Board of Health

TOWN HALL • 19 WASHINGTON ST. • SHERBORN, MASSACHUSETTS 01770
508-651-7852 • FAX 508-651-7868

MEMORANDUM

TO: **Sherborn Zoning Board of Appeals, ZBA**
FROM: **Sherborn Board of Health, BoH**
DATE: **February 26, 2024**
RE: **Farm Road Homes 40B – Compendium of BoH Determinations, Comments, and Recommendations Regarding Public Health Requirements**

Introduction

Conditional decisions, identified outstanding needs, recommendations based on the information available are organized as follows:

- Public versus Private Water Supply Issues
- Private Water Supply Compliance Determinations and Recommendations
- Septic System Issues
    - Room/Bedroom Review
    - Incomplete Information
    - Current Status of Compliance Determinations
        - Title 5, including mounding analyses and nitrogen loading analyses
        - BoH Regulation I
- Other BoH Regulations

WATER SUPPLY ISSUES

Public Versus Private Water Supply

While the Board of Health (BoH) recognizes that the private wells as presented to the Massachusetts Department of Environmental Protection (MassDEP) do not meet the thresholds or characteristics that would *mandate* categorization and regulation as public water supplies (PWS), the BoH recommends that a PWS be established for this project. Reasons for this recommendation include:

- This project represents an atypical density of both water withdrawal and septic discharges on a *relatively* small property.

- The total potential population of 152 persons served by on-site wells is significantly above the 25-person threshold for a PWS.

- The residential nature of the project means that constant and reliable water supply is critical. Should there be problems with the water supply (whether for all or part of the project), residents do not have the secondary option of a municipal supply and the density of development on the site complicates the addition of future replacement wells.

- In the setting of private wells with multiple owners, residents lack a formal process to collectively identify, troubleshoot, and remediate problems as they arise. A PWS would provide residents the oversight, information, and fiscal mechanism needed to ensure a safe and reliable water supply. None of these safeguards exist in the setting of private wells, typically owned and maintained by one party, and would need to be created by future Farm Road Homes residents, which is particularly burdensome.

The Applicant's reasoning for a private well approach, with multiple wells each serving from 18 to 24 persons, includes that this approach is:

- environmentally preferable as the project's wells can be farther from: (i) the septic effluent discharge and (ii) existing neighboring wells;
- less costly than a PWS; and
- not as difficult to locate on the property as would be a PWS.

BoH assessments of those points are summarized in this document.

Advantages of a PWS

- ***Resiliency*** -- A network of wells offers:
  - redundancy of resource access;
  - operational adjustment options during maintenance work, repair efforts, or other issues for individual wells in the network (e.g., temporary off-lining of an individual well, preferential use of certain wells according to high and low water seasons); and

- the ability to consider well yields in the aggregate, rather than each individual private well needing to always fulfill the demands of the homes to which it is assigned.[1]

- ***Economies of Scale***:
  - Sampling is most often performed at a single distribution point rather than every well, as would be the case for separate private wells. Periodically, raw water samples from individual wells are drawn, which can be informative about which wells in the network are optimal for use at any given time. Certain sampling is done at multiple points in the distribution system (e.g., for lead and copper, see Attachment A).
  - PWS shared operation and maintenance responsibilities under MassDEP's guidance/requirements for establishing funding mechanisms for such.
  - If ever required, a PWS offers the option of consolidated treatment systems rather than duplicates on individual wells.
  - A local PWS offers frequent groundwater quality information that can be of value to nearby residents (i.e., PWS analytical results for quality parameters are readily available at www.mass.gov).

- ***Efficiency of Oversight:***
  - The existing systems of MassDEP create efficiency throughout the process.
  - Requiring similar oversight through a Homeowner's Association is not logistically practical, and no mechanisms exist through the BoH.

Technical Feasibility for a PWS

Being a PWS does not mean that a single well must be the source of the water. MassDEP permits the combining of multiple wells' outputs into one PWS. Furthermore, a collection of wells providing water to a PWS need not all feed into the supply at the same time, but MassDEP looks for at least 3 wells to be operating at any one time. Wells not routinely needed to meet demand can serve to meet the requirements for back-up or alternative supply. [2]

[1] Constant fulfillment of that need may be complicated when nearby wells share bedrock fractures and exhibit preferential draw by one well over another.

[2] 310 CMR 22.21(3)(a): Any person who obtains Department approval for a community public water system that relies entirely upon groundwater sources shall provide additional wells, wellfield, or springs and pumping equipment, or the equivalent, capable of producing the same volumes and quality of water as the system's primary well, wellfield, or spring at all times, or shall provide the storage capacity equivalent to the demand of at least two average days if approved by the Department, unless an interconnection with another public water system has been provided which can adequately provide the quantity and quality of water needed.

A network of smaller wells (sometimes referred to as a well-field) may offer the following advantages:

- Locating wells can be less complicated (and offer more potential to optimize technical aspects) than associating specific residences to ownership and control of the well's access route.

- Instead of the uncertainty of variable yield rates from each individual private well, in a PWS network the high producers can supplement lower producers, reducing uncertainty at the overall project level.

- Since PWS criteria are met by combining the individual wells into a single point for distribution, one main line from a PWS is possible rather than crisscrossing distribution lines from multiple wells. As a result, site infrastructure layout can be more flexible and likely simplified. This will help with the required separation distances from water supply features to various other aspects of the project's structures and utilities. It will also help with future system maintenance activities.

