



142 Littleton Road
Westford, MA 01886
978.692.1313

June 8, 2015
Lisa Davis Lewis
Carlisle Board of Appeals
Town Hall
66 Westford Street
Carlisle, MA 01741

Re: "The Birches"
Application for Comprehensive Permit

Dear Ms. Lewis and the members of the Board of Appeals:

Please find the following submitted herewith as the response to the effect of not granting the requested local Carlisle Board of Health (BOH) waivers:

- Exhibit D – Well setback waiver not granted
- Exhibit E – Well setback and flow rate (165 gpd/br) not granted
- Proforma – Updated 06042015, 20 Units
- Proforma – Updated 06042015, 19 Units
- Proforma – Updated 06042015, 18 Units
- Proforma – Updated 06042015, 17 Units
- Proforma – Updated 06042015, 16 Units
- Proforma – Updated 06042015, 13 Units
- Attachment A2- Nitrogen Equivalency Calculations – 13 units

15.221 and Well Regulations: Waiver of well setback to leach area of 150 feet for systems in excess of 2000 GPD or condominium systems Not Granted, All other BOH waivers granted.

Exhibit D shows the reconfiguration of the units due if the Board does not grant the setback to well waiver. The coloration on the plan shows the site limitations for locating the septic system showing setbacks to wetlands, existing homes (20' to cellar), steep slopes, or wells. The available land for septic system leaching areas is in white. As the remaining area is limited, all 3 new septic systems would be located in the same general area. This is not ideal for sewer piping and other site issues but this exhibit shows the maximum that could be allowed on the site given the denial of the well setback waiver request. The net result is 18 units.

15.221 and Well Regulations: Waiver of Carlisle BOH well setback to leach area of 150 feet for systems in excess of 2000 GPD or condominium systems Not Granted

And

15.221 and 15.290-15.293: Waiver of Carlisle BOH Requirement to set the daily flow rate at 165 GPD/BR for systems above 2000 GPD as shared or condominiums, but 15.100 granted

Similarly, Exhibit E shows the same limitations but when factoring in the assumed denial of the waiver request for the local flow rate of 165 GPD/BR, a 50% increase to Title 5. As such, the septic leaching areas enlarge by 50%. This results in the loss of another unit. The net result is 17 units.

15.100: Waiver of Carlisle BOH Requirement to have no rise in groundwater elevation and no greater than 5 mg/L of total nitrogen at the perimeter boundary for systems in excess of 2000 GPD

If the waiver listed above is not granted then the septic leaching areas will need to move away from the edges of the site. For the nitrogen component, alternative studies would be required but based on the studies previously performed the system would generally need to be at least 100 feet from the property edge. The local BOH rules (waiver not requested) also require a setback from the wetland of 100 feet as opposed to Title 5 which is 50 feet.

However, the above is moot as the distance necessary to have no rise in the groundwater elevation is **at least** 300 feet in all directions from the edges of the leaching area when using the lowest groundwater mound computed (least conservative). There are no areas on this property that can accommodate a leaching area setback at least 300 feet to all property lines and be at least 100 feet from a wetland. The project could not be built under this condition, and, in fact, it is unlikely that any project could be built in any available privately held undeveloped property in Carlisle under this condition as the groundwater mound dissipates exponentially effectively requiring magnitudes of distance to attain zero increase.

Therefore, to avoid the need for this waiver the total flow would have to be under 2000 GPD. This equates to 12 bedrooms at 165 GPD/BR. Taking out the existing 4 bedroom home would leave 8 bedrooms, or 2 units at 3 bedrooms and 1 unit at 2 bedrooms for a total of a 4 unit project. Therefore, I have presented a proforma for a 4 unit project which, not surprisingly, shows a significant loss (not economically feasible).

Nitrogen Equivalency Computation

Although not allowed pursuant to Title 5, but as discussed at three of the last Board of Appeals hearings on this project I assumed that the Board may want to try to equate the Nitrogen Equivalency analysis to the total project septic flow. Attachment A2 provides this analysis and equates this to a reduction of 21 bedrooms from the 58 bedrooms currently proposed to 37 bedrooms, total. As such, I provided a proforma for 13 units, equal to 37 bedrooms. Although the layout is not provided and minor savings may be possible with a slightly shorter roadway, it is quite clear from the results of this proforma, which shows a significant negative profit, that this scenario is not economically possible.

Proformas Submitted

In addition to the 4 unit and 13 unit proforma and pursuant to the Board's request, the other related proformas are submitted herewith as listed above for 18 units (well setback waiver denied but flow rate and nitrogen limitation (15.100) granted) and 17 units (well setback waiver and flow rate waiver denied but flow rate and nitrogen limitation (15.100) granted).

Since the proforma analysis is often more profitable at unit counts divisible by 4 due to the losses accounted for in the affordable unit construction, I also provided a proforma for 16 units. Further, since the only unit count left between 16 and 20 was the 19 unit proforma, and since someone may opine that 19 units can somehow fit on this site with the constraints related to not granting of some waivers, I provided the proforma for 19 units as well.

Signed:

A handwritten signature in blue ink that reads "Jeffrey A. Brem". The signature is written in a cursive, flowing style.

Jeffrey A. Brem, PE

Cc: Douglas Deschenes