

AGENCY OF NATURAL RESOURCES  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
WATERSHED MANAGEMENT DIVISION  
ONE NATIONAL LIFE DRIVE, MAIN BUILDING, 2nd FLOOR  
MONTPELIER, VT 05620-3522

Permit No.: 3-1238  
PIN: RU95-0153  
NPDES No.: VT0100897

Name of Applicant: Town of Castleton  
P.O. Box 727  
Castleton, VT 05735

Expiration Date: **June 30, 2024**

DISCHARGE PERMIT

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 Castleton (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 Castleton Wastewater Treatment Facility (hereinafter referred to as the "WWTF") to the Castleton River in accordance with the following conditions.

This permit shall become effective on **July 1, 2019**.

Emily Boedecker, Commissioner  
Department of Environmental Conservation

By:  \_\_\_\_\_ Date: 6/24/19

Chris Gianfagna, Wastewater Program Manager  
Watershed Management Division

## Table of Contents

|   |           |
|---|-----------|
| <b>I. SPECIAL CONDITIONS</b>                                  | <b>4</b>  |
| <b>A. EFFLUENT LIMITS</b>                                     | <b>4</b>  |
| 1. Discharge Point S/N 001                                    | 4         |
| <b>B. TOTAL PHOSPHORUS</b>                                    | <b>6</b>  |
| 1. Wasteload Allocation for Phosphorus                        | 6         |
| 2. Phosphorus Optimization Plan                               | 6         |
| 3. Phosphorus Elimination/Reduction Plan                      | 7         |
| 4. Running Total Annual Pounds Calculation                    | 8         |
| 5. Total Phosphorus Reporting                                 | 8         |
| <b>C. WASTE MANAGEMENT ZONE</b>                               | <b>9</b>  |
| <b>D. REAPPLICATION</b>                                       | <b>9</b>  |
| <b>E. OPERATING FEES</b>                                      | <b>9</b>  |
| <b>F. TOXICITY TESTING</b>                                    | <b>9</b>  |
| 1. Whole Effluent Toxicity (WET) Testing                      | 9         |
| <b>G. MONITORING AND REPORTING</b>                            | <b>10</b> |
| 1. Sampling and Analysis                                      | 10        |
| 2. Effluent Monitoring  | 11        |
| 3. Annual Constituent Monitoring                              | 13        |
| 4. Influent Monitoring  | 13        |
| 5. Reporting  | 14        |
| 6. Recording of Results                                       | 14        |
| 7. Additional Monitoring                                      | 15        |
| <b>H. DRY WEATHER FLOWS</b>                                   | <b>15</b> |
| <b>I. OPERATION, MANAGEMENT, AND EMERGENCY RESPONSE PLANS</b> | <b>16</b> |
| <b>J. EMERGENCY ACTION - ELECTRIC POWER FAILURE</b>           | <b>16</b> |
| <b>K. SEWER ORDINANCE</b>                                     | <b>17</b> |
| <b>II. GENERAL CONDITIONS</b>                                 | <b>19</b> |
| <b>A. MANAGEMENT REQUIREMENTS</b>                             | <b>19</b> |
| 1. Facility Modification / Change in Discharge                | 19        |
| 2. Noncompliance Notification                                 | 19        |
| 3. Operation and Maintenance                                  | 22        |
| 4. Quality Control  | 22        |
| 5. Bypass   | 23        |
| 6. Duty to Mitigate   | 23        |
| 7. Records Retention  | 23        |
| 8. Solids Management  | 23        |
| 9. Emergency Pollution Permits                                | 23        |
| <b>B. RESPONSIBILITIES</b>                                    | <b>24</b> |
| 1. Right of Entry   | 24        |
| 2. Transfer of Ownership or Control                           | 25        |
| 3. Confidentiality  | 25        |
| 4. Permit Modification, Suspension, and Revocation            | 26        |
| 5. Toxic Effluent Standards                                   | 26        |
| 6. Oil and Hazardous Substance Liability                      | 27        |

|     |                              |    |
|-----|------------------------------|----|
| 7.  | Other Materials              | 27 |
| 8.  | Navigable Waters             | 27 |
| 9.  | Civil and Criminal Liability | 27 |
| 10. | State Laws                   | 28 |
| 11. | Property Rights              | 28 |
| 12. | Other Information            | 28 |
| 13. | Severability                 | 28 |
| 14. | Authority                    | 28 |
| 15. | Definitions                  | 28 |

**I. SPECIAL CONDITIONS**

**A. EFFLUENT LIMITS**

**1. Discharge Point S/N 001**

a. During the term of this permit, the Permittee is authorized to discharge from outfall S/N 001 (located at Lat. 43.36133, Long. -73.12372) of the WWTF to the Castleton River, an effluent for which the characteristics shall not exceed the values listed below:

| EFFLUENT CHARACTERISTICS | DISCHARGE LIMITATIONS |               |                 |                |             |                      |                |             |                       |
|--------------------------|-----------------------|---------------|-----------------|----------------|-------------|----------------------|----------------|-------------|-----------------------|
|                          | Annual Average        | Annual Limit  | Monthly Average | Weekly Average | Maximum Day | Monthly Average      | Weekly Average | Maximum Day | Instantaneous Maximum |
|                          | (MGD)                 | Mass (lbs/yr) | Mass (lbs/day)  |                |             | Concentration (mg/L) |                |             |                       |

|   |       |     |   |     |                     |  |    |              |              |
|---|-------|-----|---|-----|---------------------|--|----|--------------|--------------|
| Biochemical Oxygen Demand (5-day, 20° C) (BOD <sub>5</sub> ) <sup>1</sup> |       |     | 90  | 135 |                     | 30   | 45 | 50           |              |
| <i>E. coli</i>  |       |     |   |     |                     |  |    |              | 77 CFU/100ml |
| Flow <sup>2</sup>   | 0.480 |     | Monitor Only  |     |                     |  |    |              |              |
| Nitrite Plus Nitrate Total (NO <sub>x</sub> )                             |       |     |   |     |                     |  |    | Monitor only |              |
| Nitrogen, Ammonia Total (TAN)   |       |     | (Nov. 1 – May 31) 45 lbs., Monthly Avg.<br>(June 1 – Oct. 31) 18 lbs., Monthly Avg. |     |                     |  |    |              |              |
| Nitrogen, Kjeldahl Total, (TKN)   |       |     |   |     |                     |  |    | Monitor only |              |
| Nitrogen, Total (TN) <sup>4</sup>   |       |     |   |     | Monitor only        |  |    | Monitor only |              |
| pH  |       |     |   |     |                     | Maximum Daily between 6.5-8.5 Standard Units |    |              |              |
| Phosphorus, Total (TP) <sup>1,3</sup>                                     |       | 875 |   |     |                     | 0.8  |    |              |              |
| Septage Discharged to Treatment Facility                                  |       |     |   |     | Monitor only (gal.) |  |    |              |              |
| Settleable Solids   |       |     |   |     |                     |  |    |              | 1.0 ml/L     |
| Total Suspended Solids (TSS) <sup>1</sup>                                 |       |     | 90  | 135 |                     | 30   | 45 | 50           |              |
| Ultimate Oxygen Demand (UOD)  |       |     |   |     | 335 <sup>5</sup>    |  |    |              |              |

<sup>1</sup> The Permittee shall operate the facility to meet the concentration limitations or pounds limitation, whichever is more restrictive.

<sup>2</sup> Monthly average flow shall be calculated by summing daily effluent flow for each day in the given month and dividing the sum by the number of days of discharge in that month.

<sup>3</sup> Total Phosphorus shall be reported as Total Monthly Pounds, Running Total Annual Pounds, and Percentage of Running Total Annual Pounds to Annual Permit Limitation. See Condition II.B.5.

<sup>4</sup> Total nitrogen (TN) shall be reported as pounds and calculated as: *Average TN (mg/L) x Total Daily Flow x 8.34*; where, *TN (mg/L) = TKN (mg/L) + NO<sub>x</sub> (mg/L)*

<sup>5</sup> The Ultimate Oxygen Demand (UOD) limit shall be in effect only during the period June 1 – October 31 each year.

- b. Effluent samples shall be collected in the channel past the 5-foot rectangular weir prior to discharge.
- c. The Permittee shall operate the facility to meet the TSS concentration limitation, or the TSS pounds limitation, or to provide a TSS concentration which ensures that the UV light disinfection system can meet the *E. coli* effluent limitation, whichever is more restrictive.
- d. The Ultimate Oxygen Demand (UOD) limit shall be in effect only during the period June 1 – October 31 each year. UOD shall be calculated using the following equation:

$$\text{UOD (lbs/day)} = \text{Flow (MGD)} \times 8.34 [(\text{BOD}_5 \text{ (mg/L)} \times 1.43) + (\text{TKN (mg/L)} \times 4.57)]$$

- e. The quantity of BOD<sub>5</sub> and TKN discharged shall be limited such that the discharge does not exceed the UOD maximum daily limitation of 335 pounds or the BOD<sub>5</sub> limitations during June 1- October 31.
- f. The Permittee shall clean the quartz sleeves of the ultraviolet light disinfection system at a frequency which assures that effective disinfection is maintained and shall replace the ultraviolet light disinfection system lamps as necessary to maintain compliance with the *E. coli* bacteria limitations. The dates and a description of the ultraviolet light disinfection system maintenance activities shall be included on the monthly monitoring report.
- g. The effluent shall not have concentrations or combinations of contaminants including oil, grease, scum, foam, or floating solids which would cause a violation of the Vermont Water Quality Standards.
- h. The effluent shall not cause visible discoloration of the receiving waters.
- i. The monthly average concentrations of Biochemical Oxygen Demand (BOD<sub>5</sub>) and Total Suspended Solids (TSS) in the effluent shall not exceed 15 percent of the monthly average concentrations of BOD<sub>5</sub> and TSS in the influent into the WWTF. For the purposes of determining whether the Permittee is in compliance with this condition, samples from the effluent and the influent shall be taken with appropriate allowance for detention times.
- j. 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 consistent with approved water quality management plans.
- n. 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. TOTAL PHOSPHORUS**

### **1. Wasteload Allocation for Phosphorus**

This permit includes a Total Phosphorus (TP) annual, mass-based water quality based effluent limitation of 875 lbs, consistent with the waste load allocation (WLA) for TP of 0.397 metric tons per year, 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, pursuant to Condition II.B.4. of 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 WWTF and another WWTF pursuant to the requirements of TMDL and Vermont’s “Wasteload Allocation Process” Rule (Environmental Protection Rule, Chapter 17).

