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

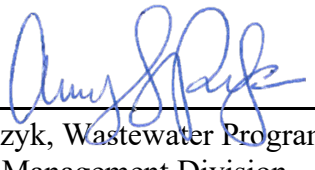
Permit Number: **3-1158**
PIN: **BR98-0399**
NPDES Number: **VT0100242**

Facility Name:	**Northfield WWTF**	
Facility Address:	**242 Dog River Rd** **Northfield VT 05663**	
Coordinates:	Lat: **44.1640**	Long: **-72.6569**
Expiration Date:	**12/31/2025**	
Reapplication Date:	**6/30/2025**	

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), and the federal Clean Water Act as amended (33 U.S.C. § 1251 *et seq*.), and implementing federal regulations, the Town of Northfield (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 Northfield Wastewater Treatment Facility (hereinafter referred to as the "WWTF") to the, Dog River, in accordance with the following conditions.

This permit shall be effective on December 1, 2020.

Peter Walke, Commissioner
Department of Environmental Conservation

By:  Date 11/3//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. 44.16369, Long. -72.65647: During the term of this permit, the Permittee is authorized to discharge from outfall S/N 001 of the Northfield WWTF to the Dog 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; 24 Hour Comp	**Year Round Weekly**	**250 lbs/day Monthly Avg**	**375 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**		
Chlorine, Total Residual; Effluent; Grab	**Year Round Daily**			**0.06 mg/l Weekly Avg**		**0.1 mg/l Instant Max**
Copper, Total; Influent; 8 Hour Comp	**Year Round Monthly**				**Monitor mg/l 30 Day Avg**	**Monitor mg/l Daily Max**
Copper, Total; Effluent; 24 Hour Comp	**Year Round 2 per Month**	**0.23 lbs/day 30 Day Avg**	**0.36 lbs/day Daily Max**		**0.027 mg/l 30 Day Avg**	**0.048 mg/l Daily Max**
E. Coli; Effluent; Grab	**Year Round 2 per Month**					**77 #/100 ml Instant Max**
Nitrogen, Ammonia Total; Effluent; Grab	**Year Round Monthly**					**Monitor mg/l Daily Max**
Nitrogen, Kjeldahl Total; Effluent; 24 Hour Comp	**06/01 - 09/30 2 per Month**		**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; 24 Hour Comp	**Year Round Weekly**			**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; 24 Hour Comp	**Year Round Weekly**	**250 lbs/day Monthly Avg**	**375 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**		
Ultimate Oxygen Demand; Effluent; Calculated	**06/01 - 09/30 2 per Month**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**

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**	**1.000 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**	**608 lbs/yr Annual Total**				
Suspended Solids, Total (%R); Percent Removal; Calculated	**Year Round Monthly**			**85 % Monthly Min**		

2. Discharge Sampling Points

a) Effluent sampling: The Permittee shall collect samples from the discharge pit prior to the v-notch weir and post dechlorination.

b) Influent sampling: The Permittee shall collect samples in the influent trough prior to the fine screen.

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: Average TN (mg/L) x Total Daily Flow x 8.34; where TN (mg/L) = TKN (mg/L) + NOx (mg/L).

e) Grab samples shall be collected in an alternating manner to be representative of each SBR cell discharged. For example, on Monday the sample shall be collected as cell #1 discharges, on Tuesday the sample shall be collected as cell #2 discharges, etc.

f) Settleable solids samples shall be collected during the period of peak flow.

g) The Permittee shall collect the daily total residual chlorine sample at the same time and location as the E. coli sample. Samples shall be collected between 6:00 AM and 6:00 PM.

h) Whole Effluent Toxicity monitoring shall be conducted as described below.

i) The Total Kjeldahl Nitrogen (TKN) and Ultimate Oxygen Demand (UOD) limitations apply from June 1 through September 30 annually.

UOD shall be reported as pounds and calculated with the following formula:
UOD (lbs/day) = [(BOD5 (lbs/day) × 1.43) + (TKN (lbs/day) × 4.57)]

j) If any two individual UOD results from a monitoring period equal or exceed 1,500 pounds per day, daily maximum, then this permit may be reopened and modified to incorporate any effluent limitations and implementation schedules necessary to ensure compliance with the Vermont Water Quality Standards.

k) 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.

l) 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%.

m) The monthly average concentrations of BOD5 and TSS in the effluent shall not exceed 15 percent of the monthly average concentrations of BOD5 and TSS in the influent into the WWTF.

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

o) 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.

p) 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.

q) 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 WWTF in the Dog River downstream 2.20 mile(s).

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, as an attachment to the DMR form WR-43 for the month in which the samples were taken for the following parameters:

Ammonia (as N)
Chlorine (total residual, TRC)
Dissolved oxygen

Nitrate/Nitrite
Kjeldahl nitrogen
Oil and grease
Phosphorus
Total dissolved solids

2. Grab samples shall be used for Temperature, Ammonia, 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.

D. CSO ANNUAL REPORT

1. The Permittee shall submit to the Secretary, according to the schedule table below, a report on CSO control project(s) of the previous calendar year. The Secretary will use the information from the report to monitor the progress on implementation of CSO control project(s). The Permittee shall report progress on:

a) Compliance with the Minimum Controls;

b) The condition and operation of the CSS;

c) The frequency, duration, and magnitude of the precipitation events leading to CSOs from the system in the past year and a comparison to prior years;

d) The frequency, duration, and magnitude of all CSOs from the system in the past year and a comparison to prior years;

e) The overall status of the Long Term Control Plan (LTCP); and

f) Key CSO control accomplishments, highlighting those that reduced the frequency and magnitude of CSOs; projects under design; and construction that occurred in the previous year.

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

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

Due Date	Event Description
1/31/2021	Permittee shall submit a report on CSO activities for the previous year by January 31.
1/31/2022	Permittee shall submit a report on CSO activities for the previous year by January 31.
1/31/2023	Permittee shall submit a report on CSO activities for the previous year by January 31.
1/31/2024	Permittee shall submit a report on CSO activities for the previous year by January 31.

E. EMERGENCY POWER FAILURE PLAN

1. The Permittee shall 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
3/1/2021	Permittee shall submit an updated Emergency Power Failure Plan within 90 days.

F. ENGINEERING EVALUATION AND REPORT/ASSET MANAGEMENT PLAN

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	Event Description
12/31/2024	Submit a 20-year evaluation conducted by a professional engineer.

