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 REPORT

APPENDIX G

CLEAN WATER ACT REPORTS:

G-1: SECTION 404(b)(1) EVALUATION
G-2: SECTION 401 MEMORANDUM OF UNDERSTANDING
G-3: COMPENSATORY WETLAND MITIGATION PLAN

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

APPENDIX G-1

SECTION 404(b)(1) EVALUATION

PREFACE

The Environmental Protection Agency's Administrator in conjunction with the Secretary of Army acting though the Chief of Engineers under Clean Water Act, Section 404(b)(1) (33 U.S.C. 1344) developed the guidelines applicable to the specification of disposal sites for discharges of dredged or fill material into waters of the United States. The guideline's purpose is to restore and maintain the chemical, physical, and biological integrity of waters of the United States through control of discharges or fill material.

When the Corps of Engineers, Rock Island District (District) plans and proposes to perform any specific civil works action involving discharges of dredged or fill material, they first evaluate the action using specific criteria specified in Clean Water Act, 40 CFR Part 230, Subpart B Section 404(b)(1). This appendix presents the District's Clean Water Act Section 404(b)(1) Evaluation (Evaluation) for placing dredged material on an island in the Mississippi River (primarily jurisdictional wetlands) for the purpose of maintaining the river's 9-foot navigation channel.

As part of this analysis, the District considered the nature and degree of effect the proposed discharge would have, individually and cumulatively, in terms of potential changes to the parameters discussed below. The District considered the proposed method, volume, location, and rate of discharge, as well as the individual and combined effects of current patterns, water circulation and fluctuations, wind and wave action, and other physical factors as part of this evaluation.

At this time in the feasibility study, the planning team has calculated reasonable quantities of dredged material for placement and other quantities such as capping material needed to complete the project. If the quantities significantly change, the team will update this Evaluation. Any potential impacts described herein, are also approximate, but based on field visits, engineering need, and a conservative approach to the final footprint and amount of dredged material placement.

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

APPENDIX G-1

SECTION 404(b)(1) EVALUATION

FIGURES

TABLES

PHOTOGRAPHS

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

APPENDIX G-1

SECTION 404(b)(1) EVALUATION

I. PROJECT DESCRIPTION

A. Location. This document specifically addresses proposed dredging and dredged material placement in the Hurricane Island Reach located in Pool 11 Mississippi River between river miles (RM) 591 to 608. (Figure G-1-1). For management purposes, this study area includes:

- dredging areas;
- existing and potential temporary placement sites near the dredging areas needed to support the projected dredging activities; and
- permanent placement at a Farm Field/Quarry site at RM 591L at Year 20 (not evaluated in this document).

The project lies in Grant County, Wisconsin and Dubuque County, Iowa. Dubuque, Iowa is approximately 10 miles south of the project area. Cassville, Wisconsin is approximately 6 miles northeast of the project area (Figure G-1-1).

B. General Description. This study evaluates additional suitable placement alternatives for both mechanical and hydraulic dredging methods at the Hurricane Island Reach. The District periodically dredges in the study area removing accumulated sediment to provide an adequate channel for tows to navigate. Historically, the District placed dredged material on the left descending bank at Hurricane Island, RM 598.8 to RM 599.0L and at Finley's Landing. (Figure G-1-1). Since these sites have reached full or near capacity, the District and other river resource agencies are investigating additional sites to accommodate larger estimated dredging needs for the next 40 years.

This project is a two-part operation including a temporary (20 year) placement site (Bathtub), followed by a permanent (40 year) placement site (Farm fields/Quarry). The Bathtub site is a Corps-managed island at RM 594.1. The Main Report, Section 5.4 details the Bathtub construction sequence and timeline. In order to get machinery on the island, the District would have to mechanically dredge a 100 feet wide approach channel to the island (Figure G-1-2). This material [approximately 9,000 cubic yards (CY)] would be permanently placed on the Bathtub site.

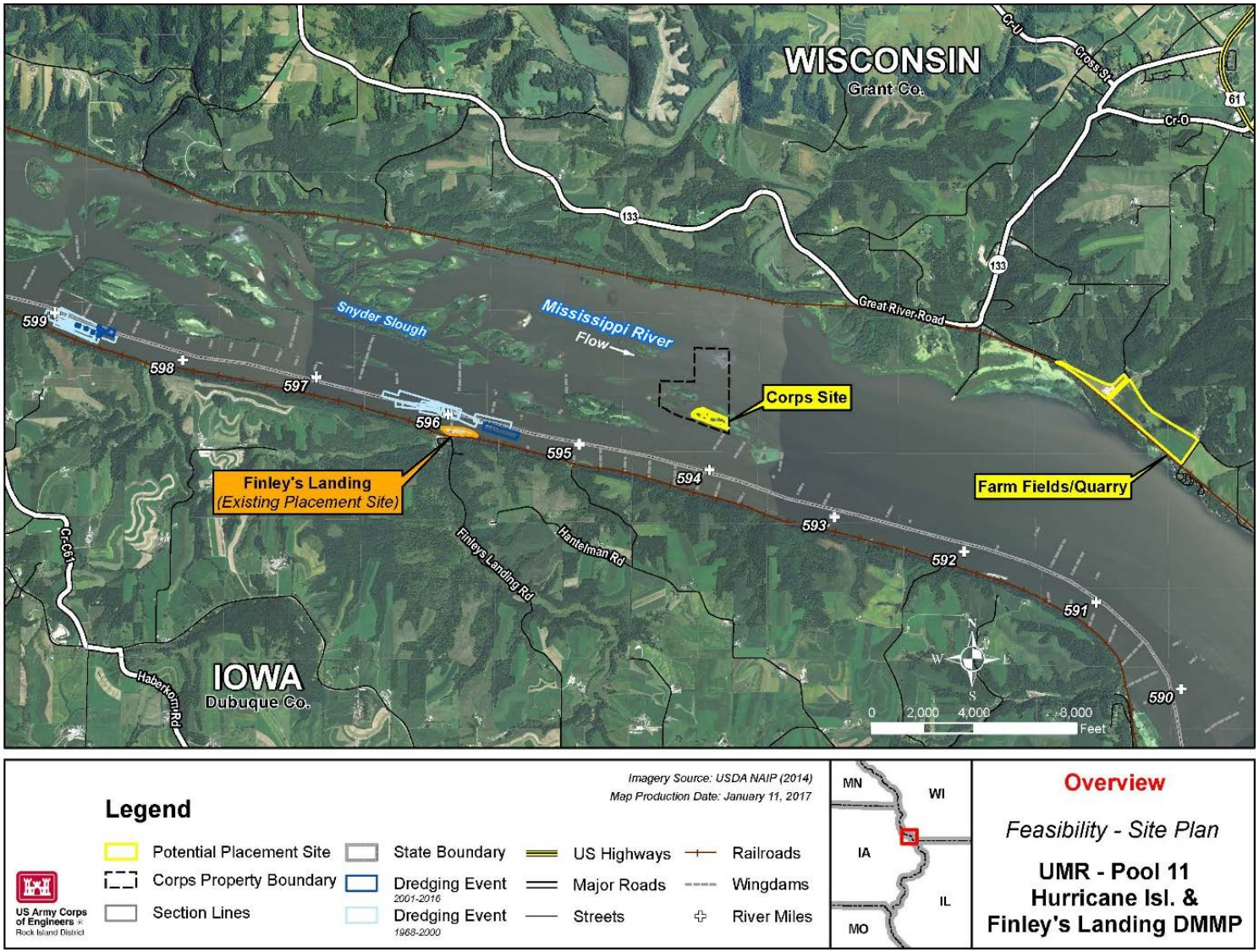


Figure G-1-1. Project Location

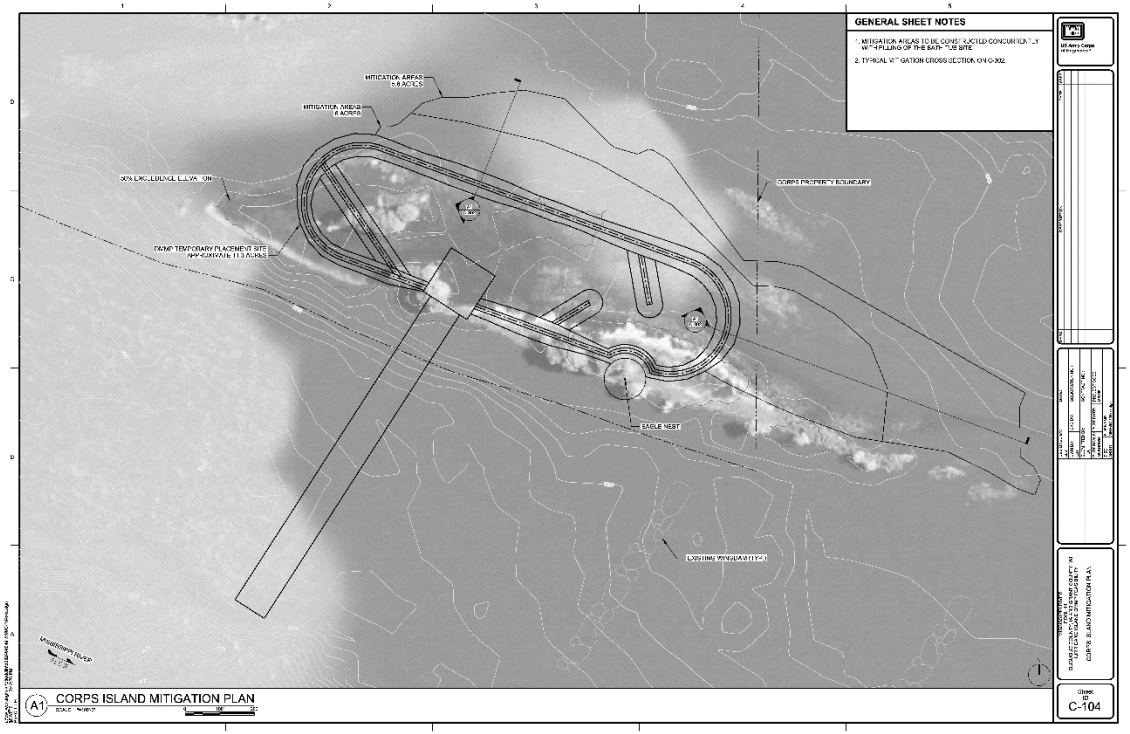


Figure G-1-2. Proposed Site Development Plan for the Bathtub Site, (RM 594.1)

The Bathtub site is approximately 11 acres and following construction of a containment berm, has a capacity of 194,000 CY. The containment berm construction requires 16,000 CY. Once the site is at full capacity (estimated at 20 years), most of the contained material (194,000 CY) would be hydraulically pumped, or offloaded, to a permanent site located at a farmfield/quarry along the Wisconsin shoreline. Then the site can be filled again with another 194,000 CY. Thus the overall capacity of the site is 16,000 + 194,000 + 194,000 = 404,000 CY.

The District would place the dredged material using large hydraulic dredging operations. The District would first construct a partial containment berm, using existing sand at the Finley's Landing placement site. As dredging continues through the first 20-year period, the District would continue the berm to protect the placed material from erosion. Once the final stage of the containment berm is completed, the District would place fine material (silts and clays) on the berm's outside slope for vegetation establishment. Finally, the District would seed the berm with native vegetation to provide additional protection against minor erosion that may occur from boat wake or wind-generated waves.

Depth averaged velocity results for the five year period beginning January 1989 through December 1993 were used to compute bed shear stress. Bed shear stress at the bathtub site does not reach critical shear stress during the five year period; therefore, stone is not required for erosion protection. Floodplain modeling using HEC-RAS (1D) showed the Bathtub would not increase floodplain heights.

As stated above, at Year 20, the District would begin offloading the bathtub to the permanent upland farmfield/quarry site. The Section 404(b)(1) evaluation for the construction, operation, and maintenance of the Farm field/Quarry site will be completed prior to the site preparation and not included in this Evaluation.

C. Authority and Purpose. The Rivers and Harbors Act of 1927; as modified by the Rivers and Harbors Acts of 1930, 1932, and 1935; 1950, and a Resolution of the House Committee on Flood Control of September 19, 1944 was the formal authorization for the Corps to perform operation and maintenance activities on the Upper Mississippi River (UMR). These Acts and Resolution authorized the construction, operation, and maintenance of the 9-foot navigation channel on the Mississippi River between the mouth of the Missouri River and St. Paul, Minnesota.

This Evaluation complies with the Clean Water Act, Section 404 pertaining to guidelines for placement of dredged or fill material into waters of the United States. This Evaluation, in conjunction with the feasibility report with integrated environmental assessment, will assist the District in analyzing alternatives for the proposed project. Further, this evaluation will provide information and data to the state water quality certifying agency demonstrating compliance with state water quality standards. This will aid in the decision making process concerning Wisconsin's Clean Water Act, Section 401 water quality certification.

D. General Description of Fill Material. The District made future projections for channel maintenance dredging using its knowledge and expertise based on historic dredging and current conditions. These projections are simply an estimate of future dredging needs. Because of the dynamic nature of the river, actual dredging needs could be different from the projections.

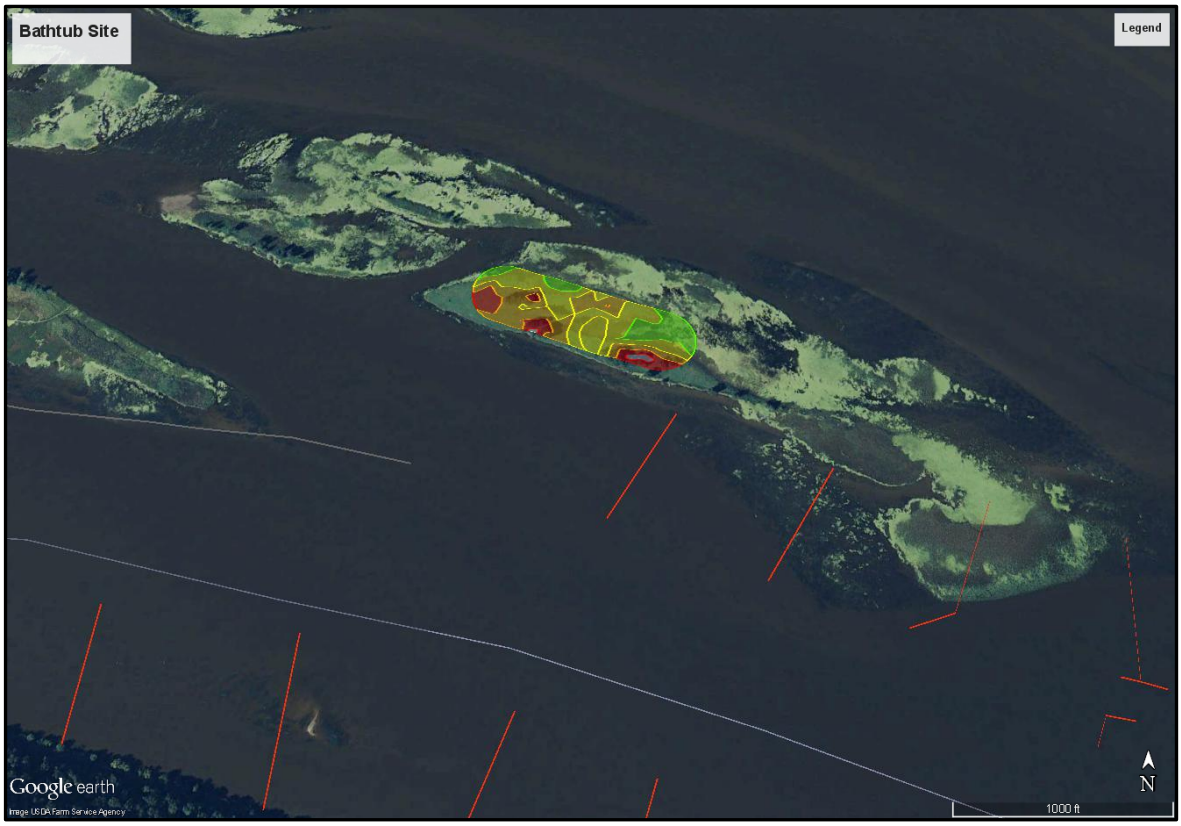
In 2015, the District collected dredged material samples from dredge cut locations and classified them in accordance with the Unified Soil Classification System. Samples ranged from gravelly course to fine grained sand with trace gravel. The dredge cuts usually produce material varying from medium to

fine sand, with some gravel and organic material. Table G-1-1 displays the proposed amounts of dredged material (sand) and capping material (silts and clays).

Table G-1-1. Estimated Dredged Material and Capping Volumes for a 20-year Period

Material	Composition	Cubic Yards	Tons
Hydraulically dredged material	Sand, with trace gravel	185,000	277,500
Mechanically dredged material	Sand, with trace gravel	9,000	13,500
Capping material	Silts, organic, clay	5,700	8550

1. Description of the Proposed Placement Sites. The Bathtub site is an approximately 11-acre low island located in the Mississippi River main channel border (Figure G-1-3 and Photograph G-1-1). It has sparse woody vegetation with grasses and swamp milkweed dominating the higher points on the island. In the protected waters at island's middle to lower end, there are floating, emergent, and submergent vegetation (Photographs G-1-2 through G-1-5). The highest point on the island is 2 feet above the normal river elevation. The island's size and vegetation composition may vary seasonally and annually depending on river levels, erosion and accretion effects. Since the Corps constructed the UMR lock and dam system raising the river elevation, the UMR has seen a remarkable loss in land composition (Photograph G-1-6).



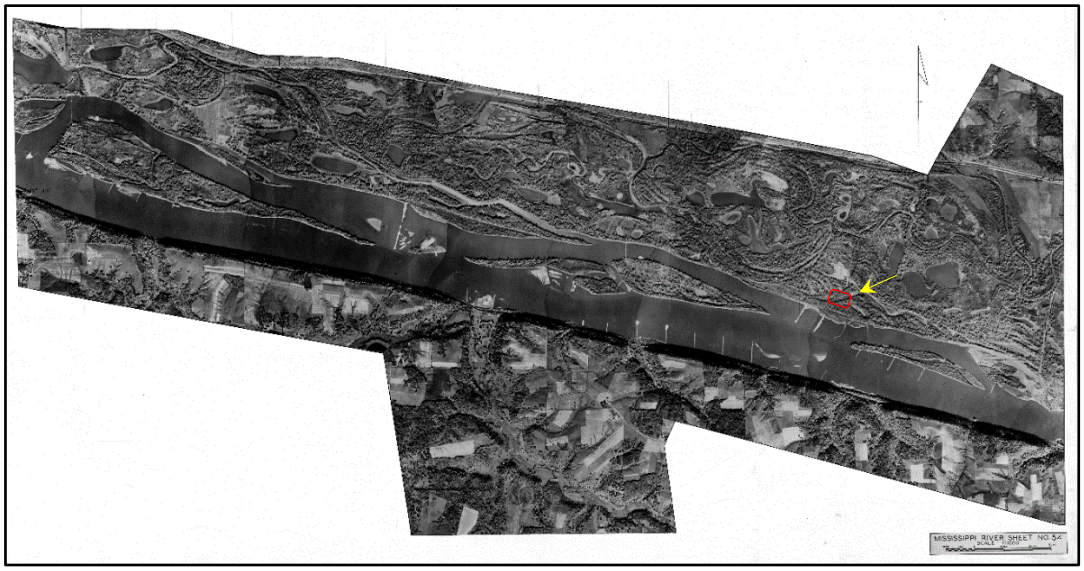
Photograph G-1-1. Aerial Photograph of the Proposed Bathtub Placement Site
Existing contours within the placement site are highlighted.

Photograph G-1-2. Upstream End of Island

Photograph G-1-3. Trees in the Middle Portion of the Island (Along the Main Channel Edge Grasses (Green) and Swamp Milkweed (Brown Stalks)

Photograph G-1-4. Trees Toward the Upper End of the Island
Note Bankline Erosion. This is the approximate location for the approach channel to the island.

Photograph G-1-5. Interior Wetlands



Photograph G-1-6. Pre Lock and Dam Conditions Near the Project Site. The Arrow Points to the Bathtub Placement Site. (Approximately 1930)

2. Description of Placement Method. The first step for construction of the bathtub is gaining access to the site. While the site is relatively close to the channel, some dredging would be required to allow access to dredge and construction equipment. The proposed access channel is 100 feet wide by up to 6 feet deep. Along with the access channel, a 150 feet by 150 feet by 8 feet area will be excavated from the interior of the bathtub, adjacent to the access channel. This is to be performed using mechanical dredging equipment. Mechanical dredgers uses floating deck-mounted machinery like cranes with clam buckets or large backhoes to remove material from the river and place it either in an adjacent hopper barge or directly on the shoreline (Photograph G-1-9). At the approach channel, the District would start riverward and work towards the bankline. The second step would be construction of a work pad as a base to support heavy equipment in such highly saturated conditions. Dredged material brought over from the approach channel, Finley's Landing, and/or the dredge cut would be used to create a work pad. The District would then use hydraulic dredging to move material to the adjacent mitigation area and to the bathtub site. Hydraulic dredging utilizes a cutterhead in combination with a centrifugal pump to entrain dredged solid materials in high velocity water (Photograph G-1-7). Dredged material is then pumped in slurry via floating discharge lines and onto the deposition area through movable shorepipe. Bulldozers, backhoes, and pipe handlers position shorepipe to deposit the dredged material where desired (Photograph G-1-8). Booster pumps are sometimes required when insufficient horsepower exists to move material the desired distance. The booster pump may be placed in the line to maintain flow of material through the pipe.

The proposed action would place the hydraulically dredged material within the bermed portion of the bathtub site. Berms would be capped as soon as constructed. All constructed berms would be completed with fine material and seed, prior to demobilization from site after each placement per USFWS recommendations for eagle nests concerns. Since the District does not anticipate a single 200,000 CY dredging event, the berm and material inside the berm would be placed incrementally over the 20-year period on an as needed basis but in a sequential order from upstream to downstream. If the site reaches full capacity before 20 years, the District would plan and prepare to offload the material to the upland Farm field/Quarry site.

The maximum depth of placement at the Bathtub site would be approximately 26 feet high. The area, approximately 11 acres, would have an estimated capacity of 200,000 CY (Figure G-1-4).

Photograph G-1-7. The Dredge Goetz

Photograph G-1-8. Hydraulic Dredge Placement (Photograph From Resource Management Group, Inc.)

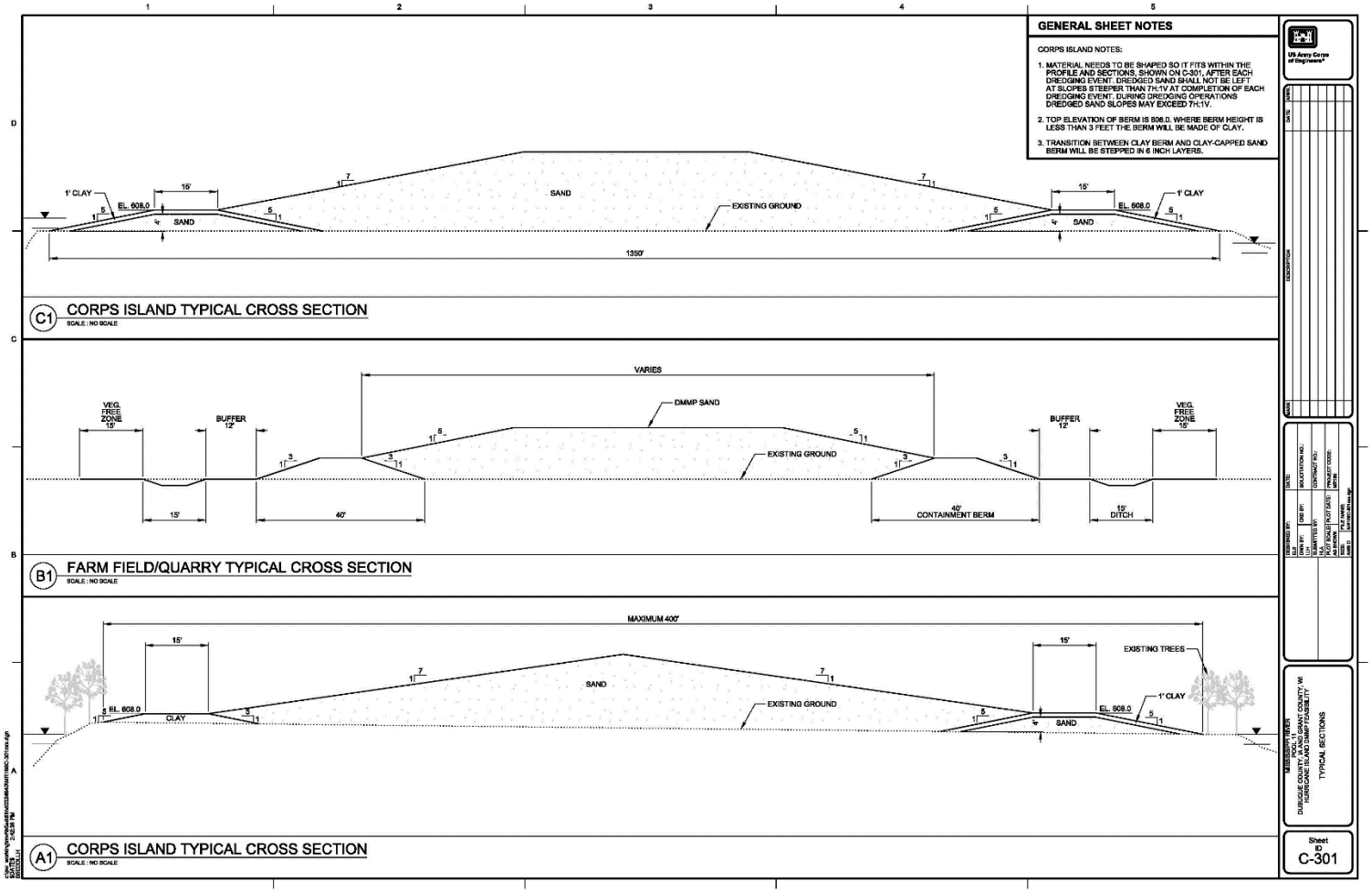


Figure G-1-3. Bathtub Placement Site Cross Sections
(See Figure G-1-2 for approximate cross section locations.)

