

APPENDIX F
ECONOMIC ASSESSMENT
DREDGE MATERIAL MANAGEMENT PLAN
GREEN BAY HARBOR, WISCONSIN

APPENDIX F

Part I

Green Bay Harbor Economic Viability Analysis

Part II

Green Bay Harbor DMMP Economic Evaluation of Alternative Plans

APPENDIX F

Part I

Green Bay Harbor Economic Viability Analysis

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ATTACHMENT: Green Bay Harbor Map

I. INTRODUCTION

The Green Bay Harbor Dredge Material Management Plan (DMMP) looks at developing various Maintenance Plans that will allow dredging of the Harbor to continue for the next 20 years. These plans: identify the amount of channel sediments to be dredged over the 20 year time period of 2012 – 2031, identify how the dredged sediment will be disposed of and examine remaining CDF capacity and the need for more disposal space.

In order to rank these various plans and to evaluate whether maintenance of the Harbor should be continued, an economic evaluation of the viability of the harbor is needed. Part I of Appendix F documents the economic evaluation of the harbors viability. Data in this economic evaluation was obtained from Buffalo District in 2009 and was generated through a computer model, Great Lake Levels System Analysis of Navigation Depths (GL-SAND). Vessel operating costs utilized in the GL-SAND model were originally developed by MARAD in 2005, these costs were then further updated to 2008 dollars for the Great Lakes Navigation System (GLNS) Supplemental Reconnaissance Study. This report uses a 20-year evaluation period and a 4.375 percent annual interest rate. Results were updated to reflect the Fiscal Year 2010 Federal Discount rate of 4.375 percent.

Benefits attributable to continued maintenance of the Harbor are vessel transportation cost increases avoided. Continued maintenance of the Harbor allows vessels to move commodities through the harbor at a specific transportation cost. Discontinued maintenance of the harbor would result in channels shoaling in. This would cause vessels to need more trips to move the same amount of tonnage, thus increasing transportation costs. The increase in Transportation Cost Avoided is a proxy for the value of continuing to maintain the harbor.

This maximum expenditure that results from a benefit-cost ratio of one can be compared to various harbor improvement costs to determine the economic viability of these harbor maintenance plans. If the costs of the various harbor maintenance plans are less than the maximum expenditure the harbor can support, the plan has a benefit-cost ratio greater than one and is economically justified.

II. HARBOR TONNAGES

Total tonnages handled at Green Bay Harbor in 2006 were 2,618,000 short tons. The primary commodities were: coal (1,028,000), limestone (608,000), cement (416,000) and non-metallic minerals (380,000). These commodities' accounted for 93 percent of the tonnage moving through the Harbor in 2006. The commodities utilized in the model to develop net benefits associated with continued maintenance of the harbor are: Cement, Coal, Sodium Chloride, Limestone and Pig Iron. The vessels actually used to move these commodities were identified, as were the origins and routes of the vessels. The 2006 vessel movements are considered representative of vessel traffic patterns and tonnages that will take place at Green Bay Harbor over the 20 year period 2012 – 2031 since there are currently no plans for harbor expansion nor any expected contractions in harbor services. The project dimensions of 300' – 500' in width are not expected to be implemented during the 20 year planning period. It is expected that the harbor will be maintained at the 300' width in the segment that is authorized for 500' but this is not expected to impact the vessel or commodity mix. A summary of the tonnages for 2001 through 2006, by commodity, is provided in **Table F-I-1**.

Table F-I-1 - Green Bay Harbor Tonnages							
(2001-2006) thousands							
Commodity	Origin	Tons					
		2006	2005	2004	2003	2002	2001
Coal	OH, WI, IL	1,028	1,277	838	763	871	728
Petroleum and Petroleum Products		90	15	37	43	38	68
Chemicals and Related Products		5	27	20	22	24	24
Limestone	MI	608	653	681	623	532	533
Non-Metallic Minerals	OH, Canada	380	308	251	161	206	200
Other Crude Materials, Inedible Except Fuels		34	31	61	32	1	224
Cement and Concrete	MI, IL	416	364	439	395	371	361
Pig Iron	Canada	57	47	34	45	33	98
Other		0	7	0	0	2	4
Total, All Commodities		2,618	2,728	2,361	2,084	2,078	2,242