G. OPERATIONS MANAGEMENT EMERGENCY RESPONSE PLAN (OMERP)

1. The Permittee shall prepare and submit to the Secretary for review and approval, an updated Operation, Management, and Emergency Response Plan for the treatment facility, sewage pumping stations, and sewer line stream crossings and sewage collection system. The Plan shall be immediately implemented upon approval by the Secretary. The Permittee shall revise these plans upon the Secretary's request or on its own motion to reflect equipment or operational changes. This plan shall comply with the provisions of 10 V.S.A. § 1278, which require:

a) Identification of those elements of the facility, including collection systems that are determined to be prone to failure based on installation, age, design, or other relevant factors.

b) Identification of those elements of the facility identified under subdivision (a) of this subsection which, if one or more failed, would result in a significant release of untreated or partially treated sewage to surface waters of the State.

c) The elements identified in subdivision (b) of this subsection shall be inspected in accordance with a schedule approved by the Secretary.

d) An emergency contingency plan to reduce the volume of a detected spill and to mitigate the effect of such a spill on public health and the environment.

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

Due Date	Event Description
5/1/2021	The Permittee shall submit a revised OMERP.

H. 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

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 Reduction and Elimination 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/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
2/1/2021	The Permittee shall submit a POP and implement optimization techniques to achieve reductions in TP.
4/1/2021	The Permittee shall commence implementation of the POP 60 days after submittal to the Secretary.
5/31/2022	The Permittee shall submit an annual report that documents TP trends and optimization techniques.
5/31/2023	The Permittee shall submit an annual report that documents TP trends and optimization techniques.
5/31/2024	The Permittee shall submit an annual report that documents TP trends and optimization techniques.
5/31/2025	The Permittee shall submit an annual report that documents TP trends and optimization techniques.

I. POLLUTANT SCAN (GREATER THAN 1 MGD)

1. The Permittee shall conduct an effluent analysis of outfall serial number S/N 001 for the pollutants included in Appendix J, Table 2 of 40 CFR Part 122 (see Attachment A) and submit the results to the Secretary.

2. When WET testing is required by this permit sampling for both the WET test and the Pollutant Scan shall coincide.

3. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall include the results of this effluent analysis with each WET test conducted.

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

Due Date	Event Description
12/31/2021	The Permittee shall submit pollutant scan results for August-October 2021 sampling.
6/30/2022	The Permittee shall submit pollutant scan results for January-February 2022 sampling.
12/31/2023	The Permittee shall submit pollutant scan results for September-October 2023 sampling.

J. 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 annual proficiency test results.
12/31/2022	The Permittee shall submit annual proficiency test results.
12/31/2023	The Permittee shall submit annual proficiency test results.
12/31/2024	The Permittee shall submit annual proficiency test results.

K. WHOLE EFFLUENT TOXICITY (WET) TESTING ACUTE/CHRONIC

1. The Permittee shall conduct two-species (Pimephales promelas and Ceriodaphnia dubia) modified acute/chronic WET tests (48-hour acute endpoints within a 7-day chronic test) 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. In this permit a numeric limit for the Chronic No Observable Effect Concentration (C-NOEC) >17% is included and has been updated from the previous limit of C-NOEC >21% based upon changes in the hydrology.

3. 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).

4. 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.

5. Permittees 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 receiving water has and poor performance in the lab controls or dilution

c) requested by permittee and approved by the Secretary

6. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall sample and report as prescribed below in a manner that assures WET results are:

(a) obtained in January or February and submitted to the Secretary by June 30 in even-numbered years; and

b) obtained in August, September, or October and submitted to the Secretary by December 31 in odd-numbered years.

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

Due Date	Event Description
12/31/2021	The Permittee shall submit WET and pollutant scan results for August-October 2021 sampling.
6/30/2022	The Permittee shall submit WET and pollutant scan results for January-February 2022 sampling.
12/31/2023	The Permittee shall submit WET and pollutant scan results for September-October 2023 sampling.
6/30/2024	The Permittee shall submit WET test results for January-February 2024 sampling.

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	Dog River	44.16369	-72.65647
002	Combined Sewer Overflow (CSO)	A	Dog River	44.14902	-72.65476

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 DRAFT PERMIT
(August 2020)
Revised October 2020

Permit Number: **3-1158**
PIN: **BR98-0399**
NPDES Number: **VT0100242**

Facility Name: **Northfield**
Facility Address: **242 Dog River Rd**
Northfield VT 05663
Coordinates: Lat: **44.1640** Long: **-72.6569**
Receiving Water **Dog River**

I. Facility and Proposed Action

Applicant's wastewater treatment facility ("facility" or "WWTF") is engaged in the treatment of municipal wastewater in Northfield, Vermont. A map of facility location, outfalls, and receiving water is provided in Attachment A.

On 12/22/2009, the Secretary of the Vermont Agency of Natural Resources (the "Secretary") received Applicant's renewal application for the permit to discharge into the designated receiving water. The facility's previous permit was issued on 5/5/2005.

The previous permit (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 (VWPCPR) § 13.5(b).

At this time, the Secretary has made a tentative decision to reissue the discharge permit.

II. Statutory and Regulatory Authority

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 BOD5, 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.

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 instream 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).

III. Permit Limit and Condition Formulation

A. Reasonable Potential Determination

In determining whether this permit has the reasonable potential to cause or contribute to an impairment, the Secretary 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 (Environmental Protection Rule, Chapter 29A), 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.

IV. Facility Information

A. History

The Town of Northfield WWTF provides wastewater treatment for residential, industrial, and commercial properties in the Town of Northfield. These services were previously provided by the Village of Northfield which merged with the Town in 2014.

During the early 2000s, the Northfield WWTF underwent an extensive refurbishment and upgrade. Specifically, the former treatment process was constructed in the late 1960s and consisted of a grit removal system at the headworks, primary clarifiers, a trickling filter, secondary clarifiers, and chlorination followed by dechlorination prior to discharge. The upgraded treatment process consists of upgraded headworks, two sequential batch reactors (SBRs), a surge tank, and an upgraded chlorination and dechlorination system. Phosphorus removal takes place by chemical addition (alum) to the SBRs. Improved sludge management was also incorporated into the upgraded WWTF, including refurbishment of the existing digestor, the addition of a new digestor, and a centrifuge for dewatering.

B. Pretreaters

There are no pretreaters permitted under the NPDES program discharging to the collection system.

V. Receiving Water: Dog River

A. Classification

All uses Class B 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.

VI. Monitoring

A. Flow Monitoring at Discharge Point 001

1. Flow

The draft permit maintains the annual average flow limitation. This facility maintains a constant discharge and continuous flow monitoring is required.

B. Conventional Pollutants Monitoring at Discharge Point 001

1. BOD, 5-Day

Permittee must sample the influent for BOD5.

The effluent limitations for BOD5 remain unchanged from the current permit. The monthly and weekly averages 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 maximum day, BOD5 limitation pursuant to Vermont Water Pollution Control Permit Regulations § 13.4.c. The Secretary implements the limitation to supplement the federal technology-based limitations. This is designed to prevent a gross one-day permit effluent violation from being 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 are calculated using the concentration limits outlined above. The BOD5 monitoring requirement is unchanged from the current permit.

