

**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"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Groton School

is authorized to discharge from the facility located at

**Groton School Wastewater Treatment Plant
Farmer's Row
Groton, Massachusetts 01450**

to receiving water named:

Nashua River (Segment MA81-06)

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on the days of signature.

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

This permit supersedes the permit issued on September 27, 2007.

This permit consists of 12 pages in Part I including effluent limitations and monitoring requirements, Part II Standard Conditions (January 2007), Attachment A- Acute Whole Effluent Toxicity Protocol (February 28, 2011), and Attachment B – Summary of Required Report Submittals.

Signed this 48th day of August 2014.

/S/SIGNATURE ON FILE

Ken Moraff, Director
Office of Ecosystem Protection
Environmental Protection Agency

/S/SIGNATURE ON FILE _____

David R. Ferris, Director
Division of Watershed Management
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Nashua River. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC		EFFLUENT LIMITS				MONITORING REQUIREMENTS ³	
PARAMETER	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY	SAMPLE ³ TYPE
FLOW ²	*****	*****	0.07 MGD	*****	Report MGD	CONTINUOUS	RECORDER
FLOW ²	*****	*****	Report MGD	*****	*****	CONTINUOUS	RECORDER
BOD ₅	18 lbs/Day 8 kgs/Day	26 lbs/Day 12 kgs/Day	30 mg/l	45 mg/l	Report mg/l	1/WEEK	24-HOUR ⁵ COMPOSITE
TSS	18 lbs/Day 8 kgs/Day	26 lbs/Day 12 kgs/Day	30 mg/l	45 mg/l	Report mg/l	1/WEEK	24-HOUR ⁵ COMPOSITE
pH RANGE ¹	6.0 - 8.3 SU (SEE PERMIT PAGE 6 OF 12, PARAGRAPH I.A.1.b.)					1/WEEK	GRAB
<u>Escherichia</u> Coli (E-Coli) ^{1,4}	*****	*****	126 cfu/100 ml	*****	409 cfu/100 ml	1/WEEK	GRAB
TOTAL PHOSPHORUS	0.6 lbs/Day	*****	1.0 mg/l	*****	Report mg/l	2/MONTH	24-HOUR ⁵ COMPOSITE

CONTINUED FROM PREVIOUS PAGE

A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge from treated effluent from outfall serial number 001 to the Nashua River. Such discharges shall be limited and monitored as specified below.							
<u>EFFLUENT CHARACTERISTIC</u>	<u>EFFLUENT LIMITS</u>				<u>MONITORING REQUIREMENTS³</u>		
PARAMETER	<u>AVERAGE MONTHLY</u>	<u>AVERAGE WEEKLY</u>	<u>AVERAGE MONTHLY</u>	<u>AVERAGE WEEKLY</u>	<u>MAXIMUM DAILY</u>	<u>MEASUREMENT FREQUENCY</u>	<u>SAMPLE TYPE</u>
Whole Effluent Toxicity ^{6,8}	Acute LC ₅₀ ≥50% ⁷					1/Year	24-Hr Comp ⁵
Hardness ⁹	*****	*****	*****	*****	Report mg/l	1/Year	24-Hr Comp ⁵
Ammonia Nitrogen as N ⁹	*****	*****	*****	*****	Report mg/l	1/Year	24-Hr Comp ⁵
Total Recoverable Cadmium ⁹	*****	*****	*****	*****	Report ug/l	1/Year	24-Hr Comp ⁵
Total Recoverable Nickel ⁹	*****	*****	*****	*****	Report ug/l	1/Year	24-Hr Comp ⁵
Total Recoverable Zinc ⁹	*****	*****	*****	*****	Report ug/l	1/Year	24-Hr Comp ⁵
Total Recoverable Copper ⁹	*****	*****	*****	*****	Report ug/l	1/Year	24-Hr Comp ⁵
Total Recoverable Lead ⁹	*****	*****	*****	*****	Report ug/l	1/Year	24-Hr Comp ⁵
Total Recoverable Aluminum ⁹	*****	*****	*****	*****	Report ug/l	1/Year	24-Hr Comp ⁵

Footnotes:

1. Required for State Certification.
2. Report annual average, monthly average, and the maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months.
3. All required effluent samples shall be collected at the point specified below. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

PARAMETER	SAMPLE LOCATION
Flow	Influent Flow-Meter Manhole
pH range	UV Weir Box
E-coli	UV Weir Box
Total Phosphorus	UV Weir Box
BOD ₅ and TSS	UV Weir Box
Whole effluent toxicity	Dilution Water: Boat House Dock
	Effluent: UV Weir Box

A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report.

All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. All samples shall be 24 hour composites unless specified as a grab sample in 40 CFR §136.

4. The average monthly limit for *E.coli* is expressed as a geometric mean.
5. 24-hour composite samples will consist of at least twenty four (24-hour) grab samples taken during one consecutive 24-hour period.

6. The permittee shall conduct acute toxicity tests once per year. The permittee shall test the daphnid, Ceriodaphnia dubia, only. Toxicity test samples shall be collected during the second week of the month of June. The results are due July 31. The tests must be performed in accordance with test procedures and protocols specified in Attachment A of this permit.

Test Date Second Week in	Submit Results By:	Test Species	Acute Limit LC ₅₀
June	July 31	Ceriodaphnia dubia (daphnid)	≥50%

7. The LC₅₀ is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 50% limit means that a sample of 50% effluent shall cause no more than a 50% mortality rate.
8. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in Attachment A (Toxicity Test Procedure and Protocol) Section IV, DILUTION WATER in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs) which is sent to all permittees with their annual set of DMRs and may also be found on the EPA, Region I web site at <http://www.epa.gov/region1/enforcementandassistance/dmr2005.pdf>.

If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in Attachment A. Any modification or revocation to this guidance will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in Attachment A.

9. For each whole effluent toxicity (WET) 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**. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report.

Part I.A.1. (Continued)

- a. The discharge shall not cause a violation of the water quality standards of the receiving waters.
 - b. The pH of the effluent shall not be less than 6.0 or greater than 8.3 at any time.
 - c. The discharge shall not cause objectionable discoloration of the receiving waters.
 - d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.
 - e. The results of sampling for any parameter done in accordance with EPA approved methods above its required frequency must also be reported.
 - f. The treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.
 - g. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions. This report may be combined with the annual I/I summary report required in Section C.3., of this permit.
2. Toxics Control
- a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.
 - b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

3. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

B. UNAUTHORIZED DISCHARGES

This permit authorizes discharges only from the outfall listed in Part I.A.1, in accordance with the terms and conditions 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 MassDEP in accordance with Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at:

<http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html>.

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:

1. Maintenance Staff

The 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.

2. Preventative Maintenance Program

The 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.

3. Infiltration/Inflow Control:

The permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection system and high flow related violations of the wastewater treatment plant's effluent limitations.

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and MassDEP annually, by March 31. The summary report shall, at a minimum, include:

- A description of activities conducted to to reduce I/I during the previous year and any ongoing efforts to identify and remove sources of infiltration and inflow.
- A calculation of the annual average I/I and the maximum month I/I for the reporting year.
- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

4. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR i 122.2).

D. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR Part 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to Section 405(d) of the CWA, 33 U.S.C. § 1345(d).
2. If both state and federal requirements apply to the permittee's sludge use and/or disposal practices, the permittee shall comply with the more stringent of the applicable requirements.
3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge 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 requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.
 5. The 40 CFR. Part 503 requirements including the following elements:
 - General requirements
 - Pollutant limitations
 - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
 - Management practices
 - Record keeping
 - Monitoring
 - Reporting

Which of the 40 CFR Part 503 requirements apply to the permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the permittee to assist it in determining the applicable requirements.¹

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) 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 +	1 /month

Sampling of the sewage sludge shall use the procedures detailed in 40 CFR 503.8.

¹ 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>

7. Under 40 CFR § 503.9(r), the permittee is a “person who prepares sewage sludge” because it “is ... the person who generates sewage sludge during the treatment of domestic sewage in a treatment works ...” If the permittee contracts with *another* “person who prepares sewage sludge” under 40 CFR § 503.9(r) – i.e., with “a person who derives a material from sewage sludge” – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the permittee does not engage a “person who prepares sewage sludge,” as defined in 40 CFR § 503.9(r), for use or disposal, then the permittee remains responsible to ensure that the applicable requirements in Part 503 are met.

40 CFR § 503.7. If the ultimate use or disposal method is land application, the permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.

8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by February 19 (*see also* “EPA Region 1 - NPDES Permit Sludge Compliance Guidance”). Reports shall be submitted to the address contained in the reporting section of the permit.

If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:

- a. Name and address of contractor(s) responsible for sludge preparation, use or disposal
- b. Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge.