As the hydraulically dredged material is placed, the sediment in the dredge water would fall out fairly quickly. The "clean" dredge water would be allowed to reenter the Mississippi River at various locations along the placement site in order to avoid water quality impacts, especially suspended sediment. Careful return water management would also reduce adverse erosion and potential failure of the retention berm. The District will test the return water to ensure water quality standards are not violated.

Photograph G-1-9. Mechanical Dredging

To collect the berm capping material, the District would either obtain it from the Bathtub interior, historically On Site Inspection Team (OSIT) approved stockpile sites or from lock and dam auxiliary locks or lock forebays. The District routinely removes this accumulated sediment from the locks and dams and found it effective to use as capping material for placement sites. One possible site might be the Lock and Dam 11 forebay area, locally referred to the Flat Rock Area used as overwintering fish habitat (Figure G-1-5). Another location would be to use suitable material from inside the Bathtub. If feasible, the District could scrape or backhoe material inside the Bathtub and then place it on the berm when decanted and needed.

The District will obtain OSIT approval of any capping material borrow location and ensure the material is appropriate and chemically acceptable for capping use. Dredging of fines would be performed mechanically. Dredged fine materials tend to have a high water content. To achieve the desired shape and thickness, the fine material would likely need time to decant. Again, capping material decanting would take place at an approved OSIT site such as inside the bathtub or at a previously approved placement site.

The timing and duration of each placement event should last one construction season (generally late spring – early fall) unless river conditions delay completion until the following construction season.

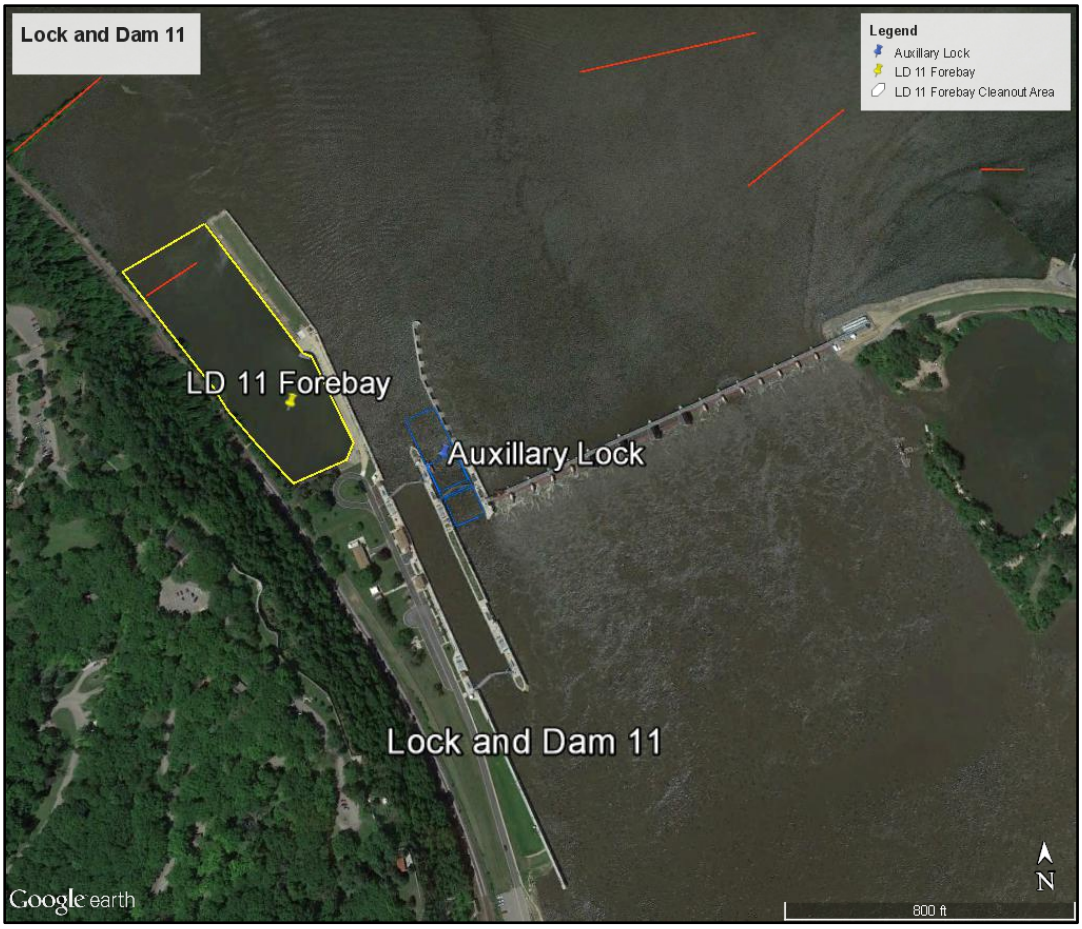


Figure G-1-5. Lock and Dam 11 Forebay Area

II. FACTUAL DETERMINATIONS

This Evaluation outlines the potential short-term or long-term effects of dredge material placement (i.e., sand placement in wetlands within the Mississippi River Valley) on the physical, chemical, and biological components of the aquatic environment. This section also addresses the actions the District proposes to avoid or minimize any impacts of material placement at the project site.

A. Physical Substrate Determinations.

1. Particle Size, Shape, and Degree of Compaction. The detailed geotechnical information concerning the Bathtub site is located in the feasibility report's Engineering appendix. A short summary is contained here.

2. Dredged Sites. At the dredging locations, the river bed is composed primarily of shifting sand creating sand waves across the river floor. In July 2015 the District collected grain size and sediment analysis data from the main channel near Rosebrook Island (RM 595) (Table G-1-2).

Table G-1-2. Mississippi River Dredging Pool 11 Grain Size Analysis of Sediment Samples

Samples Collected 23 JUL 2015; Percent Finer by Weight

	SAMPLE NUMBERS.	594.9L	595.1L	595.2L	595.2L (DUP)	595.3L
	1 1/2"					
S	**3/4"**					
I	**3/8"**		100.0%	100.0%	100.0%	
E	**#4**	100.0%	99.7%	99.9%	99.9%	100.0%
V	**#10**	99.9%	99.2%	99.7%	99.7%	99.2%
E	**#16**	99.6%	98.4%	99.2%	99.1%	96.9%
	#30	96.2%	93.4%	94.4%	94.9%	87.5%
S	**#40**	85.5%	80.4%	78.7%	79.9%	68.9%
I	**#50**	42.5%	32.7%	23.8%	26.4%	22.6%
Z	**#70**	5.3%	2.8%	1.4%	1.6%	1.7%
E	**#100**	0.6%	0.3%	0.1%	0.4%	0.2%
S	**#200**	0.1%	0.0%	0.0%	0.2%	0.0%
	CLASSIFICATION.	SP, MEDIUM TO FINE SAND	SP, MEDIUM TO FINE SAND	SP, MEDIUM TO FINE SAND	SP, MEDIUM TO FINE SAND	SP, MEDIUM TO FINE SAND

Notes:
1. Visual classification of soil is in accordance with "The Unified Soils Classification System (USCS)"
2. Laboratory testing was performed in accordance with EM 1110-2-1906, dated 30 Nov 70, revised 1 May 80 and 20 Aug 86
3. All samples were oven dried at 110 degrees centigrade. Sample designated (dup) is a duplicate sample.

3. Bathtub Placement Site. The District collected six borings with hand auger on various islands during March 2014, and the results are listed in the Engineer appendix. Some locations show different layers of soils. The island comprises 10-15 feet of overburden consisting of sandy lean to fat clay underlain by medium to fine sand. The average moisture content for the sandy lean to fat clay (CL-CH) of the only sample available from the island is 40%. Boring HI-14-01 was taken via boat near water's edge, and in 'wetter' soils. Soils at higher elevations near the trees located on Corps Island are expected to be dryer and firmer.

For analysis purposes, the shear strength and angle of internal friction for different materials are assumed based on USCS soil classification and previous testing conducted on the similar soils within Rock Island District (feasibility report, Engineering appendix).

Significant settlement caused by the weight of dredged material would occur. The District expects the excessive dredged material placement will make the sandy clay (CL) and the sandy lean to fat Clay (CL-CH) layers consolidate/drain, hence it increases the strength of the soil to an average of 450 psf for CL and over 320 psf for CL-CH in less than 20 years. See Appendix D, *Engineering*, for cohesion vs water content relation). Specific settlement calculations were not performed, since any amount of settlement and consolidation would only serve to improve foundation strength and increase total volume capacity of the placement site.

4. Capping Material Borrow Locations. Since the District does not have an exact location for capping material, it did not complete a grain size analysis on fine material. For forebay and auxiliary lock clean outs or backwater borrow sites, Table G-1-3 shows grain size analysis from the Pool 12 Overwintering Habitat Restoration Project. The District assumes this data from a backwater project in Pool 12 (down river from the Hurricane Island Reach project) is representative of the capping material used for Hurricane Island Reach Project.

Table G-1-3. Grain Size and Chemical Analysis for the Pool 12 Overwintering Project

PARAMETER	State Standard[1]	Stone Lake E-M571.9X	Tippy Lake E-M570.8K	Kehough Slough E-M567.7Y	No Name Lake E-M566.7T	Fish Trap Lake E-M566.3P	Sunfish Lake E-M564.3S	Ambient Water[4]
Total Lead (mg/L)	0.3073	0.052	0.038	0.140	0.177	0.261	0.209	0.009
Total Zinc (mg/L)	0.2656	0.221	0.159	0.369	0.455	0.927	1.020	0.046
Ammonia-N (mg/L)	15.0[2]	6.6	4.6	6.4	2.4	6.0	7.2	<0.05
Total Suspended Solids (mg/L)	-	1400	1360	3140	2500	4240	890	53
Volatile Suspended Solids (mg/L)	-	140	260	260	160	380	93	16
pH[3]	6.5 - 9.0	7.2	7.1	6.9	6.9	7.0	7.2	-
Temperature (°C)[3]	-	19	19	19	19	19	19	-
Grain Size[5]	-	99.6	98.2	98.9	98.3	88.6	99.7	-

[1] Illinois General Use Water Quality Standard (acute standard assuming a hardness level of 250 mg/L as $CaCO_3$ is given for metals).

[2] Acute ammonia-N standard at a pH≤7.6.

[3] Temperature and pH values were measured in the laboratory immediately prior to ammonia-N analysis.

[4] Collected from Sunfish Lake (E-M564.3S).

[5] Percent material passing a #200 sieve.

5. Substrate Elevation and Bottom Contours Including Outside the Disposal Areas

- **Substrate Elevation and Slope.** The project would alter the river bottom, but the river is always changing based on velocity, volume of water, and bedload through the main channel. Substrate may accrete or degrade depending on the river's discharge stage and other fluvial processes. Figure G-1-3 shows the proposed change at the placement site. The site would change from a low elevation island to an engineered placement site 26 feet high at full capacity.

- **Dredged/Fill Material Movement.** The District's thorough hydraulic modelling demonstrated there would be minimal material movement at the Bathtub placement site. A full hydraulic modelling report is included Appendix E, *Engineering*.

- **Duration and Physical Extent of Substrate Changes.** The District expects the Hurricane Island Reach will require periodic dredging for the next 40 years. The Bathtub site development should take 20 years to construct, fill, and then empty.

- **Loss of Environmental Values.** The District expects a short term loss of any benthic organisms due to construction activities. However, since the benthic community is sparse in the navigation channel, this impact is not significant. The District expects the wetland mitigation success would compensate for any wetland loss.

- **Nature and Degree of Effect, Individually and Cumulatively.** The District determined there are no additional beneficial or negative effects contributing to this project's physical substrate impacts.

- **Actions To Minimize Impacts.** The District has thoroughly analyzed velocities at the Bathtub site to ensure the final design does not impact the river aquatic community. The design includes capping the containment berm so that it quickly vegetates, the layout was moved to avoid the most wetlands in the lower area of the island, and the approach channel was moved to avoid mussel impacts. The District would perform on-site compensatory mitigation (Appendix G-3) to compensate for any wetland loss at an approved ratio set by the District's Regulatory office.

B. Water Circulation, Fluctuation, and Salinity Determinations

Typically, analysis of sand sediments, such as those found in the immediate project area, reveals negligible evidence of pollutants due to the limited surface area of sand-sized particles and the lack of strong chemical bonding of contaminates to sand grains. Any contaminants in sandy materials would be those typically contained or transported by normal fluvial processes and therefore are common constituents of the Mississippi River system. Any DMMP activity that may disturb the existing substrate therefore would not alter water chemistry in the water column.

- **Significant Changes in the Hydrologic Regime.** The proposed dredging and dredged material placement would not significantly affect currents and flows.

- **Alterations of Bottom Contours.** If the District carries out the DMMP, the river bottom within the dredge cut footprints over 40 years would change from a dune effect of shifting sand to semi trapezoidal deeper area. The dredge cut may shoal in again and the process repeated.

- **Normal Water Level Fluctuation.** The proposed project would not have any impact to normal seasonal river stages.

- **Water Chemistry.** The proposed project would not have any impact to water chemistry.

- **Salinity.** The proposed project would not have any impact to salinity.

- **Clarity.** Water clarity impacts should be minimal, and short in duration. Once the berms are in place, there should be little to no water clarity impacts.

- **Color.** There will be short-term impacts during initial site construction and little to no water color impacts after the berms are constructed

- **Odor.** The proposed project would not have any impact to odor.

- **Taste.** The proposed project would not have any impact to taste.

- **Dissolved Gas Levels.** The proposed project would not have any impact to dissolved gas levels.

- **Temperature.** The proposed project would not have any impact to water temperature.

- **Nutrients.** The proposed project would not have any impact to current river level nutrients.

- **Eutrophication.** The proposed project would not have any impact to eutrophication.

- **Loss of Environmental Values.** The District expects a short-term loss of any benthic organisms due to construction activities. However, since the benthic community is sparse in the navigation channel, this impact is not significant. The District expects the wetland mitigation success would compensate for any wetland loss.

- **Nature and Degree of Effect, Individually, and Cumulatively.** The District determined there are no additional beneficial or negative effects contributing to this project's water circulation, fluctuation, and salinity impacts.

- **Actions Taken To Minimize Impacts**. The District would use chemically stable materials and physical stabilization of materials to avoid impacts to the riverine system. See Main Report and Engineering Appendix for more information.

C. Suspended Particulate/Turbidity Determinations

- **Grain size of the Material Proposed for Discharge.** Tables G-1-2 and G-1-3 show the grain size for the sandy dredged material and representative fine capping material, respectively.

- **Shape, Size, and Duration of Discharge and Resulting Plume in the Water Column.** Dredging duration may vary from one dredging event to another. Generally they can last up to 5 days for a larger event.

The dredging process would not create a noticeable plume of suspended particles. The hydraulic dredge acts like a vacuum cleaner on the river bottom. Once the discharged material enters the placement site, the heavy material settles quickly and the "clean" water is allowed to reenter the river.

The United States Environmental Protection Agency (USEPA) and Corps' *Evaluating Environmental Effects of Dredged Material Management Alternatives-A Technical Framework*, (May 2004), states, any discharge from mechanical dredging has been determined to be minimal. Utilizing mechanical

dredging reduces impacts to the local water column and its associated aquatic communities. Placement on an existing island utilizes the higher land reduces impacts to the aquatic community. In designing the bathtub and approach channel, care was taken to avoid and minimize impacts to mussels in the area. Any plume from mechanical dredging would be small in nature, settle out quickly from the water column, and be relatively inert material.

- **Violations of Applicable Water Quality Standards.** The District anticipates this project would not violate any applicable Iowa or Wisconsin water quality standards. The District would obtain the permits, certification, and/or waiver of certification under the Clean Water Act, Section 401 before construction begins.

- **Loss of Environmental Values.** The District does not expect the construction activities to result in a loss of environmental value to the water column.

- **Nature and Degree of Effect, Individually, and Cumulatively.** The District determined there are no additional beneficial or negative effects contributing to this project's amount of suspended particulate and turbidity impacts in the Mississippi River.

- **Actions Taken To Minimize Impacts.** The District has thoroughly analyzed velocities at the Bathtub site to ensure the final design does not impact the river aquatic community. The design includes capping the containment berm so that it quickly vegetates, the layout was moved to avoid the most wetlands in the lower area of the island, and the approach channel was moved to avoid mussel impacts. The District would perform on-site compensatory mitigation (Appendix G) to compensate for any wetland loss at an appropriate ratio set by the District's Regulatory Office.

The District would accomplish construction during normal water conditions. This would keep the amount of suspended material to a minimum. Dredging quantities would be kept to the minimum amount necessary to maintain the navigation channel. Return water would not be able to return to the Mississippi River until Wisconsin water quality standards are met.

D. Contaminant Determinations

Dredged or fill material is most likely to be free from chemical, biological, or other pollutants where it is composed primarily of sand, gravel, or other naturally occurring inert material. Dredged material may be excluded from further testing if there is a reasonable assurance it is not a carrier of contaminants. Section II.A explains that existing information for this project provides a sufficient basis for making a factual determination concerning impacts to waters of the United States. The dredged material meets the exclusion from testing/evaluation criteria as explained in the Clean Water Act, Section 404(b)(1) Guidelines and the Inland Testing Manual. It is therefore reasonable to assume no further testing is required. This said, the District conducted chemical testing for dredged material in the Hurricane reach in 2015 (Table G-1-4) and the District would continue to follow a tiered approach for testing dredged material as described in the Inland Testing Manual. The District would also incorporate periodic chemical testing, as described in NR347, for material that is likely to be provided to the public for beneficial reuse. Table G-1-3 also outlines what the capping material's chemical make-up may be. This information was from backwater samples of similar capping material dredged at an ecosystem restoration project in Pool 12. Discussion with WI DNR staff on 31 May 2017 acknowledged testing results collected for the Finley's Dredge Cut are acceptable. The District acknowledged future testing would be conducted to meet detection and reporting criteria specified in NR347.

Table G-1-4. Main Channel Sediment Chemical Analysis

Sediment Sample Analysis Results									WI Guidelines		
ARDL #	**Customer #**	**Method**	**Parameter**	**Flag**	**Reported Result**	**MDL**	**PQL**	**Units**	**TEC**	**MEC**	**PEC**
001058-01	MS-595.1L	6010B	Arsenic		1.4	0.38	0.76	MG/KG	9.8		
001058-01	MS-595.1L	6010B	Cadmium		0.25	0.25	0.50	MG/KG	0.99		
001058-01	MS-595.1L	6010B	Chromium		4.3	0.63	1.3	MG/KG	43		
001058-01	MS-595.1L	6010B	Lead		1.2	0.38	0.76	MG/KG	36		
001058-01	MS-595.1L	6010B	Zinc		11.2	0.63	1.3	MG/KG	120		
001058-01	MS-595.1L	7471A	Mercury	<	0.26	0.26	0.80	MG/KG	0.18	0.64	
001058-01	MS-595.1L	350.1	Ammonia Nitrogen		10.1	0.039	0.039	MG/KG			
001058-01	MS-595.1L	8082	Aroclor 1016	<	44.5	4.1	44.5	UG/KG			
001058-01	MS-595.1L	8082	Aroclor 1221	<	44.5	15.6	44.5	UG/KG			
001058-01	MS-595.1L	8082	Aroclor 1232	<	44.5	6.7	44.5	UG/KG			
001058-01	MS-595.1L	8082	Aroclor 1242	<	44.5	6.7	44.5	UG/KG			
001058-01	MS-595.1L	8082	Aroclor 1248	<	44.5	6.5	44.5	UG/KG			
001058-01	MS-595.1L	8082	Aroclor 1254	<	44.5	6.6	44.5	UG/KG			
001058-01	MS-595.1L	8082	Aroclor 1260	<	44.5	5.3	44.5	UG/KG			
001058-01	MS-595.1L	8270C	Naphthalene	<	4.5	0.82	4.5	UG/KG	176		
001058-01	MS-595.1L	8270C	Acenaphthylene	<	4.5	0.80	4.5	UG/KG	5.9		
001058-01	MS-595.1L	8270C	Acenaphthene	<	4.5	0.66	4.5	UG/KG	6.7		
001058-01	MS-595.1L	8270C	Fluorene	<	4.5	0.76	4.5	UG/KG	77.4		
001058-01	MS-595.1L	8270C	Phenanthrene	<	4.5	0.97	4.5	UG/KG	204		
001058-01	MS-595.1L	8270C	Anthracene	<	4.5	0.81	4.5	UG/KG	57.2		
001058-01	MS-595.1L	8270C	Fluoranthene	<	4.5	1.1	4.5	UG/KG	423		
001058-01	MS-595.1L	8270C	Pyrene	<	4.5	0.92	4.5	UG/KG	195		
001058-01	MS-595.1L	8270C	Benzo(a)anthracene	<	4.5	0.70	4.5	UG/KG	108		
001058-01	MS-595.1L	8270C	Chrysene	<	4.5	1.2	4.5	UG/KG	166		
001058-01	MS-595.1L	8270C	Benzo(b)fluoranthene	<	4.5	1.2	4.5	UG/KG	240		
001058-01	MS-595.1L	8270C	Benzo(k)fluoranthene	<	4.5	1.5	4.5	UG/KG	240		
001058-01	MS-595.1L	8270C	Benzo(a)pyrene	<	4.5	0.98	4.5	UG/KG	150		
001058-01	MS-595.1L	8270C	Indeno(1,2,3-cd)pyrene	<	4.5	0.85	4.5	UG/KG	200		
001058-01	MS-595.1L	8270C	Dibenzo(a,h)anthracene	<	4.5	1.1	4.5	UG/KG	33		
001058-01	MS-595.1L	8270C	Benzo(g,h,i)perylene	<	4.5	1.2	4.5	UG/KG	170		
001058-01[1]	MS-595.1L	9060	Total Organic Carbon		240	100	100	MG/KG	0.20%		
001058-01	MS-595.1L	160.3	Solids, Percent		74.2	1.0	1.0	%			
001058-02	MS-595.2L	6010B	Arsenic		0.77	0.36	0.72	MG/KG	9.8		
001058-02	MS-595.2L	6010B	Cadmium	<	0.24	0.24	0.48	MG/KG	0.99		

Table G-1-4. Main Channel Sediment Chemical Analysis

Sediment Sample Analysis Results									WI Guidelines		
ARDL #	**Customer #**	**Method**	**Parameter**	**Flag**	**Reported Result**	**MDL**	**PQL**	**Units**	**TEC**	**MEC**	**PEC**
001058-02	MS-595.2L	6010B	Chromium		3.8	0.60	1.2	MG/KG	43		
001058-02	MS-595.2L	6010B	Lead		1.0	0.36	0.72	MG/KG	36		
001058-02	MS-595.2L	6010B	Zinc		7.9	0.60	1.2	MG/KG	120		
001058-02	MS-595.2L	7471A	Mercury	<	0.23	0.23	0.71	MG/KG	0.18	0.64	
001058-02	MS-595.2L	350.1	Ammonia Nitrogen		5.1	0.033	0.033	MG/KG			
001058-02	MS-595.2L	8082	Aroclor 1016	<	41.5	3.9	41.5	UG/KG			
001058-02	MS-595.2L	8082	Aroclor 1221	<	41.5	14.6	41.5	UG/KG			
001058-02	MS-595.2L	8082	Aroclor 1232	<	41.5	6.2	41.5	UG/KG			
001058-02	MS-595.2L	8082	Aroclor 1242	<	41.5	6.2	41.5	UG/KG			
001058-02	MS-595.2L	8082	Aroclor 1248	<	41.5	6.1	41.5	UG/KG			
001058-02	MS-595.2L	8082	Aroclor 1254	<	41.5	6.2	41.5	UG/KG			
001058-02	MS-595.2L	8082	Aroclor 1260	<	41.5	4.9	41.5	UG/KG			
001058-02	MS-595.2L	8270C	Naphthalene	<	4.2	0.77	4.2	UG/KG	176		
001058-02	MS-595.2L	8270C	Acenaphthylene	<	4.2	0.74	4.2	UG/KG	5.9		
001058-02	MS-595.2L	8270C	Acenaphthene	<	4.2	0.62	4.2	UG/KG	6.7		
001058-02	MS-595.2L	8270C	Fluorene	<	4.2	0.70	4.2	UG/KG	77.4		
001058-02	MS-595.2L	8270C	Phenanthrene	<	4.2	0.90	4.2	UG/KG	204		
001058-02	MS-595.2L	8270C	Anthracene	<	4.2	0.75	4.2	UG/KG	57.2		
001058-02	MS-595.2L	8270C	Fluoranthene	<	4.2	1.0	4.2	UG/KG	423		
001058-02	MS-595.2L	8270C	Pyrene	<	4.2	0.85	4.2	UG/KG	195		
001058-02	MS-595.2L	8270C	Benzo(a)anthracene	<	4.2	0.65	4.2	UG/KG	108		
001058-02	MS-595.2L	8270C	Chrysene	<	4.2	1.1	4.2	UG/KG	166		
001058-02	MS-595.2L	8270C	Benzo(b)fluoranthene	<	4.2	1.2	4.2	UG/KG	240		
001058-02	MS-595.2L	8270C	Benzo(k)fluoranthene	<	4.2	1.4	4.2	UG/KG	240		
001058-02	MS-595.2L	8270C	Benzo(a)pyrene	<	4.2	0.92	4.2	UG/KG	150		
001058-02	MS-595.2L	8270C	Indeno(1,2,3-cd)pyrene	<	4.2	0.79	4.2	UG/KG	200		
001058-02	MS-595.2L	8270C	Dibenzo(a,h)anthracene	<	4.2	1.0	4.2	UG/KG	33		
001058-02	MS-595.2L	8270C	Benzo(g,h,i)perylene	<	4.2	1.2	4.2	UG/KG	170		
001058-02[1]	MS-595.2L	9060	Total Organic Carbon		240	100	100	MG/KG	0.20%		
001058-02	MS-595.2L	160.3	Solids, Percent		79.6	1.0	1.0	%			
001058-03	MS-595.3L	6010B	Arsenic		1.0	0.32	0.64	MG/KG	9.8		
001058-03	MS-595.3L	6010B	Cadmium	<	0.22	0.22	0.43	MG/KG	0.99		
001058-03	MS-595.3L	6010B	Chromium		2.3	0.54	1.1	MG/KG	43		
001058-03	MS-595.3L	6010B	Lead		0.90	0.32	0.64	MG/KG	36		