- "*Zone Is of wells, whether bedrock or overburden, are allowed to overlap.*" [per MassDEP Drinking Water Program, Northeast Regional Office, 1-8-2024]

- PWSs do not necessarily require one large Zone I radius.[3]

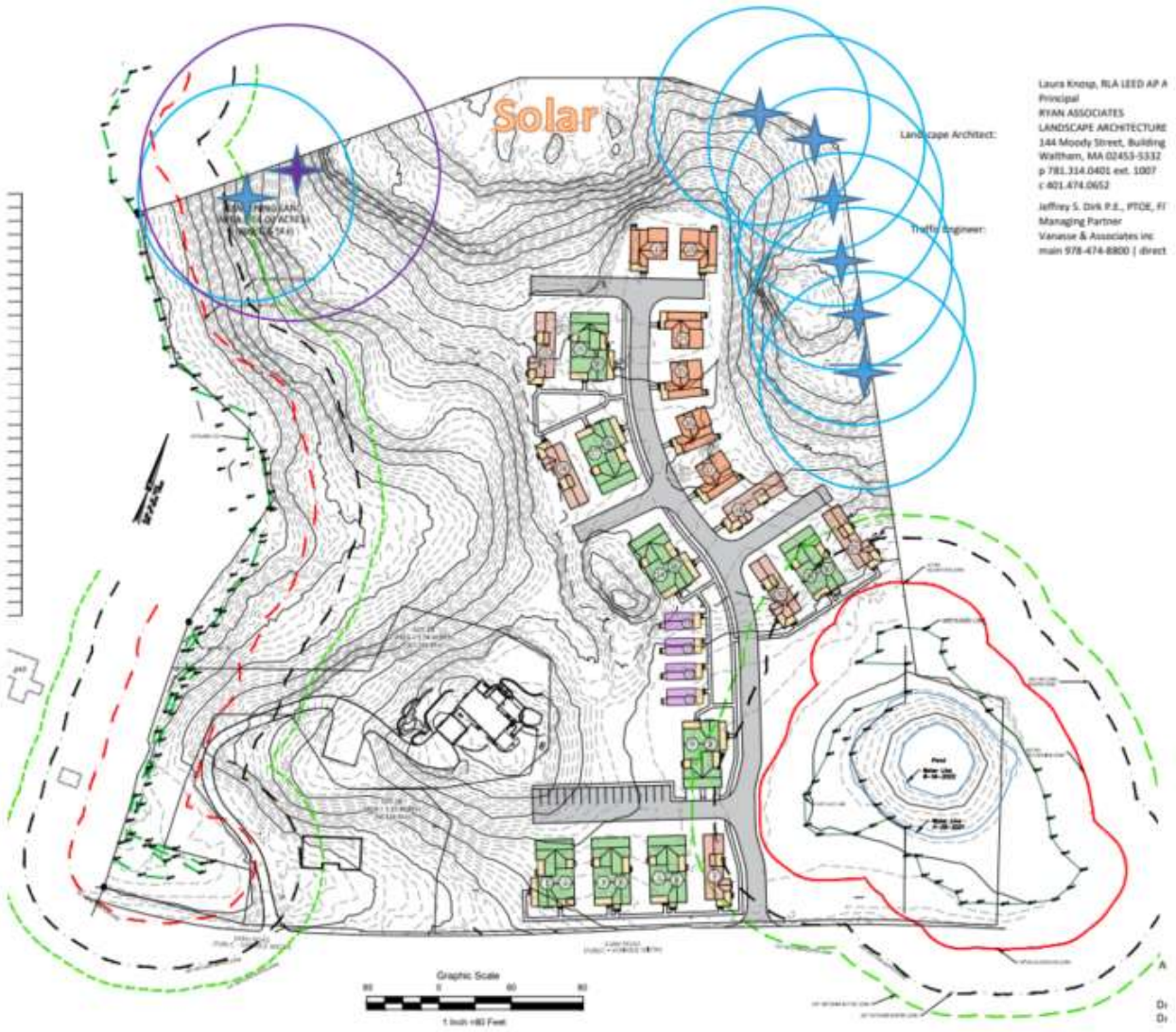
A rough illustration of a multiple-well PWS layout at the Farm Road site is presented below. It is not proposed as a required or even recommended layout. Instead, it merely demonstrates that alternative layouts may be possible.

Note that no attempt was made to alter currently proposed site plan features and thus the layout example works around them. At this stage of the project there is the ability to vary site plans significantly to accommodate alternative options, given that there is no new infrastructure yet.

Also note that having the Zone I's (the protective circles around each well) extend onto adjacent Town conservation land would require a formal agreement with the Town for compliance with MassDEP requirements for protection of PWS integrity.

[3] "For wells going through the Source Approval process, if two or more wells are located within 50 feet of one another, then the Zone I radii will be based upon the combined approved yield of the wells and will be assigned to each well in the group. If one or more of the sources going through the Source Approval process are located at a distance greater than 50 feet from any of the other sources, then MassDEP will determine which wells, if any, are to be assigned combined yields. Wells that are not assigned a combined yield will be assigned a Zone I radius based upon the approved yield for each individual well." [per MassDEP Drinking Water Program, Northeast Regional Office, 1-8-2024]

Multi-Well PWS Layout
(for purposes of concept illustration only)



Key:

	**Wellheads (roughly 60 to 80 feet apart between adjacent wells; the adjacent blue and purple wellheads are intended to show mutually exclusive options)**
	**Zone I that can support supply volume that aligns with the minimum 125-foot protective radius**
	**Zone I with a 180-foot protective radius (i.e., can support a pumping rate in gpd equal to approximately 225% that of the 125' protective radius)**
Solar	**Location of a possible solar array**
not to scale; based on an excerpt from a CLAWE plan, with only the elements noted above added; extensive site reconfiguration is not a BoH duty – this is a concept illustration	

Financial Feasibility of a PWS

Examples of Existing Viability for VSS PWSs

The following are examples (by no means exhaustive) of existing, Community (i.e., residential) PWSs in Massachusetts. Since they all serve populations of 500 or less, they are classified as very small systems (VSS).

