Board of Health

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MEMORANDUM

TO: **Sherborn Zoning Board of Appeals**

FROM: **Daryl Beardsley (Chair) on behalf of the Sherborn Board of Health**

DATE: **May 6, 2021**

RE: **Recommendations Regarding Waiver Requests for Apple Hill Estates / 31 Hunting Lane and The Pines Residences / 41 North Main Street, Sherborn**

This memorandum provides recommendations and comments regarding the waivers to Board of Health regulations and requirements requested for the following proposed new developments in Sherborn, Massachusetts:

- Apple Hill Estates at 31 Hunting Lane;
- The Pines Residences at 41 North Main Street; and
- Well Area (situated between the two above).

The Board of Health is addressing these developments together because two of the most important public health matters for them are shared: the systems for water supply and wastewater management. In this memorandum, The Pines Residences and Apple Hill Estates are jointly referred to as the Project.

The Applicant has requested waivers from Board of Health Regulations I, II, III, and IV. With respect to water supply and wastewater provisions, the principal regulatory functions of the Board of Health, the Project anticipates installing and operating systems of sizes that fall under the primary jurisdiction of the Massachusetts Department of Environmental Protection (MassDEP). Nevertheless, the Board of Health has a responsibility to consider essential water supply and sanitation issues as they may affect current and future Sherborn residents, particularly the residents of the Project as they are likely to be most impacted by conditions generated by the Project.

Due to the broad nature of the waivers request, the Board of Health has identified the following portions of its regulations[1] to address herein since these are relevant -or have potential to become applicable- to the Project. The Board of Health asks to be informed of and be able to participate in further discussions about technical and other details on these items.

[1] Excerpts from the regulations are indicated by italics.

I. SEWAGE DISPOSAL

The provisions of these regulations are based on General Law and the particular physical, environmental, hydrogeological, demographic and land use information and projections relative to the Town of Sherborn. No system or facility to be used for treating, neutralizing, stabilizing or disposing of wastewater from homes, public buildings, commercial or industrial buildings or any other types of establishments shall be located, constructed, altered, repaired or installed until a Disposal Works Construction Permit for such work shall have been issued by the Board of Health.

The Project as currently presented intends to:

- install and operate a wastewater treatment plant in accordance with *310 CMR 15*; and
- obtain and comply with a Groundwater Discharge Permit in accordance with *314 CMR 5*.

Thus, the Massachusetts Department of Environmental Protection (MassDEP) will be the key permitting authority for sewage management. However, the Board of Health has the most experience with the dynamics of soil absorption systems (SAS) in Sherborn.

3.4.1 Plan Requirements and 3.4.2 Design Requirements: The Board of Health recommends that the types of site and Project features required by these sections be implemented for the Project's plans and designs to facilitate the best possible assessments and understanding of the property by the Applicant and the future owners and operators of the Project.

3.4.3 As Built Plans: In the Board of Health's experience, it is practical and valuable to have sets of as-built plans on file in Town Hall. Uses include: assisting property owners who cannot locate copies, aiding with the safety and effectiveness of emergency response measures, supporting future site work activities (e.g., identifying the locations of underground water lines), etc. Thus, the Board of Health recommends not waiving this requirement.

5.2 Percolation Rate: *The maximum allowable percolation rate shall be 40 minutes per inch in order for soil to be considered suitable for the subsurface disposal of sewage. A rate exceeding 40 minutes per inch shall not be accepted.*

The Board of Health does not recommend waiving this requirement. Research about the effects of percolation rates above 40 minutes per inch on bacteria and virus survival prompted the Board of Health to not adopt the State's Title 5 standard. Title 5 is a minimum standard intended to also apply to towns with water supplies brought in from outside their borders or those with few septic systems. Towns that have special circumstances, such as those with both on-site wells and septic systems, are encouraged to adopt more stringent regulations to address water quality vulnerabilities.[2]