Table G-1-4. Main Channel Sediment Chemical Analysis

Sediment Sample Analysis Results									WI Guidelines		
ARDL #	**Customer #**	**Method**	**Parameter**	**Flag**	**Reported Result**	**MDL**	**PQL**	**Units**	**TEC**	**MEC**	**PEC**
001058-03	MS-595.3L	6010B	Zinc		8.1	0.54	1.1	MG/KG	120		
001058-03	MS-595.3L	7471A	Mercury	<	0.21	0.21	0.64	MG/KG	0.18	0.64	
001058-03	MS-595.3L	350.1	Ammonia Nitrogen		11.3	0.030	0.030	MG/KG			
001058-03	MS-595.3L	8082	Aroclor 1016	<	37.3	3.5	37.3	UG/KG			
001058-03	MS-595.3L	8082	Aroclor 1221	<	37.3	13.1	37.3	UG/KG			
001058-03	MS-595.3L	8082	Aroclor 1232	<	37.3	5.6	37.3	UG/KG			
001058-03	MS-595.3L	8082	Aroclor 1242	<	37.3	5.6	37.3	UG/KG			
001058-03	MS-595.3L	8082	Aroclor 1248	<	37.3	5.5	37.3	UG/KG			
001058-03	MS-595.3L	8082	Aroclor 1254	<	37.3	5.6	37.3	UG/KG			
001058-03	MS-595.3L	8082	Aroclor 1260	<	37.3	4.4	37.3	UG/KG			
001058-03	MS-595.3L	8270C	Naphthalene	<	3.8	0.69	3.8	UG/KG	176		
001058-03	MS-595.3L	8270C	Acenaphthylene	<	3.8	0.67	3.8	UG/KG	5.9		
001058-03	MS-595.3L	8270C	Acenaphthene	<	3.8	0.55	3.8	UG/KG	6.7		
001058-03	MS-595.3L	8270C	Fluorene	<	3.8	0.63	3.8	UG/KG	77.4		
001058-03	MS-595.3L	8270C	Phenanthrene	<	3.8	0.81	3.8	UG/KG	204		
001058-03	MS-595.3L	8270C	Anthracene	<	3.8	0.68	3.8	UG/KG	57.2		
001058-03	MS-595.3L	8270C	Fluoranthene	<	3.8	0.90	3.8	UG/KG	423		
001058-03	MS-595.3L	8270C	Pyrene	<	3.8	0.77	3.8	UG/KG	195		
001058-03	MS-595.3L	8270C	Benzo(a)anthracene	<	3.8	0.59	3.8	UG/KG	108		
001058-03	MS-595.3L	8270C	Chrysene	<	3.8	0.97	3.8	UG/KG	166		
001058-03	MS-595.3L	8270C	Benzo(b)fluoranthene	<	3.8	1.0	3.8	UG/KG	240		
001058-03	MS-595.3L	8270C	Benzo(k)fluoranthene	<	3.8	1.2	3.8	UG/KG	240		
001058-03	MS-595.3L	8270C	Benzo(a)pyrene	<	3.8	0.83	3.8	UG/KG	150		
001058-03	MS-595.3L	8270C	Indeno(1,2,3-cd)pyrene	<	3.8	0.71	3.8	UG/KG	200		
001058-03	MS-595.3L	8270C	Dibenzo(a,h)anthracene	<	3.8	0.94	3.8	UG/KG	33		
001058-03	MS-595.3L	8270C	Benzo(g,h,i)perylene	<	3.8	1.0	3.8	UG/KG	170		
001058-03[1]	MS-595.3L	9060	Total Organic Carbon		180	100	100	MG/KG	0.20%		
001058-03	MS-595.3L	160.3	Solids, Percent		88.4	1.0	1.0	%			

[1] Have to do a conversion, comes out to approximately 0.024% No standards to measure against

Minimum Detection Limit (MDL): An estimate of the minimum amount of a substance that an analyte process can reliably detect. An MDL is analyte-specific and matrix-specific and laboratory dependent.

Practical Quantitation Limit (PQL): The lowest level of measurement that can be reliably achieved during routine laboratory operating conditions within specified limits of precision and accuracy.

E. Aquatic Ecosystem and Organism Determinations

The following discussion centers on how potential changes to the physical environment may affect the aquatic ecosystem and organisms living there and the rate of recolonization.

- **Substrate Characteristics and Elevation.** The proposed project would alter the river bed in the main channel but shifting sand dunes deeper in the water column should resume quickly.

- **Water or Substrate Chemistry**. The District does not anticipate a change in water or substrate chemistry and their interaction on the aquatic ecosystem.

- **Nutrients.** The District does not anticipate a change in nutrients either in quantity, quality, or distribution across the various river habitats and their bearing on the aquatic ecosystem.

- **Currents.** The District does not anticipate a change in river currents.

- **Circulation.** The District does not expect any changes in the river's circulation patterns at the dredge cuts or along the Bathtub site.

- **Fluctuation.** The District does not anticipate a change in river fluctuation and its bearing on the aquatic ecosystem.

- **Salinity.** The District does not anticipate a change in salinity and its influence on the aquatic ecosystem.

- **Loss of Environmental Values.** The District does not expect a loss of environmental value to the water chemistry or flow patterns due to construction activities and the final project.

- **Nature and Degree of Effect, Individually, and Cumulatively**. The District determined there are no additional beneficial or negative effects contributing to the project area aquatic ecosystem and organisms. Wetland mitigation would replace any environmental value from the existing wetlands. The District would mitigate for any existing wetlands potentially impacted by this project would be replicated along the edges of the mitigation site.

- **Actions Taken To Minimize Impacts**. The District has thoroughly analyzed velocities at the Bathtub site to ensure the final design does not impact the river aquatic community. The design includes capping the containment berm so that it quickly vegetates, the layout was moved to avoid the most wetlands in the lower area of the island, and the approach channel was moved to avoid mussel impacts. The District would perform on-site compensatory mitigation (Appendix G) to compensate for any wetland loss at an approved ratio set by the District's Regulatory office.

F. Proposed Placement Site Determinations

This section does not address any impact analysis; it only addresses the boundaries and parameters of the mixing zone.

- **Mixing Zone Determinations.** A mixing zone is the volume of water at a placement site or discharge site required to dilute contaminant concentrations associated with a discharge of dredged material to an acceptable level. Since terrestrial placement is involved, the return water would be allowed to return the Mississippi River virtually free of sediment. No violation of any standard would result from the placement of dredged material.

- **Current Velocity, Direction, and Variability at the Disposal Sites.** The project should not change the current velocity, direction, and variability at the placement site since there would be no placement in the main channel border or backwater sloughs.

- **Degree of Turbulence.** The project should not increase turbulence at the placement site.

- **Stratification Attributable to Causes Such As Obstructions, Salinity or Density Profiles at the Disposal Sites.** The typical mixing zone of the Mississippi River main channel border includes the entire water column – surface to river bottom. The proposed project would not alter the stratification or the mixing zone in the project area.

- **Discharge Vessel Speed and Direction.** For mechanical dredging, the work barges would be stationary. The work crew would use a fixed crane to dredge and place material. Skid steers and bulldozers would shape the placement site to final grade. The hydraulic dredge is stationary as well.

- **Rate of Discharge.** The rate of discharge would be no more than five days at the Bathtub.

- **Ambient Concentration of Constituents of Interest.** The dredged material would be clean, uniform material. Its density and size would not allow it to migrate very far, from the placement site.

- **Number of Discharge Actions Per Unit of Time.** Over the first 20-year period, the District estimates the majority of dredging would take place in the first 10 years. Over the 20-year period, there may be +/- six dredging events.

- **Other Factors of the Placement Site That Affect the Rates and Patterns of Mixing.** There are no other factors beyond what is described above.

- **Determination of Compliance with Applicable Water Quality Standards.** Due to the nature of the fill material, all discharges are anticipated to be in compliance with Iowa and Wisconsin water quality standards. The District would obtain Section 401 Water Quality certification, in compliance with the Clean Water Act, and all permits necessary for the completion of the project prior to project implementation.

G. Determination of Cumulative Effects on the Aquatic Ecosystem

The District conducted an extensive cumulative effects analysis for the entire project including effects on wetlands and waters of the United States. This analysis is located in the feasibility report with integrated environmental assessment, Section 4.3. The District's analysis concluded there would be no significant negative cumulative impacts associated with this project.

H. Determination of Secondary Effects on the Aquatic Ecosystem (40 CFR 230 Subpart D – Potential Impacts on Biological Characteristics of the Aquatic Ecosystem and Subpart E – Potential Impacts on Special Aquatic Sites)

While the District anticipates several secondary effects on the aquatic ecosystem, the proposed project may contribute to a channelizing effect to this reach of the river. The District recognizes navigation channel maintenance projects may cause a departure from natural river ecosystems. The District's goal is to minimize impacts to the environment when addressing channel maintenance duties. If environmental conditions change and unidentified impacts occur, the District will reevaluate this

evaluation and coordinate the findings with, Federal, State, or local agencies, as well as input from the general public.

This section documents additional information and data the District considers in Section II, *Factual Determinations* and in Section III, *Findings of Compliance.*

- **Sensitive Species (Threatened and Endangered/Bald Eagle).** There are several Federal and State listed species listed for Dubuque County, Iowa, and Grant County, Wisconsin. There is an active bald eagle nest within the project boundary. The District considered the following potential project impacts and the possible loss of species values:
    - Covering or otherwise directly killing species
    - The impairment or destruction of habitat to which these species are limited.
    - Disturbing or altering an animal's breeding, nesting, foraging, or other normal activities.

Given these possible impacts as well as the other potential project impacts, the District does not anticipate any significant impacts or effects to sensitive species. For more information on those measures, see Section 4, *Environmental Consequences* of the Dredged Material Management Plan with Integrated Environmental Assessment.

- **Fish.** Fish species normally present in the dredging area might temporarily avoid the project area until the dredging/placement event is complete.

- **Crustaceans**. Freshwater, or fairy shrimp and crayfish would be the primary types of crustaceans affected by this project. Crayfish inhabit the existing island wetlands. To offset any loss in habitat, wetland mitigation would ensure new crustacean habitat is constructed.

- **Mollusks**. The District conducted a mussel survey near the bathtub site (ESI, 2017). The survey found mussels near the island with higher concentrations downstream of the island. The proposed bathtub placement site's approach channel would be the only project feature that would potentially impact native mussels. The District moved the approach channel to the least concentration of mussels and no federally-listed mussels were found in the impact area. The District and other OST agencies will conduct a Mitigation Site mussel survey. This survey will use the Upper Mississippi River Conservation Committee Level I sampling protocols (2013). The survey's purpose is to determine if there are Federally-listed species present in the Mitigation Site area. The survey results may be obtained by contacting the District.

- **Other Aquatic Organisms**
    - **Effects on Biota, Including Primary Producers (i.e., Zooplankton and Phytoplankton)**. Any impacts to suspension/filter feeders, and sight feeders, are anticipated to be short-term.
    - **Effects on Plankton, Nekton, and Benthos.** Because the likelihood of contamination by pollutants is generally low for projects involving dredging, the District anticipates the impacts to the aquatic ecosystem to be short term and not significant. Effects on plankton would be minimal.

The dredge cuts would remove naturally occurring sand in the river's main channel, but these areas are highly fluid from shifting sand and periodic dredging. Because of the shifting sand, benthic organisms are very sparse in the main channel. The benthos would not be affected by terrestrial dredged material placement.

The District's hydraulic modelling indicates there should be little erosion and offsite material movement at the placement site. The benthic community in the main channel border is adaptive to sediment fluctuations and any erosion from the bathtub site will not significantly increase the normal bedload downstream.

Effects on nekton would be limited to displacement and temporary disruption of foraging patterns. Because the proposed activities are generally held to low-flow (hence, non-spawning seasons), impacts to spawning species should be negligible.

- **Effects on Aquatic Food Web.** The District does not anticipate any negative affect to the food web.
- **Other Wildlife.** Other wildlife normally present would temporarily avoid the project area during the construction. The proposed action would not negatively affect the food chain or critical habitat requirements of other wildlife. The project may provide additional foraging, resting, and nesting sites for migratory birds and turtles.

- **Special Aquatic Sites**
  - **Sanctuaries and Refuges.** The project would not affect any sanctuary or refuges. Although the US Fish and Wildlife Service's Upper Mississippi National Wildlife and Fish Refuge surrounds the Bathtub site, it is located on Corps-managed lands.
  - **Wetlands.** The project would impact approximately 11 acres of wetlands. Specifically, 9.7 acres of deep and shallow marshes, and 1.4 acres of sedge meadows. The wetland cover types were defined using the Wisconsin Department of Natural Resources Mitigation Summary Worksheet and cover type descriptions (http://dnr.wi.gov/topic/Wetlands/mitigation/WWCT.html). The District's In-lieu fee mitigation program application is located at the end of Appendix G.
  - **Mudflats.** The proposed action would not affect any mudflats.
  - **Vegetated Shallows.** The proposed action would affect existing vegetative shallows on the Corps-managed island. The District would conduct compensatory mitigation to offset the loss of these 1.4 acres of sedge meadow wetlands.
  - **Coral Reefs.** The proposed action would not affect any coral reefs.
  - **Riffle and Pool Complexes.** The proposed action would not affect any riffle and pool complexes.

- **Human Use Characteristics**
  - **Municipal and Private Water Supplies.** The proposed action would not affect any municipal and private water supplies.
  - **Recreational and Commercial Fisheries.** The proposed project may increase recreational and commercial fishing opportunities.

- **Water-related Recreation.** The proposed action would not affect any water-related recreation.
- **Aesthetics.** The dredging operations are temporary in nature and would not impair aesthetics from the shoreline or by boat for a very long time. The Bathtub site would temporarily impact aesthetic resources, however, its location is not near any communities, homes, or parks. The District anticipates the bermed portion of the site to quickly vegetate and blend into the surrounding viewshed. Finally, dredged material placement sites are part of the fabric in the UMR and are not unexpected from boaters of other river users.
- **Parks, National Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves.** The proposed action would not affect any parks, national historical monuments, national seashores, wilderness areas, research sites, and similar preserves.

III. REFERENCES

Ecological Specialists, Inc. 2017. Final Report, Mussel Survey, Hurricane Island DMMP, Pool 11, River Miles 593.4 – 599.0, Mississippi River. ESI Project No. 16-016. 150pp.

USEPA/USACE. 2004. "Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework," EPA842-B-92-008, U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, Washington, D.C.

UPPER MISSISSIPPI RIVER
DREDGED MATERIAL MANAGEMENT PLAN
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

SITE PLAN FOR THE
HURRICANE ISLAND REACH

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

APPENDIX G-1

CLEAN WATER ACT,
SECTION 404(b)(1) EVALUATION

FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

1. The District made no significant adaptations of the 404(b)(1) Guidelines relative to this evaluation.

2. Evaluation of Alternative Plans. (See Feasibility Report, Section 3.3.2)

Alternative A – No Action. In compliance with the NEPA, the District considered the No Action Alternative along with the alternatives developed and documented in the feasibility report. The No Action Alternative is defined as "no change" or "business as usual". Dredging would continue as in the past without a new plan. The District would continue to place material on historic bankline locations with the concurrence of the OSIT in accordance with the Federal mandate to maintain commercial navigation.

Alternative B- RM594 Bathtub to Farm Fields/Sand Quarry. After obtaining local landowner interest in the use of the material nearby the cut, the RM 591.0L farm fields/quarry site remained for future consideration for long term placement. However, due to the approximately 15,000 feet of distance from the cuts to the farm fields/quarry site, a temporary stockpile site will have to be in place in order to meet operation criteria. This stockpile site would be designed in the form of a "bathtub" with outer berms constructed and then the interior is filled. The staging area and berms would be constructed using the existing sand on Finley's Landing, dredged material from the approach channel or from the dredge cuts. Once the site reaches near full capacity, which is estimated at Year 20 or 200,000 CY, material would be hydraulically pumped to the final long-term placement site, identified as the farm fields/quarry. Since the bathtub site is located in a high saturated area, there are anticipated wetland impacts. Appendix G-3, *Compensatory Wetland Mitigation Plan,* details the mitigation alternatives screening. Minimization and avoidance of federally-listed endangered mussels and wetland impacts were heavily considered when evaluating the alternatives. The temporary bathtub sites needed to be able to store the necessary amount of dredged material, which was another

consideration in evaluating the alternatives. Ultimately, Alternative B has been determined as the Preferred Alternative with compensatory mitigation requirements. The OSIT worked cooperatively to development permittee-responsible mitigation (PRM) plans meeting the wetland mitigation goals (Appendix G-3). Following full consideration of all DMMP planning, policies, and procedures, any or all of this area may be considered as proposed for dredged material placement. A planning level "present worth cost analysis" was prepared for the Hurricane Island Reach DMMP which included lands and damages, dredging, planning engineering, design and construction management. In addition, existing sites (Finley's Landing and Hurricane Island) would continue to be used upon OSIT approval.

3. This project complies with 40 CFR 230.11 Guidelines and project conditions to minimize pollution or adverse effects to the affected aquatic ecosystems. The District considered all the resources identified in 40 CFR 230 Subparts A, B, C, D, E, F, G, and H in this Evaluation.

4. The District would obtain the permits, certification, and/or waiver of certification under Section 401 of the Clean Water Act before construction begins. The project will be in compliance with water quality requirements of the State of Wisconsin.

5. This project would not introduce significant quantities of toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.

6. No significant impact to State or Federally listed threatened or endangered species is anticipated from this project.

7. The project would not affect any municipal or private water or degrade any waters of the United States.

8. The project would not affect marine sanctuaries.

9. The materials used for construction would be chemically and physically stable and noncontaminating.

10. The District, State, and Federal agencies, or the public have not identified other timely, practical alternatives. The proposed action is in compliance with the Clean Water Act, Section 404(b)(1), as amended. The proposed actions would not significantly impact water quality and would improve the integrity of an authorized navigation system.

17 Aug 2017
Date

Craig S. Baumgartner
Colonel, Corps of Engineers
District Commander

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

APPENDIX G-2

DRAFT MEMORANDUM OF UNDERSTANDING BETWEEN THE U. S. ARMY CORPS OF ENGINEERS, ROCK ISLAND DISTRICT, AND THE STATE OF WISCONSIN, DEPARTMENT OF NATURAL RESOURCES

DRAFT MEMORANDUM OF UNDERSTANDING
BETWEEN THE
U. S. ARMY CORPS OF ENGINEERS, ROCK ISLAND DISTRICT,
AND THE
STATE OF WISCONSIN, DEPARTMENT OF NATURAL RESOURCES
CONCERNING PLACEMENT OF DREDGED MATERIAL

This agreement is entered into by and between the U.S. Army Corps of Engineers, Rock Island District, and the state of Wisconsin, Department of Natural Resources, pursuant to section 30.202, Wisconsin Statutes, for the purpose of facilitating long term channel maintenance and recreational beach enhancement activities related to the placement of dredged material for the Upper Mississippi River System (UMRS) Nine-Foot Channel Project (Project), Upper Mississippi River Restoration Program - Habitat Rehabilitation and Enhancement Projects, water level management projects, and any future ecosystem restoration programs such as the proposed Navigation and Ecosystem Sustainability Program (NESP).

WHEREAS, the state of Wisconsin, Department of Natural Resources (hereinafter Department) regulates dredging and placement of materials in the lakes, rivers and streams of the state of Wisconsin to protect the public interest, fish and wildlife resources, water quality, flood flow capacity, recreational uses and the riverine environment, under the Wisconsin Public Trust Doctrine; and

WHEREAS, the U.S. Army Corps of Engineers (hereinafter Corps) has the responsibility and authority under Federal law to conduct dredging operations in the Project to protect the public interest in maintaining and improving navigability in and near the Mississippi River; and

WHEREAS, the Great River Environmental Action Team, GREAT II, and the UMRS Master Plan have developed a comprehensive Mississippi River Channel Maintenance Handbook after extensive research, detailed interdisciplinary evaluations, the consideration of environmental consequences, and with the participation of the state of Wisconsin, the Corps, the U. S. Fish and Wildlife Service, and other agencies and states; and

WHEREAS, the GREAT II Channel Maintenance Handbook was endorsed by the UMRS Master Plan which was adopted by the Upper Mississippi River Basin Association on January 1, 1982; and

WHEREAS the Wisconsin Legislature enacted section 30.202, Wisconsin Statutes, effective April 26, 1982, and found that:

1. The regulation of placement of the dredged material associated with Mississippi River navigation projects of the Corps required a balancing of public interest, and the interests of the Federal government, and State of Wisconsin and other states; and

2. The existing state statutes, rules, and ordinances do not provide sufficient latitude to provide a balanced approach to the regulation of the placement of these dredged materials for the Mississippi River nine-foot channel conditions; and

3. Because of these special circumstances a more flexible regulatory mechanism needed to be developed by the Department and the Corps; and

WHEREAS the Wisconsin Legislature in section 30.202, Wisconsin Statutes, authorized the Department to enter into a Memorandum of Understanding with the Corps concerning dredged material placement based upon the extensive studies of GREAT II and the UMRS Master Plan and;

WHEREAS members of the Corps, U.S. Fish and Wildlife Service, and states refined GREAT II study recommendations into a District-wide long-term document for management of dredged materials called the *Long-Term Management Strategy for Dredged Material Placement, Upper Mississippi River Miles 300-614, Main Report, August 1990* (hereinafter LTMS). This document outlines a procedure for developing individual site plans. According to 33 CFR, Parts 335-338, "District Engineers should identify and develop dredged material disposal management strategies that satisfy the long-term (greater than 10 years) needs for Corps projects." Engineering Regulation 1105-2-100 states that plans are to be developed to meet dredging needs for a minimum of 20 years.

WHEREAS Section 1103 of the Water Resources Development Act of 1986 authorized the Corps of Engineers, in consultation with the Secretary of the Interior and the States of Iowa, Illinois, Minnesota, Missouri, and Wisconsin, to undertake, as identified in the Master Plan, an Environmental Management Program now called (Upper Mississippi River Restoration) for the planning, design, construction, and evaluation of habitat rehabilitation and enhancement projects, which include the placement of fill in the Upper Mississippi River floodplain.

WHEREAS Section 8001, *et seq.*, of the Water Resources Development Act of 2007 authorized the Corps to undertake, in consultation with Secretary of Interior, the Upper Mississippi River Basin Association, and States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, navigation improvements and restoration of the ecosystem for the Upper Mississippi River and Illinois Waterway System substantially in accordance with the Final Integrated Feasibility Report and Programmatic Environmental Impact Statement for the UMR-IWW System Navigation Feasibility Study. This program of improvement is known as the Navigation and Ecosystem Sustainability Program (NESP). Work under this authority could include the placement of fill in the UMR floodplain.

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, it is agreed between the Corps and the Department:

1. This Memorandum of Understanding is entered into by the Department under the authority granted to the Department by Section 30.202 Wisconsin Statutes, and shall be construed to be in conformance with that legislation (chapter 240, Laws of 1981).. Should a conflict arise between Section 30.202 and applicable Federal law, this agreement will be voidable at the option of either party.

2. Channel maintenance, Upper Mississippi River Restoration, bankline stabilization, water level management, and proposed Navigation and Ecosystem Sustainability Program activities related to placement of dredged material subject to this agreement and carried out in accordance with this agreement are exempt from any prohibition, restriction, requirement, permit, license, approval, authorization, fee, notice, hearing, procedure or penalty specified under sections 29.601, 30.01 to 30.20, 30.21 to 30.99, 59.692 or 87.30 or chapters 281 to 285 or 289 to 299, Wisconsin Statutes, or specified in any rule promulgated, order issued or ordinance adopted under those sections or chapters.

Note: This section was updated on 6.2.2016 to reflect the current language of Section 30.202(3) of Wisconsin Statutes.

3. The Corps will continue to implement a sound, balanced, long-term channel maintenance program that is consistent with the objectives of the GREAT II study recommendations and LTMS. The Corps will comply with the dredged material placement methods, equipment and policies contained in the LTMS or any changes coordinated through the River Resources Coordinating Team (RRCT). Within the authorities provided to the Corps, and in compliance

with all applicable Federal laws and regulations, the Corps' long-term management strategy for channel maintenance will include acquisition of necessary real estate, advance preparation of sites and access to them, modification of channel control structures, dredging sediment traps and implementation of dredging quantity reduction measures.

4. The Corps may place dredged material at approved sites and conduct other approved specific activities related to channel maintenance, beach enhancement activities, Upper Mississippi River Restoration - Habitat Rehabilitation and Enhancement Projects, and NESP projects, resulting in the placement of dredged material on the UMRS according to the conditions contained herein, and/or according to additional conditions applied through the OSIT process described in the LTMS, GREAT II, and Dredged Material Management Plans, or UMRR project reports "Approved sites" under this agreement are:

(a) the endorsed DMMP sites located in Wisconsin, which are described and mapped in the GREAT II studies, and Dredged Material Management Plans are found in Exhibit A. A list of the Dredged Material Management Plans prepared for dredge cuts in Pool 11 can be found in Exhibit A(2).

