitted the draft permit and fact sheet, along with a cover letter, to NMFS Habitat Division for their review.

X. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The USFWS administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

As the federal agency charged with authorizing the discharge from this facility, EPA has conducted a review in support of our consultation responsibilities under section 7 (a)(2) of the Endangered Species Act (ESA) for potential impacts to federally listed species. Based on the information available, EPA has determined that the small whorled pogonia (*Isotria medeoloides*) and the dwarf wedgemussel (*Alasmidonta heterodon)* are the only federally protected species associated with the general area of the receiving water of the Hanover WRF discharge.

The small whirled pogonia, an orchid, has been identified in Grafton County, New Hampshire, where the Hanover WRF is located; however it has not been identified in the Town of Hanover itself. In addition, the small whorled pogonia is found in "forests with somewhat poorly drained soils and/or a seasonally high water table," according to the USFWS website. This species is not

aquatic; therefore it is unlikely that it would come into contact with the facility discharge. Furthermore, the primary threats to this species are habitat destruction and herbivory, factors not affected by this permit action.

The dwarf wedgemussel (DWM) was added to the endangered species list on March 4, 1990. Presently in New Hampshire, the dwarf wedge mussels' known population has been identified in a number of locations along the mainstem of the Connecticut River. The facility discharges into the mainstem of the Connecticut River at Hanover, NH. Based on the USFWS maps titled "*The Dwarf Wedgemussel Waters of the Connecticut River in Vermont and New Hampshire*" (http://www.fws.gov/newengland/pdfs/midNH_VT_DWM.pdf), the facility discharge is located approximately 4.5 miles downstream from the DWM location in the Connecticut River at Thetford, VT / Lyme, NH and approximately 5 miles upstream from the Hartford, VT / Lebanon, NH DWM designation. Based on the large dilution factor calculated for the discharge from Hanover WRF, the discharge plume is judged to be fully mixed well before the downstream designated area is reached and is not thought to have any detectable influence in the Connecticut River segments with DWM designation.

Based on this evaluation and the expected distribution of the DWM, EPA has determined that there are no DWM in the action area and that the project will have no effect on the species. Therefore, consultation under Section 7 of the ESA with USFWS is not required.

XI. ANTIDEGRADATION

The New Hampshire water quality standards include an antidegradation provision that states that the existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected (Env-Wq 1708).

The draft permit contains limitations and conditions which are at least as stringent as those contained in the existing permit. The State of New Hampshire has indicated that there will be no lowering of water quality and no loss of existing designated uses in the receiving water as a result of this permit action, and that additional antidegradation review is not warranted at this time.

XII. MONITORING AND REPORTING

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), and 122.48.

The draft permit includes new provisions related to Discharge Monitoring Report (DMR) submittals to EPA and the State. The Draft Permit requires that, no later than six months after the effective date of the permit, the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR, unless the permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt-out request").

In the interim (until six months from the effective date of the permit), the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR.

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr. Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

EPA currently conducts free training on the use of NetDMR, and anticipates that the availability of this training will continue to assist permittees with the transition to use of NetDMR. To participate in upcoming trainings, visit http://www.epa.gov/netdmr for contact information for New Hampshire.

The Draft Permit requires the permittee to report monitoring results obtained during each calendar month using NetDMR, no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES. If a report due date does not coincide with a NetDMR due date, permittees may submit the report with the next monthly NetDMR.

The Draft Permit also includes an "opt-out" request process. Permittees who believe they cannot use NetDMR due to technical or administrative infeasibilities, or other logical reasons, must demonstrate the reasonable basis that precludes the use of NetDMR. These permittees must submit the justification, in writing, to EPA at least sixty (60) days prior to the date the facility would otherwise be required to begin using NetDMR. Opt-outs become effective upon the date of written approval by EPA and are valid for twelve (12) months from the date of EPA approval. The opt-outs expire at the end of this twelve (12) month period. Upon expiration, the permittee must submit DMRs and reports to EPA using NetDMR, unless the permittee submits a renewed opt-out request sixty (60) days prior to expiration of its opt-out, and such a request is approved by EPA.

Until electronic reporting using NetDMR begins, or for those permittees that receive written approval from EPA to continue to submit hard copies of DMRs, the Draft Permit requires that submittal of DMRs and other reports required by the permit continue in hard copy format. Hard copies of DMRs must be postmarked no later than the 15th day of the month following the completed reporting period.

XIII. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the state water pollution control agency with jurisdiction over the receiving water(s) in which the discharge originates 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 state water quality standards or the agency waives its right to certify as set forth in 40 CFR § 124.53. The NHDES is the certifying authority within the State of New Hampshire.

The staff of the NHDES-WD has reviewed the draft permit and advised EPA Region 1 that the limitations are adequate to protect water quality. EPA Region 1 has requested permit certification by the state and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and §124.55.

XIV. COMMENT PERIOD, REQUESTS FOR PUBLIC HEARINGS 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 by the close of the public comment period to:

Robin L. Johnson
U.S. Environmental Protection Agency
5 Post Office Square - Suite 100 (OEP06-1)
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1045; Fax: (617) 918-0045

Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issue proposed to be raised at the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after a public hearing (if applicable), 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.

Information concerning the draft permit may be obtained between the hours of 9:00 am and 5:00 pm, excluding holidays.

8/4/14

Date:

Ken Moraff, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

November 13, 2015

RESPONSE TO COMMENTS
NPDES PERMIT NO. NH0100099
HANOVER WASTEWATER RECLAMATION FACILITY
HANOVER, NEW HAMPSHIRE

From August 8 through September 21, 2014, the U.S. Environmental Protection Agency Region 1 (EPA New England) and the New Hampshire Department of Environmental Services (NHDES) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Hanover Wastewater Treatment Plant in Hanover, NH. EPA New England and NHDES received comments from the Town of Hanover (the Town), Underwood Engineers, and the City of Manchester, New Hampshire. The following are responses by EPA New England to those comments and descriptions of any changes made to the public-noticed permit as a result of those comments.

The final permit is substantially identical to the draft permit that was available for public comment. Although EPA's knowledge of the facility has benefited from the various comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit. EPA did, however, make certain clarifications in response to comments. These improvements and changes are detailed in this document and reflected in the final permit. A summary of the changes made in the final permit are listed below. The analyses underlying these changes are explained in the responses to individual comments that follow.

A copy of the final permit and this response to comments document will be posted on the EPA Region 1 web site: http://www.epa.gov/region1/npdes/permits_listing_nh.html.
A copy of the final permit may also be obtained by writing or calling Robin Johnson, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1045.

A. Changes made to the final permit

a. Page 2 of 14: The monthly average limit for aluminum was removed and replaced with a reporting requirement (See response to Comment 1).
b. Page 2 of 14: The reporting units for metals collected for WET testing changed from mg/L to µg/L (see response to Comment 2).
c. Page 3 of 14: Reference to ammonia nitrogen was removed from Footnote 8 (see response to Comment 21).
d. Page 9 of 14: The requirement to develop a nitrogen optimization report was removed from the permit (See response to Comment 5).
e. Page 14 of 14: References to Env-Ws 904 were changed to Env-Wq 305 (see response to Comment 15).

B. Comments Submitted August 12, 2014 by Kevin McLean, Superintendent of the Town of Hanover Water Reclamation Facility.

1. Proposed aluminum limit of 87 µg/L

It is understood that the Connecticut River section {NHRIV010801040402-13}, as designated on the "JOINT PUBLIC NOTICE of a DRAFT NPDES PERMIT" cover page, in which the Hanover Water Reclamation Facility {WRF} discharges into has been designated as *"5-M"*

("Impaired, TMDL needed – Marginal Impairment") by New Hampshire Department of Environmental Services {DES}. It is also understood that a letter was sent to USEPA Region 1 {EPA} by DES on July 1, 2014 that states that the aluminum form of concern is the "Acid-Soluble" portion and not the "Total Recoverable" form proposed in the draft permit.

Hanover would ask EPA/DES to consider viewing the 87 µg/L value as a benchmark, rather than an actual limit and reported at the frequency proposed and treated as an annual average in the draft permit until a TMDL or alternative river study can be completed and the two regulatory bodies achieve consensus on the forms of metals to be tested.

Given the variance of the background aluminum concentrations in the Connecticut River, a high of 1600 µg/L on 07/11/2013, a low of 50 µg/L on 07/25/2012 and an average of 262 µg/L from 2007-2014, it is apparent a more definitive look should be given to the water body in question to determine the short and long term affects.

Response to Comment 1:
EPA performed an updated reasonable potential analysis for aluminum incorporating 5 years of data from 2010 through 2014 to determine if reasonable potential for aluminum still exists. Because both the median background concentration (75 µg/L) and the maximum observed effluent concentration (56 µg/L) are below the aluminum chronic aquatic life criterion (87 µg/L), there is no longer reasonable potential for aluminum in the effluent to cause or contribute to a violation of water quality standards.

