VERMONT

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Agency of Natural Resources

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9/22/2022

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RE: Hinesburg Center II Application

Dear Mitch & Dennis,

Thank you for submitting the Hinesburg Center II Application to the Rivers Program for review in accordance with 24 V.S.A. § 4424 and Section 6.13.2 (1) of the Town of Hinesburg Zoning Regulations (effective June 8, 2022).

The application is incomplete due to lack of information to demonstrate meeting the no undue adverse impact language outlined in Section 6.12.1 (5).

Typically, when our office reviews proposals for No Adverse Impact (NAI) or No Undue AI, we're looking to ensure that existing development or floodplain areas will not be flooded more frequently, quickly, or at greater depths. Because the Town participates in the National Flood Insurance Program (NFIP), the published FEMA flood flows, flood velocities and flood heights are what we use to assess changes in flooding due to proposed new development. Typically, an applicant will create an engineering model (hydraulic model) to document the current undeveloped condition, and then compare the various proposed developed conditions to assess the impacts their proposal may create. The DEC Flood Hazard Area & River Corridor (FHARC) Protection Procedure and NAI Standard is interpreted as increases below 0.1' are considered de minimis/allowable, because that is the scale at which base flood elevations are reported by FEMA. In other words, anything below a 0.1' increase would not be detected at the scale of the FEMA maps and would be considered minimal impact in terms of flood risk.

Therefore, for this project, and in accordance with the Hinesburg Zoning Regulations, we would expect to see a current conditions model (where they are modeling the current, undeveloped flood conditions of the HCII site), a model showing the impacts from the proposed HCII, and a model showing the proposed HCII and proposed culvert and pedestrian bridge. This does not appear to be what was submitted to the town with this project application. The hydraulic model submitted as Exhibit 5 provides only a comparison of the proposed HCII development to the HCII development with the bridge/culvert crossing and does not

include any comparison to the existing site conditions and the effects the proposed development would have on the FEMA published base flood elevations (BFEs) and base flood flow velocities.

Included with the application, the HCII Final Subdivision Narrative dated August 19, 2022, includes preliminary plat conditions dated February 16, 2021. #15 states: "The Applicant shall provide documentation at final Plat that the proposed bridge crossing over Patrick Brook adjacent to VT Route 116 will safely convey a 100-year stormwater discharge as required in Section 6.6.2(3)". The Applicant states: "The 100-year flood elevation at floodplain study XS 2457, located immediately downstream of Route 116, will be 331.7 ft after development of Hinesburg Center II" The FEMA Flood Insurance Study (FIS) shows XS 2457, or Cross Section C with a published BFE of 331.3', meaning that the proposed HCII development results in a 0.4' (approximately 5 inches) increase at this location which we strongly feel does not meet the criteria of the no undue adverse impact standard in Section 6.12.1 (5). It's unclear in the application whether this increase occurs from the proposed HCII development, the bridge/culvert crossing, or a combination of both. Additionally, significant increases in flood heights or velocities would not meet several criteria of the "Statement of Purpose" of the Hinesburg Zoning Regulations outlined in Section 6.2, or the intent of Section 6.5.1 – "General Policy & Development Review in Hazard Areas", which states that:

> The hazard areas are generally not appropriate sites for new structures or for development that increases the elevation of the base flood or obstructs the ability of streams to establish and maintain geomorphic equilibrium. In limited areas, or for certain types of specific uses, development in the hazard areas may be appropriate if it can be adequately demonstrated that there will be no undue adverse impact on upstream and downstream properties, stream geomorphic equilibrium, and water quality.

This increase in flood heights may impact both the proposed development and other existing development by potentially increasing the possibility of flooding, the depth of flooding experienced, or result in greater scour and damage around the proposals to public and private infrastructure such as roads and bridges. Additionally, this may create a more unstable channel for Patrick Brook, which could result in future channel adjustment and unpredictable future flooding in this area, potentially increasing risk to the public and strain on emergency services/Town resources during a flood event.

Exhibit 5, "Hydraulic Evaluation Summary Proposed Patrick Brook Culvert" dated July 20, 2022, provides hydraulic comparison of the proposed HCII infrastructure and proposed bridge/culvert crossing but does not provide a comparison of the current, existing hydraulic site conditions to proposed hydraulic condition (BFE/velocities) when the site is developed as proposed. The Rivers Program has worked with the applicant and their consultants regarding floodplain impacts and compliance with Criterion 1(D) Floodways for the Act 250 permit application (pre-application coordination); however, as of the date of this letter we have not received hydraulic modeling that demonstrates compliance with Criterion 1(D). The review criteria for Criterion 1(D) including the FHARC Procedure and NAI Standard is on par with how the Rivers Program interprets the Town's no undue adverse impact language (no more than 0.1' rise in BFE/velocities).

Additionally, the future/current functioning of the canal needs to be addressed as part of the analysis of proposed development along Patrick Brook given the significant level of investment proposed in and adjacent to the Patrick Brook Special Flood Hazard Area. This is important because the new, proposed development could be impacted by flooding as well as increase the flood hazards for pre-existing development. Currently, the canal has experienced sediment deposition and is not functioning as intended

leading to more flow being conveyed by Patrick Brook than modeled in the FEMA FIS. Since the full flow is not diverted as originally modeled, the estimated FIS flows being used as the basis for modeling may not be representative of the current flows being conveyed by Patrick Brook and thus under-representing flood risk to the proposed and pre-existing development. Higher flows are evidenced by channel widening and increased meandering downstream of Route 116 in recent years. We strongly recommend that a written operations and maintenance plan by the Town of Hinesburg be included as part of the permit application to provide assurance that the canal will function as originally modeled in the FIS.

In addition to concerns regarding the Patrick Brook/Canal flow diversion, the hydrologic methodology used to estimate flood flows in the FIS was updated in 2014. The updated equations and methodology suggest that Patrick Brook may experience *larger base flood discharges* than is modeled in the FEMA FIS/FIRMs, which may be further exacerbated in the future by the effects of climate change, making it all the more important to minimize impact to and from the proposed development primarily in an area with significant residential development and risk to the public.

The application is incomplete and thus we cannot determine whether the proposal complies with Town of Hinesburg Zoning Regulations. Any future applications will be reviewed in accordance with 24 V.S.A. § 4424 and Section 6.13.2 (1) of the Town of Hinesburg Zoning Regulations. Please let me know if you have any questions or would like to discuss further. I'm available by phone at (802) 490-6154 or email me at kyle.medash@vermont.gov.

Sincerely,

Kyle Medash
Western Floodplain Manager
VT DEC Rivers Program

cc (email): Alex Weinhagen, Director of Planning & Zoning
Rebecca Pfeiffer, State NFIP Coordinator, VTDEC
Rob Evans, Rivers Program Manager, VTDEC