

Response to Comments
for
NPDES Discharge Permit No. 3-1235
Danville Wastewater Treatment Facility

The above referenced permit was placed on public notice for comment from a period of May 30 through June 30, 2016. This is a renewal permit.

Comments on the draft permit were received during the public notice period from Paul Olander, on behalf of the Town of Danville. The following are the comments and the Agency of Natural Resources' (Agency) responses to these comments.

COMMENT: As a general comment on the permit, the Town notes that the Determination of Reasonable Potential (DRP) by the Monitoring, Assessment and Planning Program (MAPP), upon which was based a number of new permit requirements, was prepared using the 2014 Water Quality Standards, in violation of Town of Danville's vested rights to the WQS in place at the time the application for permit renewal was made. The application was received by the Agency on June 29, 2011 and the DRP should have used the 2008 WQS in place at that time. Technically, legally, the Agency should withdraw the permit, redo the DRP against the 2008 WQS, and then reissue the permit. The Town suggests that in the future the Wastewater Management Program should supply the MAPP Program with the date of application so that the applicable WQS may be used in their Determination of Reasonable Potential.

RESPONSE: *The Agency disagrees with the comment. A careful review of the language in the Reasonable Potential Determination, and language in this responsiveness summary, will reveal that the Department in each instance relied upon criteria in place in the 2008 Standards in evaluating the reasonable potential to cause or contribute to impairment in receiving waters. The specific criteria relied upon as cited in the Reasonable Potential Determination include:*

- *Phosphorus: §3-01.B.2.A.*
- *Ammonia: §3-01.B.10.a.3 and §3-01.B.10.c.*
- *pH: §3-01.B.9.*
- *Turbidity: §3-01.B.1.*
- *Dissolved Oxygen §3-04.B.2.*
- *Aquatic biota: §3-01.D, §3-04.B.4.d. and §2-01.e.*

COMMENT: Section I.A.1 (Effluent Limits Table) - Both the BOD concentration limits, and the TSS mass limits are incorrect as given in the table (and discussed in the Fact Sheet). This is an error that continues from the 2006 Discharge Permit. The BOD monthly average concentration limit should be 30 mg/L rather than 45 mg/L, and the TSS monthly average mass limit should be 22.5 pounds per day rather than 15 pounds per day.

RESPONSE: *The Agency agrees that the BOD monthly average concentration should be 30 mg/L, rather than 45 mg/L, but does not agree with raising the TSS monthly average mass limit from 15 pounds per day to 22.5 pounds per day. The statutory and regulatory provisions of anti-backsliding generally prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards less stringent than those established in a previous permit.*

The application of the permit adjustment anti-backsliding provisions, found at 40 C.F.R. § 133.105(f), to the Danville direct discharge permit require effluent limits as follows:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS							
	Annual Average	Monthly Average	Weekly Average	Maximum Day	Monthly Average	Weekly Average	Maximum Day	Instantaneous Maximum
	Mass (lbs/day)				Concentration (mg/L)			
Biochemical Oxygen Demand (5-day, 20° C) (BOD ₅)		15 ¹	22.5 ¹		30 ¹	45 ¹	50 ¹	
Total Suspended Solids (TSS)		15 ²	22.5 ¹		30 ²	45 ¹	50 ²	

¹ Effluent limit established in 1983 Discharge Permit

² Effluent limit established in 1988 Discharge Permit

40 C.F.R. § 133.102 sets the minimum requirements for BOD and TSS attainable through the application of secondary treatment. Although 40 C.F.R. § 133.105(a) and (b) provide the authority to adjust the minimum level of effluent quality for facilities with treatment equivalent to secondary treatment, the Secretary is required under 40 C.F.R. § 133.105(f) to set more stringent limitations, if achievable through proper operation and maintenance of the treatment works, based on the past performance of the treatment works. Furthermore, according to EPA guidance, it is appropriate for the permit effluent limitations to reflect the actual flow condition, plus the expected increase during the permit term. This facility has demonstrated the ability to attain the effluent quality presented in the above table at current flow (approximately 50% design flow), and has not presented evidence of a major expected increase in flow. However, the permit adjustment anti-backsliding provisions do not restrict an underloaded facility from moving towards its design capacity. If a facility demonstrates an expected increase in flow, the Agency would reevaluate the facility's eligibility for revised standards no less stringent than the standards in 40 C.F.R. § 133.102.