### **2. Phosphorus Optimization Plan**

- a. **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 POP shall:
  - (i) Be developed by a qualified professional with experience in the operation and design of WWTFs in consultation with the WWTF;
  - (ii) Evaluate alternative methods of operating the 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 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 for failure to meet the requirements of subsection (a) of this section.
- 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; and
  - (iii) The phosphorus discharge trends relative to the previous year.

The first annual report shall include data collected during 2020 and shall be attached to the December 2020 DMR form WR-43.

### **3. Phosphorus Elimination/Reduction Plan**

- 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 (Condition I.B.4), 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 Condition I.B.3.b 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 developed by qualified professionals in consultation with the WWTF. 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.

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.

#### **4. Running Total Annual Pounds Calculation**

Compliance with the annual TP limitation (presented in Condition I.A.1 and I.B.1) will be evaluated each month, using the Running Total Annual Pounds Calculation. In order to calculate running annual TP loading relative to the annual mass limit:

- a. Calculate the average of results for all TP monitoring events conducted in a month (Monthly Average TP Concentration). Units = mg/L
- b. For flow, use the average daily flow for the month as reported on the DMR. Units = MGD
- c. Calculate Total Monthly Pounds = (Monthly Average TP Concentration) × (average daily flow from DMR) × 8.34 × number of daily discharges in the month.
- d. Sum the results for the immediately preceding 12 months to derive the Running Total Annual Pounds.

#### **5. Total Phosphorus Reporting**

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

- a. Monthly Average TP Concentration, as calculated pursuant to Condition I.B.4.a.



- b. Total Monthly Pounds, meaning the total monthly pounds of TP discharged during the month, as calculated pursuant to Condition I.B.4.c.
- c. Running Total Annual Pounds, meaning the 12-month running annual TP load, as calculated pursuant to Condition I.B.4.d.
- d. Comparison (%) of Running Total Annual Pounds to Annual Permit Limitation, meaning the percentage of the Running Total Annual Pounds to the Annual TP Limitation. The comparison shall be calculated as:

Percentage of Running Total Annual Pounds to Annual Permit Limitation,  
 $\% = \text{Running Total Annual Pounds} / \text{Annual TP Permit Limit} \times 100$

### **C. 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 Castleton River downstream approximately 2.4 miles.

### **D. REAPPLICATION**

If the Permittee desires to continue to discharge after the expiration of this permit, the Permittee shall reapply on the application forms then in use at least 180 days before this permit expires.

Reapply for a Discharge Permit by: **December 31, 2023**

### **E. OPERATING FEES**

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

### **F. TOXICITY TESTING**

#### **1. Whole Effluent Toxicity (WET) Testing**

- a. During **January or February 2020 and in subsequent even numbered years**, the Permittee shall conduct a two-species (Pimephales promelas and Ceriodaphnia dubia) modified acute/chronic WET test (48-hour acute endpoints within a 7-day chronic test) on a composite effluent sample collected from S/N 001. Total Ammonia should be measured in the highest concentration of test solution at the beginning of the test. The results shall be submitted to the Secretary by **June 30, 2020 and 2022** and in subsequent even numbered years.
- b. During **August or September 2021 and in subsequent odd-numbered years**, the Permittee shall conduct a two-species (Pimephales promelas and Ceriodaphnia

dubia) modified acute/chronic WET test (48-hour acute endpoints within a 7-day chronic test) on a composite effluent sample collected from S/N 001. Total Ammonia should be measured in the highest concentration of test solution at the beginning of the test. The results shall be submitted to the Secretary by **December 31, 2021 and 2023** and in subsequent odd numbered years.

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).

Based upon the results of these tests or any other toxicity tests conducted, the Secretary reserves the right to reopen and amend this permit, pursuant to Condition II.B.4 of this permit, to require additional WET testing or a Toxicity Reduction Evaluation.

## **G. MONITORING AND REPORTING**

### **1. Sampling and Analysis**

The sampling, preservation, handling, and analytical methods used shall conform to the test procedures published in Title 40 of the Code of Federal Regulations (C.F.R.) Part 136.

The Permittee shall use sufficiently sensitive test procedures (i.e., methods) approved under 40 C.F.R. Part 136 for the analysis of the pollutants or pollutant parameters required under this Section.

Samples shall be representative of the volume and quality of effluent discharged over the sampling and reporting period. All samples are to be taken during normal operating hours. The Permittee shall identify the effluent sampling location used for each discharge. A description of the effluent sample location is included in Condition I.A.1.b.

**2. Effluent Monitoring**

During the term of this permit, the Permittee shall monitor and record the quality and quantity of discharge(s) at outfall serial number S/N 001 of the WWTF, according to the following schedule and other provisions:

| <b>During the Period from June 1 through October 31</b>  |                                      |                                |
|--|--------------------------------------|--------------------------------|
| <b>PARAMETER</b>   | <b>MINIMUM FREQUENCY OF ANALYSIS</b> | <b>SAMPLE TYPE</b>             |
| Biochemical Oxygen Demand (5-day, 20° C) (BOD <sub>5</sub> )   | 1 × weekly                           | 24-hour composite <sup>1</sup> |
| <i>E. coli</i>   | 2 × monthly                          | grab <sup>2</sup>              |
| Flow   | Continuous                           | Daily Total                    |
| Nitrite Plus Nitrate Total (NO <sub>x</sub> )  | 1 × weekly                           | 24-hour composite <sup>1</sup> |
| Nitrogen, Ammonia Total (TAN)  | 1 × monthly                          | grab <sup>2</sup>              |
| Nitrogen, Kjeldahl Total, (TKN)  | 1 × weekly                           | 24-hour composite <sup>1</sup> |
| Nitrogen, Total (TN)   | 1 × weekly                           | calculated <sup>3</sup>        |
| pH   | 1 × daily                            | grab <sup>2</sup>              |
| Phosphorus, Total (TP)   | 1 × weekly                           | 24-hour composite <sup>1</sup> |
| Settleable Solids  | 1 × daily                            | grab <sup>2,4</sup>            |
| Total Suspended Solids (TSS)   | 1 × weekly                           | 24-hour composite <sup>1</sup> |
| Ultimate Oxygen Demand (UOD)   | 1 × weekly                           | calculated                     |
| <p><sup>1</sup>Effluent samples shall be collected in the channel past the 5-foot rectangular weir prior to discharge.</p> <p><sup>2</sup>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.).</p> <p><sup>3</sup> TN = TKN + NO<sub>x</sub></p> <p><sup>4</sup> Settleable Solids samples shall be collected between 10:00 AM and 2:00 PM or during the period of peak flow.</p> |                                      |                                |

| <b>During the Period from November 1 through May 31</b> |                                      |                    |
|---|--------------------------------------|--------------------|
| <b>PARAMETER</b>  | <b>MINIMUM FREQUENCY OF ANALYSIS</b> | <b>SAMPLE TYPE</b> |

|  |              |                                |
|--|--------------|--------------------------------|
| Biochemical Oxygen Demand (5-day, 20° C) (BOD <sub>5</sub> ) | 1 × monthly  | 24-hour composite <sup>1</sup> |
| <i>E. coli</i>   | 2 × monthly  | grab <sup>2</sup>              |
| Flow   | Continuous   | Daily Total, Max., Min.        |
| Nitrite Plus Nitrate Total (NO <sub>x</sub> )                | 1 × monthly  | 24-hour composite <sup>1</sup> |
| Nitrogen, Ammonia Total (TAN)                                | 1 × monthly  | grab <sup>2</sup>              |
| Nitrogen, Kjeldahl Total, (TKN)                              | 1 × monthly  | 24-hour composite <sup>1</sup> |
| Nitrogen, Total (TN)   | 1 × monthly  | calculated <sup>2</sup>        |
| pH   | 1 × daily    | grab <sup>2</sup>              |
| Phosphorus, Total (TP)                                       | 1 × monthly  | 24-hour composite <sup>1</sup> |
| Settleable Solids  | 1 × daily    | grab <sup>1,2</sup>            |
| Total Suspended Solids (TSS)                                 | 1 × monthly  | 24-hour composite <sup>1</sup> |
| Ultimate Oxygen Demand (UOD)                                 | not required | not required                   |

<sup>1</sup>Effluent samples shall be collected in the channel past the 5-foot rectangular weir prior to discharge.