E. MONITORING AND REPORTING

The permittee shall submit monitoring data and all other NPDES permit required reports to EPA electronically using NetDMR, a web-based tool that allows permittees to electronically submit discharge monitoring reports (DMRs) and other required reports via a secure internet connection. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

1. Submittal of Reports Using NetDMR

NetDMR is accessed from: <http://www.epa.gov/netdmr>. DMRs shall be submitted electronically to EPA 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, including the MassDEP Monthly Operations and Maintenance Report, as an electronic attachment to the DMR. A permittee submitting reports using NetDMR is no longer required to submit hard copies of DMRs or other reports to EPA and no longer required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs (including Monthly Operation and Maintenance Reports, Toxicity Test Results and Nutrient Optimization Reports) to MassDEP until further notice from MassDEP.

2. Submittal of Reports in Hard Copy Form

While we do not anticipate the need for the permittee to submit hard copies of reports to EPA, any hard copies that are submitted to EPA shall be submitted to the Director at the following address:

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

Duplicate signed copies of all reports or notifications required above shall be submitted to the State at the following address:

Bureau of Resource Protection (Municipal)
627 Main Street
Worcester, MA 01608

Toxicity test reports ONLY shall also be submitted to the State at the following address:

Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

Any verbal reports, if required in Parts I and/or II of this permit, shall be made to both EPA-New England and to MassDEP

F. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.
2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.
3. Each agency shall have the independent right to enforce the terms and conditions of this permit. 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 this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as a NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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NPDES PART II STANDARD CONDITIONS
(January, 2007)

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.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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.

NPDES PART II STANDARD CONDITIONS

(January, 2007)

- (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

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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

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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

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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.

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- 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.

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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.

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- (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

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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

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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).

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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.

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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.

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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.

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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.

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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,

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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.

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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.

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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 of 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 of 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.

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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.

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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.)

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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

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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.

PERMIT ATTACHMENT A
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/swguidance/methods/wet/index.cfm#methods>

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°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/enforcementandassistance/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 TESTS¹

1. Test type	Static, non-renewal
2. Temperature (°C)	20 ± 1° C or 25 ± 1°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 <u>Selenastrum</u> 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 ³	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 TEST¹**

1. Test Type	Static, non-renewal
2. Temperature (°C):	20 ± 1 ° C or 25 ± 1 °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 the others
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	≥ 0.5 , must bracket the permitted RWC
15. Number of dilutions ³	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.

<u>Parameter</u>	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 ⁴	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-Kärber
- Trimmed Spearman-Kärber
- 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.

Summary of Required Report Submittals

This table is a summary of the reports required to be submitted under this NPDES permit as an aid to the permittee(s). If there are any discrepancies between the permit and this summary, the permittee(s) shall follow the permit requirements. The addresses are for the submittal of hard copies.

When the permittee begins reporting using NetDMR, submittal of hard copies of many of the required reports will not be necessary. See permit conditions for details.

1 U.S. Environmental Protection Agency Water Technical Unit (OES04-SMR) 5 Post Office Square - Suite 100 Boston, MA 02109-3912	2 MassDEP Surface Water Discharge Permit Program 627 Main Street, 2nd Floor Worcester, Massachusetts 01608
3 MassDEP Central Regional Office- Bureau of Resource Protection 627 Main Street Worcester, MA 01608	

Requirement	Due Date	Addressees
Toxicity test samples shall be collected during the month of; June. [Part I.A Footnote 6]	Results shall be submitted by July 31, of each year	1 and 2
If the average annual flow in any calendar year exceeds 80% of the facility's design flow, the permittee shall submit a report to MassDEP. [Part I.A.1.g.]	By March 31 of the following calendar year	1, 2 and 3
Notification of Sanitary Sewer [Overflows Part I.A.1.3.]	Within 24 hours of SSO event.	1 and 3
A summary report of all actions taken to minimize I/I during the previous calendar year. [Part C.3.]	Annually, by March 31	1, 2, and 3
Annual Sludge Report [Part I.D.8]	Annually by February 19	1, 2, and 3
Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) [Part I.E]	Postmarked no later than the 15th day of the following month.	1, 2, and 3

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
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: **MA0033324**

PUBLIC NOTICE DATE: March 20, 2014 – April 18, 2014

NAME AND ADDRESS OF APPLICANT:

**Groton School
P.O. Box 991
Groton, Massachusetts 01450**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Groton School Wastewater Treatment Facility
Farmers Row
Groton, Massachusetts 01450**

RECEIVING WATER: **Nashua River** (Nashua Basin - MA81-06)
USGS Hydrologic code: 01070004

CLASSIFICATION: **Class B - Warm Water Fishery**

I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency for re-issuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving water. The current permit was signed and became effective on September 27, 2007. The permit expired August 31, 2012. A re-application was received on February 29, 2012. The applicant filed a complete application as required by 40 Code of Federal Regulations (CFR) Part 122.6 so the existing permit has been administratively extended and will remain in effect until a renewed permit has been issued. This fact sheet includes: Attachment A – Effluent Data, Attachment B – Discharge Location Map, Attachment C – Photo of Treatment Plant, Attachment D – Process Diagram, Attachment E – Metals Data, and Attachment F - Statistical Analysis Of Metals Effluent Data.

.II. TYPE OF FACILITY AND DISCHARGE LOCATION

The Groton School is an independent secondary boarding school located in Groton, MA that operates a system for the collection and treatment of its wastewater. The discharge from this secondary wastewater treatment facility is via Outfall 001 to the Nashua River. See Attachment B, Site Location Map.

III. DESCRIPTION OF DISCHARGE

Quantitative descriptions of the discharge in terms of significant effluent parameters, based on recent discharge monitoring reports (DMRs) for January 2012 through November 2013 may be found in Fact Sheet Attachment A.

IV. LIMITATIONS AND CONDITIONS

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

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. PROCESS DESCRIPTION

The wastewater treatment facility (WWTF), which is located at the school, has a design flow of 70,000 gallons per day (gpd) or 0.07 million gallons per day (mgd), and serves a population of approximately 400 students and employees.

The treatment process consists of primary settling, biological treatment, coagulation/flocculation phosphorus removal, biological filter polishing and UV disinfection.

Sanitary flow from the campus buildings enters the first of two septic tanks in series. Septic Tank #1 (20,000 gallons) and Septic Tank #2 (14,000 gallons), provide primary settling. The septic tanks are followed by a dosing tank (4,000 gallons) which provides flow equalization. A siphon draws flow from the dosing tank, through a flow meter (Parshall flume with ultrasonic level detection) to a splitter that directs flow to the Northwest and/or Northeast sand filter beds. The sand filters treat the wastewater mechanically and biologically. Mechanically, the sand strains the wastewater and removes some solids that were able to flow through the septic tanks. Biologically, the sand provides a growth substratum to bacteria that consume organic matter in sewage and nitrifies ammonia. As in conventional treatment, a small amount of sludge is produced.

Flow from the sand filters is pumped to the first of two inclined plate separators in series which, with chemical addition, provide phosphorus removal and pH control. The treated sewage then flows to a recirculating sand filter for biological polishing.

Two ultraviolet units provide disinfection before the treated effluent is conveyed through an outfall pipe to a discharge point below the surface of the Nashua River. See Attachment D for a Process Flow Diagram. See also Attachment C for a photograph of the treatment system.

The collection system has approximately six miles of sewer line that serve the campus and approximately 30 residences owned by the school. The remainder of the campus is served by Title 5 septic systems.

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OVERVIEW OF FEDERAL AND STATE REGULATIONS

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

EPA is required to consider a) technology-based requirements, b) water quality-based requirements, and c) all limitations and requirements in the current/existing permit, when developing permit limits. These requirements are described in the following paragraphs.

Pursuant to 40 CFR. § 122.44 (d), permittees must achieve water quality standards established under Section 303 of the CWA, including state narrative criteria for water quality. Additionally, under 40 CFR. §122.44 (d)(1)(i), "Limitations must control all pollutants or pollutant parameters which the Director determines 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." When determining whether a discharge causes, or has the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numeric criterion, the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution, and where appropriate, consider the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the applicable anti-backsliding requirements, found in CWA Section 402(o) and 303(d) and at 40 CFR 122.44(l). Effluent limits based on technology, water quality, and state certification requirements are all subject to anti-backsliding provisions.

In accordance with regulations found at 40 CFR Section 131.12, the Massachusetts Department of Environmental Protection (MassDEP) has developed and adopted a statewide antidegradation policy to maintain and protect existing in-stream water quality.

The Massachusetts Antidegradation Policy is found at 314 Code of Massachusetts Regulations (CMR) 4.04. No lowering of water quality is allowed, except in accordance with the antidegradation policy. All existing uses of the Nashua River must be protected. This draft permit is being reissued with allowable discharge limits as, or more, stringent than those in the current permit and with the same parameter coverage. There is no change in outfall location.

