

**SITE PLAN FOR THE
HURRICANE ISLAND REACH**

**DREDGED MATERIAL MANAGEMENT PLAN
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**POOL 11
DUBUQUE COUNTY, IA AND GRANT COUNTY, WI
UPPER MISSISSIPPI RIVER, RIVER MILES 591-608**

FINAL

APPENDIX F

COST ESTIMATES OF ALTERNATIVES

Appendix F
Cost Estimates of Alternatives

594.1 Bathtub Site

Bathtub Site					
Item	Quantity	UOM	Unit Cost	Amount (USD)	
Lands & Acquisition Costs					
Land Purchase-dredge material placement area	0	AC	\$10,000	\$ -	
Access easements	0	AC	\$10,000	\$ -	
Land & Acquisition Subtotal				\$ -	
Mussel Relocation					
Mussel Relocation per Event	0	LS	\$50,000	\$ -	
Mussel Relocation Subtotal				\$ -	
Construction Activities					
Site Construction	Mechanically Dredged Material for Berm Construction	10,383	CY	\$15.00	\$ 155,746.50
	Containment Berm Construction	10,383	CY	\$5.00	\$ 51,915.50
	Bathtub Excavation (mech)	7,000	CY	\$15.00	\$ 105,000.00
	Clay Cap (Local from Access Channel/Bathtub Ex)	2,000	CY	\$21.64	\$ 43,280.00
	Clay Cap (Forebay: Excavation, Hauling, Spreading)	3,700	CY	\$39.63	\$ 146,631.00
	Riprap	0	TN	\$70	\$ -
	Tree Planting	0.0	AC	\$9,000	\$ -
	Vegetation Seeding	2.5	AC	\$3,885	\$ 9,712.50
Construction Cost Subtotal				\$ 512,285.50	
Construction Support	Access Channel Construction (mech) (maximum)	15,000	CY	\$15.00	\$ 225,000.00
	Workpad/path Construction (mech dredging)	13,000	CY	\$15.00	\$ 195,000.00
	Workpad/path Construction (shaping)	13,000	CY	\$5.00	\$ 65,000.00
	Construction Support Cost Subtotal				\$ 485,000.00
Dredging Operations (not counted toward construction)	Mechanical Dredging Operations USACE	36,017	CY	\$15.00	\$ 540,253.50
	Hydraulic Dredging Operations USACE	157,983	CY	\$9.00	\$ 1,421,847.90
					\$ -
	Dredging Cost Subtotal				\$ 1,962,101.40
Bathtub Decommissioning					
	Site Re-shaping/Grading (removing berms, leveling)	16,083.1	CY	\$21.64	\$ 348,038.28
	Clay Cap (Forebay: Excavation, Hauling Spreading)	26,862	CY	\$39.63	\$ 1,064,541.06
	Tree Planting (Est of tree acres there already)	0.7	AC	\$9,000.00	\$ 6,300.00
	Vegetation Seeding	11.1	AC	\$3,885.00	\$ 43,123.50
	Decommissioning Subtotal				\$ 1,462,002.84
Subtotal (First Cost)				\$ 2,960,000.00	
Contingency			25%	\$ 740,000.00	
PED	Percentage of Construction Costs		10%	\$ 99,728.55	
Construction MGT	Percentage of Construction Costs		9%	\$ 89,755.70	
Total First Cost (Berm Construction & First Fill with contingency, PED, Con Mgt)				\$ 3,890,000.00	
Total Second Cost (Second Fill with contingency, PED & Con Mgt accounted for in first cost)				\$ 2,452,626.75	
Total Third Cost (Decommission with contingency, PED, Con MGT)				\$ 2,105,284.10	
Maintenance & Monitoring	Berm Maintenance	70	Days	\$5,500	\$ 385,000.00
	Geotechnical Analysis (every 5 yrs -> 40/5 = 8)	8	Events	\$6,000	\$ 48,000.00
Overall Cost				\$ 8,880,910.85	
	Volume	398,383	CY		
	Cost/CY				\$ 23.00

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Cost Estimates of Alternatives