<sup>2</sup>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.).

<sup>3</sup>TN = TKN + NO<sub>x</sub>

<sup>4</sup>Settleable Solids samples shall be collected between 10:00 AM and 2:00 PM or during the period of peak flow.

| <b>Annual Constituent Monitoring</b> |          |                   |
|--------------------------------------|----------|-------------------|
| Dissolved Oxygen                     | 1 x year | grab <sup>1</sup> |
| Oil & Grease                         | 1 x year | grab <sup>1</sup> |
| Temperature                          | 1 x year | grab <sup>1</sup> |
| Total Dissolved Solids (TDS)         | 1 x year | 8-hour composite  |

<sup>1</sup> 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.).

**3. Annual Constituent Monitoring**

Annually, by December 31, the Permittee shall monitor 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:

- Temperature
- Dissolved Oxygen
- Oil & Grease
- Total Dissolved Solids

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

Collect annual constituent monitoring samples once per year. The season in which samples are collected shall change chronologically from year to year to represent the seasonal variation of effluent constituents. The sampling seasons are as follows: winter (January 1 – March 31), spring (April 1 – June 30), summer (July 1 – September 30), and fall (October 1 – December 31). The first samples under this permit should be taken in 2020 during the **winter** season. For easy reference regarding the season in which sampling is recommended, please refer to the “Guidance for Annual Constituent Monitoring.”

**4. Influent Monitoring**

During the term of this permit, the Permittee shall monitor the quality of the influent according to the following schedule and provisions:

| PARAMETER  | MINIMUM FREQUENCY OF ANALYSIS | SAMPLE TYPE                                |
|--|-------------------------------|--|
| Biochemical Oxygen Demand (BOD <sub>5</sub> )  | 2 × month                     | 8-hour composite, minimum <sup>1,2,3</sup> |
| Total Suspended Solids (TSS)   | 2 × month                     | 8-hour composite, minimum <sup>1,2,3</sup> |
| Septage  | Daily                         | Total volume received                      |
| <p><sup>1</sup> Composite samples for BOD<sub>5</sub> and TSS shall be taken during the hours 6:00 AM to 6:00 PM, unless otherwise specified. Eight hours is the minimum period for the composite.</p> <p><sup>2</sup> All grab or composite samples required to be taken less frequently than daily shall be taken between the hours of 6:00 am and 6:00 pm during the period of Monday through Friday, inclusive, unless otherwise specified.</p> <p><sup>3</sup> Composite samples are collected from just after the Parshall flume which is downstream of the coarse screen Auger Monster.</p> |                               |  |

## 5. Reporting

The Permittee is required to submit monthly reports of monitoring results as required in Condition I.G 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.

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 link below shall be used for electronic submittals:

<https://anronline.vermont.gov/>

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

All reports shall be signed:

- a. In the case of corporations, by a principal executive officer of at least the level of vice president, or his/her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the permit form originates and the authorization is made in writing and submitted to the Secretary;
- b. In the case of a partnership, by a general partner;
- c. In the case of a sole proprietorship, by the proprietor; or
- d. In the case of a municipal, State, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

## 6. Recording of Results

The Permittee shall maintain records of all information resulting from any monitoring activities required, including:

- a. The exact place, date, and time of sampling or measurement;
- b. The individual(s) who performed the sampling or measurements;

- c. The dates and times the analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques and methods used including sample collection handling and preservation techniques;
- f. The results of such analyses;
- g. The records of monitoring activities and results, including all instrumentation and calibration and maintenance records;
- h. 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
- i. For analyses performed by contract laboratories:
  - (i) The detection level reported by the laboratory for each sample; and
  - (ii) The laboratory analytical report including documentation of the QA/QC and analytical procedures.

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

## **7. 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.

## **H. 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 Condition II.A.2 of this permit.

## **I. OPERATION, MANAGEMENT, AND EMERGENCY RESPONSE PLANS**

The Permittee shall implement the Operation, Management, and Emergency Response Plan for the treatment facility, sewage pumping stations, sewer line stream crossings, and sewer collection system as approved by the Secretary on December 2, 2008.

By no later than **December 31, 2022**, the Permittee shall prepare and submit to the Secretary for review and approval, an updated Operation, Management, and Emergency Response Plan for treatment facility, sewage pumping stations, sewer line stream crossings, and sewage collection system. The Plan shall be immediately implemented upon approval by the Secretary. This plan shall comply with the provisions of 10 V.S.A. § 1278, which require:

- a. Identification of those elements of the WWTF, 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 WWTF 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.

The Permittee shall revise the Operation, Management, and Emergency Response Plan upon the Secretary's request or on its own motion to reflect equipment or operational changes.

## **J. EMERGENCY ACTION - ELECTRIC POWER FAILURE**

The Permittee shall indicate in writing to the Secretary within **90 days** after the effective date of this permit 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 the 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 WWTF 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.

The determination of treatment system storage capacity shall be submitted to the Secretary



upon completion.

## K. 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 under Condition I.K.c above, and to sample any discharge into the Permittee's treatment works.

## II. GENERAL CONDITIONS

### A. MANAGEMENT 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 notice to the Secretary of such changes. Following such notice, the permit may be modified, pursuant to Condition II.B.4 of this permit, to specify and limit any pollutants not previously limited.

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

- a. 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;
- b. 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
- c. 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.

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.

#### 2. 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.

- (i) Public notice. For “untreated discharges” an operator of a 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 a 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 a 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 a 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.A.2.c of this permit, an operator of a 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:

- (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.

### 3. 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, maintain in good working order and operate as efficiently as possible all treatment and control facilities and systems (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 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 qualified personnel who are licensed as required by Secretary and the Director of the Vermont Office of Professional Regulation.

### 4. Quality Control

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.

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

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  $\pm 10\%$ .

For purposes of demonstrating compliance with the requirements of Condition II.A.3.a 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. Results shall be submitted to the Secretary by December 31, annually. The first results are due by **December 31, 2020**.

## **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. 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.

## **6. Duty to Mitigate**

The Permittee shall 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.

## **7. Records Retention**

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed, all calibration and maintenance of instrumentation records and all original 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 shall be retained for a minimum of three years, and shall be submitted to the Secretary upon request. This period shall be extended during the course of unresolved litigation regarding the discharge of pollutants or when requested by the Secretary.

## **8. Solids Management**

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.

## **9. Emergency Pollution Permits**

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.A.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, he 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:

- (1) 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;
- (2) the denial of an emergency pollution permit would work an extreme hardship upon the applicant;
- (3) the granting of an emergency pollution permit will result in some public benefit;
- (4) the discharge will not be unreasonably harmful to the quality of the receiving waters;
- (5) the cause or reason for the emergency is not due to willful or intended acts or omissions of the applicant.

Application shall be made to the Secretary at the following address: Agency of Natural Resources, Department of Environmental Conservation, One National Life Drive, Main Building 2nd Floor, Montpelier VT 05620-3522.

## **B. RESPONSIBILITIES**

### **1. Right of Entry**

The Permittee shall allow the Secretary or authorized representative, upon the presentation of proper credentials:

- 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.

## 2. 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.

## 3. 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 this chapter.

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.

#### **4. 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.

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.

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.

#### **5. 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.B.4 of this permit, in accordance with the toxic effluent standard or prohibition and the Permittee so notified.

## 6. 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.

## 7. Other Materials

Other materials ordinarily produced or used in the operation of the 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,
- (iii) 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 his/her 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.

## 8. 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.

## 9. Civil and Criminal Liability

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.A.5) and “Emergency Pollution Permits” (Condition II.A.9), nothing in this permit shall be construed to relieve the Permittee from civil or criminal penalties for noncompliance. Civil and criminal penalties for non-compliance are provided for in 10 V.S.A. Chapters 47, 201, and 211.

## 10. 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.

## 11. 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.

## 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. 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.

## 14. 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, and § 402 of the Clean Water Act, as amended.

## 15. 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.

AGENCY OF NATURAL RESOURCES  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
WATERSHED MANAGEMENT DIVISION  
ONE NATIONAL LIFE DRIVE, MAIN BUILDING, 2<sup>ND</sup> FLOOR  
MONTPELIER, VT 05620-3522

**FACT SHEET FOR DRAFT PERMIT**  
**May 2019**

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

**PERMIT NO:** 3-1238  
**PIN:** RU95-0153  
**NPDES NO:** VT0100897

**NAME AND ADDRESS OF APPLICANT:**

Town of Castleton  
P.O. Box 727  
Castleton, VT 05735

**NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:**

Castleton Wastewater Treatment Facility  
320 VT Route 30 South  
Castleton, VT 05735

**RECEIVING WATER:** Castleton River

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

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

On May 29, 2008, the Secretary of the Vermont Agency of Natural Resources (hereinafter referred to as "the Secretary") received a renewal application from the Town of Castleton (hereinafter referred to as the "Permittee") for the permit to discharge from the Castleton Wastewater Treatment Facility (hereinafter referred to as the "WWTF") into the designated receiving water. The Permittee's previous permit was issued on November 3, 2003. The previous permit (hereinafter referred to as the "current permit") has been administratively continued, pursuant to 3 V.S.A. § 814, as the applicant filed a complete application for permit reissuance within the

prescribed time period as per the Vermont Water Pollution Control Permit Regulations § 13.5(b). At this time, the Secretary has made a tentative decision to reissue the discharge permit.

