

**UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
U.S. ARMY CORPS OF ENGINEERS
ROCK ISLAND DISTRICT**



**4-YEAR POST-CONSTRUCTION
ADDENDUM TO
INITIAL PERFORMANCE EVALUATION REPORT
DATED NOVEMBER 1998**

FOR

**POTTERS MARSH
HABITAT REHABILITATION AND ENHANCEMENT
PROJECT**

**POOL 13, UPPER MISSISSIPPI RIVER MILES 522.5 – 526.0
CARROLL AND WHITESIDE COUNTIES, ILLINOIS**

AUGUST 2002

**Potters Marsh Performance Evaluation Report
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Previous Performance Evaluation Reports, including the Project Monitoring Plan, and other related project documents such as the Definite Project Report (DPR) and the Project Operation and Maintenance Manual with As-Built Construction Drawings are available at: <http://www.mvr.usace.army.mil/EMP/hrep.htm>.

POTTERS MARSH HABITAT REHABILITATION AND ENHANCEMENT PROJECT

Construction Substantially Completed December 1994

Preface

This project was authorized, designed, and constructed as part of the Upper Mississippi River Environmental Management Program (UMR-EMP, PL 99-662). The program, as administered by the U.S. Army Corps of Engineers, authorizes "... the planning, construction and evaluation of measures for fish and wildlife habitat rehabilitation and enhancement..."

Once EMP projects are planned, designed, and constructed, they are operated and maintained by the Project Sponsor in accordance with Project Cooperation Agreements (for Non-Federal Sponsors) or Memorandums of Agreement (for Federal Sponsors).

Post-construction project monitoring was authorized by the EMP in efforts to validate project goals and objectives against physical, chemical, and biological aspects of the project. Post-construction monitoring also provides a systematic basis for project review of planning, design and construction principles, operation and maintenance considerations and natural resource management viewpoints.

Post-construction performance evaluations are performed each year and put out as a report, called a Post-Construction Performance Evaluation Report (PER). Principal agencies involved include the Sponsor, the U.S. Fish and Wildlife Service, U.S. Geological Survey, State Resource Agencies, and the U.S. Army Corps of Engineers. Principal components of the PER include inspections and observations, field sampling and evaluation of data relative to project goals and objectives. Field data is collected according to an established project monitoring plan presented in the PER.

The Post-Construction PER is either published as a separate report or as a supplement to previous reports. Supplements are utilized when monitoring/project data do not warrant full evaluations and analyses.

Previous Performance Evaluation Reports (PERs), including the project monitoring plan, and other related project documents such as the Definite Project Report (DPR) and the project Operation and Maintenance (O&M) Manual with as-built construction drawings are available at: <http://www.mvr.usace.army.mil/EMP/hrep.htm>.

TABLE OF CONTENTS

SECTION	PAGE
1. INTRODUCTION	1
2. PROJECT GOALS AND OBJECTIVES	1
3. PROJECT DESCRIPTION.....	2
4. PROJECT MONITORING.....	2
5. EVALUATION OF AQUATIC HABITAT OBJECTIVES	3
6. EVALUATION OF WETLAND HABITAT OBJECTIVES.....	4
7. OPERATION AND MAINTENANCE SUMMARY	5
8. CONCLUSIONS AND RECOMMENDATIONS	5

LIST OF APPENDICES

APPENDIX A - ELECTROFISHING DATA
APPENDIX B - COOPERATING AGENCY CORRESPONDENCE

LIST OF PLATES

PLATE 1 - MONITORING PLAN

1. INTRODUCTION

a. Purpose. The purpose of this report is to provide a summary of the observations for the performance evaluation monitoring that has been ongoing since the completion of the last Performance Evaluation Report (PER), dated November 1998. Specifically, the report:

- (1) summarizes the performance of the Potters Marsh HREP based on project goals and objectives.
- (2) reviews the monitoring plan for possible revisions.
- (3) summarizes project operation and maintenance efforts to date.
- (4) reviews engineering performance criteria to aid in the design of future projects

b. Scope. This report summarizes available project monitoring data, inspection records, and observations made by the U.S. Army Corps of Engineers (Corps) and the Illinois Department of Natural Resources (ILDNR) for the years 2000 and 2001, or approximately four years after construction.

c. Previous Performance Evaluation Reports. The initial PER was completed in November 1998.

