

RESPONSE SUMMARY FOR DRAFT STATE STORMWATER DISCHARGE PERMIT # 6774-INDS

Re: Proposed Stormwater Discharge Permit for Killington Village Master Plan and Resort Parking Expansion

The above referenced draft permit authorizes the discharge of stormwater runoff from the proposed impervious surfaces at the Phase I Killington Village Development and Resort Parking Project to Roaring Brook, the East Branch of Roaring Brook, an unnamed tributary of Roaring Brook, the Ottauquechee River, and Falls Brook. The subject property is located off of Killington Mountain Road in Killington, Vermont.

The draft permit was placed on public notice for comment from December 20, 2012 through January 18, 2013. The Stormwater Management Program received public comments on the draft discharge permit referenced above.

The following is a summary of the public comments received relevant to the above-referenced draft stormwater discharge permit and the Department's responses to those comments. Where appropriate, comments have been paraphrased for clarity.

1. COMMENT

As shown on the Developer's plans submitted in connection with the draft permit, substantial lands above the proposed Ramshead Brook Subdivision will drain into the proposed stormwater management system. The Developer's model does not account for [stormwater runoff from] these lands. In addition, a review of the Developer's model for the 100-year storm shows that proposed stormwater system will likely overflow during a large storm event. This overflow will enter Roaring Brook, causing an increase in peak discharge downstream during large storms. This was not accounted for in Developer's evaluation of compliance with the treatment standards, and will potentially exacerbate flooding downstream of the project which was previously impacted during Tropical Storm Irene. Failure to accurately model the proposed stormwater treatment system will result in failure to comply with Section 1.1 of the Vermont Stormwater Management Manual.

RESPONSE

In response to comments received, the applicant has provided a revised proposal to include an upslope diversion swale to address the issue of contributing offsite runoff in the Ramshead Brook Subdivision. In addition, the applicant has revised their model to include an additional area to address contributing offsite runoff (Discharge Point S/N 003-Wet Pond 1) on the Killington Village component of the project. The revised

materials, including but not limited to a revised model of the 100-year 24-hour storm event and updated plans have addressed the public comment related to potential overflow. Revised materials will be made available for review upon request. Last revisions were filed by the applicant on March 13, 2013.

While the Department recognizes the potential impacts of events such as Tropical Storm Irene, our treatment standards do not require applicants to model for storms of that magnitude, and it is therefore outside of our jurisdiction to require an applicant to design for that size storm.

2. COMMENT

As proposed, the development will be built below the stream base of a stormwater-impaired reach of Roaring Brook, which will result in the dewatering of this reach by intercepting groundwater within and above the Roaring Brook subdivision and routing this collected groundwater out of the stormwater-impaired watershed. Dewatering will result in a reduction in base flow inputs in the impaired reach of Roaring Brook. This will negatively influence aquatic biota and habitat conditions, further degrading water quality. Further, this will likely result in a reduction of average annual recharge rate and lowering of existing groundwater elevation, which constitutes a failure to comply with Section 1.1 of the Vermont Stormwater Management Manual.

RESPONSE

Applicants seeking a stormwater discharge permit must demonstrate that they have met all of the required treatment standards outlined in the Vermont Stormwater Management Manual, Volume I, and in stormwater-impaired watersheds, the treatment requirements set forth in Chapter 22 of the Vermont Environmental Protection Rules, Stormwater Management Rule for Stormwater-Impaired Waters. This includes the Groundwater Recharge Treatment Standard (Re_v); the purpose of which is to maintain the annual recharge rate for the predominant hydrologic soil groups found on a site. In addition, per Chapter 22, new and redeveloped impervious surfaces are also subject to meeting the Groundwater Recharge Treatment Standard. It is the Department's position that based on the proposed treatment and design, the applicant has satisfied this requirement of the VSWMM for the project in question.

