AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
ONE NATIONAL LIFE DRIVE, DAVIS BUILDING, 3rd FLOOR
MONTPELIER, VT 05620-3522

Permit Number: 3-1173
PIN: EJ96-0614
NPDES Number: VT0100617

Facility Name: Town of Richmond WWTF
Facility Address: 281 Esplanade
Richmond, VT 05477

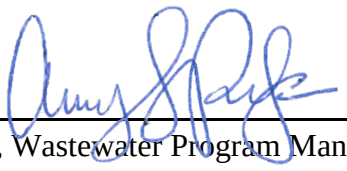
Facility Coordinates: Lat: 44.40383 Long: -73.00069

Expiration Date: December 31, 2025
Reapplication Date: June 30, 2025

In compliance with the provisions of the Vermont Water Pollution Control Act as amended (10 V.S.A., Chapter 47), the Vermont Water Pollution Control Permit Regulations as amended (Environmental Protection Rules, Chapter 13), the federal Clean Water Act as amended (33 U.S.C. § 1251 *et seq.*), and implementing federal regulations, the Town of Richmond (hereinafter referred to as the "Permittee") is authorized by the Secretary of the Agency of Natural Resources (hereinafter referred to as the "Secretary") to discharge from the Richmond Wastewater Treatment Facility (hereinafter referred to as the "WWTF") to the Winooski River in accordance with the following conditions.

This permit shall be effective on January 1, 2021

Peter Walke, Commissioner
Department of Environmental Conservation

By:  Date: 12/21/2020

Amy Polaczyk, Wastewater Program Manager
Watershed Management Division

I. PERMIT SPECIAL CONDITIONS

A. EFFLUENT LIMITS AND MONITORING REQUIREMENTS

1. Discharge Point S/N 001, Lat. 44.40228, Long. -72.99973: During the term of this permit, the Permittee is authorized to discharge from outfall S/N 001 of the Richmond WWTF to the Winooski River, an effluent for which the characteristics shall not exceed the values listed below:

Discharge Monitoring						
Constituent; Sampling Point and Sample Type	**Season and Sampling Frequency**	**Limit 1**	**Limit 2**	**Limit 3**	**Limit 4**	**Limit 5**
Flow; Effluent; Continuous	**Year Round** Daily	**Monitor MGD** Monthly Avg				
BOD, 5-Day; Effluent; 8 Hour Comp	**Year Round** Monthly	**55.5 lbs/day** Monthly Avg	**83.3 lbs/day** Weekly Avg	**30 mg/l** Monthly Avg	**45 mg/l** Weekly Avg	**50 mg/l** Daily Max
BOD, 5-Day; Influent; 8 Hour Comp	**Year Round** Monthly			**Monitor mg/l** Monthly Avg		
E. Coli; Effluent; Grab	**Year Round** 2 per Month					**77 #/100 ml** Instant Max
Nitrite Plus Nitrate Total; Effluent; 8 Hour Comp	**01/01 - 03/31** Quarterly					**Monitor mg/l** Daily Max
Nitrite Plus Nitrate Total; Effluent; 8 Hour Comp	**04/01 - 06/30** Quarterly					**Monitor mg/l** Daily Max
Nitrite Plus Nitrate Total; Effluent; 8 Hour Comp	**07/01 - 09/30** Quarterly					**Monitor mg/l** Daily Max
Nitrite Plus Nitrate Total; Effluent; 8 Hour Comp	**10/01 - 12/31** Quarterly					**Monitor mg/l** Daily Max
Nitrogen, Kjeldahl Total; Effluent; 8 Hour Comp	**01/01 - 03/31** Quarterly					**Monitor mg/l** Daily Max
Nitrogen, Kjeldahl Total; Effluent; 8 Hour Comp	**04/01 - 06/30** Quarterly					**Monitor mg/l** Daily Max
Nitrogen, Kjeldahl Total; Effluent; 8 Hour Comp	**07/01 - 09/30** Quarterly					**Monitor mg/l** Daily Max
Nitrogen, Kjeldahl Total; Effluent; 8 Hour Comp	**10/01 - 12/31** Quarterly					**Monitor mg/l** Daily Max
Nitrogen, Total; Effluent; Calculated	**01/01 - 03/31** Quarterly		**Monitor lbs/day** Daily Max			**Monitor mg/l** Daily Max
Nitrogen, Total; Effluent; Calculated	**04/01 - 06/30** Quarterly		**Monitor lbs/day** Daily Max			**Monitor mg/l** Daily Max
Nitrogen, Total; Effluent; Calculated	**07/01 - 09/30** Quarterly		**Monitor lbs/day** Daily Max			**Monitor mg/l** Daily Max

Nitrogen, Total; Effluent; Calculated	**10/01 - 12/31** Quarterly		**Monitor lbs/day** Daily Max			**Monitor mg/l** Daily Max
pH; Effluent; Grab	**Year Round** Daily			**6.5 s.u.** Min		**8.5 s.u.** Max
Phosphorus, Total; Effluent; 8 Hour Comp	**Year Round** Monthly			**0.8 mg/l** Monthly Avg		
Phosphorus, Total; Effluent; Calculated	**Year Round** Monthly	**Monitor lbs** Annual Total	**Monitor lbs** Monthly Total	**Monitor %** Monthly Total		
Settleable Solids; Effluent; Grab	**Year Round** Daily					**1 ml/l** Instant Max
Suspended Solids, Total; Effluent; 8 Hour Comp	**Year Round** Monthly	**55.5 lbs/day** Monthly Avg	**83.3 lbs/day** Weekly Avg	**30 mg/l** Monthly Avg	**45 mg/l** Weekly Avg	**50 mg/l** Daily Max
Suspended Solids, Total; Influent; 8 Hour Comp	**Year Round** Monthly			**Monitor mg/l** Monthly Avg		

Additional Monitoring

Constituent; Sampling Point and Sample Type	Season and Sampling Frequency	Limit 1	Limit 2	Limit 3	Limit 4	Limit 5
Flow; Annual Average; Calculated	**12/01 - 12/31** Annual	**0.222 MGD** Annual Avg				
BOD, 5-Day (%R); Percent Removal; Calculated	**Year Round** Monthly			**85 %** Monthly Min		
Phosphorus, Total; Annual Average; Calculated	**12/01 - 12/31** Annual	**134 lbs/yr** Annual Total				
Suspended Solids, Total (%R); Percent Removal; Calculated	**Year Round** Monthly			**85 %** Monthly Min		
Septage Received; Influent; Recorder Total	**Year Round** Daily		**Monitor gallons** Monthly Total			

2. Discharge Sampling Points

a. Effluent sampling: The Permittee shall collect effluent samples from the channel where the V-notch weir is located.

b. Influent sampling: The Permittee shall collect influent samples from the EQ tank.

3. Discharge Special Conditions

a. Monthly average flow shall be calculated by summing the daily effluent flow for each day in the given month and dividing the sum by the number of days of discharge in that month.

b. The Permittee shall operate the facility to meet the concentration limitations or pounds limitation, whichever is more restrictive.

c. Total Phosphorus shall be reported as Total Monthly Pounds, Running Total Annual Pounds, and Percentage of Running Total Annual Pounds to Annual Permit Limitation.

d. Total nitrogen (TN) shall be reported as pounds TN and calculated as: TN (mg/L) x Total Daily Flow x 8.34; where, TN (mg/L) = TKN (mg/L) + NOx (mg/L).

e. Settleable solids samples shall be collected between 10:00 AM and 2:00 PM or during the period of peak flow.

f. Composite samples for BOD_5, TSS, TP, TKN, and NO_x shall be taken during the hours 6:00 AM to 6:00 PM, unless otherwise specified. Eight hours is the minimum period for the composite. 24 hours is the maximum for the composite.

g. The monthly average concentrations of BOD_5 and TSS in the effluent shall not exceed 15 percent of the monthly average concentrations of BOD_5 and TSS in the influent into the WWTF.

h. If the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the permitted flow limitation, the Permittee shall submit to the Secretary projected loadings and a program for maintaining satisfactory treatment levels.

i. The Permittee shall demonstrate the accuracy of the effluent flow measurement device weekly and report the results on the monthly report forms. The acceptable limit of error is ± 10%.

j. The effluent shall not cause visible discoloration of the receiving waters.

k. The discharge shall be free from substances in kind or quantity that settle to form harmful benthic deposits; float as foam, debris, scum or other visible substances; produce odor, color, taste or turbidity that is not naturally occurring and would render the surface water unsuitable for its designated uses; result in the dominance of nuisance species; or interfere with recreational activities; or which would cause a violation of the Vermont Water Quality Standards.

l. The discharge shall not result in toxic substances or chemical constituents in concentrations or combinations in the receiving water that injure or are inimical to plants, animals, humans or aquatic life; or persist in the environment or accumulate in aquatic organisms to levels that result in harmful concentrations in edible portions of fish, shellfish, other aquatic life, or wildlife that might consume aquatic life.

m. Any action on the part of the Secretary in reviewing, commenting upon or approving plans and specifications for the construction of WWTFs shall not relieve the Permittee from the responsibility to achieve effluent limitations set forth in this permit and shall not constitute a waiver of, or act of estoppel against any remedy available to the Secretary, the State of Vermont or the federal government for failure to meet any

requirement set forth in this permit or imposed by state or federal law.

B. WASTE MANAGEMENT ZONE

In accordance with 10 V.S.A. § 1252, this permit hereby establishes a waste management zone that extends from the outfall of the Richmond WWTF in the Winooski River downstream one mile.

C. ANNUAL CONSTITUENT MONITORING

1. Unless monitoring more frequently than annually, the Permittee shall monitor outfall serial number S/N 001 and submit the results, including units of measurement by December 31 annually for the following parameters:

Total Ammonia Nitrogen (TAN)
Total Residual Chlorine (TRC)
Dissolved oxygen
Oil and grease
Nitrate/Nitrite (NO_x)
Total Kjeldahl Nitrogen (TKN)
Total Phosphorus (TP)
Total dissolved solids
Temperature

2. Grab samples shall be used for Temperature, Total Residual Chlorine, Dissolved Oxygen, and Oil & Grease; all other parameters shall be composite samples. Samples shall be representative of the seasonal variation in the discharge.

3. Facilities that do not use chlorine for disinfection, do not use chlorine elsewhere in the treatment process, and have no reasonable potential to discharge chlorine in their effluent are not required to sample for chlorine during Annual Constituent Monitoring.

4. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall continue annual monitoring of the above parameters on a schedule that assures samples are representative of the seasonal variation in the discharge and report by December 31 each year.

5. The Permittee shall sample and report according to the following table:

Due Date	Event Description
12/31/2021	The Permittee shall submit annual constituent monitoring results.
12/31/2022	The Permittee shall submit annual constituent monitoring results.
12/31/2023	The Permittee shall submit annual constituent monitoring results.
12/31/2024	The Permittee shall submit annual constituent monitoring results.
12/31/2025	The Permittee shall submit annual constituent monitoring results.

D. EMERGENCY POWER FAILURE PLAN

The current Emergency Power Failure Plan for the facility was submitted on October 28, 2005.

1. The Permittee shall revise the Emergency Power Failure Plan and indicate in writing to the Secretary that in the event the primary source of electric power to the WWTF (including pump stations) fails, the Permittee shall either provide an alternative source of power for the operation of its WWTF, or demonstrate that the treatment facility has the capacity to store the wastewater volume that would be generated over the duration of the longest power failure that would have affected the facility in the last five years, excluding catastrophic events.

The alternative power supply, whether from a generating unit located at the WWTF or purchased from an independent source of electricity, must be separate from the existing power source used to operate the WWTF. If a separate unit located at the WWTF is to be used, the Permittee shall certify in writing to the Secretary when the unit is completed and prepared to generate power.

2. The determination of treatment system storage capacity shall be submitted to the Secretary upon completion.

3. The Permittee shall report according to the following table:

Due Date	Event Description
4/1/2021	The Permittee shall submit a revised Emergency Action Power Failure Plan.

E. OPERATION MANAGEMENT AND EMERGENCY RESPONSE PLAN (OMERP)

The Permittee submitted the Operation, Management, and Emergency Response Plan for the treatment system, sewage collection system, sewage pumping stations, and sewer line stream crossings on September 17, 2020. Through issuance of this permit the Secretary approves the inspection schedule for the plan. The Permittee shall implement the plan in accordance with that schedule.

The Permittee shall revise the plan upon the Secretary's request or on its own motion to reflect equipment or operational changes.

F. PHOSPHORUS OPTIMIZATION PLAN

1. Wasteload Allocation for Phosphorus

This permit includes a total phosphorus (TP) water quality based effluent limitation of consistent with the waste load allocation (WLA) for TP, established by the U.S. Environmental Protection Agency (U.S. EPA) in the 2016 "Phosphorus TMDLs for Vermont Segments of Lake Champlain" (LC TMDL). The Secretary reserves the right to reopen and amend this permit to include an alternate TP limitation or additional monitoring requirements based on the monitoring data, the results of phosphorus optimization activities, or a reallocation of phosphorus wasteload allocations between the Permittee and another WWTF pursuant to the requirements of TMDL and Vermont's "Wasteload Allocation Process" Rule (Environmental Protection Rule, Chapter 17).

2. Total Phosphorus Calculations and Reporting

Total Phosphorus shall be reported monthly, via electronic Discharge Monitoring Report, in the following ways:

a. Monthly Average Phosphorus Concentration = The average concentration of phosphorus discharged this monitoring period. (sum of all daily discharges (mg/l) measured during the month divided by the number of daily discharges measured during the month)

b. Total Monthly Pounds Phosphorus = The total pounds of phosphorus discharged this monitoring period. ((Monthly Average Phosphorus Concentration) x (Total Monthly Flows) x 8.34)

c. Running Total Annual Pounds = The 12-month running annual TP load. (Sum the Total Monthly Pounds results for the immediately preceding 12 months)

d. Comparison (%) of Running Total Annual Pounds to Annual Permit Limitation = The percentage of the Running Total Annual Pounds to the Annual TP Limitation. The comparison shall be calculated as:
% = Running Total Annual Pounds / Annual TP Permit Limit × 100

3. Phosphorus Optimization Plan (POP)

a. The Permittee shall develop or update (as appropriate) and submit to the Secretary a Phosphorus Optimization Plan (POP) to increase the WWTF's phosphorus removal efficiency by implementing optimization techniques that achieve phosphorus reductions using primarily existing facilities and equipment. The POP shall:

i. Be developed by a qualified professional with experience in the operation and/or design of WWTFs in consultation with the WWTF;

ii. Evaluate alternative methods of operating the existing WWTF, including operational, process, and equipment changes designed to enhance phosphorus removal. The techniques to be evaluated may include operational process changes to enhance biological and/or chemical phosphorous removal, incorporation of anoxic/anaerobic zones, septage receiving policies and procedures, and side stream management;

iii. Determine which alternative methods of operating the existing WWTF, including operational, process, and equipment changes will be most effective at increasing phosphorus removal; and

iv. Include a proposed implementation schedule for those methods of operating the WWTF determined to be most effective at increasing phosphorus removal.

b. The Secretary shall review the POP. The Permittee shall commence implementation of the POP 60 days after submittal to the Secretary, unless the Secretary rejects the POP prior to that date.

c. The Permittee shall annually submit a report to the Secretary as an attachment to the monthly electronic Discharge Monitoring Reporting (DMR) form WR-43 that documents:

i. The optimization techniques implemented under the POP during the previous year.

ii. Whether the techniques are performing as expected.

iii. The phosphorus discharge trends relative to the previous year.