(b) the endorsed Definite Project Report for Environmental Management Program (now called Upper Mississippi River Restoration) - Habitat Rehabilitation and Enhancement Projects, the endorsed Definite Project Report for water level management projects, the endorsed ecosystem restoration measures, and the endorsed Floodplain Forest Restoration projects that may come as a result of an authorization of Navigation and Ecosystem Sustainability Program (NESP) located in Wisconsin and found in Exhibit B.

(c) the endorsed bankline stabilization sites found in Dredged Material Management Plans and GREAT II located in Wisconsin and found in Exhibit C.

5. The Corps will comply with the General Information Section, appendices, and timelines established in Dredged Material Management Plans. The Corps will follow the Standard Operating Procedures developed for sediment sampling in Wisconsin Waters (Appendix A). For General Sediment Analysis Procedures and handling:

(a) The Corps will comply with those special conditions and standards, which are developed through consultation between the Department and the Corps for the disposal of dredged material, which contains hazardous material defined as hazardous wastes under section 291.01(7), Wisconsin Statutes.

(b) Annual updates will be made to the sediment database.

(c) An Annual Report summarizing data collected that year will be prepared and provided to the Department by the following RRCT Meeting.

(d) A winter OSIT meeting will be held to discuss the previous year's monitoring and to set sampling priorities for the upcoming year for the Channel Maintenance program. A winter FWIC or RRCT meeting will be held to discuss sampling proposed or conducted under the UMRR program.

(c) Routine updates on quality of surficial sediments in the historic dredge cuts will be made at a frequency of 5yrs, or as prioritized during the winter OSIT meeting.

(d) If there is reasonable uncertainty about vertical heterogeneity, a stratified core sample will be obtained.

6. Approved dredged material placement sites will be categorized as permanent, transfer, emergency, and in-water rehandling and are described below:

(a) Permanent - Those sites listed within Exhibit A and Exhibit C of this document and identified as being permanent placement sites for dredged material. The Corps is not responsible for further removal of material from these locations. These sites are generally beneficial use sites where active removal of material is possible. Permanent placement sites may also provide direct benefits to enhance recreational or environmental resources.

(b) Transfer - Those sites listed within Exhibit A and Exhibit C of this document and identified as transfer sites. Those sites used as an interim holding location until the area is filled and it can be economically removed and transferred to a designated permanent site. The capacity of a transfer site is determined by safe operating practices and the existing boundaries of the site. Site boundaries will only be expanded after coordination with the RRCT. Should it be determined that a transfer site is no longer needed, the Corps will investigate and evaluate options for final disposition of the transfer site. One of the preferred options will include removal of the excess material remaining at the transfer site and restoring the area to an appropriate habitat. Investigations will include seeking a permanent location for the excess material. Other options will include reshaping the site, capping with fine sediments and revegetating the area. Any option will include consultation with Federal and state regulatory agencies to complete restoration work.

(c) Emergency - Those sites listed in Exhibit A and Exhibit C of this document are identified as emergency sites. Those sites designated for use only when an emergency condition or imminent closure condition exists in the channel and the necessary equipment or time is not available to place material at a permanent or transfer site. Material placed at an emergency site will be removed and transferred to a permanent or transfer site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two calendar years from the time of the emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached between the Department and the Corps.

(d) In-Water Rehandling – There are currently no sites solely designated as in-water rehandling sites in Wisconsin Waters. The sites listed in Exhibit A and Exhibit C of this document may be used as rehandling sites if necessary. In-water rehandling sites are sites which are required to reach the permanent site because of equipment reach limitations. In-water rehandling sites needed on a reoccurring basis will be designated as part of the permanent site operating plan. Material is temporarily stockpiled at the in-water rehandling site and then removed as soon as possible during the final stage of the dredging events. In-water rehandling sites are selected to coincide with a portion of the dredge cut if possible. If that is not possible, rehandling areas are selected to minimize habitat disturbance and potential for secondary movement of the material before it can be rehandled.

7. Emergency and imminent closure dredging creates conditions for dredging that may differ from routine dredging. The advance planning and preparation of the Dredged Material Management Plans should minimize the need to place dredged material in locations other than those described in the plan. However, emergency and imminent closure definitions are necessary for unpredictable situations.

(a) Emergency dredging is defined as dredging required to free a grounded vessel, remove shoals in the channel as a result of a vessel freeing itself, or restored to allow vessel passage. The emergency will continue only until an adequate channel depth and width, as determined by the Corps, is restored to allow vessel passage.

When the Corps determines that emergency dredging is required, immediate notice will be given to the U. S. Coast Guard, the appropriate Federal and state regulatory agencies, and representatives of the on-site inspection team. Equipment will be mobilized directly to the site and dredging will be accomplished as expeditiously as possible to restore navigation.

The placement site selection process will include use of the on-site inspection team, coordination with regulatory agencies, and consideration of environmental values, to the extent practical under the existing conditions. The selection procedure of a placement site for emergency dredging is in priority order:

i. DMMP Permanent and Transfer placement sites, as amended.

ii. Other sites as determined by the Corps, and if possible in consultation with Federal and state regulatory agencies.

(b) Imminent Closure is defined as dredging required because the actual water depth is projected by the Corps to be 10 feet or less within 14 days or less; or the channel width is less than 85% of the normally maintained width.

The imminent closure provision is intended to avoid the need for emergency dredging by preventing foreseeable closures of the navigation channel. When an imminent closure condition, as defined, is recognized, the Corps will follow the same notification procedure for emergency dredging, including furnishing appropriate agencies technical information justifying the imminent closure projection. Before beginning dredging, however, the Corps will conduct an additional channel survey to ensure the site will not stabilize at a depth of ten feet or greater.

The site selection procedure for imminent closure is in priority order:

i. DMMP Permanent or Transfer placement sites, as amended.

ii. Other sites as determined by the Corps, and if possible in consultation with Federal and state regulatory agencies.

(c) The Corps will report to the Department within 30 days when both of the following conditions exists: 1) emergency or imminent closure dredging has taken place, and 2) dredged material cannot be placed in a DMMP permanent or transfer placement site. The Corps will supply the following information in the report:

1) nature of occurrence that necessitated the emergency or imminent closure dredging, 2) survey date, 3) dredging depths, 4) volume of dredged material, 5) type(s) of dredging equipment used, 6) method(s) of dredged material placement, 7) available data concerning the chemical and physical composition of the sediment, 8) duration of dredging operation, including beginning and end dates, 9) project placement sites, 10) discussion of mitigative measures that were considered and used, 11) discussion of any biological effects, and 12) written projections of water surface and depth.

8. Consultation, coordination, and resolution of disagreements:

(a) The Corps will coordinate dredging actions though the OSIT. Dredging actions will be in accordance with Dredged Material Management Plans and follow coordination procedures as identified in this MOU.

(b) In the event of emergency dredging where a non-designated site was used, if, after following procedures as identified in the Dredged Material Management Plans and this MOU Section 7, an agreeable resolution is not achieved, a consultation will be held between the Department and the District Engineer. In the event of continued disagreement, the Department or Corps may pursue further action through normal regulatory procedures.

9. The Corps and the Department will continue their cooperative efforts to identify and promote the beneficial uses for dredged material and will maintain an ongoing program to assure full consideration of such beneficial uses in decisions regarding dredged material placement. The Department and the Corps will keep current the list of beneficial users and notify each other of any additions or deletions. The Corps will not be responsible for removing the material if others do not remove it unless otherwise agreed to by the Corps and the Department.

10. The Corps will exert its best efforts to minimize water quality impacts associated with effluent discharges from placement sites. Such efforts will be determined on a site specific basis within operational and equipment limitations and may include, but are not limited to, construction of baffles, use of drop structures, ponding and moving the discharge pipe to prevent short circuiting. The Corps will exert its best efforts to minimize erosion from placement sites through BMPs such as rock stabilization, grading, revegetation, or other measures as funding allows; and within the authorities provided to the Corps; and in compliance with all applicable Federal laws and regulations.

11. The Corps will require that all Corps contractors performing work under this MOU abide by the provisions contained herein.

12. The terms of this agreement shall be from the date of last signature of the parties until _____. The agreement may be modified by mutual written agreement of the parties. Should modifications be necessary to the main body of this agreement, the parties will use the RRCT in an advisory capacity to coordinate those changes and follow up by securing Department of Natural Resources Secretary's and Rock Island District, Corps of Engineers, District Commander's signatures to confirm those changes. Any modifications necessary to Exhibits A, B, or C will be coordinated through formal mutual agreement between the Corps' and the Department's designated RRCT representatives and will not require the Secretary's or Commander's signatures to certify the change. This agreement may be terminated by either party upon furnishing written notice to the other party 60 days prior to the date of termination.

13. The liaisons for this agreement are:

(a) for the Department: Mississippi River Team Leader, WDNR La Crosse Service Center, 3550 Mormon Coulee Road, La Crosse, WI 54601 (telephone 608.785.9004).

(b) for the Corps: _____ , Rock Island District , Clock Tower Building, Rock Island, IL 61204-2004 (telephone _____).

14. The Corps and the Department agree that the purpose of this agreement is to comply with section 30.202, Wisconsin Statutes, and that nothing in this agreement shall be construed as an admission or waiver of any sort in any other action or proceeding nor shall this agreement constitute an expansion of either party's jurisdiction over the Corps dredging or dredged material placement operations.

In witness whereof, the parties have hereunto set their hands.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By _____ _____
Cathy Stepp, Secretary Date

U. S. ARMY CORPS OF ENGINEERS - ROCK ISLAND DISTRICT

By _____ _____
Col. Craig S. Baumgartner, District Commander Date

EXHIBIT A

Wisconsin Approved Dredged Material Placement Sites from DMMPs, as of 2/17

Site Number [1]	Old Number	Site Name	Acreage	Approval	DMMP Report
11-608.0-LWP	5	Alliant Energy, Nelson Dewey Plant (WI Light and Power)	0.9	RRCT 12/86	Pool 11 Plan 1987, Finley's 1999
11-606.5-LWP	3	City of Cassville [2]	N/A	RRCT 12/86	Pool 11 Plan 1987
11-606.0-LWP	6	Dairyland Power	8.6	RRCT 12/86	Pool 11 Plan 1987, Turkey River 1998 Finley's 1999, Hurricane 1999
11-594.2-LWT	N/A	Bathtub	11	pending	Hurricane, Finley's 2017
11-592.0-LWP	N/A	Quarry Sites	TBD	pending	Hurricane, Finley's 2017

[1] Placement category as indicated by last letter of site number:
P = Permanent Site, T = Transfer, I = In-Water Rehandling Site

[2] GREAT Site 11.12 was used once in 1981.

EXHIBIT A(1)

Wisconsin Dredged Material Placement Sites With Prior Approvals, But Not in DMMP Reports as of 2/2017

Site Number [1]	Old Number	Site Name	Acreage	Approval	DMMP Report
11-607.7-LWP	GREAT 11.8	No Name [2]	GREAT II	N/A	11-607.7-LWP
11-606.5-LWP	GREAT 11.12	Cassville Beach [2]	GREAT II	N/A	11-606.5-LWP
11-604.5-LWP	GREAT 11.13	Gravel Pit [2]	GREAT II	N/A	11-604.5-LWP
11-604.2-LWP	GREAT 11.14	Gravel Pit [2]	GREAT II	N/A	11-604.2-LWP
11-585.0-LWP	GREAT 11.22	Gravel Pit [B]	GREAT II	N/A	11-585.0-LWP
12-581.5-LWP	GREAT 12.1	Recreation Beach [3]	GREAT II	N/A	12-581.5-LWP

[1] Placement category as indicated by last letter of site number: P = Permanent Site, T = Transfer, I = In-Water Rehandling Site

[2] These sites have never been used for placement. They have been excluded from further consideration in DMMP reports to date due to operational feasibility or environmental impacts required to access the sites. These sites cannot be used by the District without further coordination to ensure compliance with the National Environmental Policy Act (NEPA).

[3] GREAT Site 12.1 was used once in 1962. This site cannot be used by the District without further coordination to ensure compliance with the NEPA.

EXHIBIT A(2)

Dredged Material Management Plans in Pool 11

- *Pool 11 Dredged Material Disposal Plan Mississippi River, River Miles 583.0 to 615.1*, March 1987
- *Dredged Material Management Plan for Dredged Material Placement, Mississippi River Miles 607.8 – 610.9, Site Plan for the Turkey River Dredge Cut,* November 1995
- *Dredged Material Management Plan for Dredged Material Placement, Upper Mississippi River Miles 607.8 - 610.9, Pool 11, Site Plan for the Turkey River Dredge Cut*, September 1998
- *Dredged Material Management Plan for Dredge Material Placement, Upper Mississippi River Miles 595.5 – 596.5, Pool 11, Site Plan for the Finley's Landing Dredge Cut,* July 1999
- *Dredged Material Management Plan for Dredged Material Placement, Upper Mississippi River Miles 598.7 – 599.1, Pool 11, Site Plan for the Hurricane Island Dredge Cut,* September 1999
- *Upper Mississippi River Dredged Material Management Plan With Integrated Environmental Assessment, Site Plan for the Hurricane Reach, Pool 11 Dubuque County, IA and Grant County, WI, Upper Mississippi River, River Miles 591-599,* 2016

EXHIBIT B

Ecosystem Restoration and Enhancement Projects - Wisconsin, as of 12/2016

Site Number	Site Name	Category [1]	Approval
11-609.3-603.2-LW	Turkey River Bottoms	UMRR	RRCT 9/2010
11-602.8-599.0-LW	Bertom-McCartney Habitat Project	EMP	RRCT 3/1989
11-599.0-595.0-LW	Snyder Slough Backwater Complex	UMRR	RRCT 9/2010
11-592.0-583.0-LW	Pool 11 Islands, Sunfish and Mud Lake	EMP	RRCT 10/2001

[1] Category Descriptions:
UMRR = Upper Mississippi River Restoration (formerly EMP – Environmental Management Program)

EXHIBIT C

Bankline Stabilization Sites – Wisconsin, as of 1/2017

Site Number [1]	Old Number	Site Name	Approval	DMMP Report
11-598.6-LWP	8	Hurricane Island Beach	RRCT 12/86	Pool 11 Plan 1987, Hurricane 1999

[1] Placement category as indicated by last letter of site number:
P = Permanent Site, T = Transfer, I = In-Water Rehandling Site

UPPER MISSISSIPPI RIVER NAVIGATION SYSTEM
ROCK ISLAND DISTRICT – WI WATERS

APPENDIX G-2-A

STANDARD OPERATING PROCEDURES
FOR SEDIMENT EVALUATION

UPPER MISSISSIPPI RIVER NAVIGATION SYSTEM
ROCK ISLAND DISTRICT – WI WATERS

STANDARD OPERATING PROCEDURES FOR SEDIMENT EVALUATION

UPPER MISSISSIPPI RIVER NAVIGATION SYSTEM
ROCK ISLAND DISTRICT – WI WATERS

STANDARD OPERATING PROCEDURES FOR SEDIMENT EVALUATION

1. INTRODUCTION

1.1. Purpose. There are approximately 10 dredge cuts on the Upper Mississippi River (UMR) within the Rock Island District (District) waters of the State of Wisconsin, with annual dredging frequencies ranging from annual to less than once every 10 years. Because of the number of dredge cuts, the variability of the frequency of dredging, and the short time between the determination of the need for and the actual dredging, a standard operating procedure (SOP) for sediment evaluation and contaminant determinations is needed to provide a consistent and expedient decision-making process.

1.2. Existing Data Base. The existing bulk chemical, elutriate and physical data were summarized in Table 3 of the Section 404(B)(1) *Evaluation, Maintenance Dredging of the 9-Foot Channel Navigation Project Upper Mississippi River, River Miles 300.0 - 614.0, June 2014.* These tables will be updated annually, and provided to the agencies during the winter On-Site Inspection Team meetings. These data are also available electronically at http://www.umesc.usgs.gov/ as maintained by the Upper Midwest Environmental Science Center. As new data are generated, they will be input into this database as budget and schedules allow.

1.3. Applicability. This SOP is applicable to regulatory requirements of the Clean Water Act associated with the maintenance of the 9-foot Navigation Channel on the UMR, within State of Wisconsin waters of the Rock Island District. The testing and evaluation procedures described herein provide only a portion of the information necessary for a complete evaluation as required by Section 404(b)(1) and Section 401. This protocol deals only with evaluating the potential impacts of contaminants on aquatic biota from open water placement or return water from terrestrial placement sites. A variety of other factors, including physical impacts, has to be considered when evaluating a project.

1.4. Background. The guidance used to establish the SOPs described in this document was primarily derived from two sources: 1) EPA-823-B-98-0004 (Inland Testing Manual), *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual (*EPA/USACE. 1998); and 2) *Procedures for Handling and Chemical Analysis of Sediment and Water Samples* Technical Report EPA/CE -81-1 (Plumb).

2. TESTING APPROACH

2.1. Tiered Evaluation. A tiered testing approach consistent with the Inland Testing Manual, with a decision-making process at the end of each tier, is recommended as the standard testing and evaluation protocol. This approach, which uses tests of increasing complexity and sophistication to reach decisions with greater degrees of confidence, provides a defensible and technically sound rationale for decision-making. This approach allows for economical, environmentally sound early decisions in the planning process, when the conclusions from the early tiers so warrant. More effort, funding, and sophisticated tests are concentrated on projects of greater concern.

Tier I is an initial evaluation using only existing information, including:

1) particle size gradation, which can indicate a potential for contaminant levels;
2) available sediment quality data from within or near the project area;
3) historical input information, including type and proximity to point and non-point discharges, spills, and other sources of pollution;
4) sedimentation history to determine when and how the material to be dredged has accumulated;
5) description of project area, including identification of sensitive areas; and
6) project description, including quantities of dredged or fill material, and dredging and placement methods and sites being considered.

Tier II testing is performed to determine compliance with appropriate water quality standards and to predict theoretical bioaccumulation potential. The former is accomplished through the use of the modified elutriate test, while the latter involves chemical analysis of sediments and a predictive calculation based on contaminant and total organ carbon concentrations in the sediment. Tier III involves more sophisticated tests, including biological response tests (bioassays and bioaccumulation tests). The biological response tests concentrate on chronic toxicity and bioaccumulation potential from solid-phase sediments. Acute toxicity testing is not recommended. Based on the contaminant levels that have been found and the results of past acute toxicity testing, it would be extremely rare to find main channel sediments that produce acute toxicity. However, ammonia nitrogen levels in some sediments may be an exception, capable of causing acute toxicity. Appendix F of the Inland Testing Manual has a detailed discussion of "Specific Considerations for Assessing Ammonia Toxicity in Dredged Material."

2.2. Coordination/Decision Making Process. From the Tier I information, a determination is made about the potential for contaminants to be present at levels of concern. If there are concerns, the specific contaminants and types of problems associated with each of the project alternatives are identified. In making this determination, the adequacy of the data has to be considered. A lack of adequate information constitutes a reason to be concerned about contaminants. If there is no concern with contaminants, project planning proceeds without special project restrictions. If there is a concern with contaminants, the next step is to determine whether there is sufficient information to evaluate the potential effects of the project. If the answer is no, the next tier of testing proceeds. If the answer is yes, a decision is made whether economical and feasible restrictions can be made to the project to alleviate the contaminants concerns. This type of decision-making is followed after each tier.

The tiered approach is not intended to be rigid. In all cases, the Tier I initial evaluation should be performed. Beyond Tier I, decisions to continue with further testing, and the specific tests to be performed, are done on a project specific basis. In most cases, the tiers are followed in sequence, with an interagency decision process as outlined in the next paragraph, occurring at the end of each tier. However, it is not recommended that all the components within a given tier be done for all projects. This has to be decided on a project specific basis based on the results of the earlier tiers and other factors. Only those tests in a tier that are necessary to make a technically sound determination should be conducted.

2.2.1. Normal Updating of Existing Sediment Data Base. Because there are approximately 200 dredge cuts within the District and a very short time between determining the need to dredge and the actual dredging, it is not always possible to follow the tiered testing protocol sequentially. Routine

updating of the sediments database along with review of contaminant spills and point discharge records supplied by the appropriate agencies are used to determine if historically "clean" dredge cuts may have been negatively impacted. This process provides enough information to provide a Tier I decision. An annual report is prepared summarizing any data collected that year, and the sediment quality data in the Channel Maintenance Pool Plan, Tab 5, would be updated.

2.2.2. Project Specific Sediment Sampling. This section is for potentially larger projects, like new lock construction, or ecosystem restoration projects, where a decision is reached that the data provided by the routine updating of sediment quality does not provide adequate information to make a decision. These projects would be handled on a case-by-case basis, following the tiered testing approach described above in Section 2.1. Interagency coordination will be an integral part of the decision-making process. When the results of a tier are obtained, the Corps of Engineers would evaluate the results and make a preliminary determination. The results and the preliminary determination would then be coordinated with all the agencies having regulatory authority and a mutually agreed upon decision made. The agencies that would be included are the U.S. Environmental Protection Agency and the appropriate State agency having regulatory authority for the particular project. If a decision were reached to proceed to the next tier of testing, the number of samples, the sampling strategy, and the tests to be performed would be discussed with all the agencies and agreed to by the appropriate regulatory agencies for a particular project. Subsequent meetings of the technical experts would be held to discuss the interpretation of the results of the tiers and what, if any, additional testing would be required. A final contaminants determination would be included in the 404(b)(1) Evaluation that is prepared and circulated for public and agency review.

3. SEDIMENT SAMPLING PROTOCOL

3.1. Sampling Design

3.1.1. Normal Updating of Existing Sediment Data Base. When new information is available, the sediment quality database is updated in a timely manner, or at the request of CEMVR-OD (Channel Maintenance).

3.1.2. Project Specific Sediment Sampling. The ensuing discussion is for larger projects where a decision is reached that the data provided by the routine updating of sediment quality does not provide adequate information to make the decision. In designing the sampling protocol for a particular project, two major factors have to be considered; specifically, the anticipated analytical variability and the spatial heterogeneity. Measures to address analytical variability are included in the quality assurance/control section of this report. To handle horizontal heterogeneity, the most frequently used approach is stratified sampling with random sampling within the strata. This is done to reduce cost, while concentrating sampling efforts on the geographic areas of greatest concern. The reasons for stratifying the sampling can include proximity to a potential source of pollution, different sediment textures within the dredge cut(s), existing data indicating potential hot spots, different sedimentation history within the dredge cut(s), or any other reasons that would cause you to suspect and be able to predict spatial heterogeneity. If there is no basis for stratifying the sampling, then a completely randomized sampling is most appropriate. The number of sampling sites should be representative and would have to be decided on a project specific basis considering the degree of a real heterogeneity anticipated, the degree of contamination expected, and the quantities of dredged material and the placement methods being proposed.

The other source of spatial variability that needs to be considered in designing the sampling effort is vertical heterogeneity. A major concern expressed by the various agencies has been for the potential to re-expose sediments with higher concentrations of contaminants that are presently sequestered within the proposed dredge cut area. This concern is based on the fact that higher levels of persistent chemicals, such as PCs, were recorded in fish and surficial sediments in the 1960s and 1970s. Stratifying the sampling with depth quickly multiplies the amount of sampling effort and subsequently the cost.

Concern that vertical heterogeneity exists within the sediments is addressed by compositing core samples taken from depths representative of the dredge cut.

3.2. Sample Collection Methods. Sediment samples for analytical work should be collected with wide mouth corers (2 inches or greater). Samples for organic analysis should be collected with a stainless steel corer and samples for metal analysis should be collected with a PVC or similarly inert corer. To characterize the dredged material, composite samples should be collected to the depth of the proposed dredging.

3.3. Sample Storage. Sediment samples should be collected and stored at 4°C in glass containers with Teflon-lined caps for analysis of organics and either linear polyethylene containers or glass containers with Teflon-lined caps for analysis of metals. Water for elutriate preparation should be taken from locations representative of the dredge cut.

Sediment samples collected for elutriate analysis should be stored at 4°C in airtight linear polyethylene containers or glass containers with Teflon-lined caps. The elutriate procedure should be initiated within 1 week of collection. Water samples resulting from the elutriate procedure should be stored and preserved as specified for normal water samples in EPA (1983) and Plumb (1981).

4. ANALYTICAL PROCEDURE

4.1 Physical and Chemical Characterization. Using the principle of tiered testing, the specific chemical and physical parameters analyzed are determined on a case-by case-basis after consultation with appropriate State regulatory agencies. Table 1 lists the parameters to be analyzed on samples collected when there is no historic data to use as a baseline. Additional parameters would be added to evaluate a specific project, if it is suspected that other contaminants may be present at levels of concern. If an abbreviated list is decided on, at a minimum it should include elutriate ammonia nitrogen, cadmium, copper, chromium, lead, mercury, particle size, total organic carbon, total volatile solids, zinc, and PCBs.[1]. Thresholds are based on Wisconsin's Consensus Based Sediment Quality Guidelines, which list MEC threshold for evaluations.

[1] Note for PCBs, congener specific analysis will be proposed for future use. However, because there are over 200 congeners and there is no resolution on which set of congeners should be analyzed on a normal basis, it is not being proposed at this time.