3. COMMENT

As proposed, the project will create approximately 25 acres of new impervious area. The new impervious area will increase the amount of stormwater volume, sediment, and nutrients entering the receiving water. This will likely degrade water quality in Roaring Brook, even with the proposed treatment system in place. The Developer has not adequately demonstrated that the proposed offset projects will account for the increase in

loading from the new impervious area. Based on the existing condition of the receiving waters, a complete anti-degradation analysis should be conducted to demonstrate that the project will not adversely impact water quality or violate applicable anti-degradation requirements. In addition, given the magnitude of the project, which is one of the largest development projects proposed in the State of Vermont, and its location in a stormwater-impaired watershed, it is insufficient for ANR to determine compliance with anti-degradation requirements by simply relying on the presumptions contained in ANR's Interim Anti-degradation Implementation Procedure.

RESPONSE

The Roaring Brook and the East Branch of Roaring Brook do not currently meet the Vermont Water Quality Standards for aesthetics and aquatic life support due to iron and stormwater pollution and are therefore listed as impaired waters (Vermont 2012 303(d) List of Impaired Waters, Part A). New stormwater discharges to receiving waters categorized as impaired for stormwater runoff must satisfy the Anti-Degradation Policy ("Policy") in Section 1-03 of the Vermont Water Quality Standards before the Agency may issue a permit. The analysis for determining whether a proposed discharge will satisfy the Policy is set forth in the Interim Anti-degradation Implementation Procedure ("Procedure").

The Procedure requires the Secretary to determine whether a proposed discharge is consistent with the Policy by applying the Procedure in its review of applications for stormwater discharge permits. Procedure III(A), (B)(5), (D). In conducting this determination, the Secretary is required to use all credible and relevant information and the best professional judgment of Agency staff. Procedure III(D).

The Secretary may determine that a proposed project satisfies the Policy and issue a permit or approval if (1) the Secretary conducts a Tier 2 review under the Procedure and determines that the project is consistent with the Policy; (2) the Secretary has determined that the discharges automatically satisfy Tier 2 review under the Policy. When determining whether a proposed stormwater discharge will result in a reduction of water quality, the Secretary may consider one or more of the following factors: any measurable changes in ambient water quality criteria predicted at the appropriate critical conditions; percent and total change in loadings; percent reduction in available assimilative capacity; nature, persistence and potential effects of the pollutant; ratio of stream flow to discharge flow (dilution ratio); duration of discharge; measurable impacts to aquatic biota or habitat; existing physical, chemical and biological data for the receiving water; degree of hydrologic or sediment regime modifications; and any other flow modifications. Procedure IX(F)(2)(d).

In this case, the proposed project is located in a watershed in which there are waters listed as impaired due to stormwater and therefore Agency staff carefully considered whether the project would result in a reduction of water quality. In particular, Agency staff considered percent and total change in loadings (Procedure IX(F)(2)(d)(ii)) and the degree of hydrologic and sediment modifications (Procedure IX(F)(2)(d)(ix)) by closely evaluating the applicant's proposed stormwater management plan and offset projects under the Chapter 22 Rule for Stormwater Impaired Waters, the rule specifically designed to ensure proposed projects minimize their impact on stormwater-impaired waters.

Chapter 22 requires applicants to meet the standards set forth in the Vermont Stormwater Manual, Volume I, including the Channel Protection Treatment Standard,¹ to address hydrologic control and the Water Quality Treatment Standard to demonstrate that there will be no increase in the annual sediment load to the stormwater-impaired waters. Chapter 22, Appendix A (b)(1). Chapter 22 requires the applicant to utilize the Simple Method model² or an approved equivalent methodology to determine the pre- and post-development annual sediment load from the site in order to determine whether the project will result in an increase in annual sediment load. Chapter 22, Appendix B. If the applicant determines that there will be an increase in post-development hydrologic impact or annual sediment load, the applicant must mitigate the uncontrolled hydraulic impact and/or sediment load by completing an offset project (Chapter 22, Appendix A (c)(1)), which must occur within the stormwater-impaired watershed in question. Chapter 22, Section 401 (b)(1).