2. PROJECT GOALS AND OBJECTIVES

Goals and objectives, formulated during the project design phase, are summarized in Table 1.

Table 1. Project Goals and Objectives		
Goals	Objectives	Project Features
Rehabilitate and enhance aquatic habitat	Restore and create a fisheries habitat	Hydraulically dredged channel
	Reduce sediment input	Mechanically excavated sediment trap
Enhance habitat for migratory birds through wetland rehabilitation	Increase migratory bird feeding and resting areas	Managed marsh unit Grass and forbs plantings
	Increase waterfowl brood habitat and fall feeding sites	Potholes

3. PROJECT DESCRIPTION

a. General. The Potters Marsh Habitat Rehabilitation and Enhancement Project (HREP) is a part of the Upper Mississippi River System (UMRS) Environmental Management Program (EMP). The Potters Marsh HREP is located in Pool 13 on the Illinois side of the Upper Mississippi River navigation channel between river miles 522.5 and 526. As stated in the Definite Project Report (DPR), the Potters Marsh HREP was initiated in response to the quantitative and qualitative losses of off-channel aquatic wetland habitat due to sedimentation.

b. Features. The project consists of aquatic habitat channels in Potters Slough and on the upstream side of the Thomson Causeway, a mechanically excavated sediment trap on the downstream side of the Thomson Causeway, a 32.5-acre managed marsh and 7.0-acre grassland created by confined placement site construction, and 18 potholes. The definition of these features has not changed since the initial Performance Evaluation Report. All features are summarized in Table 1 in relation to project goals and objectives.

c. Construction. The construction contract was awarded to J.F. Brennan of La Crosse, Wisconsin, on September 11, 1993. Construction was essentially complete in December of 1995.

d. Operation and Maintenance. Operation and maintenance is performed as defined in the Potters Marsh Operation and Maintenance Manual with the exception of the managed marsh operation. The managed marsh is now being inundated year-round to flood out undesirable willow and cottonwood trees. Therefore, operation and maintenance generally consists of:

- (1) maintaining the well and water control structure with operation occurring less frequently
- (2) clearing potholes of debris
- (3) routinely burning the CPS dike and grassland
- (4) maintaining the access road

4. PROJECT MONITORING

a. U.S. Corps of Engineers. The Corps performs sedimentation transects on the various dredged channels of the Potters Marsh HREP every five years. The Corps also takes transects of the potholes every five years. The Corps currently monitors water quality at four stations: 523.7Y, 524.1U, 525.1Y, and 523.6W. Station 523.6W was added since the last Performance Evaluation Report. Plate 1 of this report has the revised Monitoring Plan with this modification.

b. U.S. Fish and Wildlife Service (USFWS). The USFWS continues to be responsible for operating and maintaining Potters Marsh. Specifically, the USFWS is required to conduct

annual inspections of the project and to participate in periodic joint inspections of the project with the U.S. Army Corps of Engineers. The USFWS Savanna District Manager of the Upper Mississippi River National Wildlife and Fish Refuge is still designated as the site manager.

c. U.S. Geological Survey (USGS) / Iowa Department of Natural Resources (IADNR). The USGS, in cooperation with the IADNR at the Bellevue Field Station, periodically conducts standardized monitoring of water quality, fish, macroinvertebrates, and vegetation in Pool 13 as part of the Long Term Resource Monitoring Program (LTRMP) component of the EMP. Fyke net surveys were conducted in Potters Marsh during 2000 and 2001 as part of this program.

d. Illinois Department of Natural Resources. The ILDNR monitors fish numbers through electrofishing survey methods.

