



Town of Carlisle
Office of
BOARD OF HEALTH
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MEMORANDUM

RECEIVED
JAN 22 2015

To: Zoning Board of Appeals
From: Board of Health
Date: January 20 2015

TOWN CLERK-CARLISLE
CHARLENE M. HINTON

In Re: "The Birches" 100 Long Ridge Road, Comprehensive Permit Application

As requested by the Zoning Board, the Board of Health considered the new information provided by Lifetime Green Homes on plan entitled "Residential Site Plan Set - Affordable Housing Development "The Birches", Carlisle, Massachusetts dated November 14, 2014". At a public meeting held on January 6, 2015, the Board reaffirmed its position that the water supply should be classified as a Public Water Supply (PWS) and local waivers are required.

The Board is very concerned about the proposed density of the project which puts the environment and health and safety of the residents at risk. The Board would like to point out that the project is unable to fully satisfy the following State Codes without relief:

1. **310 CMR 22.00 Mass. Drinking Water Regulations**
2. **310 CMR. 15.00 State Environmental Code Regulating Septic Systems (Title 5)**

The Board's standard of review for granting relief is that the applicant must prove that full compliance would be manifestly unjust and an equivalent level of protection has been provided. The Board does not feel that the revised design meets this standard for either Code.

310 CMR 22.00 Mass. Drinking Water Regulations

In a straw poll taken at the meeting on January 6th all five Board Members stated that the water supply should be classified as a PWS.

Although the project meets the criteria of a Public Water Supply (PWS) (25 users for 60 days or more per year), the developer is proposing eleven private drinking water wells, an irrigation well and a fire well claiming that the site cannot meet the Zone I requirement(s) of a PWS and that private wells can be legally conditioned to provide equivalent protection. The Board does not accept this position.

Water Supply

- The project consists of 20 units on 9.34 acres of land with a potential population of 122 residents. A clean, safe water supply is critical. The project density demands the additional protection of a PWS in order to guarantee the health and safety of the residents and the environment.

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- The developer has not proven conclusively that a Zone I, or multiple overlapping Zone I's, cannot be located on the site.
- There will be a total of thirteen private wells (eleven new, one existing for irrigation, and a fire cistern well). The wells are located close to one another increasing the potential for hydraulic connectivity and possible contamination of the water supply network should one well become polluted.
- There has been no data to determine whether the wells will be hydraulically connected or impact nearby abutter's wells. Any well testing protocol needs to take this into account.
- The developer claims that the existing well which will be used as an irrigation well does not have to meet the setback to a roadway since the roadway is private not public. Calling a roadway by a different name does not overcome the environmental concern which is the intent of the regulation. Without this setback there is a potential for damage to the well casing from vehicles, particularly snow plows and contamination from road runoff. The local regulation does not distinguish irrigation wells from drinking water wells. A local waiver is required
- One of the proposed drinking wells is only 5' from an underground Cultec-roof infiltration chamber. This is a source of pollution to the well.
- A number of the wells are down gradient to two large systems increasing the risk of contamination should either leaching area fail to function properly.
- Two wells and one abutter's well¹ do not meet the required 150' setback to a leaching area as required by local regulations for Condominiums and systems of 2000 GPD or greater².
- There will be no Zone I protective radius. Wells may be exposed to any number of pollutants such as lawn and garden fertilizers and pesticides, parked automobiles, leaking propane tanks allowing gas to accumulate in the well casing.
- There is no plan for backup power for the water supply. Given the location of the development in a heavily wooded neighborhood, the opportunity for a power outage is significant. This could result in 122 people not being able to flush a toilet or wash their hands.
- The Board has major concerns about the maintenance of shared wells and the ability of the Homeowner's Association (HOA) to provide enforcement and oversight.
- The developer has agreed to provide some initial and ongoing testing but not to the degree that would be required of a PWS. Well contamination may go unnoticed without regular and frequent testing. Ongoing water testing will be dependent upon individual homeowners, not the HOA, and therefore difficult for the local authority to enforce.

¹ Two onsite and one abutter's well (132 Long Ridge Road)

² Town of Carlisle Water Supply Regulations, Sec. VI: "A well shall be located a minimum of . . . one-hundred fifty (150) feet from systems 2000 GPD or greater".