TECHNOLOGY-BASED REQUIREMENTS

Technology-based requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 CFR §125 Subpart A). For existing sources, best practicable control technology currently available (BPT) is applied for conventional, non-conventional, and toxic pollutants. More stringent technology-based requirements are applied through best conventional control technology (BCT) for conventional pollutants; and best available technology economically achievable (BAT) for toxic and non-conventional pollutants. New source performance standards (NSPS) are applied to new sources, to control conventional, non-conventional, and toxic pollutants.

There are no effluent limitations guidelines (ELGs) for privately owned treatment plants treating domestic sewage. In the absence of ELGs, the permit writer is authorized under Section 402(a)(1) of the CWA to establish technology based limits on a case-by-case basis using best professional judgment (BPJ). See 40 CFR Part 125.3(c)(2) and (c)(3). Using BPJ, EPA decided to use the technology-based requirements for POTWs as the basis for the technology-based requirements for this discharge, because the wastewater composition and treatment technologies are identical to those of a small Publicly Owned Treatment Works (POTW).

The factors to be considered in developing BAT limits are set forth at 40 CFR. §§125.3(c)(2)(i) and (ii) and 125.3(d)(3)(i) - (vi) and include, among other things, the age of existing facilities, engineering issues, process changes, non-water quality-related environmental impacts, and the costs of achieving required effluent pollutant reductions.

WATER QUALITY STANDARDS AND DESIGNATED USES

The receiving water is the Nashua River, Segment MA81-06. This 9.1 mile river segment runs from the confluence with the Squannacook River, Shirley/Groton/Ayer to the Pepperell Dam, Pepperell.

This receiving water is classified by the MassDEP in 314 CMR 4.00 as a Class B, warm water fishery. The Massachusetts Surface Water Quality Standards (MA SWQS), 314 CMR 4.05(3) (b) designates Class B waters as habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation.

These waters shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. The waters should have consistently good aesthetic value.

A warm water fishery is defined in the MA SWQS at (314 CMR 4.02) as waters in which the maximum mean monthly temperature generally exceeds 20°Celsius during the summer months and are not capable of supporting a year-round population of cold water stenothermal aquatic life.

The objective of the Federal Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To meet this goal the CWA requires states to develop information on the quality of their water resources and report this information to the U.S. Environmental Protection Agency (EPA), the U.S. Congress, and the public. To this end, EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both § 305(b) and § 303(d) of the CWA. The integrated list format allows the states to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories:

1) Unimpaired and not threatened for all designated uses; 2) Unimpaired waters for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) impaired or threatened for one or more uses and requiring a TMDL.

The segment of the Nashua River receiving the Groton School discharge is classified in the State's 2012 Integrated List of Waters as category 5, as not in attainment and requiring a TMDL. The impairment causes for this segment are aquatic macroinvertebrate bioassessments, mercury in fish tissue, non-native aquatic plants, and nutrient/eutrophication biological indicators.¹

The MassDEP 2003 Water Quality Assessment Report² for the Nashua River, which is the basis for the 303(d) list, summarized available data and concluded that impairment in this receiving water segment appear limited to Pepperell Pond, and the sources of the aquatic life, primary contact, secondary contact, and aesthetic impairments are introduction of non-native organisms (accidental or intentional), municipal point source discharges, and unknown. The cause of the fish consumption impairment is atmospheric deposition- toxics and unknown.

The Nashua River Watershed 5 Year Action Plan 2002-2007 states that: *The Main stem Nashua River shows high phosphorus levels and some high bacteria counts.* The Five Year Action Plan is a product of the former Massachusetts Watershed Initiative (MWI) Nashua Team, a collaboration of watershed interests consisting of state and federal environmental agencies, municipal agencies, non-profit associations, citizens, and other interested parties.

1 Massachusetts Year 2012 Integrated List of Waters

2 Nashua River Watershed 2003 Water Quality Assessment Report 81wqar08.doc DWM CN107.5

The plan further states that: *Treated wastewater accounts for about 30% of the Nashua River's summertime flow, making the river vulnerable to malfunctions at treatment facilities and other wastewater dischargers. Major waterbodies in this subbasin include Pepperell Pond, which is classified as hypereutrophic, excessively turbid, and, containing low dissolved oxygen, excessive nutrients (otherwise known as "organic enrichment") and noxious non-native plants. As metals (Hg) have been detected, there is a fish consumption advisory.*

RIVER FLOW AND AVAILABLE DILUTION

Water quality-based limits are established with the use of a calculated available dilution. The MA SWQS at 314 CMR 4.03(3)(a) require that effluent dilution be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, occurring over a 10-year recurrence interval.

Additionally, the facility design flow is used to calculate available effluent dilution. See 40 CFR §122.45(b)(1). The facility design flow is 0.07 million gallons per day or 0.11 cubic feet per second (cfs).

The Nashua River begins at the outlet of the Wachusett Reservoir and joins the North Nashua River in Lancaster. Many POTWs discharge to the Nashua River upstream of the Groton School, including the Fitchburg East and Leominster POTWs, which discharge to the North Nashua River, the MWRA Clinton POTW, which discharges to the Nashua River upstream of the confluence with the North Nashua, and the Ayer POTW, which discharge downstream of the confluence of the North Nashua and Nashua. Water quality-based permit limits for total phosphorus found later in this fact sheet are part of a wasteload allocation that includes the upstream POTWs.

To be consistent throughout the shared watershed and shared dilution, the 7Q10 upstream of the Groton School discharge was calculated using the same general methodology that was used to establish the 7Q10 flow for the Ayer POTW draft permit (which was consistent with East Fitchburg, Leominster, and MWRA Clinton permits). This methodology used updated 7Q10 flows for the USGS gage on the North Nashua River at Leominster [Gage number 01094500] and the main stem of the Nashua River Pepperell [Gage number 01096500], dry weather flows from the wastewater treatment plants, the dry weather release from the Wachusett Reservoir and the upstream watershed areas associated with pertinent locations in the watershed.

The specific information is as follows:

	7Q10 flow cfs	Watershed Area, mi ²
Pepperell gage	40.1	435 flow based on the period from 1992-2012
Leominster gage	25.3	110 flow based on the period from 1992-2012
Wachusett Reservoir Outlet	2.8	119 flow from MWRA Clinton fact sheet
Ayer		326
Groton School		420

Dry Weather Monthly Average Flow

	cfs	mgd	
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MWRA Clinton	4.13	2.67	Lowest monthly average during June–Sept, 2010-2012
Ayer	1.47	0.95	Lowest monthly average during June–Sept, 2010-2012

The following is a description of the procedures used to calculate the Ayer 7Q10, followed by the additional calculations necessary to calculate the Groton School 7Q10

Ayer 7Q10

EPA first subtracted the Leominster gage 7Q10 from the Pepperell gage 7Q10, which yields 14.8 cfs. Then, the regulated portion of this flow (the combined MWRA Clinton and Ayer dry weather flows and the Wachusett Reservoir release – 8.4 cfs) was subtracted to determine the unregulated flows entering the watershed between the gages. This value is 6.4 cfs.

Next, the tributary watershed area generating this flow was calculated by subtracting the combined watershed area upstream of the Wachusett Reservoir and the Leominster gage (229 mi²) from the area at the Pepperell gage (435 mi²), yielding 206 mi².

The unregulated flow of 6.4 cfs was then divided by the calculated watershed area of 206 mi² to calculate a flow factor of 0.031 cfs/mi². This is the unregulated flow per square mile generated by the portion of the watershed downstream of the Wachusett Reservoir and Leominster gage, and upstream of the Pepperell gage.

The watershed area downstream of the Wachusett Reservoir outlet and the Leominster gage and upstream of the Ayer discharge was calculated by subtracting the watershed areas at the Wachusett Reservoir (119 mi²) and the Leominster gage (110 mi²) from the area at Ayer (326 mi²), yielding a watershed area of 97 mi². The total unregulated flow from this portion of the watershed was then calculated by multiplying the flow factor of 0.031 cfs/mi² by the watershed area of 97 mi², yielding a flow of 3.0 cfs.

Finally, the 7Q10 at Ayer was calculated by adding the unregulated flow calculated above (3.0 cfs), the regulated flows from the MWRA Clinton treatment plant (4.13 cfs) and the Wachusett Reservoir release (2.8 cfs), and the 7Q10 flow measured at the Leominster gage (25.3 cfs), yielding a flow of 35.24 cfs.

Groton School 7Q10

With the 7Q10 at Ayer calculated, the 7Q10 at Groton School can then be calculated by adding the dry weather flow from the Ayer treatment plant and the flow generated by the watershed between Ayer and the Groton School. The dry weather flow from Ayer is estimated from discharge monitoring reports to be 1.47 cfs. The watershed area between Ayer and the Groton School is estimated to be about 94 mi² (420 mi² – 326 mi²).

