

AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WASTEWATER MANAGEMENT DIVISION
103 SOUTH MAIN STREET
WATERBURY, VERMONT 05671-0405

FACT SHEET

May 2006

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

FILE NO.: 12-01
PROJECT ID NO.: BR95-0061
PERMIT NO.: 3-1272

NAME AND ADDRESS OF APPLICANT:

City of Barre
6 North Main Street
Suite 1
Barre, VT 05641

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Barre Wastewater Treatment Facility
69 Treatment Plant Drive
Barre, Vermont

RECEIVING WATER AND CLASSIFICATION: Stevens Branch: Class B with a waste management zone. Class B waters are suitable for bathing and recreation; irrigation and agricultural uses; good fish habitat; good aesthetic value; acceptable of public water supply with filtration and disinfection. A waste management zone 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.

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

The above named applicant has applied to the Vermont Department of Environmental Conservation for renewal of its permit to discharge into the designated receiving water. The facility is engaged in the treatment of domestic wastewater from the City of Barre and the Town of Barre. The discharge is from the Barre Wastewater Treatment Facility outfall to the Stevens Branch.

II. Description of Discharge

This permit authorizes the discharge of 4.0 MGD of treated municipal wastewater. The wastewater treatment facility receives wastewater from the City of Barre and the Town of Barre. The treatment system is considered advanced treatment of wastewater and consists of an extended aeration process followed by clarification and alum addition for phosphorus removal. Disinfection is achieved by chlorination followed by dechlorination prior to discharge to the Stevens Branch.

III. Limitations and Conditions

The effluent limitations of the permit, the monitoring requirements, and any implementation schedule (if required), may be found on the following pages of the permit:

Effluent Limitations: Pages 2 and 3
 Monitoring Requirements: Pages 5, 6, and 7

IV. Permit Basis and Explanation of Effluent Limitation Derivation

History & Summary

On December 22, 2001, the Department issued Discharge Permit No. 3-1272 to the City of Barre authorizing the expansion of its existing wastewater treatment facility from 3.4 MGD (million gallons per day) to an upgraded facility with a capacity of 4.0 MGD. In early June 2002, the City notified the Department that construction of the expanded wastewater treatment facility was complete. On June 12, 2002, the Department authorized the upgrade and expansion of the facility.

The wastewater treatment facility provides wastewater treatment capacity for both existing residential and commercial properties and for new development, in areas that lie within and outside the existing sewer service area.

On March 9, 2006 the City submitted an application for renewal of their discharge permit. Having completed its review of the application, the Department has made a tentative determination to renew the discharge permit for the wastewater treatment facility's discharge. Following is a discussion of the specific factors considered in the renewal of this permit.

Effluent Limitations

Flow

This permit includes a flow limitation of 4.0 MGD, annual average, based on the design capacity of the facility. This is unchanged from the previous permit. Flow monitoring is required daily. This facility maintains a continuous discharge.

Phosphorus

This draft discharge permit contains a phosphorus effluent concentration limit of 0.8 mg/l, monthly average, and a mass effluent limit of 7,306 total pounds, annual limitation. The concentration effluent limitation is based on the requirements of 10 V.S.A. 1266a and is unchanged from the previous permit. The mass annual effluent limitation is based on the Lake Champlain Phosphorus TMDL, effective November 4, 2002. The TMDL allocated 3.314 metric tons per year or 7,306 pounds per year to the Barre WWTF. This annual allocation limitation replaces the 22.7 lbs/day, monthly average, effluent limitation specified in the previous permit.

The annual total pounds are the total of the twelve monthly totals which are calculated by multiplying the total monthly flow x the monthly average phosphorus concentration x 8.34. The annual total must be submitted with the December monthly monitoring report.

This permit requires weekly monitoring of effluent composite samples for total phosphorus.

Ultimate Oxygen Demand (UOD) and Total Kjeldahl Nitrogen (TKN)

Based on assimilative capacity modeling done on the Stevens Branch, the Department determined the assimilative capacity of the Stevens Branch to be 1500 lbs/day, daily maximum, of UOD and 1000 lbs/day, monthly average, of UOD in the water quality limited reach below the outfall of the Barre Wastewater Treatment Facility. The City's treatment facility has been designed to meet these UOD limitations and the previous permit included a daily maximum UOD limitation of 1500 lbs/day and a monthly average UOD limitation of 1000 lbs/day.

UOD is dependent on the quantity of flow, biochemical oxygen demand (BOD₅) and total kjeldahl nitrogen (TKN), as specified in the following equation:

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

Since receiving waters are the most sensitive to oxygen depleting wastes during periods of high water temperature, the UOD limitation is in effect from June 1 - October 31 of each year.