The comment is correct that NHDES has clarified that the aluminum is an acid soluble criteria. However, data would need to be collected to establish the ratio between acid soluble and total recoverable aluminum for this stretch of the Connecticut River. In the absence of such data, EPA assumes the ratio is one.

The aluminum limit has been removed from the final permit and is replaced with monthly aluminum monitoring.

Table 1. Effluent and Background Aluminum Concentrations at the Hanover Water Reclamation Facility, 2009 through 2014.

Date	Background (µg/L)	Effluent (µg/L)
7/29/2010	71	56
7/8/2011	81	37
7/25/2012	50	29
7/11/2013	*	36
7/10/2014	79	32
	median = 75	**max = 56**

*Outlier – 1600 µg/L, removed from consideration, although inclusion of the data point would not have changed the result of this analysis.

2. Aluminum Units

The aluminum reporting value for the annual toxicity screening for metals are "Report only" and are in mg/l and not µg/L. Can the units be made consistent?

Response to Comment 2:
EPA agrees that µg/L is a more appropriate unit of measurement for aluminum and other metals, given that they are rarely observed at concentrations greater than 1 mg/L. The final permit requires reporting of metals concentrations in µg/L.

3. Proposed Total Nitrogen Monitoring

Hanover has voluntarily been collecting nitrogen data for some time now at a frequency of 2X month. Hanover is asking for consideration of maintaining the 2X/month testing year round in lieu of the split frequency regimen as proposed in the draft permit of 1X/month from October through February and 1X/week from March through September. This is desired to maintain an established sampling and analysis schedule.

Response to Comment 3:
Summer is a critical time for nitrogen loading, therefore EPA needs once per week monitoring in the summer to ensure that the Long Island Sound TMDL wasteload allocations are maintained.

This summer nitrogen monitoring frequency is consistent with EPA's current nitrogen monitoring practice for POTWs in Massachusetts, Vermont, and New Hampshire that drain to the Long Island Sound. Facilities that have a design flow over 1.0 mgd monitor for total nitrogen once per week during the summer, and facilities with design flows of 1.0 mgd or lower monitor for nitrogen once per month. The monitoring frequency is unchanged.

4. Nitrogen Load Target

To clarify, EPA has assigned a value of 360 lbs/day as a baseline Total Nitrogen loading allocation, which already reflects a 25% reduction, expressed as an annual average. Is that correct?

Response to Comment 4:
It is correct. As stated in the fact sheet the aggregate 25% reduction has already been achieved through nitrogen optimization efforts; therefore no reductions in effluent total nitrogen below 360 lbs/day are needed at this time. The intent of nitrogen monitoring and optimization is to ensure that the 25% reduction is maintained.

5. Nitrogen Optimization

It is understood that since Hanover is a voluntary participant in the "Low cost retrofits for nitrogen removal at POTWs" study funded by EPA and administered by the New England Interstate Water Pollution Control Commission [NEIWPCC] and contracted to JJ Environmental, will be allowed as fulfillment in the initial *["within one year of the effective date"]* Nitrogen Optimization Report requirement once it is released. Is this correct?

Response to Comment 5:
JJ Environmental Associates completed the final report[1] for this study in March 2015. The report suggested retrofits and operational changes that Hanover WRF could implement to reduce its nitrogen loading. In light of this report, the steps taken by the Town outlined in Comment 6 below, and the fact that Hanover's total nitrogen load is well below the baseline load of 360 lbs/day (226 lbs/day in 2012 and 208 lbs/day in 2013); the requirement to develop a nitrogen

[1] Low Cost Retrofits for Nitrogen Removal at Wastewater Treatment Plants in the Upper Long Island Sound Watershed. March 2015. Available at http://longislandsoundstudy.net/wp-content/uploads/2015/05/LIS-Low-Cost-Retrofit-Final-Report-March-2015-revised.pdf

optimization report has been removed from the permit. However, the final permit retains the requirement to submit an annual report to EPA and NHDES that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year.

6. Fact sheet, page 13 of 26-second ¶:

Items already administered as identified in paragraph two;

- Hanover installed anoxic selectors in both aeration basins in 2003-2004.
- Since August of 2011, no septage has been treated at the facility, only portable toilet waste.
- In the 2011-2013 WRF upgrade project, all process flows from dewatering and secondary sludge thickening have been relocated to a discharge point in the primary clarifier flow splitter structure.
- Hanover has been partnered with Underwood Engineers Inc. for over 10 years and has jointly discussed what future loading and upgrade projects will be required in the event of nutrient limits being set for the facility discharge. The scope of such work is preliminary only, since the actual value assigned will dictate the type of processes and technology be incorporated into the project(s).

Response to Comment 6:

Hanover's progress in nitrogen optimization is noted for the record. EPA appreciates the proactive steps that the Town has taken to reduce its nitrogen loading to Long Island Sound.

7. Transparency

Prior to proposing the bond request to the residents that are served by the facility in 2008, Hanover asked the regulatory agencies "to what extent do we build to?" No definitive response was provided other than vague references to developing criteria, insufficient data and incomplete policy development. In the future it is hoped that more transparent objectives and realistic timelines are presented to allow a fiscally responsible and scientifically sound solutions be attained and all parties reach consensus on the issues at hand.

Response to Comment 7:

The agencies try to assist and coordinate with communities whenever possible. We regret that the Town did not receive the guidance it desired.

C. Comments Submitted August 26, 2014 by the Mark Roper, Chief Operator/IPP Coordinator for the Town of Hanover.

8. Receiving Water

Receiving Water: On the Public notice Page the Receiving water is listed as Connecticut River (Segment ID NHRIV0108010402-13. This segment is not listed in the 2010 list of impaired waters in NH. The segment that Hanover WRF discharges into is listed as Wilder Lake (Segment NHLAK801040402-03).

Response to Comment 8:

Although the fact sheet listed the correct receiving water segment, the public notice did not. EPA notes the correction in the administrative record.

9. *E. coli*

Part 1, Page 2 of 14 – *Escherichia coli*: The City of Lebanon WWTP monitoring frequency for e-coli was reduced from 3/week to 2/week in its last NPDES Permit. The Town of Hanover requests that its monitoring frequency for e-coli be reduced also to 2/Week in its pending NPDES Permit.

Response to Comment 9:

It is correct that Lebanon's *E. coli* monitoring frequency was reduced to 2/week in the previous permit. However in final permit issued to Lebanon on September 30, 2015, the frequency was increased back to 3/week to be consistent with joint NHDES/EPA effluent monitoring guidance dated July 19, 1999. The monitoring frequency in Hanover's final permit remains unchanged.

10. Nitrogen Monitoring

Part 1, Page 2 of 14 – Nitrogen Monitoring: The Town of Hanover already performs total nitrogen testing voluntarily on a bimonthly basis and requests the 2/Month frequency to continue in the pending NPDES permit. Since several years of total nitrogen data already exists, weekly testing from March through September would be an administrative burden both from the perspective of managing alternating reporting frequencies and from the additional workload during the weekly monitoring time period.

Response to Comment 10:

While several years of nitrogen data is valuable for comparison purposes, it is important for EPA to confirm that nitrogen loading targets continue to be met. Each sample is a "snapshot" of the effluent concentration, meaning that more frequent snapshots give more information about effluent variability. Finally, EPA notes that once per week nitrogen monitoring from March through September is typical for facilities over 1 mgd design flow in the upper Connecticut River watershed in Massachusetts, New Hampshire, and Vermont. See also response to Comment 3.

11. Aluminum Limit

Part 1, Page 2 of 14 – Total Recoverable Aluminum: An additional 2/Month monitoring requirement and Average Monthly Limit of 87 µg/L was included with this permit for aluminum. The rationale for the aluminum monitoring requirement and limit is based on there being a "reasonable potential for aluminum to cause or contribute to an exceedance of water quality standards." The Metals Reasonable Potential Analyses, Table 5, contained in the Fact sheet uses a maximum concentration value of 90 µg/L obtained from WET testing sampling on July 28, 2008.

We request that the additional monitoring and limit for aluminum be withdrawn from the Permit on the basis that the effluent sample obtained on July 28, 2008 was not representative of a normal discharge day. Although every effort is made by the Town of Hanover to obtain samples representative of the monitored activity the sample collected on the 28th was collected following a rain event during an already unusually rainy July. It is likely that the elevated aluminum level in the WRF effluent was the result of natural conditions related to excessive inflow and infiltration of groundwater/stormwater from the recent rains. The WRF effluent flow on the 28th of July was about 25% above average which is consistent with flows observed during wet weather events.

Response to Comment 11:

The final permit no longer contains an aluminum effluent limit, however there is a monthly monitoring requirement. An updated reasonable potential analysis was done using more recent data, from 2010 through 2014, which found that both the background and effluent aluminum concentrations were below the chronic aluminum criterion. See response to Comment 1.