III. VESSEL TRANSPORTATION COSTS BY CHANNEL DEPTH

There were over 260 commercial vessel movements in 2006. U.S. vessels accounted for about 75 percent of these movements and foreign vessels (Canadian) the remaining 25 percent. Approximately 44 percent of the upbound vessel movements drafted 22 feet or greater with a high utilized draft of 27 feet (vessels will occasionally “plow through” shallower drafts.) This level of vessel activity and tonnage is expected to continue over the DMMP’s project evaluation period of 2012 – 2031.

The vessels actually used to move the four key commodities (coal, limestone, cement and non-metallic minerals) were identified, as well as the origins of the vessels. These vessel movements and corresponding tonnages were used to develop vessel transportation costs associated with dredging Green Bay Harbor to various depths. A summary of the significant characteristics of the vessels utilizing Green Bay Harbor is presented in Table F-I-2 indicating that the greatest, fully loaded, mid-summer design draft is 31’ for a vessel carrying limestone with a coal carrier mid-summer design draft requiring nearly as much at 30’8”. These vessels do not load to capacity in Green Bay Harbor. The average mid-summer drafts, varying from 25’8” for cement carriers to 28’3” for limestone carriers, meets or exceeds the project depth of 26’/24’. Thus, even at full authorized depth, vessels light-load and occasionally push through shoaled areas. Further, the width of Green Bay Harbor channel, currently at 100’, does not allow for two way traffic of vessels with beams near 70’ on average. Authorized width of the harbor varies from 300’ to 500’ with a recommended width of 300’ throughout.

Table F-I-2 Primary Vessel Characteristics				
		LOA (ft) (length over all)	BEAM (ft)	Mid- Summer Draft (ft)
Cement	low	447	50	22
	high	519.5	70	27.5
	average	482	63.8	25.6
Coal	low	579.2	60	22.3
	high	768.3	78	30.6
	average	685.6	70.0	27.5
Non-metallic Minerals	low	605	60	22.3
	high	710	75	27.7
	average	658	68	25
Limestone	low	630.0	68	26
	high	768.3	78	31
	average	693	71.5	28.3

A computer model developed by Buffalo District calculated increases in vessel transportation costs for each vessel movement given reductions in channel depth. The analysis is done in one foot increments for a maximum decrease in channel depth of 10 feet at which point it is assumed all vessel traffic would cease and commodities would move via alternative methods. In this case, there is not an acceptable alternative port and commodities would move on land routes. Thus, the analysis evaluated vessel transportation costs associated with existing authorized maintained depths of 26/24 feet in the Outer Harbor and Inner Harbor as well as channels with up to 10 feet less of water column in one foot increments.

Shoaling of channels requires shippers to load their vessels with fewer commodities or use smaller ships thereby increasing transportation costs for movement of that commodity. Based on October 2009 (FY10) dollars, transportation cost increases associated with reductions in channel depth from one to six feet were calculated for each of the 4 commodities. Annual transportation costs, by commodity, by channel depth are provided in **Table F-I-3**.

