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

REPLY TO
ATTENTION OF

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January 21, 2004

Planning, Programs, and
Project Management Division

SEE REPORT DISTRIBUTION LIST

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has enclosed for your use the 7-Year Post-Construction Performance Evaluation Report (PER) for the Potters Marsh Habitat Rehabilitation and Enhancement Project (HREP). This report is a product of the post-construction field observations and monitoring data covering the period of July 1998 through December 2002. The next report is scheduled for completion in March 2005.

Performance Evaluation Reports (PERs) are the Corps' primary mechanism for reviewing, documenting, and communicating the effectiveness of HREPs, which are a part of the Upper Mississippi River System - Environmental Management Program (UMRS-EMP). The main purposes of PERs are to summarize project performance, as well as operation and maintenance efforts, based on the project goals/objectives, and to review the monitoring plan and performance criteria to aid in the design of future HREPs.

A draft PER was provided to project sponsors for their review and comment. Those comments were incorporated into the final PER. If you have any questions regarding this report, please call Mr. Larry Melaas in the Design Branch, Engineering Division, telephone 309/794-5323.

Sincerely,

ORIGINAL SIGNED BY
Gary L. Loss, P.E.
Chief, Planning, Programs, and
Project Management Division

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

7-YEAR (YR) POST-CONSTRUCTION PERFORMANCE EVALUATION REPORT

FOR

POTTERS MARSH HABITAT REHABILITATION AND ENHANCEMENT PROJECT

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

OCTOBER 2003

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CEMVR-PM-M

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM

7-YEAR POST-CONSTRUCTION PERFORMANCE EVALUATION REPORT

For

POTTERS MARSH HABITAT REHABILITATION AND ENHANCEMENT PROJECT

MISSISSIPPI POOL 13, RIVER MILES (RM) 522.5 - 526 CARROLL AND WHITESIDE COUNTY, ILLINOIS

OCTOBER 2003

Potters Marsh Performance Evaluation Report
Points of Contact

[Please furnish any comments on this report to Larry Melaas or ATTN: CEMVR-ED-DN]

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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.

ACRONYMS

Corps	U.S. Army Corps of Engineers, Rock Island District
DA	Damage Assessment
DPR	Definite Project Report
EMP	Environmental Management Program
HREP	Habitat Rehabilitation and Enhancement Project
LTRMP	Long-Term Resource Monitoring Program
O&M	Operation and Maintenance
PER	Performance Evaluation Report
RM	River Mile
SCS	Soil Conservation Service
SPER	Post-Construction Supplemental Performance Evaluation Report
UMESC	Upper Midwest Environmental Sciences Center
UMRS	Upper Mississippi River System
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDNR	Wisconsin Department of Natural Resources
WHAG	Wildlife Habitat Appraisal Guide

Additional information about the Potters Marsh HREP and the UMRS-EMP is available via the Internet at the following addresses:
www.mvr.usace.army.mil/EMP/default.htm , www.mvr.usace.army.mil, or
http://www.mvr.usace.army.mil/EMP/hrep/bertom.htm

Executive Summary

General. The Potters Marsh Habitat Rehabilitation and Enhancement Project (HREP) is located in Pool 13, Upper Mississippi River Miles 522.5 – 526.0, in Carroll and Whiteside Counties, Illinois. This area on the Mississippi River was greatly affected by the construction of Lock and Dam 13 that raised the river level, creating a permanent backwater slough between what is now an island and the Illinois mainland bank. To provide access to the Corps of Engineers (Corps) Thomson Causeway Recreation Area, the Corps raised an existing causeway near the upstream end of the slough. The causeway has culverts that are large enough to pass high flow levels. Over time, siltation in the slough had reached a critical point. Submergent vegetation totally clogged most of the slough, drastically reducing the fisheries habitat. Additionally, siltation had filled in much of the historically productive waterfowl marshes at this location.

The Potters Marsh HREP was created to rehabilitate and enhance this valuable habitat area. Backwater hydraulic dredging has restored and created deep-water slough habitat for overwintering fish. Creation of a sediment trap has kept the upper end of the slough and causeway flow tubes from silting in completely. Construction of a managed marshland on the dredged material Confined Placement Site (CPS) provides a migratory bird feeding resting area. Pothole excavation has made additional secluded open water available for waterfowl. Implementation of the project has improved the quality and life of the valuable wetland-upland complex.

Purpose. The purpose of this report is to provide a summary of the observations for the performance evaluation monitoring covering the period of July 1998 through December 2002. Construction was completed in December 1995 so this report is identified as the 7-Year Post-Construction Performance Evaluation Report.

Goals. There are two goals for this project and they are;

- Rehabilitate and Enhance Aquatic Habitat, and
- Enhance Migratory Birds Through Wetland Rehabilitation.

Observations and Conclusions. For the report period of July 1998 to December 2002, the objectives to meet each goal had the following observations and conclusions.

1) Rehabilitate and Enhance Aquatic Habitat:

Restore and create fisheries habitat. Fish sampling included largemouth bass, bluegill, and pumpkinseed as the predominant fish species in the project area. The recommendation to resume larval fish sampling as explained in the August 2002 PER still stands as it should help determine if the area is useable as a nursery habitat in future years. Water depths were created that were sufficient in supporting fish overwintering where very shallow depth existed previously. However, sedimentation was quite rapid immediately following construction of the dredged channels and depth has been lost in Segment 2. The average deep-hole depth in Segment 2 was 5 feet, and the average deep-hole depth in Segment 3 was 9 feet (constructed depth was 8 feet and the 50-year target depth is 6 feet).

The assessment of sedimentation rate for the project area still requires further analysis and discussion with project members to ascertain if the changes identified in the transect surveys is occurring more rapid then expected. Continued monitoring of the dredged channels and deep holes at Potters Marsh may confirm if sedimentation and habitat loss is a problem.

Water Quality has shown improvement since the restoration of the deep channels. The results of instantaneous dissolved oxygen monitoring shows no dissolved oxygen problems have been observed during the winter months following project completion. Results from continuous monitoring show that low dissolved oxygen concentrations periodically occur for extended periods of time. Often they are observed for relatively short periods during the evening and early morning hours. While low dissolved oxygen concentrations are more common near the river bottom, the severity and frequency of occurrence seems to be less both near the surface and near the bottom as compared to pre-construction conditions. Further monitoring will continue to better define these trends.

Reduce sediment input. The rate of sedimentation is usually high immediately after dredging a channel but decreases as the channel reaches equilibrium. The dredged channels for the Potters Marsh HREP experienced this type of sedimentation activity once the dredging was complete. Currently, the depths range between 6 to 8 feet that is the 50-year target. There is concern whether the dredged areas will be able to maintain this depth since the project is only at the seven-year mark after the channels were dredged. Continued sedimentation monitoring at Potters Marsh is required to determine if the fisheries habitat objectives are being met.