12. Aluminum Considerations

In addition to the possibility that the sample was not representative the following should be considered before the final Permit decision:

1. The elevated aluminum concentration in the Connecticut River is due to the effects of events unrelated to WWTP effluent. Aluminum levels in the Town of Hanover WRF effluent continues to drop while Connecticut River aluminum values increase.
2. Some of the most high quality waters in the US have aluminum concentrations greater than 87 µg/L which EPA is aware of"
3. Hanover WRF records show that aluminum concentrations in the Connecticut River have exceeded the freshwater chronic quality standard since before 1992.
4. The aluminum chronic value of 87 µg/L is based on a toxicity test with Striped Bass and Brook Trout in 1988 in water with a pH of 6.5 to 6.6 SUs. Although aluminum is highly toxic to Striped (sic) Bass this fish is not capable of existing as far North (sic) as Hanover, NH unless it is physically introduced.
5. WRF effluent and Connecticut River receiving water consistently meets NPDES WET testing LC50 limits and is therefore not considered toxic.
6. Upstream Connecticut River aluminum concentrations are on average 534%above WRF effluent values. It is not possible for a lower concentration effluent to cause the receiving water aluminum concentration to be higher.
7. In addition to a bimonthly monitoring requirement the 87 µg/L NPDES limit triggers the Town's obligation to redevelop local discharge restrictions for aluminum. This will cause an administrative burden on the Town and an undue burden on its industry with little environmental benefit gains if a stringent limit is required to be enforced.
8. Major regulatory decisions should not be based on one analytical result. The Town would be happy to voluntarily increase its frequency of monitoring for aluminum in order to gain additional data.

Response to Comment 12:

EPA agrees that the high ambient levels of aluminum in the Connecticut River are from sources other than the Hanover POTW. EPA has removed the aluminum limit from the final permit because updated information shows that there is no longer reasonable potential for aluminum in the effluent to cause or contribute to an exceedance of water quality standards in the Connecticut River. However, the permit requires monitoring of once per month to ensure that the discharge does not cause or contribute to existing aluminum impairments on the Connecticut River. See response to Comment 1.

13. Aluminum Average Monthly Limit

Part 1, Page 2 of 14. Total Recoverable Aluminum Discharge Limitation – Average Monthly Discharge Limitation: The discharge limitation for aluminum in the proposed NPDES permit is a monthly average limit which conflicts with the intent of preventing an exceedance of a water quality standard. Since the NPDES Permit contains no daily maximum limit the Hanover WRF could routinely discharge effluent exceeding 87 µg/L of aluminum without ever exceeding the monthly average value contained in the Permit. If the intent of requiring aluminum monitoring is gain additional data points the Town would like to recommend a limited monthly monitoring study with an average daily and maximum daily "Report" requirement.

Response to Comment 13:

The aluminum limit has been removed from the final permit. Please see response to Comment 1.

The commenter appears to confuse the chronic and acute water quality criteria for aluminum. An effluent limit based on the acute criterion would be a maximum daily limit, because the intent of the limit would be to prevent the criterion from being exceeded in the receiving water for even short periods of time. The acute criterion is the level at which a pollutant kills aquatic organisms, and therefore exceedances of this criterion must be prevented to meet water quality standards.

However, the limit in question (which has been removed from the final permit) is a monthly average limit. EPA uses this type of limit for chronic criteria. Chronic, according to the TSD,[2] means "a stimulus that lingers or continues for a long period of time, often one-tenth of the lifespan or more." The chronic aluminum criterion document[3] states that "freshwater aquatic organisms and their uses should not be affected unacceptably, when the pH is between 6.5 and 9.0, if the four-day average concentration of aluminum does not exceed 87 µg/L more than once every three years on the average…" Therefore, an exceedance of water quality standards has not occurred if aluminum levels occasionally exceed 87 µg/L (chronic criterion) but are typically below that level. The monthly average allows the effluent concentration to sometimes exceed the limit concentration, provided that the average over a given month is below the limit.

14. Aluminum Units

Part 1, Page 2 of 14 – Total Recoverable Aluminum: It is requested that the aluminum discharge concentration abbreviation be expressed in mg/L consistent with the Freshwater Acute Toxicity Test Procedure Protocol and consistent with the other pollutants listed on Page 2.

Response to Comment 14:

This comment references the total recoverable aluminum limit which has been removed from the final permit. See response to Comment 1.

The reporting units for metals data collected for the whole effluent toxicity tests has been changed to µg/L. See response to Comment 2.

15. Pretreatment

Part 2. H.6 Page 14 of 14 – All references to Env-WS 904 are no longer effective and should be replaced with the current Env-WQ 304, Pretreatment of Wastewater.

Response to Comment 15:

The correct reference is to Env-Wq 305, Pretreatment of Industrial Wastewater. (Env-Wq 304 concerns the certification of wastewater treatment facility operators.) The final permit has been changed accordingly.

16. Available Dilution

Fact Sheet Page 10 of 26 – Available Dilution: Did the dilution factor change in the pending NPDES permit from 196 to 243? What is the basis for this change?

Response to Comment 16:

The dilution factor changed because, in 2011, NHDES updated the 7Q10 for the Connecticut River at Lebanon, NH. The previous 7Q10 calculation referred to older stream gage data, while the updated data period was April 1, 1979 through March 31, 2010. The updated data resulted in an increase in 7Q10 from 866 cubic feet per second (cfs) in the 1999 permit to 1,049 cfs in 2011.

[2] EPA, 1991. Technical Support Document for the Water Quality-Based Toxics Control. EPA/505/2-90-001.

[3] EPA, 1988. Ambient Water Quality Criteria for Aluminum. EPA 440/5-86-008.

These data reflected higher 7Q10 flows as measured at the USGS Stream Gage on the Connecticut River in Lebanon, NH.

17. Aluminum and Essential Fish Habitat

Fact Sheet IX Essential Fish Habitat: Remove reference to aluminum since the monthly average limit is not designed to prevent toxicity of an exceedance of water quality standards for aluminum.

Response to Comment 17:

There is no longer a monthly average limit for aluminum in the final permit. See response to Comment 1. Nonetheless, the water quality standards for aluminum were developed to prevent toxicity to aquatic organisms. See response to Comment 13.

18. Development of Water Quality Based Limits

Fact Sheet Page 6 of 26B. – Development of Water Quality Based Limits: In addition to the criterion for determining reasonable potential, data quality should be considered and anomalous data should be investigated when developing regulatory limitations.

Response to Comment 18:

EPA agrees and has removed outlying data points, such as the 2013 receiving water aluminum result of 1600 µg/L. Also, in re-evaluating reasonable potential, EPA relied on the last 5 years of data (including newer data from 2014) which removed a 2008 effluent data point of 90 µg/L from the dataset.

19. Nitrogen Monitoring Frequency

Fact Sheet Page 13 of 26 Part V.C.3. Nitrogen: What is the reasoning for monitoring frequencies between the March 1 – September 30 timeframe and the October 1 – February 28 timeframe. Based on temperature the Town would recommend May 1 – Nov 30 and December 1 – April 30.

Response to Comment 19:

The monitoring frequencies have been established for facilities across the Long Island Sound watershed, including in New Hampshire, Vermont and Massachusetts, to provide uniform data with which to measure attainment of TMDL targets. The monitoring frequencies in the final permit remain unchanged.

D. Comments Submitted September 17, 2014 from David J. Mercier, Senior Project Manager, Underwood Engineers.

We have reviewed the Draft NPDES permit and have the following comments:

20. Acid Soluble Aluminum

Page 2 of 14, Part I.A.1. Effluent Limitations and Monitoring Requirements
Total Recoverable Aluminum limit of 87 µg/L. We request that the limit for Aluminum be changed from Total Recoverable Aluminum (TRA) to Acid-Soluble Aluminum (ASA). Please refer to the attached letter from NHDES which confirms that the New Hampshire surface water quality regulations for freshwater acute and chronic aluminum criteria are based on acid-soluble values. Further, as ASA is typically 75% of the TRA we request that the revised aluminum limit for Hanover based on ASA be 104 µg/L. This allows for a 10% safety factor in setting the limit as is consistent with NHDES/EPA permitting standards.

Response to Comment 20:
The average monthly aluminum limit has been removed from the final permit. See response to Comment 1.

21. Ammonia Nitrogen

Page 3 of 14, Part I.A.1. Effluent Limitations and Monitoring Requirements
Footnote 8. We request the reference to "ammonia nitrogen" be struck from this footnote as its measurement is not necessary for the calculation of Total Nitrogen.

Response to Comment 21:
The comment is correct that ammonia nitrogen is not a component of the total nitrogen concentration because it is included in total kjeldahl nitrogen. The reference to ammonia nitrogen has been removed from Footnote 8 of the final permit.

E. Comments submitted September 15, 2014 by Ricardo Cantu, Superintendent of the City of Manchester, New Hampshire Wastewater Treatment Facility.

The City of Manchester is providing the following comments to the Hanover Draft Permit (NH0100099) for review and consideration.

22. Section F. Special Conditions (1) Nitrogen Optimization

The EPA has requested in the permit that Hanover complete an evaluation to optimize the removal of nitrogen. The permit calls for an evaluation of operational changes to enhance nitrification, incorporation of anoxic zones, septage receiving polices, and procedures and side stream management. The EPA reports an annual average of 360 lbs of nitrogen discharge from the Hanover WWTF between 2004 and 2005.

