

Amston LAKE
FILE



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ENVIRONMENTAL IMPACT OF
ADDITIONAL RESIDENTIAL DEVELOPMENT ON
AMSTON LAKE

PREPARED FOR THE
HEBRON PLANNING & ZONING COMMISSION

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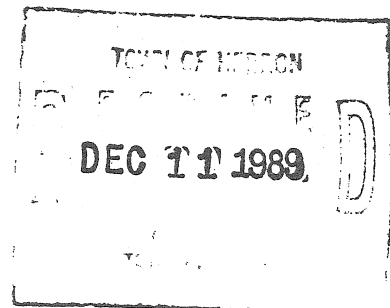


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Section I

Engineers — Planners — Landscape Architects

I. Introduction

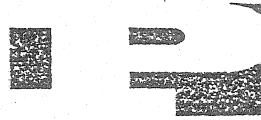
With the sewerage of the Hebron side of the Amston Lake watershed nearing completion, the Hebron Planning & Zoning Commission is contemplating amending the Amston Lake zoning district requirements to address the revised spatial requirements for each building lot. As part of the rezoning analysis, the Commission requested that a determination be made of possible additional environmental impacts on Amston Lake based on various sizes of building lots.

This environmental impact study concentrates on identifying the phosphorous loadings on Amston Lake and what, if any, limiting factors there may be. Phosphorous was chosen for the study vehicle because it is the most effectively controlled nutrient in a watershed with fairly advanced amounts of development. Since one half of the nitrogen loading to the lake from septic systems will be effectively removed once the sewer system on the Hebron side of Amston Lake is completed, nitrogen levels in the Amston Lake watershed were not extensively investigated as part of this report.

Phosphorous is an important measure in determining the relative health of a water body and what stage the pond or lake may be in as far as the eutrophication process is concerned. As described in the Connecticut Department of Environmental Protection's Watershed Management Guide For Connecticut Lakes, eutrophication is the process of lake aging caused by enrichment of the pond or lake with nutrients contributed from its surrounding watershed. During the aging process, many lake characteristics undergo dramatic changes. To lake users, changes observed include algae blooms increasing in frequency, intensity, and duration; beds of aquatic plants becoming dense and more extensive in coverage of the lake bottom; sediment deposits accumulating, shoal areas developing, and the lake becoming shallower; and the oxygen content of bottom waters declining.

There are three basic stages of eutrophication which are used to describe the age of a lake. These stages are termed "oligotrophic", "mesotrophic", and "eutrophic". Oligotrophic refers to lakes in the early stages of the eutrophication process, while eutrophic refers to lakes in the late stages. Mesotrophic refers to middle-age lakes in transition between oligotrophic and eutrophic states.

This study addresses the existing conditions of Amston Lake and what additional residential development may occur without creating an adverse environmental impact on the trophic status of the Lake.



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Section II

II. Existing Conditions

As taken from the Environmental Review Team Report of Amston Lake completed in June, 1984, Amston Lake is 184 acres in size and is bisected by the Hebron-Lebanon town line. The drainage area of Amston Lake encompasses approximately 680 acres or 1.06 square miles and has a mean depth of approximately 6 feet. Nearly 53 percent of the land area within the watershed lies within the Town of Hebron, 36 percent of the land area lies within the Town of Lebanon and the remaining 11 percent lies in the Town of Colchester. The drainage area of Amston Lake may be defined as the geographical area from which the runoff ultimately drains into the lake. The drainage area as shown by the accompanying topographic map, tends to follow along the crests of the hills surrounding the lake (see Figure 1).

The water level of Amston Lake is controlled by an earthen dam on the western side of the lake. A concrete spillway is located in the middle of the dam. The outlet stream for Amston Lake, which is unnamed, is a tributary of the Raymond Brook.

Topography

The topography throughout the drainage area ranges from gentle to steep slopes. Steepest slopes, which are found in the northwestern portion of the drainage basin are associated with areas where bedrock is at or near the surface. Slopes also rise steeply to the east from the eastern shore of Amston Lake. The southeast portion of the drainage area is characterized by moderate slopes. This area has been extensively developed for residential use (summer as well as year round). The eastern shoreline of the lake in the Town of Lebanon has also been developed for residential use at high intensity. Gentle slopes predominate in the southern parts of the drainage area.

Maximum and minimum elevations in the drainage basin are 650 feet and 445 feet above mean sea level, respectively. Glacial till covers approximately 87 percent of the watershed while stratified drift areas make up 4 percent of the watershed. The remaining 9 percent or approximately 59 acres of the surficial watershed is made up of Inland wetland soil groups, (see figures 2 & 3, Table 1).

Hydrology

The mean annual flow from Amston Lake was determined by a methodology described in Connecticut Water Resources bulletin No. 31 and is estimated to be 1.09 million gallons per day or 1.70 cubic feet per second. The groundwater flow pattern in the watershed parallels the surface flow pattern to a great extent.

*Mean Annual Flow
(1.09 million gal per day)*

1.7 Cubic Feet Per sec