5. EVALUATION OF AQUATIC HABITAT OBJECTIVES

a. Restore and create fisheries habitat. The ILDNR performed an electrofishing survey in 2001 as shown in Appendix A. This survey was completed August 3, 2001 between river miles 524.5 and 525.0 in Potters Slough and adjacent backwater areas. No surveying was done in the main channel. The duration of the survey was 60 minutes. A total of 177 fish representing 18 species were collected. Golden shiner comprised 60 specimens of the total and bluegill comprised 31 specimens. Numbers of largemouth bass, pumpkin seeds, spotted sucker, and yellow perch equaled or exceeded ten for each species. These species of fish often indicate good water quality. Two brown bullheads were also collected. Brown bullheads can sometimes indicate deteriorating water quality, even in small numbers. It is uncertain if the finding of brown bullheads is significant since other evidence suggests water quality is still satisfactory.

The USGS Bellevue Field Station also sampled fish through fyke net surveys in 2000 and 2001. The LTRMP sampling resulted in the collection of 33 species of fish (bluegill, warmouth, tadpole madtom, golden shiner, pumpkinseed, mimic shiner, fathead minnow, river shiner, largemouth bass, northern pike, flathead catfish, emerald shiner, logperch, carp, bullhead minnow, orangespotted sunfish, channel catfish, black crappie, sauger, yellow perch, bowfin, river carpsucker, shorthead redhorse, striped/white bass, walleye, shortnose gar, gizzard shad, quillback, longnose gar, yellow bullhead, white crappie, and spotted sucker) and western painted turtle.

Overall, the electrofishing has been an effective fish collection method; however, larger fish have been more difficult to collect due to interference with vegetation in the water. Performing electrofishing at night or experimenting with hoop and frame nets may allow for easier collection. Also with electrofishing, it is difficult to evaluate how the area is used as a nursery habitat other than by observing fish size. Future larval fish surveys could be one method of evaluating nursery potential.

The Illinois Natural History Survey at Kaskaskia Biological Station did survey larval fish populations bimonthly from mid-May to mid-June from 1998 through 2000. The sampling was in addition to ongoing post-construction performance modeling. The survey effort was initiated to assess the potential effects of a mid-summer drawdown of Pool 13 (1.0 foot below flat pool as measured at the dam) on larval fish production. Sampling of larval fish populations was conducted at the Potters Marsh HREP and the Browns Lake HREP. A drawdown of Pool 13 was attempted twice during summer 1998, the first for a 13-day period (June 21-July 3) and the second for a 7-day period (July 11-July 17). During the 1998 survey period, total larval fish densities were low in Potters Marsh (the experimental backwater) compared to Brown's Lake (the control backwater). Larval fish representing five families - clupeids, percids, sunfish, cyprinids, and silversides - were collected at Potters Marsh during the three-year period. Mean total larval fish density (number of larval fish per cubic meter x 100) peaked at 500 in 1998 (the experimental year) on June 3 and declined to low levels throughout the remainder of the sampling period. In 1999, mean total larval fish density peaked at 5570 on June 30. In 2000, mean total larval fish density peaked at 940 on June 17. Larval fish sampling was not performed in 2001. It may be advisable to resume larval fish sampling to evaluate the use of the area as a nursery habitat in future years.

b. Reduce sediment input. Turbidity has been low with secchi water depths between 4 and 6 feet. Sedimentation rates did seem to be as high compared to other HREP sites such as Browns Lake. Most likely, the sediment trap has collected much of the sediments that would have deposited in Potters Slough. Sedimentation transects taken in summer 2002 will better define project sedimentation rates and patterns. These sedimentation transects, along with water quality data, will be analyzed in the next PER.