4. Phosphorus Elimination and Reduction Plan (PERP)

a. The WWTF shall have 12 months from the permit effective date to optimize removal of TP.

b. If, after the optimization period, the WWTF's actual, TP loads reach or exceed 80% of the annual mass limit for the WWTF, based on the WWTF's 12-month running annual load calculated using the Running Total Annual Pounds Calculation, the Permittee shall, within 90 days of reaching or exceeding 80% of the annual mass limit for the WWTF, develop and submit to the Secretary a projection based on the WWTF's current operations and expected future loadings of whether it will exceed its annual mass limit during the permit term.

c. If the WWTF is not projected to exceed its annual mass limit within the permit term, the WWTF shall reassess when it is projected to reach its annual mass limit prior to permit renewal and submit that information with its next permit application.

d. If the WWTF is projected to exceed its annual mass limit during the permit term, the Permittee shall submit a Phosphorus Elimination and Reduction Plan (PERP) within 6 months from the date of submittal of the projection submitted under Part 2 of this Section. The PERP shall be submitted to the Secretary to ensure the WWTF continues to comply with its annual mass limit.

e. The PERP shall be treated as an application to amend the permit, and therefore, shall be subject to all public notice, hearing, and comment provisions, in place at the time the plan is submitted, that are applicable to permit amendments. The Permittee shall revise the PERP, if required by the Secretary.

f. The PERP shall be developed by qualified professionals in consultation with the WWTF operator. The PERP shall include:

i. An evaluation of alternatives to ensure the WWTF's compliance with its annual mass limit;

ii. An identification of the chosen alternative or alternatives to ensure the WWTF's compliance with its annual mass limit;

iii. A proposed schedule, including an engineer approved design and construction schedule and, if the chosen alternative or alternatives require a pilot study, a schedule for testing, that shall ensure the WWTF's compliance with its annual mass limit as soon as possible; and

iv. A financing plan that estimates the costs for implementing the PERP and describes a strategy for financing the project.

g. The Permittee shall report according to the following table:

Due Date	Event Description
5/1/2021	The Permittee shall submit a Phosphorus Optimization Plan (POP).
7/1/2021	The Permittee shall commence implementation of the POP 60 days after submittal.
1/31/2022	The Permittee shall submit an annual report that documents TP trends and optimization techniques for the previous year.
1/31/2023	The Permittee shall submit an annual report that documents TP trends and optimization techniques for the previous year.
1/31/2024	The Permittee shall submit an annual report that documents TP trends and optimization techniques for the previous year.
1/31/2025	The Permittee shall submit an annual report that documents TP trends and optimization techniques for the previous year.

G. QUALITY ASSURANCE REPORT / PROFICIENCY TESTING

1. In accordance with 10 V.S.A. § 1263.d.2, the Secretary may require a laboratory quality assurance sample program to ensure qualification of laboratory analysts. For purposes of demonstrating compliance with the requirements of this permit regarding adequate laboratory controls and appropriate quality assurance procedures, the Permittee shall conduct and pass an annual laboratory proficiency test, via an accredited laboratory, for the analysis of all pollutant parameters performed within their facility laboratory and reported as required by this permit. This can be carried out as part of an EPA DMR-QA study.

2. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall continue to complete annual proficiency tests and report by December 31 each year.

3. The Permittee shall report on quality assurance according to the following table:

Due Date	Event Description
12/31/2021	The Permittee shall submit passing proficiency test results.
12/31/2022	The Permittee shall submit passing proficiency test results.
12/31/2023	The Permittee shall submit passing proficiency test results.
12/31/2024	The Permittee shall submit passing proficiency test results.
12/31/2025	The Permittee shall submit passing proficiency test results.

H. ENGINEERING EVALUATION AND REPORT/ASSET MANAGEMENT PLAN

The current Engineering Evaluation was submitted on April 28, 2005 after the completion of facility upgrades.

1. The Permittee shall conduct an in-depth engineering inspection/evaluation of the wastewater treatment facility and shall submit a written report of the results to the Secretary. The evaluation can be combined with or part of an Asset Management Plan provided the Plan includes an inspection of the treatment facility and collection system. The engineering inspection and report shall be conducted and prepared in accordance with the following conditions:

a. A professional engineer with experience in the design of municipal wastewater treatment facilities shall be hired to perform an in-depth inspection of the wastewater treatment facility, pump stations, collection system,

and manholes. At the treatment facility, all components which are critical to the treatment process or which could adversely affect effluent quality in the event of their failure shall be evaluated. In the pump stations, all components critical to the proper conveyance of sewage, the prevention of sewage bypass, and the supporting appurtenances shall be evaluated.

b. The inspection is to be comprised of visual observation of equipment operability and condition as well as a review of maintenance records to determine recurring equipment problems and to estimate future life. Calibration checks shall be performed on all flow meters.

c. The resulting written inspection report shall document the components inspected, their condition, and include recommendations for all currently needed repairs and replacements and the need for on-site spare parts. The projected date of replacement or major rehabilitation of each component and the anticipated cost shall be estimated. The Permittee shall determine how the future anticipated costs will be met and advise the Secretary in a letter transmitted with the written inspection report.

d. Should the Secretary determine that certain critical components are in need of repair or replacement due to the results of the inspection report, this permit may be reopened and amended to include an implementation schedule for repair or replacement of those components.

2. The Permittee shall report according to the following table:

Due Date	
12/31/2024	The Permittee shall submit an engineering evaluation prepared by a professional engineer.

I. WHOLE EFFLUENT TOXICITY TESTING (WET) ACUTE

1. The Permittee shall conduct two-species (Pimephales promelas and Ceriodaphnia dubia) acute WET tests on a composite effluent sample collected from outfall serial number S/N 001. Total Ammonia shall be measured in the highest concentration of test solution at the beginning of the test. If chlorine is used in the WWTF's system, Total Residual Chlorine shall be measured in the highest concentration of test solution at the beginning of the test.

2. The WET tests shall be conducted according to the procedures and guidelines specified in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" and "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (both documents U.S. EPA October 2002 or, if a newer edition is available, the most recent edition).

3. Based upon the results of these tests or any other toxicity tests conducted, the Secretary reserves the right to reopen and amend this permit to require additional WET testing or a Toxicity Reduction Evaluation.

4. The Permittee may request the use of lab water for controls and dilution if:

a. acquiring receiving water is hazardous due to weather or topography;

b. previous WET tests have shown that the receiving water has had poor performance in the lab controls or dilution; or

c. requested by the Permittee and approved by the Secretary.

5. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall sample and report as prescribed by Wastewater Management Program's Policy on the Applicability of Whole Effluent Toxicity Testing Requirements During Administrative Continuance of Direct Discharge Permits. If this discharge permit contains a WET limit or the permitted facility is classified as a major NPDES discharge, monitoring must continue throughout administrative continuance. Non-major facilities with WET tests that indicate any acute or chronic toxicity during the permit term should project forward the WET testing schedule outlined in the permit in the event of administrative continuance. Non-major facilities where all WET tests during the permit term have NOEC or LOEC = 100% effluent (i.e., no acute or chronic toxicity) may cease WET testing during administrative continuance.

6. The Permittee shall sample and report according to the following table:

Due Date	Event Description
12/31/2022	The Permittee shall submit the WET test results for the sample taken during August-October 2022.
6/30/2024	The Permittee shall submit the WET test results for the sample taken during January-February 2024.

II. GENERAL CONDITIONS

A. GENERAL REQUIREMENTS

1. Authority

This permit is issued under authority of 10 V.S.A. §§ 1258 and 1259 of the Vermont Water Pollution Control Act, the Vermont Water Pollution Control Permit Regulation (Environmental Protection Rule, Chapter 13), and § 402 of the Clean Water Act, as amended.

2. Operating Fees

This discharge is subject to operating fees as required by 3 V.S.A. § 2822.

3. Duty to Comply

The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Except as provided in Bypass (Condition II.B.5.) and "Emergency Pollution Permits" (Condition II.B.8.), nothing in this permit shall be construed to relieve the Permittee from civil or criminal penalties for noncompliance.

4. Civil and Criminal Liability

Civil and criminal penalties for non-compliance are provided for in 40 C.F.R. § 122.41(a)(2)-(3) and 10 V.S.A. Chapters 47, 201, and 211. As of the effective date of this permit, the Vermont statutory penalties, which are subject to change, are as follows:

a. Pursuant to 10 V.S.A. Chapter 47, a civil penalty not to exceed $10,000.00 a day for each day of violation.

b. Pursuant to 10 V.S.A. Chapter 47, a fine not to exceed $25,000.00 or imprisonment for not more than six months, or both.

c. Pursuant to 10 V.S.A. Chapter 47, any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained by this permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained by this permit, shall upon conviction, be punished by a fine of not more than $10,000.00 or by imprisonment for not more than six months, or by both.

d. Pursuant to 10 V.S.A. Chapter 201, a penalty of not more than $42,500.00 for each determination of a separate violation. In addition, if the Secretary determines that a violation is continuing, the Secretary may assess a penalty of not more than $17,000.00 for each day the violation continues. The maximum amount of penalty assessed under this provision shall not exceed $170,000.00.

e. Pursuant to 10 V.S.A. Chapter 211, a civil penalty of not more than $85,000.00 for each violation. In addition, in the case of a continuing violation, a penalty of not more than $42,500.00 may be imposed for each day the violation continues.

5. Reopener Clause

In accordance with 40 C.F.R. § 122.44(c), this permit may be reopened and modified during the life of the permit to incorporate any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Clean Water Act. The Secretary may promptly modify or revoke and reissue this permit if the

standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or controls a pollutant or practice not limited in the permit.

6. Permit Modification, Suspension, and Revocation

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. Reallocation of WLA under the LC TMDL;

d. Development of an integrated WWTF and stormwater runoff NPDES permit; or

e. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

f. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance shall not stay any permit condition.

7. Toxic Effluent Standards

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under § 307(a) of the Clean Water Act for a toxic pollutant which is present in the Permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in this permit, then this permit shall be modified or revoked and reissued, pursuant to Condition II.A.6. of this permit, in accordance with the toxic effluent standard or prohibition and the Permittee so notified.

8. Other Materials

Other materials ordinarily produced or used in the operation of this facility, which have been specifically identified in the application, may be discharged at the maximum frequency and maximum level identified in the application, provided:

a. They are not:

(i) Designated as toxic or hazardous under provisions of Sections 307 and 311, respectively, of the Clean Water Act, or

(ii) Known to be hazardous or toxic by the Permittee, except that such materials indicated in (i) and (ii) above may be discharged in certain limited amounts with the written approval of, and under special conditions established by, the Secretary or their designated representative, if the substances will not pose any imminent hazard to the public health or safety;

b. The discharge of such materials will not violate the Vermont Water Quality Standards; and

c. The Permittee is not notified by the Secretary to eliminate or reduce the quantity of such materials entering the water.

9. Removed Substances

Collected screenings, sludges, and other solids removed in the course of treatment and control of wastewaters shall be stored, treated, and disposed of in accordance with 10 V.S.A. Chapter 159 and with the terms and conditions of any certification, interim or final, transitional operation authorization, or order issued pursuant to 10 V.S.A. Chapter 159 that is in effect on the effective date of this permit or is issued during the term of this permit.

10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

11. Duty to Provide Information

The Permittee shall provide to the Secretary, within a reasonable time, any information which the Secretary 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 Secretary upon request, copies of records required to be kept by this permit.

12. Other Information

If 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 Secretary, it shall promptly submit such facts or information.

13. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under 10 V.S.A. § 1281.

14. Confidentiality

Pursuant to 10 V.S.A. § 1259(b):

Any records or information obtained under this permit program that constitutes trade secrets under 1 V.S.A. § 317(c)(9) shall be kept confidential, except that such records or information may be disclosed to authorized representatives of the State and the United States when relevant to any proceedings under 10 V.S.A. Chapter 47.

Claims for confidentiality for the following information will be denied:

a. The name and address of any permit applicant or Permittee.

b. Permit applications, permits, and effluent data.

c. Information required by application forms, including information submitted on the forms themselves and any attachments used to supply information required by the forms.

15. Navigable Waters

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

16. Property Rights

Issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

17. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, 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 Director. The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

18. Other State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

All waste collection, control, treatment, and disposal facilities shall be operated in a manner consistent with the following:

a. The Permittee shall at all times properly operate and maintain in good working order all facilities and systems of treatment and control (and related appurtenances) installed or used by the Permittee to achieve compliance with the terms and conditions of this permit. 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 which are installed by the Permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

b. The Permittee shall provide an adequate operating staff, consistent with the Operator Rule (Environmental Protection Rule, Chapter 4), which is duly qualified to carry out the operation, maintenance, and testing functions required to ensure compliance with the conditions of this permit; and

c. The operation and maintenance of the WWTF shall be performed only by a person or persons holding a valid license to engage in the practice of pollution abatement facility operation.

2. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the 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. The Permittee shall also take all reasonable steps to minimize or prevent any adverse impact to waters of the State, the environment, or human health resulting from non-compliance with any condition specified in this permit, including accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

4. Dry Weather Flows

Dry weather flows of untreated municipal wastewater from any sanitary or combined sewers are not authorized by this permit and are specifically prohibited by state and federal laws and regulations. If for any reason there is a discharge to waters of the State of dry weather flows of untreated municipal wastewater from any sanitary or combined sewer, the operator of the WWTF or the operator's delegate shall comply with the notice requirements outlined in this permit.

5. Bypass

The bypass of facilities (including pump stations) is prohibited, except where authorized under the terms and conditions of an Emergency Pollution Permit issued pursuant to 10 V.S.A. § 1268.

In addition to § 1268 findings, such bypass must meet the following three conditions:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. 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 preventive maintenance; and

c. The Permittee submitted notices as required under 40 C.F.R. § 122.41(m)(3):

(i) 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.

(ii) Unanticipated bypass. The Permittee shall submit notice of an unanticipated bypass as required in Condition II.D.3. (24–hour notice).

6. Upset

a. 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 Condition II.B.6.b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

b. 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:

(i) An upset occurred and that the Permittee can identify the cause(s) of the upset;

(ii) The permitted facility was at the time being properly operated; and

(iii) The Permittee submitted notice of the upset as required in condition II.D.3. (24-hour notice).

(iv) The Permittee complied with any remedial measures required under Condition II.B.3.

