

Dredging Cost Estimate

An estimate of probable costs to dredge 11,000 cubic yards of sediment from Lake Columbia is presented in Table 2. In formulating this estimate, it was assumed that a dredge material disposal site can be found in close proximity to the lake and that special disposal restrictions will not be required. If this is the case, the estimated cost per cubic yard of dredged material would range from \$12 to \$18. Engineering, permit acquisition, and construction oversight are estimated at approximately 15 percent of dredging costs. Contingency funds allow for any unforeseen costs and are estimated at 10 percent of project costs.

If a suitable disposal site cannot be secured in close proximity to the proposed dredge area, costs related to trucking of dredge spoils, or the use of a booster pump and additional pipe to get to the disposal site could increase dredge costs dramatically.

As an alternative to hydraulic dredging, the possibility of conducting a drawdown of Lake Columbia to facilitate dredging was also evaluated. However, it does not appear that the gate on the dam spillway is operational (SME Consultants, 2000). Therefore, it would not allow the level of Lake Columbia to be lowered. In addition, a drawdown could pose significant fishery and recreational use impacts which could complicate MDEQ permit acquisition. Given the likelihood of regulatory and operational hurdles, this option was not evaluated further.

Table 2
Lake Columbia Dredging Project
Estimate of Probable Cost

Work Element	Estimate of Probable Costs
Dredge 11,000 Cubic Yards	\$132,000 - \$198,000
Engineering, Permit Acquisition, Construction Oversight (15%)	\$19,800 - \$29,700
Contingency (10%)	\$13,200 - \$19,800
TOTAL	\$165,000 - \$247,500

GOOSE CREEK SEDIMENTATION SURVEY

A field survey of Goose Creek was conducted by staff from Progressive on August 14, 2007 to identify possible sources of sediment input to Lake Columbia (Figure 7). The survey started at the confluence area immediately north of Cement City Road and continued upstream to just above the old railroad crossing (Appendix C and Figure 8). At this point, Goose Creek traverses a large wetland. In addition, there are several lakes upstream of these wetlands that likely prevent the downstream migration of significant quantities of sediment (Figure 8). In general, this stretch of Goose Creek was in good condition and contained natural meanders, and



Figure 7. Goose Creek stream survey



1 inch equals 3,000 feet

LAKE COLUMBIA
GOOSE CREEK DRAINAGE AREA MAP
JACKSON COUNTY, MICHIGAN

Progressive
1811 4 Mile Road, NE
Grand Rapids, Michigan 49525-2442
V: 616/361-2664 F: 616/361-1493
www.progressiveaeo.com

Figure 8: Goose Creek Drainage Area

riffle and pool areas (Figure 9).

The only location at which sedimentation of the stream bed was evident was in the vicinity of Cement City Road. The source of sediment is most likely a combination of road drainage from Cement City Road, drainage from unpaved side roads and driveways that drain towards Cement City Road, and possibly sedimentation from recent construction activities in the area.

In light of these observations, the construction of a sand trap in the stream channel downstream of Cement City Road might be the best location to catch sediment before it enters Lake Columbia. If a sediment trap were properly constructed and maintained, the need for periodic maintenance dredging in Lake Columbia could be reduced.



Figure 9. Goose Creek - typical riffle area.

As with a dredging project, an MDEQ permit to construct a sand trap would be required. Constructing a sand trap with a long, narrow configuration would help maximize settling efficiency. A sand trap 100 feet long and 15 feet wide excavated to a depth of 2 feet would hold about 100 cubic yards of sediment.