6. EVALUATION OF WETLAND HABITAT OBJECTIVES

a. Increase migratory bird feeding and resting areas. The managed marsh was originally intended to function as a moist soil unit. A spring or summer drawdown would encourage natural vegetative growth and fall or winter incremental flooding would enhance waterfowl use. The USFWS managed the Potters Marsh HREP in this manner until 2000 when encroachment of willow and cottonwood became uncontrollable. The density of woody encroachment increased from the drawdowns. Prescribed burning, mowing, and dozer work to try and setback the encroachment were unsuccessful. In June 2000, long-term flooding of the trees was implemented in order to maintain habitat suitable for waterfowl use. By freeze-up in November 2000, stress on the trees from the continuous flooding was observed. The managed marsh continued to be submerged through 2001, putting further stress on the trees. Encroachment was most severe in the grassland.

The change in managed marsh operation resulted in slight impacts to achieving the objective of waterfowl utilization. No summer drawdown in the containment area eliminated seasonal exposure of mudflat/sandbar habitat and prevented the germination of annual moist-soil food plants. The flooded trees offered a different type of wetland habitat, but feeding and loafing opportunities were still available. Instead of feeding on moist soil plants, waterfowl were observed feeding on invertebrates attracted to the leaf litter. Invertebrates are a source of

protein. As for vegetation, grasses and forbs such as switch grass and little bluestem were still plentiful.

b. Increase waterfowl brood habitat and fall feeding sites. Abundant quantities of waterfowl have been observed in the spring near the potholes. There has been some minor encroachment of willows and cottonwoods in the vicinity of the potholes, but it does not seem to be affecting habitat. Pothole transects were taken in 2002. These pothole transects will be analyzed in the next PER.

7. OPERATION AND MAINTENANCE SUMMARY

a. Operation. The electric pump was operated from June 27 to November 13 to inundate the moist soil unit. By November 13, ice was forming and the pump was shut down. During the pumping operation, an estimated of 21.1 million gallons was added and raised the water level within the unit by 2.3 feet.

b. Maintenance.

(1) Inspections. The site manager's reports for 2000 and 2001 can be found in Appendix B.

(2) Maintenance performed. The containment dike was mowed in June and September 2000. The access road was sprayed in 2001.

(3) Maintenance concerns. Scouring was noted in the fall of 2000 on the inside south section of the containment dike. The cause was from an additional pump (6000 gallons per minute) that was added for raising the managed marsh water level. The pump discharge dislodged the tarp underlayment and caused erosion along the inside levee slope. In 2001, scouring occurred on the southwest side of the containment dike due to flood-related wavewash. Debris were also found on the dike as a result of flooding. Therefore, mowing on the dike was not performed during 2001, making it more difficult to control the willow and cottonwood tree growth there. Woody vegetation encroachment in the grassland area and around the potholes was also observed in 2001. Beaver activity had been observed in 2000 and 2001 around the stoplog structure. So far, the activity has not been much of a problem. Mud due to beavers on the stoplog structure has actually been beneficial in keeping water impounded inside the containment dike.

8. CONCLUSIONS AND RECOMMENDATIONS

a. Project Goals and Objectives. Based on field data and observations collected for 2000 and 2001, it appears the objectives stated in Table 1 are being met.

Electrofishing and fyke net survey results showed diverse species of fish in abundant quantities. In the future, different survey methods should be attempted so larger fish can be collected. These methods might include night electrofishing or using hoop or frame nets.

As late as 2000, Potters Marsh supported nursery conditions with larval fish production. If future drawdowns of Pool 13 were implemented in the future, larval fish population monitoring would be necessary. Even if the drawdowns do not occur, larval fish sampling is still recommended so nursery habitat can be evaluated.

Sediment transects and annual water quality data will be analyzed in the next PER due in 2003.