The Fact Sheet, page 12 of 26, notes the Connecticut River had a baseline loading of 21,672 lbs/day and that there needed to be a 25% reduction according to a TMDL study conducted by the State of Connecticut. A CT DEP study indicated that the TMDL to address eutrophication impacts in the Long Island Sound should be a maximum of 16,254 lbs/day. Table 1 of the permit indicated that the current loading to the Connecticut River is 13,838 lbs/day.

The narrative indicates that Hanover's Facility had an annual average loading of 360 lbs/day (as reported in the permit). However, the loading between July 2011 and June 2012 was 226 lbs/day and between July 2012 and June 2013 was 208lbs/day for total nitrogen. These loadings demonstrate that Hanover has already achieved an aggregate reduction in nitrogen loading of 37% between 2004/2005 and 2012/2013. Currently, Hanover not only maintains the 25% reduction of baseline loading as outlined in the TMDL, but exceeds this requirement by 50% (37% reduction between 2004/2005 and 2012/2013).

Manchester believes that the evaluation of alternative methods is a very similar requirement as a facility plan study to reduce nitrogen. This study is fairly similar to what Manchester reviewed and investigated in developing a phosphorus removal plan.

These types of in-depth reviews are usually only required when a facility exceeds WQ criteria, or the 80%, of the 90-day flow capacity. The assumption by the EPA is that the Connecticut River will exceed the TMDL base loading of 16,254 lbs/day if all treatment plants along the Connecticut River do not complete this task. The evidence as presented by the EPA in Table l is

clear that these objectives have been achieved and surpassed without this evaluation of alternative methods requirement in place.

Env-WS 1703.14. The NHDES Fact Sheet, Env-WS 1703.14 notes that cultural eutrophication is defined in Env-WS 1702.15 as," ... the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen."

At a minimum, this narrative standard requires that there be a demonstration that the discharge is causing impairment, either excessive plant growth that impairs uses or plant growth that causes a dissolved oxygen criteria violation.

However, there is no demonstration provided in the Fact Sheet that the discharge from the Town of Hanover WWTF is causing an impairment of the Connecticut River upon mixing under design flow conditions. In fact, actual loadings have been reduced since the 2004/2005 nitrogen data series that demonstrates a 37% reduction.

This requirement to begin a facility plan evaluation for nitrogen is not supported by any Clean Water Act (CWA) requirements.

Response to Comment 22:
The basis of the total nitrogen monitoring requirement is the Long Island Sound TMDL, not violations of the narrative nutrient criteria. EPA is not required to demonstrate that a receiving water is not attaining water quality standards before applying a permit limit. Nor is EPA required to demonstrate that an excursion is "likely to occur." Rather, EPA is required to demonstrate that there is *reasonable potential* for the discharge to cause or contribute to a water quality standard violation. In this case, these arguments are beside the point because the nitrogen requirements stem from a TMDL wasteload allocation, not a reasonable potential analysis.

Thus, narrative nutrient criteria interpretations are not a basis for nutrient limits in this permit. There is an EPA-approved wasteload allocation related to the Hanover WRF, and regulations at 40 CFR 122.44(d)(1)(vii)(B) require that effluent limitations developed to protect water criteria are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7.

As indicated in the comment, Hanover has already achieved an aggregate reduction in nitrogen loading reductions based on an evaluation of nitrogen loading reduction practices, and the permit requirement to perform an evaluation of total nitrogen removal optimization has been removed from the permit. However, the final permit retains the requirement to submit an annual report to EPA and NHDES that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year. See response to Comment 5.

23. Unsubstantiated Assumptions

In issuing Hanover's draft permit, the Region has made three very important unsubstantiated assumptions: first, the Connecticut River will become impaired by nitrogen if the evaluation of alternatives is not undertaken; second, the incorporation of anoxic zones, septage policies, and side stream management are the only way to continue attainment of the 16,254 lbs/day TMDL and; three, the Town of Hanover WWTF is going to cause or contribute to an excursion above the assigned 16,244 lbs/day TMDL if this targeted facility plan is not implemented. As explained below, the Town of Hanover has several significant objections with the assumptions and determinations made by the Region in developing this requirement.

Response to Comment 23:
First, EPA did not make, nor did it need to make, a determination that the Connecticut River would become impaired by nitrogen if the Hanover WRF did not perform nitrogen optimization. The nitrogen optimization requirements in the final permit stem from a wasteload allocation under the Long Island Sound TMDL.

Second, the Region does not state that the optimization methods cited in the comment are the only way to maintain the target nitrogen loadings. The draft permit required that facilities examine operational modifications to reduce nitrogen discharges and merely suggested some common ways to achieve this.

Finally, the third point incorrectly mixes language from the water quality based effluent limitation (WQBEL) regulations and the TMDL regulations. EPA must impose a WQBEL when a discharge has a reasonable potential to cause or contribute to an excursion from water quality standards. A finding of reasonable potential is not required in the case of a TMDL because another agency has already found an impairment, determined the pollution sources contributing to it, calculated a TMDL, and determined wasteload allocations for point source discharges. Once a TMDL has been approved by EPA, effluent limitations must be consistent with the TMDL per 40 CFR 122.44(d)(1)(vii)(B).

As previously stated, the permit requirement to perform an evaluation of total nitrogen removal optimization has been removed from the permit. However, the final permit retains the requirement to submit an annual report to EPA and NHDES that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year. See response to Comment 5.

24. Misapplication of 40 CFR § 122.44(d)

The CWA is a “science-based” statute that requires the establishment of criteria "accurately reflecting the latest scientific information” regarding “ ... the effects of pollutants on biological community diversity, productivity and stability ... ” Section 304(a)(l); accord, 40 CFR 131.3(c) (criteria developed by EPA are based on “the effect of a constituent on a particular aquatic species”). No criteria (including a requirement to develop a nitrogen abatement plan) can be approved unless it is “based on a sound scientific rationale” 40 CFR 131.11(a). Likewise, the conditions generated to meet the “applicable standard” (16,244 lbs/day TMDL) must be demonstrated to be “necessary.” The permitting authority must demonstrate the actions are necessary to “attain and maintain applicable narrative water quality criteria” 40 CFR 122.44(d)(1)(vi), rather than unsubstantiated belief. The data provided in the permit fact sheet demonstrates that the Connecticut River is currently 15% below the calculated TMDL. Obviously compliance with the statute and applicable regulations requires an objective scientific assessment to show that the selected approach is both necessary and sufficient to achieve criteria compliance. Compliance is currently achieved and this additional burden is not warranted.

Response to Comment 24:
The comment is based on a misunderstanding of 40 CFR §122.44(d). The commenter first misquotes 40 CFR §122.44(d)(1)(vi) above as stating that the conditions generated to meet water quality “must be demonstrated to be ‘necessary.’” The word “necessary” does not appear in 40 CFR §122.44(d)(1)(vi), except in (C)(3) that

*[t]he permit requires all effluent and ambient monitoring **necessary** to show that …the indicator parameter continues to attain and maintain applicable water quality standards….*[emphasis added]

The commenter then goes on to add their own language 40 CFR §122.44(d)(1)(vi)(A), inserting the words "must" and "the actions are necessary." The actual text of the regulation reads,

"Establish effluent limits … which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use." 40 CFR §122.44(d)(1)(vi)(A)

Furthermore, the criteria approval, and regulations and guidance pertaining thereto, are not directly applicable to this permit proceeding. No narrative nutrient criteria are being interpreted or promulgated as part of this permit. There is an EPA-approved wasteload allocation for the Hanover WRF, and regulations at 40 CFR 122.44(d)(1)(vii)(B) require that effluent limitations developed to protect water criteria are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7.

25. Liability without Causation

Given the language of the Act and the implementing regulations, it is not surprising that Courts have determined "*that neither the language of the Act nor the intent of Congress appears to contemplate liability without causation*" NAMF v. EPA, 719 F. 2d 624, 640 (3rd. Cir. 1983); Ark. Poul. Fed. V. EPA, 852 F. 2d 324, 328 (8th Cir. 1988) (the discharge must at least be "a cause" of the violation.) In the TMDL context, such nutrient wasteload allocations must be based on a documented "cause and effect" relationship demonstrating that the Hanover WWTF has contributed to or directly causes a violation of the 16,244 lbs/day TMDL limitation.

Because the current analyses for the Connecticut River demonstrates compliance with the TMDL and the WWTF effluent results for nitrogen show Hanover has actually reduced average daily nitrogen loading by 37% over a 10-year period, EPA should not require an annual burdensome evaluation as a permit condition to declare that the waters of the Connecticut River will at some future point, exceed the 16,244 pound TMDL. EPA is interpreting 122.44(d) in a manner inconsistent with the rule language, as well as the structure of the Act.