TKN monitoring is required weekly but only during the period in which the UOD limit is in effect.

The UOD limitation in the draft permit is unchanged from the previous permit. The UOD sampling frequency in the draft permit is weekly and is unchanged from the previous permit.

Biochemical Oxygen Demand (BOD₅)

The concentration limits from the previous discharge permit (20 mg/l, monthly average and 35 mg/l, weekly average) have been modified. These limitations were originally derived based on a reduction in the limitations specified for secondary treatment in 40 CFR Part 133.102 in 1974 when the facility expanded from 2.4 MGD to 3.4 MGD. These limitations were not water quality or technology based and therefore are not legally or scientifically justifiable. Consequently the Agency, to be consistent with other discharge permits and the federal secondary treatment regulations, has modified the BOD concentration limitations. The draft permit contains BOD concentration limitations of 30 mg/l monthly average and 45 mg/l weekly average, which are based on 40 CFR Part 133.102. A 50 mg/l, daily maximum, limitation has been included in the draft permit. This is a limitation which the Agency implements to supplement the federal technology based limitations to prevent a gross one-day permit effluent violation to be offset by multiple sampling events which would enable the discharger to comply with the weekly average and monthly average permit limitations. The mass limitations in the previous permit of 600 pounds per day monthly average and 1100 pounds per day weekly average have been retained and the permittee must comply with the concentration limitation or mass limitation, whichever is more stringent. Since the BOD mass limitations remain unchanged, the modifications to the BOD concentration limitations will not result in an increase in the total allowable discharge of BOD. In addition to complying with these limits, the quantity of BOD in the discharge must be limited such that the discharge meets the UOD limits during the period June 1 - October 31. The draft permit requires weekly BOD monitoring. This is an increase in sampling frequency since the previous permit only requires BOD monitoring twice per month from November 1 through May 31. This sampling frequency has been increased to be consistent with other facilities discharging 1.0 MGD or greater.

Total Suspended Solids (TSS)

The concentration limits from the previous discharge permit (20 mg/l, monthly average and 35 mg/l, weekly average, have been modified. These limitations were originally derived based on reducing the limitations specified for secondary treatment in 40 CFR Part 133.102 and were adjusted in 1974 when the facility expanded. These limitations were not water quality or technology based and are not legally or scientifically justifiable. Consequently the Agency, to be consistent with all other discharge permits and the federal secondary treatment regulations, has modified the TSS concentration limitations.

The draft permit contains TSS concentration limitations of 30 mg/l monthly average and 45 mg/l weekly average, which is based on 40 CFR Part 133.102. A 50 mg/l, daily maximum, limitation has been included in the draft permit. This is a limitation which the Agency implements to supplement the federal technology based limitations to prevent a gross one-day permit effluent violation to be offset by multiple sampling events which would enable the discharger to comply with the weekly average and monthly average permit limitations. The mass limits of 600 pounds per day, monthly average, and 1100 pounds per day, weekly average, have also been retained. Since the TSS mass limitations remain unchanged, the modifications to the TSS concentration limitations will not result in an increase in the total allowable discharge of TSS. TSS monitoring is required weekly. This is an increase in sampling frequency since the previous permit only requires TSS monitoring twice per month from November 1 through May 31. This sampling frequency has been increased to be consistent with other facilities discharging 1.0 MGD or greater.

Ammonia

The previous permit included effluent limitations and monthly sampling for total ammonia based on the US EPA 1986 chronic water quality criteria for the protection of aquatic biota. These values were expressed in the previous permit as maximum day limitations of 52 lbs/day during the summer period and 253 lbs/day during the winter period. The summer limits applied during the period June 1 - October 31; the winter limits applied from November 1 - May 31.

As part of the permit renewal process, the Department reviewed the ammonia limitations based on the US EPA 1999 Update of Ambient Water Quality Criteria for Ammonia. A summer time temperature of 26°C and winter temperature of 5°C were assumed. Based upon sampling of the Stevens Branch, a pH of 8.5 was used.

The chronic instream ammonia criteria were derived to be 0.52 mg/l summer and 1.09 mg/l winter. These values were used to derive the permit effluent limitations. The instream summer criteria and the summer time instream waste concentration of 0.392 (a 4.0 MGD discharge and a summer 7Q10 stream flow of 9.6 cfs) were used and resulted in an ammonia effluent concentration of 1.33 mg/l (summer). Adjusting for the winter instream criteria and the winter instream waste concentration of 0.256 (a 4.0 MGD discharge and a winter 7Q10 stream flow of 18.0 cfs) resulted in an effluent concentration of 4.26 mg/l (winter).