Given that certain costs are somewhat fixed regardless of VSS size, such as those for permitting, operator services, and laboratory analyses for quality, the costs are apparently not prohibitive for populations as little as 20% of the size of Farm Road Homes.

Very Small System PWSs in Massachusetts		
Town	**Population**	**Name**
Colrain	28	Foundry Brook Association
Mendon	31	Mendon Housing Authority
Hubbardston	40	Silverleaf Hollow Condominiums
Hubbardston	40	Briarwood Townhomes
Hubbardston	40	Hubbardston House Apartments
Berlin	48	Northbrook Village Ret.
Brimfield	60	Brimfield Housing Authority
Granby	61	Granby Housing Authority
Grafton	64	Laurel Hill Condominiums
Berlin	80	Northbrook Village II
Boxborough	80	Liberty House Condominium
Sunderland	88	Pond Ridge Condo Assn
Belchertown	107	Sports Haven Mobil Home Park
Mashpee	112	Beechwood Point Condos
Upton	118	Cobblers Creek Condominiums
Carver	120	Meadow Woods Mobile Home Park
Lancaster	120	Lancaster Woods Condominiums
Brookfield	123	Nanatomqua Mobile Home Park
Stow	132	Arbor Glen Condominiums
Brimfield	137	Meadowbrook Acres Mobile Home Park
Tyngsborough	150	River Crossing Condominium
Granby	152	Granby Heights Condominiums
Hancock	160	Beaver Pond Meadows
Cheshire	180	Berkshire Estates
Mashpee	222	Sea Oaks Condominiums
Source: www.mass.gov website, database of PWSs, January 2024		

Existing examples of PWS financial viability in Sherborn include:

- Woodhaven – 24 units, senior rentals, reasonable rents;
- Leland Farms – over 50% of the units are affordable; and
- The Fields at Sherborn - another 32-unit 40B.

According to residents of The Fields at Sherborn, an average monthly fee for *both water and septic system management* is approximately $100. Fees are assessed from metered water usage volume per residence. The collection of fees is intended to cover on-going operation and maintenance expenses and to build up funds to cover periodic repairs or other special future needs of the systems.

The financial viability of the Woodhaven and Leland Farms PWS situations was questioned, given the on-going efforts to modify the systems there. According to Sherborn's DPW Director and a representative from WhiteWater (the firm responsible for operating these PWSs), the circumstances of current expenditures are unique to their situations and largely result from:

- the age of Woodhaven's plumbing, which was installed prior to regulations restricting the use of leaded solder;
- the downtown location and associated groundwater conditions;
- pH adjustment equipment to manage lead and copper leaching; and
- significant efforts for combining systems that had not been combined originally.

The last circumstance carries a cautionary message regarding cost challenges to future residents at Farm Road Homes if individual private wells must later be merged into a PWS to address some of the resiliency, preferential draw, or other technical issues noted under "Advantages of a PWS".

Installation Costs

Given that the wells currently proposed could be readily used for a PWS, the installation costs are not necessarily different, other than as any one well's costs could differ from another's depending on the conditions encountered.

Pump Testing Costs

For PWSs, MassDEP requires extended pump testing and monitoring of nearby existing wells for assessing broader impacts of the proposed withdrawals. For recent larger projects with shared wells, the BoH has implemented similar requirements. Thus, the costs would be similar.

Permitting Costs

According to current MassDEP's current fee structure for the permitting process, and assuming that the total volume of the residential development's water supply is under 70 GPM, the listed permitting fees for New Source Approvals are $1,380 for permit WS13 and $1,585 for permit WS15. MassDEP has indicated that it generally allows multiple wells to be permitted within a single approval process, as it did for The Fields at Sherborn. Just as well plans would need to be

developed by a professional and provided to the BoH for review, a comparable effort would be needed for preparing submissions to MassDEP.

Management Costs

PWSs must be overseen by a MA-certified water supply operator:

- Most VSSs contract with a firm that can provide certified water system operators who periodically check on the system to ensure proper functioning.

- At a minimum, certified water supply operators shall conduct monthly on-site inspections unless specifically exempted in writing by MassDEP.

- MassDEP estimates that a minimum of 6-hours of documented on-site operation per year and a minimum of 12 hours of documented total operation per year are necessary to perform the typical certified water supply operator duties. Operator demands for VSSs are generally less than for larger systems.

The operators perform sample collection and submittal to a certified laboratory for analyses according to a schedule established by MassDEP (see attachments for a sample schedule):

- An appropriate list of quality parameters is identified by MassDEP for the specific PWS' circumstances.

- Certified laboratories are able to automatically upload the data to MassDEP, where it is checked for compliance and, when applicable, outreach about non-compliance is made. Laboratories alert the PWS owners and operators about any quality parameters that do not meet drinking water standards.

Annual reporting about the PWS must be made to MassDEP:

- Reporting can be done via an on-line system.

- Once initial information is entered (such as details about system ownership, contacts, location, size, design, features, risks), subsequent years require updating of information for the reporting year, such as withdrawal volumes for each well, changes to the system, etc.

- Selected information is also provided to all residences associated with the water supply via a Consumer Confidence Report, which is usually prepared by the contracted certified operators according to templates provided by MassDEP.