Waterfowl is still being attracted to the potholes, managed marsh, and grassland, despite changes in the managed marsh operation. From general observations, the potholes also seem to be supporting habitat. Further studies of pothole habitat are recommended in the future. One suggestion is to use student thesis projects as a way of evaluating the pothole habitat. Pothole transects have been performed and will be analyzed in the next PER in 2003.

b. Post-Construction Evaluation and Monitoring Schedules. In general, project monitoring efforts have been performed according to the Post-Construction Performance Evaluation Plan and the Resource Monitoring and Data Collection Summary. The next Post-Construction Performance Evaluation Report will be completed in 2003 following collection of data for sediment and pothole transects.

c. Project Operation and Maintenance. Deficiencies noted during future inspections should be corrected by shaping, grading, or placing rock as required. The managed marsh should continue to be submerged indefinitely to flood out willow and cottonwood trees. It is anticipated that high water levels will be the key to long-term benefits providing waterfowl habitat within this management unit. Burning should be applied to the grassland and containment berm annually or biennially when possible. Mowing may also be beneficial where encroachment is initiating or when burning is not practicable.

APPENDIX A
ELECTROFISHING DATA

6/28/02

Potter's HREP

Page 1

Potter's Slough HREP

GEAR: DC Electrofishing

River Mile: MSR-524.5-525

Sampling Date: August 3, 2001 Sampling Time: 60 Minutes

Species	Number Collected
Black crappie	6
Bluegill	31
Bowfin	3
Brown bullhead	2
Carp	3
Golden shiner	60
Grass pickerel	2
Gizzard shad	10
Largemouth bass	13
Longnose gar	1
Northern pike	1
Orangespotted sunfish	1
Pumpkinseed	10
Rock bass	1
Spotted sucker	17
Shorthead redhorse	1
Walleye	2
Yellow perch	13

APPENDIX B
COOPERATING AGENCY CORRESPONDENCE

**OPERATION AND MAINTENANCE MANUAL
POTTERS MARSH REHABILITATION AND ENHANCEMENT**

**UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MANAGEMENT PROGRAM
POOL 13, RIVER MILES 522.5 THROUGH 526
CARROLL AND WHITESIDE COUNTIES, ILLINOIS**

SITE MANAGER'S PROJECT INSPECTION AND MONITORING RESULTS

Inspected By Bill Davison Date 10-24-00

Type of Inspection: annual emergency-disaster other

1. PROJECT INSPECTION.

<u>Item</u>	<u>Condition</u>
a. <u>Containment Dike</u>	
<input checked="" type="checkbox"/> Settlement, sloughs or loss of section	OK
<input checked="" type="checkbox"/> Wavewash, scouring	Scouring on inside – south section – due to pumping
<input checked="" type="checkbox"/> Overtopping erosion	none?
<input checked="" type="checkbox"/> Vegetative cover (mowing)	Mowed in June and September 2000
<input checked="" type="checkbox"/> Burrowing animals	1 fox den noted
<input checked="" type="checkbox"/> Unauthorized grazing or traffic	none
<input checked="" type="checkbox"/> Encroachments	none
<input checked="" type="checkbox"/> Unfavorable tree/shrub growth	Islands and shorelines are densely covered with cottonwood and willow
<input type="checkbox"/> Other	
b. <u>Stoplog Structure</u>	
<input checked="" type="checkbox"/> Stoplogs, stoplog keepers, stoplog slots	OK
<input checked="" type="checkbox"/> Concrete	OK
<input checked="" type="checkbox"/> Steel rails, rail posts, grating, fasteners	OK
<input checked="" type="checkbox"/> Displaced/missing riprap	OK
<input checked="" type="checkbox"/> Erosion adjacent to structure	none noted
<input checked="" type="checkbox"/> Sedimentation (culverts/approaches)	Beaver has dammed up the structure We have stoplogs in and he continues to mud them in
<input type="checkbox"/> Other	
<u>Item</u>	<u>Condition</u>

c. Well

(X) Protective casing	<u>good</u>
(X) Bollards	<u>good</u>
(X) Outlet pad	<u>good</u>
(X) Displaced/missing riprap	<u>none</u>
(X) Electrical controls	<u>OK</u>
(X) Pump	<u>OK</u>
() Other	<u></u>

d. Potholes

(X) Debris	<u>none</u>
(X) Woody vegetation encroachment on banks	<u>Densely covered for first 5 feet of bank</u>
() Other	<u></u>