COMMENT: Section I.B (TOTAL NITROGEN) - The Town operates an aerated lagoon facility, as stated by the Fact Sheet accompanying the Draft Permit. EPA's November 10, 2011 letter to Vermont DEC outlining the expectations for Vermont's implementation of the Long Island Sound TMDL recognizes the very limited potential for operational control of nitrogen removal processes in aerated lagoon treatment facilities and specifically exempts them from nitrogen loading caps. The baseline average daily Total Nitrogen load cap in Section I.B.1 should be removed from the permit, as well as Section I.B.4, page 4/23, the Wasteload Allocation reopener provision.

RESPONSE: *The baseline annual average daily TN load discharge of this facility (12 lbs/day) is a load trigger, NOT a load cap; load triggers were established in permits for exempt facilities (lagoons and RBCs). The interim load trigger temporarily constitutes a non-enforceable goal which, if exceeded, will incur additional sampling and monitoring requirements for the facility.*

The Agency is currently issuing renewal NPDES permits for facilities discharging to the LIS watershed with interim load triggers (for exempt facilities) and interim load caps (for non-exempt facilities). These interim limits were developed, in part, to assure that Vermont's wastewater treatment facilities can continue operations under their present flows and conditions and still achieve compliance with Vermont's LIS TMDL limit of 1727.3 lbs N/day. Once sufficient data of the removal efficiency that is typical for each treatment technology in Vermont's climate is obtained through the new TN monitoring requirements, the Agency will initiate the formal process of developing and assigning final facility-specific waste load allocations for ALL facilities, including lagoons and RBCs.

COMMENT: Section I.B (TOTAL NITROGEN) - The nitrogen processes in lagoon systems are temperature-controlled. There is almost no practical information available with regard to operating schemes that will promote any significant change in nitrogen removal rates in aerated lagoons. When the wastewater temperatures reach 15°C they begin to partially nitrify and denitrify and when the lagoons cool in the Fall these processes stop. The requirement for a Nitrogen Removal Optimization Plan for the Danville WWTF is therefore a needless expenditure of time and money and results in no demonstrable public or environmental benefit. This requirement in Section I.B.1 should be removed from the permit, as well as the Plan Evaluation requirement in Section I.B.2 on Page 4/23. Section I.B., Total Nitrogen, should therefore be limited to the Total Nitrogen annual average reporting required in Section I.B.3.

RESPONSE: *The Agency is requiring all Vermont facilities to evaluate the potential for optimization of nitrogen removal, regardless of treatment type. While the Agency recognizes that certain treatment types may be limited in the ability to reduce TN, we believe there is merit in analyzing each system for possible low- or no-cost reductions.*

COMMENT: Section I.F.1, 2 (Instream Monitoring – Biological) – The Town objects to the inclusion in the permit of the requirement for the Town to perform biological instream monitoring in 2016 and 2018. The Town maintains that the Agency has not demonstrated that the Danville WWTF has caused an undue adverse effect on the health of the aquatic biota in the Water Andric downstream of the WWTF discharge.

The Danville Wastewater Treatment Facility began discharging in 1984. The 2010 and 2012 biology assessments both were scored "Good", meeting the "Full Support" scoring guidelines in 8 of 8 and 7 of 8 indices, respectively (the remaining index in the 2012 sampling was assessed in the "Meets Threshold" category), as shown in MAPP's Determination of Reasonable Potential. During the 28 years of discharging, during which time facility flows and loads have risen only modestly and effluent quality has

been exceptional for this type of facility, the plant effluent had not had an undue adverse effect on the instream biota.