Private Water Supply: Compliance Determination

The Board reviewed the well information presented on the Septic plans relative to Sherborn well location regulations. All seven proposed wells meet the required setbacks from the SAS, property line, and distance from abutting wells.

Wells #1, 6, and 7 do not meet local setbacks of 55 feet from the edge of a traveled way or 50 feet from the edge of a right of way (II.6.0). These wells are not adequately protected from traffic or snow plowing, and should be relocated farther from the traveled way. Alternatively, but less optimal, plans for the protection of each of these wells shall be provided for review and approval.

Wells #2, #5, and #7 serve 24 people each, which is the maximum allowed to comply as private well. Any additional bedrooms in the units the respective wells serve would trigger the need for a PWS.

In the event the water supply is determined to be private, the Board recommends that all the Sherborn Board of Health Water Supply Regulations be followed, including well location, construction, quantity and quality performance standards.

Private Water Supply: Recommendations

Relocation of Well #7

Flooding in January 2024 rose to the location of Well #7 at 217-foot elevation. Submerged well heads risk contamination from surface water. The well shall be relocated above the 100-year flood plan.

PFAS6 Testing

If the projects water is supplied by private wells, all wells shall be tested for per- and polyfluoroalkyl substances (PFAS) at the time of well establishment to maintain the same stringent water quality standards of a PWS. Given the project is intended for families, and the greatest risks from PFAS chemicals is cumulative exposure over time, future owners should have knowledge of their potential health risks and be given the same protections as members of a PWS or other new construction in town.

PFAS6 testing should be done in accordance with Sherborn Board of Health Regulation II, Section 17.3. This includes a deed recording in the event levels are detected above the Massachusetts Maximum Contaminant Level (MMCL) of 20 ppt and subsequent treatment system installed for each unit the affected well serves.

The Board recognizes a site-specific risk for PFAS contamination at 65 Farm Road. In August 2015 a large barn fire occurred at the site, where the Sherborn Fire Department received mutual aid from four abutting communities. Given the high prevalence of per- and polyfluoroalkyl substances in firefighting foam, there is a real risk that groundwater was contaminated at this site as a result of the fire. As such, PFAS testing upon project initiation is highly recommended for the protection of future project residents.

Pump Testing

Private water supply wells shall be installed prior to any building construction to ensure sufficient water quantity. Well installation shall not be phased, as it affects the accurate determination of both quantity and quality. All on-site wells shall be pumped simultaneously for a minimum of 48 hours and possibly longer, subject to dynamics observed during the first 48 hours. The BoH agent shall be permitted to witness the testing.

The Applicant shall contact abutters and offer to monitor their wells during the pump test, at the Applicant's expense. It is the choice of the neighbors to grant or not grant permission.

Prior to performing the extended pump-test, the applicant must provide to the Town a *Pump Test Plan* for review that includes:

1. Measurement method for determining pumping rate
2. Location the pumped water will be discharged and methods to maximize reinfiltration in a manner that does not interfere with the pump testing
3. How water levels in the pumped wells will be monitored
4. Identify neighbors participating in monitoring
5. Plan to assure that bacteria and other contaminants are not introduced into the neighbors wells during monitoring
6. How long water levels will be measured before and after pumping
7. Method for analyzing the water level data
8. Contingency plan if any of the on-site wells interfere with each other OR with neighboring wells

SEPTIC SYSTEM ISSUES

Room/Bedroom Review

The Board reviewed the floor plans presented in "Architectural Design Plans" dated 7/6/23 for the four proposed unit configurations. All floor plans comply with both Title 5 and Sherborn regulations regarding room count and bedroom count. The floor plans for each unit lack a depiction of the basement and attic space, and are assumed unfinished, but this has not been confirmed by the Applicant. Basement and attic spaces have not been included in the room count review. In order to comply with bedroom count under Sherborn regulations, unfinished spaces in each of the units shall not be finished into bedrooms and any finishing of the spaces, now or in the future, must first receive Board review and approval.

If floor plans change, the Board reserves the right for additional review.

Specific comments for each of the unit floor plans follow below:

3- Bedroom Front-Loaded Unit

The 2nd floor office space is less than 70 sqft, which is the minimum square footage for a Title 5 bedroom. To not be considered a bedroom, the square footage of this space shall not be made greater than 70 sqft.

3- Bedroom Rear-Loaded Unit

Plans depict a 2nd floor loft, which appears to have a half-wall at the stairwell. This should remain a half-wall, to prevent future conversion of the loft space to a bedroom.

The 2nd floor office space is less than 70 sqft, which is the minimum square footage for a Title 5 bedroom. To not be considered a bedroom, the square footage of this space shall not be made greater than 70 sqft.

External elevation renderings show a space above the garage, which is presumed unfinished, and therefore not considered in the Board's room count review. Confirmation the space is unfinished would be appreciated.

2- Bedroom Duplex Units

External elevation renderings show a space above the garage, which is presumed unfinished, and therefore not considered in the Board's room count review. Confirmation the space is unfinished would be appreciated.

2- Bedroom Cottage Units

No additional comments.

Septic Plan Review

As of the morning of February 26, 2014, a response has not yet been received for the February 16, 2024 letter sent by the BoH to the Applicant regarding the status of the Farm Road Homes' septic plans. The letter identifies:

- Information deficiencies remain for the plans, including but not limited to:
    - data not appropriately and/or accurately presented (e.g., refusal encountered in deep observation holes, clarification of details about application of the Frimpter method to groundwater adjustments for historic high elevation determination); and
    - vertical profiles that are missing for groundwater and for system components.
- Several septic design features are not in compliance with Title 5, including but not limited to:
    - the maximum allowed soil covers over the septic tanks, pump chamber, and the soil absorption system have been exceeded; and
    - issues that might be resolved once information deficiencies are addressed.