2. BOD, 5-Day (% REMOVAL)

The BOD5 monthly average percent removal shall not be less than 85 percent as specified in 40 C.F.R. § 133.102(a)(iii). This limit is a Technology-Based Effluent Limitation (TBEL) established by the Clean Water Act that requires WWTFs to achieve a minimum level of effluent quality. TBELs are based on available technologies to reduce discharges of pollutants into waters of the United States and are developed independently of the potential impact of a discharge on the receiving water.

3. Chlorine, Total Residual

The effluent limitation for TRC remains unchanged from the current permit. The TRC instantaneous maximum limit is set in accordance with the Policy for the protection of aquatic biota and ensures compliance with the Vermont Water Quality Standards.

4. E. Coli

The instantaneous maximum E. coli limitation remains unchanged and is based upon the limitation in the current permit and the anti-backsliding provisions of Section 402(o) of the CWA.

5. pH
The pH limitation remains at 6.5 - 8.5 Standard Units as specified by Vermont Water Quality Standards § 29A-303(6). Monitoring remains at daily.

6. Settleable Solids
The settleable solids 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 Vermont Water Quality Standards § 29A-303(2).

7. Suspended Solids, Total (% Removal)
As required in the current permit, the TSS monthly average percent removal shall not be less than 85 percent as specified by 40 C.F.R. §133.102(b)(3). This limit is a Technology-Based Effluent Limitation (TBEL) established by the Clean Water Act that requires WWTFs to achieve a minimum level of effluent quality. TBELs are based on available technologies to reduce discharges of pollutants into waters of the United States and are developed independently of the potential impact of a discharge on the receiving water.

8. Suspended Solids, Total
The effluent limitations for TSS remain unchanged from the current permit. The monthly and weekly averages 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 maximum day TSS limitation pursuant to Vermont Water Pollution Control Permit Regulations § 13.4 c. The maximum day limitation supplements the federal technology-based limitations to prevent a gross one-day permit effluent violation from being offset by multiple weekly and monthly sampling events to achieve the weekly and monthly averages. The mass limits are calculated using the concentration limits outlined above. The TSS monitoring requirement is unchanged from the current permit.

9. Ultimate Oxygen Demand
On the basis of assimilative capacity modeling completed on the receiving water, an effluent UOD limit is included in the draft permit in order to ensure compliance with the dissolved oxygen water quality criteria during critical summertime instream conditions.

UOD is dependent on the quantity of Biochemical Oxygen Demand (BOD5) and Total Kjeldahl Nitrogen (TKN) in a discharge, as specified in the following equation:

UOD (lbs/day) = [(BOD5 (lbs/day) x 1.43) + (TKN (lbs/day) x 4.57)]

Calculation of the UOD concentration in the discharge is required twice per month from the period of June 1 through September 30th. The sampling frequency is unhanged from the current permit. The BOD and TKN analyses used to calculate UOD must be conducted on the same effluent sample.

Since receiving waters are the most sensitive to oxygen depleting wastes during periods of high water temperature and low flow, the UOD limitation is in effect from June 1 through September 30 of each year. The UOD limitation ensures compliance with the dissolved oxygen criteria during this time period as specified in the Vermont Water Quality Standards. During the other months of the year, the Biological Oxygen Demand limitation is adequate to ensure compliance with the dissolved oxygen criteria.

C. Nutrients Monitoring at Discharge Point 001

1. Nitrogen, Ammonia Total

Ammonia sampling is proposed in order to collect data needed to determine if discharge has the potential to exceed VWQS in the receiving water. Sampling is monthly.

2. Nitrogen, Kjeldahl Total

TKN is the sum of nitrogen in the forms of ammonia (un-ionized (NH3) and ionized (NH4+)), soluble organic nitrogen, and particulate organic nitrogen. To gather data on the amount of TKN in this discharge and its potential impact on the receiving water, a "monitor only" sampling requirement is included in the draft permit. Sampling is required twice a month and is unchanged from the prior permit.

3. Phosphorus, Total

Background:

Excess phosphorus entering Lake Champlain (the Lake) from a variety of sources has impaired the Lake's water quality. 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. The Secretary will issue wastewater discharge (NPDES) permits 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 Wastewater Management 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 million gallons per day (MGD) would be given the same allocations as in the 2002 TMDLs due to their minor contribution of phosphorus loading.

The LC TMDL establishes new annual WLAs for WWTFs with a design flow capacity of above 0.1 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 WLAs 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 limit for TP in their NPDES permit, as monthly effluent concentration limits.

Phosphorus Limit in Draft Permit:

The current permit includes a mass-based effluent limit of 1827 lbs/year. This annual mass limitation was based on an allocation that was established in the 2002 Lake Champlain Phosphorus TMDL ("LC TMDL"). The current permit also contains an effluent TP concentration limit of 0.8 mg/L, monthly average, consistent with the annual load limit. The concentration effluent limitation is based on the requirements of 10 V.S.A. § 1266a and is unchanged from the current permit.

The new, annual WLA represents a 66.7% reduction (-1219 pounds) from the current permit and is equivalent to setting the effluent TP limit at 0.2 mg/L at the design capacity of the WWTF (1.0 MGD).

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:

0.276 mt/yr * 2204.62 lbs/mt = *608* 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, 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 LC TMDL, the permit must also include a monthly average concentration limit for phosphorus. While the WLA in the LC 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 LC 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.

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 (Available at: https://ofmpub.epa.gov/waters10/attains_impaired_waters.show_tmdl_document?p_tmdl_doc_blobs_id=79000) as the water quality based effluent 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 The LC TMDL was issued June 17, 2016), 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 (For the Accountability Framework, see pages 54-59 of the LC TMDL) and is actively working to meet those that are still outstanding. For 2016, EPA gave 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 (http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/2018VermontLakeChamplainPhosphorusTMDLAccountabilityFrameworkReport.pdf), 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 (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). 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.

Since less than five years have passed since the adoption of the LC TMDL, with the State having 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 Optimization and Elimination/Reduction Plans:

To ensure the facility is operating as efficiently as possible for purposes of phosphorus removal, 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 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.

D. Toxic Pollutants Monitoring at Discharge Point 001

1. Copper, Total

The permittee must monitor the influent for Copper.

Total copper limits were revised to bring them into alignment with the 2017 VWQS. Monitoring frequency remains unchanged from previous permit.

VII. Permit Schedule Items

A. 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 those parameters identified in 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.

B. CSO Annual Report

The Permittee has one combined sewer overflow located just north of the intersection of East Street with Turkey Hill Road and King Street. Most recently, the Secretary issued 1272 Order No. 3-1158 to the Town of Northfield on April 5, 2019. In response to this Order, the Permittee has proposed that the Sectretary accept the PER dated Jan. 28, 2019 for the Main Street Stormwater Separation and CSO Abatement project as the Long Term Control Plan (LTCP), and following some minor updates the Secretary has made the decision to agree.