Multiplying this area by the flow factor of 0.031 cfs/mi² yields a flow of 2.91 cfs. The 7Q10 at the Groton School is therefore:

$$35.24 \text{ cfs} + 2.91 \text{ cfs} + 1.47 \text{ cfs} = 39.62 \text{ cfs}$$

and the dilution factor is :

$$\frac{39.62 \text{ cfs} + 0.11 \text{ cfs}}{0.11 \text{ cfs}} = 361$$

This dilution factor is about 10% less than the dilution factor calculated for the current permit, and did not result in any changes to the limitations in the permit.

OUTFALL 001 – PERMIT LIMITS

Flow – This draft permit carries forward the flow limit of 70,000 gallons per day. Note that this flow limit is expressed as an annual average limitation, to be reported on a 12 month rolling basis. The permit requires reporting of the monthly average and the maximum daily flows. Flows are not expected to increase substantially in the coming years and have declined because of success in decreasing infiltration/inflow into the sewer system.

pH - The draft permit includes pH range limitations of 6.0-8.3 s.u., the same as the limits in the current permit. The limits are more stringent than the technology standards for POTWs found at 40 CFR §133.102(c), and are necessary to protect state pH water quality standards set forth at Title 314 CMR 4.05(b)(3), for Class B waters.

The lower end of the pH range limitations (6.0 s.u.) is less stringent than the water quality criterion (6.5 s.u.), consistent with a MassDEP letter dated June 1, 2007 letter that supports the lower pH limit, finding that a decreased pH is caused by nitrification resulting from the 2003 installation of the recirculating sand filter, and that the lower limit is protective of water quality standards given the high dilution factor. The monitoring frequency remains once (1) per week.

Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS) – As described earlier, using best professional judgment, EPA has used technology requirements for publicly owned treatment works (POTWs) as technology based limits for this discharge. POTWs are subject to the secondary treatment requirements set forth at 40 CFR Part 133 and 40 CFR §122.45. The secondary treatment limitations are monthly average BOD₅ and TSS concentration of 30 mg/l, weekly average concentrations of 45 mg/l. The maximum daily concentration shall continue to be reported.

The draft permit also includes 85 percent monthly average removal limits for both BOD₅ and TSS. The technology-based percent removal requirements (40 CFR §133.102(3)) have been added consistent with EPA's best professional judgment decision to use POTW technology-based limits for this facility.

Monthly average and weekly average BOD₅ and TSS mass (lbs per day) limits have been maintained from the current permit. The mass limitations for BOD₅ and TSS are based on the 0.07 MGD design flow.

BOD₅ and TSS Mass Loading Calculations:

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

$L = C \times DF \times 8.34$ or $L = C \times DF \times 3.79$ where:

L = Maximum allowable load in lbs/day.

C = Maximum allowable effluent concentration for reporting period in mg/l. Reporting periods are average monthly and weekly and daily maximum.

DF = Design flow of facility in mgd.

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

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

BOD₅ and TSS

(Concentration limit) [30] X 8.34 (Constant) X 0.07 (design flow) = 17.5 lbs/day

(Concentration limit) [30] X 3.79 (Constant) X 0.07 (design flow) = 8.0 kgs/day

(Concentration limit) [45] X 8.34 (Constant) X 0.07 (design flow) = 26.2 lbs/day

(Concentration limit) [45] X 3.79 (Constant) X 0.07 (design flow) = 11.9 kgs/day

Escherichia coli Bacteria (E. coli)

Escherichia coli (E. coli) bacteria limits for Outfall # 001 are 126 colony forming units (cfu)/100 ml geometric monthly mean and 409 cfu/100 ml maximum daily value (this is the 90% distribution of the geometric mean of 126 cfu/100 ml). These limits are based on Massachusetts Class B surface

water quality criteria at 314 CMR 4.04.05 (3)(b)4. and are the same as those in the current permit. The testing frequency remains 1/week.

The MA SWQS Implementation Policy allows for seasonal disinfection. However, the Nashua River flows into New Hampshire, where water quality standards do not allow for seasonal disinfection. Therefore, the permit requires year-round disinfection, to ensure attainment of NH WQS.

Effluent limitations for *E. coli* as well as the pH range are based upon State Certification requirements for WWTFs under Section 401(d) of the CWA, 40 CFR 124.53 and 124.55.

Total Phosphorus (TP)

The MA SWQS (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The narrative criteria for nutrients are found in 314 CMR 4.05(5) (C) which states that nutrients “shall not exceed the site specific limits necessary to control accelerated or cultural eutrophication”

The standards also require that “any existing point source discharges containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients” (314 CMR 4.04). The Nashua River downstream of the point of discharge is listed³ for aquatic macroinvertebrate bioassessments, nutrient/eutrophication, biological indicators.

The current permit includes a monthly average total phosphorus limitation of 1 mg/l and an average monthly loading limit of 0.6 lbs/day

MassDEP has prepared a draft TMDL for the Nashua River, which may be found at <http://www.mass.gov/eea/docs/dep/water/resources/n-thru-y/nashua.pdf>. The draft TMDL includes wasteload allocations for East Fitchburg, Leominster, Ayer, and Pepperell. The draft TMDL does not include an allocation for the comparatively small Groton School discharge.

The final TMDL has not been approved by EPA. Accordingly, while the TMDL does provide useful information in establishing appropriate water quality-based phosphorus limits on discharges to the Nashua River, the permit is not required to be consistent with the TMDL pursuant to 40 CFR 122.44(d)(1)(vii)(B), and so EPA has undertaken an analysis to independently assess the adequacy of the current phosphorus limits.

In the absence of numeric criteria, EPA interprets the narrative criteria using the procedures found at 40 CFR Part 122.44(d)(1)(vi), including the use of available guidance and other relevant information. EPA Region 1 typically uses Gold Book –recommended criteria of 0.1 mg/l (100 ug/l) to interpret the narrative criteria

³ Massachusetts Year 2012 Integrated List of Waters

To check whether the current total phosphorus limit of 1mg/l is sufficiently stringent to achieve the Gold Book criteria, EPA used a mass balance equation to calculate the total phosphorus concentration downstream of the Groton School.

The basic mass balance equation is:

$$Q_r C_r = Q_s C_s + Q_d C_d$$

Q_r	=	Streamflow below outfall
C_r	=	Concentration below outfall
Q_s	=	Upstream flow
C_s	=	Upstream concentration
Q_d	=	Discharge flow
C_d	=	Discharge concentration

Solving for C_r yields:

$$C_r = \frac{Q_s C_s + Q_d C_d}{Q_r}$$

In this case, the upstream load ($C_s Q_s$) is the sum of the load downstream of Ayer at a concentration of 0.1 mg/l ($36.71 \text{ cfs} * 0.1 \text{ mg/l}$) plus the load entering the river between that location and the Groton School discharge at a concentration of 0.024 mg/l^4 ($2.91 * 0.024 \text{ mg/l}$).

Therefore, the total phosphorus concentration downstream of Ayer with Ayer discharging at summer low flow is:

$$\frac{36.71 * 0.1 + 2.91 * 0.024 + 0.11 * 1}{36.71 + 2.91 + 0.11}$$

$$= \frac{3.85}{39.73} = 0.096 \text{ mg/l}$$

This calculation shows that the current limit of 1 mg/l is sufficiently stringent to achieve the Gold Book criterion of 0.1 mg/l.

It should also be noted that at a dilution factor of 361, the Groton School discharge only increases the instream total phosphorus by about 0.003 mg/l ($1/361$), making it relatively insignificant compared to the Gold Book-recommended criteria of 0.1 mg/l for free flowing streams and 0.05 mg/l for streams entering lakes of impoundments

The limit of 1 mg/l has been retained in the draft permit.

⁴ This value is the same used in the Ayer fact sheet, and is based on measurements in local tributaries to the Nashua River.

Total phosphorus discharge data for the 48 month period of January 2010 through November 2013, shows average monthly effluent phosphorus levels consistently well below permitted limits (with the one exception of March, 2010). See data below.

