ONSITE ENGINEERING INC.

Water, Wastewater and Stormwater Specialists

April 29, 2021

Mr. Richard S. Novak, Chair
Zoning Board of Appeals
Town of Sherborn
19 Washington Street
Sherborn, MA 01770

Re: Response to Hunting Lane Neighbors Group Review
The Pines - 41 North Main Street & Apple Hill Estates - 31 Hunting Lane

Dear Mr. Chairman and Members of the Zoning Board of Appeals:

Please find Onsite Engineering (Onsite) responses to the review letter by Creative Land and Water Engineering, LLC dated April 23, 2021, provided to the ZBA on behalf of the Hunting Lane Neighbors Group. Our response is limited to the facts and recommendations as they pertain to the Water and Wastewater systems. Please note that, as our firm is not engaged on the stormwater aspects of the projects, a response from Allen & Major regarding the Stormwater comments will be provided under separate cover.

Water

A number of very general relevant facts were provided by the reviewer; additional relevant facts include the following:

1. The proposed water supply wells are bedrock wells whose yields are generally more dependent on the specific geography and fracture zone within the bedrock underlying the watershed than on the local watershed area and soils (reference Water Resources Investigations Report 93-4115, "Yields of Bedrock Wells in Massachusetts" published by the U.S. Geological Survey). Based on the report, the median reported yield of all bedrock wells (in Massachusetts) was 7 gpm (7 gpm or 10,000 gpd).
2. The reviewer fails to acknowledge that the wells are to be classified as a public water supply and as such, must be permitted through the MassDEP New Source Approval (NSA) process and in accordance with Chapter 4 of the MassDEP Guidelines for Public Water Systems (Guidelines).
3. The proposed water withdrawal is located within the larger Charles River Basin which has an estimated drainage area of 312.9 square miles and a published MassDEP safe yield of 65.2 million gallons per day (mgd). The proposed withdrawal of 20,000 gpd (0.02 mgd) represents 0.03% of the safe yield of the basin.

Prior to responding to the recommendations provided by the reviewer, we thought it prudent to reiterate, review and highlight the various steps involved with the MassDEP New Source Approval process:

- Step 1 – Explore Potential Sources of Groundwater
    - Exploratory test drilling is identified as Step 1 in the process because development of the site cannot proceed until test drilling indicates that the yield of the well(s) can support the project.
    - This exploratory step was completed in August/September 2019 when the wells were drilled; 8-hour pump tests completed; and water quality samples collected and analyzed. Based on the exploratory work, the two wells have a combined estimated permittable yield of 20,000 gpd (14 gpm) and are a viable source of water supply for the projects. The well logs, pump test data and water quality results were all submitted to the Sherborn Conservation Commission in accordance with the Order of Conditions.
- Step 2 – Water Management Program Site Screening Requirements (*not required for new source approvals with planned yields of less than 100,000 gpd*).
- Step 3 – Application for Approval to Site a Source and Conduct a Pumping Test
    - The primary objective of this step is to resolve questions concerning the potential approvable yield and existing/potential water quality.
    - Permit application BRP WS 13 – Approval to Site a Source and Conduct a Pumping Test (for a source less than 70 gpm) will be filed with MassDEP as part of this step.
    - Subsection 4.3.1.2(2) of the Guidelines specifically addresses the information to be provided as part of the Request for Site Exam including mapping within a ½-mile radius around the well (showing current land uses, zoning, approved water withdrawals and any other private, commercial or industrial wells, existing and potential sources of contamination, and the location of and geologic logs for all exploratory wells); a discussion of potential impacts of existing and potential sources of contamination to the new water supply; and exploratory well results. As noted, in order to comply with this section of the Guidelines, approved water withdrawals and any other private wells within ½-mile radius around the proposed wells must be located on the submitted mapping.
    - Subsection 4.3.1.2(3) of the Guidelines addresses the pumping test proposal requirements in which the Engineer or Hydrogeologist specifies at what rate the pump test will be conducted, water level monitoring to occur during the pumping and recovery periods (as recorded at the pumping well and abutting or installed observation wells), and water quality testing. Subsection 4.3.1.2(3)(b)(1)(d) identifies the additional requirements associated with bedrock wells including the potential impact on private wells and monitoring to assess the interaction between the bedrock aquifer and overburden aquifer.
- Step 4 – Conduct Site Exam/Pumping Test Proposal Approval
    - During this step the site exam is conducted by MassDEP's Regional Drinking Water Program staff, the water supplier, the consultant, and other stakeholders. It includes a land use/sanitary survey of the land around the well(s) and a review of proposed observation well locations for the pumping test.
    - Special conditions for pumping test design and performance are also reviewed and refined during this step.
- Step 5 – Federal Notice of Intent (NOI) Application 404 Permit/MassDEP 401 Water Quality Certification (if required) - *The project is not expected to require either of these filings.*
- Step 6 – Conduct Pumping Test
    - During this step the pumping test is conducted in accordance with the guidelines and the conditions of the pumping test proposal approval.
    - Subsection 4.3.1.4(5)(e) of the Guidelines addresses the pumping test duration and stabilization requirements for bedrock wells with planned yields less than 100,000 gpd. The minimum pumping test duration is 48-hours or until the drawdown has met the required stabilization criteria. MassDEP may require a longer duration pumping test, if deemed appropriate.
    - Significant water quality sampling and analysis is also required as part of the approved pumping test.