Further details can be found in Attachment C's copy of the Agent's Deficiency Letter.

Groundwater Mounding Analyses

The Board has not yet had the benefit of the Peer Reviewer's input regarding groundwater mounding analyses. Current concerns arise from:

- possible misapplication of data;
- the lack of transparency around methodologies and inputs; and
- insufficient information for the Peer Reviewer to perform a thorough evaluation.

A key example of ***data misapplication*** involves percolation test and sieve analysis results being used in place of saturated hydraulic conductivity investigation. The purpose of percolation testing (or sieve analyses) is to determine whether septic effluent entering the soil absorption system will be able to infiltrate the soils immediately around and below that system readily, without causing back-up into the pipes, distribution chambers, beds, etc.

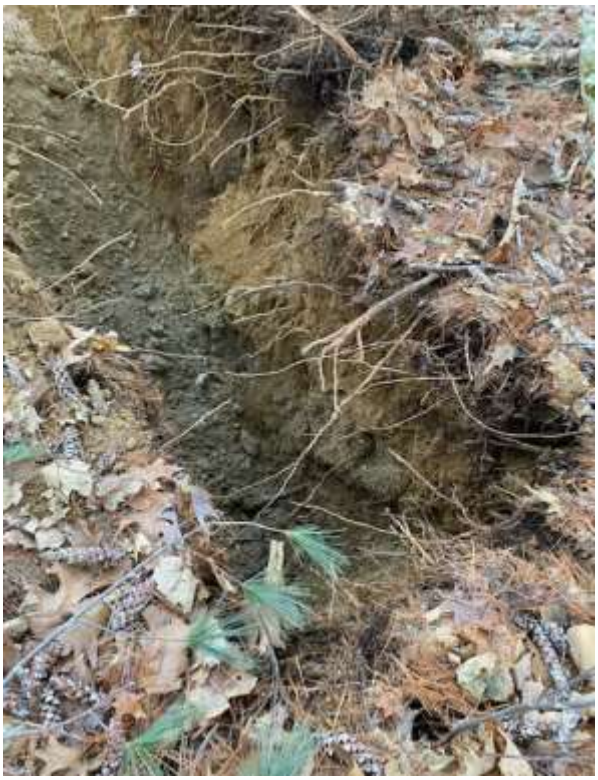
Groundwater mounding analyses, whether for septic systems or stormwater infiltration methods, seek to predict how the discharge of a large amount of fluid onto/into the ground will move downward to the overburden's groundwater surface (aka, water table - the upper surface of the zone of saturation) and cause a localized mound on the water table. The mounding results from a combination of the discharge rate, saturated condition of soils below the water table, and the types of soils encountered along the way and the speed with which fluid can move through them.

MassDEP's Stormwater Handbook notes that "***A Title 5 percolation test is not an acceptable test for saturated hydraulic conductivity. Title 5 percolation tests overestimate the saturated***

hydraulic conductivity rate." Using CLAWE's method, the actual mound will most likely be higher than predicted by that method. A problem with this could be that if, for example, the mound rises to the bottom of the soil absorption system, surface breakout of minimally treated septic effluent and/or compromised bacteria and virus reduction due to the lack of a drying out period (which promotes die-off) are more likely.

In the photographs below, taken by the BoH Agent during observation of subsurface exploratory activities and sample collection in the vicinity of the proposed soil absorption system with CLAWE (December 2023), the lighter-color upper layer consists of sandy soils. The deeper, darker layers exhibit the characteristics of glacial till, which is less hydraulically conductive than sandy soils. A proper mounding analysis must take into account the soil layers within the vertical profile. There are a variety of acceptable methods for doing so, as indicated by MassDEP's Stormwater Handbook.

Soil collected for grain size analysis (sieve analysis). Corresponds to the upper layer in the photo to the right (note color). Sand, loamy sand, and/or sandy loam.



Test pit exhibiting a profile with 2 general categories of soil: sandier material (brown hue) near the surface and glacial till (grey hue) deeper.

If the issue of ***methodology transparency*** cannot be resolved with CLAWE, the BoH recommends that all necessary raw data be provided to the Peer Reviewer, who can then use vetted software and/or methods for the septic system's groundwater mounding analyses.

Another source of uncertainty for the BoH is that the CLAWE reports contain conflicting information within them, making it all the more difficult to follow the path of assessment. For mounding analyses in particular, sieve (grain size) analyses were performed on a limited set of soil samples and the laboratory results are presented. However, it is unclear how the information was or was not used for assessing hydraulic conductivity and why. There are a range of K-values shown but it seems only one was used – why?

Nitrogen Loading Analyses

Similar concerns exist for this topic as for the groundwater mounding analyses. There is significant overlap in data types and uses between these analyses.

Significant concerns about the analyses to date make it difficult to draw conclusions about a predicted nitrogen loading situation at this time. This is primarily due to the lack of methodology transparency and the apparent use of use of atypical assumptions about site dynamics. Peer Reviewer evaluation has not yet been received.

Outstanding questions and requests for information include, but are not limited to:

- Has overburden groundwater flow direction been determined by appropriate and sufficient monitoring well readings? A minimum of 3 triangulated points are needed to establish water table slope. Wet and dry season slopes may vary, as found by CLAWE during its testing at The Fields of Sherborn.

- Once the stormwater and septic effluent mounding analyses are resolved, the BoH would like to have a project level assessment performed to capture any cumulative mounding impacts of stormwater and septic effluent systems.