[2] Per *310 CMR 15.003 Coordination with Local Approving Authorities, (3) Local approving authorities may enact more stringent regulations to protect public health, safety, welfare and the environment only in accordance with M.G.L. chapter 111, section 31.*

5.3 Watercourses and Wetland: *No portion of any septic system, including fill material, shall be constructed within the boundary of any watercourse or wetland.*

Construction over a wetland area is problematic and the MassDEP specification that sewer gravel be used for mounded systems (i.e., the planned system) does not perform as well as the more complex and reactive naturally deposited soils found in Sherborn. As preservation of drinking water quality is essential, the Board of Health does not recommend a waiver to this regulation. (See also the comments under Additional Issues – Site Investigation Observations.)

Vertical Grades and Clearances - 8.1: *The bottom of any leaching area shall be a minimum of five (5) feet above the maximum high ground water table.*

Vertical Grades and Clearances - 8.2: *Subsurface sewage disposal systems shall not be constructed in fill that is to be placed directly on or near ledge, hardpan or other impervious materials or in any area where peat is present or when the maximum groundwater level is five (5) feet or less below natural surface grade. A depth of at least five (5) feet of pervious material (determined by percolation test) in natural soil shall be maintained below the bottom of the leaching area. The vertical distance from any leaching surface of a subsurface disposal system to bedrock, ledge, fractured ledge or impervious soil shall be a minimum of six (6) feet.*

Depth to groundwater is important, particularly for what is for all practical purposes a sole-source aquifer town. As one example, studies on Cape Cod demonstrate that bacteria and virus die-off in discharges to ground is influenced by the opportunity to dry-out for an extended period; greater distance to groundwater aids in their destruction. The Board of Health does not recommend waivers to the requirements for separation to maximum high groundwater. This regulation acknowledges that the Title 5 minimum standard is not adequate for a town that has a closed wastewater/drinking water cycle.

Vertical Grades and Clearances – 8.4. Wetland and Flood Plains - Water Table Limits: *No subsurface sewage disposal system shall be constructed less than six (6) feet above the high water level in any area that is subject to periodic flooding. No basement floor shall be constructed less than two (2) feet above the high water level or ground water table. If a foundation drain is planned or existing, it must be shown on the plan along with its discharge point. Foundation drainage systems shall not terminate below the surface of the ground.*

Complexities of the Project site's groundwater dynamics (e.g., mounding) discussed elsewhere in this memorandum highlight that care must be taken to protect any planned basements from possible groundwater intrusion, which can create health hazards (e.g., mold). The Board of Health does not recommend waiving this requirement because failure to comply could pose health (and possibly structural) hazards to future occupants. Maximum high groundwater levels at each dwelling unit should be determined to assure that the level is at least two feet from the base of the foundation. This primarily applies to 31 Hunting Lane.

18.3 Temporary Facilities: *When no approved sanitary facilities exist on the site, all builders and contractors shall provide approved temporary sanitary facilities at their work sites. These facilities shall remain on the site from the first day of operation until completion of the contract.*

For the benefit of site workers, stormwater run-off quality, and general sanitation, the Board of Health does not recommend a waiver to this section. Meeting this requirement will not inhibit the Project and is a standard good practice for construction sites.

II. DOMESTIC WATER SUPPLY

***1.0 Permits**, **1.1:** In order to enforce the provisions of Article 11 of the State Sanitary Code, Regulation 4, "Water Supply", a permit from the Board of Health shall be required for the development of a suitable source of water supply prior to the start of any construction on a building or buildings intended for human occupancy where water will be used.* (Per 6.0.F, this includes wells intended for irrigation use.)

***2.1 Well:** Includes any pit, pipe excavation, spring, casing, drill hole or other source of water to be used for any purpose of supplying potable water in the Town of Sherborn and shall include dug wells, driven or tubular wells, drilled wells (artesian or otherwise) and springs, gravel packed, gravel walled wells, gravel developed and wash borings and as further described in U.S. Environmental Protection Agency Manual of Individual Water Supply Systems.*

As the Project is pursuing a Public Water Supply (PWS) as regulated under *310 CMR 22* and overseen by MassDEP, a permit from the Board of Health is not required under those circumstances. The Board of Health recommends that it be consulted if water supply plans change such that something other than PWS status is sought and if any additional on-site wells are proposed for the Project.

