

BASIS FOR OPINION OF PROBABLE COST

GRAEF was asked by the Waterford Waterway Management Commission to prepare an opinion of probable costs for the ecosystem restoration project based on the project scenario under preliminary development in June and presented in the June 28th public meeting. It is important to note that this scenario was preliminary. As previously noted, several assumptions were used to prepare the estimate, including the following:

- Land use agreements can be negotiated with the property owners for the dewatering sites;
- Sufficient capacity is available for dewatering and soil conditions at the proposed dewatering sites are suitable for construction of dewatering cells;
- Dewatered sediment can be marketed and distributed to local contractors, local sand and gravel facilities, and local government;
- The volume of dredged sediment (as measured in place) was 480,000 cubic yards; and
- The project scenario can be permitted by the Wisconsin Department of Natural Resources (WDNR) and the Army Corps of Engineers (Army Corps).

It is important to note that these cost opinions were based on the preliminary scenario and assumptions available at the time. Since the opinion was prepared, Site A1, the Conservancy Bay Peninsula extension, which was considered the most economical alternative, has been removed from further consideration due to the proposed regulatory restrictions, and Site A2, the Conservancy Bay Upland, will be of limited use based on site constraints due to wetlands, forested areas, soils, and topography. Evaluations are ongoing with the remaining dewatering/management sites (B-1, B-2, and the private site), and new sites are also undergoing evaluation.

It is also important to note that a true cost for this project, especially a project of this nature that will require coordination of multiple parties, cannot be obtained until contractors can examine the entire project in detail and provide a cost proposal with commitments from the various subcontractors and parties involved in completing the project. GRAEF cannot and does not guarantee that the proposals bids or actual project costs will not vary from the opinions of probable construction costs prepared by GRAEF.

Going forward, the strategy is to develop a permitting framework with the WDNR and Army Corps that will allow sufficient flexibility for contractors to develop the most economical means and methods for accomplishing the objectives of the restoration project

The estimate of probable costs was generally developed using average unit costs for similar work. Examples of some of these costs include the following:

- A temporary wooden barrier to contain the pumped sediment was included in the estimate for the island/peninsula extension at site A1. The costs for this barrier were based on the unit length installation costs for a similar barrier that was permitted and installed at another Wisconsin lake.
- Dredging costs were based on ranges from dredging contractors working in the Midwest.
- Transportation costs for the dewatered soils were based on contractor unit rates for the distances to the proposed final management sites.
- Dewatering pond preliminary sizes were based on pond sizes used at the Fox Waterway in Illinois, where similar sediment is hydraulically dredged, and per cubic yard unit rates for construction based on a schematic pond design and availability of adequate clay on site.
- Historical unit costs for seeding and related activities were used for site restoration.

Finally, the Opinion of Probable cost was then taken as a middle value within a \$2 million range to help convey the uncertainty in cost at this stage of the project.

Opinion of Probable Construction Cost - Summary

Project: **Waterford Ecosystem Restoration**
 Owner : **WWMD**

Location: **Waterford, Wisconsin**

Preliminary - Subject to Change

Item Description	Division Number	Qty	Unit	Total
Construction Services	31	1	LS	\$7,886,596
Mobilization and Misc. @ 2% of Construction Services Cost		1	LS	\$157,732
WDNR Permits and Fees		1	Allow	\$5,000
Consulting Services During Construction	N/A	1	LS	\$166,209
Sub Total				\$8,215,536
Contingency 15%				\$1,232,330
Project Total				\$9,447,867
Total Cubic Yards				480,000

The Project Total was rounded to \$9.4 million and was then taken as the middle value within a \$2 million range to help convey the uncertainty in cost at this stage of the project, yielding a range of \$8.4 to \$10.4 million.

Since GRAEF has no control over the cost of labor, materials, equipment or services furnished by others, the contractors means of determining prices or over the competitive bidding or market conditions; GRAEF's opinions of probable construction cost are made on the basis of GRAEF's experience and qualifications and represent GRAEF's best judgement as an experienced professional familiar with the construction industry; but GRAEF cannot and does not guarantee that the proposals bids, or actual project costs will not vary from the opinions of probable construction costs prepared by GRAEF.

Project: Waterford Ecosystem Restoration

Location: Waterford, Wisconsin

Owner : WWMD

A-1 Conservancy Bay Peninsula Wetland

Cost per Cubic Yard

\$12.40

No Longer an Option

Item No.	Description	CSI Number	Qty	Unit	Unit Price	City Adj Factor	Total
1	Dredging (1 Mile or Less)		65000	CY	\$8.00	1.032	\$536,640.00
2	Natural Barrier		2700	LF	\$25.00	1.032	\$69,660.00
3	Sediment Curtain		2,700	LF	\$14.00	1.032	\$39,009.60
4							\$0.00
5							\$0.00
6							\$0.00
7	Shallow Marsh Seed Mix		750,000	SF	\$0.15	1.032	\$116,100.00
8	Misc. Restoration		65,000	CY	\$0.20	1.032	\$13,416.00
9							\$0.00
10	Misc. Contractor Expenses		1	LS	\$30,000.00	1.032	\$30,960.00
11							\$0.00
12							\$0.00
	Division 13 - Special Construction				Subtotal		\$805,785.60

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Location: **Waterford, Wisconsin**

