AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
1 NATIONAL LIFE DRIVE – MAIN 2
MONTPELIER, VERMONT 05620-3522

NOTICE:	DRAFT DISCHARGE PERMIT
PUBLIC NOTICE NUMBER:	3-1211
PUBLIC COMMENT PERIOD:	August 15 – September 15, 2016

PERMITTEE INFORMATION

PERMITTEE NAME:	Town of Putney
PERMITTEE ADDRESS:	P.O. Box 233 Putney, VT 05346
PERMIT NUMBER:	3-1242
PROJECT ID NUMBER:	NS95-0163

DISCHARGE INFORMATION

NATURE:	Treated and disinfected municipal wastewater
VOLUME:	0.100 MGD, annual average
RECEIVING WATER:	Sacketts' Brook
EXPIRATION DATE:	September 30, 2021
DESCRIPTION:	This is a draft discharge permit proposed for issuance to the Town of Putney for the discharge of treated municipal wastewater from the Putney Wastewater Treatment Facility. This permit is a renewal, and implements the requirements for the Long Island Sound Total Maximum Daily Load for Nitrogen.

TENTATIVE DETERMINATIONS

Tentative determinations regarding effluent limitations and other conditions to be imposed on the pending Vermont permit have been made by the State of Vermont Agency of Natural Resources (VANR). The limitations imposed will assure that the Vermont Water Quality Standards and applicable provisions of the Federal Clean Water Act, PL 92-500, as amended, will be met.

FURTHER INFORMATION

The complete application, proposed permit, and other information are on file and may be inspected by appointment on the 2nd floor of the Main Building at 1 National Life Drive, Montpelier, Vermont. Copies, obtained by calling 802-828-1535 from 7:45 AM to 4:30 PM Monday through Friday, will be made at a cost based upon the current Secretary of State Official Fee Schedule for Copying Public Records. The draft permit and fact sheet may also be viewed on the Division's website at http://dec.vermont.gov/watershed/wastewater/public-notices--fact-sheets--draft-permits

PUBLIC COMMENTS/PUBLIC HEARINGS

Written public comments on the proposed permit are invited and must be received on or before the close of the business day (4:30 pm) on **September 15, 2016** to the Agency of Natural Resources, Department of Environmental Conservation, Watershed Management Division, 1 National Life Drive – Main 2, Vermont 05620-3522. Comments may also be submitted by e-mail using the e-mail comment provisions included at http://dec.vermont.gov/watershed/wastewater/public-notices--fact-sheets--draft-permits. All comments received by the above date will be considered in formulation of the final determinations.

During the notice period, any person may submit a written request to this office for a meeting to consider the proposed permit. The request must state the interest of the party filing such request and the reasons why a meeting is warranted. A meeting will be held if there is a significant public interest (including the filing of requests or petitions for such meeting) in holding such a meeting.

FINAL ACTION/RIGHTS TO APPEAL TO THE ENVIRONMENTAL COURT

At the conclusion of the public notice period and after consideration of additional information received during the public notice period, the VANR will make a final determination to issue or to deny the permit. Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Court within 30 days of the date of the decision. The appellant must submit the Notice of Appeal and include the applicable filing fee, payable to the state of Vermont.

The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and the description of the property, project or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal.

The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings.

The address for the Vermont Environmental Court is: Vermont Superior Court, Environmental Division, 32 Cherry Street, 2nd Floor, Suite 303, Burlington VT 05401 (Tel. (802) 951-1740). For further information, see the Vermont Rules for Environmental Court Proceedings, available online at www.vermontjudiciary.org.