The recently adopted Combined Sewer Overflow Rule (CSO Rule) (Environmental Protection Rule, Chapter 34), which became effective in September 2016, supersedes the CSO Policy. The CSO Rule codifies, updates, and clarifies the technology-based and water quality-based requirements applicable to CSOs. The technology-based controls for CSOs are referred to as the "Minimum Controls" and are included in this draft permit. The following CSO monitoring requirements are included in the draft permit:

- Continued monitoring and reporting of overflow events utilizing tell-tales, at a minimum;
- Notification of wet-weather overflows though public alert within one hour of discovery, and submit to the Secretary specified information regarding the discharge within 12 hours of discovery; and
- A report on CSO control project(s) of the previous calendar year, due by January 31 of each year.

The recently adopted Combined Sewer Overflow Rule (CSO Rule) (Environmental Protection Rule, Chapter 34), which became effective in September 2016, supersedes the CSO Policy. The

CSO Rule codifies, updates, and clarifies the technology-based and water quality-based requirements applicable to CSOs. The technology-based controls for CSOs are referred to as the "Minimum Controls" and are included in the draft permit. To ensure the remaining CSOs are brought into compliance with the Vermont Water Quality Standards, the Secretary, concurrent with issuance of this final permit, shall issue a 1272 Order to the Permittee, requiring the creation of a Long-Term Control Plan that complies with the requirements of the CSO Rule.

The following CSO monitoring requirements are included in the draft permit:

• Implementation of a precipitation monitoring system;

• Continued monitoring and reporting of overflow events utilizing tell-tales, at a minimum;

• Notification of wet-weather overflows though public alert within one hour of discovery, and submit to the Secretary specified information regarding the discharge within 12 hours of discovery; and

• A report on CSO control project(s) of the previous calendar year, due by January 31of each year.

C. Emergency Power Failure Plan
To ensure the facility can continue operations during the event of a power failure, within 90 days of the effective date of the permit, the Permittee must submit to the Secretary updated documentation addressing how the discharge will be handled in the event of an electric power outage.

D. Engineering Evaluation and Report/Asset Management Plan
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.

E. Operations Management Emergency Response Plan (OMERP)
The Permittee shall prepare and submit to the Secretary for review and approval, an updated Operation, Management, and Emergency Response Plan for the treatment facility, sewage pumping stations, and sewer line stream crossings and sewage collection system.

F. Phosphorus Optimization Plan
The permittee shall develop a plan to optimize the discharge of phosphorus.

G. Pollutant Scan (greater than 1 MGD)
The Toxic Pollutants Scan is codified at 40 C.F.R. § 401.15, Table 1. This requires the Permittee to conduct an effluent analysis of S/N 001 for the pollutants included in Appendix J, Table 2 of 40 C.F.R. Part 122 and submit the results to the Secretary. Based on the results of these tests or any other toxicity tests conducted, the Secretary may require additional WET testing or a Toxicity Reduction Evaluation be conducted.

H. Quality Assurance Report / 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.

I. Whole Effluent Toxicity (WET) Testing Acute/Chronic
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 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. In this permit a numeric limit for the Chronic No Observable Effect Concentration (C-NOEC) >17% is included and has been updated from the previous limit of C-NOEC >21% based upon changes in the hydrology.

Long-term observed streamflows at the U.S. Geological Survey's Dog River gage in Northfield Falls show a statistically significant increase in annual minimum 7-day average streamflow, from 1935-2017. The same has been observed for low flows on other unregulated rivers in this part of the state, including Ayers Brook, East Orange Branch, and the White, Dog, and Mad Rivers. The intent of a reasonable potential determination is to utilize streamflow statistics most likely to be representative at this location for the time period covered by the discharge permit. When trends exist in the datasets used to calculate low-flow statistics for receiving waters, using the full dataset are likely to result in streamflows that are less representative of conditions occurring over the next five years than if the analysis included only more recent observations. In such a situation the most recent 30 years of daily streamflow are used to calculate flow statistics of the receiving

water (where observed data exist). A 30-year period is chosen because any statistical analysis of low flow conditions should include a minimum of 10 years in the record, but ideally great than 25 years. Additionally, a 30-year period is common practice for defining “climate normals” in meteorological variables. For this particular dataset of the Dog River, analysis confirms that there is a statistically significant difference in annual minimum 7-day average flows when comparing the more recent 1988-2017 period with to 1958-1987. While low flows are increasing at this specific location overall, the increase in estimated 7Q10 for this determination when compared to the previous permit is also a result of using only the more recent period of streamflow data.

VIII. General Conditions

A. Electronic Reporting

The National Pollution Discharge Elimination System (NPDES) Electronic Reporting Rule (eRule)modernized Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The eRule 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 nonmajors, individually permitted or covered by a general permit, must do so electronically after December 21, 2016. The Secretary has created an electronic reporting system for DMRs and has trained facilities in its use. As of December 21, 2020, these NPDES facilities must also submit additional information electronically as specified in Appendix A in 40 C.F.R. Part 127.

B. Noncompliance Notification -

As required by 10 V.S.A. § 1295, a Noncompliance Notification 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.

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

IX. Final Determinations

The public comment period for receiving comments on this draft permit was from **August 28, 2020 through September 28, 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.

Agency of Natural Resources
Department of Environmental Conservation

Watershed Management Division
1 National Life Drive 2 Main
802-828-1535

MEMORANDUM

To: John Merrifield, Wastewater Program (WWP)

From: Rick Levey, Monitoring and Assessment Program (MAP) Rick Levey 08/25/2020
Michelle Graziosi, (MAP)

Cc: Pete LaFlamme, Director, WSMD
Amy Polaczyk, Manager, WWP
Bethany Sargent, Manager, MAP

Date: August 25, 2020

Subject: MAP Reasonable Potential Determination for the Northfield Wastewater Treatment Facility (WWTF).

MAP has evaluated the current permit limits for the Northfield WWTF in Northfield, Vermont pursuant to the 2012 procedure outlining WWM-WSMD roles and responsibilities. This memo provides MAP's review of the current permit limits and recommendations for the permit renewal of the Northfield WWTF.

Facility:
Northfield WWTF
Permit No. 3-1158
NPDES No. VT0100242

Hydrology for Northfield WWTF used in this evaluation:
Design Flow: 1.0 MGD (1.55 CFS)
7Q10 = 7.54 CFS
LMM = 17.11 CFS
IWC-7Q10 = 0.170 (IWC > 10%)
IWC-LMM= 0.083 (IWC < 10%)

Receiving Water:
Dog River, Northfield, VT
Facility Location: Lat. 44.164014, Long. -72.656961 (NAD 83)

The Dog River downstream of the Northfield WWTF discharge is a Class B water and designated as Cold-Water Fish Habitat (see Appendix A, Vermont Water Quality Standards). A 2.2-mile Waste Management Zone has been established in the river below the WWTF outfall pursuant to V.S.A., Section 1252.

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. For the Dog River segment to which this facility discharges, the database indicates the receiving water does fully support all designated uses.