The amount of sediment offset required to mitigate an increase in post-development annual sediment load is based on a pre-development condition. Chapter 22, Appendix B. The pre-development condition applicable varies based on the classification of the impervious surfaces being created (i.e. new projects vs. redevelopment projects). Projects that exclusively create new impervious surfaces may model the pre-development annual sediment load from the site for the presently existing conditions. Chapter 22, Appendix A (b)(1)(A). Projects that propose redevelopment, or projects that include a combination of existing development, redevelopment and expansion (new), are required to model the pre-development annual sediment load from the site as if it were an undeveloped field or open meadow. Chapter 22, Appendix A (b)(1)(B).

¹ The Channel Protection Treatment Standard is designed to protect stream channels from degradation by requiring storage of the channel protection volume (CPv) by means of 12 hours (cold water fish habitat) of extended detention storage for the one-year 24-hour rainfall event. Vermont Stormwater Manual, Volume I, 1.1.2.

² The Simple Method allows for calculating an estimate of annual pollutant loads for a variety of different stormwater pollutants, including sediment. The annual pollutant load is determined in consideration of annual stormwater runoff volume (average annual precipitation) and established pollutant concentrations for each land use type. The methodology of the Simple Method requires the applicant/designer to assign a pollutant concentration value ('C' value) for all different types of land uses within the project area based on established published values.

The project in this case is a combination of existing, redevelopment and expansion of impervious surfaces and therefore the latter condition applies. As a result, the applicant was required to model the pre-development annual sediment load from the site as if it were an undeveloped field or open meadow despite the fact that there is existing development and existing untreated stormwater discharges. Because the applicant was required to use this particular pre-development condition, the amount of sediment required under the offset is actually greater than the amount that would be necessary to offset new discharges caused by the proposed new and redevelopment of impervious surfaces.

To meet this required no increase in annual sediment load, the applicant has proposed to treat stormwater runoff from existing, new and redeveloped impervious surface in accordance with the Water Quality Treatment Standard (80% sediment removal) and to convert an existing gravel area into meadow land cover that will provide a sediment load reduction from this area to the East Branch Roaring Brook. In addition, the applicant has proposed to convert an additional area of gravel surface along the buffer area to the Roaring Brook into meadow land cover, which will also provide a sediment load reduction to meet the 'no increase' requirement. According to the application materials, the applicant will accomplish this revegetation by removing the gravel surface and replacing it with topsoil, grass seed, and mulch hay to restore a meadow condition. The applicant includes sediment loading calculations and a site map depicting stormwater offset restoration areas with the permit application. Under current conditions, the development surrounding these water bodies receives little to no treatment.

Chapter 22 establishes a stormwater permit program for discharges of regulated stormwater runoff from new development, existing development, redevelopment, and the expansion of impervious surfaces in stormwater- impaired watersheds. The applicant in this case has demonstrated how the proposed development will comply with all requirements set forth under the Vermont Stormwater Management Manual, Volume I and has established the method of mitigating an increased annual sediment load by implementing offsets on site. It is important to note that offsets established under Chapter 22 may be implemented anywhere within the stormwater-impaired watershed, yet the applicant in this case has proposed offset projects located within a close distance of the receiving waters. As a result, the offset projects will not only compensate for the increased annual sediment load, but may have an additional positive impact by controlling previously uncontrolled discharges. The treatment practices and proposed offsets associated with this project will serve to improve water quality in the receiving waters rather than reduce water quality. Moreover, water quality monitoring data

collected by the Agency below similar expansion/redevelopment projects, indicates that such permit conditions are effective in preventing reductions in water quality.

After carefully considering the applicant's stormwater management plan and proposed offset projects, Agency staff have determined that the developer has adequately demonstrated that the proposed offset projects will account for the increase in loading from the new impervious area and that the applicant has met the requirements set forth in the Chapter 22 Rule for Stormwater Impaired Waters.

The Anti-degradation Policy's purpose is to protect water uses and the Agency may issue a stormwater discharge permit consistent with the Policy if the Secretary determines that a project will not cause a reduction in water quality. Since the treatment practices in this case will serve to actually improve water quality in the receiving waters, the Secretary has determined based on all credible and relevant information and the best professional judgment of Agency staff that the permit satisfies the Anti-degradation Policy of the Vermont Water Quality Standards and the Department's Interim Anti-degradation Implementation Procedure.