In the 2015 aquatic biota sampling results, 6 of the 8 indices were in “Full Support”, the Biotic Index was “Near Threshold” and the PPCS-F index was in the “Non-Support” category of the guidelines. There could be a variety of reasons other than enrichment by the WWTF effluent for the distribution shift in the types of organisms present, from sampling variability to changes in the watershed affecting habitat at the sampling locations. During the period May – October 2015 bracketing that sampling the Danville WWTF continued to produce some of the finest quality effluent possible in an aerated lagoon discharge. In an observation in early October 2015 bottom features 6-8 feet below the surface of the final lagoon were able to be seen. The attached spreadsheet shows the excellent plant effluent performance during the last six years, which include all three of the VTDEC aquatic biota samplings.

There have been changes in the watershed. Beginning in 2011 and lasting through 2013 a major VTrans project on US Route 2 took place, involving road re-construction in the area of the Water Andric crossing and the installation of a new large stormwater retention pond system near the WWTF to handle a storm sewer installed along Route 2 from just above the Water Andric crossing and reaching up through the town center. The farm immediately above the river has increased its agricultural activity in the watershed. June 2015 was the wettest June on record and this would contribute additional non-point loading to the watershed above the discharge. Additionally, there is an impoundment downstream of the “Above” aquatic biota sampling point and upstream of the discharge – the pool behind the stream gauging weir. If changes or events in the watershed resulted in increased deposition behind the weir, subsequent “bleed out” of contaminants could be affecting these instream biological water quality indicators in a way that might suggest effects of the WWTF discharge.

It is very significant that the ranking of the “Above” station results went from “Very Good” for the 2012 sample to “Good” for the 2015. As well, the two indices that did not meet the guideline thresholds in the 2015 “Below” sample also showed significant decreases in “support” (BI rose, PPCS-F decreased) in the “Above” sample from 2012 to 2015. In fact, the “Above” Biotic Index and PPCS-F index were barely above “Full Support”, and the B.I. value at the “Above” station rose more between 2012 and 2015 than it did between the “Below” samples.

The Town maintains that the results from the 2015 aquatic biota do not demonstrate an undue adverse effect from the discharge and that the continued exceptional effluent quality from the Danville WWTF suggests that the Agency should look further into the changes that have occurred in the watershed. The Town strongly objects to the inclusion in the draft permit of the requirement for the very expensive instream biological monitoring and requests the requirement be removed from the permit.

RESPONSE: *MAPP has determined that the lower site (RM 6.5) did not meet Vermont’s macroinvertebrate biocriteria (an undue adverse effect) in 2015 and it was borderline in 2010 and 2012. It has not been listed on the 303d list since two years of impairment data are needed for listing. In all years sampled for biology and water quality, the facility discharge location was bracketed by sampling sites, thus accounting for upstream sources including both Stormwater and agricultural issues in the vicinity. The Stormwater ponds and discharges are above the upstream site, and the agricultural drainage comes into Water Andric below the downstream site. The following is a direct quote from MAPP’s investigator in the specific matter of the farm runoff:*

“I stopped by the water Andric and confirmed that the drainage from the farm enters the water Andric Just below (maybe 100 ft) the downstream sampling point so any runoff from this farm can’t be a factor in the drop in the assessment in 2015. “

Nutrient data shows a significant increase in TP and often TN (May 13, 2016 Danville RPD Memorandum). The lower site RM 6.5 has consistently averaged TP of over 300 µg/L in 2010, 2012 and 2015. Compared to the upper site TP < 10 µg /L all three years. This constitutes one of the highest increases in total phosphorus documented from upstream-downstream monitoring conducted by MAPP for the Department, for any facility examined since MAPP began conducting Reasonable Potential Determinations after 2010.