***15.0 Well Abandonment A:** If a well fails and an emergency replacement well is requested, the failed well shall be abandoned.*

For protection of groundwater, the Board of Health recommends that this requirement not be waived. If well abandonment is necessary, it is recommended that it be done according to *15.0.B. Abandonment Procedures.*

17.0 Water Quality and Quantity Specifications: In recognition that PWSs are subject to a routine water quality parameter monitoring schedule issued and overseen by MassDEP, the Board of Health is prepared to waive its specific quality requirements under this section, some of which are based on the circumstances of less frequent monitoring. Quantity issues are addressed by the "General" recommendation below.

***17.6 Other Use Prohibitions:** Wells used for drinking water and domestic water supply shall not be used to provide water for ground water heat pump systems, water-based cooling systems, or industrial or manufacturing processes or systems. Any well used for such systems shall be approved by the Board of Health only after the applicant has submitted evidence to the satisfaction of the Board of Health that such use will not disrupt any quantity or quality of water from any nearby well, to satisfy the manufacturer's recommendations for proper equipment operation.*

For reasons of shared resource management and oversight at the local level, the Board of Health does not recommend a waiver to this regulation. Limitations on water use may be partially addressed by other regulations (e.g. Zoning that regulates industrial activities) but the Board of

Health recommends that non-potable uses be addressed jointly with other involved regulatory authorities (e.g., Planning Board, MassDEP).

General Authority: With respect to the Board of Health's commitment to ensuring an adequate volume and quality of water for Sherborn residents, general recommendations and guidance to ZBA are believed appropriate for this Project. Bedrock fractures as the primary source of water for Sherborn are difficult, and perhaps impossible, to precisely evaluate. What the Board of Health does see is that wells are being deepened or replaced with more frequency and new wells are typically deeper in pursuit of an appropriate supply for a single family home.

The primary Board of Health recommendation focuses on the Project's water supply. Consider as a condition of the Comprehensive Permit that the following actions shall be taken before proceeding with any other Project development work:

- Perform a sustainable yield pump test of the two wells. It shall include simultaneous pumping of both wells for at least two weeks, at the same rate as is needed to serve the Project. (Note that MassDEP previously had six-month pump testing and monitoring requirements for PWS bedrock wells, due to the complexity of evaluating their sustainable yields compared to yields for wells in overburden aquifers. There is now more extrapolation of data from shorter test periods, which does present greater uncertainty.)
- Monitor existing wells in the area. The monitoring shall include -but not be limited to- immediate abutters. Bedrock fractures connect wells in ways that cannot be known from surface distance. The cost to rent calibrated, electronic data logging devices that collect and store well level data is small. The Board of Health requests to work with one of the Peer Reviewers to determine a set of nearby wells for monitoring.

  This Project is located in an area of Sherborn where long-functioning wells have required deepening or replacement in recent years due to insufficient flow. Well pump testing for another project, also in this vicinity but with a withdrawal rate an order of magnitude less than for this Project, demonstrated minor impacts to nearby wells.
- Collect water samples for laboratory analyses at different points during the test period in order to evaluate the impact on quality over time. It is a common occurrence in Massachusetts for wells to show high iron and/or manganese content when yield is stressed by pumping, for example.