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- A PWS requires an escrow account accessible by the town for future replacement and a Certified Well Operator for the ongoing maintenance and monitoring. This provides the Board of Health with direct communication to a person in charge and funding to rectify problems if needed. A PWS also requires an Operations and Maintenance Manual which is filed with the Board. It would be difficult to keep eleven separate manuals up to date as owners change.
- According to a preliminary meeting with representatives from the Mass. DEP Drinking Water Program the project as then designed would be classified as a PWS. The most recent plan, although revised, does not change anything of significance that would contradict this position.

In summary, the Board of Health stands by its position that "The Birches" development should be designated as a PWS and local waivers are required for reducing the 150' setback from three wells to a leaching area and 25' setback to a roadway.

310 CMR 15.00 State Environmental Code Regulating Septic Systems (Title 5)

Nitrogen Loading

The developer is seeking relief from 310 CMR 15.00. Title 5 imposes a nitrogen loading limitation of 440 gallons per day (gpd) per acre.³ The 9.34 acre parcel cannot meet the nitrogen loading requirements for the 20 two and three bedroom units proposed⁴. The need for additional credit land to offset the discharge of nitrogen into the ground is another example of the high density, aggressive development that is being proposed. Health risks associated with high levels of nitrogen include Blue Baby Syndrome. According to the National Institute of Health "The use of nitrate-contaminated drinking water to prepare infant formula is a well-known risk factor for infant methemoglobinemia"⁵.

A Facility Aggregation Plan to meet the 440 gpd per acre equivalency standard by securing nonfacility credit land must be submitted to the Board of Health as the local approving authority. State review is no longer required. The developer has not yet submitted a Facility Aggregation Plan so the Board cannot make any judgment as to the acceptability of the Plan. In order to determine the acceptability of the proposed credit land, the Board requires at a minimum the following:

- Hydrogeological assessment
- Site-specific mass balance analysis
- Groundwater monitoring plan
- Groundwater nitrogen plume map for the property boundary
- Identification of all down gradient sensitive receptors
- Demonstration that the proposed nitrogen reduction will meet a 5mg/l limit at the property boundary and for all onsite wells

³15.214 440 gals. per day per acre where the use of both on-site sewage disposal and on-site drinking water is proposed (private well area)

⁴ Final design flow calculations (bedrooms) has not been provided.

⁵ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1638204/>

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Design Flow Requirements

The proposed design flows of 110 gpd per bedroom do not meet the criteria of two local regulations or their intent: Section 15.211 requires a setback distance between a system 2000 gpd/br or larger to a well of 150'; Section 15.221 requires 165 gpd/br for a three bedroom house. The intent of these regulations is to avoid over sizing a system (six bedrooms+) which could interfere with functioning or under sizing a system (three bedrooms) that is being fully utilized.

The developer claims that the project consists of three separate systems. According to a determination (attached) issued by Mass. DEP on July 25, 2006 for another project "Title 5 at 310 CMR 15.002 defines an on-site system as a system or series of systems." The Board's local regulation specifically states that "Soil Absorption System is defined the same as in Title 5" thereby eliminating any question that the determination does not apply. The overall design flow for the project must be used and exceeds 2000 gpd. Legally the "Birches" will be issued a single Sewage Disposal Construction Permit (SDCP) not three separate permits further emphasizing that the series of systems is in reality one system. The design has not overcome the need for a waiver.

E/ONE Pressure Sewer System

Seven units will use grinder pumps to grind up solid waste so that it can be pumped through a force main to a septic tank. It is unclear whether the pumps will be installed inside or outside of the dwelling and whether they comply with Title 5 and the State Plumbing Code for grinder pumps which limit the discharge capacity⁶.

The Board is concerned about the susceptibility of grinder pumps to clogging because of what residents may flush down the drains. This would be exacerbated if an interior pump failed and caused sewage to enter the house. The Board would prefer a more conventional system consisting of gravity flow to a septic tank to a pump chamber which will lift sewage up to the leaching system.

Summary

The Board of Health stands by its position that the proposed redesign still requires waivers from local regulations and that the water supply should be classified as a PWS.

In order to fully support this position and provide comments to the Zoning Board, the Board requires expert assistance to evaluate the hydrology for the water supply and Title 5 issues. As reflected in the Nitsch Engineering report dated December 22, 2014, these areas are being left to the Board of Health. However, the Board of Health does not have funds available to conduct these studies. The Board would appreciate the Zoning Board's consideration of these needs.

BOH:lmf

/Lifetime Green Homes

cc: Town Clerk

⁶Title 5(310 CMR 15.229) and State Plumbing Code (248 CMR 2.15(7)(B))