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56 Maple Hill Avenue
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Town of Newington, CT
Town Engineer, Chris Greenlaw
Application 2012-22, Russell Road North of Old Highway, Toll Brothers Proposed Subdivision.

This letter is meant to summarize the concerns I have for the wetlands on Cedar Mountain. I have submitted several letters and various forms of documentation supporting the position I first presented in a letter dated November 13, 2013 to the Conservation Commission. In that, and all subsequent letters, I have stated that the subdivision's construction would likely have a significant negative impact on the wetlands physical characteristics.

For the purpose of weighing those threats from this application before the Conservation Commission; the entire project's design hinges on the critical hydrologic budget for wetland 2. That is, to accurately determine the amount of, and source of water that supplies the wetland. The current method used has been to simply calculate the water that comes from the drainage basin, which is defined as the area from which rainfall would flow on the surface of the ground, into the wetland. No value has been given to groundwater that comes from the potential groundwater basin outside the drainage basin. The potential groundwater basin is any area within reasonable proximity to the wetland that is at a higher elevation, but not limited by the peak points in the topography (drainage divide) like the drainage basin is.

I have provided documentation that shows this outdated method of defining the groundwater basin area by simply mimicking the surface drainage basin boundary is obsolete, and therefore unreliable. It has been further documented that groundwater coming from outside the surface drainage basin is even more likely in a fractured Basalt bedrock zone, which Cedar Mountain is known to be comprised of. This due to the fact that once the water is in the matrix of the fractured zone of the bedrock, it is equally capable of flowing in any direction that is at a lower elevation, and far less likely to be influenced by the topography above it, such as water would be when flowing on the surface of less permeable underlying bedrock.

I have described from the beginning how the development's excavating and trenching would disrupt that groundwater's flow in the fractured Basalt aquifer by intercepting it and diverting it away from the wetland. I never differentiated the ground waters source as being either from only the drainage basin or from beyond it. Based on my experience, I realized the potential area of contributing ground water came from a vast area of the property, but as it is now planned, only the 13 acres that represent the surface drainage basin have been considered as the source of recharge water for wetland 2. This is seriously flawed, based on the fact that the entire area that encompasses the development (Aprx. 40 acres) is situated on ground that is at a higher elevation than wetland 2, and is therefore a potential ground water basin that contributes to wetland 2.

Wetland 2 has been defined by REMA Ecological as a groundwater depression type of wetland, and therefor relies primarily on groundwater to sustain it. It should be obvious to everyone involved in this process whether professional or not, that in not fully evaluating the source of that ground water, a mitigation plan to protect the wetland's water supply, is for all practical purposes, not possible. It is highly likely and therefore should be presumed that a substantial percentage of the ground water that feeds the central wetland originates from an area outside of the surface drainage basin divide. Site specific characteristics that further support this are;

- The fact that currently only a small percentage (13 acres out of 40acres) of the total potential combined surface and sub-surface watershed is now being considered as a recharge source. An over simplification that does not appreciate the site specific complexities of the local hydrology on such a unique geological formation, with a wetland environment which has remained viable for thousands of years.

- The fact that the local regional flow of water off the mountain is to the north-west in the direction of the flow of the stream known as wetland 1, so it would not be unreasonable to predict and therefore suspected, that some water within the fractured Basalt aquifer in the upper plateau area to the south-east of wetland 2 would also move in the same direction as the regional flow, which would be in the direction of wetland 2. Note: the most concentrated part of the development is proposed for that elevated area to the south-east of wetland 2, outside of the surface drainage basin but well within the potential ground water basin.

- The recent revelation of the spring and well at the head of wetland 1 is apparently a major source of water for that wetland, and further exemplifies the proposition that ground water within various types of local aquifers, plays a significant role in hydrological environment of Cedar Mountain. This fact is very important, in that prior to the well/ spring's discovery, the idea of long term storage and conveyance of groundwater in that unique geologic formation was based primarily on speculation, and would not have been easy to prove. Indisputable evidence now exists that shows us this comprehensive theory has proven itself.

Though difficult to quantify the value of the unaccounted groundwater recharging wetland 2, it must be concluded that based on all that is known of and observed on this site, that that value is significant enough that every effort must be made to factor it into all calculations, for as I have alluded to in the past, that contribution must be completely understood before this project can move ahead. It is imperative to understand that the vast majority of the development sits above that potential ground water basin, where trenching and excavating in the bedrock threatens to divert that critical water resource away from wetland 2. Simply moving lots and roads around, and only compensating for the disrupted hydrology in the surface drainage basin, does not begin to address the threat to the complex natural hydrologic balance that has existed and thrived on Cedar Mountain to this point. The greatest threat being: The physical depletion of the wetlands due to insufficient groundwater inflow; a very real probability that cannot be ignored.