The Impact of Construction in a Watershed Area

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Introduction

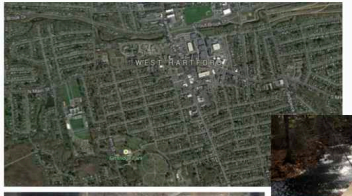
Any body of water is sensitive to the environmental factors around it. Storm water, excrement, and mineral deposits can all vastly effect the content and quality of the water in a stream, pond or brook. These factors and their effects are enhanced by human development and land alteration.

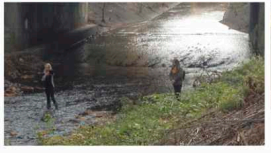
Construction almost always takes away from the drainage ability of a watershed area. In addition, there is often lots of sediment during and after construction to be washed into a body with the greater flow of rain water. New developments can stress the already challenging factors in an aquatic ecosystem. However, compromises can be reached for more ecologically friendly building, and sometimes preservation can even be achieved.

Mary Pelletier, Executive Director of Park Watershed, Inc. in West Hartford, introduced me to a conflict between a land developing company, Sard Custom Homes LLC, and neighbors living along Trout Brook. I followed the neighbors' fight to minimize downstream flooding, sewage back up, ecological damage, and future complications caused by construction on the Trout Brook watershed area. I followed the formal complaints, personal research, and requests for compromise of the neighbors through their email group. I attended several meetings at town hall as the group took on an active roll to adjust or postpone construction. The results of their efforts have been rewarding thus far.

Background on Trout Brook

Trout Brook is a tributary of Park River and runs through residential, commercial, and park areas throughout West Hartford. Along its course, Trout Brook opens up into ponds, flows over small rapids, travels beneath the ground, and narrows into offshoots. The brook has been subject to human alterations, such as rerouting and channelization. Trout Brook contains 7.9 miles of water impaired for recreational use due to elevated bacteria concentrations. Overall, however, the brook has a water quality classification of A (good-excellent) according to the Connecticut Department of Energy and Environmental Protection. This means that the water is good enough to be a potential drinking water supply, a habitat for fish and other aquatic wild life, and industrial and agricultural water supply.





I conducted a few tests on the water from sites both up stream and down stream of North Main Street and the Center of Town to verify its quality. All dissolved oxygen calculations by the Winkler method reported a dissolved oxygen content over 6mg/L (the preferred minimum for more sensitive organisms like trout or stoneflies). Alkalinity, pH, ammonia, nitrate, and nitrite were all measured to be at normal levels. A macro invertebrate sample test done just down stream of North Main Street supported the good water quality with the abundance of intolerant organisms like the Mayfly Nymph.

The Proposed Construction and Concerns

In May 2013, the American School for the Deaf (ASD) confirmed that it had an agreement to sell 9.3 acres of land from the back of its property to a home development company – Sard Custom Homes LLC. The land intended for sale slopes moderately to very steeply for 1.53 acres towards 3.3 acres of wetland. The total change in elevation of the lot is 16 feet. The original blue print plan fit 15 houses on the western side of Trout Brook.

Due to concerns regarding the upkeep of bridges, dams, and water basins along the encompassed segment of the brook, Sard and ASD agreed to a sale of just 5.53 acres to the west of , and excluding, Trout Brook. Further concerns over the density of proposed homes, Sard revised its planning to fit 12 homes.

To lessen effects of run off during construction, Sard proposed constructing a temporary swale 3 feet wide and 1 foot deep with a filter fabric fence and wood chips on the side to catch sediment and move water to the detention basin while causing minimal erosion. For the long term, a water detention basin would be installed in the south eastern corner of the land. The basin was calculated to hold a 100 year storm and the small outlet to the brook was located part way up from the bottom of the basin to meter out storm water and allow some to seep into the ground.

Clear Cutting Trees

Most of the trees on the densely wooded sight were proposed to be removed. To decrease hazards and to increase the aesthetic appeal of their homes, Sard planned to reduce forest land cover by 86%. Removing trees lessens natural absorbance and filtration of storm water (decreasing permeability of the land by 12%), diminishes habitats, and reduces the thermal and pollutant buffer that trees provide in the ecosystem.

Creating Impervious Surfaces

Around one fifth of the property was predicted to be an impervious surface post-development. The addition of a pavement cul-de-sac, driveways, and roofs where there was originally very little impervious surfaces would allow storm water to pick up more sediment and have less opportunity to filter through the ground. Even lawns can become impervious surfaces as they are matted down and frozen over.