Mitigation Plan

Mitigation Plan					
Item	Quantity	UOM	Unit Cost	Amount (USD)	
Lands & Acquisition Costs					
Land Purchase-dredge material placement area	0	AC	\$10,000	\$ -	
Access easements	0	AC	\$10,000	\$ -	
Land & Acquisition Subtotal				\$ -	
Mussel Relocation					
Mussel Relocation per Event	0	LS	\$50,000	\$ -	
Mussel Relocation Subtotal				\$ -	
Construction Activities					
Site Construction	Mechanical Dredging for Sand Flat Construction	48,000	CY	\$15.00	\$ 720,000.00
	Sand Flat Shaping	48,000	CY	\$5.00	\$ 240,000.00
	Clay Cap (Local from Access Channel/Bathtub Ex)	20,000	CY	\$21.64	\$ 432,800.00
	Clay Cap (Forebay: Excavation, Hauling, Spreading)	0	CY	\$39.63	\$ -
	Riprap	0	TN	\$70	\$ -
	Tree Planting	0	AC	\$9,000	\$ -
	Vegetation Seeding	11.80	AC	\$3,885	\$ 45,843.00
	Construction Cost Subtotal				\$ 1,438,643.00
Construction Support					
Maintain Ditches, ldr/bh, wh, 1 oper 2 hrs	0	EA	\$100	\$ -	
Mob and Demob for Ditch Clearing	0	EA	\$2,400	\$ -	
Construction Support Cost Subtotal				\$ -	
Dredging Operations (not counted toward construction)					
Contractor Mob and Demob	0	EA	\$500,000	\$ -	
Additional Booster Pump	0	EA	\$100,000	\$ -	
Return Water Pumping--Drainage Districts	0	CY	\$0.05	\$ -	
				\$ -	
Dredging Cost Subtotal				\$ -	
Subtotal				\$ 1,439,000.00	
Contingency			25%	\$ 359,750.00	
PED	Percentage of Construction Costs		10%	\$ 143,864.30	
Construction MGT	Percentage of Construction Costs		9%	\$ 129,477.87	
Total Cost				\$ 2,073,000.00	
	Volume	48,000	CY		
	Cost/CY			\$ 44.00	

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Cost Estimates of Alternatives

Farm Fields Post-Bathtub

591L Farm Fields Post-Bathtub					
Item	Quantity	UOM	Unit Cost	Amount (USD)	
Lands & Acquisition Costs					
	Land Purchase-dredge material placement area	0	AC	\$10,000.00	\$ -
	Access easements	0	AC	\$10,000.00	\$ -
	Land & Acquisition Subtotal				\$ -
Mussel Relocation					
	Mussel Relocation per Event	0	LS	\$50,000.00	\$ -
	Mussel Relocation Subtotal				\$ -
Dredging Activities					
Farmfield Construction	Dredged Material for Containment Berm	17,000	CY	\$15.00	\$ 255,000.00
	Containment Berm Construction	17,000	CY	\$5.00	\$ 85,000.00
	Seepage Ditch Construction	5,000	CY	\$3.00	\$ 15,000.00
	Clay Cap	0	CY	\$21.64	\$ -
	Riprap	0	TN	\$70.00	\$ -
	Tree Planting	0	AC	\$9,000.00	\$ -
	Vegetation Seeding	0	AC	\$3,885.00	\$ -
	Construction Cost Subtotal				\$ 355,000.00
Dredging Operations Support	Maintain Ditches, ldr/bh, wh, 1 oper 2 hrs	1	EA	\$100.00	\$ 100.00
	Mob and Demob for Ditch Clearing	1	EA	\$2,400.00	\$ 2,400.00
	Dredging Support Cost Subtotal				\$ 2,500.00
Dredging Operations (not counted toward construction)	Contractor Mob and Demob	0	EA	\$500,000.00	\$ -
	Hydraulic Dredging Operations (Contract)	383,000	CY	\$11.71	\$ 4,484,930.00
	Additional Booster Pump	2	EA	\$100,000.00	\$ 200,000.00
	Return Water Pumping--Drainage Districts	0	EA	\$0.05	\$ -
	Dredging Cost Subtotal				\$ 4,684,930.00
Subtotal					\$ 5,043,000.00
Contingency				25%	\$ 1,260,750.00
PED	Percentage of Construction Costs			10%	\$ 35,500.00
Construction MGT	Percentage of Construction Costs			9%	\$ 31,950.00
Total Cost					\$ 6,372,000.00
	Volume	400,000	CY		
	Cost/CY				\$ 16.00