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

7. Sewer Ordinance

The Permittee shall have in effect a sewer use ordinance acceptable to the Secretary which, at a minimum, shall:

a. prohibit the introduction by any person into the Permittee's sewerage system or WWTF of any pollutant which:

(i) Is a toxic pollutant in toxic amounts as defined in standards issued from time to time under § 307(a) of the Clean Water Act;

(ii) Creates a fire or explosion hazard in the Permittee's treatment works;

(iii) Causes corrosive structural damage to the Permittee's treatment works, including all wastes with a pH lower than 5.0;

(iv) Contains solid or viscous substances in amounts which would cause obstruction to the flow in sewers or other interference with proper operation of the Permittee's treatment works; or

(v) In the case of a major contributing industry, as defined in this permit, contains an incompatible pollutant, as defined in this permit, in an amount or concentration in excess of that allowed under standards or guidelines issued from time to time pursuant to Sections 304, 306, and/or 307 of the Clean Water Act.

b. Require 45 days prior notification to the Permittee by any person or persons of a:

(i) Proposed substantial change in volume or character of pollutants over that being discharged into the Permittee's treatment works at the time of issuance of this permit;

(ii) Proposed new discharge into the Permittee's treatment works of pollutants from any source which would be a new source as defined in § 306 of the Clean Water Act if such source were discharging pollutants; or

(iii) Proposed new discharge into the Permittee's treatment works of pollutants from any source which would be subject to § 301 of the Clean Water Act if it were discharging such pollutants.

c. Require any industry discharging into the Permittee's treatment works to perform such monitoring of its discharge as the Permittee may reasonably require, including the installation, use, and maintenance of monitoring equipment and monitoring methods, keeping records of the results of such monitoring, and reporting the results of such monitoring to the Permittee. Such records shall be made available by the Permittee to the Secretary upon request.

d. Authorize the Permittee's authorized representatives to enter into, upon, or through the premises of any industry discharging into the Permittee's treatment works to have access to and copy any records, to inspect

any monitoring equipment or method required by this permit, and to sample any discharge into the Permittee's treatment works.

8. Emergency Pollution Permits

a. Maintenance activities, or emergencies resulting from equipment failure or malfunction, including power outages, which result in an effluent which exceeds the effluent limitations specified herein, shall be considered a violation of the conditions of this permit, unless the Permittee's discharge is covered under an emergency pollution permit under the provisions of 10 V.S.A. § 1268. The Permittee shall notify the Secretary of the emergency situation by the next working day, unless notice is required sooner under Condition II.D.2.

10 V.S.A. § 1268 reads as follows:

When a discharge permit holder finds that pollution abatement facilities require repairs, replacement, or other corrective action in order for them to continue to meet standards specified in the permit, the holder may apply in the manner specified by the Secretary for an emergency pollution permit for a term sufficient to effect repairs, replacements or other corrective action. The Secretary shall proceed in accordance with Chapter 170 of this title. No emergency pollution permit shall be issued unless the applicant certifies and the Secretary finds that:

(i) there is no present, reasonable alternative means of disposing of the waste other than by discharging it into the waters of the State during the limited period of time of the emergency;

(ii) the denial of an emergency pollution permit would work an extreme hardship upon the applicant;

(iii) the granting of an emergency pollution permit will result in some public benefit;

(iv) the discharge will not be unreasonably harmful to the quality of the receiving waters; and

(v) the cause or reason for the emergency is not due to willful or intended acts or omissions of the applicant.

b. Application shall be made to the Secretary at the following address: Agency of Natural Resources, Department of Environmental Conservation, One National Life Drive, Davis 3, Montpelier VT 05620-3522.

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 of 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 5 years (or longer as required by 40 C.F.R. § 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. This period shall be extended during the course of unresolved litigation and may be extended by request of the Secretary at any time.

c. Records of monitoring information shall include:

(i) The date, exact place, and time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) The date(s) analyses were performed;

(iv) The individual(s) who performed the analyses;

(v) The analytical techniques or methods used; and

(vi) The results of such analyses.

(vii) The records of monitoring activities and results, including all instrumentation and calibration and maintenance records;

(viii) The original calculation and data bench sheets of the operator who performed analysis of the influent or effluent pursuant to requirements of this permit; and

(ix) For analyses performed by contract laboratories:

(a) The detection level reported by the laboratory for each sample; and

(b) The laboratory analytical report including documentation of the QA/QC and analytical procedures.

(x) When "non-detects" are recorded, the method detection limit shall be reported and used in calculating any time-period averaging for reporting on DMRs.

d. Monitoring must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. Subchapters N or O.

2. Quality Control

a. The Permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at regular intervals to ensure accuracy of measurements or shall ensure that both activities will be conducted.

b. The Permittee shall keep records of these activities and shall provide such records upon request of the Secretary.

3. Right of Entry

The Permittee shall allow the Secretary, 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. To 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. To have access to and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;

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

d. To sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Facility Modification / Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant more frequently than, or at a level in excess of, that identified and authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such a violation may result in the imposition of civil and/or criminal penalties pursuant to 10 V.S.A. Chapters 47, 201, and/or 211. Any anticipated facility alterations or expansions or process modifications which will result in new, different, or increased discharges of any pollutants must be reported by submission of a new permit application or, if such changes will not violate the effluent limitations specified in this permit, by advance notice to the Secretary of such changes. This notification applies to pollutants which are subject neither to effluent limitations in this permit, nor to notification requirements for toxic pollutants under 40 C.F.R. § 122.42(a)(1). Following such notice, the permit may be modified, pursuant to Condition II.A.6 of this permit, to specify and limit any pollutants not previously limited.

2. Change in Introduction of Pollutants to WWTF

a. The Permittee, within 30 days of the date on which the Permittee is notified of such discharge, shall provide notice to the Secretary of the following:

(i) Any new introduction of pollutants into the treatment works from a source which would be a new source as defined in § 306 of the Clean Water Act if such source were discharging pollutants;

(ii) Except for such categories and classes of point sources or discharges specified by the Secretary, any new introduction of pollutants into the treatment works from a source which would be subject to § 301 of the Clean Water Act if such source were discharging pollutants; and

(iii) Any substantial change in volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into such works at the time of issuance of the permit.

b. The notice shall include:

(i) The quality and quantity of the discharge to be introduced into the system, and

(ii) The anticipated impact of such change in the quality or quantity of the effluent to be discharged from the WWTF.

3. Noncompliance Notification

a. The Permittee shall give advance notice to the Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

b. In the event the Permittee is unable to comply with any of the conditions of this permit due, among other reasons, to:

(i) Breakdown or maintenance of waste treatment equipment (biological and physical-chemical systems including all pipes, transfer pumps, compressors, collection ponds or tanks for the segregation of treated or untreated wastes, ion exchange columns, or carbon absorption units);

(ii) Accidents caused by human error or negligence;

(iii) Any unanticipated bypass or upset which exceeds any effluent limitation in the permit;

(iv) Violation of a maximum day discharge limitation for any of the pollutants listed by the Secretary in this permit; or

(v) Other causes such as acts of nature,

the Permittee shall provide notice as specified in subdivisions c and d of this subsection.

c. Pursuant to 10 V.S.A. § 1295, notice for "untreated discharges," as defined in section III.

(i) Public notice. For "untreated discharges" an operator of the WWTF or the operator's delegate shall as soon as possible, but no longer than one hour from discovery of an untreated discharge from the WWTF, post on a publicly accessible electronic network, mobile application, or other electronic media designated by the Secretary an alert informing the public of the untreated discharge and its location, except that if the operator or his or her delegate does not have telephone or Internet service at the location where he or she is working to control or stop the untreated discharge, the operator or his or her delegate may delay posting the alert until the time that the untreated discharge is controlled or stopped, provided that the alert shall be posted no later than four hours from discovery of the untreated discharge.

(ii) Secretary notification. For "untreated discharges" an operator of the WWTF shall within 12 hours from discovery of an untreated discharge from the WWTF notify the Secretary and the local health officer of the municipality where the facility is located of the untreated discharge. The operator shall notify the Secretary through use of the Department of Environmental Conservation's online event reporting system. If, for any reason, the online event reporting system is not operable, the operator shall notify the Secretary via telephone or e-mail. The notification shall include:

(a) The specific location of each untreated discharge, including the body of water affected. For combined sewer overflows, the specific location of each untreated discharge means each outfall that has discharges during the wet weather storm event.

(b) Except for discharges from the WWTF to a separate storm sewer system, the date and approximate time the untreated discharge began.

(c) The date and approximate time the untreated discharge ended. If the untreated discharge is still ongoing at the time of reporting, the entity reporting the untreated discharge shall amend the report with the date and approximate time the untreated discharge ended within three business days of the untreated discharge ending.

(d) Except for discharges from the WWTF to a separate storm sewer system, the approximate total volume of sewage and, if applicable, stormwater that was released. If the approximate total volume is unknown at the time of reporting, the entity reporting the untreated discharge shall amend the report with the approximate total volume within three business days.

(e) The cause of the untreated discharge and a brief description of the noncompliance, including the type of event and the type of sewer structure involved.

(f) The person reporting the untreated discharge.

d. For any non-compliance not covered under Condition II.D.3.c of this permit, an operator of the WWTF or the operator's delegate shall notify the Secretary within 24 hours of becoming aware of such condition and

shall provide the Secretary with the following information, in writing, within five days of becoming aware of such condition:

(i) Cause of non-compliance;

(ii) A description of the non-complying discharge including its impact upon the receiving water;

(iii) Anticipated time the condition of non-compliance is expected to continue or, if such condition has been corrected, the duration of the period of non-compliance;

(iv) Steps taken by the Permittee to reduce and eliminate the non-complying discharge; and

(v) Steps to be taken by the Permittee to prevent recurrence of the condition of non-compliance.

e. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather.

4. Planned Changes

a. The Permittee shall give notice to the Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(i) 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 C.F.R. § 122.29(b); or

(ii) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements at 40 C.F.R. § 122.42(a)(1).

(iii) 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 that are 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.

5. Transfer of Ownership or Control

This permit is not transferable without prior written approval of the Secretary. All application and operating fees must be paid in full prior to transfer of this permit. In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the Permittee shall provide a copy of this permit to the succeeding owner or controller and shall send written notification of the change in ownership or control to the Secretary at least 30 days in advance of the proposed transfer date. The notice to the Secretary shall include a written agreement between the existing and new Permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them. The Permittee shall also inform the prospective owner or operator of their responsibility to make an application for transfer of this permit.

This request for transfer application must include as a minimum:

a. A properly completed application form provided by the Secretary and the applicable processing fee.

b. A written statement from the prospective owner or operator certifying:

(i) The conditions of the operation that contribute to, or affect, the discharge will not be materially different under the new ownership;

(ii) The prospective owner or operator has read and is familiar with the terms of the permit and agrees to comply with all terms and conditions of the permit; and

(iii) The prospective owner or operator has adequate funding to operate and maintain the treatment system and remain in compliance with the terms and conditions of the permit.

c. The date of the sale or transfer.

The Secretary may require additional information dependent upon the current status of the facility operation, maintenance, and permit compliance.

6. Monthly Reporting

a. The Permittee is required to submit monthly reports of monitoring results and operational parameters on Discharge Monitoring Report (DMR) form WR-43 or through an electronic reporting system made available by the Secretary. Reports are due on the 15th day of each month, beginning with the month following the effective date of this permit.

b. Unless waived by the Secretary, the Permittee shall electronically submit its DMRs via Vermont's on-line electronic reporting system. The Permittee shall electronically submit additional compliance monitoring data and reports specified by the Secretary. When the Permittee submits DMRs using an electronic system designated by the Secretary, which requires attachment of scanned DMRs in PDF format, it is not required to submit hard copies of DMRs. The electronic submittals are submitted through the State of Vermont Agency of Natural Resources' Online Services Portal, or its replacement.

c. If, in any reporting period, there has been no discharge, the Permittee must submit that information by the report due date.

7. Signature Requirements

a. All reports shall be signed:

(i) For a corporation. By a responsible corporate officer or a duly authorized representative of that person. For the purpose of this section, a responsible corporate officer means: (1) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (2) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

(ii) For a partnership or sole proprietorship. By a general partner or the proprietor, respectively; or

(iii) For a municipality, state, or other public agency. By either a principal executive officer or ranking elected official, or a duly authorized representative of that person.

b. For the purposes of subdivision (d) of this subsection, a person is a duly authorized representative only if:

(i) The authorization is made in writing by a person described in subdivision (d) of this subsection;

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, or an individual or position having overall responsibility for environmental matters for the company; and

(iii) The written authorization is submitted to the Secretary.

c. Changes to authorization. If an authorization under subdivision (e) of this subsection is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of subdivision (e) of this subsection must be submitted to the Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. Certification. Any person signing a document under subdivisions (d) or (e) of this subsection shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

8. Additional Monitoring

If the Permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the DMR form WR-43. Such increased frequency shall also be indicated.

III. DEFINITIONS

For purposes of this permit, the following definitions shall apply.

Agency – means the Vermont Agency of Natural Resources.

Annual Average – means the highest allowable average of daily discharges calculated as the sum of all daily discharges (mg/L, lbs or gallons) measured during a calendar year divided by the number of daily discharges measured during that year.

Average – means the arithmetic means of values taken at the frequency required for each parameter over the specified period.

Bypass – means the intentional diversion of waste streams from any portion of the treatment facility.

The Clean Water Act – means the federal Clean Water Act, as amended (33 U.S.C. § 1251, et seq.).

Composite Sample – means a sample consisting of a minimum of one grab sample per hour collected during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportionally to flow over that same time period.

Daily Discharge – means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling.

For pollutants with limitations expressed in pounds the daily discharge is calculated as the total pounds of pollutants discharged over the day.

For pollutants with limitations expressed in mg/L the daily discharge is calculated as the average measurement of the pollutant over the day.

Discharge – means the placing, depositing, or emission of any wastes, directly or indirectly, into an injection well or into the waters of the State.

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

Incompatible Substance – means any waste being discharged into the treatment works which interferes with, passes through without treatment, or is otherwise incompatible with said works or would have a substantial adverse effect on the works or on water quality. This includes all pollutants required to be regulated under the Clean Water Act.

Instantaneous Maximum – means a value not to be exceeded in any grab sample.

Major Contributing Industry – means one that: (1) has a flow of 50,000 gallons or more per average work day; (2) has a flow greater than five percent of the flow carried by the municipal system receiving the waste; (3) has in its wastes a toxic pollutant in toxic amounts as defined in standards issued under § 307(a) of the Clean Water Act; or (4) has a significant impact, either singly or in combination with other contributing industries, on a treatment works or on the quality of effluent from that treatment works.

Maximum Day or **Maximum Daily Discharge Limitation** – means the highest allowable "daily discharge" (mg/L, lbs or gallons).

Mean – means the arithmetic mean.

Monthly Average or **Average Monthly Discharge Limitation** – means the highest allowable average of daily discharges (mg/L, lbs or gallons) over a calendar month, calculated as the sum of all daily discharges (mg/L, lbs or gallons) measured during a calendar month divided by the number of daily discharges measured during that month.

NPDES –means the National Pollutant Discharge Elimination System.

Secretary – means the Secretary of the Agency of Natural Resources or the Secretary's duly authorized representative.

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.

Untreated Discharge – means (1) combined sewer overflows from a WWTF; (2) overflows from sanitary sewers and combined sewer systems that are part of a WWTF during dry weather flows, which result in a discharge to waters of the State; (3) upsets or bypasses around or within a WWTF during dry or wet weather conditions that are due to factors unrelated to a wet weather storm event and that result in a discharge of

sewage that has not been fully treated to waters of the State; and (4) discharges from a WWTF to separate storm sewer systems.