The WWTF is engaged in the treatment of municipal wastewater.

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

## **II. Description of Discharge**

The WWTF is engaged in the treatment of municipal wastewater including domestic and commercial. There are no pretreaters permitted under the NPDES program discharging to the collection system. The WWTF type is sequencing batch reactor (SBR). The design flow of the WWTF is 0.480 million gallons per day (MGD) and the design biochemical oxygen demand (BOD) loading is 176 mg/l (794 lbs/day). The average flow to the WWTF over the last 5 years is approximately 0.26 MGD.

The WWTF maintains a continuous discharge to the Castleton River.

## **III. Limitations and Conditions**

The draft permit contains limitations for effluent flow, Biochemical Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), Total Phosphorus (TP), Settleable Solids (SS), *Escherichia coli*, Ultimate Oxygen Demand (UOD), and pH. It also contains monitoring requirements for Total Nitrogen (TN), Total Kjeldahl Nitrogen (TKN), Nitrate/Nitrite (NO<sub>x</sub>), and Total Ammonia Nitrogen (TAN). The effluent limitations of the draft permit and the monitoring requirements may be found on the following pages of the draft permit:

|                          |                   |
|--------------------------|-------------------|
| Effluent Limitations:    | Pages 4-9 of 30   |
| Monitoring Requirements: | Pages 10-15 of 30 |

## **IV. Statutory and Regulatory Authority**

### **A. Clean Water Act and NPDES Background**

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



Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: “technology-based” limitations and “water quality-based” limitations. CWA § 301, 303, 304(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant-reducing technology available and economically achievable for the type of facility being permitted. CWA § 301(b). As a class, WWTFs must meet performance-based requirements based on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for WWTFs is referred to as “secondary treatment.” Secondary treatment is comprised of technology-based requirements expressed in terms of BOD<sub>5</sub>, TSS and pH; 40 C.F.R. Part 133.

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

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

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

Where a state has not established a numeric water quality criterion for a specific chemical pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: based on a “calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use”; on a “case-by-case basis” using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an “indicator parameter.” 40 C.F.R. § 122.44(d)(1)(vi)(A-C).

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

### **1. Reasonable Potential Determination**

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

- 1) Existing controls on point and non-point sources of pollution as evidenced by the Vermont surface water assessment database;
- 2) Pollutant concentration and variability in the effluent as determined from the permit application materials, monthly discharge monitoring reports (DMRs), or other facility reports;
- 3) Receiving water quality based on targeted water quality and biological assessments of receiving waters, as applicable, or other State or Federal water quality reports;
- 4) Toxicity testing results based on the Vermont Toxic Discharge Control Strategy, and compelled as a condition of prior permits;
- 5) Available dilution of the effluent in the receiving water, expressed as the instream waste concentration. In accordance with the applicable Vermont Water Quality Standards, available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life and human health criteria for non-carcinogens, or at all flows for human health (carcinogens only) in the receiving water. For nutrients, available dilution for stream and river discharges is assessed using the low median monthly flow computed as the median flow of the month containing the lowest annual flow. Available dilution for lakes is based on mixing zones of no more than 200 feet in diameter, in any direction, from the effluent discharge point, including as applicable the length of a diffuser apparatus.
- 6) All effluent limitations, monitoring requirements, and other conditions of the draft permit.

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

### **B. Anti-Backsliding**

Section 402(o) of the CWA provides that certain effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the current permit. EPA has also promulgated anti-backsliding regulations which are found at 40 C.F.R. § 122.44(l). Unless applicable anti-backsliding exemptions are met, the limits and conditions in the reissued permit must be at least as stringent as those in the current permit.

## **V. Description of Receiving Water**

The receiving water for this discharge is the **Castleton River**, a designated Cold-Water Fish Habitat. At the point of discharge, the river has a contributing drainage area of 53 square miles. The summer 7Q10 flow of the river is estimated to be 2.28 cubic feet per second (CFS) and the summer Low Median Monthly flow is estimated to be 11.90 CFS. The instream waste concentration at the summer 7Q10 flow is 0.246 (24.6 %) and the instream waste concentration at the summer Low Median Monthly flow is 0.058 (5.8%)

In addition, the Castleton River drains into Lake Champlain, which is impaired for phosphorus and is subject to a Total Maximum Daily Load (TMDL) for phosphorus. This is discussed further in Section VII.C.1. of this Fact Sheet.

## **VI. Facility History and Background**

The Town of Castleton owns and operates the WWTF which provides secondary treatment of municipal wastewater. In the late 1990's the Town completed a facility upgrade including sequencing batch reactor (SBR) treatment followed by ultraviolet (UV) disinfection.

## **VII. Permit Basis and Explanation of Effluent Limitation Derivation**

**A. Flow** – The draft permit maintains the annual average flow limitation of 0.480 MGD. Before upgrades the WWTF had a permitted flow of 0.360 MGD. This WWTF maintains a continuous discharge. Continuous flow monitoring is required.

### **A. Conventional Pollutants**

#### **1. Biochemical Oxygen Demand (BOD<sub>5</sub>)**

The effluent limitations for BOD<sub>5</sub> remain unchanged from the current permit. The monthly average (30 mg/L) and weekly average (45 mg/L) reflect the minimum level of effluent quality specified for secondary treatment in 40 C.F.R. Part 133.102. In addition, the draft permit contains a 50 mg/L, maximum day, BOD<sub>5</sub> limitation. This is the Agency standard applied to all such discharges pursuant to 13.4 c. of the Vermont Water Pollution Control Permit Regulations. The Secretary implements the limit to supplement the federal technology-based limitations. This is designed to prevent a gross one-day permit effluent violation from being offset by multiple weekly and monthly sampling events. Mass limits (90 lbs/day, monthly average and 135 lbs/day, weekly average) are charges pursuant to 13.4 c. of the Vermont Water Pollution Control Permit Regulations. Mass limits were derived by multiplying the concentration limits by a previously permitted flow of 0.360 MGD (i.e. before the upgrade/expansion of the WWTF). The BOD<sub>5</sub> weekly summer and monthly winter monitoring requirement is unchanged from the previous permit. The twice monthly influent BOD<sub>5</sub> requirement remains unchanged. This requirement is due to significant fluctuations in the results.

2. **Total Suspended Solids (TSS)** – The effluent limitations for TSS remain unchanged from the current permit. The monthly average (30 mg/L) and weekly average (45 mg/L) reflect the minimum level of effluent quality specified for secondary treatment in 40 C.F.R. Part 133.102. In addition, the draft permit contains a 50 mg/L, maximum day, TSS limitation. This is the Agency standard applied to all such discharges pursuant to 13.4 c. of the Vermont Water Pollution Control Permit Regulations. The Secretary implements the limit to supplement the federal technology-based limitations. This is designed to prevent a gross one-day permit effluent violation from being offset by multiple weekly and monthly sampling events. Mass limits (90 lbs/day, monthly average and 135 lbs/day, weekly average) are calculated using the concentration limits outlined above, and the permitted flow prior to the WWTF upgrade and expansion (0.360 MGD). The permitted mass limits are being held in order to prevent degradation of the receiving water body that could occur based on a larger volume of permitted flow from this WWTF. The TSS weekly summer and monthly winter monitoring requirement is unchanged from the current permit. The twice monthly influent TSS requirement remains unchanged. This requirement is due to significant fluctuations in the results.
3. ***Escherichia coli*** – The *E. coli* limitation is 77 CFU/100 ml, instantaneous maximum, based upon the limitation in the current permit and the anti-backsliding provisions of § 402(o) of the CWA. As in the current permit, twice monthly monitoring is required.
4. **pH** – The pH limitation remains at 6.5 - 8.5 Standard Units as specified in § 29A-303(6) in the Vermont Water Quality Standards. Monitoring remains at daily.

## **B. Non-Conventional and Toxics**

### **1. Total Phosphorus (TP)**

#### *Total Maximum Daily Load Background:*

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

In the 2016 LC TMDL, the EPA took a targeted approach to identifying the degree of reductions required for WLAs between the 2002 and 2016 LC TMDLs. The EPA targeted

reductions to two categories of WWTFs, WWTFs in those lake segment watersheds where the currently permitted wastewater load represents a significant (defined in the 2016 LC TMDL as being 10% or greater) portion of the total phosphorus load to that lake segment from all sources (Main Lake, Shelburne Bay, Burlington Bay, St. Albans Bay) and WWTFs where wastewater upgrades would meaningfully reduce the phosphorus reduction burden placed on non-wastewater (non-point) sources for a lake segment (Missisquoi Bay). The 2016 LC TMDL assigned WWTFs with a design flow capacity of 0.1 to 0.2 gallons per day (MGD) that discharge into these five lake segments a WLA based on a 0.8 mg/L effluent phosphorus concentration at permitted flow. WWTFs with design capacity of more than 0.2 MGD were assigned a WLA based on a 0.2 mg/L effluent phosphorus concentration at permitted flow. The EPA determined that WWTFs with a design flow of less than 0.1 million MGD that discharge into these five lake segment (Main Lake, Shelburne Bay, Burlington Bay, St. Albans Bay, and Missisquoi Bay) would continue to receive the same WLA as in the 2002 TMDL due to their minor contribution to phosphorus loading. Pursuant to EPA's analysis, the 2016 LC TMDL also assigned WWTFs discharging to the Port Henry, Otter Creek, Mallets Bay, Northeast Arm, Isle LaMotte, and the South Lake A/B lake segments the same WLA as in the 2002 TMDL.