2) Enhance Migrating Waterfowl Habitat:

Increase migratory bird feeding and resting areas. The managed marsh continues to be submerged year round in order to control the encroachment of willow and cottonwood trees by keeping the marsh too wet for the trees to thrive. Observations of migratory bird usage were not provided in this report but will be discussed in the next performance evaluation report.

Increase waterfowl brood habitat and fall feeding sites. Continued monitoring and interpretation of the land use maps will help identify if project objectives are being met. Several areas of grass and forbs have been identified in and adjacent to the project area. A plant survey was conducted in August 2002 that identified a variety of species that included little bluestem, Canada wild rye, wild bergamot, poppy mallow, and the common sunflower. There were no clear trends in comparing the performance of the mechanically dredged potholes versus the blasted potholes. For the most part, the sides of the potholes are experiencing some sloughing, however the interiors of the potholes seem to be retaining their constructed depth.

Conclusions and Recommendations.

1) Project Goals, Objectives, and Management Plan. Based on field data and observations collected since the initial PER completed in November 1998, there is a concern about sedimentation rates and whether the dredged channels and deep holes will maintain their depth to the 50–year target depth and meet long-term objectives. The current water quality and fish usage assessments meet requirements so that the objectives are currently being met. Unwanted vegetation growth of cottonwoods and willows is currently being addressed by keeping the marsh submerged and this appears to be eliminating the unwanted vegetation. Overall, the project features appear successful in meeting project objectives although some issues with sedimentation have raised some concern towards meeting long-term goals.

2) Post-Construction Evaluation and Monitoring Schedules. A Post-Construction Performance Evaluation Supplement is normally prepared annually. The data collection and analysis for the project is scheduled to use much of the calendar year ending December 2004 so the next Post-Construction Performance Supplement will cover 9-years after construction, for distribution in March 2005. The next comprehensive Post-Construction Performance Evaluation Report will be completed following the collection of data for sediment and pothole transects scheduled in FY2007.

Project monitoring efforts have been generally performed according to the Post-Construction Performance Evaluation Plan (Appendix A) and Resource Monitoring and Data Collection Summary (Appendix B). The Waterfowl usage and fish sampling have not been performed each year; however, field observations are provided when the performance evaluation reports are generated. Additional waterfowl surveys are recommended for the pothole and the marsh areas so the migratory bird habitat objective can be more thoroughly evaluated. The evaluation for this is scheduled for FY2004 for the next supplemental PER.

3) Project Operation and Maintenance. A second pump was added to the project site and used to help sustain the raised water levels in the managed marsh. The additional pump caused some erosion. The erosion is scheduled for repair in 2003 and results will be reported in the next PER. Beaver dam material located around the stoplog structure has not been removed since it is helping to keep water impounded in the marsh. Beaver activity has not been a problem in the project area. If beaver dams become a problem or interferes with the operation of the stoplog structure, then appropriate action will be taken. Other project operation and maintenance has been conducted in accordance with the O&M manual. Annual site inspections by the site manager have resulted in appropriate maintenance actions.

4) Project Design Enhancement. In general, the fish and aquatic habitat have improved in the project area. The monitoring and observations of biological response by the Corps, USFWS, USGS and ILDNR indicate that fisheries and vegetative habitat are developing and the flooding of the marsh area has appeared to reduce the amount of unwanted vegetation growth. The acres of grassland and marsh still need to be determined and are

scheduled for discussion in the next report (due March 2005). Good usage of the project features by waterfowl was identified by field observation, but a survey of waterfowl was not provided for this report but is recommended for the next report. The depths and side slopes of the some channels and deep holes have decreased from project design that may indicate that habitat loss may be an issue. It still is not clear if sedimentation is a problem and whether the long–term objectives are in jeopardy. Further analysis of the hydrographic surveys is needed to better assess project objectives and this effort is scheduled for FY2004.

TABLE OF CONTENTS

SECTION **PAGE**

FIGURES AND TABLES

APPENDICES

LIST OF PLATES

1. INTRODUCTION.

a. Purpose. The purpose of this report is to provide a summary of the observations for the performance evaluation monitoring. Specifically, the report 1) summarizes the performance of the Potters Marsh Habitat Rehabilitation and Enhancement Project (HREP) based on project goals and objectives; 2) reviews the monitoring plan for possible revisions; 3) summarizes project operation and maintenance efforts to date; and 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), the U.S. Fish and Wildlife Service (USFWS), and the Illinois Department of Natural Resources (ILDNR) covering the period of July 1998 through December 2002. Construction was completed in December 1995 so this report is identified as the 7-Year Post-Construction Performance Evaluation Report.

2. PROJECT BACKGROUND.

a. General. The Potters Marsh Habitat Rehabilitation and Enhancement Project (HREP) is located in Pool 13, Upper Mississippi River Miles 522.5 – 526.0, in Carroll and Whiteside Counties, Illinois. This area on the Mississippi River was greatly affected by the construction of Lock and Dam 13 that raised the river level, creating a permanent backwater slough between what is now an island and the Illinois mainland bank. To provide access to the Corps of Engineers (Corps) Thomson Causeway Recreation Area, the Corps raised an existing causeway near the upstream end of the slough. The causeway has culverts that are large enough to pass high flow levels. Over time, siltation in the slough had reached a critical point. Submergent vegetation totally clogged most of the slough, drastically reducing the fisheries habitat. Additionally, siltation had filled in much of the historically productive waterfowl marshes at this location.

The Potters Marsh HREP was created to rehabilitate and enhance this valuable habitat area. Backwater hydraulic dredging has restored and created deep-water slough habitat for overwintering fish. Creation of a sediment trap has kept the upper end of the slough and causeway flow tubes from silting in completely. Construction of a managed marshland on the dredged material confined placement site (CPS) provides a migratory bird feeding resting area. Pothole excavation has made additional secluded open water available for waterfowl. Implementation of the project has improved the quality and life of the valuable wetland-upland complex.

b. Goals and Objectives. Goals and objectives, formulated during the project design phase, are summarized in Table 2-1.

Table 2 - 1. Project Goals, Objectives, and Project Features

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

c. 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, dated November 1998. All features are summarized in Table 2-1 in relation to project goals and objectives.

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

e. 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. Operation and maintenance of the project features 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, and

(4) maintaining the access road

f. Previous Performance Evaluation Reports. The initial PER (IPER) was completed in November 1998. A 4-year Addendum (four years after the 1998 IPER) to the Initial PER was completed in August 2002 to cover performance evaluation for the years 2000 and 2001.