Waste – means effluent, sewage or any substance or material, liquid, gaseous, solid, or radioactive, including heated liquids, whether or not harmful or deleterious to waters.

Waste Management Zone – means a specific reach of Class B waters designated by a permit to accept the discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings. Throughout the receiving waters, water quality criteria must be achieved but increased health risks exist in a waste management zone due to the authorized discharge.

Waters – means all rivers, streams, creeks, brooks, reservoirs, ponds, lakes, springs, and all bodies of surface waters, artificial or natural, which are contained within, flow through, or border upon the State or any portion of it.

Weekly Average or **Average Weekly Discharge Limitation** – means the highest allowable average of daily discharges (mg/L, lbs or gallons) over a calendar week, calculated as the sum of all daily discharges (mg/L, lbs or gallons) measured during a calendar week divided by the number of daily discharges measured during that week.

Whole Effluent Toxicity (WET) – means the aggregate toxic effect of an effluent measured directly by a toxicity test.

Wastewater Treatment Facility (WWTF) – means a treatment plant, collection system, pump station, and attendant facilities permitted by the Secretary for the purpose of treating domestic, commercial, or industrial wastewater.

IV. TABLE OF PERMITTED DISCHARGE POINTS

Discharge ID	Discharge Activity	Discharge Status	Receiving Water	Latitude	Longitude
001	Sanitary Waste Outfall	A	Winooski River	44.40228	-72.99973

AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
ONE NATIONAL LIFE DRIVE, DAVIS BUILDING, 3rd FLOOR
MONTPELIER, VT 05620-3522

FACT SHEET FOR PERMIT
November 2020

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE STATE

PERMIT NO: 3-1173
PIN: EJ96-0614
NPDES NO: VT0100617

NAME AND ADDRESS OF APPLICANT:

Town of Richmond
PO Box 285
Richmond, VT 05477

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Town of Richmond Wastewater Treatment Facility
281 Esplanade
Richmond, VT 05477

FACILITY COORDINATES: Lat: 44.40383 Long: -73.00069

RECEIVING WATER: Winooski River

CLASSIFICATION: All uses Class B(2) with a waste management zone. Class B waters are suitable for swimming and other primary contact recreation; irrigation and agricultural uses; aquatic biota and aquatic habitat; good aesthetic value; boating, fishing, and other recreational uses; and suitable for public water source with filtration and disinfection or other required treatment. A waste management zone is a specific reach of Class B(1) or B(2) waters designated by a permit to accept the discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings.

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

The Secretary of the Vermont Agency of Natural Resources (hereinafter referred to as "the Secretary") received a renewal application for the permit to discharge into the designated receiving water from the above-named applicant on March 24, 2010. The facility's previous permit was issued on July 5, 2005 with an effective date of October 1, 2005. The previous permit

(hereinafter referred to as the "current permit") has been administratively continued, pursuant to 3 V.S.A. § 814, as the applicant filed a complete application for permit reissuance within the prescribed time period per the Vermont Water Pollution Control Permit Regulations Section 13.5(b). At this time, the Secretary has made a tentative decision to reissue the discharge permit.

The facility is engaged in the treatment of municipal wastewater and is classified as a Grade IV Domestic Non-Major NPDES Wastewater Treatment Facility (WWTF).

A map showing the location of the facility, outfalls, and the receiving water is provided in the Reasonable Potential Determination (Attachment A).

II. Description of Discharge

The WWTF is engaged in the treatment of municipal wastewater which includes residential, commercial, and industrial wastewaters. There is one pretreater permitted under the NPDES program that discharges to the collection system (Stone Corral Brewery, LLC). The WWTF is an extended aeration system that consists of an EQ tank, three anoxic tanks, two aeration tanks, two clarifiers, and ultraviolet disinfection. The design flow of the WWTF is 0.222 million gallons per day (MGD) and the design Biochemical Oxygen Demand (BOD_5) loading is 600 lbs./day. The average flow from the facility over the last 5 years is approximately 0.065 MGD, which includes dewatered septage.

The WWTF maintains a constant discharge to the Winooski River.

III. Limitations and Conditions

The draft permit contains limitations for effluent flow, Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), Total Phosphorus (TP), Settleable Solids, *Escherichia coli*, and pH. It also contains monitoring requirements for Total Nitrogen (TN), Total Kjeldahl Nitrogen (TKN), Nitrate/Nitrite (NO_x), as well as septage received. The effluent limitations of the draft permit and the monitoring requirements may be found on the following pages of the draft permit:

Effluent Limitations:	Pages 2-3 of 27
Monitoring Requirements:	Pages 2-5 of 27

IV. Statutory and Regulatory Authority

A. Clean Water Act and NPDES Background

Congress enacted the Clean Water Act (CWA or Act), “to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.” CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specified permitting sections of the Act, one of which is § 402. CWA §§ 301(a), 402(a). Section 402 establishes one of the CWA's principal permitting programs, the National Pollutant Discharge Elimination System (NPDES). Under this section of the Act, the U.S. Environmental Protection Agency (EPA) may “issue a permit for the discharge of any pollutant, or combination of pollutants” in accordance with certain conditions. CWA § 402(a). The State of Vermont has been approved by the EPA to administer the

NPDES Program in Vermont. NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. CWA § 402(a)(1) - (2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. CWA §§ 301, 303, 304(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant-reducing technology available and economically achievable for the type of facility being permitted. CWA § 301(b). As a class, WWTFs must meet performance-based requirements based on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for WWTFs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of BOD_5, TSS, and pH; 40 C.F.R. Part 133.

Water quality-based effluent limits, on the other hand, are designed to ensure that state water quality standards are achieved, irrespective of the technological or economic considerations that inform technology-based limits. Under the CWA, states must develop water quality standards for all water bodies within the state. CWA § 303. These standards have three parts: (1) one or more "designated uses" for each water body or water body segment in the state; (2) water quality "criteria," consisting of numerical concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an antidegradation provision, focused on protecting high quality waters and protecting and maintaining water quality necessary to protect existing uses. CWA § 303(c)(2)(A); 40 C.F.R. § 131.12. The applicable water quality standards for this permit are the 2017 Vermont Water Quality Standards (Environmental Protection Rule, Chapter 29a).

A permit must include limits for any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality standard, including narrative water quality criteria. See 40 C.F.R. § 122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion. A NPDES permit must contain effluent limitations and conditions in order to ensure that the discharge does not cause or contribute to water quality standard violations.

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from the State's water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable instream pollutant concentrations. Acute aquatic life criteria are generally implemented through maximum daily limits and chronic aquatic life criteria are generally implemented through average monthly limits.

Where a state has not established a numeric water quality criterion for a specific chemical pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use"; on a "case-by-case basis" using CWA §

304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an "indicator parameter." 40 C.F.R. § 122.44(d)(1)(vi)(A-C).

The state rules governing Vermont's NPDES permit program are found in the Vermont Water Pollution Control Permit Regulations (Environmental Protection Rule, Chapter 13).

1. Reasonable Potential Determination

In determining whether this permit has the reasonable potential to cause or contribute to an impairment, Vermont has considered:

1) Existing controls on point and non-point sources of pollution as evidenced by the Vermont surface water assessment database;

2) Pollutant concentration and variability in the effluent as determined from the permit application materials, monthly discharge monitoring reports (DMRs), or other facility reports;

3) Receiving water quality based on targeted water quality and biological assessments of receiving waters, as applicable, or other State or Federal water quality reports;

4) Toxicity testing results based on the Vermont Toxic Discharge Control Strategy, and compelled as a condition of prior permits;

5) Available dilution of the effluent in the receiving water, expressed as the instream waste concentration. In accordance with the applicable Vermont Water Quality Standards, available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life and human health criteria for non-carcinogens, or at all flows for human health (carcinogens only) in the receiving water. For nutrients, available dilution for stream and river discharges is assessed using the low median monthly flow computed as the median flow of the month containing the lowest annual flow. Available dilution for lakes is based on mixing zones of no more than 200 feet in diameter, in any direction, from the effluent discharge point, including as applicable the length of a diffuser apparatus; and

6) All effluent limitations, monitoring requirements, and other conditions of the draft permit.

The Reasonable Potential Determination for this facility is attached to this Fact Sheet as Attachment A.

B. Anti-Backsliding

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

122.44(l). Unless applicable anti-backsliding exemptions are met, the limits and conditions in the reissued permit must be at least as stringent as those in the current permit.

V. Description of Receiving Water

The receiving water for this discharge is the Winooski River, a designated Cold-Water Fish Habitat. At the point of discharge, the river has a contributing drainage area of 940 square miles. The summer 7Q10 flow of the river is estimated to be 134.33 cubic feet per second (CFS), and the summer Low Median Monthly flow is estimated to be 396.68 CFS. The instream waste concentration at the summer 7Q10 flow is 0.003 (0.3%) and the instream waste concentration at the summer Low Median Monthly flow is 0.001 (0.1%).

In addition, the Winooski River drains into Lake Champlain, which is impaired for phosphorus and is subject to a Total Maximum Daily Load (TMDL) for phosphorus. This is discussed further in Section VIII.C. of this Fact Sheet.

VI. Waste Management and Mixing Zones

A **Waste Management Zone** (WMZ) is a specific reach of Class B waters designated by a permit to accept the discharge of properly treated wastes that contained organisms pathogenic to human beings prior to treatment. Throughout the receiving waters, water quality criteria must be achieved but increased health risks exist in a WMZ due to the authorized discharge.

10 V.S.A. § 1252 describes the process by which the Secretary may establish a WMZ as part of the issuance of a discharge permit. The model used to determine the WMZ is based upon three precepts of domestic wastewater treatment facility discharges: 1) the use of coliform bacteria as an indicator of pathogenic organisms, 2) despite proper operation and maintenance disinfection failures may occur, and 3) a reasonably sized waste management segment provides a "buffer zone" downstream of the wastewater discharge in which contact recreation is not recommended. If a disinfection failure should occur at the WWTF, the time of travel through this zone will provide time during which some pathogen die-off will occur and may also allow time for public notification. A WMZ is not a Mixing Zone.

The draft permit retains the existing waste management zone (WMZ) that extends downstream from the outfall for approximately one mile in the Winooski River.

Mixing Zone. A Mixing Zone is a length or area within Class B waters required for the dispersion and dilution of waste discharges adequately treated to meet federal and state treatment requirements and within which it is recognized that specific water uses or water quality criteria associated with the assigned classification for such waters may not be realized. A mixing zone shall not extend more than 200 feet from the point of discharge and must meet the terms of 10 V.S.A. § 29A-204. For a mixing zone to be applicable to a discharge it must be authorized within the discharge permit.

VII. Facility History and Background

The Town of Richmond owns and operates the WWTF. The WWTF was constructed in 1973 and was upgraded in 2005. The collection system consists of one pump station, therefore, a

majority of wastewater flows by gravity to the WWTF. The headworks building consists of a Lakeside mechanical screen and an aerated grit removal system. Wastewater flows from the headworks to three anoxic tanks with submersible mixers. From the anoxic tanks, wastewater flows to one of two aeration tanks with a diffused fine-bubble aeration system. Sodium Aluminate is dripped into the effluent channel prior to entering one of the two secondary clarifiers. Filtration is achieved using cloth disk filters that consist of two, two-disk units located in the Process Building. Wastewater flows from the cloth disk filter units to a UV disinfection system that consists of two banks of UV lamps in series prior to discharge to the Winooski River.

The WWTF has the capability to accept up to 12 million gallons of septage per year. Sludge handling was upgraded in 2005 to include new dewatering equipment, chemical feed and polymer feed equipment, two aerated holding basins with a diffused fine bubble aeration system, and a sludge transfer pump. The sludge transfer pump has the ability to transfer sludge and septage from the aerated holding basins to the aerobic digester or between the two aerated holding basins.

VIII. Permit Basis and Explanation of Effluent Limitation Derivation

A. Flow – The draft permit maintains the annual average flow limitation of 0.222 MGD. This facility maintains a constant discharge. Continuous flow monitoring is required.

B. Conventional Pollutants

1. **Biochemical Oxygen Demand (BOD_5)** – The effluent limitations for BOD_5 remain unchanged from the current permit. The monthly average (30 mg/L) and weekly average (45 mg/L) reflect the minimum level of effluent quality specified for secondary treatment in 40 C.F.R. Part 133.102. In addition, the draft permit contains a 50 mg/L, maximum day, BOD_5 limitation. This is applied to all such discharges pursuant to 13.4 c. of the Vermont Water Pollution Control Permit Regulations. The Secretary implements the limit to supplement the federal technology-based limitations to prevent a gross one-day permit effluent violation to be offset by multiple weekly and monthly sampling events which would enable a discharger to comply with the weekly average and monthly average permit limitations. Mass limits (55.5 lbs/day, monthly average and 83.3 lbs/day, weekly average) are calculated using the concentration limits outlined above. The BOD_5 monthly monitoring requirement is unchanged from the current permit.

   The monthly "monitor only" monitoring requirement for influent BOD_5 is unchanged from the current permit.

2. **Total Suspended Solids (TSS)** – The effluent limitations for TSS remain unchanged from the current permit. The monthly average (30 mg/L) and weekly average (45 mg/L) reflect the minimum level of effluent quality specified for secondary treatment in 40 C.F.R. Part 133.102. In addition, the draft permit contains a 50 mg/L, maximum day, TSS limitation. This is applied to all such discharges pursuant to 13.4 c. of the Vermont Water Pollution Control Permit Regulations. The Secretary implements the limit to supplement the federal technology-based limitations to prevent a gross one-day permit effluent violation to be offset by multiple weekly

and monthly average permit limitations. Mass limits (55.5 lbs/day, monthly average and 83.3 lbs/day, weekly average) are calculated using the concentration limits outlined above and the permitted flow. The TSS monthly monitoring requirement is unchanged from the current permit.

The monthly "monitor only" monitoring requirement for influent TSS is unchanged from the current permit.

3. ***Escherichia coli*** – The *E. coli* limitation is 77 cfu/100ml, instantaneous maximum, based upon the limitation in the current permit and the anti-backsliding provisions of Section 402(o) of the CWA. As in the current permit, monitoring is required twice monthly.

4. **pH** – The pH limitation remains at 6.5 - 8.5 Standard Units as specified in Section 29A-303(6) in the Vermont Water Quality Standards. Monitoring remains at daily.

C. Non-Conventional and Toxics

1. Total Phosphorus (TP)

Background:

Excess phosphorus entering Lake Champlain from a variety of sources has impaired the water quality of the lake. The Lake Champlain Total Maximum Daily Load (LC TMDL), places a cap on the maximum amount of phosphorus from point and non- point sources that is allowed to flow into the lake while still meeting Vermont's water quality standards. The EPA developed phosphorus TMDLs for the twelve Vermont segments of Lake Champlain in collaboration with the Vermont Agency of Natural Resources, Department of Environmental Conservation and the Vermont Agency of Agriculture, Food, and Markets, and released the document titled "Phosphorus TMDLs for Vermont Segments of Lake Champlain" (June 2016). The 2016 LC TMDL specifies allowable phosphorus loads, or waste load allocations (WLA), expressed as metric tons per year (mt/yr), for each of the 59 WWTFs that discharge to the Lake's watershed. Discharge (NPDES) permits will be issued by the Secretary in accordance with the permit issuance schedule in the Lake Champlain TMDL Phase 1 Implementation Plan (Chapter 3, page 46). The Secretary will follow this schedule unless special circumstances are raised by the facility that warrant the issuance of the permit sooner (e.g., planned facility upgrades), and the Program has sufficient staff capacity to handle the request.