*Analysis in Support of Phosphorus Water Quality-Based Effluent Limit in Permit:*

The Secretary has used the WLA assigned to this facility in the 2016 LC TMDL to require a Water Quality-Based Effluent Limit (WQBEL) for phosphorus in the draft permit equal to the WLA. Using the WLA from the 2016 LC TMDL as the phosphorus WQBEL is appropriate because little time has passed since adoption of the 2016 LC TMDL, the State continues to make significant progress toward meeting the milestones established in the LC TMDL Accountability Framework that guides water quality restoration of Lake Champlain, and the State has received positive reports from EPA. There is no reason to believe that the assumptions upon which the WLA was developed – including that contributions of phosphorus from other sectors will be reduced in the future – are no longer valid.

The State has largely met the milestones in the LC TMDL Accountability Framework<sup>1</sup> and is actively working to meet the two that remain outstanding. For the State's work in 2016, the EPA's report card identified that 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.<sup>2</sup> Subsequently, as outlined in the 2018 Vermont Lake Champlain Phosphorus Total Maximum Daily Loads Accountability Framework Report<sup>3</sup>, the State completed a majority of the milestones in the LC TMDL Accountability Framework due by December 30, 2017. For the State's work in 2017, the EPA's report card gave Vermont a "provisional pass" and identified plans to review Vermont's progress on three outstanding milestones in mid-2019.<sup>4</sup> The report card identified that EPA is "encouraged that progress has

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<sup>1</sup> For the Accountability Framework, see pages 54-59 of the LC TMDL.

<sup>2</sup> 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.

<sup>3</sup> Submitted by the State to EPA on March 7, 2018; available at:

<http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/2018VermontLakeChamplainPhosphorusTMDLAccountabilityFrameworkReport.pdf>

<sup>4</sup> Letter dated April 2, 2018 from EPA Regional Administrator Alexandra Dapolito Dunn to Secretary of Natural Resources Julie Moore and Secretary of Agriculture, Food and Markets Anson Tebbetts.

been made toward the completion of each [outstanding milestone].” Subsequent to the EPA’s most recent report card, on July 27, 2018, Vermont completed the additional milestone of revision and issuance of the Municipal Separate Storm Sewer System (MS4) General Permit.

While two milestones remain to be completed, this is not sufficient to undermine the assumption that reductions in phosphorus contributions from 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 finalize 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.

Further, if the EPA finds that the State’s progress is not satisfactory, the EPA may, amongst other things, revise the TMDLs to reallocate additional load reductions from nonpoint to point sources (i.e., create more stringent WLAs). The EPA has taken no such actions; rather, the EPA has thus far provided positive assessment of the State’s compliance with the LC TMDL Accountability Framework. The State has received nothing from EPA indicating that the assumptions upon which the WLA was developed are no longer reliable.

It is appropriate to establish a phosphorus WQBEL for this facility that is equal to its WLA in the 2016 LC TMDL.

*Phosphorus Effluent Limits in Draft Permit:*

Effluent limits for phosphorus in this permit are expressed as both:

- (1) an annual mass limit, and
- (2) a monthly average concentration limit.

The current discharge permit for this facility includes an annual mass limit of 875 pounds of total phosphorus (TP) per year. This annual mass limit was based on the WLA of 0.397 metric tons established in the 2002 LC TMDL for this facility. The current permit also contains a monthly average concentration limit of 0.8 mg/L, which is consistent with the annual mass limit at a design flow of 0.36 MGD (i.e., design flow prior to upgrade/expansion of the facility).

The draft permit for this facility continues to include an annual mass limit of 875 pounds of TP per year, which is based upon the WLA of 0.397 metric tons established in the 2016 LC TMDL for this facility. The draft permit also continues to include a monthly average concentration limit of 0.8 mg/l TP, which is consistent with the annual mass limit at a design flow of 0.36 MGD.

To determine the annual mass limit for the draft permit, the WLA was converted from metric tons to pounds, and rounded down to the nearest pound, using the following equation:

$$(0.3969\text{mt/yr}) (2204.62\text{lbs/mt}) = 875 \text{ lbs/yr}$$

Compliance with the annual mass limit will be determined each month using the Running Total Annual Pounds Calculation (Condition I.B.4. of the permit), rather than once at the end of the calendar year.

A monthly average concentration limit is required in the draft permit pursuant to 10 V.S.A. § 1266a, which states 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.” The annual mass limit of 875 pounds equates to the monthly average concentration limit (0.8 mg/L) multiplied by a previously permitted flow of 0.36 MGD (i.e., before upgrade/expansion of the facility). This corresponds to a concentration of 0.6 mg/l at the current design flow of the facility (0.48 MGD).

It is important to note that because the annual mass and average monthly concentration limits in the draft permit are not mathematically equivalent, meeting the average monthly concentration limit will not necessarily result in meeting the annual mass limit. The Permittee must comply with both the annual mass limit and average monthly concentration limit; in other words, the Permittee must operate the facility to meet the more restrictive limit under the circumstances. What limit is more restrictive primarily depends upon discharge flows at the facility. If the facility is operating at design flows, the annual mass limit may be the more restrictive limitation. If the facility is operating at low flows, the average monthly concentration limit may be the more restrictive limitation.

**Weekly summer and monthly winter monitoring for total phosphorus is required.**

Condition I.B.5. of this draft permit requires the submission of monitoring reports to the Secretary specific to tracking TP in the discharge. A report that documents the annual TP discharged from the facility, summarizes phosphorus removal optimization and efficiencies, and tracks trends relative to the previous year shall be attached to the December WR-43 form. The annual and monthly TP loads discharged from the facility are also required to be reported electronically.

*Phosphorus Optimization and Elimination/Reduction Plans:*

In the 2016 LC TMDL, EPA also 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 Program maintains a tracking system for phosphorus loading from Vermont WWTFs so that a facility approaching, or over, 80% of the annual mass limit in its permit can be identified. The 80% threshold is calculated by comparing the individual annual mass limit to the actual phosphorus discharge load from the WWTF over the prior 12 months:

$$\text{WWTF Annual TP Load} / \text{Annual Mass Limit} \times 100$$

There are currently WWTFs in the Lake Champlain watershed with existing discharged loads of phosphorus already at, or above, 80% of their current annual mass limits.

To ensure that all facilities are operating as efficiently as possible, all reissued wastewater discharge permits under the 2016 LC TMDL will require facilities to develop or update 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. Facilities will be given 12 months following permit issuance to engage in optimization techniques for the removal of TP.

In addition to the POP, all permits will require facilities' phosphorus discharge to be evaluated by the Secretary relative to the 80% threshold after the optimization period and based on the prior 12 months. The 80% evaluation will continue on a rolling 12-month basis thereafter. If a facility is at, or reaches, 80% of its annual mass limit, the permittee must develop a Phosphorus Elimination/Reduction Plan (PERP) to ensure that the facility will comply with its annual mass limit.

Condition I.B.2 of the draft permit requires that within 120 days of the permit effective date, the Permittee shall develop or update, and submit to the Secretary, a POP. 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. If, after the 12-month optimization period, the WWTF's actual TP loads reach or exceed 80% of the annual mass limit, based on the WWTF's 12-month running annual load calculated using the Phosphorus Load Calculation (Condition I.B.4 of the permit) 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.

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. 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 to the Secretary to ensure the WWTF continues to comply with its annual mass limit. The PERP shall be treated as an application to amend the permit, and therefore, shall be subject to all public notice, hearing, and comment provisions, in place at the time the plan is submitted, that are applicable to permit amendments. The WWTF shall revise the PERP if required by the Secretary.

2. **Settleable Solids** – The limitation of 1.0 mL/L instantaneous maximum and daily monitoring remain unchanged from the current permit. This numeric limit was established in support of the narrative standard in § 29A-303(2) of the Vermont Water Quality Standards.
3. **Total Ammonia Nitrogen (TAN)** – TAN is the sum of two states of nitrogen, un-ionized ( $\text{NH}_3$ ) and ionized ( $\text{NH}_4^+$ ). The 1997 permit included ammonia limits of 18 lbs/day, monthly average (summer) and 45 lbs/day, monthly average (winter) based on the 1986 ammonia criteria. In 2003, Calculations using EPA's 1999 "Update of Ambient Water Quality Criteria for Ammonia" indicate that a summer limit of 19 lbs/day will not cause an instream toxic effect. The winter limit was removed and a summer limit of 19 lbs/day, monthly average, was adopted. This change did not fulfill the specific exceptions outlined in 40 C.F.R. § 122.44(l) to



the general prohibition against the establishment of less stringent effluent limitations. Based on these findings, the 1999 permit conditions are re-established. The winter (November 1 – May 31) monthly average limit is set at 45 lbs and the summer (June 1 – October 31) monthly average limit is set at 18 lbs. Monitoring remains monthly.