- Step 7 – Pumping Test Shut Down
    - The pumping test may be shut down only after consultation with MassDEP, in order to assure that MassDEP agrees that stabilization has been achieved.
- Step 8 – Submit Source Final Report to MassDEP Regional Office
    - Permit application BRP WS 15 – Approval of Pumping Test Report and to Construct Source (for a source less than 70 gpm) will be filed with MassDEP as part of this step.
    - During this step the proponent must submit a Source Final Report as described in Section 4.6 of the Guidelines. In summary, the Source Final Report shall include all data collected during the pumping test in both tabular and graphical formats; calculated approvable yield (See Section 4.3.1.5.); water quality analysis results presented and explained; a discussion of treatment options (if applicable); a discussion of hydraulic connections to nearby surface water features and abutting private wells.
- Step 9 – Assess Capacity
    - During this step, the new public water system must demonstrate the managerial, technical and financial ability to comply with the Safe Drinking Water Act and other drinking water requirements pursuant to 310 CMR 22.00. The applicant must submit a business plan (and/or other financial assurance mechanisms as determined by MassDEP) in a format approved by MassDEP. The documents must demonstrate the system's proficiency in all three capacity areas: technical, managerial and financial.

As you can see, many of the concerns raised by the abutting property owners' consultant regarding impacts on surrounding wells due to the potential development of this site would be thoroughly evaluated and reviewed as part of the normal New Source Approval permitting process with MassDEP. The water level and quality review and monitoring required both during the pumping test and long term (if the wells are ultimately approved), is far more involved than past water supply projects permitted and constructed on the local level in Sherborn for this area of Town.

In addition to the general information related to the water supply approval process noted above, we also prepared specific responses to the seven bulleted water recommendations provided by the reviewer below. For clarity, we copied the comment into this letter as shown in *italics* prior to our response:

Require a comprehensive water budget analysis to support the proposed water need in the Watershed.

A water budget analysis is not a typical requirement of the New Source Approval process for a withdrawal of this size (less than 70 gpm or 100,000 gpd) and is more appropriate as a larger scale planning tool when evaluating surface or shallow groundwater withdrawals.

Require a sound aquifer modeling and testing and monitoring for the long-term impact of the huge increase in water withdrawal from the deep bedrock aquifer.

An aquifer model is not a typical requirement of the New Source Approval process for a withdrawal of this size (less than 70 gpm or 100,000 gpd). Testing and monitoring of the water withdrawal impacts are contemplated and considered during the New Source Approval process described above.

Require a six month (in summer and early fall) pumping testing of the proposed wells on the site to assure adequate supply for the projects.

A six-month pumping test is an unreasonable recommendation and is significantly longer than the 5-10 day duration pump test that is required for a typical municipal well water withdrawal of greater than one million gallons per day. The proposed pumping test duration will comply with MassDEP Guidelines and MassDEP input received during the New Source Approval process.

Require long term testing of the proposed wells as well as all abutters' wells during the driest season to assure that abutters will not suffer any shortages of water supply.

The New Source Approval process will require monitoring of the abutters private wells during the pumping test and an evaluation of the potential hydraulic connection between the wells. In addition, public water supply wells are typically equipped with water level indicators and require long term monitoring of groundwater levels. Long term testing or monitoring of private abutters wells is beyond the scope of the MassDEP New Source Approval process.

Require an environmental impact study on the potential impacts on the wetland areas, including the perennial stream, adjacent to the project and appropriate mitigation if required.

The New Source Approval process typically requires monitoring of water levels in adjacent wetland areas during the pumping test and an evaluation of the collected data in the Pump Test Report. In addition, MassDEP may, at their discretion, require long term (water quality and water level) monitoring as part of a groundwater monitoring well plan. These recommendations are made based upon the MassDEP's expert analysis of the pump test data relative to their extensive experience with permitting hundreds of these water supply well sites across the Commonwealth.

Require a bond in the amount enough to provide adequate fund to remedy damage to abutting owners.

As noted above, Step 9 of the New Source Approval process requires that the applicant demonstrate the technical, managerial and financial capacity to operate a public water system. Bonding is not a typical requirement for MassDEP approved public water system projects.

Require background water quality testing and long term impact water quality testing including but not limited to VOCs, bacteria, metals, N, P, emerging chemicals, and PFAs.

Water quality testing requirements both during the pumping test and in the long term are significant and will be in accordance with MassDEP requirements. As referenced in the Guidelines, water quality testing during the pumping test will include but not be limited to total coliform bacteria, radionuclides, inorganic chemicals, nitrate, nitrite, perchlorate and all regulated and unregulated volatile organic compounds; secondary contaminants; synthetic organic chemicals, and PFAS. Longer term water

quality testing and reporting will be in accordance with the sampling schedule as set by the MassDEP based on their extensive experience with permitting hundreds of these water supply well sites across the Commonwealth.