Manchester would like to see the "evaluation of alternatives" requirement removed from the final issued permit language as this approach may impact future permits issued to Manchester which would mean the expenditure of unnecessary resources to do facility investigations into a WQ problem that does not exist.

Response to Comment 25:

The requirement to perform an evaluation of total nitrogen removal optimization has been removed from the permit. However, the final permit retains the requirement to submit an annual report to EPA and NHDES that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year. See response to Comment 5.

The commenter's reference to NAMF V. EPA, in which the court ruled "*that neither the language of the Act nor the intent of Congress appears to contemplate liability without causation*," is misplaced. The ruling in question pertains to industrial users of POTWs rather than water quality-based effluent limitations. The court ruled that, if an industrial discharger was

complying with its pretreatment permit, the Act did not intend for the industrial discharger to be found liable for interfering with the POTW treatment process. This standard is completely different from and unrelated to the requirements of the permit authority to "*[e]stablish effluent limits … which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use.*" 40 CFR §122.44(d)(1)(vi)(A).

26. Upper Blackstone decision

On its face, 122.44(d) itself indicates that more restrictive requirements only apply if the discharge "causes" a water quality criteria excursion[4] as discussed in the Upper Blackstone decision. The Upper Blackstone decisions repeatedly refer to the fact that nutrients were demonstrated to be "*causing extensive 'cultural eutrophication'*" as the basis for imposing more restrictive requirements.[5]

Response to Comment 26:

The City of Manchester's interpretation of the First Circuit's decision in Upper Blackstone is incorrect. Manchester contends that the *Upper Blackstone* decision actually stands for the proposition that "causation" must be proven prior to imposition of a water quality-based effluent limitation under 40 C.F.R. § 122.44(d), pointing to the Court's use of the word "causing" and its reference to EPA's conclusion, based on a laboratory experiment, "*that the basic causal relationship demonstrated in the Marine Ecosystems Laboratory ("MERL") experiments 'corresponds to what is actually occurring in the Providence /Seekonk River system.'*" Although the Court in *Upper Blackstone* may indeed have been convinced that EPA's record demonstrated that the District's treatment plant was "causing" a water quality standards excursion, it nowhere suggested that such a finding was necessary prior to imposing a water quality-based effluent limitation. On the contrary, the court specifically acknowledges the full breadth of the regulations:

> *EPA regulations require permitting authorities to include in NPDES permits conditions which control all pollutants or pollutant parameters . . . [that] are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. We thus reject the notion that in order to strengthen the District's discharge limits, the EPA must show that the new limits, in and of themselves, will cure any water quality problems [internal quotation marks and citations omitted]. Upper Blackstone Water Pollution Abatement Dist. v. U. S. EPA, 690 F.3d 9, 33 (1st Cir. 2012).*

The City of Manchester's reading of the case is impossible to reconcile with the Court's view that, "[R]ecognizing…the developing nature of [the field]…[t]he [EPA] Administrator may apply his expertise to draw conclusions from suspected, but not completely substantiated, relationships between facts, from trends among facts, from theoretical projections from imperfect data, from

[4] The "or contributes" language means it is contributing to the "cause" of the violation.

[5] Upper Blackstone Water Pollution Abatement Dist. v. EPA, 690 F.3d 9 (1 11 Cir. 2012) "An influx of nitrogen and phosphorus from sewage treatment plants is causing serious problems for the River's waters and those downstream. The Blackstone, Seekonk, and Providence Rivers, and Narragansett Bay, all suffer from severe cultural eutrophication." (at 11). "State water quality standards generally supplement these limitations, so that where one or more point source dischargers, otherwise compliant with federal conditions, are nonetheless causing a violation of state water quality standards, they may be further regulated to alleviate the water quality violation. Id. § 131/(b){l}(C) (at 14);

probative preliminary data not yet certifiable as 'fact,' and the like." *Id.* at 24 (quoting *Ethyl Corp. v. EPA*, 541 F.2d 1, 27-28 (D.C. Cir. 1976).

Contrary to the comment above, EPA is not required to demonstrate that a receiving water is not attaining water quality standards before applying a permit limit. Nor is EPA required to demonstrate that an excursion is "likely to occur." Rather, EPA is required to demonstrate that there is *reasonable potential* for the discharge to cause or contribute to a water quality standard violation. In this case, these arguments are beside the point because the nitrogen requirements stem from a TMDL wasteload allocation, not a reasonable potential analysis. The appropriate time for Manchester to comment on the wasteload allocations would have been during the TMDL public review process.

27. Aluminum

Page 17 of 26, Table 4 of the fact sheet, illustrates aluminum concentrations for 2/22/2008 (99 μg/L), 7/29/2008 (160 μg/L), 7/23/2009 (100 μg/L), 7/29/2010 (71 μg/L), 7/8/2011 (81 μg/L), 7/25/2012 (50 μg/L) and July of 2013 (1,600 μg/L). The median aluminum concentration is listed as 99 μg/L.

The 2/28/2008 sample had a concentration of (99 μg/L). Attachment 1 is the USGS gaging station readings at Wells River VT for all samples. There is no data from the 9th through the 23rd. It is hard to determine river flows, but indications illustrate a period of time where the river gage was probably above 4,000 cfs for most of the period. This is almost 4 times the 7Q10 flow of 1,049 cfs. Also, swings in flow levels indicate timed dam releases.

The 7/29/2008 sample was taken a few days after a significant rain and a river flows of >30,000 cfs. This condition is 30 times the 7Q10 condition, would indicate excessive bottom scouring, and would account for the higher aluminum concentration of 160 μg/L. This concentration should be referenced against the 750 μg/L limit acute limit as the river gage far exceeded 7Q10 flows.

The 7/23/09 sample shows daily dam releases prior to sample date that brought the river level down to about 1,200 cfs and again raising the levels to 5,500 cfs (a significant scouring velocity condition). Under these extreme conditions the sample was 100 μg/L.

On 7/29/2010 the river flow was less than 2,000 cfs with a few calm days with no indication of dam release. This was the low measured result at 71 μg/L and close to 7Q10 critical conditions. This sample is less than the 87 μg/L WQ criteria and representative on non-dam release flows that would be expected in the Connecticut River during the low flow season.

The 7/8/11 sample was taken after a dam release that increased the river flow by 4,000 cfs to over 6,000 cfs which would produce scouring velocities of the river bed. The result was 81 μg/L.

The 7/25/2012 sample was taken after a rain event on 7/21/2013. The attached USGS gage information indicates that the flows had peaked around 4,500 cfs and were gradually diminishing to about 2,000 cfs at the time the sample was taken. The result was 50 μg/L and very representative of a receding flow where naturally occurring aluminum can settle out in the riverbed from the flow. The behavior of this sample date mimics the 7/29/2010 sampling conditions.

The flow graphs and samples indicate that at quiescent conditions approaching 7Q10 flows that the Connecticut River is in compliance with the chronic concentration criteria for aluminum. As the flows increase, or there are dam releases, there is a scouring action that stirs up the settled

river bed aluminum, brings it back into suspension and transports this aluminum down the Connecticut River. This high flow, quick hitting conditions are more representative of the one-hour acute condition where 750 µg/L is the compliance concentration.

The City of Manchester undertook an aluminum study within the Merrimack River that indicates that aluminum is a naturally occurring condition beginning in the White Mountain's feeder ponds. Low river aluminum was also measured during times when the Merrimack River approached 7Q10 conditions and aluminum increased significantly when the flows exceeded 6,500 cfs and the river bottom began to scour.

In Manchester's comments on the Whitefield permit we discovered the following:

There were 18 upstream datasets that measured aluminum above Whitefield's outfall. The median was aluminum concentration was 140 µg/L with the maximum being 230 µg/L. Whitefield's outfall samples measured a median of 60 µg/L and a maximum of 220 µg/L. We noted that both median and maximum discharge from the Whitefield WWTP is less than the ambient concentrations in the Saint John River.

The City of Manchester submitted an extensive Aluminum Study document that illustrated that aluminum was a naturally occurring condition in the feeder ponds of the White Mountains. The findings from the streams that discharge into the Merrimack River are very similar to the findings in the Johns River upstream from Whitefield's WWTP.

Aluminum is a naturally occurring substance, is higher upstream than what is discharged from the Whitefield WWTP and as such, the John River should be delisted for Aluminum with no resultant permit limitation placed upon the Town of Whitefield for Aluminum.

Manchester is convinced that the background aluminum from the St John River, along with many other contributing small rivers, contributes to the high aluminum in the Connecticut River. NHDES is of the belief that the aluminum that is dissolved from the bedrock is a result of acid rain (a human induced condition) and not from natural causes as contributed by dead and decaying vegetation in the form of humic, tannic acids and other naturally occurring processes.

Response to Comment 27:
The monthly average aluminum limit has been removed from the final permit. See response to Comment #1.