Total Phosphorus Effluent Limits and Data

DMR Data	Ave Mon	Ave Mon	Max Day	DMR Data	Ave Mon	Ave Mon	Max Day
Limit	0.6	1	Report	Limit	0.6	1	Report
Date	Lbs/Day	mg/l	mg/l	Date	Lbs/Day	mg/l	mg/l
01/31/2010	.1	.2	.4	01/31/2012	.03	.02	.02
02/28/2010	.1	.1	.2	02/29/2012	.2	.2	.37
03/31/2010	.9	.9	1.1	03/31/2012	.3	.4	.5
04/30/2010	.2	.2	.3	04/30/2012	.2	.4	.5
05/31/2010	.	.1	.1	05/31/2012	.2	.3	.4
06/30/2010	.	.2	.3	06/30/2012	.1	.1	.12
07/31/2010	.	.1	.1	07/31/2012	.02	.1	.1
08/31/2010	.1	.1	.1	08/31/2012	.01	.08	.08
09/30/2010	.02	.06	.07	09/30/2012	.03	.1	.12
10/31/2010	.1	.1	.1	10/31/2012	.12	.3	.44
11/30/2010	.1	.1	.1	11/30/2012	.11	.4	.5
12/31/2010	.02	.05	.05	12/31/2012	.2	.6	.9
01/31/2011	.01	.05	.05	01/31/2013	.16	.4	.5
02/28/2011	.01	.06	.1	02/28/2013	.29	.7	.7
03/31/2011	.1	.1	.2	03/31/2013	.16	.16	.3
04/30/2011	.3	.2	.2	04/30/2013	.09	.2	.2
05/31/2011	.1	.1	.1	05/31/2013	.13	.4	.4
06/30/2011	.1	.1	.1	06/30/2013	.19	.4	.4
07/31/2011	.03	.1	.1	07/31/2013	.07	.3	.28
08/31/2011	.1	.1	.1	08/31/2013	.03	.02	.2
09/30/2011	.1	.1	.1	09/30/2013	.07	.2	.3
10/31/2011	.2	.1	.1	10/31/2013	.16	.6	.6
11/30/2011	.1	.1	.1	11/30/2013	.19	.8	.98
12/31/2011	.1	.1	.1	Average	0.14	0.23	0.28

Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. An evaluation of the concentration of metals in the facility's effluent (from Whole Effluent Toxicity reports submitted between January 2008 and March 2012) was used to determine reasonable potential for effluent discharges to cause exceedances of the water quality criteria for aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Metals may be present in both dissolved and particulate forms in the water column. 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.

(Water Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-05a], <http://www.epa.gov/waterscience/standards/handbook/chapter03.html#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])).

Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals.

EPA's Office of Water - Office of Science and Water Technology stated in a letter dated July 7, 2000 that "[t]he hardness of water containing the discharged toxic metal should be used for determining the applicable criterion. Thus the downstream hardness should be used." The theoretical hardness of the Nashua River downstream of the treatment plant under 7Q10 low flow conditions were calculated based on ambient and effluent hardness data reported in the recent toxicity tests conducted in 2009 through 2012. The hardness is reported as an equivalent concentration of calcium carbonate.

Calculation of hardness in the receiving water downstream of the WWTF:

In order to determine the hardness downstream of the treatment plant during the 7Q10 low flow periods, the effluent and ambient hardness values from whole effluent toxicity tests conducted in July and October were used in the mass balance equations:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

Where:

Q_s = 7Q10 river flow upstream of plant is 39.62 cfs =21.3 mgd

Q_d , = Discharge flow from plant is 0.07 MGD (0.11 cfs)

Q_r , = Combined river flow (7Q10 + plant flow) is 39.62 + 0.11= 39.73 cfs

$C_{s,}$ = Upstream hardness concentration is 56

C_d = Effluent hardness is 140

C_r = Receiving water hardness downstream

Calculation:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r} = \frac{((0.11 \text{ cfs})(140 \text{ mg/l}) + (39.62 \text{ cfs})(56 \text{ mg/l}))}{(39.73 \text{ cfs})} = 56 \text{ mg/l}$$

For metals with hardness-based water quality criteria, the criteria were determined using the equations in *National Recommended Water Quality Criteria: 2002*, using the appropriate factors for the individual metals found in the MA SWQS (see table below). As described above, the downstream hardness was calculated to be 56 mg/l as CaCO₃, using a mass balance equation with the design flow, and receiving water 7Q10.

The downstream hardness was used to determine the total recoverable metals criteria. The following table presents the factors used to determine the acute and chronic total recoverable criteria for each metal:

Metal	Parameters				Total Recoverable Criteria	
	Ma	ba	mc	bc	Acute Criteria (CMC)* (ug/L)	Chronic Criteria (CCC)** (ug/L)
Aluminum	N/A	N/A	N/A	N/A	750	87
Cadmium	1.1280	-3.6867	0.7852	-2.7150	2.35	1.56
Copper	1.2730	-1.4600	1.2730	-4.7050	8.11	5.68
Lead	0.8473	0.8840	0.8473	0.8840	39.03	1.52
Nickel	0.9422	-1.7000	0.8545	-1.7020	287.28	31.94
Zinc	0.8460	2.2550	0.8460	0.0584	73.31	73.31

*Acute Criteria (CMC) = $\exp\{ma \cdot \ln(\text{hardness}) + ba\}$

$$**\text{Chronic Criteria (CCC)} = \exp\{mc \cdot \ln(\text{hardness}) + bc\}$$

In order 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 = effluent flow (design flow = 0.07 MGD (0.11 cfs))

C_d = maximum effluent metals concentration in ug/L

Q_s = stream flow upstream = 39.62 cfs

C_s = background in-stream metals concentration in ug/L (median)

Q_r = resultant in-stream flow, after discharge ($Q_s + Q_d = 39.62 + 0.11 = 39.73$ cfs)

C_r = resultant in-stream concentration in ug/L

The table below shows there is no reasonable potential for the discharge to cause or contribute to an exceedance of State Water Quality Standards for total aluminum, cadmium, copper, lead, nickel, or zinc.

Example for Total Aluminum:

$$= \frac{((0.11 \text{ cfs}) * (703 \text{ ug/l}) + (39.62 \text{ cfs}) * (76 \text{ ug/l}))}{(39.73 \text{ cfs})} = 77.7 \text{ ug/l}$$

Metal	Qd	Cd ¹ (Max)	Qs	Cs ² (Median)	Qr = Qs + Qd	Cr = (QdCd+QsCs)/Qr	Criteria		Reasonable Potential? Cr > Criteria
		ug/l		ug/l			Acute (ug/l)	Chronic (ug/l)	
Aluminum	0.11	703	39.62	76	39.73	77.7	750	87	No
Cadmium		0		0		N/A	2.35	1.56	No
Copper		42		3		3.1	8.11	5.68	No
Lead		0		0		N/A	39.03	1.52	No
Nickel		5		0		N/A	287.28	31.94	No
Zinc		13		8		8.0	73.31	73.31	No

¹ Values calculated using data from the 2009-2012 WET testing (see Attachment E).

² Median upstream data taken from Whole Effluent Toxicity (WET) testing on the Nashua River just upstream of the discharge (see Attachment E).

Because of the small sample size, EPA performed additional statistical analyses of the effluent metals data to determine whether increased sampling should be included for any metal to ensure a more robust data set for the next permit issuance.

Using a methodology from the *Technical Support Document for Water Quality-based Toxics Control* (“the TSD”), EPA calculated a projected upper bound of effluent concentrations based on a statistical analysis of the facility’s effluent data from its whole effluent toxicity tests and used this value to estimate a downstream concentration for each metal analyzed.

The statistical analysis used on the effluent data accounts for the fact that maximum measured concentration may not correspond to the true upper bound of effluent concentrations, particularly for small sample sizes ($n < 10$) as are available here. This analysis accounts for the uncertainty that arises from small sample sizes by characterizing the maximum measured concentration as a percentile of the underlying distribution at a particular confidence level, then scaling that number upward by a “multiplying factor” in order to project an upper bound (95th percentile) concentration at that confidence level. EPA uses a 95 percent confidence level for this characterization. See Attachment F 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.

Metal	Qd	Cd ¹ (Upper bound)	Qs = Qr - Qd	Cs ² (Median)	Qr	Cr = (QdCd+QsCs)/Qr	Total Recoverable Criterion		Criteria Exceeded?
	cfs	ug/l	cfs	ug/l	cfs	ug/l	Acute (ug/l)	Chronic (ug/l)	Cr > Criteria
Aluminum	0.11	1617	39.62	76	39.73	80	750	87	No
Cadmium		0		0		0	1.18	0.18	No
Copper		97		3		3.2	8.11	5.68	No
Lead		0		0		0	39.03	1.52	No
Nickel		5		0		0	287.28	31.94	No
Zinc		30		15		15	73.31	73.31	No

¹ Values calculated using annual toxicity measurements from the 2008-2011 WET testing noted above

² Median upstream data taken from WET testing results on the Nashua River just upstream of the WWTF (see Attachment E).

This analysis shows that instream criteria would be achieved even at the effluent concentrations estimated using the 95 percent confidence level, so no increase in sampling frequency is necessary.

Whole Effluent Toxicity – (WET)

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The MA SWQS include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

“All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.”

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others.

The Region’s current policy is to include toxicity testing requirements in all permits, while Section 101(a) (3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Based on the potential for toxicity resulting from domestic sewage, in accordance with EPA national and regional policy, and in accordance with MassDEP policy, the draft permit includes acute toxicity limitations and monitoring requirements. (See Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants, 50 Fed. Reg. 30,784 (July 24, 1985); EPA's Technical Support Document for Water Quality-Based Toxics Control" September, 1991; and MassDEP’s Implementation Policy for the Control of Toxic Pollutants in Surface Waters (February 23, 1990).

Pursuant to EPA, Region I and MassDEP policy, discharges having a dilution factor greater than 100:1 (361 for this discharge) require acute toxicity testing and an acute LC₅₀ limit of 50%. The draft permit requires the permittee to conduct two acute WET tests per year.