III. PUBLIC AND ENVIRONMENTAL HEALTH REVIEW REGULATIONS AND STANDARDS FOR OTHER THAN A SINGLE FAMILY DWELLING ON A SINGLE LOT

2.0 Purpose: *These regulations are intended to protect the public and environmental health, provide adequate water supply and wastewater treatment, and ensure that there will be adequate protection against flooding, siltation, and other drainage problems. These regulations are also intended to make certain that earth removal projects will (a) maintain a depth to groundwater which is adequate for the construction of subsurface wastewater disposal systems under both local regulations and the State Environmental Code and (b) not be injurious to water supply and (c) will be carried out so as to provide adequate protection against flooding, siltation, and other drainage problems.*

Naturally deposited soils are recognized as best for treatment of stormwaters that recharge groundwater reserves. A greater thickness of soil provides a correspondingly greater degree of filtration, adsorption, absorption, and reaction (including drying out time of viruses and bacteria) of possible contaminants. Thus, removal of soils diminishes protection of area-wide groundwater resources.

As currently described, significant soil removal or redistribution is anticipated by this Project. If soils are to be removed from current locations, the Board of Health recommends that the soils be used elsewhere on site, particularly as the Project describes the need to bring in fill to, for example, increase the separation to groundwater of the SAS. This may be a practical cost-saving measure and, as much of the land was previously undeveloped, the risk of importing contamination to the site is reduced.

3.1 Environmental Health Impact Report: *The applicant for any proposed project of ten (10) or more dwelling units, whether in a subdivision or on an approved roadway, or any commercial or industrial development with a gross floor area exceeding 7500 square feet, or a design sewage flow of 2000 gallons per day or greater, or any Planned Unit Development (PUD), or any earth removal project exceeding 350 cubic yards of material per lot, or 1000 cubic yards of material per project, shall submit an Environmental Health Impact Report (EHIR) to the Board of Health.*

This regulation addresses large volume septic system discharges, impervious surfaces, and the importance of overlying, naturally deposited soils throughout Sherborn for stormwater retention and filtering prior to groundwater recharge. The Board of Health recommends that the requirements of *Section 13.0 Earth Removal Standards* be applied rather than waived in the event that the Project identifies the need for removal of 1000 cubic yards or more of earth.

The Board of Health is willing to consider whether compliance with EHIR requirements can serve as an alternative to some or all of the individual regulatory requirements for which the Board of Health has recommended against waiving.

3.2 Environmental Health Permit: *The applicant for any project that meets the criteria stated above shall be required to obtain an Environmental Health Permit from the Board of Health.*

The Board of Health notes:

- The current storm water management plans for the Project have been reviewed and amended through the ZBA's Peer Review process, but several issues remain outstanding.
- Groundwater is known to be shallow (less than 5 feet below the surface) at 41 North Main Street, based on multiple test pits for subsurface assessment witnessed by and on record with the Board of Health. These pits were predominantly along the western and highest elevation portion of the property. Wetland conditions are verified along the eastern and lower elevation portion, which is not favorable to septic systems and perhaps buildings.
- At and near 31 Hunting Lane, the ground and surface water flow characteristics require more effort to define and predict due to the varied, undulating, intermittently steep terrain, as illustrated by contour maps for the Project. There are areas that retain stormwater flows and others that shed them quickly. Residents in the vicinity of the Project report long-established patterns of, for example, temporary flows from the Project site across their properties, which support wetlands and form intermittent streams.
- A great deal of surface change is forthcoming under the proposed Project. Although stormwater flow post-construction may be heavily controlled through the use of conveyances, interim storage features, etc., without a thorough understanding of what stormwater patterns now exist, claims of insignificant changes to on- and off-site flow (within +/-10%) are not reliable (see also comments for 12.1).
- Both stormwater flows and the large volume of wastewater effluent to be discharged in a concentrated area at the highest elevation of the Project are likely to result in changes to groundwater levels through mounding impacts, which may influence basement flooding, performance of stormwater management features, contaminant conveyance from the SAS, groundwater recharge, etc.
- Multiple proposed site features, including a significant increase in impervious surfaces (more than tripled) and new stormwater flow patterns, are expected to change the ways that stormwater replenishes groundwater.