Acute and chronic criteria are based on the duration and frequency of exposure to increased aluminum concentrations. Specifically, chronic aquatic life criteria represent the 4-day average concentration not to be exceeded more than once every 3 years on average, while acute aquatic life criteria represent the 1-hour average concentration not to be exceeded more than once every 3 years on average. In order to be protective of water quality uses, these criteria must be met under all flow regimes (i.e., 7Q10 low flow or higher flow). To account for the difference in averaging periods of the chronic and acute criteria in NPDES permits, EPA generally applies chronic criteria as monthly average limitations and acute criteria as daily maximum limitations. EPA determined that the median value of the upstream samples and the 95th percentile of the distribution of effluent data sufficiently characterizes chronic exposure conditions. To be conservative, EPA also applied the same values in characterizing acute exposure conditions.

The commenter suggests that elevated instream aluminum concentrations in the Connecticut River are naturally-occurring, and, as a result, the draft permit should not have included an

aluminum limit. The draft permit included an aluminum limit that was established to ensure adequate protection of the aluminum criterion contained in the State water quality standards at Env-Wq 1703.21, Table 1703.1.

New Hampshire's Surface Water Quality Regulations includes procedures for determining alternative site-specific criteria in situations where site-specific information is available which substantiates the use of different criteria and/or where new information, not considered in the development of the criteria, are available (Env-Wq 1704). Any such determination would be part of a Water Quality Standards process, not an individual permit issuance process. No such determination has been made by NHDES for the Connecticut River, and no evidence has been provided that would indicate that the aluminum concentrations currently found upstream of the Hanover WRF are naturally occurring. In the absence of site-specific criteria for the Connecticut River or the development and adoption of statewide criteria that are different from those contained within the existing State water quality standards, EPA is compelled to establish limits that ensure compliance with all existing applicable criteria, which, in this case, are those found at Env-Wq 1703.21, Table 1703.1.

Even if there is a clear correlation between elevated ambient aluminum concentrations and the concentrations of aluminum detected in the effluent discharged from the Hanover WRF, it is not clear how this would allow EPA to justify the lack of a water quality-based limit if there were reasonable potential for the discharge to cause or contribute to a violation of an existing water quality criterion. The aluminum limit in the draft permit was established specifically to meet the requirement in the New Hampshire water quality standards, which state that "Unless naturally occurring or allowed under part Env-Wq 1707, all surface waters shall be free from toxic substances or chemical constituents in concentrations or combinations that: (1) Injure or are inimical to plants, animals, humans or aquatic life; or (2) Persist in the environment or accumulate in aquatic organisms to levels that result in harmful concentrations in edible portions of fish, shellfish, other aquatic life, or wildlife which might consume aquatic life". (See Env-Wq 1703.21(a). Additionally, the standard requires that, "Unless allowed in part Env-Wq 1707 or naturally occurring, concentrations of toxic substances in all surface waters shall not exceed the recommended safe exposure levels of the most sensitive surface water use shown in Table 1703.1, subject to the notes as explained in Env-Wq 1703.22" (Env-Wq 1703.21(b)).

28. Aluminum and Acid Rain

The 2009 "Clean Air Markets Report" (http://www.epa.gov/airmarkets/progress/ARP09 3.html - Attachment 2) indicates that, *"Data collected from monitoring networks show that the decline in SO_2 emissions from the power industry has improved air quality. Based on data from EPA's latest air emission trends report, the national composite average of SO_2 annual mean ambient concentrations decreased 76 percent between 1980 and 2009, as shown in Figure 1 (based on state, local, and EPA monitoring sites located primarily in urban areas). The largest single-year reduction (20 percent) occurred in the first year of the ARP, between 1994 and 1995. The second largest single-year reduction (16 percent) occurred most recently between 2008 and 2009."*

"These trends are consistent with the regional ambient air quality trends observed in the Clean Air Status and Trends Network (CASTNET)." Between the 1989 to 1991 and 2007 to 2009 observation periods, average decreases in wet deposition of sulfate averaged more than 43 percent for the eastern United States (see Table 1 and Figure 5). Along with wet sulfate deposition, wet sulfate concentrations have also decreased by similar percentages. A strong correlation between large-scale S01 emission reductions and large reductions in sulfate concentrations in precipitation has been noted in the Northeast, one of the areas most affected by acid deposition. The reduction in total sulfur deposition (wet plus dry) has been even more

dramatic than that of wet deposition in the Mid-Atlantic and Midwest, with reductions of 50 and 53 percent, respectively."

The best proof that organic matter is now causing the lowered pH values (natural occurrence) as opposed to acid rain can be found on page 9 of this report. *"Dissolved organic carbon (DOC), essentially organic material, is derived from many sources, some of which include: atmospheric deposition, decaying leaf litter, soil organic matter, aquatic sediments, and aquatic organisms. DOC is an important part of the acid-base chemistry of most low-alkalinity freshwater systems. A host of factors control DOC in surface water including the inputs from acidifying deposition, discharge, temperature, and nutrient enrichment. Recently, scientists have suggested that increased concentrations of DOC are likely due to declining sulfate content from atmospheric deposition, increasing seasonal temperatures, or a combination of both. With increasing loading of acid deposition, soils release lower quantities of organic acids, thereby causing DOC to decrease in surface water. <u>This means that as surface waters recover from acidic deposition. DOC concentrations are returning toward pre-industrial levels. On the other hand, as temperatures warm, more organic acids in the soil break down and are released to surface waters and increase DOC concentrations.</u> These increasing DOC concentrations could be a possible sign of climate change. Another mechanism that could cause increases in DOC is a soil microbial response to nitrogen deposition that results in greater export of humic material to surface waters."*

"Sulfate concentrations are declining at most sites in the Northeast (New England, Adirondacks, Catskills/Northern Appalachian Plateau). However, in the Central Appalachians, sulfate concentrations in some streams (21 %) are increasing. This region has highly weathered soils that can store large amounts of deposited sulfate. As long-term sulfate deposition exhausts the soil's ability to store sulfate, a decreasing proportion of the deposited sulfate is retained in the soil and an increasing proportion is exported to surface waters. Thus sulfate concentrations in surface waters, mainly streams in this region, are increasing despite reduced sulfate deposition."

- *Nitrate concentrations are decreasing in some of the sites in all four regions, but several lakes and streams indicate flat or slightly increasing nitrate trends. <u>This trend does not appear to reflect changes in emissions or deposition in these areas and is likely a result of ecosystem factors.</u> In 2008, 45% of the Central Appalachian streams had a decreasing trend in nitrate, compared to 24% in 2007. This increase in the number of sites with a decreasing nitrate trend may be due to continued recovery following gypsy moth defoliation in the early 1990s.* Gypsy moth defoliation has been shown to increase nitrate export from affected forests to surface waters by as much as 50 times. While defoliation from gypsy moths may only occur over several months, impacts on nitrate transport and in-stream concentrations may be seen for many years.

- *ANC, as measured in surface waters, is increasing in many of the sites in the Adirondack and Catskills/Northern Appalachian Plateau regions, which in part can be attributed to declining sulfate deposition. The site trends also indicate variation within each region. Only 12% of sites in New England and the Central Appalachians have improving ANC trends, but overall, only seven sites in all regions have a significant downward trend in ANC.*

- *DOC is increasing in only about 20% to 42% of the low ANC lakes and streams of the Adirondack Mountains, Catskills/Northern Appalachian Plateau, and New England. The Adirondack Mountains have the highest percentage (42%) of lakes with an increasing DOC trend. These results suggest that the change of DOC in the LTM catchments is*

complex, with the majority of low ANC water bodies not changing over the past 18 years. Of the lakes and streams with increasing DOC, no single environmental factor is likely for the cause of the increase. Declines in sulfate deposition (Figure 5) and warmer seasonal and annual temperatures may have contributed to the rise in surface DOC.

The snippets of text taken from the Acid Rain Report demonstrate that acid rain has become far less a problem and naturally occurring 'dissolved organic carbon' is taking its place which results in the acid neutralizing capacity (ANC) of rivers and ponds to react more slowly. Manchester believes that the underlined texts above support the condition of natural occurrence.

Manchester is also providing an alkalinity chart (Attachment 3) provided by the NHDES on various feeder ponds in the New Hampshire White Mountains. The annual dates from 1993 through 2006 are included in the lower right. As can be seen from the chart, the acid neutralizing capacity continues to rise from 1997 through 2002 (as acid rain becomes more and more abated as outlined in the Acid Rain Program reports). In 2002, you once again begin to see the ANC begin to fall. This is due to the natural vegetation decay this is causing the release of naturally occurring acids. The EPA has indicated that $S0_2$ and nitrogen has steadily decreased since the inception of the Acid Rain Program. If there was not naturally occurring phenomenon then it would be reasonable to believe that the ANC would continue to increase in concentration. The fact that there is a decrease as the $S0_2$ continues to decrease points to an alternate source of low pH, and that is the naturally occurring condition.

None of the samples taken for aluminum were done via the clean sampling technique method. This in itself can skew the results by as much as 50%. Manchester is providing a copy of a letter that the NHDES forwarded a letter to EPA indicating that acid soluble aluminum (ASA) was going to be the new WQ standard (Attachment 4). Manchester's aluminum study had indicated that ASA was 75% on average of the total recoverable aluminum (TRA). If this average is applied state-wide then Hanover's median 99 µg/L concentration would be 74 µg/L for ASA. That would be below the 90% safety factor of 78 µg/L for TRA and demonstrate compliance with the new WQ standards.