[The Nutrient Criteria for Vermont's Inland Lakes and Wadeable Streams Technical Support Document \(10/30/2014\)](#) specifies a sampling design framework for the determination of stream responses to nutrients. The number of samples required for compliance purposes may be determined on a site-specific basis, but should in no case be less than three samples collected on separate non-consecutive days. The flow conditions during nutrient sampling should approximate the low median monthly flow for the site. The Water Andric above/below sampling all occurred under base flows; not directly influenced by surface runoff, with flow level either low or moderate.

Insofar as this facility applied for reauthorization to discharge prior to promulgation of the numeric nutrient criteria for phosphorus, the application was not reviewed against the numeric nutrient criteria. Instead, the assessment of undue adverse effect was evaluated according to a decision framework similar to that presented in Table 13 of Nutrient Criteria document, that relies specifically on water quality criteria that existed in the 2008 Water Quality Standards. Under this framework when nutrient response variables of pH, DO, turbidity, or biological response are not met; annual monitoring will be recommended by MAPP to the Wastewater Program for phosphorus concentration and all nutrient response conditions at sites affected by permitted discharges.

Monitoring is justified as “reasonable potential” exists for water quality excursions as evidenced by the very significant increases in instream phosphorus concentration coupled with biological assessments that have been on the threshold all years sampled, and failed in 2015. The biology shows a classic nutrient enrichment fingerprint, and nutrient sampling has shown significant increases in TP below the WWTF. Further substantiating these conclusions, the instream phosphorus concentrations observed downstream of the facility are consistent with calculated phosphorus concentrations attributable to the facility discharge using facility flows.

Therefore, MAPP does not see how the other sources cited could account for the loss in biological quality downstream of the wastewater discharge.

COMMENT: Section I.F.3 (Instream Monitoring- Chemical) - the Town objects to the use of a few stream grab samples (9 samplings over a 6 year period) to characterize the instream water quality of the Water Andric and to assess the impacts on the stream from the Danville WWTF. Grab samples provide a mere snapshot of the instantaneous concentration at a particular moment in a particular day and are subject to misinterpretation. They do not define the water quality in the receiving waters but are merely indicators. Far more creditable data would be produced by instream composites and comparison to WWTF effluent composites, using stream and plant flows. As stated in the general comment, the Town also objects to the use of the 2014 WQS in the assessment.

DO - one downstream sample of the 6 taken in the 2010-2015 period, on 9/2/2012, did not meet the 6 mg/L minimum value. The one “O2 percent saturation” that was below the 70% criterion for “Cold Water Fish Habitat” occurred in November 2012. The data for these two dates indicates lower than expected DO concentrations in the “Above” samples and raises a question as to the accuracy of the meter

used during that period, and suggests that these two results do not indicate that the Town should begin monthly warm weather instream monitoring.

RESPONSE: As cited above, [the Nutrient Criteria for Vermont's Inland Lakes and Wadeable Streams Technical Support Document](#) (10/30/2014) specifies the number of samples required for compliance purposes may be determined on a site-specific basis, but should in no case be less than three samples collected on separate non-consecutive days. The flow conditions during nutrient sampling should approximate the low median monthly flow for the site. While the guidance pertains to application of the numeric nutrient criteria in the 2014 water quality standards, the recommendations contained therein comprise common sampling practices that have been in place in the Department since MAPP began conducting Reasonable Potential Determinations after 2010. They are not specific to the application of the numeric nutrient criteria per-se, and thus are applicable in this instance.

The water chemistry data presented in Table 1 (May 13, 2016 Danville RPD Memorandum) represents a total of 9 sampling events, 3 samples were collected in 2010 (August, September, November), 3 samples were collected in 2012 (July, August, September) and 3 samples were collected in 2015 (August 3, August 20 and September). We feel this data is more than satisfactory for compliance purposes and adequately reflects the water chemistry above and below the outfall. MAPP contends that the increase in accuracy resulting from the acquisition of instream composite samples would not appreciably change the conclusions of our analysis. Further substantiating this conclusion is the finding that the instream phosphorus concentrations observed downstream of the facility are consistent with calculated phosphorus concentrations attributable to the facility discharge, using facility flows.