- How does the method used for Farm Road Homes compare with those applied by CLAWE, Hydrogeocycle/Beta Groups, and Nobis for The Fields at Sherborn project? Given similarities in septic system size, soils, and climate, what accounts for the significant differences in ***projected nitrogen levels*** at identified receptors? Note the following site-specific distances from the downgradient edge of the soil absorption systems to the primary/nearest identified receptor of effluent plumes:
    - for The Fields at Sherborn, approximately 600 feet to the northern edge of Dirty Meadow Swamp, reached by predicted nitrogen concentrations of 23 to 26 mg/l; and
    - for Farm Road Homes, approximately 150 feet to the property line to the west[4], reached by predicted nitrogen concentrations of 4 to 7 mg/l.

[4] The location of the downgradient receptor is not clear; for now it is assumed to be the property line to the west of the soil absorption system.

Making sure that the nitrogen loading analysis is done well for this large source of potential contamination is important. Although nitrogen and nitrogen compounds are not the only contaminants of concern for septic effluent plume impacts to sensitive receptors and down-gradient properties, they are closely affiliated with septic system wastewaters and have been extensively studied. Once appropriate nitrogen loading analyses are performed, nitrogen can be used as a reference point for understanding the transport of other septic contaminants to receptors.

Note that the ***nitrogen reduction*** innovative-alternative (I/A) technology proposed for the septic system at Farm Road Homes does not treat many of the other contaminants found in septic effluent. Thus, while the I/A technology allows for additional density of development due to its potential to meet nitrogen discharge targets, other contaminants are likely to be higher in groundwater with the additional 25% loading allowance granted to users of the nitrogen-reducing I/A systems.

OTHER PUBLIC HEALTH ISSUES

III.3.1 Environmental Health Impact Report
III.14.0 Environmental Health Impact Report – Scope and General Submittal Requirements

These regulations require projects of ten or more dwelling units or a design flows of >2,000 gpd to submit an Environmental Health Impact Report (EHIR). An EHIR shall include the following analyses:

- Geologic stratigraphy
- Determination of groundwater flow directions
- Determination of maximum groundwater elevation
- Evaluation of water table mounding
- Prediction of down-gradient water quality impacts

The Applicant submitted a "Hydrogeologic Evaluations Report" on December 11, 2023, which includes the above analyses. Verification of the input data and evaluation of the methodologies applied is currently under review by the Peer Reviewer and the Board. The Board will consider this requirement fulfilled following receipt and review of the Peer Reviewer's final report.

III.12.0 Drainage

This regulatory section addresses stormwater management topics. The Applicant submitted an updated version of a "Stormwater Management Report" on February 23, 2024. Further review by the Peer Reviewer is anticipated. The Board considers this stormwater process as a reasonable substitute for its regulations with the exception that it would like the cumulative groundwater mounding effects from stormwater retention/infiltration basins and the soil absorption system SAS to be evaluated, primarily for reasons of predicting septic system performance issues and impacts.

III.13.0 Earth Removal Standards

On February 23, 2024, the Applicant submitted a letter regarding "2nd Comprehensive Permit Plan Changes". It contains a "cut and fill analysis" for the septic construction area, multiple stormwater basins, and the well access area, with a net of 10,667 cubic yards being removed. This is noted as potentially impacting the abutting properties and resources. Per 13.1, the threshold for applicability is 350 cubic yards of material per lot or 1,000 cubic yards per project. Existing site documents provide much of the information required by the Earth Removal Restoration Plan and the Board does not recommend duplication of information.

Standards specified by 13.2 are important for public health and groundwater protection and are recommended for this project.

ATTACHMENT A

Example of a PWS Water Quality Sampling Schedule and Analytical Costs

MassDEP issues a "Required Water Quality Sampling Schedule Frequency" to each PWS at least every 3 years. Based on findings from each sampling round, the Schedule may be amended and re-issued during the 3-year period, to keep it current with new conditions being experienced by the PWS.

- Each schedule is customized to the specific PWS's characteristics.
- Not all tests are performed with the same frequency, depending upon the historic trends of findings for the quality parameter and/or the nature of its health implications.

Using the attached Schedule for The Fields at Sherborn as a guide for cost estimation, the following table shows approximate comparisons between PWS monitoring versus possible private well monitoring regimes. It illustrates the economies of scale associated with the PWS for broader and more frequent water quality information versus through multiple but separate shared private wells.

In the table, the "cost per sample" figures were drawn from recently published price lists for a variety of analytical laboratories providing drinking water quality services. Laboratory costs change over time and vary from laboratory to laboratory. These estimates are meant to give a sense of the magnitude of water quality testing expenses only.

Approximate Comparisons of Water Quality Analytical Costs: Private Shared-Well versus PWS

Quality Parameters	Test Frequency	# Samples (per 3 yrs)	Cost per Sample*	Total Cost (per 3 yrs)
Shared Private Well - estimate based on less rigorous testing than used by PWSs				
Homeowners' Package [a]	annual	3	$ 175	$ 525
Volatile Organic Compounds	annual	3	$ 135	$ 405
PFAS	triennial	1	$ 250	$ 250
			3 Year Cost	$ 1,180
			Annual Cost	$ 393
			Annual Cost per Connection (w/4 service connections)	***$ 98***
PWS - based on Fields at Sherborn's 2023-2025 schedule – with modifications as noted				
Bacteria	monthly	36	$ 50	$ 1,800
Gross Alpha Particle Activity	[b]	1	$ 125	$ 125
Inorganics	triennial	1	$ 100	$ 100
Lead & Copper Rule	annual	15 [c]	$ 60	$ 900
Manganese	triennial	1	$ 30	$ 30
Nitrate	annual	3	$ 40	$ 120
Nitrite	triennial	1	$ 40	$ 40
Perchlorate	annual	3	$ 175	$ 525
PFAS	annual	3	$ 250	$ 750
Radium 226 & Radium 228	triennial	3	$ 275	$ 825
Secondary Contaminants	voluntary	0		
Synthetic Organic Compounds	triennial	1	$ 135	$ 135
Uranium	[b]	0		
Volatile Organic Compounds	annual	3	$ 135	$ 405
			3 Year Cost	$ 5,755
			Annual Cost	$ 1,918
			Annual Cost per Connection (w/32 service connections)	***$ 80***