Table 1. MVR Channel Maintenance Dredging Sediment Sampling Parameters for Wisconsin Waters

MVR - Channel Maintenance Dredging	Channel and Ecosystem **<20% Passing #200 Sieve** (both in-river and ben-use) **Mechanical or Hydraulic**	Channel and Ecosystem **>20% Passing #200 Sieve** (both in-river and ben-use) **Mechanical Dredging**	Channel and Ecosystem **>20% Passing #200 Sieve** (both in-river and ben-use) **Hydraulic Dredging**	TEC	MEC	PEC
Total Organic Carbon	**B (Bulk)**	B	B			
Particle Size	B	B	B			
Ammonium Nitrogen		B	E (Elutriate)			
Metals		mg/kg dry wt				
Arsenic	B	B	B	9.8	21.4	33
Cadmium	B	B	B	0.99	2.995	5
Chromium	B	B	B	43	76.5	110
Hexavalent Chromium	B	B	B		0	
Copper	B	B	B	32	91	150
Lead	B	B	B	36	83	130
Manganese	B	B	B	460	780	1100
Mercury	B	B	B	0.18	0.64	1.1
Nickel	B	B	B	23	36	49
Zinc	B	B	B	120	290	460
Sediment Contamininat		ug/kg dry wt. at 1% TOC				
Phenols	B	B	B	4200	8100	12000
PCB and Pesticides		ug/kg dry wt. at 1% TOC				
Total PCB's (c) (e.d.)		B	B	60	368	676
Sum O,P'+P, P' DDT		B	B	4.2	33.6	63
SUM DDD		B	B	4.9	16.45	28
SUM DDE		B	B	3.2	17.1	31
Chlordane		B	B	3.2	10.6	18
Dieldrin (c) (.e.d.)		B	B	1.9	31.95	62
PAH's		ug/kg dry wt. at 1% TOC				
Acenaphthene		B	B	6.7	47.85	89
Acenaphthylene		B	B	5.9	66.95	128
Anthracene		B	B	57.2	451.1	845
Benz(a)anthracene		B	B	108	579	1050
Fluoranthene		B	B	423	1326.5	2230
Benzo(b)fluoranthene		B	B	240	6820	13400
Benzo(k)fluoranthene		B	B	240	6820	13400
Pyrene		B	B	195	857.5	1520
Benzo(a)pyrene		B	B	150	800	1450
Benzo(g,h,i)perylene		B	B	170	1685	3200

4.2. Modified Elutriate

4.2.1. Elutriate Preparation. The modified elutriate procedure as described in Environmental Effects of Dredging Technical Notes - EEDP-04-2 (WES 1985) (EM 1110-2-5025) would be followed for samples that require elutriate evaluation. This procedure involves mixing a 3¾-liter slurry of sediment and dredging site water, with a concentration of 150 g/l (dry-weight basis) sediment, for 5 minutes using a laboratory mixer in a 1-gallon glass jar. This mixture is then bubble aerated for 1 hour to ensure oxidized conditions in the supernatant during the subsequent settling phase. This is then allowed to settle for 24 hours or the predicted project settling time as determined through the Column

Settling test described in Section 4.3. When trying to simulate the effects of open water placement of dredged material, the standard elutriate procedure rather than the modified elutriate procedures should be followed.

4.2.2. Analysis of Supernant. The supernatant samples are then treated and analyzed following the methods for water samples (EPA 1983). The modified elutriate procedure calls for the analysis of the dissolved and total fractions. For analysis of the dissolved constituents, the samples are first filtered (0.45 um filters) and/or centrifuged, depending on the specific parameters to be tested. Samples for analysis of total concentrations would undergo appropriate digestion (EPA 1983) prior to analysis. The volume of receiving water and sediment samples needed depends on the number and types of analyses to be performed.

The parameters tested in the filtered or whole supernatant should be those that were found to be of potential concern from the existing database or based on the results of the bulk chemistry obtained in the Tier II testing. The appropriate analytical water sample methods for each of the parameters shall be selected based on the detection levels needed to compare the results with the water quality criteria developed by EPA (1986, including revisions) and state water quality standards. Actual detection limits will vary slightly depending on the nature of the individual samples and the specific equipment of the laboratory and would be reported along with the data.

4.3. Column Settling Test. The column settling test is designed to provide a way to predict the concentration of suspended solids in an effluent and to define the settled behavior of a particular sediment. The protocol is described in EM 1110-2-5025. The tests are conducted in an 8" diameter ported column, usually with a test column depth of 6 feet, although this can be varied to approximate the effective settling depth at the placement area. A slurry of water and sediment (concentration of 150 g/l dry weight equivalent) is prepared and then allowed to settle. Samples for suspended solids analysis are then taken at prescribed depth intervals above the supernatant/settled solids interface over time. The suspended solids results can then be used to predict, including anticipated resuspension, the effluent quality after various times of settling.

4.4. Theoretical Bioaccumulation of Nonpolar Organic Chemicals. Neutral organic chemicals such as PCBs are distributed within an aquatic ecosystem primarily in the lipids of organisms and in the organic carbon fraction of the sediment. Several investigators have calculated the partition coefficient or preference factor for the neutral organics for organism lipid over sediment organic carbon. This preference factor has been estimated based on laboratory and field experiments at 4.0 (McFarland, 1987). This relationship then allows for a calculation of the maximum possible concentration that could result in an organism's lipid and subsequently whole-body bioaccumulation potential. This predictive model is relatively simple and is described as follows:

$TBP = pf * L * (C_s / FOC)$
pf = Preference Factor (a constant set to 4.0)
TBP = Maximum whole-body bioaccumulation potential (wet weight - in the same units of concentration as C_s.
L = Decimal fraction of an organism's lipid content (wet weight).
C_s = Concentration of chemical in the sediment (dry weight - any unit of measurement).
FOC = Decimal fraction of organic carbon content of the sediment (wet weight).

This predictive model assumes no metabolic degradation or biotransformation of the chemical and

total bioavailability of sediment-associated chemical to the organism. Therefore, estimates of TBP from this model can present a worst-case prediction of bioaccumulation from the sediments. The model does not take into account if a major source of the contaminants is from suspended solids or dissolved in the water or if bio magnification is an important consideration for the particular parameter of interest. The model was developed for sessile organisms living within and obtaining their life prerequisites from the sediments. For mobile species, such as fish, the predictive equation can be complicated by a variety of factors and should be considered a worst-case analysis. This predictive model is still very much state of the art and is based in theory and laboratory experiments, with some field verification (Clarke, McFarland, and Dorkin, 1988) and (Rubenstein, 1989). As additional research is conducted, slight modifications to this equation, especially for the preference factor constant, may occur.

The TBP for the proposed dredged material should be interpreted by comparison to the TBP of the reference material. If the TBP of the dredged material is not greater than that of the reference sediment, no bioaccumulation testing for non-polar organics may be necessary. For any non-polar organics having a consumption advisory, the TBP for the appropriate species and size/age classes should be evaluated.

The TBP algorithm is not suitable for sediments with FOCs of less than 0.5%. It can be presumed that some level of uptake would occur, if the contaminant concentration is greater and/or the total organic carbon is less in the dredged material versus the reference sediments. When the FOCs are less than 0.5%, the need for going on to Tier III bioaccumulation testing will have to be determined on a case-by-case basis. It should be noted that most main channel sediments on the UMR are relatively coarse and contains less than 0.5% FOCs.

In summary, the model will not provide a definitive answer for the bioaccumulation potential of neutral organics, but will provide a rough estimate that can be used to assist in the determination of whether bioaccumulation of neutral organics is a concern and whether a laboratory determination of bioaccumulation is warranted for a particular project.

5. QUALITY ASSURANCE/CONTROL PROCEDURES

5.1. Analytical – General. Contractors performing analytical work are required to have a comprehensive quality assurance/control program, including documentation following the procedures of U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. Contractor labs are required to have state certification.

5.2. Analytical - Project Specific. In addition to evaluating a contractor's quality assurance program, the following quality assurance measures are run routinely with every batch of samples analyzed by the contractor's laboratory.

5.2.1. Duplicate Samples. Duplicate or split samples are collected in the field for at least 10% of all samples collected, but never less than one duplicate per collection effort. The results of these split samples analyses are evaluated by the Corps to assess the performance of the contractor's laboratory. Subsequent duplicate samples collected are analyzed by the contractor's laboratory as field replicates.

5.2.2. Replicate Analyses. Replicate analyses are conducted for each parameter on a

minimum of 10% of the samples collected. The contractor computes the relative percent differences and/or the coefficient of variation and reports it with the data. Samples selected for replicate analysis are distributed equally among the different types of samples encountered.

5.2.3. Reagent Blanks. The contractor runs a minimum of one reagent blank for every 10 samples and every time samples are analyzed. The reagent blank is interspersed with the regular samples; it is not analyzed separately. Data for each reagent blank are reported along with other quality control data for any given analysis.

5.2.4. Spiked Samples. For each parameter possible, at least one sample is spiked with a known concentration and analyzed during the normal analytical procedure. Surrogate spiking is allowed for PCBs and would be allowed only for other parameters if the laboratory can provide sufficient documentation that the surrogate results reflect the normal recovery of the parameters actually being analyzed. Percent recovery would then be computed and reported with the rest of the data.

5.2.5. Blind Samples. At its discretion, the Corps provides blind water samples from the EPA Quality Assurance Laboratory in Cincinnati, Ohio, to the contractors for quality assurance testing of water samples. The contractor analyzes the samples with a normal run of collected or submitted samples. The results of this testing is reported with the data from that analytical period.

All contractors would be required to analyze established blind sediment sample as a preliminary screening. At its discretion, the Corps would also be provide blind sediment sample to the contractor along with a normal run of collected samples for quality assurance testing.

5.2.6. Uninterrupted Parameter Analysis. The Corps requires that the contractor analyze a single parameter or set of parameters for a group of samples during the same analytical session. All analyses for parameters in samples, reagent blanks, spiked samples, and blind samples would be conducted during the same analytical session. To clarify, once the instrument or procedure is set up and running for a given parameter or set of parameters, all samples and their associated controls are run. The instrument or procedure is not stopped, except for an emergency, until the analyses for that parameter are completed on all samples. If the analytical sequence is interrupted or delayed, upon resumption all blanks, spiked samples, and the remaining unknowns are run.

5.2.7. Performance Criteria. Acceptable accuracy on blind sample and spiked sample analyses is +/- 2 standard deviations of the mean value. If more than 5% of blind sample or spiked sample analyses exceed +2/- standard deviations of the mean value, the Corps may request that quality control be checked or may order another laboratory inspection. In addition, if blind sample or spiked sample analyses exceed + 3 standard deviations, the data for this set of samples would be rejected by the Corps. The Corps expects the coefficient of variation on replicate analyses to be less than 10% for most parameters.

6. REFERENCES

Clarke, Joan U., Victor A McFarland, and John Dorkin, 1988. Evaluating bioavailability of neutral organic chemicals in sediments -- a confined placement facility case study. Presented at U.S. Army Corps of Engineers Water Quality '88 Seminar, February 1988, Charleston, SC

McFarland, Victor, and John Clarke, 1987. Simplified approach for evaluating bioavailability of neutral organic chemicals in sediment. Environmental Effects of Dredging Technical Notes EEDP-01-8, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS

Palermo, Dr. Michael. 1985. Interim guidance for predicting quality of effluent discharged from confined dredged material placement areas -- test procedures. Environmental Effects of Dredging Technical Notes EEDP-04-02, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS

Plumb, R.H., Jr. 1981. Procedures for Handling and Chemical Analysis of Sediment and Water Samples. Technical Report EPA/CE-81-1. Prepared by Great Lakes Laboratory, State University College at Buffalo, N.Y., for the U.S. Environmental Protection Agency/Corps of Engineers Technical Committee on Criteria for Dredged and Fill Material. Published by the U.S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, MS

U.S. Environmental Protection Agency, Federal Register, October 24, 1986, Volume 49, No. 209, pages 43234 - 43442. Guidelines Establishing Testing Procedures for Analysis of Pollutants Under the Clean Water Act; Final, Interim and Proposed Rules

1986. Test methods for evaluating solid waste. Volume 1a. EPA 955-001-00000-1

1983. Methods for Chemical Analysis of Water and Wastes. EPA/600/14/79/020. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio

December 1982. Test methods for inductively coupled plasma - atomic emission spectrometric method for trace element analysis of water and wastes, Method 200.7

1979. Handbook for analytical quality control in water and wastewater laboratories. EPA-600/4-79/-019. Environmental Monitoring and Support Laboratory, Office of Research and Development, Cincinnati, OH

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

APPENDIX G-3

COMPENSATORY WETLAND MITIGATION PLAN

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

APPENDIX G-3

COMPENSATORY WETLAND MITIGATION PLAN

FIGURES

PHOTOGRAPHS

TABLES

APPENDICES

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

APPENDIX G-3

COMPENSATORY WETLAND MITIGATION PLAN

1. BACKGROUND

This appendix describes the mitigation planning process and resulting mitigation plan developed for the U.S. Army Corps of Engineers (Corps), Rock Island District's (District) Hurricane Island Reach Dredged Material Management Plan. The Hurricane Island Reach is located in the Mississippi River, Pool 11, between river miles (RM) 599 and 591 (Figure G-3-1). The U. S. Fish and Wildlife Service (USFWS) Upper Mississippi River (UMR) National Wildlife Refuge manages this reach of the river, as it pertains to their policies. The District proposes to place the dredged material at a small island (RM 594.1), located downstream of Hurricane Island. The District would construct a berm out of dredged material and then place dredge material inside the berm on an as needed basis. This is referred to as the Bathtub Site. Once the approximately 11-acre Bathtub Site is at full capacity, the District would remove the material and place it on an upland field/quarry along the Wisconsin shoreline. The main feasibility report details the Hurricane Island project's dredging history, project engineering, construction, and dredging techniques, and environment impact information.

The Hurricane Island Dredged Material Management Plan (DMMP) would provide a minimum of 20-year maintenance dredging plan for the UMR. The projected average dredging per 5-year event would be 50,000 cubic yards (CY) of sand, totaling 200,000 CY over 20 years.

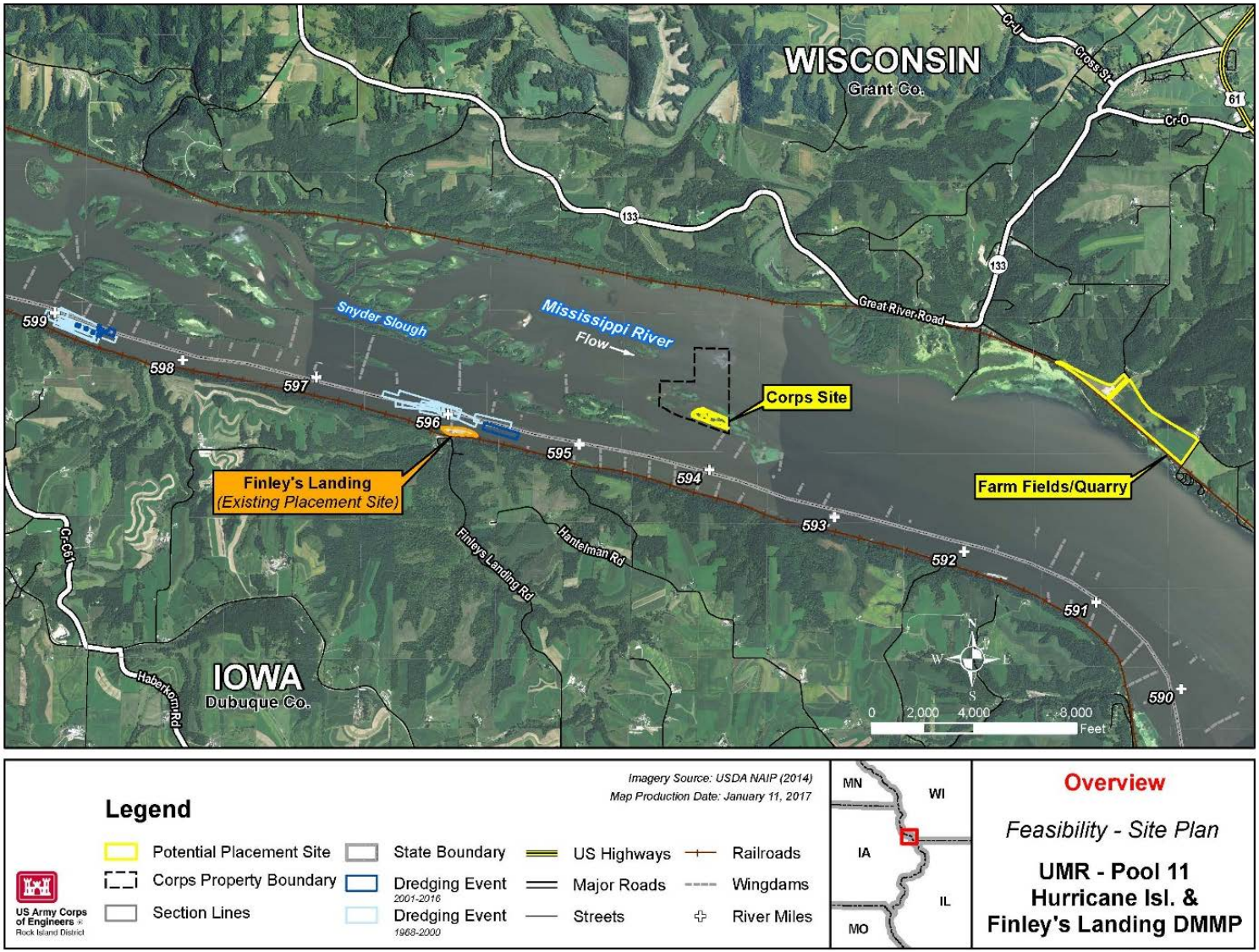


Figure G-3-1. Project Overview

2. WETLAND IMPACTS

The Bathtub Site is an approximately 11-acre low island located in the Mississippi River main channel border (Figure G-3-2). It has sparse woody vegetation with grasses and swamp milkweed dominating the higher points on the island. In the protected waters at island's middle to lower end, there are floating, emergent, and submergent vegetation (Photographs G-3-1 and G-3-2). The highest point on the island is 2 feet above the normal river elevation. The island's size and vegetation composition may vary seasonally and annually depending on river levels, erosion, and accretion effects. The U. S. Geologic Survey mapped out the UMR's hydraulic condition of the river's wetlands based on 2010 land cover analysis (Figure G-3-2). Table G-3-1 shows the types of wetlands and coverage area/percent.

On a site visit to the Bathtub Site on October 14, 2016, the District found the dominant wetland vegetation (seasonally flooded and saturated soils areas) is reed canarygrass (*Phalaris arundinacea*), Purple Loosestrife (*Lythrum salicarias),* scattered silver maple (*Acer saccharinum*), willow (*Salix nigra*), and swamp milkweed (*Asclepias incarnata*). Duckweed (*Lemna minor*), river bulrush (*Schoenoplectus fluviatilis*), softstem bulrush (*Schoenoplectus tabernaemontani*), and cattail (*Typha latifolia*) dominated the permanently and semipermanently flooded interior of the wetland. All these species are wetland obligate species (Midwest 2016 Regional Wetland Plant List). According to the Corps' National Wetland Plant List and Indicator Rating Definitions, obligate indicator status is defined as occurring at a 99% rating under natural conditions in wetlands. Therefore, the District determined the entire 11-acre Bathtub Site is a wetland.

The location of this wetland is in the middle of the river once part of the Wisconsin shoreline prior to the 9-foot navigation project. The 9-foot navigation project raised river levels three feet creating a patchwork of islands throughout this area. In the past 80 years, many of these islands have eroded leaving smaller isolated islands in this part of the Pool 11. Beavers, muskrats, raccoons, and other semi aquatic mammals frequent the island. Birds such as neotropical migrants, ducks and shorebirds also use the island for nesting and foraging. There is also beneficial habitat for fish during spring spawning and higher water periods. Fill in this area would have long-term adverse effects on the plant and animal community.

The wetland's location adjacent to the river shows potential for a minor amount of flood flow alternation function, through inundation of the site during flood events. This function is limited by the small size of the site. The site's problematic hydrology and fluctuating water levels makes it difficult to delineate the wetlands.

The island also provides some limited wind fetch reduction across a large expanse of water.

The wetland may provide minor nutrient removal/retention/transformation functions by allowing some filtering and sedimentation in the island's interior.

In addition, visual quality/aesthetics are considered through the presence of readily identifiable wetlands with corresponding wildlife usage.

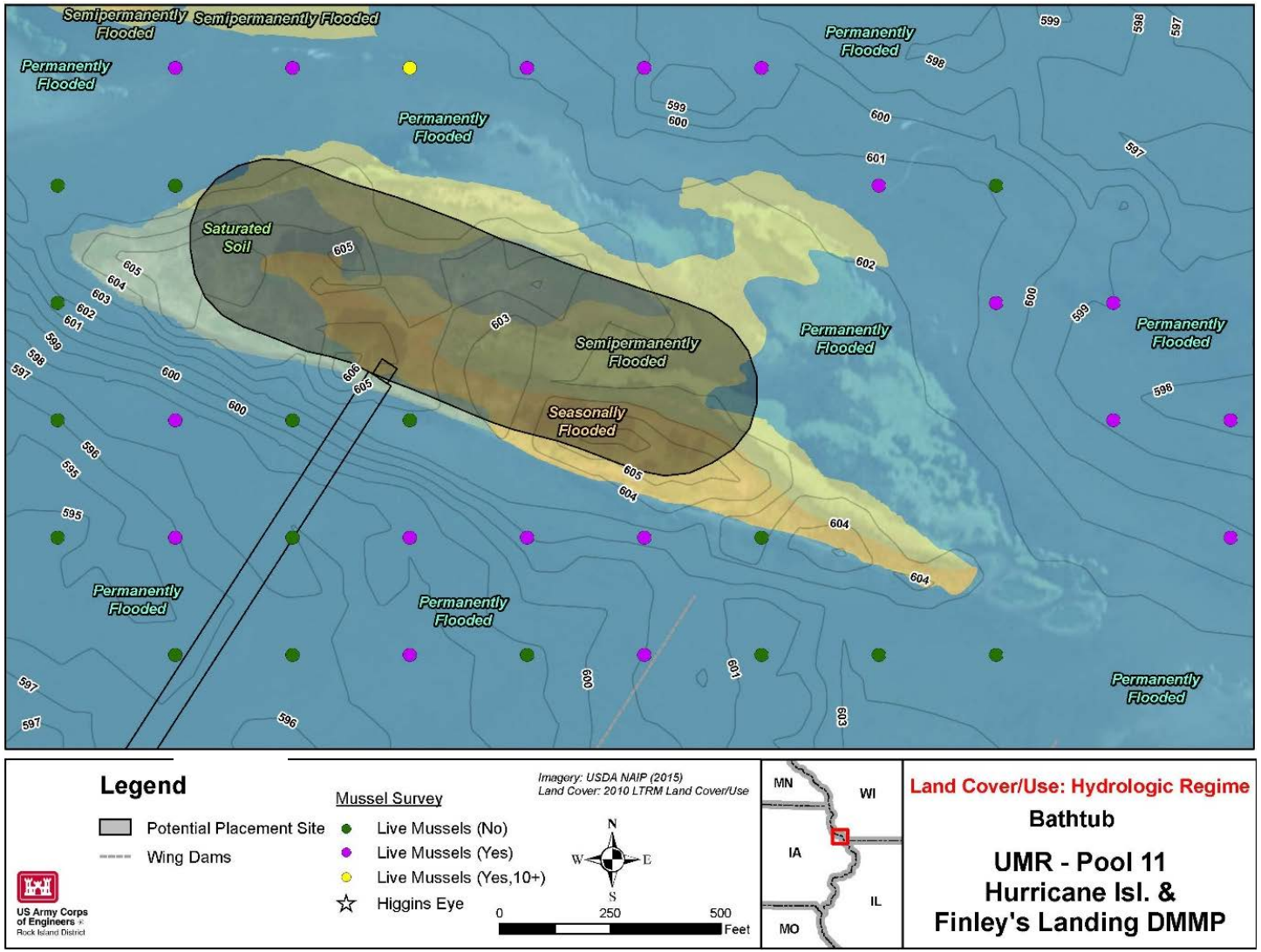


Figure G-3-2. Hydraulic Conditions at the Bathtub Site

Photograph G-3-1. Trees in the Middle Portion of the Island (Along the Main Channel Edge); Grasses (Green) and Swamp Milkweed (Brown Stalks)

Photograph G-3-2. Interior Wetlands

Table G-3-1. Impacted Wetlands at the Bathtub Site

Wetland Hydrology Type	Area	Percent Total
deep/shallow wetlands (emergent)	9.7 acres	87
Permanently Flooded (flat pool)	1.4 acres	13

The different wetland types were categorized using the WI Department of Natural Resources (WI DNR) definitions based on soil type and saturation levels (https://dnr.wi.gov/topic/wetlands/types.html). The Bathtub Site consists of a mix of shallow/deep wetland and sedge meadow wetlands. The acreage amounts for each wetland type were determined using hydraulic data (1912 MSL Datum) from this site. Under the Corps' Wetland Delineation Manual (https://www.usace.army.mil/Portals/2/docs/civilworks/reg_supp/erdc-el-tr-10-16.pdf), the standard of defining a wetland requires 14 or more consecutive days of flooding or ponding during the growing season. The District analyzed the last 30 years of hydraulic elevation data at the Bathtub Site, and determined a 25% exceedance at elevation 604 MSL. Emergent wetlands are considered any vegetation from the 25% exceedance of 604 feet minus 3 feet (verbal communication with Corps Regulatory). Therefore, deep/shallow wetlands are considered at an elevation at and below 604 (9.7 acres) and any area at 605 or above (1.4 acres) is considered a sedge meadow community. The District Regulatory office validated these types of wetlands and the acreages on a May 10, 2017, on-site wetland delineation.

When considering wetland sites for dredged material placement in Pool 11, the District and other agencies attempted first to avoid, then to minimize, and ultimately to mitigate for wetlands located in the proposed plan. The cost of this mitigation and quality (functions and values) of the wetlands were considered in the site selection process before a final alternative was selected.

3. MITIGATION PLANNING

3.1. Opportunities and Constraints

- Hydraulically dredged material obtained during construction of the Bathtub Site could be used in a beneficial use manner by converting open water areas to wetland. Wetland creation could use up to 35,000 – 45,000 cubic yards (CY) of dredged material to construct a low island (maximum elevation 606msl) saturated soil/sedge wetland.
- The District would cap any dredged material (primarily sand) with fine sediment (silts and clays) accumulated in backwater areas or at lock and dams where the material accumulates in forebay and auxiliary lock areas. Removing the material from the locks and dams would provide a beneficial use of this maintenance issue at each of the lock and dams and would provide improved overwinter fish habitat.
- Mitigation would preferably be located within the same watershed (Mississippi-Maquoketa –Plum Service Area).
- On-site mitigation is preferred over off-site opportunities.
- Possible out of kind mitigation may be necessary to fully compensate for wetland loss.
- Mitigation cannot be located in areas causing impacts that in turn would require mitigation.
- Significant resources such as endangered species (such as mussels) and floodplain standards cannot be impacted with mitigation activities.
- Mitigation banks and in-lieu fee opportunities are limited in the Service Area.

