

APPENDIX 4

SARNIA WATERFRONT SHORELINE REVIEW City of Sarnia



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1.0 INTRODUCTION

Shoreplan Engineering Limited was retained by the City of Sarnia to provide descriptions, and construction estimates for various shoreline improvements along Sarnia's waterfront from Seaway Road south to the concrete plant on the former CNR Lands. As part of the assignment, a review of the shoreline protection over the past 15 years was to be considered. On November 16, 2004, Shoreplan Engineering Limited personnel undertook a visual inspection of the shoreline.

Shoreline protection works must function at a full range of water levels experienced at the site. A summary of the water levels is provided below. The water level along the St. Clair River drops from the outlet of Lake Huron to the inlet of Lake St. Clair 1.6 m. Therefore, two sets of water levels (i.e., design high water level (DHWL), water level for fish habitat, and water level at time of site visit) were used at our study site. All water levels referred to in this report are with respect to International Great Lakes Datum (IGLD) 1985. At the north end of the study site reaches 1 to 7, the design high water level was found to be 177.7 m, and the fish habitat water level was found to be 176.7 m. At the time of the site visit (November 16, 2004), the water level was 175.8 m. At the south end of the site reaches 8 to 12, the design high water level was found to be 177.6 m, the fish habitat water level was 176.6 m, and the water level at the time of the site visit was 175.7 m. The design high water level is the 100-year peak instantaneous water level based on recorded levels and does not include wind setup. Fish habitat water levels are based on the highest monthly mean water level at 80th percentile on Lake Huron (176.96 m) adjusted to the account for the drop in water level along the St. Clair River at MNR water level sectors SCR 3 and SCR 4. The approximate boundary of the two water level sectors is at reach 8c, see Figure 1.

2.0 SITE REVIEW AND RECOMMENDATIONS

For the purpose of this report, the shoreline was divided into 12 reaches starting at the north end of the site near Seaway Road (at the south shore of Sarnia Harbour) proceeding south to the former CNR Lands. Figure 1 shows the location of the reaches. Areas were identified within these reaches where the shoreline protection could be improved. A description of each reach and the proposed improvements are described below.

A cost estimate of the proposed improvements is also provided. Each estimate is based on the concept cross section included in this report. The cross sections are taken from the existing site surveys and/or based on photos taken during the site visit and are approximate only. Final design of any of the proposed structures would require a detailed topographic survey and a diving survey of the site. Table 1 shows a summary of the shoreline improvements and cost estimate by reach. The cost included in the estimates are those associated with the shoreline improvements only. No allowances are included for backshore improvements. A design and construction contingency allowance have been included in the estimates.

A number of possible improvements along the shore have been discussed with the staff of the City of Sarnia. These include a boardwalk along the marina breakwater, and along the west part of the basin and provisions of public access along the front of the Ferry Dock Hill Property. These are discussed in the report.

Photographs of each reach are provided in Appendix A. Only one or two photographs are provided for each reach. Additional photographs are available upon request.

Table 1 Summary of Proposed Shoreline Improvements

Reach	Description	Shoreline Improvement	Typical Section	Estimated Cost
1	Seaway Road	Rip rap revetment - 40 m	Figure 2, Section A	\$60,000
2	Sydney Smith	None		
3	Point Lands	Rip rap revetment - 160 m	Figure 2, Section B	\$175,000
4	Sarnia Bay Marina Breakwater	Boardwalk along breakwater - 240 m	Figure 3, Section C	\$160,000
5	West Shore Sarnia Bay Marina	Dredging 2.0 m below datum 1.8 m below datum 1.6 m below datum	Figure 1	\$535,000 \$310,000 \$140,000
6	North Shore Sarnia Bay Marina	None		
7	Public Docks and Beach	None		
8	McLean Centre to Ferry Dock Hill	None		
9	Ferry Dock Hill	Alternative 1 - concrete caisson and rip rap - 70 m	Figure 3, Section D	\$500,000
		Alternative 2 - existing structure with concrete cap and rip rap - 50 m	Figure 4, Section E	\$310,000
		Rip rap revetment - 70 m	Figure 4, Section F	\$130,000
10	Davis Street to Johnston Street	Rip rap revetment - 335 m	Figure 5, Section G	\$500,000
		Concrete cap on existing SSP wall		\$25,000
11	Johnston Street to Concrete Plant	Armour stone pier - 35 m	Figure 5, Section H	\$380,000
		Rip rap revetment - 155 m	Figure 6, Section I	\$360,000
		Rip rap revetment - 100 m	Figure 6, Section J	\$220,000
12	Concrete Plant	Rip rap revetment - 120 m	Figure 7, Section K	\$300,000
		Rip rap revetment - 125 m	Figure 7, Section L	\$325,000