3. PROJECT MONITORING.

a. U.S. Army Corps of Engineers. The Corps performs sedimentation transects on the various dredged channels of the Potters Marsh HREP every five years as shown on Plate 3, Monitoring Plan. The Corps also takes transects of the potholes every five years. The Corps currently monitors water quality at three stations: 523.6W, 524.1U, and 525.1Y. Water quality monitoring station 523.7Y, which had been previously monitored, was discontinued because Upper Mississippi Environmental Science Center (UMESC) has a monitoring station nearby that provides data to the Corps and it was considered redundant for the Corps to monitor at the same location.

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.

d. Illinois Department of Natural Resources (ILDNR). The ILDNR monitors fish numbers through electrofishing survey methods. Waterfowl surveys are done to monitor waterfowl use of project features.

4. EVALUATION OF AQUATIC HABITAT OBJECTIVES.

a. Restore and Create Fisheries Habitat.

(1) Monitoring.

Fish Sampling. The ILDNR performed an electrofishing survey as shown in Appendix C. This survey was completed September 11, 2002 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 30 minutes. A total of 49 fish representing 7 species were collected. Largemouth bass comprised 25 specimens of the total. Bluegill comprised 12 specimens of the total. Pumpkinseed comprised 7 specimens of the total. Numbers of grass pickerel, bowfin, golden shiner, and yellow perch were small, with two or less of each species collected. There were no indications of brown bullheads collected as there were in 2001, and the numbers of golden shiner were low compared to 2001. Brown bullheads and high numbers of golden shiner can be an indicator of turbid, polluted, or overly warm water. In general, the types of fish species that are collected tend to indicate

that the water quality is good and meeting project expectations. Further fish sampling will continue to help identify the success of this feature.

Sedimentation Transects. The Corps of Engineers performed sediment transects in the summer of 2002. These transects were compared against the same transects completed in 1997. Dredged material plans, profiles, and composite sedimentation cross-sections for the hydraulically dredged channel (named segments 2 and 3) are shown on plates 6 through 16. The depth at year 0 was 8 feet in all of segments 2 and 3 except for the deep holes. As shown in Table 4-1, segments 2 and 3 channel transects indicate average depths in 2002 ranged from 4 to 9 feet below flat pool (elevation 583 NGVD 1912). The shallowest depths seemed to occur on the downstream slough ends of traverses B and C. Sedimentation rates are typically higher in the downstream end of sloughs, so depths of only 4 to 6 feet are not unexpected. However, depths less than 6 feet do not meet the goal of maintaining a water depth of at least 6 feet over the project life (DPR pages 24-25). There is a concern that additional sedimentation may block fish passage to the middle areas of the slough. Future performance evaluations should continue to monitor depths to ensure they do not decrease any further.

As observed with the sediment transects performed for the initial performance evaluation report, side slopes show change from those collected in 1997. These changes may be the result of sloughing or sedimentation. The thalweg of segments 2 and 3 seems to have remained unchanged in width. The location of the thalweg shifted only slightly relative to as-built conditions, if at all. The average deep-hole depth in Segment 2 was 5 feet, and the average deep-hole depth in Segment 3 was 9 feet.

At the time of construction, 290 acre-feet of fish habitat existed. According to the initial performance evaluation report dated November 1998, the objective of the Potters Marsh project was to have 190 acre-feet of fisheries habitat 50 years after construction (the value was changed from the original 220 acre-feet due to a change in channel lengths during construction). As shown in Table 4-1, 240 acre-feet existed in 2002, meaning 50 acre-feet have already been lost in 6 years. If 50 more acre-feet of fish habitat are lost, the fisheries habitat objective of 190 acre-feet after 50 years will not be met. However, several years of bathymetric data collected at other HREP projects indicate sediment deposition in dredged channels is high immediately after dredging of the channels is completed, but then decreases as the dredged channel reaches equilibrium. Continued monitoring of the dredged channels and deep holes at Potters Marsh may confirm this phenomenon and determine if sedimentation and habitat loss is a problem.

Table 4 - 1. Potters Marsh Fisheries Habitat, Segments 2 and 3.

Segments 2 and 3 Hydrographic Survey Results						
		Average Depth, Feet	**Approximate Cross-Sectional Area, Square Feet**	**Average Cross-Sectional Area, Square Feet**	**Length, Feet**	**Deep Water, Acre-Feet**
Segment 2	Transect 2A, Traverse C	**6**	**396**	**449**	**9265**	**96**
	Transect 2A, Traverse D	**7**	**462**			
	Transect 2B, Traverse C	**9**	**594**			
	Transect 2B, Traverse K	**8**	**528**			
	Transect 3C, Traverse C	**4**	**264**			
Segment 3	Transect 3A, Traverse B	**7**	**462**	**390**	**12007**	**108**
	Transect 3A, Traverse S**	**4**	**432**			
	Transect 3B, Traverse B	**5**	**330**			
	Transect 3C, Traverse B	**6**	**396**			
	Transect 3D, Traverse B	**5**	**330**			
Main Channel, Segments 2 and 3						**204**
Segment 2	Transect 3D, Traverse J	**5**	**1120**	**1120**	**500**	**13**
Segment 3	Transect 3E, Traverse B	**9**	**2016**	**2016**	**500**	**23**
Deep Holes, Segments 2 and 3						**36**
Total at Year 7						**240**
**Traverse S was 4 feet deep with a bottom width of 100 ft.						

Water Quality. Water quality monitoring is useful in evaluating the ability of the channels to support fish. As detailed in the Definite Project Report, sedimentation in the backwater areas had led to a loss of habitat suitable for fisheries. The sedimentation of the deeper channels in the slough resulted in shallow water that would freeze from top to bottom during the winter. Also, the sediments present were shown to contain a high percentage of organic material (peat) placing a high sediment oxygen demand on the water column causing poor water quality during critical summer and winter periods. By completing

selective dredging during critical periods, deep water habitat was created and water quality was improved.

Since the last PER, three locations have been monitored: sites 523.6W, 524.1U and 525.1Y (see Plate 3). Site 523.7Y, which had been previously monitored, was discontinued because UMESC has a monitoring station nearby. All four sites were shallow prior to construction but are now within the deep channels dredged as part of the project. Baseline water quality monitoring was conducted from May 1991 through March 1994 at sites 523.7Y, 524.1U and 525.1Y. Post-project monitoring continues at sites 524.1U and 525.1Y that began in June 1996. In addition, sampling at site 523.6W, which was initiated in February 1998, is still collected. This site is located at one of the deep, dredged holes. Parameters monitored at all locations include measures of dissolved oxygen, temperature, depth, pH, conductivity, water clarity and several meteorological and hydrologic variables.