Alyssa B. Schuren, Commissioner
Department of Environmental Conservation

Agency of Natural Resources
Department of Environmental Conservation

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

MEMORANDUM

To: Mary Borg, Deputy Director (WSWD)

From: Neil Kamman, Manager, Monitoring, Assessment and Planning Program (MAPP)

Cc: Pete LaFlamme, Director, Watershed Management Division (WSMD)
Rick Levey, MAPP
Nick Giannetti, WWM

Date: August 8, 2016

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

MAPP has evaluated the draft permit limits for the Putney WWTF in Putney, 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 Putney WWTF prepared by the WWM. MAPP notes in the draft Permit an increase in flows relative to the prior authorization, resulting in an increase is flow from 0.8 to 0.10 MGD. As such, MAPP has also reviewed the Antidegradation Analysis referenced by the draft Permit Fact Sheet. We note that the increased discharge authorizes an increase of 0.02MGD in volume, but the permit does not authorize an increase in weekly or monthly load limits for BOD and TSS. As such, while effluent volume is authorized to increase in this discharge relative to the prior permit, the concentration of these wastewater pollutants in the effluent, which is what impacts instream designated uses, will remain at their maximum at prior permitted levels. The net effect is a reduced overall concentration of wastewater pollutants in receiving waters.

Facility:
Putney Wastewater Treatment Facility
Permit No. 3-1211
NPDES No. VT0100277

Hydrology for Putney WWTF used in this evaluation:
Design Flow: 0.10 MGD = 0.155 CFS
7Q10 = 1.21 CFS, LMM = 3.65 CFS
IWC-7Q10 =0.113 (>10%)
IWC-LMM= 0.041 (>1%)

Receiving Water:
Sacketts Brook, Putney, VT
Facility Location: Lat. 42.97081 Long. 72.51952 (NAD 83)

Sacketts Brook downstream of the Putney WWTF is classified as Class B and is designated Cold Water Fish Habitat. At the point of discharge, the river has a contributing drainage area of 13.5 square miles. The proposed permit retains the existing waste management zone (WMZ) that extends downstream from the outfall for approximately 1.0 mile from the facility outfall at river mile 0.6 in Sackett's Brook (Figure 1) before terminating in the Connecticut River. There are no permitted discharges upstream of this discharge.

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 Sackett's Brook the segment to which this facility discharges, the database indicates Sacketts Brook is altered from below Putney Paper withdrawal (River Mile 1.5) to the confluence with the Connecticut River. Impairment is to aquatic life/ habitat altered due to artificial and insufficient flow below Putney Paper water withdrawal.

Ambient Chemistry Data for Sackett's Brook above and below the Putney WWTF:
There is ambient chemistry data available from VTDEC sampling that occurred in July, August and September 2012, bracketing the facility outfall with sites at RM 0.7 and RM 0.5. Additionally, Southeastern Vermont Watershed Alliance's (SeVWA's) water quality program made possible by the VTDEC LaRosa Partnership Program provides water chemistry data (TP, TN, Turbidity) below the Putney WWTF at station 0.15 (above I91 bridge) in 2015.

The VTDEC water chemistry data provided sufficient data for evaluation and represented flow conditions suitable for evaluating water quality changes and nutrient impacts; as such the SeVWA's data which did not bracket the facility as well and represented variable flow conditions was not utilized in this review, with the exception of the E. coli discussion presented later in this document. Results of VTDEC water chemistry measures for the following parameters: total phosphorus (TP), total nitrogen (TN), nitrate + nitrite (NOX), ammonia (NH3), turbidity, pH and dissolved oxygen (DO) and percent saturation are summarized in Table 1. Data repesentiveness 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.

Table 1: Concentrations of surface-water chemistry above and below the Putney Wastewater Treatment Facility (River Mile 0.7 and RM 0.5 refer to stations above and below the outfall respectively).

Date	River Mile	TP µg/L	TN Mg/L	NOX mg/L	TNH3 mg-N/L	Turb (NTU)	pH	DO mg/L	% Saturation
7/23/2012	0.7	13.4	0.36	0.28	<0.05	1.77	-	-	-
7/23/2012	0.5	157	1.16	1.05	<0.05	2.29	-	-	-
8/22/2012	0.7	13.2	0.3	0.27	<0.05	1.12	-	-	-
8/22/2012	0.5	129	1.21	1.13	<0.05	1.02	-	-	-
9/25/2012	0.7	12.6	0.2			1.2	7.65	11.1	100
9/25/2012	0.5						7.94	10.27	94