* Costs were drawn from recently published price lists for a variety of analytical laboratories providing drinking water quality services. Laboratory costs change over time and vary from laboratory to laboratory.
[a] bacteria, metals, nitrogen compounds, TSS, pH, other (depending on each laboratory's offerings)
[b] current schedule reflects a special condition of Fields at Sherborn; thus, frequency is adjusted for this example calculation
[c] Fields at Sherborn samples 5 taps once per year

Required Water Quality Sampling Schedule for Fields at Sherborn PWS

October 05, 2023 — Required Water Quality Sampling Schedule Frequency For **2023** To **2025** — Page 1 of 2

PWS ID **3269032** PWS Name **FIELDS AT SHERBORN CONDO TRUST** Town: **SHERBORN** Class: **COM**

BACTERIA SAMPLING Apr - Sep: 1 per MONTH; Oct - Mar: 1 per MONTH. Season Start Date: 01/01. Season End Date: 12/31. Refer to your DEP Coliform Sampling Plan for approved coliform sample locations. Systems open before or beyond the start/end dates must collect samples during these extra months.

Loc ID #	SAMPLE LOCATION	MULT/SIN	R/F	D/S	WAIVER Y / N	2023 QTR1	2023 QTR2	2023 QTR3	2023 QTR4	2024 QTR1	2024 QTR2	2024 QTR3	2024 QTR4	2025 QTR1	2025 QTR2	2025 QTR3	2025 QTR4
GROSS ALPHA PARTICLE ACTIVITY																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S					X	X	X	X	X	X	X	X	X
3269032-01G	WELL 1																
3269032-02G	WELL 2																
INORGANICS																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S	N							X					
3269032-01G	WELL 1																
3269032-02G	WELL 2																
LEAD AND COPPER RULE																	
	5 APPROVED TAPS	S	F	D				X				X				X	
MANGANESE																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S								X					
3269032-01G	WELL 1																
3269032-02G	WELL 2																
NITRATE																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S				X				X				X	
3269032-01G	WELL 1																
3269032-02G	WELL 2																
NITRITE																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S								X					
3269032-01G	WELL 1																
3269032-02G	WELL 2																
PER- AND POLYFLUOROALKYL SUBSTANCES																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S					OCT				OCT				OCT
3269032-01G	WELL 1																
3269032-02G	WELL 2																
PERCHLORATE																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S	N			X				X				X	
3269032-01G	WELL 1																
3269032-02G	WELL 2																
RADIONUCLIDES																	

R/F = RAW OR FINISHED WATER; D/S = DISTRIBUTION OR SOURCE SAMPLE; Waiver: (Y)es, or (N)o; MULT/SIN: (MULT)iple sources or a (SIN)gle source

This monitoring schedule is based on the system's current inventory and is subject to change. Water systems are responsible for promptly reporting schedule errors or omissions. Errors or omissions on monitoring schedules do not prohibit the MassDEP from enforcing monitoring requirements set forth by the Regulations.

October 05, 2023 — Required Water Quality Sampling Schedule Frequency For **2023** To **2025** — Page 2 of 2

PWS ID **3269032** PWS Name **FIELDS AT SHERBORN CONDO TRUST** Town: **SHERBORN** Class: **COM**

BACTERIA SAMPLING Apr - Sep: 1 per MONTH; Oct - Mar: 1 per MONTH. Season Start Date: 01/01. Season End Date: 12/31. Refer to your DEP Coliform Sampling Plan for approved coliform sample locations. Systems open before or beyond the start/end dates must collect samples during these extra months.

Loc ID #	SAMPLE LOCATION	MULT/SIN	R/F	D/S	WAIVER Y / N	2023 QTR1	2023 QTR2	2023 QTR3	2023 QTR4	2024 QTR1	2024 QTR2	2024 QTR3	2024 QTR4	2025 QTR1	2025 QTR2	2025 QTR3	2025 QTR4
RADIONUCLIDES																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S				X				X				X	
3269032-01G	WELL 1																
3269032-02G	WELL 2																
SECONDARY CONTAMINANTS						[DEP recommends annual testing]											
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S													
3269032-01G	WELL 1																
3269032-02G	WELL 2																
SYNTHETIC ORGANIC COMPOUNDS																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S	N							X					
3269032-01G	WELL 1																
3269032-02G	WELL 2																
URANIUM																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S					X	X	X	X	X	X	X	X	X
3269032-01G	WELL 1																
3269032-02G	WELL 2																
VOLATILE ORGANIC COMPOUNDS																	
1000	WELLS 1 & 2 (AFTER TANK)	M	F	S	N			X				X				X	
3269032-01G	WELL 1																
3269032-02G	WELL 2																

ATTACHMENT B:

From "Draft Language Well Ownership and Control 1012022.pdf"

The following is draft language to be used in the Condominium Master Deed. This paragraph is for Well Group #1 and additional paragraphs would be similarly inserted for Well Group #2, #3, #4, #5, #6 and #7.