For the above stated reasons, Manchester respectfully requests that aluminum limitation be removed from the final release of Hanover's NPDES permit.

Response to Comment 28:
EPA has removed the aluminum limit from the final permit because updated information shows that there is no longer reasonable potential for aluminum in the effluent to cause or contribute to an exceedance of water quality standards in the Connecticut River. See response to Comment 1.

A determination that aluminum levels in the Connecticut River are naturally occurring would need to be made by NHDES as part of the Water Quality Standards process, not an individual permit process. See response to Comment 27.

3. Comment Letter submitted September 13, 2014 by Kevin McLean, Superintendent of the Town of Hanover Water Reclamation Facility.

The following comments to the Hanover Draft Permit (NH0100099) are included for consideration.

29. Section F. Special Conditions (1) Nitrogen Optimization

The EPA has requested in the permit that Hanover complete an evaluation to optimize the removal of nitrogen. The permit calls for an evaluation of operational changes to enhance nitrification, incorporation of anoxic zones, septage receiving polices, and procedures and side stream management The EPA reports an annual average of 360 lbs of nitrogen discharge from the Hanover WWTF between 2004 and 2005.

The Fact Sheet, page 12 of 26, notes the Connecticut River had a baseline loading of 21,672 lbs/day and that there needed to be a 25% reduction. A CT DEP study indicated that the TMDL to address eutrophication impacts in the Long Island Sound should be a maximum of 16,254 lbs/day. Table 1 of the permit indicated that the current loading to the Connecticut River is 13,838 lbs/day.

The narrative indicates that Hanover's Facility had an annual average loading of 360 lbs/day (as reported in the permit). However, the loading between July 2011 and June 2012 was 226 lbs/day and between July 2012 and June 2013 was 208 lbs/day for total nitrogen. This shows Hanover has already achieved an aggregate reduction in nitrogen loading of 37% between 2004/2005 and 2012/2013. Currently, Hanover not only maintains the 25% reduction of baseline loading as outlined in the TMDL, but exceeds this requirement by 50%.

The evaluation of alternative methods is a very similar requirement as a facility plan study to reduce nitrogen. These are usually only required when a facility exceeds a WQ criteria, or the 80%, 90-day flow capacity. The assumption by the EPA is that the Connecticut River will exceed the TMDL base loading of 16,254 lbs/day if all treatment plants along with Connecticut River do not complete this task. The evidence as presented by the EPA in Table 1 is clear that these objectives have been achieved and surpassed without this evaluation of alternative method requirement in place.

Env-Ws 1703.14. The NHDES Fact Sheet, ENV-WS 1703.14 notes that cultural eutrophication is defined in Env-Ws 1702.15 as," ... the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen."

At a minimum, this narrative standard requires that there be a demonstration that the discharge is causing impairment, either excessive plant growth that impairs uses or plant growth that causes a dissolved oxygen criteria violation.

However, there is no demonstration provided in the Fact Sheet that the discharge from the Town of Hanover WWTF is causing an impairment of the Connecticut River upon mixing under design flow conditions. In fact, actual loadings have been reduced since the 2004/2005 nitrogen data series that demonstrates a 37% reduction.

This requirement to begin a facility plan evaluation for nitrogen is not supported by any Clean Water Act (CWA) requirements.

Response to Comment 29:

This comment received from Hanover is essentially the same as Comment 22 received from Manchester. See response to Comment 22.

30. Unsubstantiated Assumptions

In issuing Hanover's draft permit, the Region has made three very important unsubstantiated assumptions: first, the Connecticut River will become impaired by nitrogen if the evaluation of

alternatives is not undertaken; second, the incorporation of anoxic zones, septage policies, and side stream management are the only way to continue attainment of the 16,254 lb/day TMDL and; three, the Town of Hanover WWTF is going to cause or contribute to an excursion above the assigned 16,244 lbs/day [sic] TMDL if this targeted facility plan is not implemented. As explained below, the Town of Hanover has several significant objections with the assumptions and determinations made by the Region in developing this requirement.

Response to Comment 30:
This comment received from Hanover is essentially the same as Comment 23 received from Manchester. See response to Comment 23.

31. Scientific Basis

1. Misapplication of 40 CFR § 122.44(d) The CWA is a "science-based" statute that requires the establishment of criteria "accurately reflecting the latest scientific information" regarding " ... the effects of pollutants on biological community diversity, productivity and stability ... " Section 304(a)(l); accord, 40 CFR 131.3(c) (criteria developed by EPA are based on "the effect of a constituent on a particular aquatic species"). No criteria (including a requirement to develop a nitrogen abatement plan) can be approved unless it is "based on a sound scientific rationale". 40 CFR 131.11(a). Likewise, the conditions generated to meet the "applicable standard" (16,244 lbs/day TMDL) must be demonstrated to be "necessary." The permitting authority must demonstrate the actions are necessary to attain and maintain applicable narrative water quality criteria" 40 CFR 122.44(d)(1)(vi), rather than unsubstantiated belief. The data provided in the permit fact sheet demonstrates that the Connecticut River is currently 15% below the calculated TMDL. Obviously compliance with the statute and applicable regulations requires an objective scientific assessment to show that the selected approach is both necessary and sufficient to achieve criteria compliance[6]. Compliance is currently achieved and this additional burden is not warranted.

Given the language of the Act and the implementing regulations, it is not surprising that Courts have determined "that neither the language of the Act nor the intent of Congress appears to contemplate liability without causation" NAMF v. EPA, 719 F. 2d 624, 640 (3rd. Cir. 1983); Ark. Poul. Fed. V. EPA, 852 F. 2d 324, 328 (8th Cir. 1988) (the discharge must at least be "a cause" of the violation.) In the TMDL context, such nutrient wasteload allocations must be based on a documented "cause and effect" relationship demonstrating that the Hanover WWTF has contributed to or directly causes a violation of the 16,244 lbs/day TMDL limitation.

On its face, 122.44(d) itself indicates that more restrictive requirements only apply if the discharge "causes" a water quality criteria excursion[7] as discussed in the Upper Blackstone decision. The Upper Blackstone decisions repeatedly refer to the fact that nutrients were demonstrated to be "causing" extensive "cultural eutrophication" as the basis for imposing more restrictive requirements.[8]

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[6] Sufficient does not mean that the individual facility must ensure WQS are attained, but that the selected criteria, when achieved will produce this result.
[7] The "or contributes" language means it is contributing to the "cause" of the violation.
[8] Upper Blackstone Water Pollution Abatement Dist. v. EPA, 690 F.3d 9 (1 11 Cir. 2012) "An influx of nitrogen and phosphorus from sewage treatment plants is causing serious problems for the River's waters and those downstream. The Blackstone, Seekonk, and Providence Rivers, and Narragansett Bay, all suffer from severe cultural eutrophication." (at 11). "State water quality standards generally supplement these limitations, so that where one or more point source dischargers, otherwise compliant with federal conditions, are nonetheless causing a violation of state water quality standards, they may be further regulated to alleviate the water quality violation. Id. § 131/(b){l}(C) (at 14);

Because the current analyses for the Connecticut River demonstrates compliance with the TMDL and the WWTF effluent results for nitrogen show Hanover has actually reduced average daily nitrogen loading by 37% over a 10-year period, EPA should not require an annual burdensome evaluation as a permit condition to declare that the waters of the Connecticut River will at some future point, exceed the 16,244 pound [sic] TMDL. EPA is interpreting 122.44(d) in a manner inconsistent with the rule language, as well as the structure of the Act.

Hanover is requesting that the "evaluation of alternatives" requirement removed from the final issued permit language, but has no objection to the required monitoring for TKN, Nitrate, and Total Nitrogen as report only.

Response to Comment 31:
This comment received from Hanover essentially combines Comments 24, 25, and 26 received from Manchester. See responses to Comments 24, 25, and 26.

32. Aluminum

Page 17 of 26, Table 4 of the fact sheet, illustrates aluminum concentrations for 2/22/2008 (99 μg/L), 7/29/2008 (160 μg/L), 7/23/2009 (100 μg/L), 7/29/2010 (71 μg/L), 7/8/2011 (81 μg/L), 7/25/2012 (50 μg/L) and July of 2013 (1,600 μg/L). The median aluminum concentration is listed as 99 μg/L.

The 2/28/2008 sample had a concentration of (99 μg/L). Attachment 1 is the USGS gaging station readings at Wells River VT for all samples. There is no data from the 9th through the 23rd. It is hard to determine river flows, but indications illustrate a period of time where the river gage was probably above 4,000 cfs for most of the period. This is almost 4 times the 7Q10 flow of 1,049 cfs. Also, swings in flow levels indicate timed dam releases.