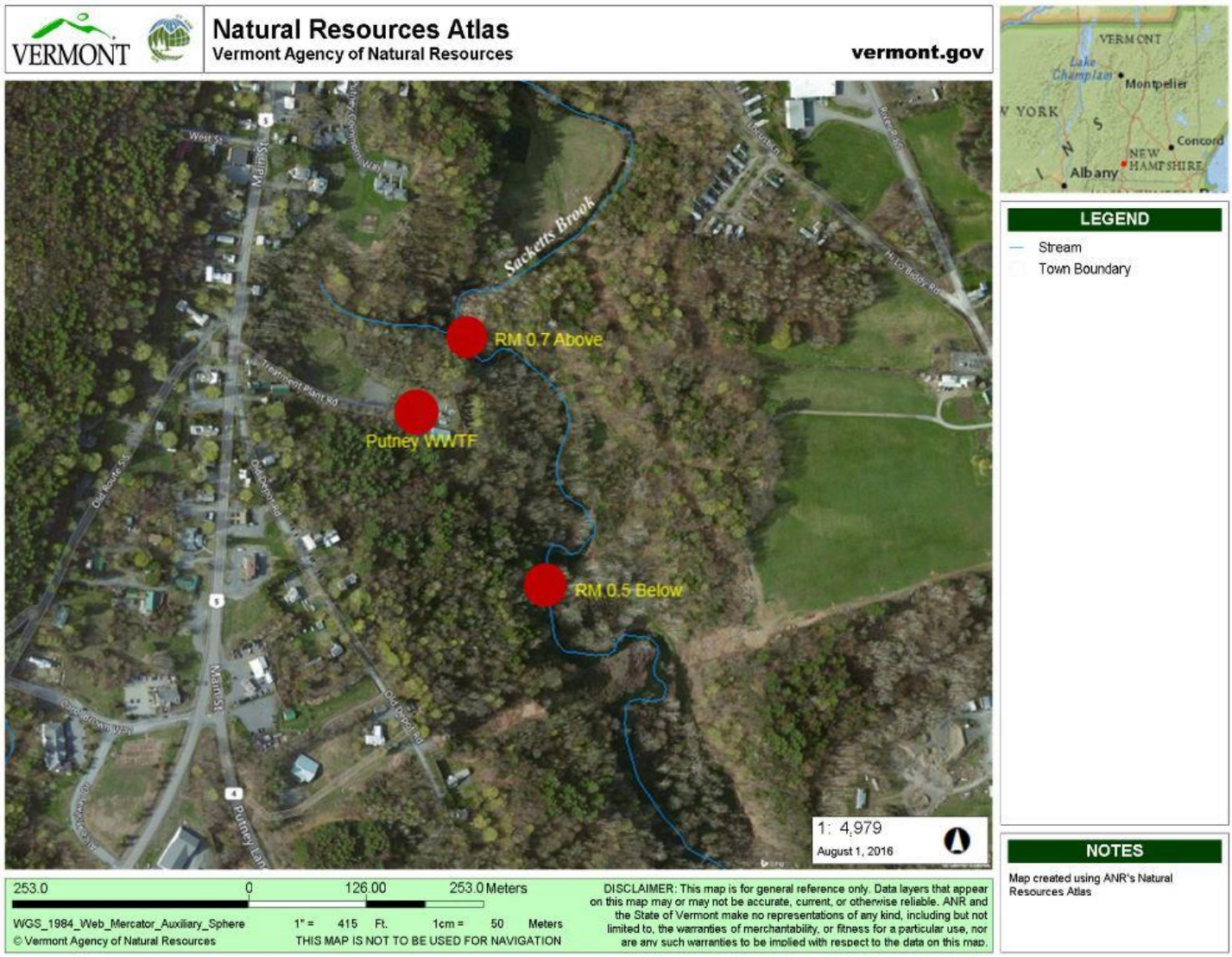

Figure 1. Sackett's Brook in the vicinity of the Putney WWTF, showing upstream and downstream sampling locations. Figure taken from the Vermont Integrated Watershed Assessment System on the VTANR Atlas (https://anrweb.vt.gov/DEC/IWIS/).