3.2. Goals and Objectives. The goal of this mitigation plan is to:

- Replace the wetland functions and values lost as a result of impacts to approximately 11 emergent wetland acres from dredged material placement at the Bathtub Site. Some of these wetland functions and values include:
  - Sediment/shoreline stabilization through the presence of thick wetland vegetation to protect the river shoreline from erosion
  - Nutrient removal/retention/transformation
  - Habitat for birds, pollinators, mammals, fish, reptiles, amphibians, invertebrates etc.

The goal would be met through the following objectives:

- Develop roughly 11-acre extension directly downstream of the Bathtub Site in open water
- Use island design promoting wetland development among and adjacent to the islands, e.g., within the island "shadow"
- Establish a diverse, native, wetland plant community
- Establish wetland hydrology

The Water Resources Development Act (WRDA) of 2007 details mitigation requirements for fish and wildlife and wetland losses caused by water resources projects. An excerpt from Title VIII, Section 2036 of WRDA 2007 states:

> *(3) MITIGATION REQUIREMENTS.—*
> *(A) IN GENERAL.—To mitigate losses to flood damage reduction capabilities and fish and wildlife resulting from a water resources project, the Secretary shall ensure that the mitigation plan for each water resources project complies with the mitigation standards and policies established pursuant to the regulatory programs administered by the Secretary.*

The Bathtub Site construction and filling would impact approximately 11 emergent wetland acres. If this proposed compensatory mitigation plan is found to be unworkable for any reason prior to implementation, the District would coordinate with the state and Federal natural resources and regulatory agencies in order to establish an alternative mitigation plan in a timely manner.

3.3. Avoidance Measures. Avoidance requires no discharge of dredged or fill material be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. Wetland losses (approximately 11 acres) at the Bathtub Site are unavoidable if this site is used for placement.

The District considered several upland sites (one in Iowa and three in Wisconsin). The Iowa farm fields were too far from the river to hydraulically pump dredged material and the access roads had weight restrictions preventing full dump trucks from leaving the river's offload site. Two Wisconsin power plants offered to take material to cover tier fly ash piles, yet these sites are too far away to pump dredged material, and the sites are not large enough to hold the 40-year amount of sand (approximately 400,000 CY).

The third Wisconsin site, a farm field now being converted to a quarry, is too far away to be economically feasible to hydraulically pump dredged material for each dredging event. The Goetz Dredge has 2 miles of available pipe and the Farm Fields/Quarry is 3.8 miles from the dredge cut. The District will use this site to offload the Bathtub Site once every 20 years, or sooner if the Bathtub Site is at full capacity. The Bathtub Site is 1.6 miles from the Farm fields/Quarry.

3.4. Minimization Measures. Minimization requires projects be designed, to the extent practicable, to minimize unavoidable adverse impacts to the aquatic ecosystem, by limiting the degree or magnitude of the action and its implementation. Although impacts to part of the Bathtub Site wetlands are unavoidable, placement methods should seek to minimize encroachment to adjacent wetlands.

Avoidance and *Minimization*, as addressed in the previous sections, conform to conditions found in Section 230.10 of the Section 404(b)(1) Guidelines. The District reduced the Bathtub Site size specifically to reduce wetland impacts. The Bathtub Site design decreased from 13 emergent wetland acres to approximately 11 acres. To accommodate the same amount of dredged material, the District redesigned the berms to stack the material higher, resulting in the smaller placement footprint. The District also repositioned the Bathtub Site upstream to reduce downstream wetland impacts.

4. COMPENSATORY MITIGATION

The Corps issued implementation guidance dated November 6, 2008 and August 31, 2009, specifically outlining how it would follow WRDA 2007, Section 2036(c).

> *(c) WETLANDS MITIGATION.—*
> *(1) IN GENERAL.—In carrying out a water resources project that involves wetlands mitigation and that has impacts that occur within the service area of a mitigation bank, the Secretary, where appropriate, shall first consider the use of the mitigation bank if the bank contains sufficient available credits to offset the impact and the bank is approved in accordance with the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 Fed. Reg. 58605) or other applicable Federal law (including regulations).*

In 2008, Environmental Protection Agency (EPA) and the Corps jointly promulgated regulations revising and clarifying requirements regarding compensatory mitigation. According to these regulations, compensatory mitigation means the restoration establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of wetlands, streams and other aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Under the regulations, there are three mechanisms for providing compensatory mitigation (listed in order of preference as established by the regulations): mitigation banks, In-Lieu Fee Programs, and permittee-responsible mitigation. Prior to even implementing any mitigation measures the District attempted to avoid and minimize wetland impacts. These measures are described below.

The mitigation plan proposed for this project was developed through an interagency planning team OSIT comprised of representatives from the District; the USFWS; the Iowa Department of Natural

Resources (IADNR); the WI DNR; and the U.S. Environmental Protection Agency. These organizations make up the On Site Inspection Team (OSIT). The OSIT is a multi-agency group that assists the District with dredged material management decisions.

4.1. Alternative Development and Preliminary Screening Criteria. Under Section 2036(c)(1) of the WRDA of 2007, the Corps is obligated to consider the use of a mitigation bank to fulfill compensatory mitigation requirements for Federal projects.

- Acquire credits from one or more approved mitigation banks
- Acquire credits from an approved In-Lieu Fee Program
- Construct on-site, in-kind wetland habitat
- Construct off-site, in-kind wetland habitat
- Construct out-of-kind mitigation
- Protect restore, or enhance existing wetland habitat

4.2. Preliminary Screening. For the potential range of alternatives described above, a preliminary screening was conducted to identify alternatives that would proceed to further analysis (Table G-3-2). The criteria used for preliminary screening included: engineering effectiveness, economic efficiency, and environmental and social acceptability. The alternatives that did not meet these criteria were considered infeasible and were eliminated from further study.

Table G-3-2. Preliminary Alternative Screening Results

Mitigation Alternative	Eliminated	Carried Forward
Acquire credits from one or more approved mitigation banks		X
Acquire credits from an approved In-Lieu Fee Program		X
Construct on-site, in-kind wetland habitat		X
Construct off-site, in-kind wetland habitat	X	
Construct out-of-kind mitigation	X	
Protect restore, or enhance existing wetland habitat		X

4.3. Mitigation Options Considered. The OSIT considered a number of alternatives but eliminated some from detailed consideration for various reasons, such as environmental, operation feasibility, and/or costs (Figure G-3-3). See Appendix F, *Cost Estimate*, for additional information on estimated costs.

The USFWS' Upper Mississippi River National Wildlife Refuge manages this reach of the river as it pertains to its policies. Mitigation alternatives were discussed with USFWS, along with the OSIT, to ensure activities on USFWS fee-titled land adhere to USFWS and its National Wildlife Refuge management policies.

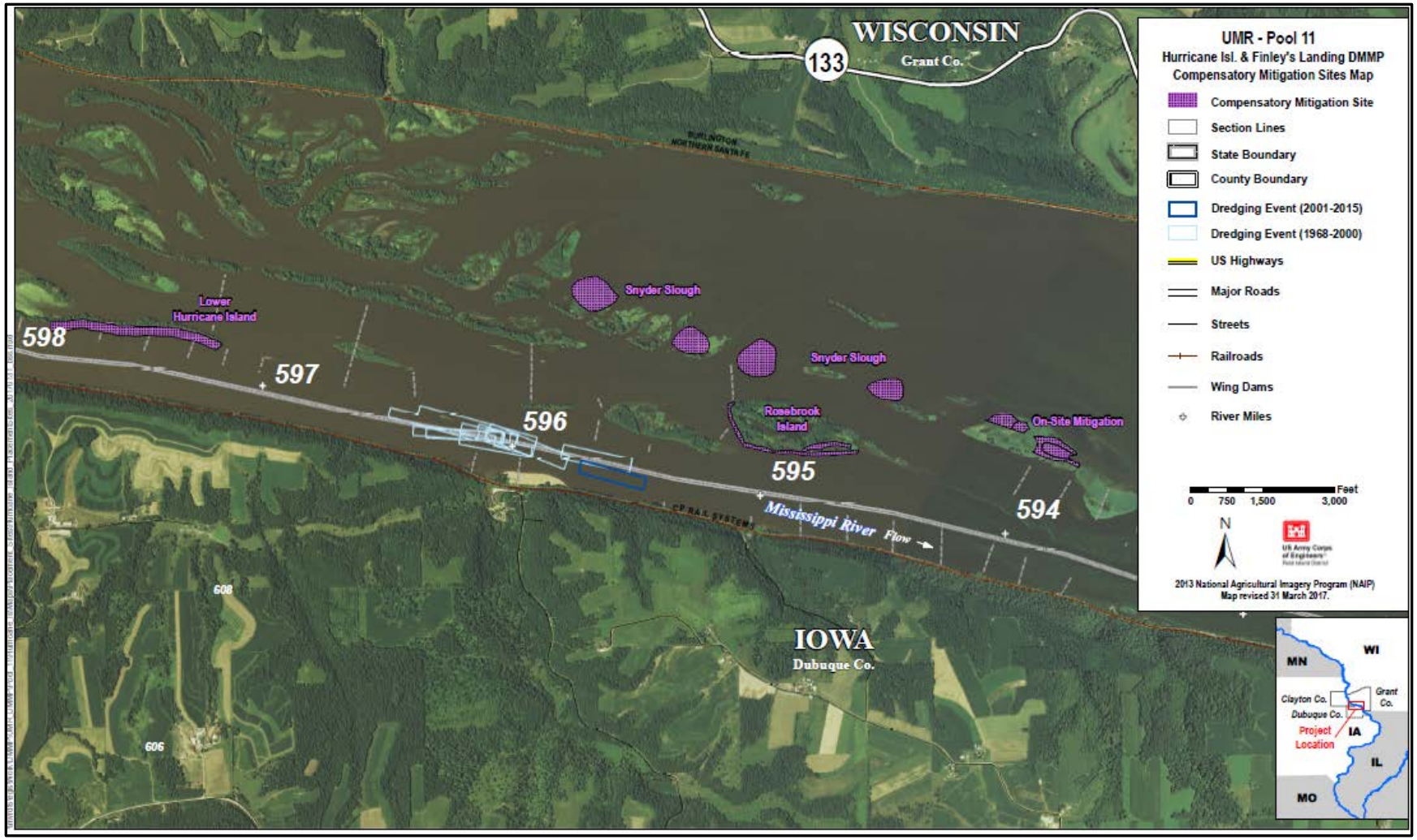


Figure G-3-3. Mitigation Options Considered

Enhance Rosebrook Island - A. The USFWS proposed filling in an interior wetland, converting the emergent wetland to bottomland hardwoods. Rosebrook Island has a remnant pin oak stand that could naturally seed the newly elevated areas. While the WI DNR has identified bottomland pin oaks as a critical and rare species in Wisconsin, the WI DNR felt the interior emergent habitat's value outweighed the pin oak forest's benefit.

Enhance Rosebrook Island - B. The District proposed placing dredged material along the riverside bankline, cap the material with fine material, and then plant oak trees to augment the island's existing pin oak stand. Hydraulic modelling demonstrated placed material on the bankline would require riprap protection to avoid erosion. This alternative was eliminated due to the high cost of the riprap protection, resulting in a total cost $2,521,000. Additionally, floodplain modeling was conducted and was demonstrated to go beyond the State of Wisconsin-accepted level of less than 0.00 ft at the 100-year flood event.

Protect Rosebrook Island. Rosebrook Island Riprap (RM 594.6-595.2) includes the placement of approximately 3,000 linear feet of rock around the head of the island and extending along the right descending bankline. This option also includes sand placement behind the rock along the right descending bankline of the island. Placement in these locations would provide bankline stabilization and protection of the interior wetlands. Additionally, pockets may be made between the rock/sand placement and the existing island to create isolated wetlands for amphibian and reptile benefits. This alternative did not pass floodplain analysis; therefore, was not carried forward as a consideration.

Enhance Lower Hurricane Island. The District proposed placing dredged material along the riverside bankline, cap the material with fine material, and then allow the site to naturally revegetate. This feature would increase wetland habitat and protect a backwater wetland. Again, hydraulic modeling demonstrated placed material on the bankline would require riprap protection to avoid erosion. This alternative was eliminated due to the high cost of the riprap protection, resulting in a total cost $4,272,000.

Protect Lower Hurricane Island. Lower Hurricane Island Riprap (RM 597-589.1) includes the placement of approximately 2,000 linear feet of rock along the lower portion of Hurricane Island, bordering the navigation channel. Rock placement at this location would provide bankline stabilization and protection of interior wetlands. Additionally, this option has the potential to result in navigation channel maintenance benefit through the reduction of eroded material being deposited within the channel.

According to the 2008 Compensatory Mitigation for Losses of Aquatic Resources (Mitigation Rule), proposed activities are evaluated to determine a net improvement of the function of the site. This is further defined as restoration (re-establishment or rehabilitation), enhancement, establishment (creation), buffer, or preservation (http://www.sac.usace.army.mil/Portals/43/docs/regulatory/Guidelines_for_Preparing_a_Compensatory_Mitigation_Planf.pdf). Preservation is defined as

> *"removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanism. Preservation does NOT result in a gain of aquatic resource area or functions."*

This alternative was estimated to cost approximately $1,100,000 and did not provide enough credits by providing a preservation of existing wetlands to compensate for the wetland loss at the project site; therefore, it was removed from consideration.

Snyder Slough Restoration. Snyder Slough is located in the backwaters of the Mississippi, extending from RM 599 to 595. The WI DNR proposed using material directly from dredging the Hurricane Island Dredge cut to create a unique backwater habitat and help protect the backwater against bedload and suspended solids. Hydraulic modeling showed velocities bounding the perimeter of the Snyder Slough placement site are less than 0.5ft/s and thus no stone protection is required for erosion protection. Access to Snyder Slough was cost prohibitive, at an estimated cost of $14,305,000, due to its location in backwaters and distance to the dredge cuts. In addition, the District would have to dredge into the Snyder Slough area just to construct the new wetland features, which would add additional dredged material management requirements (storage, temporary impacts) to the project.

Bathtub Mudflat (RM 593.8-594.0) includes an extension of the downstream end of the proposed Bathtub Site. The extension would be constructed of rock (as needed for erosion protection) and sand to mimic the structure and function of the wetland area lost within the placement footprint in an immediately adjacent location.

Construct a Similar Island. The District proposed to construct a similar island to the Bathtub Site Island. The island would mimic similar islands built in the lower portion of Pool 13. Those islands have attracted pelican and mallard nesting, and fish and mussel use. The open water habitat is void of any historic islands. The District would place a narrow half oval of stone facing upstream, fill the interior portion with dredged material, and cap it with fine sediment. The OSIT felt this alternative would have endangered mussel impacts and was not carried forward for consideration.

Mitigation Banks. The District investigated mitigation banks within Southwest Wisconsin and Northeast Iowa in the primary and secondary service areas. The closest mitigation bank, the Sauk – Big Hollow Wetland Bank, near Spring Green, WI, is pending and located in a secondary service area approximately 51 miles from the project area. The OSIT felt this mitigation bank was too far away and the District would have to mitigate at a higher ratio due to the distance and also not specifically riverine wetland type and function.

In-Lieu Fee Programs. The Wisconsin Wetland Conservation Trust (WWCT) is a wetland mitigation In-Lieu Fee (ILF) Program sponsored and administered by the WI DNR. Through the sale of WWCT credits, the WWCT can satisfy a permittee's legal responsibility to purchase wetland mitigation credits specified by Corps and DNR wetland permits. Credits are available for sale to permittees having first avoided, then minimized wetland impacts and are currently seeking to satisfy a wetland compensatory mitigation requirement. The WWCT utilizes the funds generated from credit sales to implement wetland restoration projects to help offset the wetland impacts resulting from permitted projects.

4.4. Evaluation of Alternatives Considered in Detail

4.4.1. Wisconsin Wetland Conservation Trust. On January 20, 2017, the District submitted a WWCT In-Lieu Fee Program Application (Appendix G-3-1). In its March 3, 2017, email response the WI DNR denied the District's In-Lieu request since the project would not require Section 404, Section 10, or WI DNR permits (Appendix G-3-2). In a letter dated April 17, 2017, the District requested the WI DNR to reconsider its position if on site mitigation cannot meet state and Federal regulations or

meet mitigation success criteria (Appendix G-3-2). The District ultimately withdrew this mitigation alternative based on the WIDNR's lack of support.

4.4.2. Permittee-Responsible Mitigation (PRM). The District and OSIT worked cooperatively to develop mitigation alternatives meeting the wetland mitigation goals.

The Mitigation Rule identifies three types of permittee-responsible mitigation (PRM) plans: PRM under a watershed approach, PRM through on-site and in-kind mitigation, and PRM through off-site and/or out-of-kind mitigation. In addition, this PRM plan addresses the components of a complete mitigation plan as described in the Mitigation Rule (33 CFR 332.4(c)).

4.4.3. PRM/In-Lieu Fee Hybrid. If PRM does not fully compensate for all mitigation loss, the District would again attempt to meet the full mitigation need by combining PRM with the WWCT. The District ultimately withdrew this mitigation alternative based on the WIDNR's lack of support.

5. MITIGATION PLAN

The Bathtub Site Mitigation plan was based on the following WI DNR proposal:

> *Bathtub Mudflat (RM 593.8-594.0)* includes an extension of the downstream end of the proposed Bathtub Site. The extension would be constructed of rock (as needed for erosion protection) and sand to mimic the structure and function of the wetland area lost within the placement footprint in an immediately adjacent location.

The Bathtub Mudflat mitigation alternative is located on USFWS fee-titled land. The proposed mitigation would protect the lower end of the island and would allow for sediment accretion. It does not create enough habitat to compensate for the approximately 11 emergent wetland acres lost. The District modified this mitigation alternative to create the required approximately 11 acres of needed mitigation.

Based on the preceding evaluation of mitigation alternatives, the Bathtub Site mitigation plan consists of the following:

- Use dredged material to expand the existing island in a phased approach; as the bathtub expands over several years, appropriate mitigation development will also expand. The preliminary design of the mitigation would fill aquatic habitat to a maximum elevation of 606 MSL. Elevation 606 MSL and below is the same elevation as the impacted wetland (Figure G-3-4).
- Include swale(s) within the mitigation area(s).
- Cap with fine material from a nearby lock and dam, backwater site, or Bathtub Site interior.
- Seed with native, local ecotype herbaceous sedge and emergent wetland plant species.
- Control invasive species.
- Monitor and adaptive manage to ensure success.

The WRDA of 2007 details mitigation requirements for fish and wildlife and wetland losses caused by water resources projects. An excerpt from Title VIII, Section 2036 of WRDA 2007 states:

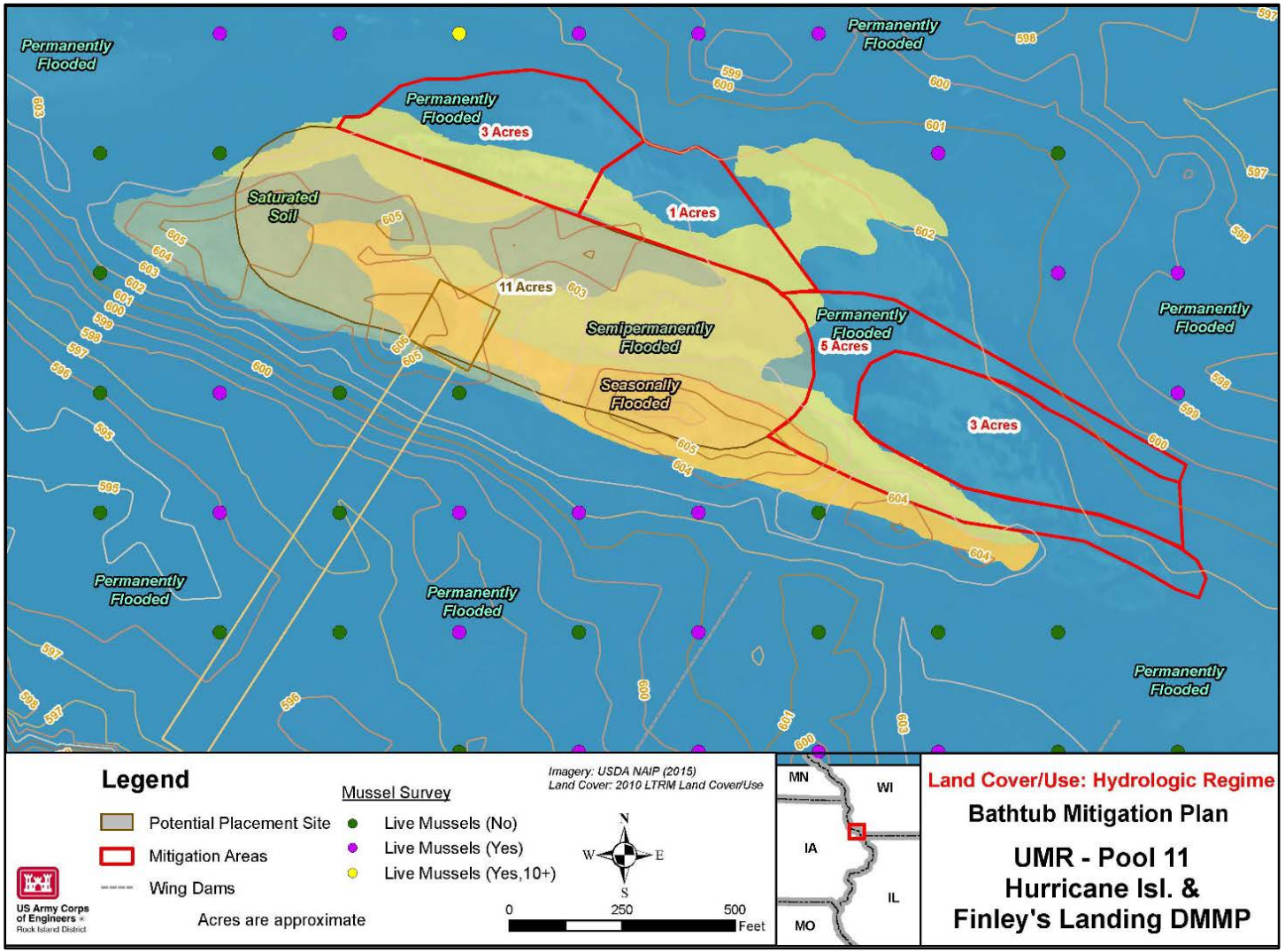


Figure G-3-4: Mitigation Plan

(3) MITIGATION REQUIREMENTS.—

(B) INCLUSIONS.—A specific mitigation plan for a water resources project under paragraph (1) shall include, at a minimum—

(i) a plan for monitoring the implementation and ecological success of each mitigation measure, including the cost and duration of any monitoring, and, to the extent practicable, a designation of the entities that will be responsible for the monitoring;

(ii) the criteria for ecological success by which the mitigation will be evaluated and determined to be successful based on replacement of lost functions and values of the habitat, including hydrologic and vegetative characteristics;

(iii) a description of the land and interests in land to be acquired for the mitigation plan and the basis for a determination that the land and interests are available for acquisition;

(iv) a description of—

(I) *the types and amount of restoration activities to be conducted;*

(II) *the physical action to be undertaken to achieve the mitigation objectives within the watershed in which such losses occur and, in any case in which the mitigation will occur outside the watershed, a detailed explanation for undertaking the mitigation outside the watershed; and*

(III) *the functions and values that will result from the mitigation plan; and*

(v) a contingency plan for taking corrective actions in cases in which monitoring demonstrates that mitigation measures are not achieving ecological success in accordance with criteria under clause (ii).

(C) RESPONSIBILITY FOR MONITORING.—In any case in which it is not practicable to identify in a mitigation plan for a water resources project the entity responsible for monitoring at the time of a final report of the Chief of Engineers or other final decision document for the project, such entity shall be identified in the partnership agreement entered into with the non-Federal interest under section 221 of Flood Control Act of 1970 (42 U.S.C. 1962d–5b).

(4) DETERMINATION OF SUCCESS.—

(A) IN GENERAL.—A mitigation plan under this subsection shall be considered to be successful at the time at which the criteria under paragraph (3)(B)(ii) are achieved under the plan, as determined by monitoring under paragraph (3)(B)(i).

(B) CONSULTATION.—In determining whether a mitigation plan is successful under subparagraph (A), the Secretary shall consult annually with appropriate Federal agencies and each State in which the applicable project is located on at least the following:

(i) The ecological success of the mitigation as of the date on which the report is submitted.

(ii) The likelihood that the mitigation will achieve ecological success, as defined in the mitigation plan.

(iii) The projected timeline for achieving that success.

(iv) Any recommendations for improving the likelihood of success.

(5) MONITORING.—Mitigation monitoring shall continue until it has been demonstrated that the mitigation has met the ecological success criteria.

5.1. Objectives. The objective of this Mitigation Plan is to fully compensate for unavoidable losses of important fish and wildlife resources, by providing in-kind mitigation at an on-site location to the maximum extent practicable. For the Bathtub Site, the direct losses of important resources include approximately 11 wetland acres (9.7 acres of deep/shallow marsh; 1.4 acres of sedge meadow). During the project's Preconstruction Engineering and Design (PED) Phase, the District will reexamine unavoidable losses in light of further developments in project planning to determine if impacts to important resources might change with regard to resource type and quantity. The District would coordinate such activities with the OSIT.