The 7/29/2008 sample was taken a few days after a significant rain and a river flows of>30,000 cfs. This condition is 30 times the 7QIO condition, would indicate excessive bottom scouring, and would account for the higher aluminum concentration of 160 μg/L. This concentration should be referenced against the 750 μg/L limit acute limit as the river gage far exceeded 7Q10 flows.

The 7/23/09 sample shows daily dam releases prior to sample date that brought the river level down to about 1,200 cfs and again raising the levels to 5,500 cfs (a significant scouring velocity condition). Under these extreme conditions the sample was 100 μg/L.

On 7/29/2010 the river flow was less than 2,000 cfs with a few calm days with no indication of dam release. This was the low measured result at 71 μg/L and close to 7Q10 critical conditions. This sample is less than the 87 μg/L WQ criteria and representative on non-dam release flows that would be expected in the Connecticut River during the low flow season.

The 7/8/11 sample was taken after a dam release that increased the river flow by 4,000 cfs to over 6,000 cfs which would produce scouring velocities of the river bed. The result was 81 μg/L.

The 7/25/2012 sample was taken after a rain event on 7/21/2013. The attached USGS gage information indicates that the flows had peaked around 4,500 cfs and were gradually diminishing to about 2,000 cfs at the time the sample was taken. The result was 50 μg/L and very representative of a receding flow where naturally occurring aluminum can settle out in the riverbed from the flow. The behavior of this sample date mimics the 7/29/2010 sampling conditions.

The flow graphs and samples indicate that at calm, close to 7Q10 conditions, the Connecticut River is in compliance with the chronic concentration criteria for aluminum. As the flows increase, or there are dam releases, there is a scouring action that stirs up the settled river bed aluminum, brings it back into suspension and transports this aluminum down the Connecticut River. These conditions are more representative of the one-hour acute condition where 750 µg/L is the compliance concentration.

The City of Manchester, Hanover's neighbor to the west [sic], undertook an aluminum study within the Merrimack River that indicates that aluminum is a naturally occurring condition beginning in the White Mountain's feeder ponds. In their response to the Whitefield permit they indicated the following:

There were 18 upstream datasets that measured aluminum above Whitefield's outfall. The median was 140 µg/L with the maximum being 230 µg/L. Whitefield's outfall samples measured a median of 60 µg/L and a maximum of 220 µg/L. Note that both median and maximum discharge from the Whitefield WWTP is less than the ambient.

The City of Manchester submitted an extensive Aluminum Study document that illustrated that aluminum was a naturally occurring condition in the feeder ponds of the White Mountains. The findings from the streams that discharge into the Merrimack River are very similar to the findings in the Johns River upstream from Whitefield's WWTP.

Aluminum is a naturally occurring substance, is higher upstream than what is discharged from the Whitefield WWTP and as such, the Johns River should be delisted for Aluminum with no resultant permit limitation placed upon the Town of Whitefield for Aluminum.

Hanover believes that the background aluminum from the St John River, along with many other contributing small rivers, contributes to the high aluminum in the Connecticut River. NHDES is of the belief that the aluminum that is dissolved from the bedrock is a result of acid rain (a human induced condition) and not from natural causes as contributed by dead and decaying vegetation in the form of humic and tannic acids.

The 2009 "Clean Air Markets Report" (http://www.epa.gov/ainnarkets/progress/ARP09_3.html - Attachment 2) indicates that, *"Data collected from monitoring networks show that the decline in SO_2 emissions from the power industry has improved air quality. Based on data from EPA's latest air emission trends report, the national composite average of SO_2 annual mean ambient concentrations decreased 76 percent between 1980 and 2009, as shown in Figure 1 (based on state, local, and EPA monitoring sites located primarily in urban areas). The largest single-year reduction (20 percent) occurred in the first year of the ARP, between 1994 and 1995. The second largest single-year reduction (16 percent) occurred most recently between 2008 and 2009."*

"These trends are consistent with the regional ambient air quality trends observed in the Clean Air Status and Trends Network (CASTNET)." Between the 1989 to 1991 and 2007 to 2009 observation periods, average decreases in wet deposition of sulfate averaged more than 43 percent for the eastern United States (see Table 1 and Figure 5). Along with wet sulfate deposition, wet sulfate concentrations have also decreased by similar percentages. A strong correlation between large-scale $S0_2$ emission reductions and large reductions in sulfate concentrations in precipitation has been noted in the Northeast, one of the areas most affected by acid deposition. The reduction in total sulfur deposition (wet plus dry) has been even more

dramatic than that of wet deposition in the Mid-Atlantic and Midwest, with reductions of 50 and 53 percent, respectively."

The best proof that organic matter is now causing the lowered pH values (natural occurrence) as opposed to acid rain can be found on page 9 of this report. *"Dissolved organic carbon (DOC), essentially organic material, is derived from many sources, some of which include: atmospheric deposition, decaying leaf litter, soil organic matter, aquatic sediments, and aquatic organisms. DOC is an important part of the acid-base chemistry of most low-alkalinity freshwater systems. A host of factors control DOC in surface water including the inputs from acidifying deposition, discharge, temperature, and nutrient enrichment. Recently, scientists have suggested that increased concentrations of DOC are likely due to declining sulfate content from atmospheric deposition, increasing seasonal temperatures, or a combination of both. With increasing loading of acid deposition, soils release lower quantities of organic acids, thereby causing DOC to decrease in surface water. <u>This means that as surface waters recover from acidic deposition. DOC concentrations are returning toward pre-industrial levels. On the other hand, as temperatures warm, more organic acids in the soil break down and are released to surface waters and increase DOC concentrations.</u> These increasing DOC concentrations could be a possible sign of climate change. Another mechanism that could cause increases in DOC is a soil microbial response to nitrogen deposition that results in greater export of humic material to surface waters."*

"Sulfate concentrations are declining at most sites in the Northeast (New England, Adirondacks, Catskills/Northern Appalachian Plateau). However, in the Central Appalachians, sulfate concentrations in some streams (21 %) are increasing. This region has highly weathered soils that can store large amounts of deposited sulfate. As long-term sulfate deposition exhausts the soil's ability to store sulfate, a decreasing proportion of the deposited sulfate is retained in the soil and an increasing proportion is exported to surface waters. Thus sulfate concentrations in surface waters, mainly streams in this region, are increasing despite reduced sulfate deposition."

- *Nitrate concentrations are decreasing in some of the sites in all four regions, but several lakes and streams indicate flat or slightly increasing nitrate trends. <u>This trend does not appear to reflect changes in emissions or deposition in these areas and is likely a result of ecosystem factors.</u> In 2008, 45% of the Central Appalachian streams had a decreasing trend in nitrate, compared to 24% in 2007. This increase in the number of sites with a decreasing nitrate trend may be due to continued recovery following gypsy moth defoliation in the early 1990s.* Gypsy moth defoliation has been shown to increase nitrate export from affected forests to surface waters by as much as 50 times. While defoliation from gypsy moths may only occur over several months, impacts on nitrate transport and in-stream concentrations may be seen for many years.

- *ANC, as measured in surface waters, is increasing in many of the sites in the Adirondack and Catskills/Northern Appalachian Plateau regions, which in part can be attributed to declining sulfate deposition. The site trends also indicate variation within each region. Only 12% of sites in New England and the Central Appalachians have improving ANC trends, but overall, only seven sites in all regions have a significant downward trend in ANC.*

- *DOC is increasing in only about 20% to 42% of the low ANC lakes and streams of the Adirondack Mountains, Catskills/Northern Appalachian Plateau, and New England. The Adirondack Mountains have the highest percentage (42%) of lakes with an increasing DOC trend. These results suggest that the change of DOC in the LTM catchments is*

complex, with the majority of low ANC water bodies not changing over the past 18 years. Of the lakes and streams with increasing DOC, no single environmental factor is likely for the cause of the increase. Declines in sulfate deposition (Figure 5) and warmer seasonal and annual temperatures may have contributed to the rise in surface DOC.

The snippets of text taken from the Acid Rain Report demonstrate that acid rain has become far less a problem and naturally occurring 'dissolved organic carbon' is taking its place which results in the acid neutralizing capacity (ANC) of rivers and ponds to react more slowly. Hanover believes that the underlined texts above supports Hanover's position.

None of the samples taken for aluminum were done via the clean sampling technique method. This in itself can skew the results by as much as 50%. Hanover understands that the NHDES forwarded a letter to EPA indicating that acid soluble aluminum (ASA) was going to be the new WQ standard (Attachment 3). The Manchester study had indicated that ASA was 75% on average of the total recoverable aluminum (TRA). If this average is applied state-wide then Hanover's median 99 µg/L concentration would be 74 µg/L for ASA. That would be below the 90% safety factor of 78 µg/L for TRA and demonstrate compliance with the new WQ standards.

For the above stated reasons, Hanover respectfully requests that aluminum limitation be removed from the final release of the upcoming NPDES permit.

Response to Comment 32:
This comment received from Hanover essentially combines Comments 27 and 28 received from Manchester. See responses to Comments 27 and 28.