4. **Nitrite Plus Nitrate Total (NO<sub>x</sub>)** – Nitrite and nitrate are oxygenated forms of nitrogen. To gather data on the amount of Total Nitrogen in this discharge, Nitrite (NO<sub>2</sub><sup>-</sup>) plus Nitrate (NO<sub>3</sub><sup>-</sup>) monitoring is proposed in the new permit. The proposed monitoring is once per weekly for the summer and once per monthly during the winter.
5. **Ultimate Oxygen Demand (UOD)** - On the basis of assimilative capacity modeling completed on the Castleton River, the Secretary has determined that an ultimate oxygen demand (UOD) limit of 335 lbs/day will ensure compliance with the dissolved oxygen water quality criteria (6.0 mg/l) during critical summertime instream conditions. The permit includes this limit to be calculated based on the quantity of flow, BOD<sub>5</sub>, and Total Kjeldahl Nitrogen (TKN). This limit is effective during the period June 1 through October 31 each year, and weekly monitoring is required during the period.
6. **Total Kjeldahl Nitrogen (TKN)** – TKN is the sum of nitrogen in the forms of ammonia (un-ionized (NH<sub>3</sub>) and ionized (NH<sub>4</sub><sup>+</sup>)), soluble organic nitrogen, and particulate organic nitrogen. TKN weekly monitoring is required in the current permit during June 1 through October 31 each year to allow the calculation of Ultimate Oxygen Demand. This condition will not change. To gather data on the amount of Total Nitrogen (TN) in this discharge, monthly TKN monitoring is proposed in the new permit for the period of November 1 through May 31.
7. **Total Nitrogen (TN)** - TN is the sum of nitrate, nitrite, ammonia, soluble organic nitrogen, and particulate organic nitrogen. To gather data on the amount of Total Nitrogen (TN) in this discharge and its potential impact on the receiving water, a weekly summer and monthly winter “monitor only” requirement for Nitrate/Nitrite (NO<sub>x</sub>) and Total Kjeldahl Nitrogen (TKN) has been included in this permit. TN is a calculated value based on the sum of NO<sub>x</sub> and TKN, and, shall be reported as pounds, calculated as:

$$\text{Average TN (mg/L)} \times \text{Total Daily Flow} \times 8.34$$

$$\text{where, TN (mg/L)} = \text{TKN (mg/L)} + \text{NO}_x \text{ (mg/L)}$$

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

Like P, N promotes noxious aquatic plant and algal growth. High concentrations of P and N together cause greater growth of algae than P alone. The relative abundance of these nutrients also influences the type of species within the community. Furthermore, a high N-to-P ratio

may exacerbate the growth of cyanobacteria, while elevated levels of nitrogen increase toxicity in some cyanobacteria species. Given the dynamic nature of all aquatic ecosystems, for the State to fully understand the degradation to water quality it is necessary to limit P and monitor bioavailable N (including nitrate, ammonium, and certain dissolved organic nitrogen compounds).

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

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

8. **Toxicity Testing** – 40 C.F.R. Part 122.44(d)(1) requires the Secretary to assess whether the discharge causes or has the reasonable potential to cause or contribute to an excursion above any narrative or numeric water quality criteria. Per these federal requirements, the Permittee shall conduct Whole Effluent Toxicity (WET) testing and toxic pollutant analyses according to the schedule outlined in Condition I.F.1. of the draft permit. If the results of these tests indicate a reasonable potential to cause an instream toxic impact, the Secretary may require additional WET testing, establish a WET limit, or require a Toxicity Reduction Evaluation.
9. **Annual Monitoring** - For all facilities with a design flow of greater than 0.1 MGD, 40 C.F.R. § 122.21(j) requires the submittal of effluent monitoring data for those parameters identified in Condition I.G.3. of the draft permit. Samples must be collected once annually such that by the end of the term of the permit, all quarters have been sampled at least once, and the results will be submitted by December 31 of each year. Sampling in 2020 should be completed in winter (January 1 to March 31). For subsequent sampling, the “Guidance for Annual Constituent Monitoring” document should be referred to determine the season in which samples should be taken each year.

### C. Special Conditions

1. **Waste Management Zone (WMZ)** – As defined under 10 V.S.A. §1251(16), a WMZ is “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 due to the authorized discharge”.

The draft permit retains the existing waste management zone (WMZ) that extends downstream from the outfall for approximately 2.4 miles in the Castleton River.

2. **Laboratory Proficiency Testing** - To ensure there are adequate laboratory controls and appropriate quality assurance procedures, the Permittee shall conduct an annual laboratory proficiency test for the analysis of all pollutant parameters performed within their facility laboratory and reported as required by their NPDES permit. Proficiency Test samples must be obtained from an accredited laboratory. This requirement may be fulfilled through the successful completion of an EPA DMR-QA study. Results shall be submitted to the Secretary by December 31, annually, beginning in 2020.

- 3. Operation, Management, and Emergency Response Plans (OMERP)** – As required by the revisions to 10 V.S.A. § 1278, Condition I.I. has been included in the draft permit. This condition requires that the Permittee implement the Operation, Management, and Emergency Response Plans for the WWTF, sewage pump/ejector stations, and stream crossings as approved by the Secretary. The present OMERP for the WWTF was submitted in 2008 and needs to be updated. The Permittee shall prepare and submit to the Secretary for review and approval, an Operation, Management, and Emergency Response Plan for the WWTF and its major components (sewage pump/ejector stations, stream crossings, sewage collection system, etc.) by December 31, 2022.
- 4. Engineering Evaluation** – An Engineering Evaluation is not required during this permit cycle. This condition requires the Permittee to conduct an in-depth inspection and report of the treatment WWTF to identify and repair equipment, processes, and other possible deficiencies which may adversely affect effluent quality or proper operation. The WWTF conducted a 10 Year Sewer and Wastewater Treatment Facility Planning Study in November 2016.
- 5. Electric Power Failure Plan** – To ensure the WWTF can continue operations even 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.
- 6. Septage Capacity** – Permit special Condition I.A.1.f requires that the WWTF conform to the provisions of 10 V.S.A. § 1626a, awards for wastewater treatment plants with a capacity of 250,000 gallons or more per day. The plant capacity must be sufficient to receive, treat, and dispose of septage in a quantity equivalent to the ratio of 4,000 gpd of septage for each 1 MGD of WWTF hydraulic capacity. Thus, the WWTF must reserve 1,920 gpd and its equivalent BOD<sub>5</sub> for septage.
- 7. Electronic Reporting** - The EPA recently promulgated a final rule to modernize the Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule requires the inclusion of electronic reporting requirements in NPDES permits that become effective after December 21, 2015. The rule requires that NPDES regulated entities that are required to submit discharge monitoring reports (DMRs), including majors and nonmajors, individually permitted or covered by a general permit, must do so electronically after December 2016. The Secretary has created an electronic reporting system for DMRs and has recently trained facilities in its use. As of December 2020, these NPDES facilities will also be expected to submit additional information electronically as specified in Appendix A in 40 C.F.R. part 127.
- 8. Noncompliance Notification** - As required by the passage of 10 V.S.A. §1295, Condition II.A.2 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.
- 9. Reopener** - This draft permit includes a reopener whereby the Secretary reserves the right to reopen and amend the permit to implement an integrated plan to address multiple Clean Water

Act obligations.

**E. Reasonable Potential Analysis**

The Secretary has conducted a reasonable potential analysis, which is attached to this Fact Sheet as Attachment A. Based on this analysis, the Secretary has determined the available data indicate that this discharge does not cause, have a reasonable potential to cause, or contribute to an instream toxic impact or instream excursion above the water quality criteria. As such, other than the effluent limitation for phosphorus as discussed in Section II.B.1 of this document, the development of water quality based effluent limitations (WQBELs) will not be necessary.

**VIII. Procedures for Formulation of Final Decision**

The public comment period for receiving comments on this draft permit is from **May 15, 2019 through June 18, 2019** during which time interested persons could their written views on the draft permit. No comments were received during this period.

**Agency of Natural Resources  
Department of Environmental Conservation**

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

**MEMORANDUM**

To: Shea Miller, Wastewater Program (WWP)

From: Rick Levey, Monitoring, Assessment and Planning Program (MAPP) *Rick Levey 12/17/2018*

Cc: Pete LaFlamme, Director, WSMD  
Mary Borg, Deputy Director, WSMD  
Ethan Swift, Manager, MAPP

Date: December 17, 2018

Subject: MAPP Reasonable Potential Determination for the Castleton Wastewater Treatment Facility (WWTF).

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MAPP has evaluated the draft permit limits for the Castleton WWTF in Castleton, Vermont pursuant to the 2012 procedure outlining WWM-WSMD roles and responsibilities. This memo provides MAPP's concurrence with the permit limits set forth by the draft permit for Castleton WWTF prepared by the WWP.

***Facility:***

Castleton Wastewater Treatment  
Facility Permit No. 3-1238  
NPDES No. VT0100897

***Hydrology for Castleton WWTF used in this evaluation:***

Design Flow: 0.480 MGD=0.743 CFS  
7Q10 = 2.28 CFS  
LMM = 11.90 CFS  
IWC-7Q10 = 0.246 (IWC > 10%)  
IWC-LMM= 0.058 (IWC > 1%)

***Receiving Water:***

Castleton River, Castleton, VT  
Outfall Location: Lat. 43.361330 Long. -73.123724 (NAD 83)

The Castleton River downstream of the Castleton WWTF is classified as Class B and is designated a Cold-Water Fish Habitat. At the point of discharge, the river has a contributing drainage area of 53 square miles. The proposed permit waste management zone (WMZ) in the Castleton River begins at the outfall of this WWTF and extends downstream approximately 2.4 miles (Figure 1). There are no permitted discharges upstream.