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Snyder Slough Restoration

Snyder Slough Restoration				
Item	Qty	UOM	Unit Cost (USD)	Amount (USD)
Lands & Acquisition Costs				
Land Purchase-dredge material placement area	0	AC	\$10,000.00	\$ -
Access easements	0	AC	\$10,000.00	\$ -
Land & Acquisition Subtotal				\$ -
Dredging Activities				
Containment berm construction	0	CY	\$5.00	\$ -
Seepage ditch construction	0	CY	\$3.00	\$ -
Clay cap	0	CY	\$39.63	\$ -
Riprap	0	TN	\$70.00	\$ -
Construction Cost Subtotal				\$ -
Maintain Ditches, ldr/bh, wh, 1 oper 2 hrs	0	EA	\$100.00	\$ -
Mob and Demob for Ditch Clearing	0	EA	\$2,400.00	\$ -
Dredging Support Cost Subtotal				\$ -
Contractor Mob and Demob	4	EA	\$500,000.00	\$ 2,000,000.00
Small Hydraulic Dredging Operation (Contract)**	400,000	CY	\$23.42	\$ 9,368,000.00
Return Water Pumping--Drainage Districts	0	CY	\$0.05	\$ -
Dredging Cost Subtotal				\$ 11,368,000.00
Dredging Subtotal				\$ 11,368,000.00
Contingency			25%	\$ 2,842,000.00
Subtotal				\$ 14,210,000.00
PED	Assumed due to no construction costs			\$ 50,000.00
Construction MGT	Assumed due to no construction costs			\$ 45,000.00
Total First Cost				\$ 14,305,000.00
Volume (CY)	400,000			
Cost/CY				\$ 36.00

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Cost Estimates of Alternatives

Enhance Rosebrook Island – A

Enhance Rosebrook Island - A				
Item	Qty	UOM	Unit Cost (USD)	Amount (USD)
Lands & Acquisition Costs				
Land Purchase-dredge material placement area	0	AC	\$ 10,000.00	\$ -
Access easements	0	AC	\$ 10,000.00	\$ -
Lands & Acquisition Subtotal				\$ -
Dredging Activities				
Containment berm construction	0	CY	\$ 5.00	\$ -
Seepage ditch construction	0	CY	\$ 3.00	\$ -
Clay cap	0	CY	\$ 39.63	\$ -
Riprap	0	TN	\$ 70.00	\$ -
Construction Cost Subtotal				\$ -
Maintain Ditches, ldr/bh, wh, 1 oper 2 hrs	0	EA	\$ 100.00	\$ -
Mob and Demob for Ditch Clearing	0	EA	\$ 2,400.00	\$ -
Dredging Support Cost Subtotal				\$ -
Mechanical Dredging Operations USACE	0	CY	\$15.00	\$ -
Hydraulic Dredging Operations USACE	35,000	CY	\$9.00	\$ 315,000.00
Return Water Pumping--Drainage Districts	0	CY	\$0.05	\$ -
Dredging Cost Subtotal				\$ 315,000.00
Dredging Subtotal				\$ 315,000.00
Contingency			25%	\$ 78,750.00
Subtotal				\$ 394,000.00
PED	Assumed due to no construction costs			\$ 50,000.00
Construction MGT	Assumed due to no construction costs			\$ 45,000.00
Total First Cost				\$ 489,000.00
Volume (CY)	35,000			
Cost/CY				\$ 14.00

Appendix F
Cost Estimates of Alternatives

Enhance Rosebrook Island – B

Enhance Rosebrook Island - B				
Item	Qty	UOM	Unit Cost (USD)	Amount (USD)
Lands & Acquisition Costs				
Land Purchase-dredge material placement area	0	AC	\$ 10,000.00	\$ -
Access easements	0	AC	\$ 10,000.00	\$ -
Lands & Acquisition Subtotal				\$ -
Dredging Activities				
Containment berm construction	0	CY	\$ 5.00	\$ -
Seepage ditch construction	0	CY	\$ 3.00	\$ -
Clay cap	18,000	CY	\$ 39.63	\$ 713,340.00
Riprap	9,000	TN	\$ 70.00	\$ 630,000.00
Construction Cost Subtotal				\$1,343,340.00
Maintain Ditches, ldr/bh, wh, 1 oper 2 hrs	0	EA	\$ 100.00	\$ -
Mob and Demob for Ditch Clearing	0	EA	\$ 2,400.00	\$ -
Dredging Support Cost Subtotal				\$ -
Mechanical Dredging Operations USACE	0	CY	\$15.00	\$ -
Hydraulic Dredging Operations USACE	52,000	CY	\$9.00	\$ 468,000.00
Return Water Pumping--Drainage Districts	0	CY	\$0.05	\$ -
Dredging Cost Subtotal				\$ 468,000.00
Dredging Subtotal				\$1,811,340.00
Contingency			25%	\$ 452,835.00
Subtotal				\$2,265,000.00
PED	Percentage of Construction Costs		10%	\$ 135,000.00
Construction MGT	Percentage of Construction Costs		9%	\$ 121,000.00
Total First Cost				\$2,521,000.00
Volume (CY)	52,000			
Cost/CY				\$ 49.00