The tests use the species, Ceriodaphnia dubia, in accordance with existing permit conditions, and are to be conducted in accordance with the EPA Region I Toxicity protocol found in Attachment A of the draft permit.

VI. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

The permit standard conditions for "Proper Operation and Maintenance" are found at 40 CFR 122.41(e). These require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, the permittee has a "duty to mitigate" as stated in 40 CFR §122.41(d).

This requires the permittee to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment. EPA and MassDEP maintain that these programs are an integral component of ensuring permit compliance under both these provisions.

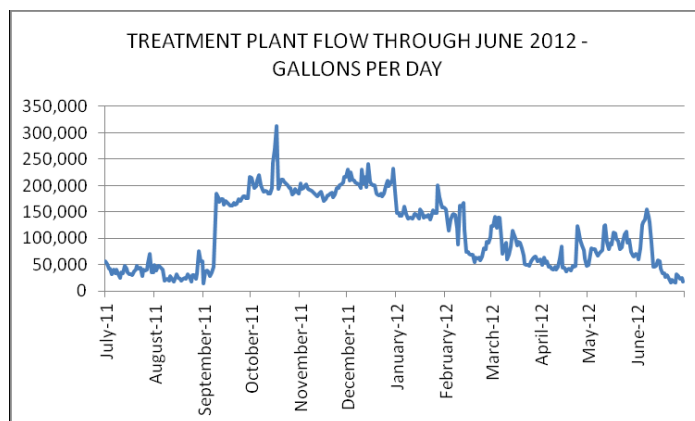
Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems.

Significant I/I in a collection system may displace sanitary flow reducing the capacity and the efficiency of the treatment works and may cause bypasses to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems.

Information provided by the permittee on its discharge monitoring reports and in its permit application show that extremely high flows were measured at the treatment plant during the permit term, indicating large amounts of I/I. For the period from October 2011 through November, 2012, the permittee exceeded its annual average flow limit of 0.07 MGD

While a portion of this extraneous flow appears to be from rainfall on the uncovered filter beds⁵, the main cause of the violations appears to be a water main break, discovered in February 2012 that resulted in large quantities of drinking water entering the sewer system for several months.

The following chart from the permit application shows flows before and after the discovery of this break



The measured annual average flow has returned to about 0.05 MGD, but maximum daily flows of up to 0.15 MGD continue to be measured during wet weather months, indicating that there are remaining I/I sources. The permittee has not reported exceeding the (rolling monthly) annual average flow limit of 0.07 MGD since November of 2012.

⁵ In its permit application, the permittee estimates that one inch of rainfall will add approximately 15,000 gallons of flow to the treatment system.

The draft permit includes requirements for the permittee to control infiltration and inflow (I/I) into its collection system and to submit an annual report that documents these activities and estimates current I/I .

VII. SLUDGE INFORMATION AND REQUIREMENTS

V. Sludge

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

Part 503 regulations have a self-implementing provision; however, the CWA requires implementation through permits. Domestic sludge which is disposed of in municipal solid waste landfills are in compliance with Part 503 regulations provided the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 CFR Part 258.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA-New England has 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 be found at:

<http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf>.

The Groton School WWTP produces approximately 2.6 metric tons of sludge each year. The septic tanks are pumped out twice per year. Liquid sludge and septage is trucked to one or more of the following; Pepperell, Fitchburg, Lowell or Ayer POTWs, with the Pepperell facility receiving the majority. The sludge is treated and disposed of by the POTWs receiving the sludge.

If the ultimate sludge disposal method changes, the permittee must notify EPA and MassDEP and the requirements pertaining to sludge monitoring and other conditions will apply. Any subsequent change in sludge use or disposal will also require notification to EPA and MassDEP and appropriate changes to monitoring requirements.

The permittee is required to submit an annual report to EPA Region 1 and MassDEP, by February 19th each year, containing the information required by the permit for the chosen method of sewage sludge use or disposal practices.

VIII. UNAUTHORIZED DISCHARGES

The draft permit authorizes discharges only from the outfall(s) listed in Part I.A.1, in accordance with the terms and conditions of the permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by the permit and shall be reported to EPA and MassDEP in accordance with Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting). No SSO discharges have been reported by the permittee to date.

Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at <http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html>.

IX. MONITORING AND REPORTING

The permittee is obliged to monitor and report sampling results to EPA and the MassDEP within the time specified in the permit. The effluent monitoring requirements have been established to yield data representative of the discharge by the authority under Section 308(a) of the CWA in accordance with 40 CFR, 122.44, and 122.48.

X. ESSENTIAL FISH HABITAT DETERMINATION

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C § 1801 *et seq.* (1998)), EPA is required to consult with the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat," 16 U.S.C. § 1855(b).

The Amendments broadly define "essential fish habitat" (EFH) as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," 16 U.S.C. § 1802(10). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH, 50 C.F.R. § 600.910(a).

Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. *Id.*

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

There is no "habitat of particular concern," as defined under § 600.815 (a)(9) of the Magnuson-Stevens Act, designated for this site.

EPA and MassDEP have determined that a formal EFH consultation with NMFS for this discharge is not required. The proposed discharge permit is developed to meet State Surface Water Quality Standards and will not adversely impact EFH.

XI. 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 have 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 United States Fish and Wildlife Service (USFWS) administer Section 7 consultations for freshwater species. The National Marine Fisheries Service (NOAA Fisheries) administers Section 7 consultations for marine species and anadromous fish.

EPA and the MassDEP have determined that an ESA consultation is not required for this discharge, since no listed species or critical habitats are located in an area that could be affected by the facility’s discharge.

XII. STATE PERMIT CONDITIONS

The NPDES Permit is issued jointly by the U. S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the MassDEP Commissioner.

XIII. GENERAL CONDITIONS

The general conditions of the permit are based primarily on the NPDES regulations 40 CFR 122 through 125 and consist primarily of management requirements common to all permits.

XIV. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving waters certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

XV. PUBLIC COMMENT PERIOD, PUBLIC HEARING; AND PROCEDURES FOR FINAL DECISIONS

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to: Mr. Doug Corb, NPDES Permit Program, U.S. Environmental Protection Agency, 5 Post Office Square-Suite 100, Mailcode OEP06-1, Boston, Massachusetts 02109-3912.

Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-New England and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing.

A public hearing may be held after at least thirty (30) days public notice whenever the Director finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA New England's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Director 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.

XV. EPA CONTACT

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

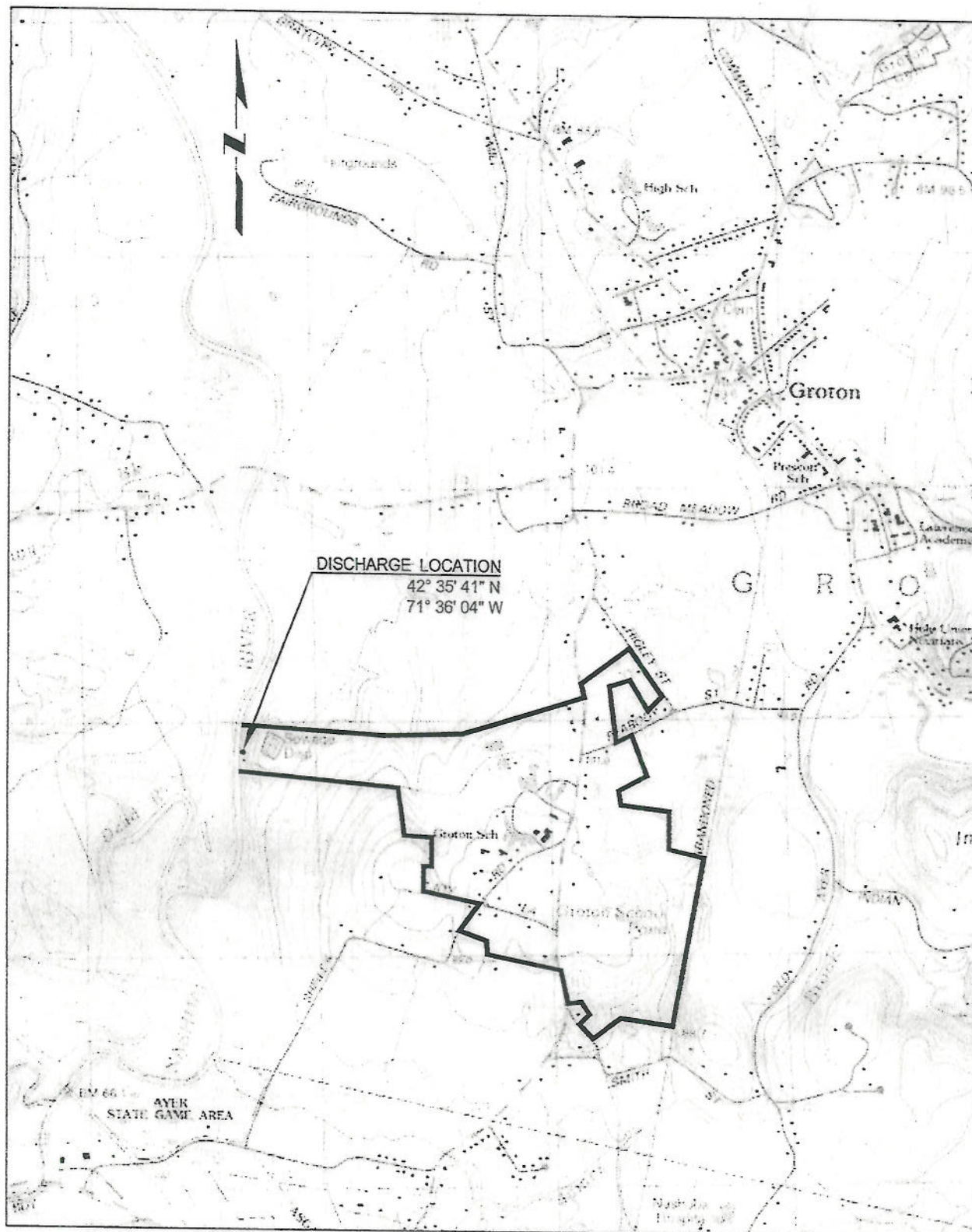
Doug Corb, Environmental Scientist
Office of Ecosystem Protection
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code OEP06-1
Boston, MA 02109-3912
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Claire A. Golden, EEIV
Massachusetts Department of Environmental
Protection
Division of Watershed Management
205B Lowell Street
Wilmington, Massachusetts 01887
Telephone: (978) 694-3244
claire.golden@state.ma.us