Reductions in WLAs are targeted only to WWTFs in those lake segment watersheds where the currently permitted wastewater load represents a significant (defined as being 10% or greater) portion of the total phosphorus load to that segment from all sources (Main Lake, Shelburne Bay, Burlington Bay, St. Albans Bay) or where wastewater upgrades would meaningfully reduce the phosphorus reduction burden placed on non-wastewater (non-point) sources (Missisquoi Bay). Therefore, WWTFs discharging to the Port Henry, Otter Creek, Mallets Bay, Northeast Arm, Isle LaMotte, and the South Lake A/B lake segments were not assigned a new waste load allocation. The EPA also determined that wastewater facilities with a design flow of < 0.1 MGD would be given the same allocations as in the 2002 TMDLs due their minor contribution of phosphorus loading.

The LC TMDL establishes new annual WLAs for WWTFs with a design flow capacity of above 0.1 million gallons per day (MGD) that discharge to the Main Lake, Shelburne Bay, Burlington Bay, St. Albans Bay, and Missisquoi Bay lake segments. Specifically, WWTFs with a design flow capacity of 0.1 to 0.2 MGD were assigned WLAs based on a 0.8 mg/L effluent phosphorus concentration at permitted flow while WWTFs with design capacity of > 0.2 MGD were assigned a WLA based on a 0.2 mg/L effluent phosphorus concentration at permitted flow.

In the LC TMDL, EPA acknowledged and supported the Secretary's commitment to employ flexible approaches to implementing the WWTF WLAs including "providing a period of time for optimization to be pursued and the corresponding load reduction results to be realized, and then commencement of the process to upgrade phosphorus treatment facilities will be required when actual phosphorus loads reach 80% of the LC TMDL limits." The Wastewater Management Program maintains a tracking system for phosphorus loading from Vermont WWTFs so facilities approaching or over the 80% threshold can be identified. The 80% phosphorus load threshold is calculated by comparing the individual WWTF phosphorus WLA established in the LC TMDL to the actual phosphorus discharge load from the WWTF over last 12 months:

WWTF Annual TP Load / LC TMDL WLA x 100

There are currently WWTFs in the Lake Champlain watershed with existing discharged loads of phosphorus already at, or above, 80% of allowable loads. To ensure facilities are operating as efficiently as possible, all reissued wastewater discharge (NPDES) permits under the LC TMDL will specify a period of 12-months for optimization to be pursued and the corresponding load reduction results to be realized, prior to evaluating where a facility ranks relative to the 80% trigger. Discharge permits will specify that after the optimization period, when an existing facility reaches 80% of its WLA for phosphorus (evaluated as a rolling, 12-month load), the Permittee will have to develop and submit a projection of whether the facility will exceed its WLA during the permit term and if it is projected to do so, then the facility will be required to develop a Phosphorus Elimination/Reduction Plan (PERP) that will ensure the facility continues to comply with its WLA.

Effluent TP limits in permits are expressed as:
(1) total annual mass loads, and
(2) for facilities that currently have an existing monthly effluent concentration limits for TP in their NPDES permit, as monthly effluent concentration limits.

Phosphorus Limit in Draft Permit:

The current discharge permit for this facility includes a mass-based, effluent limit of 405 pounds of TP per year. This annual mass limitation was based on an allocation of 0.184 metric tons established in the 2002 Lake Champlain Phosphorus TMDL.

This proposed draft permit contains a phosphorous mass effluent limit of 134 total pounds, annual limitation. The concentration effluent limitation is based on the requirements of 10

V.S.A. § 1266a. The mass annual effluent limitation is based on the LC TMDLs. The LC TMDL allocated 0.061 metric tons per year or 134 pounds per year to the Richmond WWTF.

To convert units of the WLA from metric tons to pounds for the annual, mass-based TP permit limit, the following equation was used and the resulting WLA rounded down to the nearest pound:

(0.061 mt/yr) (2204.62 lbs/mt) = 134 lbs/yr

The LC TMDL includes WLAs for WWTFs expressed as total annual mass loads. Compliance with the annual limit will be calculated each month using the Running Total Annual Pounds Calculation (Condition I.F.2.c. of the permit), rather than once at the end of the calendar year. The LC TMDL does not include monthly average concentration effluent limits for WWTFs. State law (10 V.S.A. 1266a) requires that, "No person directly discharging into the drainage basins of Lake Champlain or Lake Memphremagog shall discharge any waste that contains a phosphorus concentration in excess of 0.80 milligrams per liter on a monthly average basis." Therefore, in addition to the annual mass load effluent limitation required by the TMDL, the permit must also include a monthly average concentration limit for phosphorus. While the WLA in the TMDL was calculated based on a TP effluent concentration of 0.20 mg/L, the permit does not include 0.20 mg/L as the concentration effluent limitation because a Permittee may not need to achieve 0.20 mg/L to ensure compliance with the WLA established in the TMDL. Rather the permit includes a monthly average concentration limit for phosphorus of 0.80 mg/L to ensure compliance with state law and to recognize seasonal variations in the facility's discharge. It is important to note that because the annual mass load and average monthly concentration limits are not mathematically consistent in the permit, meeting a 0.8 mg/L concentration limit at design flows will not result in meeting the annual mass limit.

The Permittee must comply with both limitations and, as required by the permit, must operate the facility to meet the more restrictive limitation, which may vary depending upon discharge flows at the facility. If the facility is operating at design flows, the annual mass load limitation will be the more restrictive limitation. However, if the facility is operating at low flows, the monthly average concentration limit may be the more restrictive limitation.

Monthly sampling for total phosphorus is required.

Condition I.F.3.c. of this draft permit requires the submission of monitoring reports to the Secretary specific to tracking TP in the discharge. A report that documents the annual TP discharged from the facility, summarizes phosphorus removal optimization and efficiencies, and tracks trends relative to the previous year shall be attached to the December WR-43 form. The annual and monthly TP loads discharged from the facility shall also be reported electronically with other required parameters.

Analysis in Support of Phosphorus Limit:

The Secretary is using the WLA from the LC TMDL[1] as the water quality-based effluent

[1] Available at:
https://ofmpub.epa.gov/waters10/attains_impaired_waters.show_tmdl_document?p_tmdl_doc_blobs_id=79000

limitation (WQBEL) for phosphorus for this permit. Because this is the first permit issued to this facility under the new LC TMDL and the TMDL is less than five years old[2], an analysis of the assumptions underlying the TMDL is not required. *In re Montpelier WWTF Discharge Permit*, 2009 WL 4396740, 6, 9-10 (Vt. Envtl. Ct. June 30, 2009) (stating that it "probably would have been meaningless to engage in further analysis" of the 2002 Lake Champlain TMDL a mere year and a half after its adoption, while also holding that when issuing a permit more than five years after the adoption of a TMDL, ANR must assess whether the past assumptions upon which the WLA was based upon "continue to have a basis of reliability"). Notwithstanding the fact that an analysis is not required, the Agency provides the following.

Using the WLA from the LC TMDL as the phosphorus WQBEL in the permit is appropriate because the State is making significant progress toward meeting the assumptions upon which the WLA is based.

First, the State has largely met the milestones in the LC TMDL Accountability Framework[3] and is actively working to meet those that are still outstanding. For 2016, EPA has already given Vermont an "excellent" report card for meeting milestones by December 30, 2016 (see below). For 2017, as outlined in the 2018 Vermont Lake Champlain Phosphorus Total Maximum Daily Loads Accountability Framework Report[4], the State has completed a majority of the milestones in the LC TMDL Accountability Framework due by December 30, 2017 and is actively working to complete those that are still outstanding. While not every milestone was completed by December 30, 2017, this is not sufficient to undermine the assumption that reductions in other sectors will occur in the future. For example, while the "Developed Lands General Permit" has not yet been issued, the State is actively working to adopt the rules necessary to issue and implement this permit, and the date by which applicants must apply for coverage under the permit – October 1, 2023 – has not changed. Thus, despite a delay in issuance of this permit, it is still appropriate to assume that reductions will be achieved in this sector based upon the timeframe envisioned when the LC TMDL was issued.

Second, the EPA's assessment of the State's progress under the LC TMDL has found that the State is making satisfactory progress. EPA's "overall assessment is that Vermont has made excellent progress in achieving the milestones in the [LC TMDL] Accountability Framework" through December 30, 2016.[5] EPA's next "report card" is expected within a couple months. If EPA finds that the State's progress is not satisfactory, EPA may, amongst other things, revise the TMDLs to reallocate additional load reductions from nonpoint to point sources (i.e. create more stringent WLAs). EPA has taken no such actions, but rather, has thus far provided positive assessment of the State's compliance with the LC TMDL Accountability Framework. Therefore, the State has nothing from EPA indicating that the assumptions upon which the WLA was developed are no longer reliable.

With so little time having passed since adoption of the LC TMDL, with the State having

[2] The LC TMDL was issued June 17, 2016.
[3] For the Accountability Framework, see pages 54-59 of the LC TMDL.
[4] Submitted by the State to EPA on March 7, 2018; available at: http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/2018VermontLakeChamplainPhosphorusTMDLAccountabilityFrameworkReport.pdf
[5] Letter dated February 15, 2017 from EPA Acting Regional Administrator Deborah A. Szaro to Secretary of Natural Resources Julie Moore and Secretary of Agriculture, Food and Markets Anson Tebbetts.

completed or working to complete milestones, and with positive reports thus far from EPA, there is no reason to believe that the assumptions upon which the WLA was developed – including that discharges in other sectors will be reduced in the future – are no longer valid. Therefore, it is appropriate to establish the phosphorus WQBEL for this facility based upon its WLA in the LC TMDL.

Phosphorus Elimination and Reduction Plan:

To ensure the facility is operating as efficiently as possible for purposes of phosphorus removal, Condition I.F.3. of the permit requires that within 120 days of the permit effective date, the Permittee shall develop or update (as appropriate), and submit to the Secretary, a Phosphorus Optimization Plan (POP) to increase the WWTF's phosphorus removal efficiency by implementing optimization techniques that achieve phosphorus reductions using primarily existing facilities and equipment. The techniques to be evaluated may include operational process changes to enhance biological and/or chemical phosphorous removal, incorporation of anaerobic/anoxic zones, septage receiving policies and procedures, and side-stream management.

The facility shall have 12 months from the permit effective date to optimize removal of total phosphorus. If, after the 12-month optimization period, the WWTF's actual TP loads reach or exceed 80% of the LC TMDL WLA for the WWTF, based on the WWTF's 12-month running annual load calculated using the Phosphorus Load Calculation (Condition I.F.2.d. of the permit) the Permittee shall, within 90 days of reaching or exceeding 80% of the LC TMDL WLA for the WWTF, develop and submit to the Secretary a projection based on the WWTF's current operations and expected future loadings of whether it will exceed its WLA during the permit term.

If the facility is not projected to exceed its WLA within the permit term, the WWTF shall reassess when it is projected to reach its WLA prior to permit renewal and submit that information with its next permit application. If the facility is projected to exceed its WLA during the permit term, the Permittee shall submit a Phosphorus Elimination/Reduction Plan (PERP) within 6 months to the Secretary to ensure the WWTF continues to comply with its WLA. The PERP shall be treated as an application to amend the permit, and therefore, shall be subject to all public notice, hearing, and comment provisions, in place at the time the plan is submitted, that are applicable to permit amendments. The WWTF shall revise the PERP, if required by the Secretary.

2. Total Nitrogen (TN)

A quarterly "monitor only" requirement for TN has been included in this permit. TN is a calculated value based on the sum of NO_x and TKN, and, shall be reported as pounds, calculated as:

TN (mg/L) x Total Daily Flow x 8.34

where, TN (mg/L) = TKN (mg/L) + NO_x (mg/L)

Per EPA, excess nitrogen (N) and phosphorus (P) are the leading cause of water quality degradation in the United States. Historically, nutrient management focused on limiting a single nutrient—phosphorus or nitrogen—based on assumptions that production is usually phosphorus limited in freshwater and nitrogen limited in marine waters. Scientific research demonstrates this is an overly simplistic model. The evidence clearly indicates management of both phosphorus and nitrogen is necessary to protect water quality. The literature shows that aquatic flora and fauna have differing nutrient needs, some are P dependent, others N dependent and others are co-dependent on these two nutrients.

Like P, N promotes noxious aquatic plant and algal growth. High concentrations of P and N together cause greater growth of algae than P alone. The relative abundance of these nutrients also influences the type of species within the community. Furthermore, a high N-to-P ratio may exacerbate the growth of cyanobacteria, while elevated levels of nitrogen increase toxicity in some cyanobacteria species. Given the dynamic nature of all aquatic ecosystems, for the State to fully understand the degradation to water quality it is necessary to limit P and monitor bioavailable N (including nitrate, ammonium, and certain dissolved organic nitrogen compounds).

Facilities with design flow greater than 1 MGD will complete monthly monitoring unless more frequent sampling is already required by the permit. Facilities with design flows less than 1 MGD will complete quarterly unless more frequent sampling is already required by the permit.

For more information, see:
https://www.epa.gov/sites/production/files/documents/nandpfactsheet.pdf

3. **Total Kjeldahl Nitrogen (TKN)** – TKN is the sum of nitrogen in the forms of ammonia (un-ionized (NH_3) and ionized (NH_4^+)), soluble organic nitrogen, and particulate organic nitrogen. A quarterly "monitor only" requirement has been included in the draft permit.

4. **Nitrate/Nitrite (NO_x)** – Nitrite and nitrate are oxygenated forms of nitrogen. A quarterly "monitor only" requirement has been included in the draft permit.

5. **Settleable Solids** – The limitation of 1.0 mL/L instantaneous maximum and daily monitoring remain unchanged from the current permit. This numeric limit was established in support of the narrative standard in Section 29A-303(2) of the Vermont Water Quality Standards.

6. **Septage Received –** A daily "monitor only" requirement for the monthly total gallons of septage received has been included in the draft permit.

7. **Toxicity Testing** – 40 C.F.R. Part 122.44(d)(1) requires the Secretary to assess whether the discharge causes or has the reasonable potential to cause or contribute to an excursion above any narrative or numeric water quality criteria. Per these federal requirements, the Permittee shall conduct WET testing and toxic pollutant analyses according to the schedule outlined in Condition I.I. of the draft permit. If the results of these tests indicate a reasonable potential to cause an instream toxic impact, the Secretary may require additional WET testing, establish a WET limit, or require a Toxicity Reduction Evaluation.

8. **Annual Constituent Monitoring -** For all facilities with a design flow greater than 0.1 MGD, 40 CFR § 122.21(j) requires the submittal of effluent monitoring data for parameters identified in Condition I.C. of the draft permit. Samples must be collected once annually such that by the end of the term of the permit, all quarters have been sampled at least once, and the results will be submitted by December 31 of each year. For subsequent sampling, the "Guidance for Annual Constituent Monitoring" document should be referred to determine the season in which samples should be taken each year.