4. COMMENT

Given the size and scope of this project, it is insufficient for ANR to determine compliance with the applicable treatment standards in Section 1.1 of the Vermont Stormwater Management Manual without reviewing in detail the Developer's model, including the modeling tool used together with inputs and assumptions, to determine that the design calculations on which permitting decisions are based have been determined accurately and correctly. ANR should also review how the development grading and proposed routing of stormwater through a connected closed pipe system will serve to reduce baseflow conditions in the watershed and the resulting impact on water quality in the impaired section of Roaring Brook.

RESPONSE

The applicant provided a complete hydrologic model with the stormwater permit application, which was prepared using the computer program HydroCAD. In general, the HydroCAD modeling program allows a designer to characterize stormwater runoff conditions on a project site by taking into account many factors, including project hydrologic soil groups, land cover, slopes, conveyance, and pre- and post-development conditions. In addition, the Vermont Stormwater Manual, Volume 1 requires designers to characterize pre-development conditions as undeveloped, woods, meadow, or pasture in good condition, which is typically representative of much lower runoff conditions in comparison to developed conditions. The applicant's model characterized pre- and post-development stormwater runoff, and included routing and stormwater controls (best

management practices) in the post-development model to demonstrate that the project meets the applicable requirements of the Vermont Stormwater Manual, Volume I. Agency staff carefully reviewed the modeling inputs and modeling assumptions utilized by the designer in their preparation of the hydrologic modeling report. Based on this review and public comments received, the Agency requested additional changes to the designer's hydrologic model and proposed stormwater conveyance to ensure that stormwater routing in the post-development condition met the applicable requirements up through the 100-year 24-hour rain event. The changes made by the designer reflect updated modeling and modifications to the design of the closed drainage system. In particular, the Agency required the designer to address off-site contributing runoff and modify the infrastructure design to prevent surcharging of a portion of the closed drainage system during the 100-year 24-hour rain event.

In reviewing this application, Agency staff considered proposed site grading, drainage modifications, and stormwater routing for the proposed development, and considered these design elements in light of preserving the integrity of the watershed, including baseflow conditions of the receiving waters. Agency staff first needed to consider that the receiving waters are classified as impaired due to untreated and uncontrolled stormwater runoff from existing development. The proposed design would implement treatment and controls for unmanaged impervious surfaces, thus improving water quality and controlling stormwater volume pursuant to the requirements of the Vermont Stormwater Manual and Chapter 22. In addition to the Water Quality Treatment Standard and the Channel Protection Treatment Standard set forth in the Vermont Stormwater Manual, Volume 1, the applicant is also required to meet the Groundwater Recharge Treatment Standard.³ The Groundwater Recharge Treatment Standard can be satisfied by routing stormwater runoff from the site to stormwater treatment practices (STPs) that are listed as acceptable for meeting the recharge requirement, pursuant to Table 2.2 in the Vermont Stormwater Manual. The applicant's design not only utilized closed drainage systems to manage stormwater runoff, but also incorporated open channels—specifically grass channels that are designed for stormwater runoff to travel for a specific amount of time, velocity and depth—to meet the requirements of the Groundwater Recharge Treatment Standard.

Agency staff have reviewed the materials submitted with this application to the fullest extent and has determined that the application meets the requirements set forth in the Vermont Stormwater Manual and Chapter 22. The applicant's updated plans have been referenced in the stormwater permit and are available upon request.

³ The Groundwater Recharge Standard is designed to maintain the average annual recharge rate for the prevailing hydrologic soil groups on site in order to preserve existing water table elevations. Vermont Stormwater Manual, Volume 1, 1.1.3.

5. **COMMENT**

In reference to the proposed design of Wet Pond 1, the Developer's model does not include the total amount of drainage area that will be within the pond subwatershed. Therefore, the model results and pond design specifications including storage volume and outlet configuration cannot be relied upon to justify control and safe passage of discharges.

RESPONSE

The Department approved the proposed design of Wet Pond 1 based on compliance with the stormwater treatment standards outlined in the Vermont Stormwater Management Manual, Volume I. Please also see DEC's response to Comment #1.