e. Vegetation – Grassland Planting

(X) Grassland and forb species	<u>OK</u>
(X) Woody vegetation encroachment	<u>Some encroachment noted – was prescribe burned on 3-1-00</u>
() Other	<u></u>

f. Access

(X) Road – granular surfacing, etc.	<u>good</u>
(X) Drainage - CMP	<u>OK</u>

2. COMMENTS.

Pumping of water into the containment cell with a 6000 gpm barnes pump resulted in a section of the interior levee washing out. This is a very wide part of the levee and should not be a concern for breaking. We are planning on repairing and riprapping the area so we can pump again without problems.

Ed Britton
Site Manager

**OPERATION AND MAINTENANCE MANUAL
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**UPPER MISSISSIPPI RIVER
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POOL 13, RIVER MILES 522.5 THROUGH 526
CARROLL AND WHITESIDE COUNTIES, ILLINOIS**

SITE MANAGER'S PROJECT INSPECTION AND MONITORING RESULTS

Inspected By Bill Davison Date 10-28-01

Type of Inspection: annual emergency-disaster other

1. PROJECT INSPECTION.

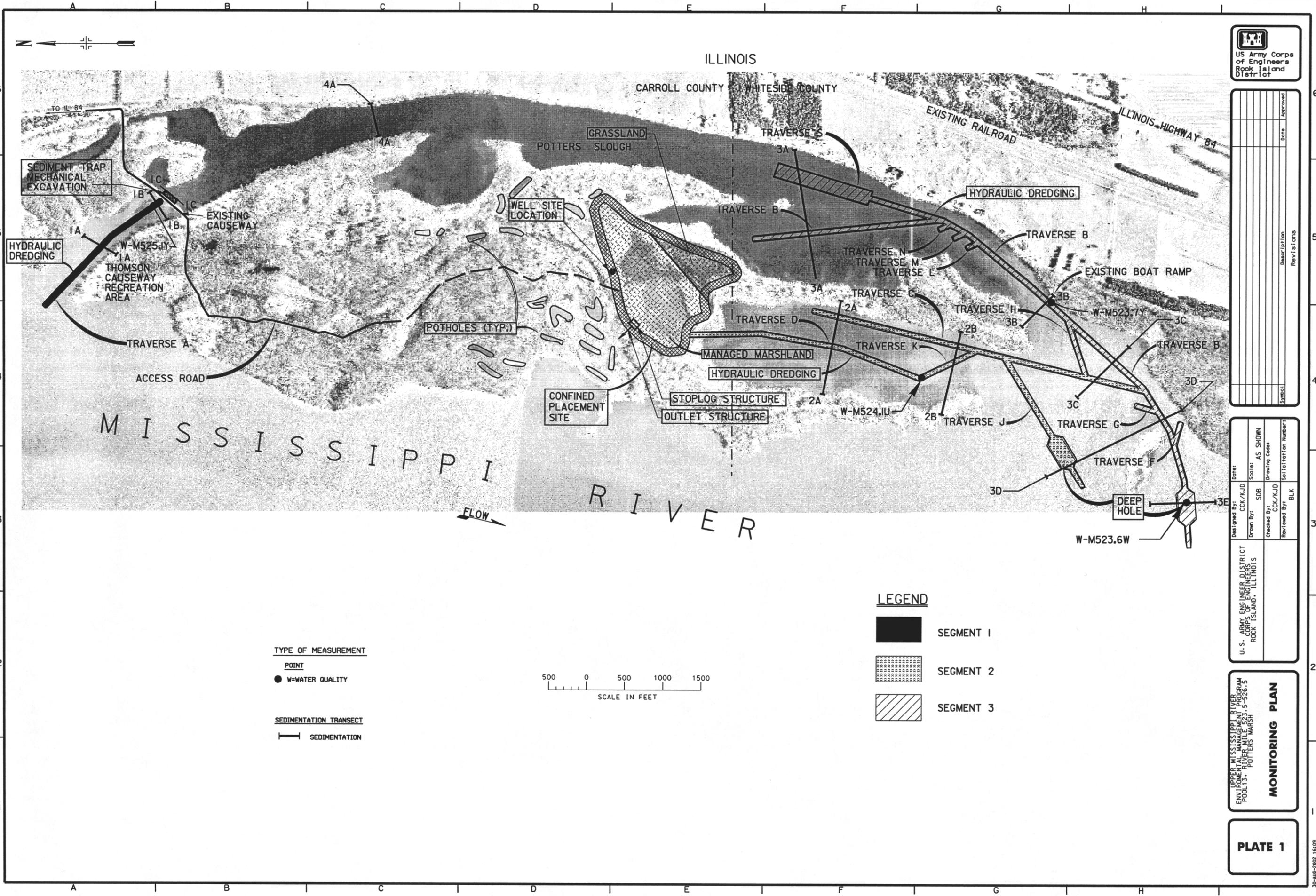
<u>Item</u>	<u>Condition</u>
a. <u>Containment Dike</u>	
<input checked="" type="checkbox"/> Settlement, sloughs or loss of section	OK
<input checked="" type="checkbox"/> Wavewash, scouring	some scouring on the southwest side due to wavewash in 2001 flood
<input checked="" type="checkbox"/> Overtopping erosion	none
<input checked="" type="checkbox"/> Vegetative cover (mowing)	not mowed in 2001 (high water and debris)
<input checked="" type="checkbox"/> Burrowing animals	OK
<input checked="" type="checkbox"/> Unauthorized grazing or traffic	none
<input checked="" type="checkbox"/> Encroachments	none
<input checked="" type="checkbox"/> Unfavorable tree/shrub growth	islands and shorelines densely covered with cottonwood and willow
<input type="checkbox"/> Other	
b. <u>Stoplog Structure</u>	
<input checked="" type="checkbox"/> Stoplogs, stoplog keepers, stoplog slots	OK
<input checked="" type="checkbox"/> Concrete	OK
<input checked="" type="checkbox"/> Steel rails, rail posts, grating, fasteners	OK
<input checked="" type="checkbox"/> Displaced/missing riprap	none
<input checked="" type="checkbox"/> Erosion adjacent to structure	none
<input checked="" type="checkbox"/> Sedimentation (culverts/approaches)	none - beaver continues to mud in stoplogs
	as water raises
<input type="checkbox"/> Other	