5.2. Site Selection. The OSIT recommended the mitigation site to be adjacent to the impact site. This site provides a reduction in the construction costs with the reduced transportation distance for the material (Figure G-3-3). Hydraulic modeling shows river flows in this area are low enough that bankline protection would not be needed which contributes to reduced costs.

5.3. Site Protection. The Corps and USFWS manage the mitigation site as fee title, meaning the lands are in Federal ownership. There are no privately held lands in the project vicinity. Both Federal agencies have designated, or zoned, the lands for Wildlife Management. This designation will not change with the project. The District will seek a work easement with the USFWS to actively build the mitigation site lying on USFWS fee title land.

5.4. Baseline Information

5.4.1. Impact Sites. See Section 2, *Wetland Impacts*, for the Bathtub Site's detailed physical habitat description.

5.4.2. Mitigation Sites. The mitigation site is comprised of permanently flooded areas (16.1 acres) and semipermanently flooded (4.5) totaling 20.8 acres. This site is highly influenced by fluctuating river levels. During normal growing seasons, American lotus (*Nelumbo lutea*), and Wild celery (*Vallisneria americana*) are found in the area. During flooding conditions during the growing season, aquatic vegetation is not present and may take a year or two to begin recolonizing the site.

5.5. Determination of Credits. For wetland impacts, the Corps uses mitigation ratios to calculate how much mitigation is needed. As an example, a Corps' Regulatory office may recommended for every acre of wetland loss, the applicant would have to create 3 acres of constructed, enhanced, or rehabilitated a new or existing wetland. This is a 3:1 ratio. The additional wetlands created compensates for the loss of wetland quality, specifically, loss of habitat maturity, wildlife use, and regeneration. Mitigation ratios can be adjusted based on the habitat quality of the impacted wetland.

The Rock Island District Regulatory office provided a schedule of mitigation credit ratios for calculating mitigation needs at the Bathtub Site (Table G-3-3). The project would impact approximately 11 acres of a mixed herbaceous wetland [sedge meadow (1.4 acres)/emergent (9.7 acres)]. Based on the replacement ratios, the project would need to create approximately 12 acres of similar wetlands. There is enough adjacent permanently flooded aquatic area to accommodate all the mitigation requirement (Figure G-3-3).

Table G-3-3. Generalized Ratios for Generating Mitigation Credits[1]

Impact Site Credit Ratio	Mitigation Site Credit Ratio	Location	Final Mitigation Acres Required
1:1		Bathtub Emergent wetland loss (9.7 ac)	9.7
1.5:1		Bathtub Sedge meadow loss (1.4 ac)	2.1
	1:1	Permanently flooded area wetland establishment (creation)[2]	Approx 12 acres of mitigation to take place in
	1.5:1	Semipermanently flooded area wetland enhancement[3]	No mitigation will take place in this location

[1] Final credit rations a site may produce may deviate from the above ratios as deemed appropriate by the permitting agencies. All ratios listed above indicate the number of mitigation credits per acre (credits: 1 = 1 acre).

[2] *Establishment* (creation) means the manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area and functions (Corps, 2010).

[3] *Enhancement* means the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area (Corps, 2010).

5.6. Work Plan for the Wetland Creation/Enhancement Areas[1]

5.6.1. Dredged Material Placement. Once the District begins constructing the Bathtub Site with dredged material, it will begin placing material adjacent to the Bathtub Site and push it to the mitigation site limits. Once enough material is placed to support heavy equipment, the site would be groomed to a maximum elevation 606 MSL, which is similar to the Bathtub Site's wetlands. The District would then place approximately one foot of fine (silt and clay) material on top of the sandy dredged material. The fine material would be dredged from either the interior of the Bathtub Site, backwaters, or from a lock and dam facility needing an auxiliary lock or forebay cleanout. Once the fine material is dry enough to work, the District would level the material to final grade. The final grade would vary and include at least one swale to accommodate a graduation of saturated soils. Following compaction and dewatering, the District will plant/seed the area with wetland vegetation appropriate for the site. For wetland restoration, the District assumed existing elevations of the proposed Bathtub Site's average, is about 1.5 to 3 feet of above the river's ordinary high water mark. Maximum slurry elevation would be +3.5 to 10 feet high. The final target grade elevation for wetland would be +1.5 to 2 feet, or somewhat equal to the Bathtub Site (elevation 603-606 MSL). Necessary adjustments to these elevations would be determined during the PED phase.

5.6.2. Planting Plan. Once the dredged material has settled to the final target grade, the District will plant/seed the area with wetland vegetation appropriate for the site. Typical invader species include reed canary grass (*Phalaris arundinacea)*, smartweed (*polygonum sp*.), cottonwood (*Populus deltoids*), silver maple (*Acer saccharinum*), cattail (*Typha sp*.) and swamp milkweed (*Asclepias incarnata)*.

Drought, high water, and other environmental extremes can occur during the first year of seedling establishment, which can kill or seriously harm much of a planted crop. In addition, some later

[1] *This work plan describes the steps the District will take to implement on-site compensatory mitigation for wetland habitat losses. The work plan also describes the District's steps to restore and create wetland using dredged material placed in nearby shallow open water disposal areas. The mitigation steps are part of the Recommended Plan.*

successional species require pioneer species establishment before they can germinate. For these two reasons, the District proposes to conduct a gradual planting plan to increase the establishment success of planted seeds.

In sedge meadow restorations, the District would plant a matrix of Carex stricta, along with twelve species, at the beginning of a sedge meadow restoration (Table G-3-4). As the tussocks develop, more species can be added to the site. This planting method embraces adaptive management of mitigation banks and will help avoid instances of low seedling establishment that lead to invasions of non-native species.

The District plans to broadcast seed across the site and plant bulbs or tubers in the swale area(s). Table G-3-4 shows the planting rate and seeds per acre. All plants are on the National Wetland Plant List (Corps, 2016).

Table G-3-4: Suggested Plant Species [1]

Species Name	Common Name	Guild	Planting Rate [2] (lb/ac)	Seeds/ sq ft
Sagittaria latifolia	broad-leaved arrowhead	Vine-like, stems climb or drape over tussocks	.30	6.80
Alisma triviale	common water plantain		.40	9.70
Sparganium eurycarpum	giant bur reed		.49	.09
Carex vulpinoidea	fox sedge		.14	5.00
Acorus americanus	sweet flag		.28	.67
Carex scoparia	pointed broom sedge	Forbs, can grow in the shaded sub-canopy of tussocks	.05	1.60
Impatiens capensis	spotted touch-me-not		.05	.08
Juncus tenuis	path rush		.03	10.00
Scirpus atrovirens	dark green bulrush		.12	20.00
Calamagrostis canadensis	bluejoint	Graminoids	.04	4.00
Carex lacustris	lake sedge		.06	.24
Carex stricta [3]	tussock sedge		.04	25
Eleocharis palustris	Marsh spikerush		.10	1.90
Leersia oryzoides	rice cut grass	Emergent	.30	3.70
Asclepias incarnata	swamp milkweed		.28	.50
Schoenoplectus tabernaemontani	soft stem bulrush		.44	5.00
Bolboschoenus fluviatilis	river bulrush		.76	1.20
Verbena hastata	blue vervain		.22	7.35

[1] Plant species may vary depending on availability

[2] Planting Rates from MN DOT, 2014

[3] Preferential associates of tussock sedge (*Carex stricta*) from Johnston and Zedler (2013). Species are grouped alphabetically by guild.

In Wisconsin, reed canarygrass (*Phalaris arundinacea*) dominates almost 500,000 acres of wetlands (Hatch & Bernthal 2008.) is also extremely successful at both establishing at new locations and persisting to form monocultures. Therefore, it is imperative control measures be taken if these species are present at a site. If invasive species colonize 50 percent of the mitigation site prior to preferred wetland plants, the District would have to physical remove or chemically treat the plants for the first 5 years after berm seeding.

The District would obtain plant material from a registered licensed regional nursery/grower and of a regional eco-type species properly stored and handled to ensure viability. The plants will typically be planted during the period from March 15 through June 15.

5.6.3. Performance Standards. The ecological success (performance) standards applicable to these efforts are described as follows. The year numbers cited are based on the initiation of mitigation construction activities beginning in the first year after the mitigation site is completed (construction and planting (if needed)). Monitoring will last at least 5 years or until the success criteria has been met.

In order for the mitigation area to be considered acceptable for offsetting wetland impacts, the site vegetation, soils, and hydrology will be restored such that the site meets wetland criteria as described in the Corps 1987 Wetland Delineation Manual. Additionally, the following criteria are applicable:

Initial Success Criteria. Initial placement of dredged material is completed and at least 80 percent of site is within "as-built" or initial construction elevation range (average +1.5 feet).

Year Three Success Criteria

- After at least 2 full years following each construction phase, no less than 50 percent of the wetland creation site is within the "functional wetland" elevation range (e.g., +1.0 feet to + 1.5 feet).
- At least 80 percent of the mitigation area should be vegetated.
- At least 50 percent of the vegetative cover consists of plant species classified as Facultative (FAC) or wetter, as verified by monitoring reports and OSIT verified.

Year Five Success Criteria

- 5 years after construction, at least 75 percent of the created wetland remains within the "functional wetland" target elevation range.
- Observed use of created wetland by wildlife species typically found in natural wetland habitats of similar habitat.

6. MONITORING REQUIREMENTS AND ADAPTIVE MANAGEMENT

6.1. As-Built Reports. The District will submit an As-Built Report to the OSIT for the wetland restoration/creation area within 1 year following completion of all the work. For the wetland restoration/creation area, the As-Built Report shall contain a survey providing the areal extent of the dredge disposal area and the settled grade of the dredged material and adjacent wetland areas.

6.2. Monitoring Provisions. The District agrees to perform all necessary work to monitor the Hurricane Island project to demonstrate compliance with the success criteria established in this monitoring plan. The monitoring program shall follow these guidelines:

- **Visual Description.** Visual descriptions shall be provided with each monitoring report by one of the following means:

- Photographs - Permanent GPS points shall be established to ensure the same locations (and view directions) are monitored in each monitoring period, or

- One color aerial photograph (8x10 inches or larger) depicting the entire site. An aerial photograph should be taken once the site has been constructed, stabilized and planted (preferably in Year 3 or Year 5 following completion of initial work).

- **Hydrology.** The District will measure river hydrology using river stages. The condition of the constructed wetland noting general flow characteristics, noting excessive scouring and/or silting in of the area, especially any constructed swale. Since riverine wetlands are subject to high, long flood durations, some alteration to the final wetland site is expected. Any flood induced change will be noted in the monitoring reports.

- **Vegetation**

  - The District and OSIT shall conduct a vegetation survey at or near the end of the first growing season. Surveys shall be conducted in accordance with an accepted academic or industrial sampling methodology (e.g. Steyer et. al., 1995). The District shall document the species and percentage coverage by key indicator wetland plant species. The District will begin monitoring the continuous monitoring plots and submit monitoring reports to the OSIT at required intervals.

  - The District shall provide a written report to the OSIT describing the developing vegetative communities developing within the wetland by determining:
    - dominant vegetation species;
    - a coverage assessment;
    - the number and species rated FAC or wetter (excluding FAC-) growing in wetlands (total and #/acre);
    - the percentage of dominant species FAC or wetter (excluding FAC-); and
    - an invasive/noxious species assessment.

  - The report shall describe the general condition of the vegetation, and discuss likely causes for any observed mortality.

- **Site Elevation.** The District shall provide a topographic survey. Surveys should be included in monitoring reports for years 1, 3, and 5.

- **Timing**

  - Monitoring shall be conducted during the growing season following Years 1, 3, and 5.

  - Monitoring for the first year or any year following construction shall take place between July and September;

6.3. Monitoring Reports

6.3.1. Upon achievement of the initial success criteria, the District shall document the results of this monitoring in a report submitted to the OSIT. Additional reports will be submitted following Years 3 and 5.

6.3.2. The reports shall contain a description of the conditions of the project relating those conditions to the success criteria and shall contain the following;

- An aerial photograph (only in report submitted after Year 3 or 5) taken during the growing season, depicting a completed tract of the project with the photo date and approximate scale noted (drone or Google Earth are acceptable sources of photographs)
- Ground level photographs;
- A detailed narrative summarizing the condition of the project and all regular maintenance activities;
- A drawing based upon the site plan depicting topography, sampling plots and permanent photo stations;
- River stage data;
- Results of vegetation survey including visual estimates of percentage (%) overall cover and % cover by each species, % exotic vegetation, total % facultative" and total % "upland" species in each vegetation layer, survival rate of planted vegetation (if planted), an estimate of natural revegetation, and a qualitative estimate of plant vigor as measured by evidence of reproduction; and
- If Year 1 success criteria is obtained, but all performance criteria have not been met in Year 3, a monitoring report shall be required for each consecutive year until two annual sequential reports indicate that all criteria have been successfully satisfied (i.e., that corrective actions were successful).

Reports will be submitted by December 31 of each monitoring year. Monitoring reports shall be provided to the OSIT and made available to other members of the natural resource agencies upon request.

Table G-3-5 displays the currently anticipated monitoring report schedule and the party responsible for conducting the monitoring and preparing the report.

6.4. Long-Term Management Plan. The mitigation features will remain in the ownership of the District, who will also be responsible for all operation, maintenance, repair, replacement and rehabilitation (OMRR&R) of these features.

Table G-3-5: Standard Monitoring Report Schedule

Year	Monitoring Report Number
1 (begin & complete initial construction activities; completion near end of year)	N/A
2 (begin & complete final construction activities; filled areas settle to final target grades near end of year)	1 (Time Zero Report)
3 (if needed, complete initial plantings early in year; complete initial invasive/nuisance plant eradication)	2
4 (1 year after initial plantings; 2 years after completion of final construction activities)	3
5 (3 years after completion of final construction activities)	4

6.5. Adaptive Management Plan. If site conditions are unsuccessful or successful criteria has not been met due to unavoidable or natural disaster, the District and OSIT will reassess the project location and determine if alternative methods are necessary to meet successful criteria.

In the event monitoring reveals initial success criteria have not been met, the District shall take measures to achieve those criteria in accordance with the following plan:

- **Fill Material Elevations and Area**

  - Should the initial placement of dredged material not meet the 80 percent target construction elevation or areal coverage, the District shall either deposit additional dredged material or redistribute existing material as necessary to achieve the target percentage and areal coverage.

  - At Year 5, if less than 75 percent of the wetland creation area contains emergent vegetation (at least 50 percent of which have an FAC or wetter designation and may include reed canary grass), then the District may be required, at the discretion of the OSIT, to deposit and plant (according to their specifications) additional dredged material. Should the agencies decide such measures are necessary, the location and extent of fill placement and vegetative plantings will be determined in consultation with, and with their approval.

  - From Years 6 through 7 (if success has not been achieved by Year 5), if less than 50 percent of the wetland creation area contains emergent vegetation (at least 50 percent of which have an FAC or wetter designation), then the District may be required, at the discretion of the OSIT, to deposit additional material and plant these areas (according to their specifications) so the extent of wetland coverage is at minimum 50 percent at Year 7. Should the agencies decide such measures are necessary, the location and extent of fill placement and vegetative plantings will be determined in consultation with, and with their approval.

- **Vegetative Plantings**

  - If vegetative plantings survival is less than 50 percent per acre as determined by sampling or by observing high mortality at any location within the planted tract, the District shall take appropriate actions, as recommended by the OSIT, to address the causes of mortality and shall replace all dead plantings during the following planting season. Replanting, monitoring, and reporting, shall occur as needed to achieve and document the required 1-year survival rate. If the survival criterion is not met after a second unsuccessful attempt, the District will convene a meeting to decide if replanting should continue. Should the OSIT determine achieving the required survival rate would not be likely, the District

shall be required to provide replacement mitigation for the increment of value not accruing within the unsuccessful tracts within 1 year of this decision. In addition, the OSIT will reassess the restored/created wetland to determine if a new management potential should be calculated incorporating the new conditions.

- Year 5 monitoring shall verify vegetation composition and survivorship goals. The District shall implement remedial action, as deemed necessary by the OSIT, to ensure attainment of Year 5 survivorship and composition criteria.

- **Invasive Species Management.** The District does not expect any adaptive management for invasive species. No adaptive management is expected to be needed as maintenance of invasive species is part of the O&M for the project (begin eradication of invasive species if the mitigation site has 50% coverage of invasive species). If a large amount of invasive species are removed through O&M efforts, potential Adaptive Management actions include replanting of the areas previously covered by invasive species. Additional thresholds/triggers would be developed during the project's PED phase.

- **Financial Assurances.** Financial assurances are required to ensure the compensatory mitigation project would be successful. The District has the right to complete, operate, maintain, repair, rehabilitate or replace any project feature, including mitigation features.

- **Cost.** The District prepared detailed cost estimate for the wetland habitat mitigation construction, monitoring and adaptive management (Appendix F). The District's mitigation cost estimate totaling $2,073,000million for the PRM cost.

7. LITERATURE CITED

Haber, Elizabeth, Pat Trochlell and Tom Bernthal. No date. Suggested Science-based criteria for site selection, design, and evaluation of Wisconsin Wetland Mitigation banks. WI DNR. 48pp.

Hatch, B.K. and Bernthal, T.W. 2008. *Mapping Wisconsin wetlands dominated by reed canary grass, Phalaris arundinacea L.: A landscape level assessment.* Final Report to USEPA-Region V (Wetland Grant #96544501-0).

Johnston, C.A. and Zedler, J.B. 2013. Identifying preferential associates to initiate restoration plantings. *Restoration Ecology* 20(6):764-772.

Minnesota Dept. of Transportation. 2014. Seeding Manual 2014 Edition. Office of Environmental Stewardship Erosion Control Engineering Unit. http://www.dot.state.mn.us/environment/erosion/pdf/seedingmanual.pdf. 44pp.

Steyer, G. D., R. C. Raynie, D. L. Steller, D. Fuller, and E. Swenson. 1995. Quality management plan for Coastal Wetlands Planning, Protection, and Restoration Act monitoring program. Open-file report no. 95-01. Baton Rouge, LA: Louisiana Department of Natural Resources Coastal Restoration Division. 97 pp. plus appendices.

U.S. Army Corps of Engineers. 2010. Guidelines for preparing a compensatory mitigation plan. http://www.sac.usace.army.mil/Portals/43/docs/regulatory/Guidelines_for_Preparing_a_Compensatory_Mitigation_Planf.pdf. Charleston District. 114pp.

2016. National Wetland Plant List, version 3.3. http://wetland_plants.usace.army.mil/ U.S. Army Corps of Engineers. Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH

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

APPENDIX G-3-1

ROCK ISLAND DISTRICT IN-LIEU FEE PROGRAM APPLICATION

From:	Herzog, Kathryn M CIV USARMY CEMVR (US)
To:	Schense, Pamela J - DNR; Pericak, David M - DNR; Rasmussen, Kurt A - DNR; Jarosz, Sarah G - DNR (Sally)
Cc:	Jones, Donna M CIV USARMY CEMVR (US); Jamesr.Fischer@WISCONSIN.GOV; Hauser, Kerrie J CIV USARMY CEMVP (US); Ziegler, Adam T CIV CEMVR CEMVD (US); Jordan, Joseph W CIV (US); Cornish, Mark A CIV USARMY CEMVP (US); Afflerbaugh, Matthew J CIV USARMY CEMVR (US); Klingman, Jon A CIV USARMY CEMVR (US); SARA_SCHMUECKER@FWS.GOV
Subject:	RE: Pool 11 Channel Maintenance Project
Date:	Friday, January 20, 2017 11:50:36 AM
Attachments:	hurr_isl_dmmp_bathtub_contours_msl1912_ft_20161219.kmz Mitigation Summary Form and Enclosures.pdf

Hello all,

Please see the attached application to the WI-DNR In-Lieu Fee Program for the Pool 11 Channel Maintenance Project (Hurricane Island). There are approximately 11 acres of wetland impacts anticipated at the proposed placement site, which is detailed in the Wetland Assessment as an enclosure to the application. Also attached is the kmz of the area with the acreages at the different elevations using historic hydraulic data. We appreciate all the input and guidance WI-DNR has offered in getting this processed. At this point, we are requesting WI-DNR to provide an estimate of the amount of wetland credits and purchase cost from this transaction. Please feel free to let me know if you have any questions or need any additional information.

Thanks,
Kat

Kat Herzog-Biologist
309-794-5231 (w)
United States Army Corps of Engineers
Environmental Planning Section
St. Paul District at Rock Island
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004

-----Original Message-----
From: Schense, Pamela J - DNR [mailto:Pamela.Schense@wisconsin.gov]
Sent: Thursday, September 01, 2016 2:04 PM
To: Herzog, Kathryn MVP @ MVR <Kathryn.Herzog@usace.army.mil>; Pericak, David M - DNR <David.Pericak@wisconsin.gov>; Rasmussen, Kurt A - DNR <Kurt.Rasmussen@wisconsin.gov>
Subject: [EXTERNAL] RE: Pool 11 Channel Maintenance Project

Hi Kat,

Attached is the mitigation summary worksheet I mentioned yesterday. This is what we have applicants fill out to identify the different types of wetlands proposed to be impacted.

If you have any questions, please let me know.

We are committed to service excellence.
Visit our survey at Blockedhttp://dnr.wi.gov/customersurvey to evaluate how I did.

Pam Schense
Phone: (608) 266-9266
Pamela.Schense@wisconsin.gov

-----Original Message-----
From: Herzog, Kathryn MVP @ MVR [mailto:Kathryn.Herzog@usace.army.mil]
Sent: Tuesday, August 16, 2016 7:12 AM
To: Pericak, David M - DNR; Rasmussen, Kurt A - DNR; Schense, Pamela J - DNR
Subject: FW: Pool 11 Channel Maintenance Project

Good morning all,

David, please see the attached information regarding the Pool 11 channel maintenance project. I sent you an invitation to the poll for an upcoming meeting to discuss further. Looking forward to working with you and let me know if you have any questions.

Thanks
Kat

-----Original Message-----
From: Herzog, Kathryn MVP @ MVR
Sent: Thursday, August 11, 2016 1:34 PM
To: Hauser, Kerrie J MVP <Kerrie.J.Hauser@usace.army.mil>; 'pamela.schense@wisconsin.gov' <pamela.schense@wisconsin.gov>
Cc: 'Kurt.Rasmussen@WIsconsin.gov' <Kurt.Rasmussen@WIsconsin.gov>
Subject: Pool 11 Channel Maintenance Project

Hello Kerrie and Pam,

Please see attached for the kmz of the location for a proposed channel maintenance project USACE, Rock Island District is currently planning. This site is going to be designed as a bathtub and will be offloaded at 20+years at the nearby farm fields/quarry for final placement. Please see the attached pdf for location of those fields. This project has some history with it, as it's been in the planning phase for a couple of years now. This proposed bathtub site will have some herbaceous wetland and riverine impacts that will have to be mitigated. At current design, we are at approximately 9 ac. wetland and approx. 4 ac of aquatic impacts. This is still being revised and the PE is trying to decrease these acres, but is where we stand currently. We have been thinking that we would have to mitigate onsite, but if we can use the In-Lieu Fee program that WI has in place, that would be easier/more efficient. We would like to have a conference call with both of you to discuss this in more detail. I will be sending out a doodle poll shortly to get an idea of people's schedules. If either of you have any questions or need clarification, please feel free to reach out. It took more a few months to get this project figured out, so I'm expecting some questions:)

Thank you for your help!
-Kat

Kat Herzog
309-794-5231 (w)
Biologist, Environmental Planning Section St. Paul District at Rock Island Clock Tower Building P.O. Box 2004
Rock Island, IL 61204-2004

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Mitigation Summary Worksheet for Wetland Individual Permit

(Rev. 12/2014)

Notice: Pursuant to § 281.36, Wis. Stats., this Mitigation Summary Worksheet (MSS) must be completed in its entirety and submitted to the Department of Natural Resources (DNR) prior to the required pre-application meeting set up by the DNR. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin Open Records law [§§ 19.31 – 19.39, Wis. Stats.]

This MSS is required for Wisconsin Department of Natural Resources Wetland Individual Permit (IP) applications as wetland compensatory mitigation is required for all issued IP projects. The applicant, or authorized representative, shall complete all fields below and submit this MSS along with their required pre-application materials in advance of the mandatory pre-application meeting. A final version of the MSS shall then be re-submitted along with the final IP application following completion of the pre-application meeting reflecting any resulting alterations to the proposed project representing the final wetland compensatory mitigation details.

☒ Preliminary mitigation summary sheet	☐ Final mitigation summary sheet

CONTACT INFORMATION	APPLICANT	AUTHORIZED REPRESENTATIVE
Name (Last, First, Middle Initial)	United States Army Corps of Engineers Rock Island District	Kathryn Herzog, Environmental Planning Branch
Title		Biologist
Organization / Entity		USACE, MVR-Environmental Planning
Mailing Address	Clock Tower, PO Box 2004	
City, State, Zip Code	Rock Island, IL 61204-2004	
Email Address		kathryn.herzog@usace.army.mil
Phone Number (incl. Area Code)		309-794-5231

PROJECT INFORMATION	
Project Name	Hurricane Island Dredged Material Management Program
Mitigation Service Area	Upper Mississippi-Maquoketa-Plum Service Area; HUC 8 Grant-Little Maquoketa Watershed -- 07060003
Latitude---Longitude Coordinates	N 42.656667, W 90.769167, RM 599-591
Municipality Location (City, Village, Town)	Southwest of Potosi, WI, North of Sherrill, IA
Township --- Range --- Section	T2N, R4W, S10
County Location	Grant, WI and Dubuque, IA
Project Description (including description of wetland impact)	Impacted site is a proposed placement site for dredged material from USACE Channel Maintenance in Pool 11. Approximately 11 acres of wetlands will be disturbed. See attached wetland assessment for more information.

