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July 27, 2022

Daniel C. Hill
Hill Law
6 Beacon Street
Suite 600
Boston, MA 02108

Re: The Sanctuary, School Street, Manchester, MA

Dear Dan:

At your request, I have reviewed the required waivers from the local Manchester-by-the-Sea wetlands Bylaw and Regulations. I have also reviewed the responses by the Applicant to my prior comment letters.

1. Encroachment in “No Build” and “No Disturbance” Zones: The proposed project encroaches on the “no build” and “no disturbance” zones associated with the vernal pools as defined under the Manchester Wetlands Bylaw and Regulations (Section 10.1 of the Manchester Wetlands Bylaw). See Applicant’s Bylaw Buffer Exhibit dated 5/24/22, attached hereto as Exhibit A. The portions of the Project within the depicted local Bylaw buffer zones would require waivers .

2. Alternatives Analysis: To obtain a waiver, the Bylaw requires an “alternatives analysis” and an assessment of “significant immediate and cumulative adverse effects”. Section 9.7 states, “Prior to the issuance of a permit for work or activity which Alters a Vernal Pool, the Applicant shall demonstrate by Clear and Convincing Evidence as set forth in an Alternatives Analysis that there is no Practicable Alternative to the work or activity proposed. Any Alteration which impacts the topography, soil structure, plant community composition, vegetation canopy or understory, hydrologic regime, drainage patterns, migratory paths of Vernal Pool species and/or water quality of a Vernal Pool shall be presumed to have a Significant Immediate and Cumulative Adverse Effect to the Vernal Pool and the wetlands values protected by the By-Law” (emphasis added).

To my knowledge, no alternatives analysis has been provided. It is clear that if the project were reduced in size, the loop road circling the building could be kept outside of these “no build” and “no disturbance” zones. However, this type of alternative plan was not provided or evaluated. As there has been no alternatives analysis, there is no legitimate basis for a waiver.

3. Cumulative Impact Analysis: The local regulations also require a “cumulative impact analysis”. However, this has not been provided and should not be waived. In my prior comments, I have identified three probable impacts that need to be evaluated: 1) hydrologic

alterations, 2) thermal impacts, and 3) chlorides (salt) from de-icing applications. I address these concerns, below:

A. Hydrologic Impacts: In my prior comment letters, I stated my opinion that there will be hydrologic alterations to the certified vernal pools caused by the Project's extensive stormwater system. That stormwater system proposes to direct stormwater from impervious surfaces within the vernal pool recharge area, to a large infiltration system outside of the recharge area. As stated in my prior comments, this will result in a net reduction of groundwater recharge of 40 – 50% to the northern vernal pool.

The Applicant's May 11, 2022 response claims that they do not have to do a water budget analysis, citing guidance from MADEP Stormwater Handbook that states: "water budgeting is not required if the recharge is directed to the same subwatershed where the impervious surfaces are proposed". However, this is clearly not the case for this Project. As is evident from the site plans, stormwater runoff from impervious areas within the watershed to the northern vernal pool is directed outside of this recharge area and to the large infiltration system in the southern portion of the site. A hydrologic budget analysis is therefore required.

B. Thermal Impacts to Cold-Water Fishery Stream: As stated in my earlier comments, the site is adjacent to Sawmill Brook, a Cold-Water Fish Resource ("CFR") that is highly sensitive to thermal impacts. The extensive clearing of trees and the construction of impervious surfaces in close proximity to the Brook will dramatically impact the microclimate, and specifically the temperature of stormwater that is recharged to groundwater. Groundwater in the immediate area has been measured at 47 degrees F, and provides an important cooling baseflow to the Brook under existing, pre-development conditions. Stormwater runoff from solar-heated impervious surfaces can exceed 95 degrees F (Thompson et al, 2008). A cumulative impact analysis of thermal impacts is therefore required.

Section 9.5 of the Manchester Wetlands Bylaw states: "Stream. Prior to the issuance of a permit for work or activity which Alters a Stream, the Applicant shall demonstrate by Clear and Convincing Evidence as set forth in an Alternatives Analysis that there is no Practicable Alternative to the work or activity proposed. Any Alteration which may adversely affect the water quality of a stream (as measured by sediments, nutrients, bacteria, temperature, dissolved oxygen, and toxic chemicals) or its ability to support fish and other aquatic life shall be presumed to have a Significant Immediate and Cumulative Adverse Effect to the Stream and values protected by the By-Law" (emphasis added). These standards under the Bylaw have not been met.

C. De-icing salts/chlorides: Wetland resources areas including vernal pools and streams have been significantly impacted by excessive chlorides that are commonly derived from de-icing salts. The U.S. Environmental Protection Agency (USEPA) has established water quality standards for chlorides for acute toxicity (kills fish quickly) at 860 mg/liter and chronic toxicity (kills fish slowly) at 230 mg/liter. Beals and Thomas's July 12, 2022 Supplemental

Environmental Peer Review for the Project confirmed that the information provided by the Applicant was deficient to evaluate these potential impacts, stating that: “We also note the potential chemical and/or thermal impacts from deicing salts/chemicals and stormwater runoff on the vernal pools. Design confirmation that treated water will be infiltrated vertically completely through the soil profile and only break out at the natural location (wetland edge) should be provided.” (p. 3).

4. Burden of Proof: Section 12 of the Manchester Wetlands Bylaw clarifies that the burden of proof for the aforementioned impact analyses is on the Applicant. In section 12.1, it states: “Except where a higher burden of proof is specified in this By-Law or any rules and regulations promulgated hereunder, the applicant shall have the burden of proving by a preponderance of credible evidence that the work proposed in the NOI will not have adverse effects, immediate or cumulative, upon the Resource Area” (emphasis added). There has been no analysis or evidence presented by the Applicant with respect to probable impacts of the project on the hydrologic regime of the vernal pools, or the thermal impacts to the cold-water fishery stream.

Please contact me with any questions that you might have.

Sincerely,

A handwritten signature in black ink, appearing to read 'SWH', with a large, stylized flourish extending from the end.

Scott W. Horsley
Water Resources Consultant