Instantaneous Monitoring. Throughout the pre- and post-project monitoring period, instantaneous (grab) samples have been taken bi-weekly during the summer months and monthly during the winter. Grab samples were taken just beneath the water surface. Field analyses have been performed for ephemeral parameters and preserved sub-samples are shipped to a commercial laboratory for further analysis. Prior to the project 37 instantaneous monitoring events were performed. Since project completion 56 instantaneous monitoring events have been performed.

Continuous Monitoring. Periodic, in-situ, continuous monitoring using YSI models 6000 and 6600 data sondes has been performed since project completion during both the summer and winter. Monitoring equipment is calibrated in the laboratory prior to placing in the field. A single monitoring event lasts for a period of two weeks during the summer and approximately seven weeks during the winter. Monitors are suspended approximately 3 feet beneath the water surface or 3 feet above the bottom as deemed relevant. Upon retrieval, the monitors are recalibrated in the laboratory and adjustments are made to the data where necessary to compensate for drift.

Water Quality Monitoring Results. All monitoring results are shown in Appendix D in table and graphic form. Samples and field measurements were taken from the approximate mid-point, or point of maximum depth, at each monitoring location. Prior to project construction, water depth throughout the project vicinity was less than 3 feet. Since project completion, depths between 6 and 9 feet have been consistently observed (see Page D-1, Appendix D). There was a rapid decrease in water depth immediately after project completion; however, the rate of sedimentation seems to have lessened over time. The increase in water depth has resulted in water column stratification that can be significant during the summer and occur occasionally during the winter.

Results of instantaneous surface dissolved oxygen monitoring show that most low dissolved oxygen concentrations occur during the summer months (June – September). Only on two occasions were low surface dissolved oxygen concentrations seen during the winter (December – February). This occurred at site 524.1U prior to project construction. Post-project surface dissolved oxygen concentrations have all exceeded 5 mg/l. During the

summer, however, low surface dissolved oxygen were observed very frequently prior to project construction and continued during the post-project phase at all three monitoring locations. Results from the continuous monitors reveal more details regarding the frequency and duration of these episodes and will be discussed in more detail later in this report.

Quantitative comparison of pre- and post-project water clarity is not possible because, on several occasions, the secchi disk depth was equal to or greater than the water depth prior to project construction. Thus, an accurate measure of secchi disk depth was not possible on those occasions. Post-project secchi disk depths are generally very good, often exceeding 2 feet during the growing season. Water clarity at site 524.1U was particularly good, with secchi disk depths in excess of 4 feet being measured on several occasions. Comparing pre- and post-project turbidity values does not reveal a remarkable difference at any of the sites. Suspended solids concentrations, on the other hand, were substantially higher pre-project at site 525.1Y. There does not appear to be any difference at site 524.1U. Determining whether these post-project reductions in suspended solids concentrations at site 525.1Y are related to project features may require collection of additional data. It is noteworthy that there was no evidence of excessive algal growth based on measurements of chlorophyll concentrations.

Continuous monitoring is much more revealing in terms of the frequency and duration of episodic events. For example, it is quite apparent that often dissolved oxygen concentrations fell below acceptable levels for short periods each day (see pages D-21 through D-25, Appendix D). This corresponds closely with other parameters such as pH and occasionally water temperature. It is also noteworthy that these episodes can last for several days or weeks. The magnitude of the dissolved concentration change within a 24-hour period can also be quite significant. In some cases, dissolved oxygen concentrations changed by up to 8 mg/l in a single day. This type of insight is not evident from the instantaneous monitoring data.

Pages D-24 and D-25, Appendix D, show the degree of dissolved oxygen stratification that can occur between surface and bottom water. While dissolved oxygen concentrations may be quite good near the surface, unacceptable concentrations may exist near the bottom. Occasionally these conditions persist for several days or weeks.

Results from the continuous monitoring also reveal slight temperature stratification occurring during the winter. On December 17, 1998 no ice was observed, but on January 20, 1999, 13 inches of ice and 3 inches of snow were observed. As shown by the graph, sometime near December 21, 1998 the ice cover formed. Once the ice formed the water began to stratify, resulting in a warmer layer of water near the bottom and affording fish the opportunity to avoid the very cold water temperatures.

(2) Conclusions. Fish sampling included largemouth bass, bluegill, and pumpkinseed as the predominant fish species in the project area. The recommendation to resume larval fish sampling as explained in the August 2002 PER still stands as it should help determine if the area is useable as a nursery habitat in future years. The assessment of

sedimentation rate for the project area still requires further analysis and discussion with project members to ascertain if the changes identified in the transect surveys is occurring more rapid then expected. Continued monitoring of the dredged channels and deep holes at Potters Marsh may confirm if sedimentation and habitat loss is a problem.

Water Quality has shown improvement since the restoration of the deep channels. The results of instantaneous dissolved oxygen monitoring shows no dissolved oxygen problems have been observed during the winter months following project completion. Results from continuous monitoring show that low dissolved oxygen concentrations periodically occur for extended periods of time. Further monitoring will continue to better define these trends.

b. Reduce Sediment Input.

(1) Monitoring. Dredged material plans, profiles, and composite sedimentation cross-sections for the sediment trap and the dredged channel upstream of the causeway (named segment 1) are shown on plates 4 through 5.

The depth at year 0 for the sediment trap and segment 1 was 10 feet below flat pool. As shown in Table 4-2, the sediment trap averaged 6 feet deep and segment 1 was 7 to 8 feet deep. The depths meet the objective of maintaining a 6 feet depth in the area after 50 years, however the depths may not meet the objective in the future if the current sediment deposition rates continue.

Other observations of the transects include a thalweg that has shifted toward the left descending bank at section 1A and towards Potters Marsh at section 1B. Side slopes have become flatter in the sediment trap and in segment 1 that may indicate sloughing or sedimentation.

In 1995, at the time of construction, 37 acre-feet of fish habitat existed. The 50-year target is 24 acre-feet. As shown in Table 4-2, 27 acre-feet existed in 2002; meaning 10 acre-feet of fish habitat had already been lost in 7 years. If three more acre-feet of fish habitat are lost, the fisheries habitat objective of 24 acre-feet after 50 years will not be met.

Table 4 - 2. Potters Marsh Fisheries Habitat, Segment 1.