Total Phosphorus (TP) values above the outfall ranged from 12.6 µg/L to 13.4 µg/L. TP values below the outfall ranged from 129 µg/L to 157 µg/L illustrating an increase of over 100 µg/L-TP downstream of the facility.

Total Nitrogen (TN) values above the outfall ranged from 0.20 mg/L – 0.36 mg/L. TN values below the outfall ranged from 1.16 mg/L – 1.21 mg/L, indicating an increase of almost 1.0 mg/L-TN.

Turbidity, Dissolved Oxygen, pH:

Turbidity values above the outfall ranged from 1.12 – 1.77 Nephelometric Turbidity (NTU). Turbidity values below the outfall ranged from 1.02 – 2.29 NTU, well below the 10 NTU criteria. Dissolved oxygen and percent saturation were 11.1 mg/L and 100% respectively, above at RM 0.7 and 10.27 mg/L and 94% below at RM 0.5 on 9/25/2012. The pH above at RM 0.7 was 7.65, and 7.94 below on 9/25/2012.

Biological Assessments:
Biological assessments conducted above and below the outfall in 2012 (Table 2) scored "Very Good" and "Good" respectively. The biological condition has met or exceeded Class B standards for aquatic biota and aquatic habitat uses for the Medium High Gradient (MHG) stream type. The bioassessment below the outfall did have high density, moderately elevated BI value, as well as moderately low EPT; all of which indicate a moderate level of nutrient enrichment below the outfall.

Total Nitrogen:
MAPP notes that EPA, in a November 10, 2011 letter to the Agency indicated that Vermont must establish total nitrogen limitations in permits such that the total nitrogen load from all facilities in the Connecticut River watershed is consistent with the requirements of the Long Island Sound Total Maximum Daily Load (TMDL). Section I.B in this permit requires the Permittee have a qualified consultant develop and submit a Nitrogen Removal Optimization Plan by December 31, 2016. The plan shall be provided to the Agency before implementation. Additionally, an annual report will be due to the Agency documenting the pounds of TN discharged as well as removal optimization and efficiencies; the first annual report shall be submitted by January 15, 2018, as an attachment to the December 2017 DMR WR-43 report. Finally, this Condition contains as clause that allows the Agency to reopen the permit to include a wasteload allocation for this facility based on the LIS TMDL.

Optimization Plan:
By December 31, 2016 the Permittee shall develop and submit to the Agency of Natural Resources (Agency) for review and approval a Nitrogen Removal Optimization Evaluation Plan for the evaluation of alternative methods of operating the existing wastewater treatment facility to optimize the removal of nitrogen. The methods to be evaluated include: operational, process, equipment changes designed to enhance nitrification and denitrification (seasonal and year-round); incorporation of anoxic zones; septage receiving policies and procedures; and side stream management. The Permittee shall implement these recommended operational changes to maintain a mass discharge of total nitrogen (TN) lower than the existing mass loading of TN, notwithstanding the increased discharge volume of 0.02MGD. The baseline annual average daily TN load discharge from this facility is estimated to be approximately 16 lbs./day. This plan shall be developed by a qualified professional with experience in the operation and/or design of municipal wastewater treatment facilities in conjunction with the Chief Operator of the facility.

Table 2. Results of biological monitoring for macroinvertebrates on Sacketts Brook, above and below the Putney WWTF discharge.