D. Special Conditions

1. **Laboratory Proficiency Testing -** To ensure there are adequate laboratory controls and appropriate quality assurance procedures, the Permittee shall conduct an annual laboratory proficiency test for the analysis of all pollutant parameters performed within their facility laboratory and reported as required by their NPDES permit. Proficiency Test samples must be obtained from an accredited laboratory or as part of an EPA DMR-QA study. Results shall be submitted to the Secretary by December 31, annually, beginning in **2021.**

2. **Operation Management and Emergency Response Plan (OMERP)** – The Permittee submitted the Operation, Management, and Emergency Response Plan for the treatment facility, sewage collection system, sewage pumping stations, and sewer line stream crossings on September 17, 2020. Through issuance of this permit the Secretary approves the inspection schedule for the plan. The Permittee shall implement the plan in accordance with that schedule. The Permittee shall revise the plan upon the Secretary's request or on its own motion to reflect equipment or operational changes.

3. **Engineering Evaluation** – An engineering evaluation condition is included in this permit. This condition requires the Permittee to conduct an in-depth inspection and report of the treatment facility to identify and repair equipment, processes, and other possible deficiencies which may adversely affect effluent quality or proper operation. This type of evaluation is required once every 20 years and per DEC records was last completed on April 28, 2005 after the completion of facility upgrades.

4. **Emergency Power Failure Plan** – The current Emergency Power Failure Plan for the facility was submitted on October 28, 2005. To ensure the facility can continue operations during the event of a power failure, Permittees are required to have Emergency Power Failure Plans on file. Within **90** days of the effective date of the permit, the Permittee must ensure this plan is up to date by submitting to the Secretary updated documentation addressing how the discharge will be handled in the event of an electric power outage.

5. **Electronic Reporting -** The EPA recently promulgated a final rule to modernize the Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule requires the inclusion of electronic reporting requirements in NPDES permits that become effective after December 21, 2015. The rule requires that NPDES regulated entities that are required to submit discharge monitoring reports (DMRs), including majors and non-majors, individually permitted or covered by a general permit, must do so electronically after December 2016. The Secretary has created an electronic reporting system for DMRs and has recently trained facilities in its use. As of

December 2020, these NPDES facilities will also be expected to submit additional information electronically as specified in Appendix A in 40 C.F.R. part 127.

6. **Noncompliance Notification -** As required by the passage of 10 V.S.A. § 1295, promulgated in the 2016 legislative session, Condition II.D.3. has been included in the draft permit. Section 1295 requires the Permittee to provide public notification of untreated discharges from wastewater facilities. The Permittee is required to post a public alert within one hour of discovery and submit to the Secretary specified information regarding the discharge within 12 hours of discovery.

7. **Reopener -** This draft permit includes a reopener whereby the Secretary reserves the right to reopen and amend the permit to implement an integrated plan to address multiple Clean Water Act obligations.

E. Reasonable Potential Analysis

The Secretary has conducted a reasonable potential analysis, which is attached to this Fact Sheet as Attachment A. Based on this analysis, the Secretary has determined the available data indicate that this discharge does not cause, have a reasonable potential to cause, or contribute to an instream toxic impact or instream excursion above the water quality criteria. As such, the development of water quality based effluent limitations (WQBELs) will not be necessary.

IX. Procedures for Formulation of Final Decision

The public comment period for receiving comments on this draft permit was from November 3, 2020 to December 3, 2020. Comments were received and considered in the formulation of the final determination to issue, deny, or modify the draft permit. Those comments and the replies are included below as Attachment B.

ATTACHMENT A.

REASONABLE POTENTIAL DETERMINATION

Agency of Natural Resources
Department of Environmental Conservation

Watershed Management Division
1 National Life Drive 3 Davis
802-828-1535

MEMORANDUM

To:	Kathleen Parrish, Wastewater Program (WWP)
From:	Michelle Graziosi, Monitoring and Assessment Program (MAP) Rick Levey, Monitoring and Assessment Program (MAP)
Cc:	Pete LaFlamme, Director, WSMD Bethany Sargent, Manager, MAP Amy Polaczyk, Manager, WWP
Date:	June 1, 2020
Subject:	MAP Reasonable Potential Determination for the Richmond Wastewater Treatment Facility (WWTF).

MAP has evaluated the draft permit limits for the Richmond WWTF in Richmond, Vermont pursuant to the 2012 procedure outlining WWM-WSMD roles and responsibilities. This memo provides MAP's review of the most recent water quality monitoring data for the receiving water of and current permit limits for the Richmond WWTF.

Facility:
Richmond WWTF
Permit No. 3-1173
NPDES No. VT010617

Hydrology for Richmond WWTF used in this evaluation:
Design Flow: 0.222 MGD = 0.343 CFS
7Q10 = 134.33 CFS
LMM = 396.68 CFS
IWC-7Q10 = 0.003 (IWC < 1%)
IWC-LMM= 0.001 (IWC < 1%)

Receiving Water:
Winooski River, Richmond, VT
Facility Location: Lat. 44.403837 Long. -73.00069

The Town of Richmond owns and operates the Richmond Wastewater Treatment Facility (WWTF) which consists of treatment through an Equalization (EQ) Tank, headworks equipped with a Lakeside mechanical screen and aerated grit removal system. Flows proceed to anoxic mixing and aeration tanks which are then processed through a clarifier. The effluent is filtered and processed through a UV

disinfection system before discharging to the Winooski River.

The Winooski River downstream of the Richmond WWTF discharge is a Class B(2) water and designated as Cold-Water Fish Habitat (see Appendix A, Vermont Water Quality Standards). A one-mile Waste Management Zone has been established in the river below the WWTF outfall pursuant to V.S.A., Section 1252.

The Stone Corral is the only known pretreatment facility connected to the Town's gravity-fed collection system.

General Assessment – VTDEC Assessment Database:
MAP maintains the VTDEC assessment database, an EPA-required database which described the conditions of Vermont's surface waters with respect to their attainment of VWQS. The database indicates that the Winooski River segment to which this facility discharges does fully support all designated uses.

Ambient Chemistry Data for the Winooski River below the Richmond WWTF:
Water quality sampling was conducted above the Richmond WWTF at River Mile (RM) 30.2 in 2015 and below at RM 29.9 in 2010 and 2015 (Table 1).

Water chemistry measures for the following parameters are available and summarized in Table 1: water temperature, pH, alkalinity, conductivity, dissolved oxygen and percent saturation, turbidity, total phosphorus (TP), total nitrogen (TN), and total ammonia nitrogen (TAN). Priority metals were analyzed above and below the WWTF at RM 30.2 and RM 29.9 respectively and are summarized in Table 4.

Data representativeness was assessed by evaluating the flow conditions at which samples were collected from field sheets and from the most proximal USGS gauge for which data were available, and in consideration of possible downstream sensitive reaches. The location of the upstream and downstream sampling locations (RM 30.2 and 29.9) effectively brackets the WWTF (Figure 1). The downstream sampling location is the most sensitive location.

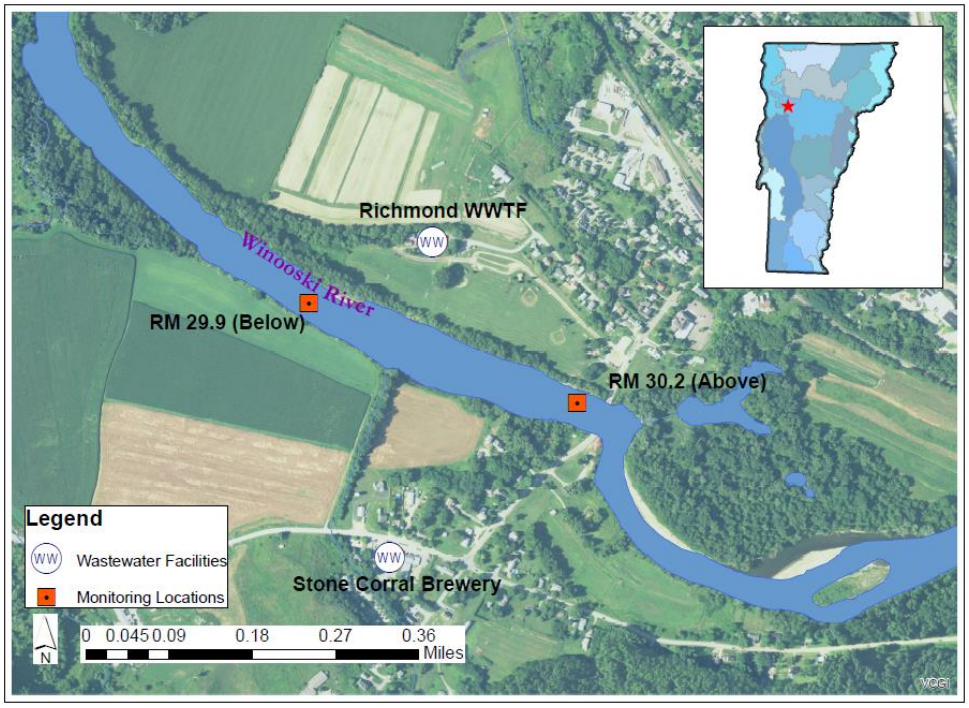


Figure 1. Winooski River near the Richmond WWTF, showing upstream monitoring location (RM 30.2), downstream monitoring location (RM 29.9) and facility location. Stone Corral Brewery is also shown here and is an industrial user that discharges directly to the Richmond WWTF.

Table 1. Concentrations of surface water chemistry above (RM 30.2) and below (RM 29.9) the Richmond WWTF.

Visit Date	Location	RM	Water Temp (deg C)	pH	Alkalinity (mg/l)	Conductivity (umho/cm)	DO (%)	DO (mg/l)	Turbidity (NTU)	Total Phosphorus (ug/l)	Total Nitrogen (mg/l)	Total Ammonia Nitrogen (mg/l)
9/14/2010	Below	29.9	16.6	7.8	-	219	96.2	9.20	-	-	-	-
8/19/2015	Above	30.2	24.1	7.8	-	241.2	77.8	6.45	1.32	10.0	0.55	<0.05
	Below	29.9	24.0	7.7	-	243.8	97.3	7.94	1.14	9.3	0.56	<0.05
9/9/2015	Above	30.2	-	-	69	-	-	-	0.98	9.8	0.65	<0.05
	Below	29.9	24.3	7.6	71	254	88.4	7.21	0.92	9.7	0.73	<0.05

Total Phosphorus, Total Nitrogen, Total Ammonia Nitrogen (TAN)

Total Phosphorus (TP) results show that concentrations above and below the facility (RM 30.2 & 29.9) were nearly equal. The recorded downstream values ranged from 9.3 µg/L – 9.7 µg/L with slightly higher values recorded upstream of the facility which ranged from 9.8 µg/L – 10 µg/L.

Total Nitrogen (TN) concentrations were also nearly equal upstream and downstream of the facility in August 2015 (0.55 mg/L-TN and 0.56 mg/L-TN, respectively). A slight increase of 0.08 mg/L-TN was measured below the facility in September 2015 (0.65 mg/L-TN above vs. 0.73 mg/L-TN below).

Total Ammonia Nitrogen (TAN) was below the detection limit of 0.05 mg/L-TAN both above and below the outfall in 2015.

Turbidity, Dissolved Oxygen, pH:
Turbidity values varied slightly between the August and September 2015 sampling events, and even less so between the above and below monitoring stations. The average turbidity for both locations was about 1 Nephelometric Turbidity Unit (NTU). For both 2015 sampling events, turbidity was slightly higher above the facility (1.32 NTU above vs. 1.14 NTU below in August, 0.98 NTU above and 0.92 NTU below in September).

Recorded pH values above and below the facility were also very similar (7.8 above and 7.7 below in August 2015).

In August 2015, the dissolved oxygen (DO) was higher downstream of the facility compared to the upstream monitoring site. Above the facility, DO was measured as 77.8% and 6.45 mg/L, while below the facility DO was measured as 97.3% and 7.94 mg/L. The lower upstream DO concentration could be due to difference in habitat or depth of sampling between the two sites. Downstream of the facility, water chemistry was collected in the same riffle from which macroinvertebrates were collected. The upstream sampling location may not have had available riffle habitat and samples were likely collected in a run, which tend to be less oxygenated than riffles. Both sampling locations meet the DO criteria for a cold-water stream (Table 3).

Biological Assessments:
Biological assessments were conducted in 2010 and 2015 below the Richmond WWTF at RM 29.9. Both met water quality standards for the Medium High Gradient Stream Type (MHG) (Table 2).

Table 2. Macroinvertebrate assessment results for the Winooski River RM 29.9, below the Richmond WWTF. Scoring guidelines are for Stream Type WWMG and WQ Class B (2).

Macroinvertebrate Site Summay											
Date	Location	RM	Density	Richness	EPT Richness	PMA-O	B.I.	Oligo.	EPT/EPT + Chiro	PPCS-F	Community Assessment
9/14/2010	**Below**	29.9	4000	44.0	25.0	79.8	3.57	0.70	0.96	0.36	Meets WQS
9/9/2015	**Below**	29.9	1505	41.0	26.0	75.2	4.46	0.23	0.87	0.46	Meets WQS
Full Support			≥ 300	≥ 30	≥ 16	≥ 45	≤ 5.4	≤ 12	≥ 0.45	≥ 0.4	
Indeterminate			≥ 250	≥ 28	≥ 15	≥ 40	≤ 5.65	≤ 14.5	≥ 0.43	≥ 0.35	
Non-Support			< 250	< 28	< 15	< 40	> 5.65	> 14.5	< 0.43	< 0.35	

Total Phosphorus:

Instream Phosphorus concentrations were calculated using a Simple Steady State Receiving Water Concentration Model, such that Receiving Water Concentration (RWC) equals:

RWC = Qe*Ce / (Qe + Qs)
Qe = effluent flow (MGD or CFS)
Ce= Effluent concentration (mg/L)
Qs = Receiving Water flow (MGD or CFS)

Full design effluent flow (Qe) of 0.343 CFS was used, with effluent TP concentration (Ce) of 0.085 mg/L, which is the average monthly effluent concentration measured during 2015-2019 (n=59) from facility monitoring records. The low median monthly flow of 396.68 CFS was used for receiving water flow (Qs) as this is the critical flow to use for nutrient criteria implementation.

At these conditions the calculated RWC of TP attributable to the Richmond WWTF is 0.00007 mg/L-TP (0.07 µg/L-TP), this is an extremely small contribution, less than 1/10th ppb and represents greater than 1000-fold dilution available at LMM flows.

(RWC= (0.343 CFS) (0.085 mg/L) / 0.343 CFS + 396.68 CFS = 0.00007 mg/L-TP)

Review of the Richmond WWTF flow records indicate that average facility flow for 2014-2018 is 0.07 MGD, which is 31.5% percent of the 0.222 MGD permit limit. Instream TP concentrations (RWC) attributable to discharge at the average flow rate and average TP effluent concentration would be 0.02 µg/L-TP.

