

133 Keyes Road
Concord, MA 01742

**DATE: April 21, 2020****MEMORANDUM**

TO: Elizabeth Hughes, Town Planner
From: Alan H. Cathcart, Director of Public Works
Prepared by: Valerie Doerrer, Public Works Engineer-Water Systems
Justin Richardson PE, Assistant Town Engineer
CC: Steve Dookran PE, Town Engineer
SUBJECT: 246 Old Road to Nine Acre Corner: Concord Country Club Earth Removal
Special Permit

Concord Public Works (CPW) acknowledges receipt of the additional information provided by Stamski and McNary, Inc., dated March 19, 2020, and Golf Water, LLC., dated March 17, 2020. However, in order to proceed with a detail review of this additional information, CPW requires that the applicant address fully the Engineering Division Comment, Item 5 (restated below) from the Concord Public Works correspondence dated March 2, 2020. The test pits must be observed by a Town representative to ensure that the irrigation pond complies with Zoning Bylaw Section 7.6.6.11 which states that removal of soil, loam, sand, gravel, or any other mineral substance within four feet of the historical high groundwater table elevation is prohibited within the Groundwater Conservancy District. While the applicant indicates that the additional test pits were completed, the Town was not contacted to witness that work. Also, the applicant seems to identify the concern as only needing any finish grades outside the four-foot zone. The law requires no excavation of undisturbed soil within that zone and this needs to be demonstrated.

Engineering Division Comment Item 5 from March 2, 2020 Correspondence:

Soil testing was performed on the west side of the pond embankment, but no testing was performed inside the pond or on the east embankment at the higher ground elevations. A minimum of six (6) additional soil tests shall be performed in the areas indicated on the attached plan to ensure that groundwater is not affected by the new pond. The soil testing shall go down four (4) feet deeper than the bottom elevation of the pond, be performed on soil in its natural state (undisturbed), and be observed by a Town representative. Pursuant to Zoning Bylaw Section 7.6.6.11, removal of soil, loam, sand, gravel, or any other mineral substance within four feet of the historical high groundwater table elevation is prohibited within the Groundwater Conservancy District.

Applicant's response: Additional soil testing has been performed to demonstrate that the proposed excavation will not result in any finished grades that are within 4' of the historical high water table where the pre-development finished grade is/was greater than 4' above the historical high water table. In light of the chaos surrounding the current COVID-19 situation, these test pits were not observed by a representative from the town. Confirmatory test pits can be performed prior to the issuance of the permit or commencement of the work.

CPW performed a cursory review of the additional information submitted in regards to the irrigation system and offer the following for the applicant to consider:

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The information presented by Concord Country Club's consultants suggests the proposed irrigation system improvement project has the potential to allow for improved irrigation system operation and efficiencies. Based on the supporting documentation provided, it remains unclear as to what, if any, impact these modifications will have on the municipal water supply wells located immediately down-gradient of this site.

When the applicant's consultant states "*The more efficient irrigation system supplied by existing wells will have increased water distribution uniformity and efficiency and by utilizing a new storage base, demand on well water will be reduced.*", it is not entirely clear as to how they arrive at this conclusion. While it is possible that these claims could be accurate, it requires a more detailed explanation as to site specific operating conditions and constraints. Without this evaluation, it is not too difficult to surmise that during high demand periods, especially during extended period of droughts, make-up water pumped to the irrigation pond will be predominantly from the existing groundwater wells. By design, the new irrigation pond would eliminate existing controls on groundwater withdrawals, notably well and pump design and efficiencies. As such, if groundwater withdrawal volumes are simply regulated relying upon "average" daily withdrawal values or annual water registration allowances, it is quite possible that groundwater withdrawals could be more significant during hydrogeologically stressed conditions.

Again, depending on specific operational conditions, the statement suggesting that "*the average daily flow will not change with the new system installation and the new pumping scenario from a pond*" presents a false sense of protection that is not supported by the information provided. For instance, the operation of both wells at their maximum available pumping capacities (again dictated by well and pump efficiencies) may significantly exceed the 120,000 gallons per day "average" for weeks or months at a time. Without sufficient detail and clarification, such withdrawal rates could intercept essential recharge that would otherwise flow towards the Town's drinking water supply wells – especially during a prolonged drought. To this same point, the statement suggesting the proposed irrigation system modifications "*will reduce the burden on the wells and reduce the impact on the water table while providing the same gross volume*" is entirely dependent upon actual withdrawal rates anticipated over very specific periods of time during very specific hydrogeologic conditions. The town is most interested in understanding what the impact will be on the municipal wells when it most matters, when the hydrogeologic system is stressed.

To be clear, it is quite possible that the irrigation system could be designed and operated in a manner that would allow for more water to be drawn during periods of water abundance (with appropriate considerations as to time of year, duration, and other environmental factors), and in a manner that the irrigation pond could act as a buffer and actually improve availability for the Town during droughts. However, lacking such detail, the Public Works Commission (PWC) will be unable to provide the ZBA with recommendations as to how the issuance of this Special Permit will either a.) impact the health, safety, and general welfare of the community by ensuring an adequate quality and quantity of drinking water for the residents, institutions, and businesses of the Town of Concord or, b.) preserve and protect the Town's existing and potential sources of public drinking water supplies, as outlined within the Groundwater Conservancy District Zoning regulations.

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Everyone including the applicant involved in this effort would be best served if the applicant could provide an irrigation system plan that clearly identifies all irrigation system components including the location and appropriate characteristics of wells, piping systems, storage systems and discharge points as well as operating protocols to be implemented during normal and more importantly, drought periods. Once this information is provided, we can expect to have a better understanding as to if this project will have an adverse impact on the municipal water supply, or not. Such a program would be well advised regardless of this permitting effort and would be in keeping with sustainable water resource practices that are being developed within the golf course industry.

Given the project's size, scale, complexity, potential impact or use of the land and Town's drinking water supply, it may be warranted for the ZBA to call for the assistance of outside consultants to assist in this review, in accordance with MGL Ch.44, Section 53G.

In conclusion, whereas the information provided to date makes it difficult to reasonably determine if the project as proposed will or will not have a deleterious impact on the municipal water supply well, the applicant is directed to present its case to the PWC so that the PWC can be educated as to the project and provide an informed recommendation to the ZBA.