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Cost Estimates of Alternatives

Enhance Lower Hurricane Island

Enhance Lower Hurricane Island				
Item	Qty	UOM	Unit Cost (USD)	Amount (USD)
Lands & Acquisition Costs				
Land Purchase-dredge material placement area	0	AC	\$ 10,000.00	\$ -
Access easements	0	AC	\$ 10,000.00	\$ -
Lands & Acquisition Subtotal				\$ -
Dredging Activities				
Containment berm construction	0	CY	\$ 5.00	\$ -
Seepage ditch construction	0	CY	\$ 3.00	\$ -
Clay cap	22,000	CY	\$ 39.63	\$ 871,860.00
Riprap	12,000	TN	\$ 70.00	\$ 840,000.00
Tree planting	14.00	AC	\$ 9,000.00	\$ 126,000.00
Construction Cost Subtotal				\$ 1,837,860.00
Maintain Ditches, ldr/bh, wh, 1 oper 2 hrs	0	EA	\$ 100.00	\$ -
Mob and Demob for Ditch Clearing	0	EA	\$ 2,400.00	\$ -
Dredging Support Cost Subtotal				\$ -
Mechanical Dredging USACE Operations	63,600	CY	\$ 15.00	\$ 954,000.00
Hydraulic Dredging USACE Operations	46,400	CY	\$ 9.00	\$ 417,600.00
Dredging Cost Subtotal				\$ 1,371,600.00
Dredging Subtotal				\$ 3,209,460.00
Contingency			25%	\$ 802,365.00
Subtotal				\$ 4,011,825.00
PED	Percentage of Construction Costs		10%	\$ 184,000.00
Construction MGT	Percentage of Construction Costs		9%	\$ 76,000.00
Total First Cost				\$ 4,272,000.00
Volume (CY)	110,000			
Cost/CY				\$ 39.00

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Cost Estimates of Alternatives

SUMMARY

	ALTERNATIVE				
	Bathtub to Farm Fields w/ Mitigation	Enhance Rosebrook Island - A	Enhance Rosebrook Island - B	Lower Hurricane Island w/ Stone	Snyder Slough Restoration
Permanent Mitigation Placement	Mitigation at Bathtub	Rosebrook Middle Mitigation	Rosebrook Bankline Mitigation	Lower Hurricane Island w/ Stone	Snyder Slough Stand Alone
Site Acres	Approximately 12	15.4	13.3	15.8	-
Site Capacity	48,000	35,000	52,000	110,000	400,000
Cost/CY Permanent Placement	\$35.00	\$14.00	\$49.00	\$42.00	\$36.00
Temporary Placement (20 years)	594.1 Bathtub	None	None	None	None
Site Acres	Approximately 11				
Site Capacity	398,383				
Cost/CY Temporary Placement	\$16.00				
Permanent Placement (40 years)	591L Farm Fields Post-Bathtub	None	None	None	None
Site Acres	20				
Site Capacity	2,340,000				
Cost/CY Permanent Placement	\$13.00				
Total Alternative	Bathtub to Farm Fields w/ Mitigation	Rosebrook Middle Mitigation	Rosebrook Bankline Mitigation	Lower Hurricane Island w/ Stone	Snyder Slough Stand Alone
Total Capacity for Alternative	446,383¹	35,000	52,000	110,000	400,000²
Total Cost/CY for Alternative	\$29	\$14.00	\$49.00	\$42.00	\$36.00
Cost for Alternative	\$12,820,500	\$489,000	\$2,521,000	\$4,620,000	\$14,305,000

¹ Total Capacity is 48,000CY for mitigation, 10,383CY for Containment Berm, 194,000CY Capacity within Berm, One Offload then Refill: 48,000+ 10,383 + 194,000 + 194,000 = 446,383CY

² Further detail of site acres and actual capacities not analyzed due to high cost associated with dredging an estimated 400,000CY.