Table F-I-3 - Green Bay Harbor - Vessel Transportation Costs, by Commodity, by Channel Depth (FY 2010 Dollars)						
Depth Change	0	0	-1	-2	-3	-4
Commodity	Starting Channel Depth	Maintained Channel Depth 26/24	Maintained Channel Depth 25/23	Maintained Channel Depth 24/22	Maintained Channel Depth 23/21	Maintained Channel Depth 22/20
Cement and Concrete	26/24	\$4,575,166	\$4,779,663	\$5,033,691	\$5,357,847	\$5,775,872
Coal	26/24	\$48,252,556	\$48,346,466	\$48,561,519	\$48,939,952	\$49,510,579
Sodium Chloride	26/24	\$3,438,752	\$3,496,159	\$3,576,670	\$3,711,747	\$3,908,603
Limestone	26/24	\$5,035,636	\$5,114,744	\$5,232,917	\$5,362,027	\$5,526,896
Pig Iron	26/24	\$1,839,848	\$1,845,391	\$1,863,219	\$1,908,397	\$1,973,378
TOTAL		\$63,141,958	\$63,582,423	\$64,268,016	\$65,279,970	\$66,695,328
Depth Change	-5	-6	-7	-8	-9	-10
Commodity	Maintained Channel Depth 21/19	Maintained Channel Depth 20/18	Maintained Channel Depth 19/17	Maintained Channel Depth 18/16	Maintained Channel Depth 17/15	Maintained Channel Depth 16/14
Cement and Concrete	\$6,352,527	\$7,148,349	\$8,290,830	\$9,390,949	\$10,392,461	\$10,962,775
Coal	\$50,284,053	\$51,267,239	\$52,483,883	\$54,018,468	\$60,325,011	\$65,945,575
Sodium Chloride	\$4,172,882	\$4,504,354	\$4,919,227	\$5,451,851	\$6,313,079	\$7,077,009
Limestone	\$5,725,075	\$5,954,315	\$6,227,979	\$6,558,814	\$7,136,425	\$7,791,112
Pig Iron	\$2,045,072	\$2,100,636	\$2,129,356	\$2,141,150	\$2,144,414	\$2,144,414
TOTAL	\$68,579,609	\$70,974,893	\$74,051,275	\$77,561,232	\$86,311,390	\$93,920,885

Vessel transportation costs ranged from \$63,141,958 for providing channels with 26/24 feet of water column, to \$93,920,885 for providing channels with 16/14 feet of water column.

IV. AVERAGE ANNUAL HARBOR BENEFITS

Benefits for this evaluation are the transportation cost increases avoided, by continuing to maintain the channels at the harbor. The difference in vessel transportation costs associated with maintaining current harbor depths (With-Project Condition) and vessel transportation costs associated with discontinuing harbor dredging (Without-Project Condition), over a 20-year period, are the benefits associated with continuing to maintain the harbor.

A. With Project Condition Average Annual Vessel Transportation Costs. **Table F-I-3** provides the annual transportation costs associated with various maintained channel depths. The average annual transportation costs associated with continued maintenance of the harbors authorized 26/24 foot channels is presented in the column labeled “Maintained Channel Depth 26/24”. These average annual transportation costs amount to \$63,141,958. These are With-Project Condition Average Annual Vessel Transportation Costs.

B. Without Project Condition Average Annual Vessel Transportation Costs. If dredging at Green Bay Harbor was to cease due to lack of a suitable dredge material management plan, the channels would gradually fill in and additional transportation costs would be incurred as estimated in **Table F-I-3**.

Transportation costs associated with not maintaining the harbor is the transportation cost time stream that develops due to discontinued dredging and the harbors annual shoaling rate. If Green Bay harbor dredging were to cease, the federal navigation channel would fill in rather quickly with sediment. The infilling would take only a few years in certain areas, particularly those in that intersect zones of high sediment transport. Conversely, there might be some parts of the channel that would take considerably longer to completely fill. Regardless of these areas of low deposition, the channel would be unusable once any part of it fills in, which, based on a 3 foot per year shoaling rate, is likely to take only a few years. The equilibrium depth of the harbor would vary along the 11 miles of federal channel in Green Bay since the depth of the bay varies. Assuming no dredging, depth would approach that of the bay on either side of the present channel with a limiting depth of 5 feet. Thus, the equilibrium limiting depth of the channel is assumed to be 5 feet. A transportation cost time stream was developed for a 20-year evaluation period based on the shoaling rate and the annual transportation costs by maintained channel depth provided in **Table F-I-3**. **Table F-I-4** provides a summary of the transportation cost time streams given the shoaling rate and assuming a 20-year project life.