Water chemistry data presented in Table 1 (May 13, 2016 Danville RPD Memorandum) does not reflect the commenter's analysis provided above. The DO sample below 6.0 mg/L is from 9/2/2010 and the percent saturation value below 70% is from 11/3/2010; the Reasonable Potential Document exercises a conservative approach by examining worst-case values during the period of monitoring record. Analysis of the data indicates that DO and percent saturation were lower below the Danville outfall for all sampling events except on 9/10/2012 when percent saturation was slightly higher below the outfall (99.8% vs 98.3%). We have reviewed the data and do not find it suspect. Examination of a DO saturation table for these data indicate that the data are in fact accurate. The relevant data are:

<u>Downstream</u>	<u>Upstream</u>
Temperature: 2.5C	Temperature: 2.5C
DO: 8.55 mg/L	DO: 10.87
DO saturation: 64%	DO Saturation: 84.2

The DO concentration at this temperature, for 70% saturation would be 9.6 mg/L, suggesting an excess BOD load in the vicinity of 1mg/L at the time of sampling relative to criteria, and of 2.3 mg/L relative to the upstream DO concentration.

The recommended monthly warm weather (June – October) instream monitoring is not simply the result of the two DO results; it is because biological monitoring results do not consistently indicate attainment of all thresholds, and therefore the stream did not comply with VWQS for all identified response variables. To better assess compliance with the 2014 nutrient criteria at the next permit issuance and to ensure compliance with VWQS, we recommend water quality monitoring effort above and below the outfall to include turbidity, TP, pH and DO.

COMMENT: Section I.F.3 (Instream Monitoring – Chemical – Total Phosphorus) - It should be noted that while the DRP uses a default value of 5 mg/L Total Phosphorus, two years of Marshfield WWTF effluent data indicates that the effluent from a small aerated lagoon treating mostly domestic wastewater averages closer to 3.5 mg/L Total Phosphorus.

The Town agrees to a need to perform monthly effluent TP monitoring. Assessment of instream TP concentrations can be done via a calculation method using the effluent phosphorus and the plant and stream flows. This will result in far better information than monthly instream grab sampling. The Town requests that all instream chemistry sampling be removed from the permit.

RESPONSE: *The default of 5 mg/L-TP is the standard concentration used to reflect “no phosphorus removal,” when evaluating facilities that do not have effluent monitoring data such as the Danville WWTF. We agree that the average effluent concentration may be below 5 mg/L-TP at the Danville facility. It is also likely that effluent concentrations at Danville WWTF will at times exceed the 5 mg/L - TP value used, similar to the Marshfield facility where data indicates several exceedances of 5.0 mg/L-TP.*

Effluent TP concentration at the Danville facility was calculated for Sept 3rd, 2015 using effluent flow data and stream flow data reported in the Danville DMRs and instream TP values from VTDEC monitoring. Calculations indicated the effluent concentration was 3.3 mg/L-TP, resulting in the observed instream TP concentration of 324 µg/L-TP. These calculations illustrate that instream chemistry can also be used to calculate effluent concentration when discharge and stream flow are known. Instream chemistry sampling will provide data necessary to ensure compliance with water quality standards and also ensure that other measures such as stream flow, facility flow and effluent concentrations are in alignment with computations.

COMMENT: Section I.H.2 (Effluent Monitoring - Ammonia) – In a letter dated May 27, 2009 VTDEC required monthly ammonia sampling of the Danville WWTF discharge. Further communication specified grab samples of the effluent rather than composites. Ammonia grab samples have typically been taken by plant personnel the morning after the day that composites for TKN are taken, immediately before both are sent to the contract laboratory for analysis. A review of the effluent ammonia and TKN data from 2010 through 2015 illustrates the problem with these grab samples. In 23 of the 30 samplings during the period the ammonia concentration found in the grab is higher, and in many cases significantly higher, than the TKN value in the composite. Again, grab samples are only snapshots of a moment and do not provide useful information about stream loadings or plant processes. The Town requests that the required monthly effluent ammonia samples be taken as composites, from the same samples as TKN.