Date: March 12, 2014
Ken Moraff, Director*
Office of Ecosystem Protection
U.S. Environmental Protection Agency

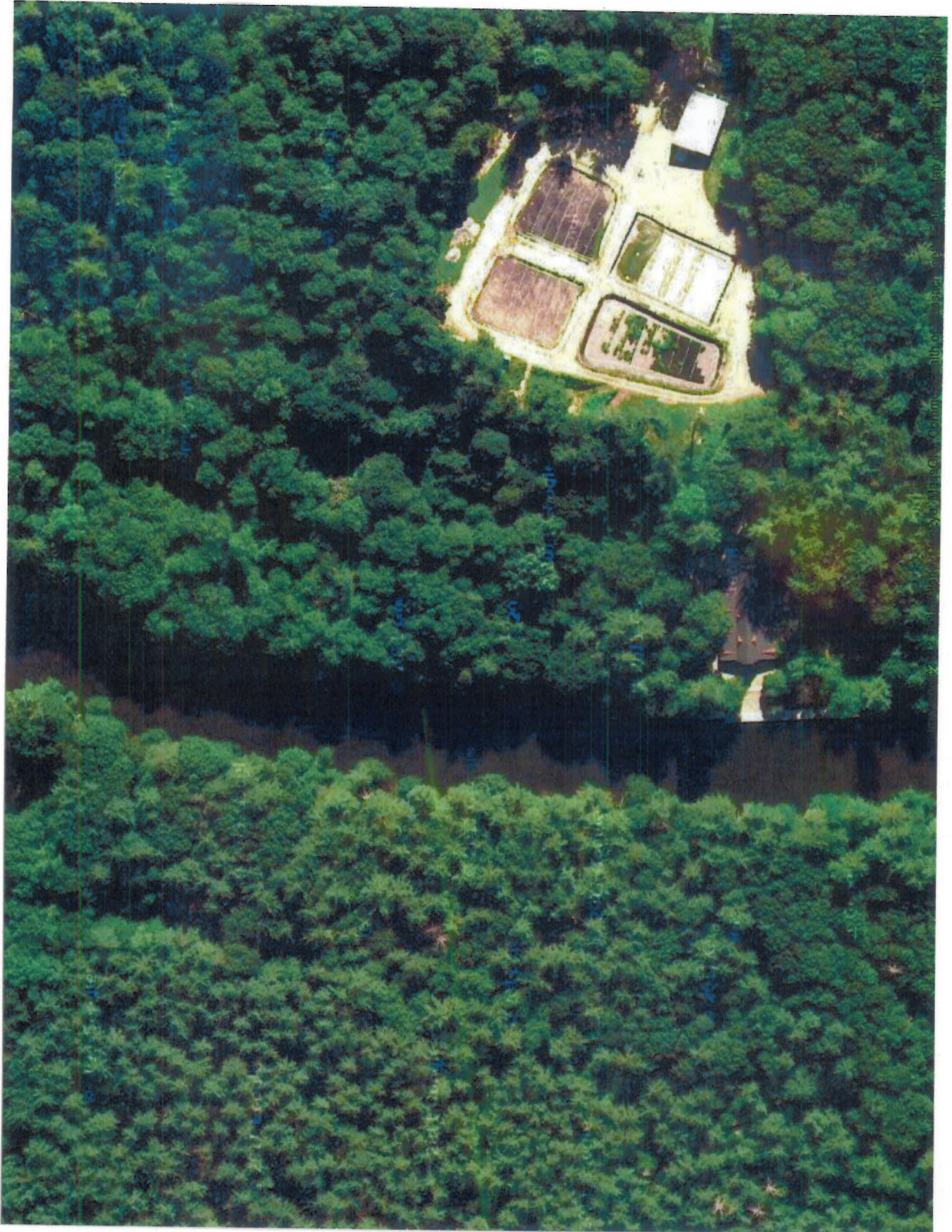
* Please address all comments to Doug Corb and Claire A. Golden at the addresses above.

Rolling										
Month	Month Av Flow 0.07 mgd	Av Month BOD 18 lb/d	Av Month BOD 30 mg/L	Max Day BOD Mon mg/L	Av Month TSS 18 lb/d	Av Month TSS 30 mg/L	Max Day TSS Mon mg/L	Min 6.0 pH SU	Max 8.3 pH SU	≥ 50 LC50 %
01/31/2012	.113	2.5	2.	2.	5.	4.	4.	6.1	6.2	06/30/2010 100.
02/29/2012	.12	2.1	2.5	4.	3.4	4.	4.	6.	6.2	09/30/2010 100.
03/31/2012	.12	1.4	2.	2.	2.9	4.	4.	6.1	6.5	06/30/2011 100.
04/30/2012	.12	1.9	4.	7.	1.9	4.	4.	6.3	6.9	09/30/2011 100.
05/31/2012	.11	3.4	4.8	7.	4.	5.5	10.	6.2	6.3	06/30/2012 100.
06/30/2012	.11	1.4	2.8	4.	2.	4.	4.	6.1	6.8	09/30/2012 100.
07/31/2012	.111	.4	2.	3.	.8	4.	4.	6.3	6.8	06/30/2013 100.
08/31/2012	.11	.4	2.	2.	.8	4.	4.	6.4	7.3	09/30/2013 100.
09/30/2012	.1	.6	2.2	2.6	1.	4.	4.	6.5	6.9	
10/31/2012	.089	1.2	2.7	4.	1.8	4.	4.	6.1	6.6	
11/30/2012	.075	1.	3.7	4.4	1.1	4.	4.	5.9	6.7	
12/31/2012	.062	1.6	5.2	7.	1.2	4.	4.	6.3	6.8	
01/31/2013	.05	2.	5.3	7.	1.5	4.	4.	6.2	6.4	
02/28/2013	.05	3.3	7.7	10.	1.7	4.	4.	6.3	6.8	
03/31/2013	.05	2.1	2.8	5.	3.	4.	4.	6.1	6.6	
04/30/2013	.05	2.	3.2	4.	2.5	4.	4.	5.9	6.7	
05/31/2013	.047	.8	2.3	3.	1.4	4.	4.	6.1	6.4	
06/30/2013	.047	1.4	2.8	4.	2.	4.	4.	6.2	6.8	
07/31/2013	.048	.5	2.	2.	1.1	4.	4.	6.5	6.2	
08/31/2013	.05	.4	2.	2.	.8	4.	4.	6.4	6.9	
09/30/2013	.047	1.	3.6	7.	1.1	4.	4.	6.2	6.8	
10/31/2013	.05	1.	3.8	6.	1.	4.	4.	5.7	6.4	
11/30/2013	.046	1.6	7.3	12.	.9	4.	4.	5.7	6.5	