The summer effluent limitation is expressed in the draft permit as a monthly average mass limitation of 44 lbs/day. The winter effluent limitation is expressed in the draft permit as a monthly average mass limitation of 142 lbs/day. The summer limits apply during the period June 1 - October 31; winter monitoring is required from November 1 - May 31. Monitoring is required once per week during the summer period and twice per month during the winter period.

The acute instream ammonia criteria was derived to be 2.14 mg/l based upon a pH of 8.5. Using this instream criteria and applying the summer instream waste concentration resulted in an effluent limitation of 5.46 mg/l and is expressed in the draft permit as a maximum day limitation of 182 lbs/day. Using the instream criteria and applying the winter instream waste concentration resulted in an effluent limitation of 8.36 mg/l and is expressed in the draft permit as a maximum day limitation of 278 lbs/day.

Escherichia coli bacteria

The *E. coli* limitation is 77/100ml, instantaneous maximum and is based on Section 3-04.B.3 of the Vermont Water Quality Standards effective July 2, 2000. This limitation is unchanged from the previous permit. *E. coli* monitoring is required weekly. This is an increase in sampling frequency since the previous permit only requires *E. coli* monitoring twice per month from November 1 through May 31. This sampling frequency has been increased to be consistent with other facilities discharging 1.0 MGD or greater.

Settleable Solids

The Settleable Solids limitation is 1.0 ml/l, instantaneous maximum and is established in support of the narrative standard in Section 3-01.B.5 of the Vermont Water Quality Standards effective July 2, 2000. This limitation is unchanged from the previous permit. Sampling is required once per day and is unchanged from the previous permit.

Total Residual Chlorine

The Total Residual Chlorine limitation is 0.1 mg/l, instantaneous maximum. This limitation will ensure that the instream water quality criteria of chlorine of 0.019 mg/l (acute) and 0.011 mg/l (chronic) of the Vermont Water Quality Standards effective July 2, 2000 is met. This limitation is unchanged from the previous permit. Total residual chlorine sampling is required once per day and is unchanged from the previous permit.

Waste Management Zone

The previous permit established a waste management zone beginning at the outfall of the Barre Wastewater Treatment Facility and extending downstream for 2.6 miles. The draft permit will maintain this waste management zone.

Additional Conditions

The following conditions are in the previous permit and also have been included in the draft permit.

Toxicity Testing and Additional Pollutant Testing

Previous Whole Effluent Toxicity (WET) tests conducted on this discharge have indicated that this discharge does not have a reasonable potential to cause an instream toxic impact.

However to ensure compliance with 40 CFR 122.21.j, at the time of permit renewal, a requirement (Condition I.E) to conduct WET testing has been included in the draft permit. This Condition requires a two species acute WET test to be done in 2008, and 2010. The species to be tested are fathead minnow and daphnia and the time of year the test will be conducted will alternate between winter and late summer to ensure representative sampling is done.

In addition, per the requirements of 40 CFR 122.21.j, annual monitoring for temperature,

Dissolved Oxygen, Oil & Grease, Nitrate/Nitrite, and Total Dissolved Solids has been included in the draft permit.

VI. Procedures for Formulation of Final Determinations

The public comment period for receiving comments on this draft permit is from April 17, 2006 through May 16, 2006 during which time interested persons may submit their written views on the draft permit. All written comments will be retained by the Department and considered in the formulation of the final determination to issue, deny or modify the draft permit. The period of comment may be extended at the discretion of the Department.

Written comments should be sent to:

Vermont Agency of Natural Resources
Department of Environmental Conservation
Wastewater Management Division - Sewing Building
103 South Main Street
Waterbury, VT 05671-0405

Comments may also be faxed to: 802-241-2596.

Any interested person or groups of persons may request or petition for a public hearing with respect to this draft permit. Any such request or petition for a public hearing shall be filed within the public comment period described above and shall indicate the interest of the party filing such request and the reasons why a hearing is warranted.

The Department will hold a hearing if there is significant public interest in holding such a hearing. Any public hearing brought in response to such a request or petition will be held in the geographical area of the draft discharge or other appropriate area, at the discretion of the Department and may, as appropriate, consider related groups of draft permits. Any person may submit oral or written statements and data concerning the draft permit at the public hearing. The Department may establish reasonable limits on the time allowed for oral statements and may require the submission of statements in writing. All statements, comments, and data presented at the public hearing will be retained by the Department and considered in the formulation of the final determination to issue, deny, or modify the draft permit.

The complete application, draft permit, and other information are on file and may be inspected at the VTDEC, Wastewater Management Division, Waterbury Office. Copies will be made at a cost based on the previous Secretary of State Official Fee Schedule for Copying Public Records from 8:00 am to 4:00 pm, Monday through Friday.



0 200M

0 200yd

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