Table F-I-4 - Green Bay Harbor Without Project Condition Transportation Cost Time Stream
Shoaling Rate = 3.0 feet/year

(FY 2010 Dollars)

Project Year	Channel Depth	Cement & Concrete	Coal	Sodium Chloride	Limestone	Pig Iron
1	26.0/24.0	\$4,575,166	\$48,252,556	\$3,438,752	\$5,035,636	\$1,839,848
2	23.0/21.0	\$5,357,847	\$48,939,952	\$3,711,747	\$5,362,027	\$1,908,397
3	20.0/18.0	\$7,148,349	\$51,267,239	\$4,504,354	\$5,954,315	\$2,100,636
4	17.0/15.0	\$10,392,461	\$60,325,011	\$6,313,079	\$7,136,425	\$2,144,414
5	14.0/12.0*	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
6	11.0/9.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
7	8.0/6.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
8	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
9	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
10	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
11	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
12	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
13	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
14	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
15	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
16	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
17	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
18	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
19	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414
20	5.0/5.0	\$10,962,775	\$65,945,575	\$7,077,009	\$7,791,112	\$2,144,414

* Modeling efforts including calculations to a 10 foot decrease in available draft. This report assumes average annual vessel transportation costs remain constant after that level of available draft (16.0/14.0).

Calculation of the Without-Project Condition (WOP) vessel transportation costs for the five key commodities are provided in **Table F-I-5**. The time stream transportation costs presented in **Table F-I-4** are adjusted utilizing the current interest rate of 4.375 percent and a project life of 20 years to determine present worth.

Average annual without project conditions vessel transportation costs are summarized in **Table F-I-6** by commodity. The total average annual transportation costs associated with not maintaining the harbor over a 20 year evaluation period are then \$87,656,900.

**Table F-I-5 - Computation of the Without-Project Condition Average Annual Vessel Transportation Costs
Average Annual Transportation Cost Time Streams, Shoaling Rate = 3.0 feet/year to an equilibrium depth of 5.0 feet
(FY 2010 Dollars)**

Project Year	Channel Depth	Present Worth Factor	Cement & Concrete	Coal	Sodium Chloride	Limestone	Pig Iron
			Present Worth				
1	26.0/24.0	0.958083832	\$4,383,393	\$46,229,994	\$3,294,613	\$4,824,561	\$1,762,729
2	23.0/21.0	0.91792463	\$4,918,100	\$44,923,187	\$3,407,104	\$4,921,937	\$1,751,765
3	20.0/18.0	0.879448747	\$6,286,607	\$45,086,909	\$3,961,348	\$5,236,515	\$1,847,402
4	17.0/15.0	0.842585626	\$8,756,538	\$50,828,987	\$5,319,310	\$6,013,049	\$1,806,852
5	14.0/12.0*	0.807267666	\$8,849,894	\$53,235,730	\$5,713,041	\$6,289,513	\$1,731,116
6	11.0/9.0	0.773430099	\$8,478,940	\$51,004,293	\$5,473,572	\$6,025,881	\$1,658,554
7	8.0/6.0	0.741010873	\$8,123,535	\$48,866,388	\$5,244,141	\$5,773,299	\$1,589,034
8	5.0/5.0	0.709950537	\$7,783,028	\$46,818,096	\$5,024,326	\$5,531,304	\$1,522,428
9	5.0/5.0	0.680192131	\$7,456,793	\$44,855,661	\$4,813,726	\$5,299,453	\$1,458,614
10	5.0/5.0	0.651681084	\$7,144,233	\$42,975,484	\$4,611,953	\$5,077,320	\$1,397,474
11	5.0/5.0	0.62436511	\$6,844,774	\$41,174,116	\$4,418,638	\$4,864,499	\$1,338,897
12	5.0/5.0	0.598194118	\$6,557,868	\$39,448,255	\$4,233,425	\$4,660,597	\$1,282,776
13	5.0/5.0	0.573120113	\$6,282,987	\$37,794,735	\$4,055,976	\$4,465,243	\$1,229,007
14	5.0/5.0	0.549097114	\$6,019,628	\$36,210,525	\$3,885,965	\$4,278,077	\$1,177,492
15	5.0/5.0	0.526081067	\$5,767,308	\$34,692,718	\$3,723,080	\$4,098,757	\$1,128,136
16	5.0/5.0	0.504029765	\$5,525,565	\$33,238,533	\$3,567,023	\$3,926,952	\$1,080,848
17	5.0/5.0	0.482902769	\$5,293,954	\$31,845,301	\$3,417,507	\$3,762,350	\$1,035,543
18	5.0/5.0	0.462661336	\$5,072,052	\$30,510,468	\$3,274,258	\$3,604,646	\$992,137
19	5.0/5.0	0.443268345	\$4,859,451	\$29,231,586	\$3,137,014	\$3,453,553	\$950,551
20	5.0/5.0	0.424688235	\$4,655,762	\$28,006,310	\$3,005,522	\$3,308,794	\$910,707
Total			\$129,060,410	\$816,977,277	\$83,581,543	\$95,416,299	\$27,652,062
Partial Payment Factor			0.07605	0.07605	0.07605	0.07605	0.07605
Average Annual Equivalent Value			\$9,814,492	\$62,127,629	\$6,356,019	\$7,256,002	\$2,102,821
Rounded			\$9,814,500	\$62,127,600	\$6,356,000	\$7,256,000	\$2,102,800
TOTAL Average Annual Equivalent Value							\$87,656,900