It is in the interest of the Project to accurately anticipate these dynamics prior to construction (e.g., basement flooding, drinking water availability). With the current state of technical information about the Project as noted above, the Board of Health is not inclined to recommend a waiver to this regulation because an EHIR would require resolution of these issues, some of which are outside of MassDEP's review scope. However, it may be possible to resolve some issues through: the remainder of the ZBA Peer Review process (e.g., for stormwater issues), conditions for the Comprehensive Permit, or MassDEP's approval processes for the PWS, wastewater treatment facility, and effluent discharge to ground. It is important to recognize that

MassDEP relies heavily on the accuracy and completeness of the information and analyses presented to them.

10.0 Bedrock Disruption: *Bedrock disruption means any activity performed upon ledge or bedrock, including, but not limited to, hammering, drilling, and blasting and any other activity that breaks up and/or removes portions of ledge and bedrock; bedrock disruption shall not include water well drilling.*

Requirements apply to the Project if 10 or more cubic yards of bedrock (i.e., ledge) is affected during site construction. Bedrock disruption above threshold is considered likely because MassGIS maps, Applicant information, historic information from prior owners' testing of the properties, and site features all indicate that shallow depth to bedrock/ledge exists in some areas. Thus, bedrock may be encountered when reconfiguring the landscape and/or installing subsurface features, such as those serving: stormwater retention and infiltration; PWS system distribution lines and underground holding tanks; wastewater conveyance to the treatment plant; treated effluent conveyance the SAS; and basements.

The Board recommends that *III.10.0* requirements not be waived if site activities meet or exceed the threshold of applicability. There is evidence in Sherborn and elsewhere that bedrock disruption can have detrimental impacts on groundwater quality. The requirement for notification of abutters is of low cost. Other costs may involve application of best practices regarding bedrock disruption management and may already be part of the Project's planning.

12. Drainage: There are a variety of local requirements pertaining to how land development that impacts stormwater dynamics must be assessed, designed, and/or managed to minimize detrimental consequences. Over multiple ZBA hearings, the Applicant and its agents as well as the Peer Reviewers have indicated that the stormwater management plans for the Project will adequately address Board of Health concerns that have been raised. Comments on several specific issues are provided below.

- ***12.1:*** *The proposed drainage for a subdivision or project shall not cause an increase of more than 10% nor a decrease of more than 10% in either the total volume of runoff discharged offsite, or total rate of runoff discharged offsite, as compared with the respective discharge offsite prior to the development. Such condition shall be required for storms of 2, 10, and 100-year frequency events.*

  The Applicant's technical consultants have indicated that they do not anticipate any increase in runoff from the site and the Peer Reviewer concurs. However, as there has not yet been an explicit evaluation regarding the decrease in off-site runoff, the Board of Health recommends that this evaluation be performed.

- ***12.2:*** *No channelization of surface runoff shall be allowed offsite without the written consent of the owner of the land affected, in the form of a permanent grant of easement, recorded at the Registry of Deeds.*

The Board of Health recommends that this requirement is not waived for reasons of the significant problems that could be created on nearby properties, such as inundation of a septic system's soil absorption system, without recourse for the affected owners.

- ***12.5:*** *... Unless, in the opinion of the Board of Health, such testing is not applicable for a particular site, all permeability tests shall be in-situ field bore hole tests for permeabilities in the acceptable range as specified above. ...*

  The Applicant is using infiltration rate design methods as outlined in the MassDEP stormwater and stormwater mitigation standards and plans thereof have undergone Peer Review. Given that a significant amount of earth may be moved during site development, settling may not be complete at the time of testing. Under these circumstances, the Board of Health will defer to MassDEP standards but recommends that the Peer Review takes into consideration that state standards for treatment and re-infiltration are meant to be practical for areas that may not use groundwater as drinking water and thus represent minimum standards, which may or may not be sufficient for Sherborn.