Ambient Chemistry Data for the Stevens Branch below the Northfield WWTF:
There is ambient chemistry data available from multiple VTDEC sampling events between 2010-2019. The upstream site is located at river mile (RM) 9.0 and the downstream site is located at RM 8.8. Water chemistry measures are available and summarized in Table 1. Priority metals were analyzed above and below the WWTF at RM 9.0 and RM 8.8 respectively and are summarized in Table 4.

Data representativeness was assessed by evaluating the flow conditions at which samples were collected from field sheets in consideration of possible downstream sensitive reaches. The location of the upstream and downstream sampling locations (RM 9.0 & 8.8) effectively brackets the WWTF outfall (Figure 1). The downstream sampling location is the most sensitive location.

Figure 1. Dog River near the Northfield WWTF, showing upstream monitoring location (RM 9.0), downstream monitoring location (RM 8.8).

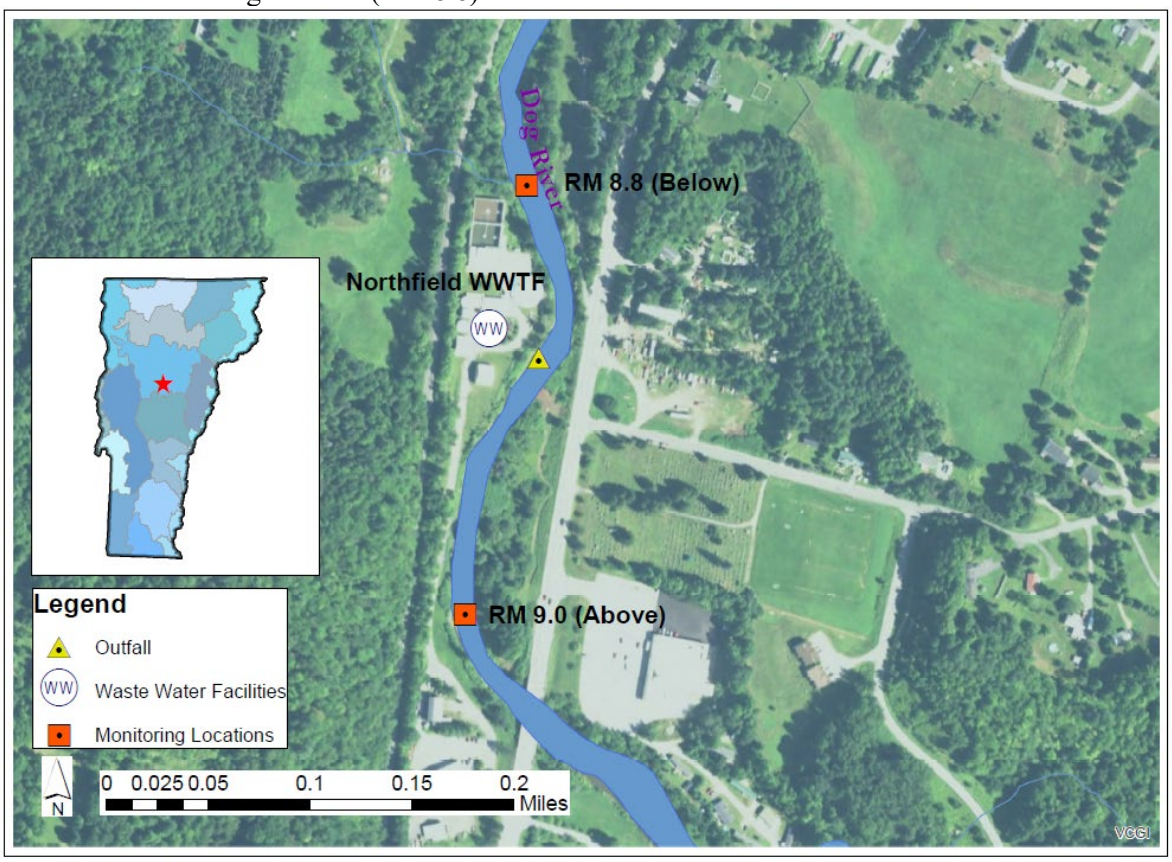


Table 1. Concentrations of surface water chemistry above (RM 9.0) and below (RM 8.8) the Northfield WWTF.

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)
9/22/2010	Above	9.0	12.7	7.4	56.6	202	91.8	9.50	0.92	6.8	0.37	-
	Below	8.8	12.9	7.6	57.8	208	91.0	9.36	0.90	14	0.30	-
8/27/2014	Above	9.0	-	-	-	-	-	-	-	<5	0.41	-
8/10/2015	Below	8.8	16.2	7.8	-	211.1	101	9.59	0.32	6.2	0.37	<0.05
8/18/2015	Below	8.8	21.7	7.9	-	212.5	85.2	7.32	0.37	7.2	0.36	<0.05
8/31/2015	Above	9.0	19.3	7.7	60	230.7	93.4	8.32	0.61	6.6	0.34	<0.05
	Below	8.8	20.5	7.8	65	245.7	96.8	8.45	0.76	16.7	0.63	0.172
7/16/2019	Above	9.0	16.7	7.6	50.5	186.1	86.6	8.35	0.48	6	0.34	<0.05
	Below	8.8	16.8	7.4	53	209.5	89.2	8.51	0.51	19	0.74	0.39

Total Phosphorus:
Total phosphorus (TP) below the outfall (RM 8.8) during the past 10 years ranged from 6 µg/L – 19 µg/L-TP, the average instream increase below the facility was about 10 µg/L-TP. The maximum increase observed downstream was 13 µg/L-TP, which coincided with the highest observed downstream concentration of 19 µg/L-TP. The Medium High Gradient (MHG) stream type threshold value for TP is 15 µg/L.

Turbidity, Dissolved Oxygen, pH:
Turbidity values above the outfall (RM 9.0) ranged from 0.48 – 0.92 Nephelometric Turbidity Units (NTU). Below the outfall (RM 8.8) turbidity ranged 0.32 – 0.90 NTU.
The pH measured ranged from 7.4-7.9 above and below the outfall. Dissolved oxygen and percent saturation were measured most recently on 7/16/2019, the downstream DO and percent saturation were 8.51 mg/L and 89.2% respectively. Upstream DO and percent saturation were 8.35 mg/L and 86.6% respectively.

Biological Assessments:
Biological assessments have been conducted above (RM 9.0) and below (RM 8.8) the outfall most recently in 2015 and in 2010. Bioassessments met water quality standards at both monitoring locations for the Medium High Gradient (MHG) Stream Type in 2015 and 2010. (Table 2).

Table 2. Macroinvertebrate assessment results for monitoring stations above (RM 9.0) and below (RM 8.8) the Northfield WWTF. Scoring guidelines are for Stream Type MHG and WQ Class B (2).