Macroinvertebrate Site Summary			
Location:	Sacketts Brook	**Location ID:**	501274
Town:	Putney	**Bio Site ID:**	040000000009/05
Description:	Sites RM 0.9 (above) and RM 0.5 Blw Putney WWTF	**WBID:**	VT13-12
Stream Type:	Medium High Gradient		

Date	Density	Richness	EPT Richness	PMA-O	B.I.	Oligo.	EPT/EPT + Chiro	PPCS-F	Community Assessment	Attainment Status
Above 9/25/2012	669	42.0	21.0	58.2	3.95	2.56	0.74	0.45	Vgood	Meets WQS
Below 9/25/2012	1131	46.0	18.0	65.0	4.31	1.82	0.72	0.5	Good	Meets WQS
Full Support	≥ 350	≥ 32	≥ 20	≥ 50	≤ 4.85	≤ 9.5	≥ 0.47	≥ 0.45		
Meets Threshold	≥ 300	≥ 30	≥ 18	≥ 45	≤ 5	≤ 12	≥ 0.45	≥ 0.4		
Near Threshold	≥ 250	≥ 28	≥ 16	≥ 40	≤ 5.15	≤ 14.5	≥ 0.43	≥ 0.35		
Non-Support	< 250	< 28	< 16	< 40	> 5.15	> 14.5	< 0.43	< 0.35		

*Scoring Guidelines for Stream Type MHG and WQ Class B.

Total Phosphorus:
Instream Phosphorus Concentrations were calculated using the low monthly median flow (LMM) of 3.65 CFS at design flow of 0.155 CFS (0.1 MGD) and using the effluent phosphorus concentration of 5.0 mg/L assuming no phosphorus removal since there was no effluent data available. The calculated phosphorus concentration at these conditions attributable to discharge was 0.205 mg/L (205µg/L-TP). Data collected (Table 1) above and below the outfall show a TP increase of 116 – 143 µg/L-TP.

Facility flow records indicate that the plant has been operating at about 50% of the new design flow (0.05 MGD). Phosphorus concentrations at these conditions attributable to the discharge would be 102 µg/L-TP; very close to the instream values observed below the facility. These computations likely reflect the facilities phosphorus discharge and resulting water quality chemistry observed below the outfall. Monthly effluent monitoring detailed in the draft permit will provide effluent TP and TN values which will provide needed data for accurate computations.

The potential impacts of phosphorus discharges from this facility to the receiving water have been assessed in relation to the narrative criteria in §3-01.B.2 of the 2011 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 relies on a framework which examines TP concentrations in relation to existing response criteria in the water quality standards. Under the framework, MAPP can make a positive finding of compliance with the narrative standard 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.

Notwithstanding the significant observed increase in total phosphorus attributable to the facility, aquatic life use is shown to be fully supported, and the stream complies with VWQS for all identified response

variables, and thus the narrative standard presented in §3-01.B.2 of the VWQS is supported (Table 3). 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 does not recommend biomonitoring be included in the permit. However, to better assess compliance with the 2014 nutrient criteria at the next permit issuance, MAPP recommends instream water quality monitoring as described below, in addition to the current effluent monitoring in the draft Permit.

Table 3. Assessment of phosphorus response variables for Putney WWTF. The relevant target values are referenced to the appropriate section of the VWQS.

Response variable (VWQS reference)	Target Value	River-mile 0.7 (Upstream)	River-mile 0.5 (Downstream)
pH (§3-01.B.9)	<8.5 s.u.	7.65	7.94
Turbidity (§3-04.B.1)	< 10 NTU at low mean annual flow	1.12	1.02
Dissolved Oxygen (min) (§3-04.B.2)	>6 mg/L and 70% saturation	11.1 (100%)	10.27 (94%)
Aquatic biota, based on macroinvertebrates, (§3-04-B.4), also see Table 2.	Attaining an assessment of good, or better.	Meets WQS (2012)	Meets WQS (2012)

Whole Effluent Toxicity (WET) and Priority Pollutant Testing:

40 CFR Part 122.44(d)(1) requires the Agency to assess whether the discharge causes, or has the reasonable potential to cause or contribute to an excursion above any narrative or numeric water quality criteria. The goal of the Vermont Toxic Discharge Control Strategy is to assure that the state water quality standards and receiving water classification criteria are maintained. The draft permit includes a requirement to conduct a two-species WET test in August of September of 2019. If the results of this test indicate a reasonable potential to cause an instream toxic impact, the Agency may require additional WET testing, establish a WET limit, or require a Toxicity Reduction Evaluation. Previous WET test conducted in 1999 indicated instream toxicity would not be a problem, based on a No Observable Effect Concentration (NOEC) at 25% effluent, and a 7Q10 IWC of 11.3%.