Instream monitoring data from above and below the discharge indicate no detectable increase in TP and was recorded between 9 - 10 µg/L above and below the facility in 2015. The TP nutrient criteria threshold for Class B(2) Warm Water Medium Gradient streams is 27 µg/L.

The potential impacts of phosphorus discharges from this facility to the receiving water have been assessed in relation to the narrative criteria in §29A-302(2)(A) of the 2017 VWQS, which states:

> *In all waters, total phosphorous loadings shall be limited so that they will not contribute to the acceleration of eutrophication or the stimulation of the growth of aquatic biota in a manner that prevents the full support of uses.*

To interpret this standard, MAP typically relies on a framework which examines TP concentrations in relation to existing numeric phosphorus criteria and response criteria in §29A-306(a)(3)(c) of the Water Quality Standards, for streams that can be assessed using macroinvertebrate biocriteria. Under this framework, MAP can make a positive finding of compliance with the narrative standard when nutrient criteria are attained, or when specific nutrient response variables; pH, Turbidity, Dissolved Oxygen, and aquatic life use, all display compliance with their respective criteria in the Water Quality Standards.

Both the instream water sampling results and mass balance calculations using facility effluent monitoring records indicate that the increases in phosphorus attributable to this facility are extremely low, less than 1/10th ppb-TP.

Further, aquatic life use is shown to be fully supported, and the stream complies with VWQS for all identified response variables. Therefore, the narrative standard presented in §3-01. B.2 of the VWQS is supported (Table 3) as are the combined numeric nutrient criteria in §29A-306(a)(3)(c). MAP recommends continued monthly TP effluent monitoring as a permit requirement to continue to assess compliance with the 2014 nutrient criteria and Lake Champlain TMDL at the next permit issuance.

Table 3. Assessment of phosphorus response variables for the Winooski River above (RM 30.2) and below (RM 29.9) the Richmond WWTF. The relevant target values are references to the appropriate section of the VWQS.

Response variable (VWQS reference)	Target Value	River Mile: 30.2 (Upstream) 8/19/2015	River Mile: 29.9 (Downstream) 8/19/2015
pH (§3-01.B.9)	6.5-8.5 s.u.	*7.8*	*7.7*
Turbidity (§3-04.B.1)	< 10 NTU at low mean annual flow	*1.32*	*1.14*
Dissolved Oxygen (min) (§3-04.B.2)	>6 mg/L and 70% saturation	*6.45 (77.8%)*	*7.94 (97.3%)*
Aquatic biota, based on macroinvertebrates.	Attaining an assessment of good, or better.	*N/A*	*Meets WQS (9/9/2015)*

Whole Effluent Toxicity (WET) and Priority Pollutant Testing:
40 CFR Part 122.44(d)(1) requires the Agency to assess whether the discharge causes or has the reasonable potential to cause or contribute to an excursion above any narrative or numeric water quality criteria. The goal of the Vermont Toxic Discharge Control Strategy is to assure that the state water quality standards and receiving water classification criteria are maintained.

It is recommended the 2020 draft permit require one summer (August-October 2022) and one winter (January/February 2024) 2-species acute WET test.

Ammonia Monitoring:
Facility monitoring records indicate an annual ammonia monitoring results collected in 2015, 2017, 2018 and 2019 range from 0.22 mg/L-TAN – 0.99 mg/L-TAN with an average of 0.60 mg/L-TAN (n=4). Using the maximum effluent TAN concentration of 0.99 mg/L, the IWC attributable to this facility at 7Q10 design flow conditions would be 0.003 mg/L-TAN (IWC-7Q10 0.003 * 0.99 mg/L-TAN = 0.003 mg/L-TAN). The EPA chronic criteria for ammonia at pH 8.0 and Temperature of 20C is 0.78 mg/L-TAN. Although the available data and significant dilution at 7Q10 flows does not indicate a risk of exceeding the TAN criteria, MAP recommends that the annual effluent ammonia monitoring requirement is maintained in the permit reissuance to continue to assess RP for ammonia. In addition, Total Kjeldahl Nitrogen (TKN) results may be used as a conservative assessment of TAN in the discharge.

Suspended Solids, Hardness, and Metals:
Instream total suspended solids were calculated using the 7Q10 of 134.33 CFS at design flow of 0.343 CFS (0.222 MGD) assuming the maximum permitted daily concentration of 50 mg/L. The calculated suspended solids concentration at these conditions is 0.15 mg/L (7Q10-IWC 0.003 X 50 = 0.15 mg/L), indicating a very slight increase of instream ambient suspended solids concentrations in receiving waters.

The hardness of the Winooski River below the Richmond WWTF (RM 29.9) was 90.3 mg/l CaCO3 on 9/9/2015 (Table 4). Hardness data are utilized to determine compliance with Vermont's aquatic biota-

based metals criteria as specified in § 29A-303(7) and Appendix C of the Vermont Water Quality Standards. Vermont DEC priority metal chemistry data below the outfall (Table 4) did not detect any exceedances of the VWQS.

The potential for municipal WWTFs to discharge metals was evaluated by collecting and analyzing over 15 years of effluent data from facilities in Vermont. Using statistical analysis and the methodology described in the EPAs TSD a screening value was developed for each individual metal based on the number of samples, the coefficient of variability and the maximum observed values. Hardness-based VWQS were calculated for each metal, and these values were used to determine the in-stream waste concentration at which a discharge is likely to exceed VWQS for metals based on hardness and the potential metal effluent concentrations.

Based on the IWC, the receiving water not being identified as impaired or stressed, and the absence of known toxic discharges, this facility does not have Reasonable Potential to discharge metals in toxic amounts. No additional monitoring should be included in the permit. In the event of an upset, toxic bypass or failing WET test, metals analysis may be required as part of the process to identify the source of toxicity.

Table 4. Priority pollutant metals measured above (RM 30.2) and below (RM 29.9) the Richmond WWTF.

Visit Date	**9/9/2015**	
Location	**Above**	**Below**
RM	**30.2**	**29.9**
Hardness (mg/L)	88.68	90.31
Total Aluminum (ug/l)	<50	<50
Total Antimony (ug/l)	<10	<10
Total Arsenic (ug/l)	<1	<1
Total Beryllium (ug/l)	<1	<1
Total Cadmium (ug/l)	<1	<1
Total Calcium (mg/l)	29.18	30.08
Total Chromium (ug/l)	<5	<5
Total Copper (ug/l)	<10	<10
Total Iron (ug/l)	74.96	70.21
Total Lead (ug/l)	<1	<1
Total Magnesium (mg/l)	3.841	3.69
Total Manganese (ug/l)	35.13	36.65
Total Molybdenum (ug/l)	<5	<5
Total Nickel (ug/l)	<5	<5
Total Selenium (ug/l)	<5	<5
Total Silver (ug/l)	<1	<1
Total Thallium (ug/l)	<1	<1
Total Zinc (ug/l)	<50	<50

Recommended Biological and Water Quality Monitoring:
Monitoring results consistently indicate attainment of all thresholds, the stream complies with VWQS for

all identified response variables, and that the narrative standard presented in §29A-302(2)(A) of the VWQS is supported (Table 3). Thus, MAP does not recommend biomonitoring be included in the permit. To better assess compliance with the 2014 nutrient criteria and Lake Champlain TMDL at the next permit issuance, MAP does support the effluent monitoring required by the permit which includes effluent monitoring for TP and TAN.

Recommended Effluent Monitoring:
In addition to the monitoring required in the current permit, the following monitoring is suggested for inclusion in the renewed permit to provide additional data to support future Reasonable Potential Determinations:

- To provide additional data for future assessments of WET reasonable potential, it is recommended two 2-species acute tests be included in the draft permit, one during the summer (August-October 2022) and winter (January/February 2024).

- The facility is subject to comply with the Lake Champlain TMDL (LC TMDL). For the next permit term, phosphorus sampling shall be completed monthly and comply with the TMDL 0.2 mg/L maximum daily limitation for Total Phosphorus. Per the LC TMDL, the annual phosphorus loading rate will be reduced to 134 lbs./year. The monitoring frequency should not change from the current permit.

Conclusion:
The available data indicate that this discharge does not cause, have a reasonable potential to cause, or contribute to an instream toxic impact or instream excursion above the water quality criteria. As such, the development of WQBELs will not be necessary.

ATTACHMENT B.

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
NPDES Discharge Permit # 3-1173
Town of Richmond
Wastewater Treatment Facility

The above referenced permit was placed on public notice for comment from a period of November 3, 2020 through December 3, 2020. This is a renewal permit.

Comments on the draft permit were received during the public notice period from Kendall Chamberlin, on behalf of the Town of Richmond. The following is a summary of the comments and the Agency's responses to those comments. A copy of any or all comments received can be obtained by contacting the Agency's Watershed Management Division at (802) 828-1115. See letter dated November 27, 2020 from the Town of Richmond (attached).

RESPONSE TO TOWN OF RICHMOND:

COMMENT:

Reducing Richmond's annual phosphorus pounds limit from 405 to 134 puts Richmond at a significant future disadvantage. The fact finding the permit reduction is based on is sound today, however, it does not provide an equitable solution for any future growth in the community and potentially imposes inequitable costs on the community to do so. I will use Waterbury as an example, in that should Richmond grow to need ~.500 mgd in comparable size, our discharge would have to be significantly lower in phosphorus to meet 134 lbs annual discharge. Since the Monitoring and Assessment Program (MAP) for Richmond performed by the state concludes: *"Both the instream water sampling results and mass balance calculations using facility effluent monitoring records indicate that the increase in phosphorus attributable to this facility are extremely low, less than 1/10th ppb-TP"*, my question is: Should Richmond grow in the future and require additional WW capacity (for example, a flow increase to .500 mgd), will the annual phosphorus lbs limit be increased comparably to Waterbury (over 300 lbs annually) or will Richmond be required to still meet 134 lbs regardless?

RESPONSE:

Should Richmond grow in the future and require additional hydraulic capacity, the facility will continue to be required meet the 134 lbs/year phosphorus limit while the 2016 Lake Champlain TMDL is in effect. When the wasteload allocation was calculated under the Lake Champlain TMDL, the USEPA applied a method that refers to future, as well as existing, point and nonpoint sources (40 C.F.R. 130.2(g) and (h)). The Vermont Wasteload Allocation Process also includes future population growth in establishing wasteload allocations. The requirement to maintain 134 lbs/yr TP loading if a flow increase is granted is also consistent with the Secretary's approach to permitting throughout Vermont, where facilities that expand are held to existing loading rates to abide by the state Antidegradation Policy and Federal Anti-Backsliding requirements.

An option for the Town of Richmond is wasteload reallocation. The town may come to a formal agreement with another town discharging to the Main Lake segment of Lake Champlain to reallocate Phosphorus between the facilities. Once both parties agree to the terms of the reallocation in a Memorandum of Understanding, the Wastewater Management Program will amend the applicable permits to reallocate the TP load. However, the facility will continue to be held to the statutory discharge limit of 0.8 mg/L TP on average per month.

COMMENT:

The Richmond WWTF has kept Brook Trout, Rainbow Trout and Brown Trout in an idled aeration tank filled with 100% treated effluent since 2006. The tank also has a robust assortment of aquatic macro invertebrates, including midge hatches and other organisms. Ducks land on it in the winter. Additionally, our clarifiers support a rich diversity of plant life such as cattails, duckweed, grasses, lily pads and the like, which in my opinion enhance treatment. As you know, Brook Trout are generally accepted as superior water quality indicators, as they only thrive in clean, cold water. During discussions during the permit preview, it was indicated that Richmond could apply for a WET test exemption going forward should the testing in this permit be 100%. WET testing is very expensive. As Richmond has taken/is taking significant amounts of septage along with industrial discharge and domestic waste since 2006, any toxicity of our effluent would have been indicated by loss of our small wetland community, along with the trout. I can provide testimony this has never happened due to toxicity. Since there is a clause in the permit that states *"if the results of these tests indicate a reasonable potential to cause an instream toxic impact, the Secretary may require additional WET testing, establish a WET limit, or require a Toxicity Reduction Evaluation",* it seems only fair to include the opposite: I respectfully ask that if Richmond performs WET testing that confirms no toxicity during this permit period, The Secretary puts in writing a statement that indicates WET testing can be substantially reduced or eliminated going forward until/unless there is a substantial change in the facility discharge.

RESPONSE: The condition quoted above is a required standard permit condition based on State and Federal requirements to ensure conformance with the Clean Water Act's prohibition on toxic pollutants in toxic amounts, 33 U.S.C. § 1251(a)(3) (CWA), and the related narrative condition of Vermont Water Quality Standards (VWQS) § 29A-303(7)(A)(iii), requiring waters to be "managed to prevent the discharge of toxic substances in concentrations, quantities, or combinations that exceed . . . acute or chronic toxicity to aquatic biota or wildlife" ("No Toxics in Toxic Amounts").

While the biota maintained by the facility may be an indicator of effluent quality, WET tests are designed to test for toxicity in a controlled environment that the biota living in your facility may have adapted to over time. Moreover, changes to WET testing could be required when there is a substantial change in the facility influent/sources as well as changes in the discharge. However, it is currently the approach of the Wastewater Management Program to reduce WET testing if all WET tests conducted over the permit term have a No Observable Effect Concentration (NOEC)

and a Lowest Observable Effect Concentration (LOEC) >= 100% effluent (i.e., no acute or chronic toxicity).

COMMENT:

Richmond currently has been doing the singular annual constituent monitoring in consecutive quarters that includes nitrate/nitrite, TKN, nitrogen and ammonia. *It currently does not require a total phosphorus test.* The proposed permit moves to quarterly nitrate/nitrite, TKN and nitrogen testing. The new permit requires all components of nitrogen be tested quarterly except ammonia. Since ammonia is part and parcel of EPA criteria, it seems odd to me to continue the nitrogen portion of the annual constituent monitoring to obtain one random ammonia sample per year. It also seems redundant to include phosphorus in that testing when that is already specified monthly in the new permit. I understand continuing to monitor for dissolved oxygen, oil and grease, total dissolved solids, and temperature for the annual constituent monitoring, but not nitrogen components or phosphorus. Can the draft permit be modified to require a quarterly ammonia sample to go along with the other nitrogen constituents to provide better data? Can any/all nitrogen and phosphorus monitoring be eliminated from the annual constituent monitoring?

RESPONSE:

Condition I.C.1. states the following: *Unless monitoring more frequently than annually, the Permittee shall monitor outfall serial number S/N 001 and submit the results, including units of measurement by December 31 annually for the following parameters.*

TP, TN, TKN, and NO_x are exempt from annual constituent monitoring and shall be sampled in accordance with Condition I.A.1. of the discharge permit. Total Ammonia Nitrogen shall be sampled annually during the annual constituent monitoring sampling event.

COMMENT:

The permit under 3.Discharge special conditions, d. states" Total Nitrogen (TN) shall be reported as pounds TN and calculated as: TN (mg/L) x Total Daily Flow x 8.34; where, TN (mg/L) = TKN (mg/L) + NOx (mg/L)." I am somewhat unclear how the result we get from the quarterly sample will be used for this calculation from the sampling day until the next sample. Please expand for clarity how this new monitor only permit limit (2 and 5) is to be calculated daily in subsection d.