Macroinvertebrate Assessment Summary											
Date	Location	RM	Density	Richness	EPT Richness	PMA-O	B.I.	Oligo.	EPT/EPT + Chiro	PPCS-F	Community Assessment
9/22/2010	Below	8.8	5864	70.0	39.0	81.9	4.15	0.00	0.87	0.59	Meets WQS
	Above	9.0	2544	59.0	35.0	91.4	3.66	0.00	0.90	0.81	Meets WQS
8/31/2015	Below	8.8	2760	59.0	29.0	85.1	4.52	0.87	0.70	0.57	Meets WQS
	Above	9.0	2436	57.0	29.0	81.2	4.64	1.64	0.65	0.66	Meets WQS
Full Support			≥ 300	≥ 30	≥ 18	≥ 45	≤ 5	≤ 12	≥ 0.45	≥ 0.4	
Indeterminate			≥ 250	≥ 28	≥ 16	≥ 40	5-15	≤ 14.5	≥ 0.43	≥ 0.35	
Non-Support			< 250	< 28	< 16	< 40	> 15	> 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 = QeCe / (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 1.55 CFS was used, with effluent TP concentration (Ce) 0.291 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 17.11 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 is 0.024mg/L-TP (24 µg/L-TP).
(RWC = 1.55 CFS * 0.291 mg/L-TP / (1.55 CFS + 17.11 CFS) = 0.024 mg/L-TP)

Review of the Northfield WWTF flow records indicate that average facility flow for 2015-2019 is 0.51 MGD which is 51% of the 1.0 MGD permit limit. Instream TP concentrations (RWC) attributable to discharge at the average flow rate would be about 13 µg /L-TP using the average effluent concentration.

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.

Currently 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 that monthly TP effluent monitoring be required to continue to assess compliance with the Lake Champlain Phosphorus TMDL and 0.8 mg/L monthly average permit limit.

Table 3. Assessment of phosphorus response variables for the Dog River above (RM 9.0) and below (RM 8.8) the Northfield WWTF. The relevant target values are references to the appropriate section of the VWQS.

Response variable (VWQS reference)	Target Value	River-mile: 9.0 (Upstream) 7/16/2019	River-mile: 8.8 (Downstream) Date: 7/16/2019
pH (§3-01.B.9)	6.5-8.5 s.u.	7.59	7.35
Turbidity (§3-04.B.1)	< 10 NTU at low mean annual flow	0.48	0.51
Dissolved Oxygen (min) (§3-04.B.2)	>6 mg/L and 70% saturation	*8.35 (86.6%)*	*8.51 (89.2%)*
Aquatic biota, based on macroinvertebrates.	Attaining an assessment of good, or better.	*Meets WQS (8/31/2015)*	*Meets WQS (8/31/2015)*

Whole Effluent Toxicity (WET):
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. The 2020 draft permit requires two-species (Pimephales promelas and Ceriodaphnia dubia) modified acute/chronic WET tests (48-hour acute endpoints within a 7-day chronic test) on a composite effluent sample be conducted annually and will represent all seasons accordingly.

Total Residual Chlorine (TRC):
The current permit limits for TRC 0.1 mg/L instantaneous maximum and 0.06 mg/L weekly average. At 7Q10 conditions, the instantaneous instream TRC concentration would be 17 µg/L-TRC (7Q10-IWC 0.170 X 0.1mg/L = 0.017 mg/L = 17 µg/L), which is below the acute criteria of 19 µg/L-TRC. At 7Q10 conditions, the weekly average TRC concentration would be 10 µg/L (7Q10-IWC 0.170 X 0.06 mg/L = 0.0102 mg/L = 10 µg/L), which is below the chronic criteria of 11 µg/L-TRC. As such the TRC permit limits for instantaneous maximum and weekly average will be protective of VWQS.

Ammonia Monitoring:
Due to the moderate Instream Waste Concentration at 7Q10 flow conditions (17%) there may be reasonable potential for the discharge to exceed VWQS. The EPA chronic criteria for ammonia at pH 8.5 and Temperature of 20C is 0.35 mg/L-TAN. Effluent TAN concentrations above 2.06 mg/L- TAN would exceed this chronic criterion at 7Q10 conditions. On 7/16/2019, an instream TAN concentration of 0.39 mg/L was measured, which exceeds this chronic criterion. There is no TAN facility monitoring data to evaluate. The draft 2020 permit requires monthly TAN monitoring at the facility to further evaluate the potential for exceeding VWQS.

Suspended Solids, Hardness, and Metals:
Instream total suspended solids were calculated using the 7Q10 of 7.54 CFS at design flow of 1.55 CFS (1.0 MGD) assuming the maximum permitted daily concentration of 50 mg/L. The calculated suspended sediment concentration at these conditions was 8.5 mg/L (7Q10-IWC 0.170 X 50 = 8.5 mg/L). From 2015-2019, monthly facility monitoring records indicate an average daily maximum of 16.08 mg/L-TSS. A daily maximum of 203.0 mg/L-TSS was measured on 12/31/2019, an amount four times higher than the permit limit and the only such event in the past four years.

The hardness of the Dog River below the Northfield WWTF (RM 8.8) was recorded as 56.7 mg/l

CaCO3 on 7/16/2019 (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 above and below the outfall (Table 4) did not detect any exceedances of the VWQS.

Total Copper:
The previous permit contains Total Copper effluent limitation of 0.26 lbs./day, monthly average and 0.36 lbs./day, maximum day. These limitations reflect outdated VWQS, at a hardness of 50 mg/L-CaC03, and an instream waste concentration (IWC) of 0.21 (or 21%) of the discharge at 7Q10 flows. The draft 2020 permit includes new copper limits which reflect 2017 VWQS and updated flows for the receiving waters.

Table 4. Priority pollutant metals measured above (RM 9.0) and below (RM 8.8) the Northfield WWTF.

Visit Date	7/16/2019	
Location	Above	Below
RM	9.0	8.8
Hardness	56.79	56.7
Total Aluminum (ug/l)	<20	42.9
Total Antimony (ug/l)	<5	<5
Total Arsenic (ug/l)	<1	<1
Total Beryllium (ug/l)	<1	<1
Total Cadmium (ug/l)	<1	<1
Total Chromium (ug/l)	<1	<1
Total Copper (ug/l)	<5	<5
Total Iron (ug/l)	99.5	110
Total Lead (ug/l)	<1	<1
Total Magnesium (mg/l)	2.39	2.43
Total Manganese (ug/l)	24.3	26.9
Total Molybdenum (ug/l)	<5	<5
Total Nickel (ug/l)	<1	<1
Total Selenium (ug/l)	<5	<5
Total Silver (ug/l)	<1	<1
Total Sodium (mg/l)	13.8	17.2
Total Thallium (ug/l)	<1	<1
Total Zinc (ug/l)	<10	<10

Recommended Biological and Water Quality Monitoring:
In light of the fact that the most recent monitoring results indicate attainment of all thresholds, and 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), MAP does not recommend biomonitoring be included in the permit. To better assess compliance with the 2017 VWQS and the Lake Champlain Phosphorus TMDL at the next permit issuance, MAP does support the effluent monitoring required by the permit which includes weekly effluent monitoring for TP.