PROPOSED UNAVOIDABLE WETLAND IMPACTS BY COVER TYPE AND DELINEATED ACREAGE	
Acreage (to nearest 0.01)	**Wetland Cover Type**
	Shallow, Open Water
9.7ac See attached wetland assessment for more information.	Deep and Shallow Marshes
1.4ac See attached wetland assessment for more information.	Sedge Meadows
	Fresh (Wet) Meadow
	Wet to Wet-Mesic Prairie
	Calcareous Fens
	Bogs (Open or Coniferous)
	Shrub – Carr or Alder Thicket
	Hardwood or Coniferous Swamps
	Floodplain Forests
	Seasonally Flooded Basins

CHECK SELECTION	PROPOSED COMPENSATORY MITIGATION	EXPLAIN WHY TYPE WAS CHOOSEN / LIST CONTACTED PARTY	EXPLAIN WHETHER CREDITS ARE AVAILABLE
☐	Credit Purchase: Mitigation Bank		
☒	Credit Purchase: WI Wetland Conservation Trust (In-Lieu Fee)	WI DNR; No mitigation banks available in area.	wetland credits available
☐	Permittee Responsible Mitigation		

HURRICANE ISLAND
DREDGED MATERIAL MANAGEMENT PROGRAM

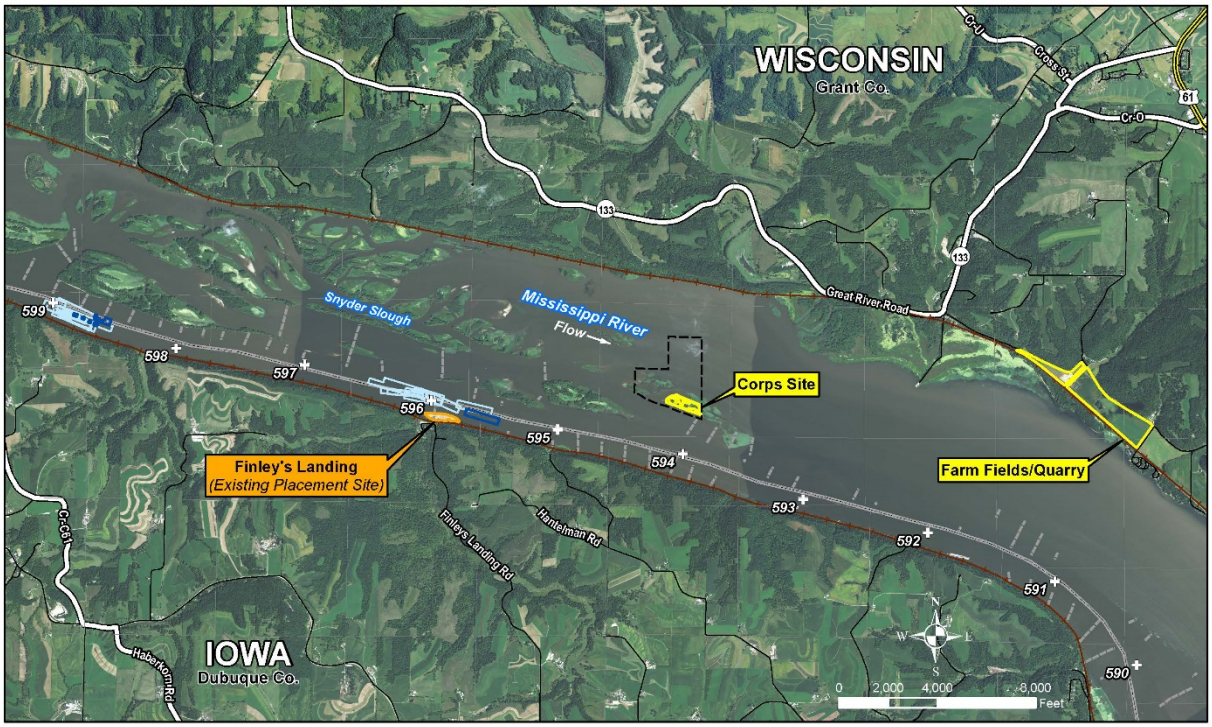
WETLAND ASSESSMENT

The U.S. Army Corps of Engineer (Corps), Rock Island District (District), has identified the need for a new placement site for the long-term Dredged Material Management Program (DMMP) at the Hurricane Island Dredge Cut in Pool 11 of the Upper Mississippi River (UMR). This dredge cut extends along the UMR, within the navigation channel between river miles (RM) 599 and 591, Dubuque County, IA and Grant County, WI (Figure 1). The District has identified approximately 11 acres for the proposed temporary placement site (RM 594L) with offloading, when reached to near full capacity, to a nearby farm field (RM 592L) for long-term placement.

Currently, historic bankline placement sites are the only sites available when dredging at the Hurricane Island Dredge Cut. On the right descending bank, a historic bankline placement site at Finley's Landing (RM 596R) has been frequently used and is at full capacity. An island has been identified as the preferred temporary placement area, which will be designed as a "bathtub" with the inner circle filled as the cut is dredged and placed (Figure 2, 85% Drafted Plans, Sheets C-104 and C-301).

A site visit was conducted on October 14, 2016, and the observed dominant vegetation species at the bathtub were cattail (*Typha sp.*) and swamp milkweed (*Asclepias incarnata*), both wetland obligate species (Midwest 2016 Regional Wetland Plant List). According to the Corps' National Wetland Plant List and Indicator Rating Definitions, obligate indicator status is defined as occurring at a 99% rating under natural conditions in wetlands. Therefore, it has been determined that the entire approximate 11-acre bathtub site is a wetland. Photographs 1 and 2 show the typical wetland community at the proposed bathtub site.

The different wetland types were categorized using the Wisconsin Department of Natural Resources (WI DNR) definitions based on soil type and saturation levels (https://dnr.wi.gov/topic/wetlands/types.html). The bathtub site consists of a mix of shallow/deep marsh and sedge meadow wetlands. The acreage amounts for each wetland type were determined using hydraulic data (1912 MSL Datum) from this site. Under the Corps' Wetland Delineation Manual (https://www.usace.army.mil/Portals/2/docs/civilworks/reg_supp/erdc-el-tr-10-16.pdf), the standard of defining a wetland requires 14 or more consecutive days of flooding or ponding during the growing season. Analyzing the last 30 years of hydraulic elevation data at the bathtub site, a 25% exceedance was determined to be at elevation 604 feet. Emergent wetlands are considered any vegetation from the 25% exceedance of 604 feet minus 3 feet (verbal communication with Corps Regulatory). Therefore, deep/shallow marshes are considered at an elevation at and below 604 (9.7 acres) and any area at 605 (1.4 acres) is considered a sedge meadow community. Please refer to Figure 3 for acreages at each elevation.


WISCONSIN
Grant Co.
IOWA
Dubuque Co.
Snyder Slough
Mississippi River
Flow
Corps Site
Finley's Landing
(Existing Placement Site)
Farm Fields/Quarry
Great River Road
Finleys Landing Rd
Hamelman Rd
Haberkorn Rd
Cr-C61
Cr-U
Cross St
Cr-O
133
61
599
598
597
596
595
594
593
592
591
590
0 2,000 4,000 8,000
Feet

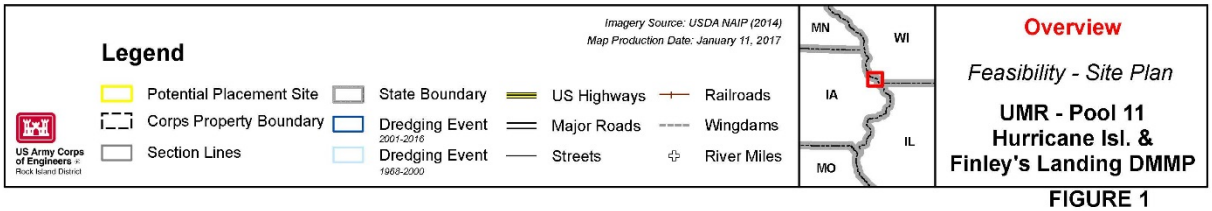

Legend
Potential Placement Site
Corps Property Boundary
Section Lines
State Boundary
Dredging Event
2001-2016
Dredging Event
1968-2000
US Highways
Major Roads
Streets
Railroads
Wingdams
River Miles
Imagery Source: USDA NAIP (2014)
Map Production Date: January 11, 2017
US Army Corps of Engineers
Rock Island District
MN
WI
IA
IL
MO
Overview
Feasibility - Site Plan
UMR - Pool 11
Hurricane Isl. &
Finley's Landing DMMP

FIGURE 1

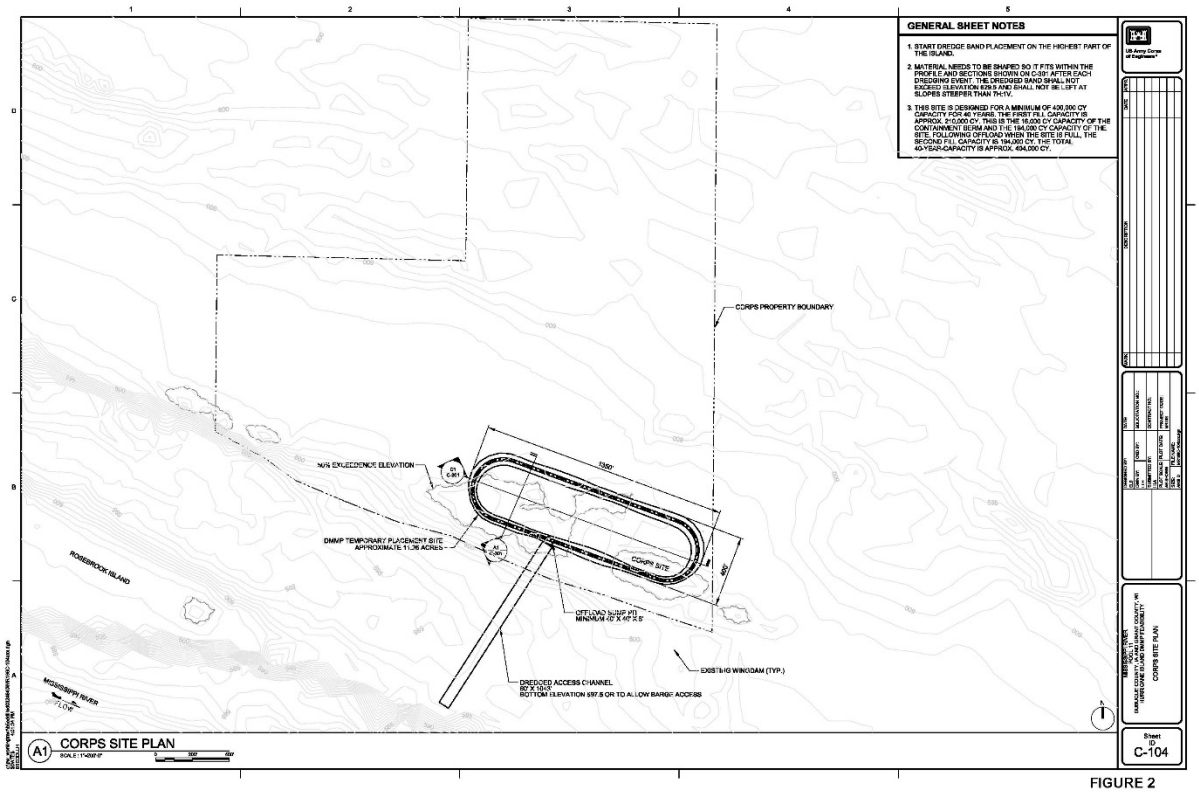

GENERAL SHEET NOTES
1. START DREDGE SAND PLACEMENT ON THE HIGHEST PART OF THE ISLAND.
2. MATERIAL NEEDS TO BE SHAPED SO IT FITS WITHIN THE PROFILE AND SECTIONS SHOWN ON C-501 AFTER EACH DREDGING EVENT. THE DREDGED SAND SHALL NOT EXCEED ELEVATION 609.5 AND SHALL NOT BE LEFT AT SLOPES STEEPER THAN 7H:1V.
3. THIS SITE IS DESIGNED FOR A MINIMUM OF 430,000 CY CAPACITY FOR 40 YEARS. THE FIRST FILL CAPACITY IS APPROX. 410,000 CY. THIS IS THE 10,000 CY CAPACITY OF THE CONTAINMENT BERM AND THE 184,000 CY CAPACITY OF THE SITE. FOLLOWING OFFLOAD WHEN THE SITE IS FULL, THE SECOND FILL CAPACITY IS 194,000 CY. THE TOTAL 40-YEAR-CAPACITY IS APPROX. 404,000 CY.
CORPS PROPERTY BOUNDARY
1350'
400'
CORPS SITE
10% EXCEEDENCE ELEVATION
C1
C-501
DMMP TEMPORARY PLACEMENT SITE
APPROXIMATE 11.36 ACRES
A1
C-501
ROSEBROCK ISLAND
OFFLOAD SUMP PIT
MINIMUM 40' X 40' X 5'
DREDGED ACCESS CHANNEL
80' X 1000'
BOTTOM ELEVATION 597.5 OR TO ALLOW BARGE ACCESS
EXISTING WINGDAM (TYP.)
MISSISSIPPI RIVER
NAVIGATION CHANNEL
MISSISSIPPI RIVER
DARGUE COUNTY, IOWA AND GRANT COUNTY, WISCONSIN
MILE 615.1 TO MILE 616.1
CORPS SITE PLAN
Sheet ID
C-104
A1 CORPS SITE PLAN
SCALE: 1"=200'-0"

FIGURE 2

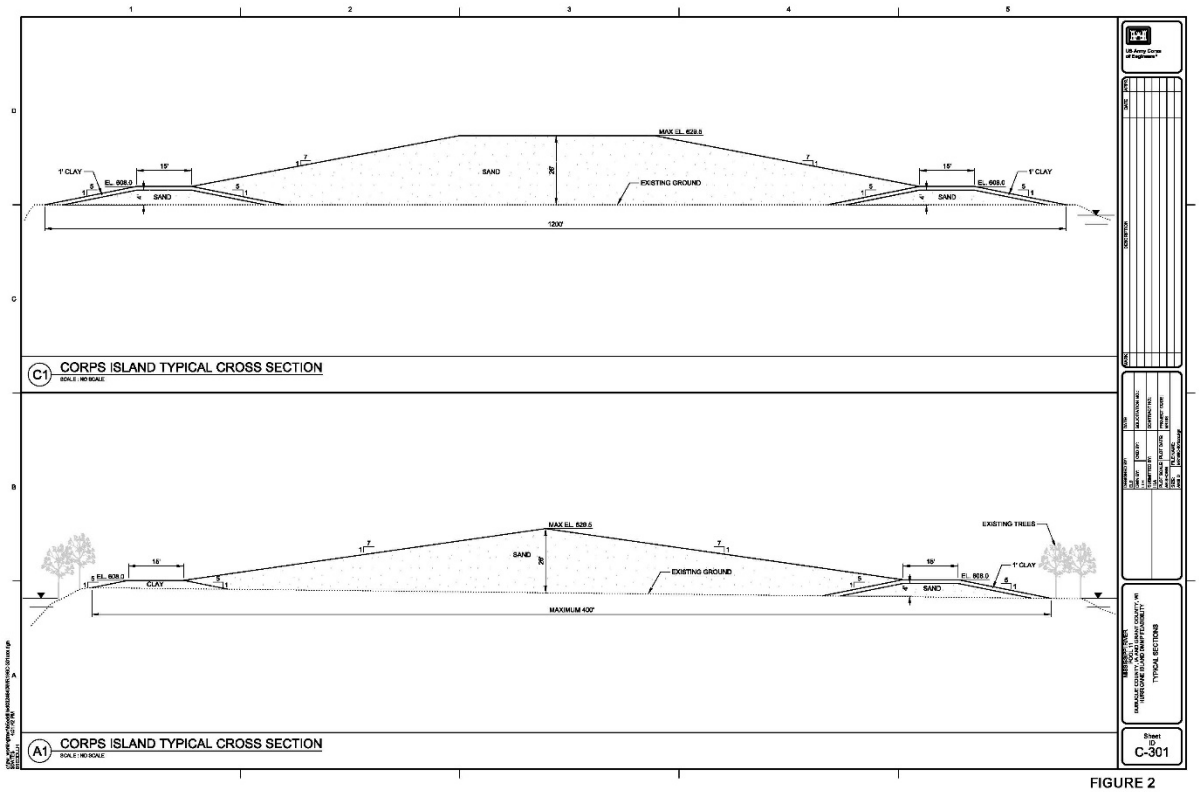
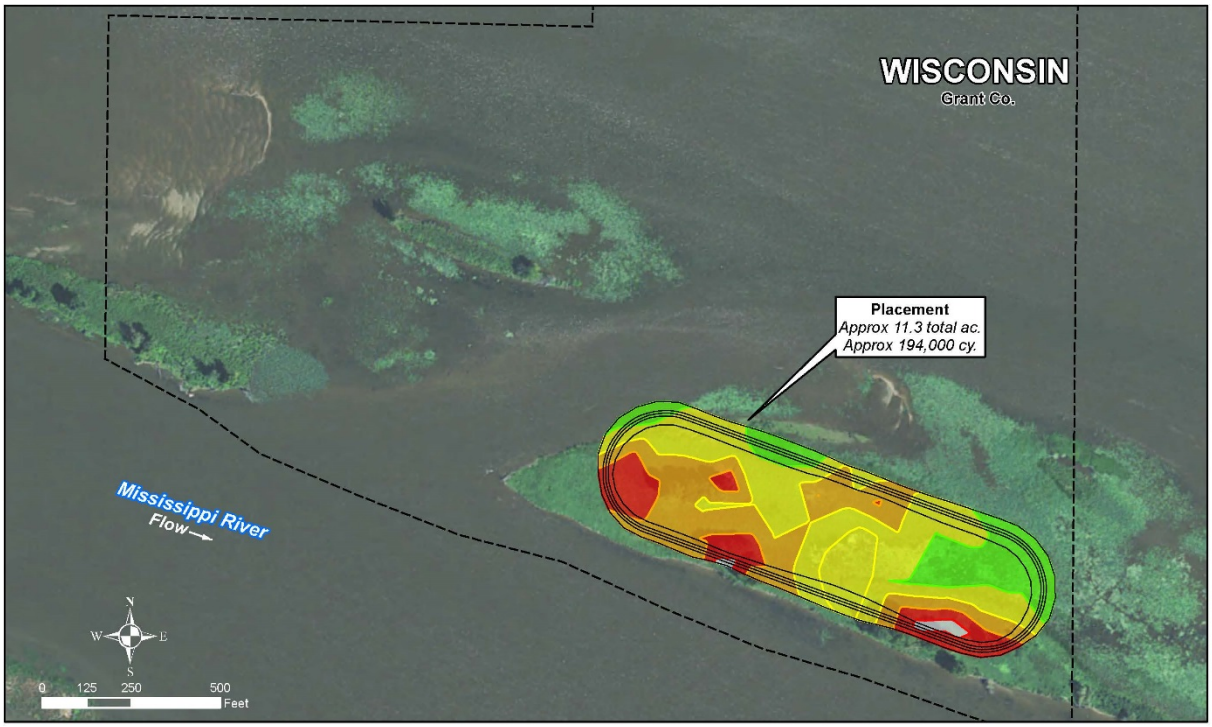

MAX EL. 628.5
1' CLAY
15'
EL. 608.0
SAND
EXISTING GROUND
EL. 608.0
1' CLAY
1200'
C1 CORPS ISLAND TYPICAL CROSS SECTION
SCALE : NO SCALE
MAX EL. 628.5
EXISTING TREES
SAND
CLAY
EL. 608.0
EXISTING GROUND
1' CLAY
SAND
MAXIMUM 400'
A1 CORPS ISLAND TYPICAL CROSS SECTION
SCALE : NO SCALE
TYPICAL SECTIONS
Sheet
C-301

FIGURE 2



Legend

- Potential Placement Site
- Corps Property Boundary

US Army Corps of Engineers
Rock Island District

Elevation / (Feet, MSL1912)	Total Acres
606'	~0.1 ac.
605'	~1.4 ac.
604'	~3.2 ac.
603'	~4.6 ac.
602'	~1.9 ac.

Imagery Source: USDA NAIP (2014)
Map Production Date: January 11, 2017

Corps Site

Feasibility - Site Plan

UMR - Pool 11
Hurricane Isl. & Finley's Landing DMMP

FIGURE 3

Photograph 1. Typical Sedge Meadow Vegetation at Proposed Bathtub Site

Photograph 2. Typical Deep/Shallow Marsh Vegetation at Proposed Bathtub Site

HURRICANE ISLAND
DREDGED MATERIAL MANAGEMENT PROGRAM

WETLAND ASSESSMENT

DISTRIBUTION

Kurt Rasmussen
Water Resources Management Specialist
3550 Mormon Coulee Road
La Crosse, WI 54601

Jim Fischer
Natural Resources Basin Supervisor
3550 Mormon Coulee Road
La Crosse, WI 54601

Pam Schense
Water Regulations and Zoning Specialist
PO Box 7921
Madison, WI 53707-7921

Dave Pericak
Natural Resources Basin Supervisor
3550 Mormon Coulee Road
La Crosse, WI 54601

Sally Jarosz
Water Resources Management Specialist
PO Box 7921
Madison, WI 53707-7921

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

APPENDIX G-3-2

IN-LIEU FEE COORDINATION

Herzog, Kathryn M CIV USARMY CEMVR (US)

From: Brown, Joshua A - DNR
Sent: Friday, March 03, 2017 3:57 PM
To: Herzog, Kathryn M CIV USARMY CEMVR (US) Rasmussen,
Cc: Kurt A - DNR
Subject: [EXTERNAL] Pool 11/Hurricane Island wetland mitigation

Ms. Herzog,

As we discussed via phone on February 22nd, the Wisconsin Wetland Conservation Trust (WWCT) is not able to fulfill the Corps' wetland mitigation obligations resulting from the Rock Island Corps District's Hurricane Island/Pool 11 dredging project. Our WWCT Program Instrument, which details the Program's guidelines and responsibilities, states that "Through the sale of WWCT credits the Sponsor (DNR) accepts the legal responsibility to satisfy wetland compensatory mitigation requirements specified by US Army Corps of Engineers-St. Paul District permits authorized under Section 404 of the Clean Water Act, Section 10 of the River and Harbors Act and Wisconsin DNR Wetland Individual Permits pursuant to Chapter 281.36." Because there is no Section 404, Section 10, or DNR Wetland permit, the WWCT does not feel it can accept the Corps' mitigation obligations.

In a February 20th meeting with DNR staff, Kurt Rasmussen (copied here) of the DNR Mississippi River Team, suggested that the Rock Island Corps District work with the Upper Mississippi River (UMR) interagency partnership teams (Fish and Wildlife Interagency Committee and the On-Site Inspection Team) to develop alternative compensatory mitigation options on Pool 11 of the Mississippi River. We believe that working with UMR partnership teams will provide you with a reasonable solution to fulfilling your mitigation requirements. This option would also allow the Rock Island District to provide input on the restoration project and ensure that the project be located in or near the river, two of your requests that the WWCT could not accommodate.

Please let me know if you have any questions or comments.

Thanks,

Josh

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ROCK ISLAND DISTRICT
PO BOX 2004 CLOCK TOWER BUILDING
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

CEMVR-PM-M

APR 17 2017

Mr. Dan Baumann
1300 W Clairemont Avenue
Eau Claire, WI 54701

Dear Mr. Baumann:

The U.S. Army Corps of Engineers, Rock Island District (District), is nearing completion of the Hurricane Island Reach Dredged Material Management Plan (DMMP), Pool 11 of the Upper Mississippi River. This DMMP will address one of the highest risk navigation channel sections in the Mississippi River that experienced an emergency channel closure in 2016, negatively impacting river commerce in the States of Wisconsin, Minnesota, Iowa and Illinois. We seek a proactive approach in order to avoid any future emergency closures.

This DMMP identifies new placement sites to accommodate anticipated 40-year channel maintenance dredging quantities. The planning effort for this particular DMMP began in 2010. The technical challenges that this stretch of river present contribute to the duration of this effort. From 2010 to the present, the District partnered with various resource agencies, including the Wisconsin Department of Natural Resources (WI DNR), the Iowa DNR, and the U.S. Fish and Wildlife Service (USFWS), in an attempt to collaboratively find a solution to this problematic area.

Our partnership generated a number of conceptual ideas that have been further vetted against Federal standards and regulations. As many conceptual ideas develop, they often fail to meet the expectations of one or more of the partners.

During recent project development, the District applied on January 20, 2017, to the WI DNR In-Lieu Fee Program (Enclosure 1) to address mitigation needs for wetland impacts from the construction and use of the proposed placement site. Upon follow up of the status of the application, the District learned that the WI DNR could potentially reject the application. In response to this information, the District met on February 14, 2017, with the WI DNR, the Iowa DNR, and the USFWS to generate additional conceptual options to address compensatory mitigation. The District received an e-mail on March 3, 2017 (Enclosure 2), confirming that the WI DNR had rejected the In-Lieu Fee Program application, stating that the District should find a compensatory mitigation option within Pool 11 instead.

Since the February 14 meeting, the District has continued to evaluate the conceptual options and developed a Compensatory Wetland Mitigation Plan (Enclosure 3) that is constructible, fits within the Corps' channel maintenance authority, and meets all applicable laws and standards. This mitigation plan, based on an option proposed by the WI DNR and other resource agencies, is included in the Public Review Draft of the DMMP that will be available no later than the end of April 2017.

If, during the 30-day public review period, it is determined that this new mitigation plan does not meet the expectations of the WI DNR, the District is asking for a reconsideration of the January 20, 2017, application to the In-Lieu Fee Program.

Thank you for the opportunity to communicate the current status of the Hurricane Island Reach DMMP. We continue to appreciate the partnership as we produce a finalized DMMP report intended to manage risks to navigation and state impacts on the Upper Mississippi River.

The point of contact for this matter is Mr. Adam Ziegler, 309-794-5168 or e-mail: adam.t.ziegler@usace.army.mil.

Enclosures (3)

CRAIG S. BAUMGARTNER
COL, EN
Commanding