Wastewater

In addition to reviewing the water comments, we also reviewed the wastewater related comments and offer the following responses/clarifications. As with the water comments, we copied the comment into this letter as shown in *italics* prior to our response:

Require extensive soil and aquifer testing in order to determine if the groundwater mounding would cause sewage break out resulting in failure of septic systems and contamination of abutters' well water. It is important to understand and simulate, based on accurate onsite data, the impact of the ground water mounding on the system itself and on the abutting properties due to this surmounted water discharge in the overburdened shallow aquifer upgradient of many houses serviced by well water and septic. The impact should be simulated by proper groundwater modeling (e.g., Modflow) to consider both stormwater and wastewater discharge areas and supported with adequate and accurate soil and aquifer testing data.

As previously presented to the Board, the MassDEP hydrogeological permitting process includes a rigorous review of the proposed site assessment program prior to beginning any field work and modeling. Specifically, the process includes preparing a written hydrogeological testing and modeling scope of work that will detail the plan for test pits, borings, and monitoring wells, as well as identifying any potential sensitive downgradient receptors and stormwater interaction(s), and how the proposed discharge would be evaluated relative to those impacts. Once this scope of work is developed, it is submitted to MassDEP while simultaneously being publicly noticed that the applicant is seeking approval of a hydrogeological site assessment from MassDEP. During that public comment period, MassDEP will accept comments on the proposed scope of work.

Also as part of the process, a meeting with MassDEP technical staff is held to review and discuss the scope of work and ultimately determine the agreed upon course of action that should be undertaken in order to properly demonstrate site suitability. As part of the review and approval process, MassDEP will consider any public comments they receive on the published scope of work and incorporate any modifications deemed appropriate into their final approval of the scope of work. No site assessment, testing or modeling begin until the scope of work approval is issued by MassDEP. Given this process and the rigorous assessment of the testing program prior to implementation, we believe that the MassDEP process is sufficient to adequately assess and address any potential impacts from the proposed discharge.

Any comprehensive permit should be conditioned so as to monitor and mitigate the impact of regulated and unregulated chemicals on abutters' wells

As the science of assessing environmental impacts from wastewater discharges is ever evolving, to speculatively condition discharges based upon currently unregulated chemicals that may or may not be present in a particular discharge is problematic. Ongoing research at the Federal and State level regularly reviews wastewater discharges and updates corresponding regulations and discharge limits accordingly. As such, the Groundwater Discharge Permit secured for this site will encompass the required monitoring, treatment and removal of all priority pollutants deemed to degrade groundwater for use as a water supply. Based on our experience with the regulatory processes at the State level for groundwater discharges, MassDEP is regularly reviewing new information and technical data and updating regulations accordingly. In the event that future contaminates are identified during this process and become regulated, this change will be reflected in the ongoing Permit renewal processes for this discharge, as the MassDEP issues permits on a five-year cycle. Given this rigorous process, we believe that the conditions that will be imposed on this discharge for effluent limits, testing and monitoring will be an appropriate level of oversight as determined by MassDEP in their regulatory mandate to protect the groundwaters of the Commonwealth as sources of drinking water under the Groundwater Discharge Permit Program.

Require investigation and protection of vernal pools on the project site

In the unlikely event that vernal pools are positively identified on or near the site, the State mandated setbacks from all treatment system components to them will be maintained.

The extending of the mounding to the abutting land and its impact on their septic system and drinking water wells should be modeled and monitored for negative impact.

The extent of mounding from the discharge will be determined during the hydrogeological analysis and if there are any interactions or impacts with downgradient receptors, those are required to be identified, investigated and discussed as part of the hydrogeological permit report and submission to MassDEP.

The Board shall consider a proper condition so the groundwater mounding impact can be monitored and mitigated if found impacting public health and safety.

As part of the hydrogeological site analysis, the applicant will propose a network of downgradient groundwater monitoring wells that the MassDEP will evaluate in order to determine if they are appropriate relative to their location and if they will capture an accurate representation of groundwater quality downgradient from the proposed discharge. The frequency of sampling and testing requirements are also discussed and reviewed as part of this process. MassDEP input and approval of these locations will need to be secured prior to their installation, therefore we believe that this rigorous analysis, review and final approval issued is an appropriate level of review, as the final determination will be made by MassDEP while enforcing their regulatory mandate of protecting

the groundwaters of the Commonwealth as sources of drinking water under the Groundwater Discharge Permit Program.

We trust that this information is responsive to the comments raised by Creative Land and Water Engineering, LLC in their review letter dated April 23, 2021 and provides the Board with the additional information necessary to allow for the permitting process to move forward. If you have any questions or would like to discuss our responses in more detail, please contact us.

Sincerely,

Onsite Engineering, Inc.

David Formato, P.E.
President