Sediment, Hardness, and Metals:

Instream total suspended solids were calculated using the 7Q10 of 1.21 CFS at design flow of 0.155 CFS (0.1 MGD), assuming the maximum permitted daily concentration of 50 mg/L. The calculated suspended sediment concentration at these conditions was 5.65 mg/l, indicating a minor augmentation of instream ambient suspended sediment concentrations in receiving waters.

The hardness of Sackett's Brook below the Putney outfall was recorded to be 85 mg/l CaCO3. The below hardness data is utilized to determine compliance with Vermont's aquatic biota based metals criteria as specified in Section 3-01 B.10.c. and Appendix C of the Vermont Water Quality Standards. Due to the moderate dilution of the receiving waters and the domestic nature of this discharge there are no concerns for metals exceeding criteria. There currently is no priority metal chemistry data from below the outfall. Metals data from above the outfall RM 0.9 (Table 4) did not detect any exceedances and most analytes were below detection.

Table 4. Sacketts Brook Metals (Total) Water Chemistry – above the Putney WWTF outfall.

Date	9/25/2012
Site (River Mile)	Above (0.9)
Calcium (mg/l)	28.8
Magnesium (mg/l)	4.02
Sodium (mg/l)	6.53
Potassium (mg/l)	1.21
Aluminum (µg/l)	47
Arsenic (µg/l)	<1
Cadmium (µg/l)	<1
Chromium (µg/l)	<5
Copper (µg/l)	<10
Iron (µg/l)	675
Lead (µg/l)	<1
Manganese (µg/l)	278
Nickel (µg/l)	<5
Selenium (µg/l)	<5
Zinc (µg/l)	<50

E. coli Bacteria

In response to concerns articulated by DEC staff on behalf of recreational boating users of the receiving water, MAPP has reviewed data provided by SeVWA regarding *E. coli* concentrations above (RM 1.0) and below (RM 0.15) the facility, as shown by Table 5. The data indicate that upstream and downstream of the facility, E. coli concentrations are in excess of the applicable water quality criterion for E. coli, though more data is needed to document an impairment. Therefore, MAPP examined monitoring data from the facility to determine the incidence of *E. coli* violations of permit limits (the limit is 77 E. coli /100mL), of which none were noted. Further, we note that the downstream concentrations are lower than upstream, suggesting that the WWTF is not the source of the bacteria, that it may in fact dilute concentrations. We conclude that the facility does not contribute to the observed E. coli concentrations.

Table 4. Sacketts Brook E. coli, from Southeast Vermont Watershed Alliance.

Location	22-Jun	6-Jul	20-Jul
Sacketts Brook, end of Mill St (Upstream)	2420	866	687
Sacketts Brook, above I-91 (Downstream)	1203	548	816

Recommended Biological and Water Quality Monitoring:

In light of the fact that biological monitoring results indicate attainment of all thresholds, and the stream presently complies with VWQS for all identified response variables the narrative nutrient standard presented in §3-01.B.2 of the VWQS is supported (Table 3), and thus MAPP does not recommend that biomonitoring be included in the permit. However, in light of the significant increases in observed total phosphorus downstream of the facility, to better assess compliance with the 2014 nutrient criteria at the next permit issuance, MAPP does support effluent monitoring detailed in the draft permit, and further recommends that the permittee undertake instream monitoring for total phosphorus, dissolved oxygen (and saturation), pH, and turbidity, at locations representive locations up and downstream of the discharge.

Should the permit contain conditions for water quality assessment, samples for TP, TN, pH, and turbidity should be collected monthly for the period of June through October during the years 2017, 2018, and 2019. Samples should be collected both upstream (RM 0.7) and downstream (RM 0.5) of the discharge.

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, and as such, the development of a WQBEL's will not be necessary. The water quality monitoring (chemical and biological) conducted above and below the Putney WWTF discharge to date supports this conclusion.