RESPONSE:

The calculation should be completed once per quarter to reflect the TN discharge on the day of sampling. It is not intended to quantify the TN discharged during the entire quarter. The calculation should be carried out based on the quarterly samples of NOx and TKN required, with the flow on the day these samples were collected used as the "Total Daily Flow" in the calculation.

COMMENT:

It often seems like monitor-only testing of effluent constituents typically leads to future costly regulatory treatment requirements for those constituents. Richmond will incur significant costs over the term of the permit to test for nitrogen constituents. The results of this testing may require significant future costs for Richmond. Can the Secretary state in writing in the new permit that any/all future facility modifications required to treat as yet undetermined limits related to the nitrogen monitoring requirements in this permit be fully eligible for as much federal/state funding as available at that time?

RESPONSE:

The estimated cost for a TN sample is $75 (based on the current Endyne price list), resulting in an increased compliance cost of around $225 per year, as nitrogen constituents were required once per year during annual constituent monitoring. This equates to an increase of approximately $1125 over the 5-year permit cycle. As permits are renewed, particularly after many years of administrative continuance, the Wastewater Management Program assesses the discharge for reasonable potential to exceed or contribute to an exceedance of Vermont Water Quality Standards. Sufficient effluent data allow permit writers to determine if additional limits are required and often the more data collected, the less likely permit limits are required since we have a better representation of the variability of monitored parameters over the permit cycle. Limits are included when the data indicate they are required to protect water quality.

All municipal facilities are eligible to apply for applicable federal and state funding to support upgrades. However, it is outside the jurisdiction of the permitting program to include funding eligibility statements in the permit.

From: Kendall Chamberlin
To: ANR - WSMD Wastewater
Subject: 3-1173 Town of Richmond PUBLIC COMMENTS
Date: Friday, November 27, 2020 2:21:07 PM

Good afternoon to whom it may concern.

Comments on discharge permit # 1173, Town of Richmond.

As Chief Operator of the Richmond WWTF and a private citizen of the state, I'd like to post some comments on the draft discharge permit For the Town of Richmond.

1) Phosphorus

Reducing Richmond's annual phosphorus pounds limit from 405 to 134 puts Richmond at a significant future disadvantage. The fact finding the permit reduction is based on is sound today, however, it does not provide an equitable solution for any future growth in the community and potentially imposes inequitable costs on the community to do so. I will use Waterbury as an example, in that should Richmond grow to need ~.500 mgd in comparable size, our discharge would have to be significantly lower in phosphorus to meet 134 lbs annual discharge. Since the Monitoring and Assessment Program (MAP) for Richmond performed by the state concludes: *"Both the instream water sampling results and mass balance calculations using facility effluent monitoring records indicate that the increase in phosphorus attributable to this facility are extremely low, less than 1/10th ppb-TP"*, my question is:

Should Richmond grow in the future and require additional WW capacity (for example, a flow increase to .500 mgd), will the annual phosphorus lbs limit be increased comparably to Waterbury (over 300 lbs annually) or will Richmond be required to still meet 134 lbs regardless?

2) Effluent toxicity testing.

The Richmond WWTF has kept Brook Trout, Rainbow Trout and Brown Trout in an idled aeration tank filled with 100% treated effluent since 2006. The tank also has a robust assortment of aquatic macro invertebrates, including midge hatches and other organisms. Ducks land on it in the winter. Additionally, our clarifiers support a rich diversity of plant life such as cattails, duckweed, grasses, lily pads and the like, which in my opinion enhance treatment. As you know, Brook Trout are generally accepted as superior water quality indicators, as they only thrive in clean, cold water. During discussions during the permit preview, it was indicated that Richmond could apply for a WET test exemption going forward should the testing in this permit be 100%. WET testing is very expensive. As Richmond has

taken/is taking significant amounts of septage along with industrial discharge and domestic waste since 2006, any toxicity of our effluent would have been indicated by loss of our small wetland community, along with the trout. I can provide testimony this has never happened due to toxicity. Since there is a clause in the permit that states *"if the results of these tests indicate a reasonable potential to cause an instream toxic impact, the Secretary may require additional WET testing, establish a WET limit, or require a Toxicity Reduction Evaluation",* it seems only fair to include the opposite:

I respectfully ask that if Richmond performs WET testing that confirms no toxicity during this permit period, The Secretary puts in writing a statement that indicates WET testing can be substantially reduced or eliminated going forward until/unless there is a substantial change in the facility discharge.

3) Annual Constituent Monitoring.

Richmond currently has been doing the singular annual constituent monitoring in consecutive quarters that includes nitrate/nitrite, TKN, nitrogen and ammonia. *It currently does not require a total phosphorus test.* The proposed permit moves to quarterly nitrate/nitrite, TKN and nitrogen testing. The new permit requires all components of nitrogen be tested quarterly except ammonia. Since ammonia is part and parcel of EPA criteria, it seems odd to me to continue the nitrogen portion of the annual constituent monitoring to obtain one random ammonia sample per year. It also seems redundant to include phosphorus in that testing when that is already specified monthly in the new permit. I understand continuing to monitor for dissolved oxygen, oil and grease, total dissolved solids and temperature for the annual constituent monitoring, but not nitrogen components or phosphorus.

Can the draft permit be modified to require a quarterly ammonia sample to go along with the other nitrogen constituents to provide better data? Can any/all nitrogen and phosphorus monitoring be eliminated from the annual constituent monitoring?

4) Nitrogen Total, Daily Max.

The permit under 3.Discharge special conditions, d. states" Total Nitrogen (TN) shall be reported as pounds TN and calculated as: TN (mg/L) x Total Daily Flow x 8.34; where, TN (mg/L) = TKN (mg/L) + NOx (mg/L)." I am somewhat unclear how the result we get from the quarterly sample will be used for this calculation from the sampling day until the next sample.

Please expand for clarity how this new monitor only permit limit (2 and 5) is to be calculated daily in subsection d.

5) Future Nitrogen

It often seems like monitor-only testing of effluent constituents typically leads to future costly regulatory treatment requirements for those constituents. Richmond will incur significant costs over the term of the permit to test for nitrogen constituents. The results of this testing may require significant future costs for Richmond.

Can the Secretary state in writing in the new permit that any/all future facility modifications required to treat as yet undetermined limits related to the nitrogen monitoring requirements in this permit be fully eligible for as much federal/state funding as available at that time?

Thank you for the ability to submit comments on Richmond's proposed new discharge permit.

Kendall Chamberlin

966 Old Pump Road

Essex Junction, VT 05452

Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
1 National Life Drive,Davis 3
Montpelier, VT 05620-3522

Permittee:	
NPDES Permit No.	
Preparer/Contact:	
Telephone:	
Email:	
Month/Year:	

Total Phosphorus Waste Load Allocation from Lake Champlain Phosphorus TMDL:		metric tons/year lbs/year	Select your facility in the pulldown list next to Permittee above.
Monthly Average TP concentration		mg/L	Enter this value from WR-43.
Monthly Average Daily Flow Rate		MGD	Enter this value from WR-43.
Number of days with discharge		days	Enter the number of days with discharge.
Average TP Concentration * Average Flow Rate * Days of Discharge * 8.34	0.00	lbs	Pounds of Phosphorus discharged this month.
12 Month Running Total Pounds of Phosphorus		lbs/year	Enter the 12 Month Running Total Pounds of Phosphorus.
12 Month Running Total / Waste Load Allocation * 100		%	Percentage of Annual Phosphorus Load from TMDL

This form should be submitted monthly by facilities that have a Total Phosphorus Waste Load Allocation under the Lake Champlain Phosphorus TMDL. If you have a permit issued before 2017 DO NOT USE this form.

Notes:

Table 9. Vermont Individual WWTF Phosphorus Wasteload Allocations
(*Facilities with allocations different from the 2002 TMDLs are shown in italics.*)

Facility	Lake Segment	Design Flow (mgd)	Current Permit Load (mt/yr)	TMDL Wasteload Allocation (mt/yr)	Change in Permitted Load (mt/yr)
Alburgh	13 Isle LaMotte	0.130	0.108	0.108	0.000
Barre City	*05 Main Lake*	4.000	3.314	1.105	-2.209
Barton				0.246	
Benson	01 South Lake B	0.018	0.122	0.122	0.000
Brandon	04 Otter Creek	0.700	0.580	0.580	0.000
Brighton				0.695	
Burlington Electric McNeil Generating Station	05 Main Lake	0.365	0.017	0.017	0.000
Burlington Main	*07 Burlington Bay*	5.300	4.392	1.464	-2.928
Burlington North	*05 Main Lake*	2.000	1.657	0.552	-1.105
Burlington River (East)	*05 Main Lake*	1.200	0.994	0.331	-0.663
Cabot	05 Main Lake	0.050	0.041	0.041	0.000
Castleton	01 South Lake B	0.480	0.397	0.397	0.000
Enosburg Falls	*12 Missisquoi Bay*	0.450	0.373	0.124	-0.249
Essex Junction	*05 Main Lake*	3.300	2.569	0.911	-1.658
Fair Haven	01 South Lake B	0.500	0.414	0.414	0.000
Fairfax	09 Malletts Bay	0.078	0.539	0.539	0.000
Global Foundries (I B M Corp)	*05 Main Lake*	8.000	5.531	2.210	-3.321
Hardwick	09 Malletts Bay	0.371	0.410	0.410	0.000

Hinesburg	*06 Shelburne Bay*	*0.250*	*0.276*	*0.069*	*-0.207*
Jeffersonville	09 Malletts Bay	0.077	0.532	0.532	0.000
Johnson	09 Malletts Bay	0.270	0.224	0.224	0.000
Marshfield	05 Main Lake	0.045	0.311	0.311	0.000
Middlebury	04 Otter Creek	2.200	1.823	1.823	0.000
Milton	09 Malletts Bay	1.000	0.829	0.829	0.000
Montpelier	*05 Main Lake*	3.970	3.290	1.097	-2.193
Morrisville	09 Malletts Bay	0.550	0.352	0.352	0.000
Newport City				0.964	
Newport Town (Newport Center)	*12 Missisquoi Bay*	0.042	0.006	0.116	0.110
North Troy	*12 Missisquoi Bay*	0.110	0.760	0.122	-0.638
Northfield	*05 Main Lake*	1.000	0.829	0.276	-0.553
Orleans				0.176	
Orwell	02 South Lake A	0.033	0.228	0.228	0.000
Otter Valley Union High School	04 Otter Creek	0.025	0.173	0.173	0.000
P B M Nutritionals Inc	09 Malletts Bay	0.425	0.352	0.352	0.000
Pawlet (West Pawlet)	01 South Lake B	0.040	0.276	0.276	0.000
Pittsford	04 Otter Creek	0.085	0.483	0.483	0.000
Pittsford Fish Hatchery (US Dept of Interior-DEisenhower NFH)	04 Otter Creek	2.600	0.691	0.691	0.000
Plainfield	*05 Main Lake*	0.125	0.691	0.138	-0.553

Poultney	01 South Lake B	0.500	0.414	0.414	0.000
Proctor	04 Otter Creek	0.325	0.359	0.359	0.000
Richford	*12 Missisquoi Bay*	0.380	0.420	0.105	-0.315
Richmond	*05 Main Lake*	0.222	0.184	0.061	-0.123
Rutland City	04 Otter Creek	8.100	5.634	5.634	0.000
Shelburne #1 (Crown Road)	*06 Shelburne Bay*	0.440	0.348	0.122	-0.226
Shelburne #2 (Harbor Road)	*06 Shelburne Bay*	0.660	0.497	0.182	-0.315
Sheldon Springs	12 Missisquoi Bay	0.054	0.373	0.373	0.000
Shoreham	04 Otter Creek	0.035	0.242	0.242	0.000
South Burlington Airport Parkway	*05 Main Lake*	3.300	1.906	0.911	-0.995
South Burlington Bartlett Bay	*06 Shelburne Bay*	1.250	0.878	0.345	-0.533
St Albans Northwest Correctional	11 St. Albans Bay	0.040	0.028	0.028	0.000
St. Albans City	*11 St. Albans Bay*	4.000	2.762	1.105	-1.657
Stowe	*05 Main Lake*	1.000	0.282	0.276	-0.006
Swanton	*12 Missisquoi Bay*	0.900	0.746	0.249	-0.497
Troy/Jay	*12 Missisquoi Bay*	0.800	0.221	0.221	0.000
Vergennes	04 Otter Creek	0.750	0.621	0.621	0.000
VT Fish & Wildlife - Ed Weed Fish Culture Station	05 Main Lake	11.500	0.914	0.914	0.000

VT Fish & Wildlife - Salisbury Fish Hatchery	04 Otter Creek	1.310	0.181	0.181	0.000
Wallingford FD 1	04 Otter Creek	0.120	0.829	0.829	0.000
Waterbury	*05 Main Lake*	0.510	0.563	0.141	-0.422
West Rutland	04 Otter Creek	0.450	0.364	0.364	0.000
WestRock Converting (Rock Tenn)	*12 Missisquoi Bay*	2.500	1.260	0.691	-0.569
Williamstown	*05 Main Lake*	0.150	1.036	0.166	-0.870
Winooski	*05 Main Lake*	1.400	1.160	0.387	-0.773
Total			55.802	32.336	-23.465

The yellow column contains the P loads for each facility in mt/year (metric ton per year).

Alburgh	3-1180
Barre City	3-1272 3-1202
Benson	3-1166
Brandon	3-1196 3-1213
Burlington Electric McNeil Generating Station	3-1219
Burlington Main	3-1331
Burlington North	3-1245
Burlington River	3-1247
Cabot	3-1440
Castleton	3-1238
Enosburg Falls	3-1234
Essex Junction	3-1254
Fair Haven	3-1307
Fairfax	3-1194
I B M Corp	3-1295
Hardwick	3-1143

Hinesburg	3-1172
Jeffersonville	3-1323
Johnson	3-1149
Marshfield	3-1195
Middlebury	3-1210
Milton	3-1203
Montpelier	3-1207
Morrisville	3-1155 3-1241
Newport Town	3-1236
North Troy	3-1139
Northfield	3-1158 3-1201
Orwell	3-1214
Otter Valley Union High School	3-0293
P B M Nutritionals Inc	3-1209
Pawlet	3-1220
Pittsford	3-1189
US Dept of Interior-DEisenhower NFH	3-1188
Plainfield	3-0381

Poultney	3-1231
Proctor	3-1298
Richford	3-1147
Richmond	3-1173
Rutland	3-1285
Shelburne 1 (Crown Rd)	3-1289
Shelburne 2 (Harbor Rd)	3-1304
Sheldon Springs	3-1108
Shoreham	3-1459
South Burlington - Airport Parkway	3-1278
South Burlington - Bartlett Bay	3-1284
St Albans Northwest Correctional	3-1260
St Albans City	3-1279
Stowe	3-1232
Swanton	3-1292
Troy & Jay	3-1311
Vergennes	3-0368
VT Fish & Wildlife - Ed Weed Fish Culture Station	3-1312

VT Fish & Wildlife - Salisbury Fish Hatchery	3-0361
Wallingford FD 1	3-0365
Waterbury	3-1160
West Rutland	3-1237
WestRock Converting Company	3-1118
Williamstown	3-1176
Winooski	3-1248