Recommended Effluent Monitoring:
MAP does support the effluent monitoring now included in the draft 2020 permit; this monitoring described below will provide additional data to support future Reasonable Potential Determinations:

- The 2020 draft permit requires two-species (Pimephales promelas and Ceriodaphnia dubia) modified acute/chronic WET tests (48-hour acute endpoints within a 7-day chronic test) on a composite effluent sample be conducted annually and will represent all seasons accordingly. The 2020 draft permit also requires that TAN and TRC analysis be conducted on each composite effluent sample collected for use in these WET tests to assist with interpreting WET results.

- The 2020 draft permit requires monthly TAN effluent monitoring needed to assess RP for ammonia.

- The 2020 draft permit requires priority pollutant scans be conducted on composite effluent samples that coincide with WET test sample collection, this will provide effluent monitoring data for Priority Pollutant Metals which is needed to assess RP.

Conclusion:
The available data indicate that this discharge does have reasonable potential to cause or contribute to an instream toxic impact or instream excursion above the water quality criteria for copper and ammonia. As such, the development of WQBELs for these chemical parameters will be necessary.

Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
1 National Life Drive Davis 3
802-828-1535

MEMORANDUM

Prepared by: John Merrifield, Wastewater Program (WWP)

Cc: Amy Polaczyk, Manager, WWP
Bethany Sargent, Manager, Monitoring and Assessment Program (MAP)
Rick Levey, MAP

Date: June 30, 2020

Subject: WQBEL Permit Limit Review and Calculations for the Northfield WWTF Facility (3-1158)

I. Introduction

This memo serves as a record of the review and calculation of Water Quality Based Effluent Limits (WQBEL) and is intended to supplement the Reasonable Potential Determination memo prepared for the subject facility. The memo is broken into the following parts:

- An introduction
- A description of new or revised permit limit requirements.
- A description of the methodology used to develop WQBEL permit limits
- Narrative justifications for any new permit limits

The spreadsheet used to perform these calculations is available upon request.

II. New Permit Limits

	Proposed WQBEL Discharge Limitations						
	Annual Limit	Monthly Average	Max Day	Monthly Average	Max Day	Reporting Limit	Sampling Frequency
Effluent Characteristics (Constituents)	lbs/year	Mass (lbs/day)		Concentration (mg/L)			(per month)
Whole Effluent Toxicity C-LOEC					>17%	N/A	N/A
Total Ammonia Nitrogen as N (summer)		MO	MO	MO	MO	0.050	Monthly (1)
Total Ammonia Nitrogen as N (winter)		MO	MO	MO	MO	0.050	Monthly (1)
Total Copper		0.22	0.36	0.027	0.046	0.005	Twice a Month (2)
Total Phosphorus	608			0.8		0.005	Weekly (4)

The constituents shown above in Table 1 were developed in order to ensure that the proposed discharge is protective of Vermont Water Quality Standards (VWQS) in the receiving water.

The following constituents were not analyzed as WQBELs: Flow, Ultimate Oxygen Demand, BOD, TSS, Settleable Solids, TKN, TN, E. coli and pH. These constituents are either subject to TBELs or the data to model as WQBELs is unavailable.

III. WQBEL calculation methodology

The Water-Quality Based Effluent Limitations (WQBELs) for pollutants of concern were assessed via the mass balance steady state model method outlined in the Chapter 4 of the EPA's Technical Support Document for Water Quality-Based Toxics Control (TSD) (page 86). Results were then compared to the current permit limit. The recommended permit limit was selected by comparing applicable Technology-Based Effluent Limits (TBELs), current WQBELs, and WQBELs calculated based on 2017 VWQS acute and chronic criteria.

The steady-state mass balance method produces a Waste Load Allocation (WLA), the critical effluent pollutant concentration based on the VWQS acute and chronic critical thresholds for the constituent(s) of concern. The method assumes complete mixing of the pollutant within the receiving water. The resulting WLA is the WQBEL for each acute and chronic VWQS criteria dilution assessed.

Per the TSD method, WLA results were used to calculate the Long-Term Average (LTA) for each criteria type using methods provided in Table 5-1 (TSD page 102). WLA multipliers are picked from the 99th percentile column. The most conservative LTA is then used to determine the Maximum Daily Limit (MDL) or Average Monthly Limit (AML) using the calculation shown in Table 5-2 (TSD page 103). The 99th percentile column is used for the MDL calculation and the 95th percentile columns are used for the AML calculation.

In this process data for the facility and receiving waters is used. When necessary values for VWQS were calculated based upon the methods described in their appendices and footnotes. Monitoring frequency are taken from the existing permit or assigned for new pollutants based upon similar facilities. In the absence of ambient receiving water data a value of 5% of the VWQS has been generally assumed for the upstream concentration. Please see the individual calculation tabs for specific analyses.

The resulting MDL and AML are compared with the existing permit limits, any applicable TBELs including TMDLs, and any legislated limits to determine the final effluent limits that are protective of quality standards. The proposed limits are entered into the spreadsheet and Table 1 (above) and a short narrative is prepared justifying the limits. Those narratives are presented in the next section.

IV. Justification of Proposed WQBELs

1. Whole Effluent Toxicity – Chronic Lowest Observable Effect Concentration

The previous permit included WET testing requirements and included a numeric Chronic Lowest Observable Effect Concentration based upon the instream waste concentration at 7Q10. The hydrologic calculations have changed since the last permit and the instream waste concentration changed. It is necessary to revise the WET limit to reflect the new instream waste concentration at 7Q10.

2. Total Ammonia Nitrogen as N (Summer and Winter)

New monitor only requirements for Total Ammonia Nitrogen are proposed in order to gather information necessary to evaluate the impacts of ammonia on water quality. Monitor only limits for Maximum Day and Monthly Average concentrations and loads should be added to the permit to

facilitate future data analysis to ensure that the receiving waters comply with the 2013 EPA Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater. Samples should be analyzed once a month.

3. Total Copper

The VWQS for Copper have changed since the previous permit was issued. The previous permit contained Maximum Day and Monthly Average mass limits. New Maximum Day (0.048 mg/l) and Monthly Average (0.027 mg/l) concentration limits and Monthly Average (0.22 lbs/day) mass limits are proposed based upon TSD calculations. The existing Maximum Day (0.36 lbs/day) loading is retained because it is more restrictive than the one calculated using the TSD method (0.40 lbs/day). Sampling remains at twice a month.

4. Total Phosphorus

This facility has been assigned an Annual Limit of 608 lbs of Total Phosphorus in the Lake Champlain Phosphorus TMDL. The existing Total Phosphorus Monthly Average limit of 0.8 mg/l will be retained. These limits should be included in the new permit. Sampling remains at weekly.