Long Term Maintenance of the Water Control System

In theory the water detention basin would allow water to seep into the soil below, but as sediment would be caught and built up at the bottom, filtration would become difficult. Every now and then maintenance would be needed to keep the large basin working well. The basin, however, would be located in the back of a private lot and maneuvering a routine checkup would be a hassle and potentially overlooked

Effects of Increased Runoff

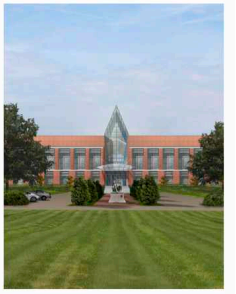
Storm water runoff carries pollutants into the aquatic ecosystem, potentially disturbing its balance. Along the brook, runoff can create erosion that changes plant and animal habitats on the banks. For humans, more runoff can lead to increased flooding and possibly water damage to homes near the brook.

Stress On Sanitary Sewer System

The sewage system in the area around ASD is made up of clay pipes from 1956. Plant roots have penetrated some of the pipes and continue to grow throughout them. Many homes are connected to this sewage system, and with Sard's proposal, 12 more homes would be adding pressure. Sewage backup already occurs from time to time along Trout Brook, and with high levels of bacteria already present in segments of the brook, more waste could worsen the water quality to a more significant degree.

A Course of Action

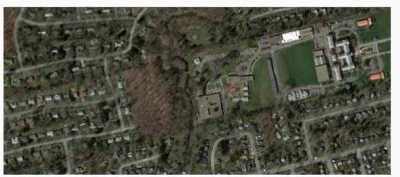
Home owners from all around the Trout Brook watershed area had an opinion on Sard Homes' plan for its newly purchased land. Many families downstream of ASD had had experience with flooding and sewage back up on their properties and feared an increase in such incidents. Neighbors down the street from the lot worried about the safety of large construction vehicles on their roads. For everyone, regardless of their location in relation to the brook, the effects that the construction could have on the environment were another point of opposition.



The coalition of concerned neighbors presented concerns to the town hall. In November 2013, the commission, which serves as the town's inland wetlands and watercourses regulation agency, reviewed Sard's application. In response to the neighbors' skepticism towards the REMA Ecological Services' report on behalf of Sard, which stated that the development would not negatively effect the wetlands, the commission voted unanimously to require that an independent environmental consultant review the application.

The independent review by Steven Danzer, Ph.D. and Associates LLC suggested rearranging the site layout to reduce the density of homes, planning to preserve certain trees, shrinking or reshaping the detention basin so that less tress would need to be cut, and cutting down necessary trees in phases. The neighbors involved had suggestions such as widening the conservation easement between the development and wetlands and decreasing the number of homes even more. Many neighbors even hoped for the land to be bought by the town and kept as a public preserve.

Sard Custom Homes was reluctant to make too many compromises that they saw as unnecessary. Concerns were rehashed by the neighbors at a Conservation and Environment Commission meeting in December, 2013. At the Planning and Zoning meeting in January, 2014, the commission postpone the vote on Sard's pending wetlands permit. This decision was then postponed a second time as controversial discussions of the planned development had not been resolved and the neighbors still stood firmly against the project.



Results and Moving Forward

On February 3, 2014, the town planning and zoning committee voted unanimously to deny Sard's request for a wetlands permit. As reported in the Hartford Courant, Commissioner Jeffery Daniels stated that "the risk to the wetlands is apparent, and it needs to, at minimum, be studied more carefully."

While the application is denied, if Sard chooses to reapply, there is no waiting period. However, the commission would not be likely to change its vote unless the proposal were to be significantly changed or circumstances that weren't present or weren't appreciated at the time of the initial application were to appear.

Currently, American School for the Deaf still owns the land. There is a Purchase and Sale agreement with Sard Custom Homes LLC, but the property has not been conveyed. The hope is to raise enough funds for the 5.53 acres of watershed area to be purchased by the towan and maintained as a public open space.

References

Thank you to my science teachers Tim Allerton and Fritz Goodman, to my community partner Mary Pelletier, and to the ASD neighbors for their hard work and community involvement.
Data from a third party independent environmental review and comments by Steven Danzer, PhD & Associates LLC and also from the CT Watershed Summary.