

To: Maureen Fitzgerald, Waterford Conservation Commissioners

From: Sigrun N. Gadwa, Principal, Carya Ecological Services, LLC

Date: February 22, 2023

RE: Waterford Cons. Comm. App # C 22-14, Clark Lane Proposed Residential Project; additional document for the hearing record

Concerns about the application; their adverse effects on Wetlands; changes offered by the applicant, or requested of the applicant, to address the problems.

1. *Ditch along western property line will divert ground water to large detention basin, which will adversely affect hydrology in upland review area and in the wetlands.*
 - Flow from this ditch has been redirected to the forest to the east. Runoff from more rooftops also redirected. The old Clark Lane pipe will continue to flow easterly. **Concern addressed.**
2. *Excavation of ditch, and the cut along western property line will damage trees of Clark Lane Neighbors if root loss is over about 40%. Similarly, filling on east side of project will kill or cause dieback to trees on east side of project, at base of fill slope. Wetlands will be adversely impacted by loss of the trees' nutrient uptake and wildlife support services. The proposed arborvitae hedge will have little benefit to wetland; it needs supplementation.*
 - Compensatory tree planting is being requested as mitigation. Additional detail can be provided,
3. *Concern was that too much water will enter the large detention basin, coming from runoff from Clark Lane, new roofs and impervious roadways surfaces, & the new ditch reverting existing groundwater. The concern was erosion along flow patch during*

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109R & 131 CLARK LANE

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EXHIBIT #66

periods of high soil saturation, occurring when runoff during very large storms under saturated conditions would reach the steeper more erodible slopes. In major storm the protracted flow of a very large volume would cause shallow swales and gully formation which would release sediment to the wetlands and carry pollutants.

- Applicant has proposed to significantly reduce the discharge volume that could potentially erode the flow path, and to repair gullies in early stages. If carried out this will be an effective strategy. A reporting form and a regular schedule for inspection of the flow path are needed. Criteria need to be developed in consultation with staff: following what sizes of storms will inspections take place?.
- *Concern addressed* Note: the details of the configuration and location of the level spreader of the pipe carrying Clark Lane runoff also need to be worked out in consultation with staff. Currently multiple tree trunks are spreading the runoff but these lie within the development footprint.

4. *Bioretention basin design problems.*

They have been corrected with addition of a saturated denitrification component. *Concern addressed. Fine particles, with the highest proportion of toxicants are treated by the bioretention basin.*

5. *Some fine sediments will not settle out and will be resuspended due to the detention basin's rapid drainage time during the larger storm events.* However, In small to moderate events, most small particles are filtered by the bioretention basin and by buffer soils along the flow patch when not saturated When water depth is

shallow to start fine particles will be filtered in with, flowing through a correctly constructed vegetated wetland with micropool, mounds, etc.

6. We were concerned that mosquitos will breed in large retention basin.
 - Changes will allow development of a constructed wetland that support predators controlling mosquitos .
7. It is expensive to change out media of basin. Proposed water quality monitoring will help ensure this is done in a timely fashion.
Concern addressed.

Note that we had suggested that raingardens would reduce the crowding, provide green spaces, providing aesthetic function. Moreover, they will help reduce the size, cost, and frequency of maintenance of the bioretention basin since they would handle some of the water. We still think they would improve the project.

8. E. box, spotted, & wood turtles are noted to be possible in the site by experts SLR, Carya, Theroux. Sigrun Gadwa of Carya has observed or received recent reports of these turtles in similar coastal habitats. The spotted and wood turtles have a key role in the aquatic food web. E box turtle dispersed wetland wildflower seeds.
 - We request not using heavy machinery that could run over turtles, unless area has been cleared by a search beforehand. when grading and using brush hogging and hand-held saws.