<u>Item</u>	<u>Condition</u>
c. <u>Well</u>	
(X) Protective casing	OK
(X) Bollards	OK
(X) Outlet pad	OK
(X) Displaced/missing riprap	OK
(X) Electrical controls	OK – needed to replace fuse in fall 2001
(X) Pump	OK
() Other	
d. <u>Potholes</u>	
(X) Debris	minimal after flood
(X) Woody vegetation encroachment on banks	some encroachment noted after flood
() Other	
e. <u>Vegetation – Grassland Planting</u>	
(X) Grassland and forb species	OK
(X) Woody vegetation encroachment	encroachment increasing due to inability to burn – will mow in 2002
() Other	
f. <u>Access</u>	
(X) Road – granular surfacing, etc.	OK – was sprayed once in 2001
(X) Drainage - CMP	OK

2. COMMENTS.

Ed Britton
Site Manager

PLATES



TYPE OF MEASUREMENT

POINT

● W-WATER QUALITY

SEDIMENTATION TRANSECT

— SEDIMENTATION

500 0 500 1000 1500
SCALE IN FEET

LEGEND

■ SEGMENT 1

▨ SEGMENT 2

▧ SEGMENT 3

Symbol	Description	Date	Approved

Designed By: CCK/KJD	Date:
Drawn By: SDB	Scale: AS SHOWN
Checked By: CCK/KJD	Drawing Code:
Reviewed By: BLK	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

MONITORING PLAN

UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MONITORING PROGRAM
POOL 13 - POTTERS MARSH

PLATE 1

3/20/00 15:08
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