* Modeling efforts including calculations to a 10 foot decrease in available draft. This report assumes average annual vessel transportation costs remain constant after that level of available draft (16.0/14.0).

Table F-I-6 - Summary - Green Bay Harbor Without Project Condition Average Annual Vessel Transportation Costs	
(FY 2010 Dollars)	
Commodity	Average Annual Vessel Transportation Costs
Cement and Concrete	\$9,814,500
Coal	\$62,127,600
Sodium Chloride	\$6,356,000
Limestone	\$7,256,000
Pig Iron	\$2,102,800
WOP Average Annual Transportation Costs	\$87,656,900

C. Average Annual Harbor Transportation Benefits. Average annual Harbor transportation cost savings associated with continuing to maintain harbor channel depths is the difference in average annual transportation costs between the WOP condition and providing currently maintained depths of 26/24 feet (\$63,141,958). Average annual harbor transportation cost savings associated with maintaining a 26/24 foot channel depth are \$24,514,942 (as summarized in **Table F-I-7**).

Table F-I-7 - Green Bay Harbor Average Annual Harbor Transportation Cost Savings Associated with Maintaining a 26/24 foot Project Depth Transportation Costs			
(FY 2010 Prices)			
Commodity	Without Project Condition Average Annual Equivalent Transportation Costs	With Project Condition Average Annual Equivalent Transportation Costs	Average Annual Equivalent Transportation Benefits
Cement and Concrete	\$9,814,500	\$4,575,166	\$5,239,334
Coal	\$62,127,600	\$48,252,556	\$13,875,044
Sodium Chloride	\$6,356,000	\$3,438,752	\$2,917,248
Limestone	\$7,256,000	\$5,035,636	\$2,220,364
Pig Iron	\$2,102,800	\$1,839,848	\$262,952
TOTALS	\$87,656,900	\$63,141,958	\$24,514,942

V. NET HARBOR BENEFITS

Average annual harbor dredging costs were subtracted from total harbor transportation benefits to arrive at net harbor benefits. Average annual harbor dredging costs were based on the actual dredging costs for the years 1997 – 2008 as presented in **Table F-I-8**.