The Condominium Master Deed would also contain a provision restricting occupancy to two people per bedroom.

Section 6.4: Exclusive Rights and Responsibility with Respect to Water Supply Wells:

Notwithstanding any other provision of the Master Deed or Declaration of Trust, the Owners of Units 19, 20, 21 and 22 shall have the exclusive right and obligation as Owners to maintain and operate, and if necessary, make capital improvements in connection with Well #1 for the supply of water to their respective Units. This exclusive ownership right and obligation shall include the right and obligation to maintain, repair or replace the wells themselves, their distribution lines, any storage tank, and their supply lines to their Units, and any other appurtenance to those specific Wells. The Owners of Units 19, 20, 21 and 22 shall have the right and obligation as Owners, unfettered by any other Unit Owner, to make such decisions as they deem necessary or prudent to assure a continuous supply of potable water to their units from Well #1 and shall each have responsibility for one-fourth of the costs of maintaining and operating Well #1. Similarly, the Owners of Units 19, 20, 21 and 22 shall have no right to participate in any decisions made by other Unit Owners who have been granted exclusive right to determine the maintenance or repair obligations, or need for capital improvements of Wells #2, #3, #4, #5, #6 and #7 or their appurtenances. This sub-group of Unit Owners responsible for Well #1 may, at their discretion, create and maintain a separate monetary reserve, to fund the costs or anticipated costs, of any Well #1 expense. The decisions of the sub-group shall be by majority vote of the Unit Owners who comprise the sub-group, limited to one (1) vote per Unit.

BoH note: These provisions do not address how to resolve water supply problems that may arise with the proposed individual private wells, such as the process for if/when a well needs to be replaced (e.g., how to identify new locations that may impact others at the project, how to work around existing infrastructure, etc.).

ATTACHMENT C

Letter of Deficiencies for Proposed Septic System and Overall Site and Plan Index

As of the morning of February 26, 2014, a response has not yet been received for the following letter regarding the status of the Farm Road Homes' septic plans. The letter identifies remaining informational deficiencies and septic design features that are not in compliances with Title 5.

TOWN OF SHERBORN SETTLED 1674

Board of Health

TOWN HALL • 19 WASHINGTON ST. • SHERBORN, MASSACHUSETTS 01770
508-651-7852 • FAX 508-651-7868

February 16, 2024

Fenix Partners Farm Road LLC
177 Lake Street
Sherborn MA 01770

RE: Response to February 2, 2024 letter addressing the 65 Farm Road Letter of Deficiencies for Proposed Septic System and Overall Site and Plan Index

Dear Fenix Partners Farm Road LLC

The following is a review of the response letter including the septic and well plans dated February 2, 2024 in respect to the deficiencies noted on the deficiency letter dated January 18, 2024 sent by the Board of Health:

Deficiency:

#7, The water lines have been provided on the plot plan, additional details on the depth of the water lines and if there are any water shut offs are to be provided on a profile for these water lines. Also, is there any plan to double pipe the water lines when they are placed under paved areas?

#9, A groundwater profile is to be provided for the estimated groundwater determination at the septic tanks and the pump chamber. This detailed profile is to show the groundwater deep holes labeled SLTP 2 and SWTP 3 and the extrapolation of the groundwater from these deep observation holes to the septic tanks and pump chamber. Please define the labeling acronyms for these deep holes and provide the Frimpter method adjustments with the formula utilized including the USGS comparison well utilized in this formula for the Frimpter method.

#10 and Note E, The soil testing shown on the plot plans does not correspond to the field soil evaluations. This shall be resolved including the need to note the sandy loams soils that were determined in the field to allow for accurate groundwater mounding and groundwater adjustments. Please note that the determined Soil Web data determined onsite indicated the following soils: Hollis at 35%, Rock Outcrop at 30 %, Charlton at 20%, Canton at 10% and Montauk at 3%. This information will be helpful in determining the determination the soil types and with setting the groundwater adjustments and mounding.

#14, The elevations of the percolation test holes should be shown on the percolation test table on sheet 4 of 10 to allow the transfer of this information provided in a separate location on the deep hole data.

#15, Refusal was determined in the field for deep observation holes 55-10 and 55-10 AN. The refusal was found and recorded as being that the bottom of both these deep observation holes and have not been shown on the revised soil testing date on sheet 4 of 10 on the plot plans.

The following is still pending further review:

The groundwater adjustment data and formula utilizing the Frimpter method is to be provided including the USGS reference well for the groundwater adjustment noted on deep observation holes 55-2 and 55-11 shown on Sheet 4 of 10.

In the review of the revised septic plans, it was determined that the required maximum cover allowed over the septic tanks, pump chamber and the soil absorption system has been exceeded by more than 36 inches and is not in compliance with Title 5, 310 CMR 15.221 (7). The profiles for the septic tanks and pump chamber are to indicated the final grades on the profile. The stepped soil absorption system utilizing Cultecs are to be shown on a profile with the adjusted groundwater, the Cultecs chambers and final cover.

The Board of Health will be addressing the February 2, 2024 responses in respect to the deficiency letter dated January 16, 2024 and other documents for this project at their Board of Health meeting scheduled for February 21, 2024.

Feel free to contact me with any questions.

Sincerely,

Mark Oram, Sherborn Board of Health Agent

Electronically copied to owner and engineer and sent by mail

-Mr. Robert Murchison, AB Realty Trust

-Engineer- Desheng Wang, P.E., Creative Land &Water Engineering, LLC

-Tetra Tech Consultants