IV. DESIGN, OPERATION AND MAINTENANCE OF SMALL WASTEWATER TREATMENT FACILITIES

1.0 Permit Requirements / 1.1 Disposal Works Construction Permit: *No system or facility to be used for treating, neutralizing, stabilizing or disposing of wastewater from homes, public buildings, commercial or industrial buildings or any types of establishments shall be located, constructed, installed, operated, altered or repaired until a Disposal Works Construction Permit for such shall have been issued by the Board Of Health.*

The Board of Health expects to defer to MassDEP's requirements for and oversight of the wastewater treatment facility for the Project.

However, one issue that may be addressed at the Comprehensive Permit level involves the location of the wastewater treatment facility on the property. A study performed in Massachusetts evaluated the performance of wastewater treatment facilities in the general size category as is proposed for this Project, i.e., a non-municipal system serving residences. Findings showed a clear correlation between performance and the facility's placement within a project. Facilities placed at the edges of projects were more prone to on-going problems than those placed more centrally. The analysis suggested that indicators of system problems, such as odors or overflows, were more readily addressed when the effects impacted the owners of the facilities. When off-site people or properties/environments bore the brunt of the impacts, the wastewater treatment facility problems tended to linger, even with regulatory authority intervention.

There are a couple of instances whereby schools in neighboring towns have had difficulty with the performance of their wastewater treatment facilities. In both cases, the problems of non-compliant effluent discharge persisted for years as corrective actions were sought, but the facilities kept operating because it was not possible to shut down the schools they served. The same will be true for a non-compliant system serving residences – it will not be possible to shut the system down until corrected because that would make the homes unihabitable.

Thus, an approach is to more centrally integrate the facility into the served community. This has been successfully done at other locations in Massachusetts.

ADDITIONAL ISSUES

Site Investigation Observations

The Board of Health does note that subsurface investigations (e.g., soil testing) were performed for Project development feasibility assessment but the information provided is too limited for making decisions about selected aspects of historic high groundwater levels, groundwater mounding potential, stormwater reinfiltration, and other complex topics. There is also conflicting information when comparing Project information from the applicant with other sources of information including Board of Health records, recollections of the former property owner /agents/neighbors, MassGIS, and site walk observations.

For example, during the site walk of April 22, 2021, a Project consultant noted that water observed at the proposed location for the SAS was only just deposited by the prior day's rain. In contrast, neighbors to the Project who have the benefit of being near it on a daily basis, have provided accounts of many years of past observations of pools of water accumulating there for months at a time every year. Photographs of the pools were taken in December 2020 and weeks prior to the site walk.

The Board of Health recommends that any future subsurface investigations be observed by Town officials credentialed as soil evaluators. This would strengthen the information and offer the benefit of Sherborn-specific knowledge.

Other Regulated Activities

Project plans to date do not include indications of or provisions for:

- commercial or shared food preparation and/or service operations;
- retail sales of packaged foods or tobacco and nicotine delivery products; or
- body art or bodywork (e.g., massage) activities.

If such activities are pursued at the Project at any point in time, the Board of Health recommends full compliance with the requirements specified in:

- *V. Water Testing Requirements for Food Establishment Permits*
- *VI. Regulation Restricting the Sale and Use of Tobacco and Nicotine Delivery Products*
- *VII-A. Body Art Establishments and Practitioners*
- *VII-B. Bodywork Regulations*

The Board of Health is also the local implementation authority for *state food establishment, housing, and other relevant regulations*. Public health protections in these arenas are necessary and should be applied equitably across the state, meaning that compliance requirements should not be waived.

Although unlikely that this Project's construction will involve handling of outdated mercury-containing thermostats, adherence to *VIII. Mercury Thermostat Disposal Regulations* should not be waived given the significant health and environmental risks posed by improper mercury disposal.

For the protection of groundwater resources being used throughout Sherborn for drinking water, the Board of Health recommends that all materials brought onto the Project property for fill shall be tested for contaminants that could impair groundwater potability.

Clear cutting of this project should be avoided since it could lead to major consequences from flooding and erosion during storm events, which are increasing in intensity and frequency.