Table F-I-8 – Dredge Costs, Quantities and Locations, 1997 – 2008 2010 dollars					
FY	Total Cost	Cubic Yards	Cost/CY	Dredge Area	Survey Page(s)
2008	\$3,599,150	228,000	\$15.79	OUTER HARBOR 225+50B-351+00B (189,366CY)	5, 6, 7
				EAST SIDE OF CHANNEL 50' OFFSET & MOUTH 0+00-65+00B (38634CY) EAST SIDE OF CHANNEL	10
2007	\$2,343,191	124,000	\$19.23	182+00-277+00 (65015CY)	16, 17, 18
				0+00-62+00 (49000CY)	11, 12
				245+00-249+00 (9985CY)	17
2006	\$2,121,622	87,188	\$23.63	CRITICAL SHOALS	NOT AVAILABLE
				(AREA 1) 0+00-50+00 BAY	10
				(AREA 2) 160+00B- 180+00B WEST HALF	8
				(AREA 3 OPTION) 145+00-175+00 RIVER	15
				(AREA 1 DREDGED)	
2005	\$1,769,824	89,981	\$19.67	CRITICAL SHOALS	NOT AVAILABLE
2003	\$2,230,133	115,098	\$19.38	AREA 1 - 124+00-137+00;	14
				AREA 2 - 0+00-17+00;	11
				RIVER AREA 3 - 50+00-65+00;	12
				OPTION AREA 4 - 210-240 S SIDE OF CHANNEL 30' OFFSET	16, 17
2002	\$2,224,470	113,934	\$19.53	FT HOWARD TURNING BASIN - 142+00	14, 15, 16
				(81128CY FROM OUTER HARBOR),	
				(32806CY FROM GEORGIA PACIFIC TURNING BASIN),	15, 16
				(1396CY FROM FOX RIVER)	

Table F-I-8 - Dredge Quantities and Locations, 1997 – 2008, continued					
2001	\$3,195,669	160,683	\$19.87	0+00-50+00B,	10
				EAST RIVER TB,	12
				FORT HOWARD TB	16
2000	\$1,684,313	133,075	\$12.66	210+00B-190+00B;	7
				160+00B-140+00B;	8, 9
				188+00-142+00	14, 15, 16
1999	\$1,318,375	102,284	\$12.89	80+00B-140+00B	9
				EAST SIDE ONLY .5' O.D.	
1998	\$2,619,993	233,661	\$11.21	0+00B-70+00B	10
				50'TD TO 24' DEPTH AND TURNING BASIN	
1997	\$1,942,843	167,612	\$11.59	70+00-145+00 N.SIDE;	13, 14
				142+00-172+00 RIVER (RIVER 53, 174CY)	14, 15
("B" or "BAY" INDICATE OUTER HARBOR - OTHERWISE, INNER)					
Average Annual Dredging Costs per CY					\$16.18

Quantities dredged in the past were limited by funds and by the prohibitive cost per cubic yard. The expected annual quantity per year is 215,300 CY as presented in the main report. This quantity, along with the average cost per cubic yard of \$16.18 were utilized to develop a 20 year time stream and were converted to average annual costs using a 4.375 percent annual interest rate. **Table F-I-9** presents the average annual dredging costs based on current dredging and disposal costs. Average annual dredging costs are thus \$3,483,554.

Average annual harbor dredging costs of \$3,483,600 (**Table F-I-9**) were subtracted from total average annual harbor benefits \$24,514,942 (**Table F-I-7**) resulting in net average annual harbor benefits of \$21,031,300 (**Table F-I-10**).

Table F-I-9 - Average Annual Green Bay Harbor Dredging Costs	
2010 dollars	
A. Yearly Dredging Costs	
	Without Project Dredging Costs Per Year 2012-2031
Cubic Yards Removed Annually	215,300
Total Cost per CY	\$16.18
Total Annual Dredging Costs	\$3,483,554
B. Average Annual Dredging Costs	
26/24 foot project depth	
PW of Dredging over 20 years	\$45,808,677
Amortization factor/Partial Payment Factor at 4.375%	0.076045725
Average Annual Dredging Cost Per Year	\$3,483,554

VI. SUPPORTABLE IMPROVEMENT PROJECTS

The net benefits can be converted to equivalent first costs which represent the level of new disposal options investments Green Bay Harbor can support. Coverable total costs represent the maximum cost possible to achieve a benefit-cost ratio of 1.0. This process is presented in **Table F-I-10**. Green Bay Harbor can support new CDF investment of approximately \$276.5 million.

Table F-I-10 - Green Bay Harbor - Level of Supportable CDF Project Costs						
2010 dollars						
Plan Depth	Shoaling Rate per Year	Average Annual Harbor Benefits	Total Average Annual Dredging Costs	Net Average Annual Benefits	Present Worth of \$1/period	Coverable Total Costs
26/24	3.0 feet	\$24,514,900	\$3,483,600	\$21,031,300	13.14998320	\$276,561,200