

Carya Ecological Services, LLC



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February 9, 2023

Conservation Commission, Town of Waterford
Ms. Maureen FitzGerald, Environmental Planner
15 Rope Ferry Road
Waterford, CT 06385

RE: Application Review, App # C22-15 47-Unit Residential Subdivision w. affordable units
Response to Applicant's rebuttals; housekeeping for the public hearing record

Carya Job No.: 23- WFD 3

This letter has been pasted from an e-mail to the town Conservation Commission, Mas Fitzgerald, and also to my client and the applicant's attorney & engineer. It was sent today at 3:06 PM . It has not been altered except for minor proof-reading, including separating paragraphs. A high resolution photo of the flow[path display board was attached.

Sincerely,

Sigrun N. Gadwa, MS
Ecologist, Wetland Scientist, Registered Soil Scientist
Carya Ecological Services LLC

**C-22-14
109R & 131 CLARK LANE
PUBLIC HEARING
EXHIBIT # 44**

VIA E-MAIL

Sigrun Nicodemus <sigrun.n.gadwa@gmail.com> 3:06 PM (30 minutes ago)

to Maureen, Mark, David, arlene

Dear Ms. Fitzgerald and Conservation Commissioners:

This display board describes some flow path characteristics, between Detention Basin outfall & Fenger Brook. There is clearly a reasonable likelihood of damage to Fenger Brook and to wetlands

downgradient of the level spreader. However, more information is needed on soils and on topography in the steep section, and on the downgradient plant community. In particular, the extent and duration of saturation to the surface is needed to more accurately assess risk of channelization/erosion, which would discharge suspended sediment into the brook. It is also needed to assess the risk/extent of harm to trees and the overall plant community.

A jurisdictional wetland can provide considerable infiltration capacity - and stormwater attenuation - if saturation is well below the surface for extended periods. *Such "transitional" wetlands can support* a diverse array of facultative species of plants, quite different from the limited suite of plant species in a very wet forested wetland, usually saturated to within an inch or two of the surface. But plant diversity may not be very high in a post-ag wetland forest or thicket with transitional hydrology - largely because many wetland species that could thrive there have not yet colonized, or because invasive species arrived first and are preventing establishment of native species. Wetland soils with a low seasonal high-water table (e.g. below ten or fifteen inches) *do* help prevent flooding and stream degradation by disconnecting runoff sources from surface waters at least during smaller storm events like summer thunderstorms. Mr. Theroux indicated that this is the predominant hydrologic regime, and that flood storage is negligible because multiple rivulets connect to the brook.

In that case, likelihood of severe impacts to Fenger Brook, including channel degradation due to bank-full or near bank-full conditions for longer periods. Banks - and level bare ground- are gradually eroded if water flows past or over them for extended periods, even if velocities are low, especially if the soil has a significant fine particle fraction (e.g. silt loam, fine sandy loam, loam, or very fine sandy loam). The duration of contact with flow is the key factor here. The stormwater management system does not meet the channel protection criteria in the CT 2004 Stormwater Manual. The detention basin capacity and discharge is quite high, even for small interval storms. Stream bank erosion and widening: Even infiltrated, redistributed runoff can result in a significant increase in groundwater discharge if the discharge volume is great enough.

The applicant has also not provided groundwater recharge calculations. They should be done for the northern half of the project because Clark Lane is the high point, the watershed Divide between the Fenger Brook Basin(CT2000-30)and the Jordan Brook Drainage Basin (Basin 2201-03), which means watershed size to the west of the Fenger Brook wetland system is not in fact very large, as Mr Theroux believes, based on his rebuttal regarding our concerns that drought stress will increase in the upland review area, and also in the wetland where the upland buffer is narrow (e.g. + - 50 feet).

We are pleased that pollutant loading calculations have been done but have not yet had an opportunity to review them.

The concerns expressed will be part of my presentation, and each commissioner and the applicant will receive an 11 X 8.5 copy of the display board. I send this letter in email form, primarily to be fair to the applicant, who may wish to request an extension.

On behalf of my clients, we shall be recommending denial without prejudice. They are providing a list of categories of additional information needed, either before a permit is granted, or to be provided as permit conditions.

Substantial additional field data is needed on buffer characteristics, both on the subject property and on town-owned land. Field evidence and CTECO & USDA Soils data, to date, point to effective infiltration of the existing Clark Lane discharge into the upland buffer along a ~ 250-foot flow path. Dispersed flow begins downgradient of the deep ~ 60'-long, steep-sided ditch that has formed below the outfall over the past few decades. The flow from the Clark Lane pipe spreads out in a tree cluster, to be clear-cut, and evidence of channelized flow is absent in the downgradient riparian corridor of Fenger Brook. But more soil depth data is needed to assess the likelihood of drought stress from significant water diversion. (Impact is less for deep soils, with deep groundwater, than for shallow soils with hard pan or ridge near the surface.) Nutrient data is needed from Fenger Brook, down-gradient of the flow path from the lower Clark Lane discharge pipe, and from the upper end of the brook, below the Clark Lane outfall from the pipe along the northern property line. Nutrient analysis is needed, not just the "catch-all" specific conductivity parameter.

I shall also use two other display boards tonight. One is a blow up of 4 figures in the existing conditions report. The second is a large watershed map clarifying the question as to whether the site is in the Fenger Brook or Jordan Brook watershed (a collage of 9 printouts covering its 3.1 square mile, 3.47 miles long watershed (CT-2000-30) from the on-line CTECO map.) The board shows topography, watershed boundaries, and all surface waters (including Alewife Cove). It shows the easterly flow direction of the "connecting" unnamed stream that appears at first glance to link Fenger Brook to Jordan Mill Pond. I shall leave the board with you tonight, for the record. I shall also give numbered copies of the CT-ECO map print-outs to the applicant tonight.

Could I enter the full 16 page Fenger Brook Watershed Study into the Record without making copies for the commissioners and the applicant? It is downloadable from the CTDEEP website. My clients have already provided the commission with copies of an excerpt of this 2015 CTDEEP report on Fenger Brook as Attachment A to the Carya Report dated 2-7-23.

Best Regards,

Sigrun. N. Gadwa, MS

Soil Scientist, Consulting Ecologist, Botanist

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One attachment • Scanned by Gmail