Segment 1 Hydrographic Survey Results					
	Average Depth, Feet	**Approximate Cross-Sectional Area, Square Feet**	**Average Cross-Sectional Area, Square Feet**	**Length, Feet**	**Deep Water, Acre-Feet**
Transect 1A, Traverse A	**8**	**560**			
Transect 1B, Traverse A	**7**	**490**			
Segment 1			**525**	**2100**	**25.3**
Transect 1C	**6**	**1200**			
Sediment Trap			**1200**	**60**	**1.7**
Total at Year 7					**27**

(2) Conclusions. As stated before, the rate of sedimentation is usually high immediately after dredging a channel but decreases as the channel reaches equilibrium. The dredged channels for the Potters Marsh HREP experienced this type of sedimentation activity once the dredging was complete. Currently, the depths range between 6 to 8 feet that is the 50-year target. There is concern whether the dredged areas will be able to maintain this depth since the project is only at the seven-year mark after the channels were dredged. Continued sedimentation monitoring at Potters Marsh is required to determine if the fisheries habitat objectives are being met.

5. EVALUATION OF WETLAND HABITAT OBJECTIVES.

a. Increase Migratory Bird Feeding and Resting Areas.

(1) Monitoring.

Vegetation. The managed marsh continues to be submerged year round in order to control the encroachment of willow and cottonwood trees by keeping the marsh too wet for the trees to thrive. The project has been operated in this manner since June 2000. As mentioned in the Site Manager's Project Inspection and Monitoring Results (Appendix G), the strategy of flooding the marshland has been somewhat successful in killing undesirable vegetation, but encroachment remains a problem and would most likely worsen if the managed marshland were operated as a moist soil unit (moist soil units are drawn down in the summer months). Encroachment continues to be worse in the grassland area on the south and east side of the managed marshland where the land is higher and flooding is not possible.

Migratory Bird Usage. Bird counts and observations are still needed to establish the migratory bird use and determine the success of this objective. The Addendum PER dated August 2002 did identify that waterfowl were observed feeding on invertebrates attracted to leaf litter.

(2) Conclusions. The managed marsh continues to be submerged year round in order to control the encroachment of willow and cottonwood trees by keeping the marsh too wet for the trees to thrive. Observations of migratory bird usage were not provided specifically for this report but will be discussed in the next performance evaluation report.

b. Increase Waterfowl Brood Habitat and Fall Feeding Sites.

(1) Monitoring.

Vegetation. The vegetation encroachment and the need for evaluating migratory bird usage as explained above is the same for this objective as well. Land cover/land use mapping was completed in 1989 (before the project) and in 2000. The maps are shown in Appendix E. Land cover/land use mapping reflects physical and vegetation changes associated with construction of the project and other changes in land cover not directly associated with the project. The 1989 map shows evidence of some of the problems that would be addressed by the project, including the loss of deep aquatic habitat and other indicators of a succession change from predominately aquatic to increasingly terrestrial cover types.

The 2000 map shows an increase in land cover classes identified for the project area, and also shows continued post-construction changes in vegetation communities resulting from project construction (most notably the increase in open water provided by the HREP dredge cuts and potholes, and the marsh and grassland cover created by the "duck foot" containment site).

It should be noted that some changes in land cover acreages between 1989 and 2000 could reflect changes in LTRM classification methodology rather than actual changes in the field. Similarly, other changes may be due to the after effects of flooding or water table changes (for example, the increase in rooted floated aquatics at the expense of emergents), natural succession not influenced by the HREP, changes in photo-interpretive techniques, or a combination of these or other unknown factors.

The on-site observations by Corps staff of areas within and adjacent to the containment site in the summer of 2002 identified dominant grass and forb species in the area classified "wet meadow" by the 2000 map as more characteristic of the drier "grass/forbs" category, such as little bluestem, Canada wild rye, wild bergamot, poppy mallow, and common sunflower (see Photos F-1 through F-5, Appendix F, for plant survey photographs). Additionally, from on-site observations the dredge cut leading to the containment site still appears as open water, though this does not show on the 2000 map.
Potholes. Mechanically excavated and blasted potholes were created to increase waterfowl brood habitat and fall feeding sites. The Corps performed transects of the potholes in the

summer of 2002. Sedimentation cross-sections for the potholes are shown on plates 17 through 27. The total acreage of the potholes had decreased from 9.45 acres in 1998 to 8.3 acres in 2002 (see Table 5-1 and Table A-1). The 8.3 acres is still above the 50-year goal of 6.8 acres.

Table 5 - 1. Potters Marsh Pothole Areas.

Pothole Area				
Pothole	**Length, feet**	**Width, feet**	**Area, square feet**	**Area, acres**
1	180	40	7200	0.17
2	100	50	5000	0.11
3	220	60	13200	0.30
4*	337	68	22916	0.53
5*	240	70	16800	0.39
6*	340	73	24820	0.57
7*	325	95	30875	0.71
8	150	50	7500	0.17
9	100	200	20000	0.46
10	170	50	8500	0.20
11*	***310***	***39***	***12090***	***0.28***
12*	285	77	21945	0.50
13*	***290***	***58***	***16820***	***0.39***
14*	***337***	***48***	***16176***	***0.37***
15	520	110	57200	1.31
16*	***312***	***39***	***12168***	***0.28***
17	370	90	33300	0.76
18	***240***	***100***	***24000***	***0.55***
19	***290***	***40***	***11600***	***0.27***
Total	**5116**	**1357**	**362110**	**8.3**
*Measurements from the last PER were used due to erroneous or incomplete data.				
Bold/Italicized Numbers indicate potholes that were blasted. All other potholes were mechanically dredged.				

(2) Conclusion. Continued monitoring and interpretation of the land use maps will help identify if project objectives are being met. Several areas were identified as having grass and forbs during a site visit in 2002. There were no clear trends in comparing the performance of the mechanically dredged potholes versus the blasted potholes. For the most part, the sides of the potholes are experiencing some sloughing, however the interiors of the potholes seem to be retaining the constructed depth.

6. OPERATION AND MAINTENANCE SUMMARY.

a. Operation. The project has managed as a submerged marshland since June 2000. Continuous flooding of the trees was implemented in order to maintain habitat suitable for waterfowl use and to put stress on the willow and cottonwood trees. There were no concerns expressed about the operation of project features.

b. Maintenance.

(1) Inspections. The site manager's report for 2002 can be found in Appendix G.

(2) Maintenance performed. The containment dike was mowed in August 2002 in an attempt to control growth. Bollards around the well were painted in 2002. Maintenance on the access road was performed in May and July 2002. The condition of the access road was acceptable.