**General Assessment – VTDEC Assessment Database:**

MAPP maintains the VTDEC assessment database, an EPA-required database which describes the conditions of Vermont’s surface waters with respect to their attainment of VWQS. For the Castleton River segment to which this facility discharges, the database indicates the receiving water does fully support all designated uses.

**Ambient Chemistry Data for the Castleton River below the Castleton WWTF:**

There is ambient chemistry data available from VTDEC sampling that occurred in 2010 and 2015 above and below the facility. The above site is located at River Mile 6.5, the below site in 2010 was at RM 6.2, in 2015 the below site was moved downstream to RM 6.0 because of river morphology adjustments.

Water chemistry measures for the following parameters are available and summarized in Table 1: water temperature, pH, alkalinity, conductivity, turbidity, dissolved oxygen and percent saturation, total phosphorus (TP) and total nitrogen (TN). Priority metals were analyzed above and below the WWTF at RM 6.5 and RM 6.0 respectively and are summarized in Table 4.

Data representativeness was assessed by evaluating the flow conditions at which samples were collected from field sheets and from the most proximally-located USGS gauge for which data were available, and in consideration of possible downstream sensitive reaches. The location of the downstream sampling location RM 6.2 & 6.0 effectively targets the WWTF outfall (Figure 1). The downstream sampling location is the most sensitive location, and the sampling results are representative of low flows based on the actual flows shown from the USGS gauge, and field notes collected by DEC technical staff. Thus, the data presented below are relevant for inclusion in this analysis.

**Table 1:** Concentrations of surface-water chemistry above (River Mile 6.5) and below (River Mile 6.2 & 6.0) the Castleton Wastewater Treatment Facility

| Sample Date | River Mile | Water Temp (°C) | pH  | Alkalinity (mg/l) | Conductivity (umho/cm) | Turbidity (NTU) | DO (%) | DO (mg/l) | Total Phosphorus (ug/l) | Total Nitrogen (mg/l) |
|-------------|------------|-----------------|-----|-------------------|------------------------|-----------------|--------|-----------|-------------------------|-----------------------|
| 8/26/2010   | 6.5        | 15.3            | 7.5 | 115               | 302                    | 0.39            | 74.4   | 7.3       | 13.7                    | 0.24                  |
|             | 6.2        | 15.5            | 7.5 | 114               | 310                    | 0.53            | 75.6   | 7.5       | 17.3                    | 0.27                  |
| 10/14/2010  | 6.5        | 9.0             | 7.6 | 97                | 261                    | 0.98            | 82.3   | 8.9       | 11.7                    | 0.38                  |
|             | 6.2        | 9.6             | 7.5 | 97                | 276                    | 1.30            | 83.6   | 9.1       | 13.3                    | 0.94                  |
| 11/16/2010  | 6.5        | 8.2             | 7.4 | 85                | 229                    | 0.61            | 67.0   | 8.2       | 11.2                    | 0.28                  |
|             | 6.2        | 8.2             | 7.4 | 85                | 230                    | 1.26            | 65.4   | 7.5       | 11.5                    | 0.31                  |
| 7/22/2015   | 6.5        | 17.3            | 7.8 | -                 | 335                    | 1.70            | 89.6   | 8.4       | 10.7                    | 0.47                  |
|             | 6.0        | 17.2            | 7.8 | -                 | 342                    | 1.58            | 89.6   | 8.4       | 13.0                    | 0.55                  |
| 7/28/2015   | 6.5        | -               | 7.7 | -                 | 290                    | 1.00            | -      | -         | 8.2                     | 0.53                  |
|             | 6.0        | -               | 7.7 | -                 | 291                    | 1.14            | -      | -         | 9.6                     | 0.53                  |
| 10/7/2015   | 6.5        | 12.2            | 7.4 | 106               | 307                    | -               | -      | 8.7       | 7.7                     | 0.38                  |
|             | 6.0        | 11.9            | 7.4 | 103               | 328                    | -               | -      | 8.3       | 18.9                    | 0.55                  |



**LEGEND**

- Stream
- Town Boundary

**NOTES**

Map created using ANR's Natural Resources Atlas

1: 3,251  
December 4, 2018

165.0 0 82.00 165.0 Meters  
WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere 1" = 271 Ft. 1cm = 33 Meters  
© Vermont Agency of Natural Resources THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

**Figure 1.** Castleton River near the Castleton WWTf, showing upstream (RM 6.5) and downstream (RM 6.2 & 6.0). Outfall location shown by arrow. Figure taken from the Vermont Integrated Watershed Assessment System on the VTANR Atlas (<https://anrweb.vt.gov/DEC/IWIS/>).

Total Phosphorus (TP) below the outfall (RM 6.2 & 6.0) ranged from 9.6 – 18.9 µg/L while above the outfall (RM 6.5) TP ranged from 7.7 – 13.7 µg/L. The greatest TP increase measured from above to below was 11.1µg/L on 10/7/2015.

Total Nitrogen (TN) below the outfall (RM 6.2 & 6.0) ranged from 0.27 – 0.94 mg/L and above (RM 6.5) ranged from 0.24 – 0.53 mg/L.

***Turbidity, Dissolved Oxygen, pH:***

Turbidity above the outfall ranged from was 0.39 – 1.7 Nephelometric Turbidity (NTU) and below the outfall ranged from 0.53 – 1.58 NTU. The pH above and below the facility ranged from 7.4 – 7.8. Dissolved oxygen and percent saturation were measured above and below on 7/22/2015 and were 8.4 mg/L and 89.6 percent saturation.

**Biological Assessments:**

Biological assessments were conducted in 2015 above and below the Castleton WWTF at RM 6.5 & 6.0 respectively (Table 2). The bioassessments conducted met water quality standards for the Medium High Gradient Stream type. A bioassessment conducted in 2007 below the WWTF at RM 6.2 did not meet water quality standards; however, this data is over 10 years old and the 2015 assessments will be used for this determination.

**Table 2.** Results of the Biological Monitoring for Macroinvertebrates on the Castleton River, above (RM 6.5) and below (RM 6.2 & 6.0) the Castleton WWTF discharge.

| <b>Macroinvertebrate Site Summary</b>                                 |            |         |          |              |       |        |        |                 |        |                      |
|---|------------|---------|----------|--------------|-------|--------|--------|-----------------|--------|----------------------|
| <b>Location:</b> Castleton River                                      |            |         |          |              |       |        |        |                 |        |                      |
| <b>Town:</b> Castleton  |            |         |          |              |       |        |        |                 |        |                      |
| <b>Description:</b> Sampling Sites Above and Below the Castleton WWTF |            |         |          |              |       |        |        |                 |        |                      |
| Date  | River Mile | Density | Richness | EPT Richness | PMA-O | B.I.   | Oligo. | EPT/EPT + Chiro | PPCS-F | Community Assessment |
| 10/8/2003   | 6.2        | 7100    | 56.0     | 24.0         | 73.3  | 3.91   | 0.00   | 0.87            | 0.58   | Meets WQS            |
|   | 6.5        | 7468    | 67.0     | 30.0         | 65.2  | 3.64   | 0.11   | 0.86            | 0.48   | Meets WQS            |
| 10/9/2007   | 6.2        | 4408    | 46.0     | 16.0         | 41.2  | 4.48   | 0.36   | 0.22            | 0.52   | Non-Support          |
| 10/7/2015   | 6.0        | 7604    | 69.0     | 36.5         | 88.5  | 3.79   | 0.18   | 0.84            | 0.59   | Meets WQS            |
|   | 6.5        | 4368    | 60.0     | 33.0         | 72.4  | 2.78   | 2.20   | 0.97            | 0.50   | Meets WQS            |
| <b>Full Support</b>   |            | ≥ 300   | ≥ 30     | ≥ 18         | ≥ 45  | ≤ 5    | ≤ 12   | ≥ 0.45          | ≥ 0.4  |                      |
| <b>Indeterminate</b>  |            | ≥ 250   | ≥ 28     | ≥ 16         | ≥ 40  | ≤ 5.15 | ≤ 14.5 | ≥ 0.43          | ≥ 0.35 |                      |
| <b>Non-Support</b>  |            | < 250   | < 28     | < 16         | < 40  | > 5.15 | > 14.5 | < 0.43          | < 0.35 |                      |

\*Scoring Guidelines for Stream Type MHG and WQ Class B(2).

**Total Phosphorus:**

Instream Phosphorus Concentrations were calculated using the low monthly median flow (LMM) of 11.90 CFS at design flow of 0.743 CFS (0.480 MGD) and using an effluent phosphorus concentration of 0.25 mg/L which is the average monthly effluent concentration observed during 2013 – 2018 (n=57), from facility monitoring records; effluent TP values ranged from 0.10 – 1.4 mg/L. The calculated phosphorus concentration at these conditions attributable to discharge is 0.145 mg/L (14 µg/L).

Review of the Castleton WWTF flow records indicate that average facility flow for 2013- 2018 is about 1/2 (0.25 MGD) of the design flow (0.48 MGD). Instream TP concentrations at these flow rates would be 7 µg/L-TP using the average effluent concentration observed.

