

Town Hall Meeting Lake Maintenance 7-22-2015

The Lake Maintenance discussion is about the stuff that accumulates at the bottom of the lake. It is made up of soil (sand, silt, clay), organics (leaf, weeds, branches) and junk. The stuff is collected by water, mostly stormwater, that flows the 4+ miles from Shongum Lake and drains 6.5 square miles of homes, businesses, roads and forests. Enough organics exist to permit hydroraking the lake, but not the forebays.

The lake has accumulated sediment since its formation 120 years ago. PH measured the accumulation as 160,000 CY. Their tests for contamination indicated that benzo[a]pyrene slightly exceeded residential standards; any contaminated sediment requires handling by approved facilities. Years ago we constructed the forebays to trap some of the sediment before it enters the lake. PH used standard measurements and tables to that estimate that 2100 CY per year currently enter the forebays. PH said that this may be high; to help bound the actual inflow, our 120 year historical average is 1333 CY per year. PH calculated that the forebays can remove 5% - 13% of the stuff (depending on how full they are); so significant sediment will continue to enter the lake regardless of how empty the forebays are. The area hydroraked in 2010 is mostly filled; the area hydroraked in 2014 shows little sign of filling in.

The capital budget for lake maintenance has \$120,000 and we have been adding \$28,000 per year. A new form of capital budget will be considered that allows greater discretion in how the money is allocated. If approved this could increase currently available funds to \$200,000 with as much as \$53,000 added per year. Additional money from transfer fees, land sales additional corporation shares and not anticipated

The Lake Maintenance committee has defined these goals:

The goals of the Lake Maintenance are to assure the most used parts of the lake are navigable and minimize the sediment entering the lake through Den Brook. Navigable is defined as a water depth of two feet or the natural lake bottom. The most used part of the lake is defined as the Den Brook inlet to Bergers extending 75 yards from the cabin shore plus Bergers to Reitwiesner extending the entire lake width. These goals imply: removing sediment from areas where sediment reduces the water depth to less than two feet, removing stream deltas as they develop from the smaller streams and maintaining the forebays. Because of financial constraints work on the forebays and cabin shoreline are given priority.

Consistence with these goals and the money available, the suggested path forward is to clean the roadside stream deltas as they form, to clean the forebays as they fill, to hydrorake the cabin shoreline if islands develop and to develop better cost estimates for providing better access to the cabin shoreline. This priority is chosen because the cost of dredging the forebays may be considerably less than expected. Rick Price has investigated the regulations related to dredging areas less than one acre, e.g. the forebays. He finds that if the wetlands area can be managed, or perhaps restored, dredging can be done without engineering and oversight costs associated with larger dredge projects.

We anticipate dredging the forebays and cleaning the cabin shoreline via dredging or hydroraking. After the initial cleaning, additional sediment will enter the forebays and lake; these areas will require periodic cleaning. Cleaning the stream deltas have not been a major cost, less than \$10,000; their cleaning frequency is probably at least 10 years. Campers suggest forebays need cleaning at least every 5 years; this cost will be determined when they are cleaned. It is anticipated that the cabin area will receive at least 1000 CY of sediment per year; this area will also have to be periodically maintained.

The costs estimates below are based on PH data from 2010 (trying to make reasonable adjustments for contamination and sediment volume), 2014 hydroraking and discussions with Clean Earth (which handles contaminated soil), not with estimates from contractors. The table shows that for the estimated sediment volume the cost and years to accumulate the money using the old and an optimistic view of the new capital budget; cost per CY is also indicated. While you should take the actual values with a grain of salt, they do give some indication of time needed to accumulate money for major projects.

Costs	CY	Not Contaminated	Contaminated	Island	Hydrorake
Whole West End	76,701	\$2,188,000 73/34 yr \$29/CY	\$3,822,000 132/63 yr \$50/CY	\$1,364,000 44/24 \$18/CY	
Cabin Area	16,000	\$564,000 15/6 yr \$35/CY	\$901,000 27/12 yr \$56/CY	\$394,000 9/4 yr \$26/CY	6,000 CY \$225,000 3/1yr \$35-51/CY
< 2 feet water depth	18,000	\$1,321,000 42/23 yr \$73?CY	\$1,701,000 56/31 yr \$94/CY	\$1,100,00 34/18yr \$61/CY	40% is too shallow

The graphic below is based on the PH Dredge Feasibility study. It shows the areas hydroraked (white), the cabin shore area (red) and the areas with less than 2 feet of water depth.