A-2 **Conservancy Bay Upland** Cost per Cubic Yard **\$12.02**
Limited Option

Item No.	Description	CSI Number	Qty	Unit	Unit Price	City Adj Factor	Total
1	Dredging (1 Mile or Less)		35000	CY	\$8.00	1.032	\$288,960.00
2	Dewatering Cell Construction		35000	CY	\$1.80	1.032	\$65,016.00
3							\$0.00
4							\$0.00
5							\$0.00
6							\$0.00
7	Prairie Seed Mix		250,000	SF	\$0.15	1.032	\$38,700.00
8	Misc. Restoration		35,000	CY	\$0.20	1.032	\$7,224.00
9							\$0.00
10	Misc. Contractor Expenses		1	LS	\$20,000.00	1.032	\$20,640.00
11							\$0.00
12							\$0.00
Division 13 - Special Construction					Subtotal		\$420,540.00

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Location: **Waterford, Wisconsin**

B-1 **West of Marsh Road**

Cost per Cubic Yard **\$19.21**

Under Evaluation

Item No.	Description	CSI Number	Qty	Unit	Unit Price	City Adj Factor	Total
1	Dredging (2.0+ Mile Ave.)		180000	CY	\$11.00	1.032	\$2,043,360.00
2	Dewatering Cell Construction		120000	CY	\$2.00	1.032	\$247,680.00
3							\$0.00
4	Site Management, Monitoring, and Control		180,000	CY	\$1.00	1.032	\$185,760.00
5	Soil Management Allowance		180,000	CY	\$5.00	1.032	\$928,800.00
6							\$0.00
7	Prairie Seed Mix		250,000	SF	\$0.15	1.032	\$38,700.00
8	Misc. Restoration		35000	CY	\$0.25	1.032	\$9,030.00
9							\$0.00
10	Misc. Contractor Overhead		1	LS	\$5,000.00	1.032	\$5,160.00
11							\$0.00
12							\$0.00
	Division 13 - Special Construction				Subtotal		\$3,458,490.00

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Project: **Waterford Ecosystem Restoration**
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Location: **Waterford, Wisconsin**

B-2 East of Marsh Road Cost per Cubic Yard \$18.01
Under Evaluation

Item No.	Description	CSI Number	Qty	Unit	Unit Price	City Adj Factor	Total
1	Dredging (2.0 Mile Ave.)		150000	CY	\$10.00	1.032	\$1,548,000.00
2	Dewatering Cell Construction		100000	CY	\$2.00	1.032	\$206,400.00
3							\$0.00
4	Site Management, Monitoring, and Control		150,000	CY	\$1.00	1.032	\$154,800.00
5	Soil Management Allowance		150,000	CY	\$5.00	1.032	\$774,000.00
6							\$0.00
7	Prairie Seed Mix		0	SF	\$0.15	1.032	\$0.00
8	Misc. Restoration		50000	CY	\$0.25	1.032	\$12,900.00
9							\$0.00
10	Misc. Contractor Overhead		1	LS	\$5,000.00	1.032	\$5,160.00
11							\$0.00
12							\$0.00
Division 13 - Special Construction					Subtotal		\$2,701,260.00

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Location: **Waterford, Wisconsin**

C Private Site Cost per Cubic Yard \$10.01
Under Evaluation

Item No.	Description	CSI Number	Qty	Unit	Unit Price	City Adj Factor	Total
1	Dredging (1 Mile Ave.)		50000	CY	\$8.00	1.032	\$412,800.00
2	Dewatering Cell Construction		50000	CY	\$0.25	1.032	\$12,900.00
3							\$0.00
4	Site Management, Monitoring, and Control		50,000	CY	\$0.50	1.032	\$25,800.00
5	Soil Management on Site		50,000	CY	\$0.25	1.032	\$12,900.00
6						1.032	\$0.00
7	Prairie Seed Mix		100,000	SF	\$0.15	1.032	\$15,480.00
8	Misc. Restoration		50000	CY	\$0.30	1.032	\$15,480.00
9							\$0.00
10	Misc. Contractor Overhead		1	LS	\$5,000.00	1.032	\$5,160.00
11							\$0.00
12							\$0.00
Division 13 - Special Construction					Subtotal		\$500,520.00

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Consultng Services

Item No.	Description	CSI Number	Qty	Unit	Unit Price	City Adj Factor	Total
1	Weekly Dredge Log Review and Report						\$0.00
	26 wks/yr x 3 yrs x 4hrs/wk		312	hr	\$125.00	1.032	\$40,248.00
2	Verification Surveys - Monthly						\$0.00
	18 x 12 hrs ea. For two man team		216	HR	\$160.00	1.032	\$35,665.92
	Equipment		18	EA	\$300.00	1.032	\$5,572.80
3	Monthly Visit and WDNR Report						\$0.00
	18 x 8 hrs per Visit and report		144	HR	\$135.00	1.032	\$20,062.08
4	PM and Communications						\$0.00
	3.5 hrs per wk x 78 wks.		273	HR	\$135.00	1.032	\$38,034.36
5	Misc Closeout and WDNR Meetings		80	HR	\$135.00	1.032	\$11,145.60
6	Post Construcion Monitoring-WDNR Sites and Private (3 Years)		3	yr	\$5,000.00	1.032	\$15,480.00
							\$0.00
	Division 03 - Concrete				Subtotal		\$166,208.76