(3) Maintenance concerns. The containment dike had suffered erosion damage on the south end and was scheduled for repair in 2003. The cause was from an additional pump (6000 gallons per minute) that was added for sustaining the managed marsh water levels year round. The pump discharge dislodged the tarp underlayment and caused erosion along the inside levee slope. Levee material from the Spring Lake HREP will be used to repair the erosion damage. Apart from minor scouring or wave wash problems, keeping the managed marshland submerged seemed to be beneficial. The high water levels inside the containment facility were killing undesirable growth. Heavy growth of cottonwood and willow trees was still occurring in some areas. The containment dike was mowed in August 2002 in an attempt to control the growth. As in past years, woody vegetation was encroaching in the grassland area and around the potholes. Grassland and forb species were especially threatened by the encroachment. Possible prescribed burning in the spring of 2003 may alleviate willow and cottonwood growth. As in past years, beaver activity continued to be observed around the stoplog structure. Mud and sticks had been placed around the stoplogs by the beavers. As a result, the stoplogs required occasional cleaning. Overall, the beaver activity has not been a significant problem (see Photo F-6, Appendix F). Stoplogs clogged with mud was beneficial in keeping water impounded inside the containment dike.

7. CONCLUSIONS AND RECOMMENDATIONS.

a. Project Goals and Objectives. Based on field data and observations collected since the initial PER completed in November 1998, there is a concern about sedimentation rates and whether the dredged channels and deep holes will maintain their depth to the 50–year target depth and meet long-term objectives. The current water quality and fish usage assessments meet requirements so that the objectives are currently being met. Unwanted vegetation growth of cottonwoods and willows is currently being addressed by keeping the marsh submerged and this appears to be eliminating the unwanted vegetation. Overall, the project features appear successful in meeting project objectives although some issues with sedimentation have raised some concern towards meeting long-term goals.

b. Post-Construction Evaluation and Monitoring Schedules. A Post-Construction Performance Evaluation Supplement will be prepared annually. The data collection and analysis for the project is scheduled to use much of the calendar year ending December 2004 so the next Post-Construction Performance Supplement will cover 9-years after construction, for distribution in March 2005. The next comprehensive Post-Construction

Performance Evaluation Report will be completed following the collection of data for sediment and pothole transects in FY2007.

Project monitoring efforts have been generally performed according to the Post-Construction Performance Evaluation Plan (Appendix A) and Resource Monitoring and Data Collection Summary (Appendix B). The Waterfowl usage and fish sampling have not been performed each year; however, field observations are provided when the performance evaluation reports are generated. Additional waterfowl surveys are recommended for the pothole and the marsh areas so the migratory bird habitat objective can be more thoroughly evaluated. The evaluation for this is scheduled for FY2004 for the next supplemental PER.

c. Project Operation and Maintenance. A second pump was added to the project site and used to help sustain the raised water levels in the managed marsh. The additional pump caused some erosion. The erosion is scheduled for repair in 2003 and results will be reported in the next PER. Beaver dam material located around the stoplog structure has not been removed since it is helping to keep water impounded in the marsh. Beaver activity has not been a problem in the project area. If beaver dams become a problem or interferes with the operation of the stoplog structure, then appropriate action will be taken. Other project operation and maintenance has been conducted in accordance with the O&M manual. Annual site inspections by the site manager have resulted in appropriate maintenance actions.

d. Project Design Enhancement. In general, the fish and aquatic habitat have improved in the project area. The monitoring and observations of biological response by the Corps, USFWS, USGS and ILDNR indicate that fisheries and vegetative habitat are developing and the flooding of the marsh area has appeared to reduce the amount of unwanted vegetation growth. The acres of grassland and marsh still need to be determined and are scheduled for discussion in the next report (due March 2005). Good usage of the project features by waterfowl was identified by field observation, but a survey of waterfowl was not provided for this report but is recommended for the next report. The depths and side slopes of the some channels and deep holes have decreased from project design that may indicate that habitat loss may be an issue. It still is not clear if sedimentation is a problem and whether the long –term objectives are in jeopardy. Further analysis of the hydrographic surveys is needed to better assess project objectives and this effort is scheduled for FY2004.

Appendix A
Post-Construction Performance Evaluation Summary

Table A 1. Potters Marsh HREP Post-Construction Performance Evaluation Plan

Potters Marsh Habitat Rehabilitation and Enhancement Project Post-Construction Performance Evaluation Plan[1]											
Enhancement Potential											
Goal	**Objective**	**Alternative**	**Enhancement Feature**	**Unit**	**Year 0 (1995) Without Alternative**	**Year 0 (1995) With Alternative (As-Built)**	**Year 7 With Alt.**	**Year 7 With Alt.**	**Year 50 Target With Alt.[2/]**	**Feature Measurement**	**Annual Field Observations by Site Manager**
Rehabilitate & Enhance Aquatic Habitat	Restore & create fisheries habitat in lower Potters Slough and embayment areas	Create deep water in lower channel & embayment areas	Hydraulically dredge channel seg. 2 & 3	Acre-feet of deep water	0	290	220	240	190	Soundings	Describe presence of snags, debris, channel sedimentation or vegetation
			Improved water quality	Mg/l DO	Approx. 1-4			Generally ≥5 at times	> 5	Perform water quality tests	Describe presence of fish stress or kills
				Fish Counts				49 fish, 7 species		Fish survey	Describe fish usage
	Reduce sediment input in the upper Potters Slough area	Create deep water above and below causeway	Hydraulically dredge Seg. 1 & mech. excav. hole below causeway	Acre-feet of deep water	0	37	32	27	24	Soundings	Describe presence of snags, debris, channel sedimentation or vegetation
Enhance Habitat for Migratory Birds Through Wetland Rehabilitation	Increase migratory bird feeding or resting area	Best use of Confined Placement Site surface	Managed marshland	Acres of managed water level	0	32.5	32.5	Not determined	32.5	Aerial survey	Presence of waterfowl
			Grass and forbs plantings	Acres of grassland		7		Not determined	7	Vegetation transect	Survival of plantings
	Increase waterfowl brood habitat & fall feeding sites	Pothole creation	Pothole Creation	Acres of potholes	Approx. 2.0		9.45	8.3	6.8	Sediment transects/aerial photography	Presence of vegetation and presence of waterfowl

[1] See Plate 3 Monitoring Plan

[2] Year 50 Target With Alternatives were revised in the IPER dated November 1998.

Table A 2. Potters Marsh HREP Data Collection Transects & Surveys for Project Objectives Evaluation.