RESPONSE: *If ammonia is in the permit limit, it is instantaneous maximum concentration. Composite samples would not be used to capture “instantaneous maximum concentration”. Ammonia is unstable, and as such unionized ammonia is always a grab sample. The goal is to capture extreme conditions, to ensure compliance with water quality standards. During the collection of composite samples, the nitrification continues and unionized ammonia values will decrease, thus not representing the “real time” toxicity risk posed to aquatic biota.*

Effluent ammonia monitoring at the Danville facility has indicated that there is reasonable potential for excursions of water quality standards (May 13, 2016 Danville RPD Memorandum -Ammonia Monitoring). Observed effluent ammonia values have indicated the chronic criteria would be exceeded at all temperatures during 7Q10 flows; which are the flow conditions that apply to this pollutant. As such it

would be careless to rely on composite sampling for ammonia. If the applicant would like to collect composite samples as well as grab samples for comparison data; we are supportive.

COMMENT: Section I.H.4 (Stream Flow Monitoring) – current maintenance on the stream gauging station consists of cleaning out the impoundment area behind the weir in Spring before the streamflow measurement requirements commence in June. The station is monitored daily and if sediment is found to be collecting behind the weir it is cleaned again. The weir earthen embankments have been repaired a number of times. The Town requests that the Agency be more specific about the way in which the Town is to “determine the appropriate long-term schedule to calibrate or verify the gauging station at intervals sufficient to ensure acceptable accuracy and reliability”.

As a side note: MAPP’s DRP document states that on two separate occasions in the past year VTDEC personnel have observed the weir and had concerns about the accuracy of measurements due to problems seen with the weir. Unfortunately these concerns were not relayed to the Town or the WWTF staff. Should this happen in the future, please notify us immediately (802 – 684-2108) so that we can control or address any factors that could affect stream flow measurements.

RESPONSE: *Duly noted. DEC personnel had been examining the weir specifically to ensure the validity of conclusions made in the Reasonable Potential Determination. During a site visit, MAPP scientists noted water flowing around the ends of the weir and speculated as the possibility of additional subsurface loss through the coarse gravel substrate that appears to have been exacerbated after the 2011 flood. The observation was made at moderate to high flows, so an assessment of whether the weir is being bypassed at lower flows would be informative. The role of DEC’s MAPP scientists is to conduct assessments of the stream quality. However, in the future, any such observations will be relayed promptly to the Wastewater Program inspector, to be relayed to the operator.*

The Agency cannot prescribe how often a recalibration of the weir should occur. The Permittee is responsible for the determination of calibration intervals, as s/he is in the best position to understand the long-term behavior of the weir, under various conditions.

COMMENT: Section I.J, K (Operation, Management and Emergency Response Plan and Emergency Action-Electric Power Failure Plan) – The Town requests that the language in these two sections be revised to reflect the fact that the Town has prepared and implemented both an OM&ER Plan (DEC Approval: 8/18/2008) and an EA-EPF Plan (DEC Approval: 3/2/2006) and needs merely to review and, if necessary, update those plans.

RESPONSE:

*Section I.J.1: The permit has been modified to state that “The Permittee shall **continue to implement the Operation, Management, and Emergency Response Plan for the wastewater treatment facility . . .**”*

*Section I.J.2: The permit has been modified to state that “The Permittee shall implement the Operation, Management, and Emergency Response Plan for the sewage collection system **as submitted to the Agency on February 18, 2009.**”*

Section I.K: Per current procedure, all wastewater treatment facilities are required to update and resubmit an Emergency Action – Electric Power Failure plan. This condition remains in the permit.