Attachment B

RESPONSIVENESS SUMMARY
for
NPDES Discharge Permit # 3-1158
Town of Northfield Wastewater
Treatment Facility

The above referenced permit was placed on public notice for comment from August 28, 2020 through September 28, 2020. This is a renewal permit.

Comments on the draft permit were received during the public notice period from Jeff Shultz, Town Manager, on behalf of the Town of Northfield. 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.

The letter dated September 26, 2020 from the Town of Northfield is attached for reference.

COMMENT:

The proposed requirement to reduce the current permit phosphorus limits to a phosphorus limit of 608 lbs./year, 0.8 mg/1 Monthly Average will be very difficult to achieve.

We feel that the current levels are more realistic and present no harm to aquatic life.

Further, we strongly feel that the new phosphorous limits are unnecessary because the current load limits and testing are not allowing any harmful or poor-quality flows into the river.

RESPONSE:

A review of the Northfield WWTF's effluent data from 2015-2019 indicates the average annual Total Phosphorus (TP) load was 457.6 lbs/year. This is less than 80% of the Wasteload Allocation and would not require the facility to prepare a Phosphorus Elimination and Reduction Plan. During this time period the average monthly Total Phosphorus concentration exceeded 0.8 mg/l only one time, and the average value was 0.279 mg/l. The reported effluent data indicates that the new limits are achievable by the facility.

Using a data-driven approach the VT DEC and US EPA have determined Lake Champlain is impaired by increased TP from loading throughout the watershed. The 2016 Lake Champlain Total Phosphorus TMDL establishes a framework to address this impairment and assigns an annual load to this facility of 608 lbs/year. This permit implements the requirements of the TMDL.

In addition, 10 VSA 1266a sets a statutory requirement that limits your facility to a maximum discharge concentration of 0.80 mg/l of Total Phosphorus on a monthly average.

This permit implements this requirement and is unchanged from the previous permit issued to this facility. While data does not suggest discharges of Total Phosphorus are causing or contributing to water quality problems in the Dog River downstream of the Northfield WWTF, it does contribute to the overall loading to Lake Champlain and is therefore limited as described in the 2016 Lake Champlain TMDL.

COMMENT:

The Town of Northfield has incurred significant costs and effort to reduce the phosphorus loads through adjustments to the sewer plant process and the removal of stormwater from the plant.

In addition, the Town is planning additional projects and efforts to further reduce the amount of stormwater to the sewer plant, including the Main Street Stormwater Upgrade Project.

RESPONSE:

This information regarding previous phosphorus reduction efforts should be included in your Phosphorus Optimization Plan to describe what actions have already been implemented. As indicated later in the letter, prices for everything are increasing and the Town has effectively realized a cost savings by performing these tasks when prices were lower. Documenting previous investments in your treatment system may be helpful in applying for future funding opportunities should additional phosphorus reduction be necessary.

Removing stormwater from the WWTF influent is being done in compliance with your obligations as a CSO community and savings should be realized through reductions in treatment chemicals and energy use from the reduced hydraulic loading.

COMMENT:

The added costs of the new requirements will further and unnecessarily burden the municipality at a time when its costs are significantly increasing and it is facing additional revenue losses. Northfield is and will continue to have difficultly providing adequate and mandated services to the community due to these requirements and other State and Federal mandates.

RESPONSE:

Monthly Total Ammonia Nitrogen sampling was added to the permit in order to determine if discharge has the potential to exceed VWQS in the receiving water. As stated in the Reasonable Potential Determination supporting the permit renewal:

> *The moderate Instream Waste Concentration at 7Q10 flow conditions of 17% may lead to reasonable potential for the discharge to exceed VWQS. The EPA chronic criteria for ammonia at pH 8.5 and Temperature of 20C is 0.35 mg/L-TAN. Effluent TAN concentrations above 2.06 mg/L- TAN would exceed this chronic criterion at 7Q10 conditions. On 7/16/2019, an instream TAN concentration of 0.39 mg/L was measured, which exceeds this chronic criterion.* ***There is no TAN facility monitoring data to evaluate****. The draft 2020 permit requires monthly TAN monitoring at the facility to evaluate the potential for exceeding VWQS.*

This test costs ~ $25 per test if a contract laboratory is used. This translates to ~$300 per year and $1,500 per permit cycle.

In order to protect the investment your community has made in its WWTF and collection system, the requirement for a 20 Year Engineering Evaluation is included in your permit. The intent of this requirement is that problem areas in the WWTF are identified before catastrophic failure, and to ensure that the necessary steps are taken to budget for maintenance, repairs and upgrades.

The Clean Water State Revolving Fund offers low cost loans for planning costs that include 0% interest, 5 years before the first payment and additional subsidy in the form of loan principal forgiveness of 50% of the eligible planning costs up to $100,000. This additional subsidy is available on a first come, first served basis. Additional subsidies are subject to change each year. Please contact Tom Brown (Thomas.Brown@vermont.gov, 802 622 4205) to discuss the available subsidies, the requirements of the Qualification Based Selection process, and the eligibility of project activities under this program.

MUNICIPAL OFFICES

Jeff Schulz
Town Manager

Phone (802) 485-6121
Fax (802) 485-8426

51 SOUTH MAIN STREET
NORTHFIELD, VERMONT 05663

September 26, 2020

VT Agency of Natural Resources
Watershed Division
1 National Life – Davis 3
Montpelier, VT 05620-3522

Re: 3-1158 – Town of Northfield Sewage Treatment Plant Operating Permit – Public Comment

To Whom it May Concern,

This letter to provide public comment on the VT Agency of Natural Resource's draft operating permit for the Town of Northfield's Sewage Treatment Plant. The proposed requirement to reduce the current permit phosphorus limits to a phosphorus limit of 608 lbs./year, 0.8 mg/l Monthly Average will be very difficult to achieve. The Town of Northfield has incurred significant costs and effort to reduce the phosphorus loads through adjustments to the sewer plant process and the removal of stormwater from the plant. In addition, the Town is planning additional projects and efforts to further reduce the amount of stormwater to the sewer plant, including the Main Street Stormwater Upgrade Project. However, the combination of past, current and costly future projects will still make it difficult to achieve the new limits. We feel that the current levels are more realistic and present no harm to aquatic life.

Further, we strongly feel that the new phosphorous limits are unnecessary because the current load limits and testing are not allowing any harmful or poor-quality flows into the river. In addition, the added costs of the new requirements will further and unnecessarily burden the municipality at a time when its costs are significantly increasing and it is facing additional revenue losses. Northfield is and will continue to have difficultly providing adequate and mandated services to the community due to these requirements and other State and Federal mandates.

If you have any questions, please contact meat 802-485-9822 or jschulz@northfield.vt.us.

Sincerely,

Jeff Schulz, Northfield Town Manager