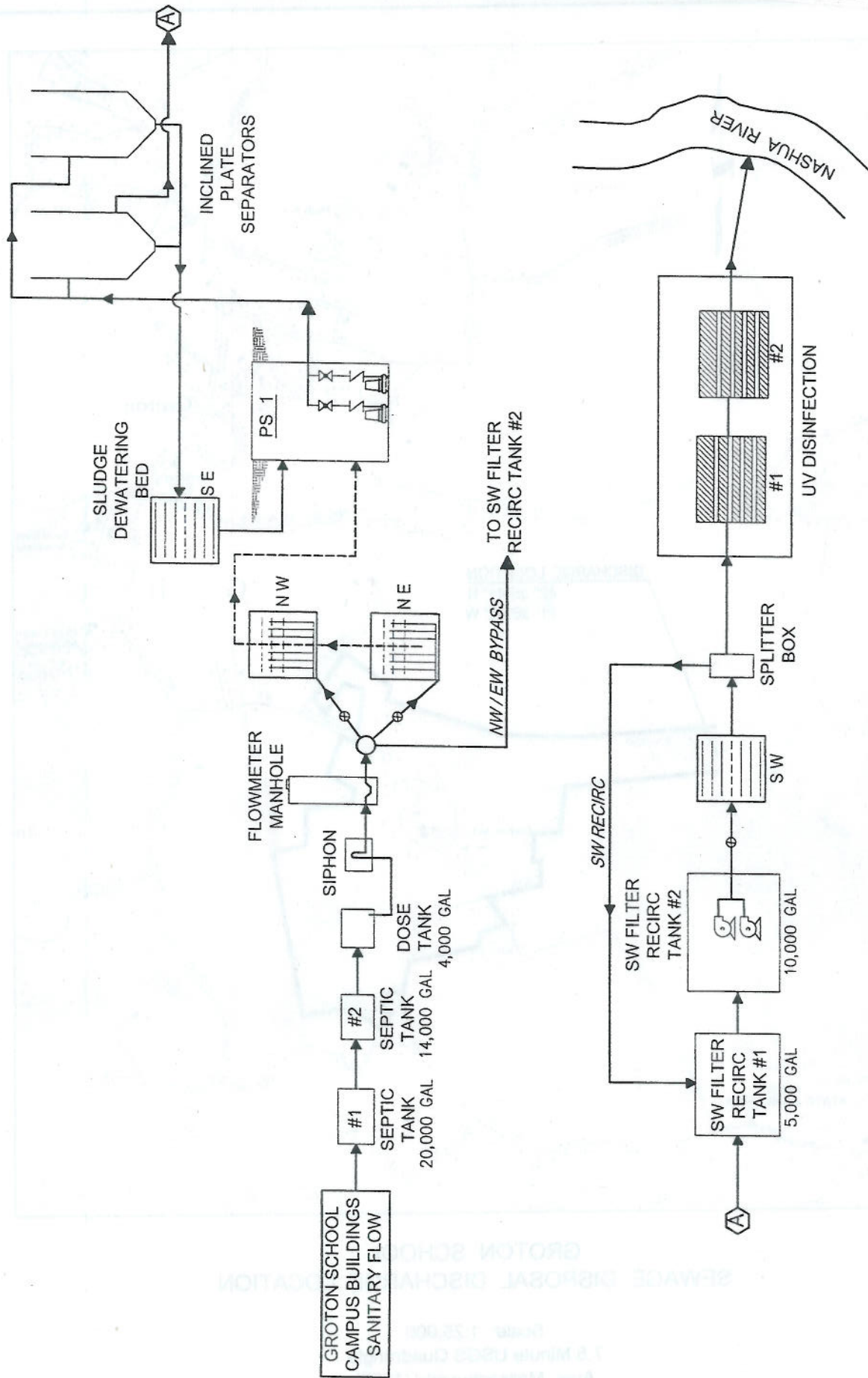


GROTON SCHOOL
SEWAGE DISPOSAL DISCHARGE LOCATION

Scale: 1:25,000
7.5 Minute USGS Quadrangle
Ayer, Massachusetts (1988)



Groton 2012\Groton\0212.Dwg\2/15/12



GROTON SCHOOL
NPDES PERMIT APPLICATION
PROCESS FLOW DIAGRAM

Fact Sheet Attachment E

Effluent	ug/L						Ambient	ug/L					
Pram	Al	Cd	Cu	Pb	Ni	Zn	Al	Cd	Cu	Pb	Ni	Zn	
9/8/2009	30	<1	42	<5	<4	13	61	<1	<2.5	<5	<4	8	
6/7/2010	703	<1	18	<5	5	10	76	<1	3	<5	<4	9	
9/13/2010	376	<1	13	<5	<4	5	202	<1	4	<5	<4	6	
21/09/11	451	<1	9	<5	<4	9	162	<1	8	<5	<4	12	
9/10/2012	44	<1	17	<5	<4	10	41	<1	3	<5	<4	8	
Average	321	ND	20	ND	5	9	108	ND	4.5	ND	ND	9	

ND = Non-Detect

	ug/L											6	
	30		9			5	41		<2.5			6	
	44		13			9	61		3			8	
Median	376		17			10	76		3			8	
	451		18			10	162		4			9	
Highest	703		42		5	13	202		8			12	

Effluent		Ambient	
NH3	pH	NHS	pH
<0.1	7.41	<0.1	7.05
3.4	7.54	<0.1	7.11
<0.1	7.5	<0.1	7.5
8.5	7.58	<0.1	6.64
7.4	7.52	<0.1	6.67
1	7.46	<0.1	6.58
1.6	7.54	0.12	6.88
6.7	7.14	<0.1	6.39
0.16	7.56	<0.1	6.81
<0.1	7.8	<0.1	6.98
<0.1	7.72	N/A	7.02
3.372	7.536	Non-D	6.858
8.5	7.8	Non-D	7.5
	7.14		6.39

ATTACHMENT F – STATISTICAL ANALYSIS FOR METALS EFFLUENT DATA

In order to account for the uncertainty that arises from small sample sizes ($n < 10$), EPA uses a methodology from the *Technical Support Document for Water Quality-based Toxics Control* (“the TSD”) to calculate a projected upper bound of effluent concentrations based on a statistical analysis of the facility’s effluent data. As the statistical parameters of the sample distribution may differ from the underlying population, this approach determines a projection of the possible upper bound effluent concentration at the 95th percentile with a 95 percent confidence level, assuming a lognormal distribution of the underlying sample population. This 95th percentile projected upper bound represents a conservative estimate of the possible upper bound concentration based on a limited dataset. Where this upper bound concentration would not result in an exceedance of water quality criteria in the receiving water, EPA can say with certainty (95 percent confidence) that the data excludes the potential for an exceedance. Where that is not the case, EPA requires additional monitoring to better characterize the effluent.

The statistical analysis characterizes the maximum measured concentration as a percentile of the underlying distribution at a particular confidence level, then scaling that number upward by a “multiplying factor” in order to project an upper bound concentration at that confidence level. For sample datasets with less than 10 data points, EPA uses the 95th percentile with a 95 percent confidence level to characterize the upper bound concentration.

The formula for characterizing a maximum measured concentration as a percentile is:

$$p_n = (1 - \text{confidence level})^{1/n}$$

This formula gives the lowest percentile that a maximum measurement may correspond to, given a specific confidence level (EPA uses the 95 percent confidence level). For example, where $n=4$, we can be 95 percent confident that the maximum measurement represents at least the 47th percentile of the underlying distribution, since:

$$p_n = (1 - 0.95)^{1/4} = 0.473.$$

TSD at 52. It should be noted that this represents the lower end of the 95 percent confidence interval. Because of the uncertainty due to the small sample size there is a significant range in interpretation of the maximum; where $n=4$ we can be 95 percent confident that the maximum value represents somewhere between the 47th and 99th percentile of the underlying distribution.

The calculated percentile is then scaled up to a projected upper bound based on a selected probability basis (here the 95th percentile). The scaling factor (or “multiplying factor”) is the ratio between the 95th percentile and the calculated percentile in a lognormal distribution with a particular coefficient of variation. These are calculated as follows:

Multiplying factor = C_{95}/C_{pn} ; where

$$C_{95} = \exp(1.645\sigma - 0.5\sigma^2);$$

$$C_{pn} = \exp(z_{pn} \times \sigma - 0.5\sigma^2);$$

z_{pn} = z-score of the calculated percentile

σ^2 = variance of the log-transformed data = $\ln(CV^2 + 1)$

CV = coefficient of variation

The *TSD* recommends use of a coefficient of variation of 0.6 where sample size is less than 10. Thus for $n=4$ the multiplying factor (for 95-percent confidence level and 95th percentile probability basis) is:

$$p_n = 0.473$$

$$z_{pn} = -0.068$$

$$C_{95} = 2.135$$

$$C_{47} = 0.826$$

Multiplying factor = 2.6

In practice this process is implemented using tables set forth in *TSD*, chapter 3 and box 3-2, as follows:

Step 1) The maximum effluent value of the samples is determined.

Step 2) Coefficient of variation (CV) = 0.6, for less than 10 samples

Step 3) The multiplying factor (MF) is determined using table 3-2 in the *TSD*, based on the number of samples in the data set and a CV of 0.6.

Step 4) The 95th percentile projected upper bound is the maximum effluent value multiplied by the MF.