Data Collection Transects & Surveys for Project Objectives Evaluation				
Engineering Data				
Type of Measure	**Project Feature**	**Monitoring Site Title**	**Transect Title & Station**	**Objectives Evaluated**
Transects/ Hydrographic Soundings	Potters Slough Dredged Channels	S-M525.2X to S-M525.2Y S-M525.1X to S-M525.1Y S-M524.9X to S-M524.9Y S-M524.2V to S-M524.2Y S-M524.2U to S-M524.1V S-M523.9T to S-M523.8V S-M523.8W to S-M523.7Y S-M523.7W to S-M523.7X S-M523.8T to S-M523.6Y S-M 523.7T to S-M523.7V	1 2 3 5 6 7 8 9 10 11	Restore and Create Fisheries Habitat
Transects/ Hydrographic Soundings	Dredged Channel Sediment Trap	1A 1B 1C 4A	Segment 1 Segment 1 Sediment Trap East and West Bank	Reduce Sediment Input
Transects/ Hydrographic Soundings	Dredged Channels “ “ “ “ “ Deep Hole Deep Hole Dredged Channels	2A 2B 3A 3B 3C East 3C West 3D East 3D West 3E Traverse A, B, C, D; F; G; H; J; K; L; M; N; S	Segment 2, East and West Bank Segment 2, East and West Bank Segment 3, East and West Bank Segment 3 Segment 3 Segment 2 Segment 3 Deep Hole Deep Hole Profile Traverse	Restore and Create Fisheries Habitat
Transects/ Hydrographic Soundings/Aerial Survey	Potholes	1-20	Potholes 1-10, 12, 15, and 17 were mechanically dredged Potholes 11,13, 14, 16, 18, and 19 were blasted	Increase Waterfowl Brood Habitat & Fall Feeding Sites
Vegetation Survey	Aquatic Bed/ Marsh	V-M524.5S to V-M524.4Y	Aerial Photo Interpretation/Vegetation Mapping Wildlife Observations by Site Manager	Enhance Migratory Waterfowl Habitat

Appendix B

Resource Monitoring and Data Collection Summaries

Table B 1. Potters Marsh HREP Monitoring and Performance Evaluation Matrix.

Potters Marsh Habitat Rehabilitation and Enhancement Project Monitoring and Performance Evaluation Matrix						
Project Phase	**Type of Activity**	**Purpose**	**Responsible Agency**	**Implementing Agency**	**Funding Source**	**Implementation Instructions**
Pre-Project	Sedimentation Problem Analysis	System-wide problem definition. Evaluates planning assumptions.	USGS	USGS	LTRMP[1]	--
	Pre-Project Monitoring	Identifies and defines problems at HREP site. Establishes need of proposed project features.	USFWS	USFWS	USFWS	--
	Baseline Monitoring	Establishes baselines for performance evaluation.	Corps	Corps	HREP[2]	See Table A-2
Design	Data Collection for Design	Includes quantification of project objectives, design of project, and development of performance evaluation plan.	Corps	Corps	HREP	See Table A-2
Construction	Construction Monitoring	Assesses construction impacts; assures permit conditions are met.	Corps	Corps	HREP	See State Section 401 Stipulations
Post-Construction	Performance Evaluation Monitoring	Determines success of project as related to objectives.	Corps (quantitative) Sponsor (field observation)	Corps USFWS	HREP	See Table A-2
	Analysis of Biological Responses to Projects	Evaluates predictions and assumptions of habitat unit analysis. Studies beyond scope of performance evaluation, or if projects do not have desired biological results.	Corps	Corps	HREP	--

[1] Long-Term Resource Monitoring Program is a component of the UMRS-EMP.

[2] Habitat Rehabilitation and Enhancement Projects

Table B 2. Potters Marsh HREP Resource Monitoring and Data Collection Summary.

Potters Marsh Habitat Rehabilitation & Enhancement Project
Resource Monitoring and Data Collection Summary [1/]

Type Measurement	Water Quality Data					Engineering Data			Natural Resource Data			Sampling Agency	Remarks
	Pre-Project Phase	Design Phase		Post-Const. Phase		Pre-Project Phase	Design Phase	Post-Const. Phase	Pre-Project Phase	Design Phase	Post-Const. Phase		
		Apr-Sep	Oct-Mar	Jun-Sep	Dec-Mar								
POINT MEASUREMENTS													
Water Quality Stations												Corps	
Turbidity				2M	M								
Secchi Disk Transparency	2W			2M	M								
Suspended Solids	2W			2M	M								
Dissolved Oxygen	2W			2M	M								
Specific Conductance	2W			2M	M								
Water Temperature	2W			2M	M								
pH	2W			2M	M								
Total Alkalinity				2M	M								
Chlorophyll	2W			2M	M								
Velocity				2M	M								
Water Depth	2W			2M	M								
Ice Thickness					M								
Snow Depth					M								
Wind Direction				2M	M								
Wind Velocity				2M	M								
Wave Height				2M	M								
Air Temperature				2M	M								
Percent Cloud Cover				2M	M								

Type Measurement	Water Quality Data						Engineering Data			Natural Resource Data			Sampling Agency	Remarks
	Pre-Project Phase		Design Phase		Post-Const. Phase		Pre-Project Phase	Design Phase	Post-Const. Phase	Pre-Project Phase	Design Phase	Post-Const. Phase		
	Apr-Sep	Oct-Mar	Apr-Sep	Oct-Mar	Apr-Sep	Oct-Mar								
POINT MEASUREMENTS (Cont'd)														
Sediment Test Stations														
Bulk Sediment			1										Corps	
Elutriate			1										Corps	
Grain Size			1										Corps	
Boring Stations														
Geotechnical Borings - See Construction Drawings								1					Corps	
Column Settling Analysis														
Waterfowl Surveys														
Aerial Survey												Y	ILDNR	
Fish Stations														
Electrofish/Netting												Y	ILDNR	
TRANSECT MEASUREMENTS														
Sedimentation Transects														
Hydrographic Soundings							1		5Y				Corps	
Informal Vegetation Surveys														
Moist-Soil Plant Survey												5Y	Corps	

[1/] See plate 3 of this report for locations of post-construction phase sampling points (stations), transects, and area measurements. See DPR for locations of design phase sampling locations.