Monitoring data from above and below the discharge indicate that on average, there is a TP increase of 3.5 µg/L, the highest observed increase was 11.2 µg/L-TP. These instream monitoring results are in alignment with the 7 µg/L-TP described above using the average effluent TP value at average facility flow.



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, MAPP 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, MAPP 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.

The total phosphorus concentrations in receiving waters are low, and this finding, coupled with the mass balance calculation presented above, indicated that increases in phosphorus attributable to the facility are low. Further, aquatic life use is shown to be fully supported at high levels, and the stream complies with VWQS for all identified response variables. Therefore, the narrative standard presented in §3-01. B.2 of the VWQS is supported (Table 3) as are the combined numeric nutrient criteria in §29A-306(a)(3)(c).

As described below, for facilities where there are increases in phosphorus attributable to the discharge, and biological monitoring results do consistently indicate attainment of all thresholds, MAPP recommends that monthly TP effluent monitoring be required to better assess compliance with the 2014 nutrient criteria at the next permit issuance.

**Table 3.** Assessment of phosphorus response variables for Castleton River above (RM 6.5) and below (RM 6.0) the WWTF. The relevant target values are referenced to the appropriate section of the VWQS.

| Response variable (VWQS reference)         | Target Value                                | RM 6.5 (Above)<br>10/7/2015 | RM 6.0 (Below)<br>10/7/2015 |
|--|---|-----------------------------|-----------------------------|
| pH (§3-01.B.9)                             | 6.5-8.5 s.u.                                | 7.4                         | 7.4                         |
| Turbidity (§3-04.B.1)                      | < 10 NTU at low mean annual flow            | 0.75                        | 1.24                        |
| Dissolved Oxygen (min) (§3-04.B.2)         | >6 mg/L and 70% saturation                  | 8.7                         | 8.3                         |
| Aquatic biota based on macroinvertebrates. | Attaining an assessment of good, or better. | <i>Meets WQS</i>            | <i>Meets WQS</i>            |

***Whole Effluent Toxicity (WET) and Priority Pollutant Testing:***

40 C.F.R. § 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 2018 draft permit requires a modified acute/chronic WET test (48-hour acute endpoints within a 7- day chronic test) be conducted in August or September 2021. If the results of this test indicate a reasonable potential to cause an instream toxic impact, the Department may require additional WET testing, establish a WET limit, or require a Toxicity Reduction Evaluation.

***Ammonia Monitoring:***

Review of the Castleton WWTF effluent ammonia records from 2013 - 2018, indicate effluent ammonia concentrations ranged from 0.4 mg – 30.6 mg TAN/L. Using the highest effluent ammonia concentration of 30.6 mg/L TAN observed in January 31, 2018, the receiving water concentration (RWC) at 7Q10 instream waste concentration (IWC) of 24.6% used for implementing the acute criteria would be 7.5 mg TAN/L (7Q10 IWC .246 X 30.6 mg TAN/L). This value is below the acute criteria of 15 mg TAN/L for receiving water pH of 7.4 for winter temperatures; and is above the chronic criteria of 3.5 mg TAN/L. Review of the seasonal TAN effluent monitoring data indicates that the chronic criteria may be exceeded during the summer and winter months, with the summer season having a higher probability of exceedance due to the more stringent criteria. Of note is that effluent ammonia values when expressed as 90<sup>th</sup> percentile are very similar for summer and winter months, 13.9 mg/L TAN and 14.3 mg/L TAN respectively.

While the data set reviewed indicates that there is a risk of exceeding the TAN chronic criteria, the TAN chronic criteria is implemented as a 30-day rolling average and the critical flow utilized is the 30Q10 not the 7Q10. As such the probability of exceeding the TAN chronic criteria based on computations shown above, would be diminished significantly when utilizing the 30-day rolling average values and the higher 30Q10 flows. MAPP recommends increasing the ammonia monitoring frequency from monthly to weekly; this will provide the data needed for proper evaluation. Additionally, the staff Hydrologist will calculate 30Q10 flow conditions for this facility to allow for proper implementation of the TAN chronic criteria and provide assurance that TAN will not exceed VWQS.

***Sediment, Hardness, and Metals:***

Instream total suspended solids were calculated using the 7Q10 of 2.28 CFS at design flow of 0.743 CFS (0.48 MGD), assuming the maximum permitted daily concentration of 50 mg/L. The calculated suspended sediment concentration at these conditions was 12.3 mg/l, indicating a slight increase of instream ambient suspended sediment concentrations in receiving waters.

The hardness of the Castleton River below the Castleton WWTF (RM 6.0) was recorded to be 134 mg/l CaCO<sub>3</sub> on 9/25/2017 (Table 5). Hardness data is utilized to determine compliance with Vermont’s aquatic biota-based metals criteria as specified in § 29A-303(7) and Appendix C of the Vermont Water Quality Standards. Vermont DEC priority metal chemistry data below the outfall (Table 5) did not detect any exceedances of the VWQS.

**Table 4.** Castleton River Metals (Total) Water Chemistry – above and below the Castleton WWTF outfall at RM 6.5 & RM 6.0 on October 7, 2015.

| Date              | 10/7/2015      |                |
|-------------------|----------------|----------------|
|                   | Above (RM 6.5) | Below (RM 6.0) |
| Hardness          | 121            | 134            |
| Aluminum (µg/l)   | <50            | <50            |
| Antimony (µg/l)   | <10            | <10            |
| Arsenic (µg/l)    | <1             | <1             |
| Beryllium (µg/l)  | <1             | <1             |
| Cadmium (µg/l)    | <1             | <1             |
| Chromium (µg/l)   | <5             | <5             |
| Copper (µg/l)     | <10            | <10            |
| Iron (µg/l)       | 67.5           | 95.7           |
| Lead (µg/l)       | <1             | <1             |
| Manganese (µg/l)  | 48.0           | 66.2           |
| Molybdenum (ug/l) | <5             | 10.9           |
| Nickel (µg/l)     | <5             | <5             |
| Potassium (mg/l)  | 1.01           | 1.66           |
| Selenium (µg/l)   | <5             | <5             |
| Silver (µg/l)     | <1             | <1             |
| Thallium (µg/l)   | <1             | <1             |
| Zinc (µg/l)       | <50            | <50            |

***Recommended Biological and Water Quality Monitoring:***

In light of the fact that monitoring results consistently 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), MAPP does not recommend biomonitoring be included in the permit. To better assess compliance with the 2014 nutrient criteria at the next permit issuance, MAPP does support the effluent monitoring required by the permit which includes monthly effluent monitoring for TP and TAN.

***Conclusion:***

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

## DELIVERABLES GUIDANCE

This table is for guidance only. It is the responsibility of the permittee to read and understand the conditions of the entire permit.

| YEAR        | DATE DUE      | CONDITION         | ITEM  |
|-------------|---------------|-------------------|---|
| <b>2019</b> |               |                   | 01-August, Discharge Permit effective date  |
|             | 30- September | I.K.              | Submit Emergency action - electric power failure plan   |
|             | 28 - October  | I.B.2.a           | Submit Phosphorus Optimization Plan (POP)   |
|             | 27-December   | I.B.2.b.          | Implement Phosphorus Optimization Plan  |
| <b>2020</b> | January/Feb   | I.F.1.            | Conduct two-species WET tests   |
|             | 30-June       | I.F.1.            | Submit WET test results   |
|             | 31-December   | I.G.3.            | Submit Annual Constituent Monitoring  |
|             | 31-December   | II.A.4.           | Submit Laboratory Proficiency Test  |
| <b>2021</b> | 15-January    | B.2.c.            | Submit Annual Total Phosphorus Report for 2020  |
|             | August/Sept   | I.F.1.            | Conduct two species WET tests   |
|             | 31-December   | I.F.1.            | Submit WET test results   |
|             | 31-December   | I.G.3.            | Submit Annual Constituent Monitoring  |
|             | 31-December   | II.A.4.           | Submit Laboratory Proficiency Test  |
| <b>2022</b> | 15-January    | I.B.2.c.          | Submit Annual Total Phosphorus Report for 2021  |
|             | January/Feb   | I.F.1.            | Conduct two-species WET tests   |
|             | 30-June       | I.F.1.            | Submit WET test results   |
|             | 31-December   | I.G.3.            | Submit Annual Constituent Monitoring  |
|             | 31-December   | II.A.4.           | Submit Laboratory Proficiency Test  |
|             | 31-December   | I.                | Submit updated Operation, Management, and Emergency Response Plan   |
| <b>2023</b> | 15-January    | I.B.2.c.          | Submit Annual Total Phosphorus Report for 2022  |
|             | August/Sept   | I.F.1.            | Conduct two species WET tests   |
|             | 31-December   | I.F.1.            | Submit WET test results   |
|             | 31-December   | I.G.3.            | Submit Annual Constituent Monitoring  |
|             | 31-December   | II.A.4.           | Submit Laboratory Proficiency Test  |
|             | 31-December   | J.                | Submit Engineering Evaluation   |
|             | 31-December   | I.D. and I.B.3.c. | Submit discharge permit renewal application with a projection of when the Castleton WWTF will reach its Total Phosphorus Annual Pounds limit. |
| <b>2024</b> | 15-January    | I.B.2.c.          | Submit Annual Total Phosphorus Report for 2023  |
|             | 30-June       |                   | Discharge Permit Expiration Date  |