[2/] Mapping (Post-Construction Phase)
July 12, 1993, Color Aerial Photography (Scale = 1000 ft/in)
April 17, 1994, Color Aerial Photography (Scale = 1000 ft/in)

1994 Color Infrared
November 21, 1995, Black and White Aerial Photography (low flight - Scale = 1400 ft/in)
November 24, 1995, Black and White (high flight - Scale = 2800 ft/in)

Legend

M = Monthly
Y = Yearly
nM = n-Month interval
nY = n-Year Interval
1,2,3,.... = Number of times data were collected within designated project phase

Appendix C

Fish Survey Data

ID=19088 2BED 9/11/2002 MSR-524.5-525 Mississippi River: Potter's Slough HREP
30 minutes. Carroll County. 30 minute DC electrofishing - Habitat Improvement area

Record	Kn	N	Millimeter	Gram	Inch	Pound	Min Ind	Inmt	Disease	Remark
BLG Bluegill										
2931		1	33		1.3					
2932		1	45		1.77					
2933		1	53		2.09					
2934		1	65		2.56					
2935		1	79		3.11					
2936		1	74		2.91					
2937		1	70		2.76					
2938		1	79		3.11					
2939		1	93		3.66					
2940		1	106		4.17					
2941		1	103		4.06					
2942		1	120		4.72					
		12		0.0		0.000				
PUD Pumpkinseed										
2943		1	87		3.43					
2944		1	92		3.62					
2945		1	103		4.06					
2946		1	106		4.17					
2947		1	112		4.41					
2948		1	116		4.57					
2949		1	125		4.92					
		7		0.0		0.000				
GRP Grass pickerel										
2950		1	230	70.0	9.06	.154				
		1		70.0		.154				
BOW Bowfin										
2951	***	1	428	750.0	16.85	1.653				
2952	***	1	447	940.0	17.6	2.072				
		2		1690.0		3.726				
LMB Largemouth bass										
2953		1	75		2.95					

LMB Largemouth bass

2954	1	74		2.91
2955	1	78		3.07
2956	1	77		3.03
2957	1	86		3.39
2958	1	89		3.5
2959	1	84		3.31
2960	1	82		3.23
2961	1	89		3.5
2962	1	87		3.43
2963	1	89		3.5
2964	1	83		3.27
2965	1	95		3.74
2966	1	96		3.78
2967	1	92		3.62
2968	1	96		3.78
2969	1	106		4.17
2970	1	102		4.02
2971	1	104		4.09
2972	1	107		4.21
2973	1	104		4.09
2974	1	115		4.53
2975	1	112		4.41
2976	1	117		4.61
2977	1	119		4.69
	25		0.0	0.000

GOS Golden shiner

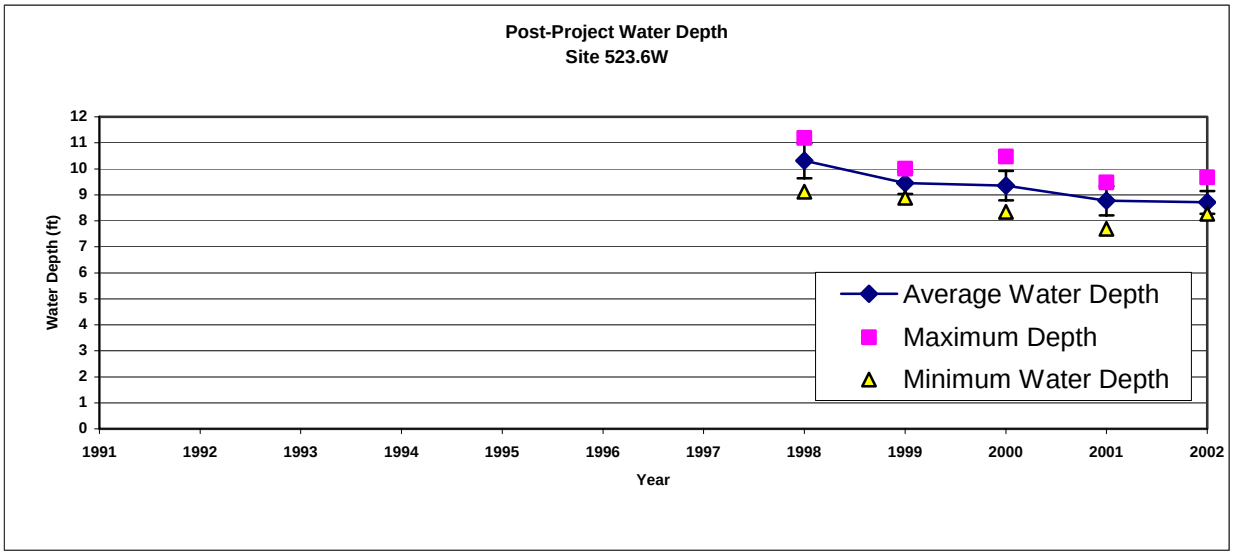
2978	1	113		4.45
	1		0.0	0.000

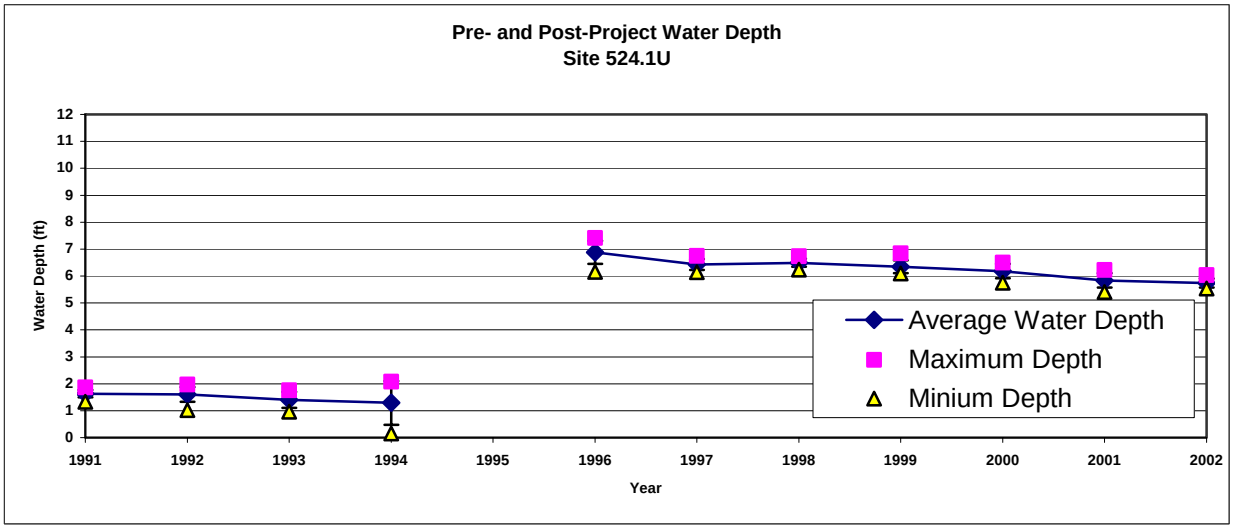
YEP Yellow perch

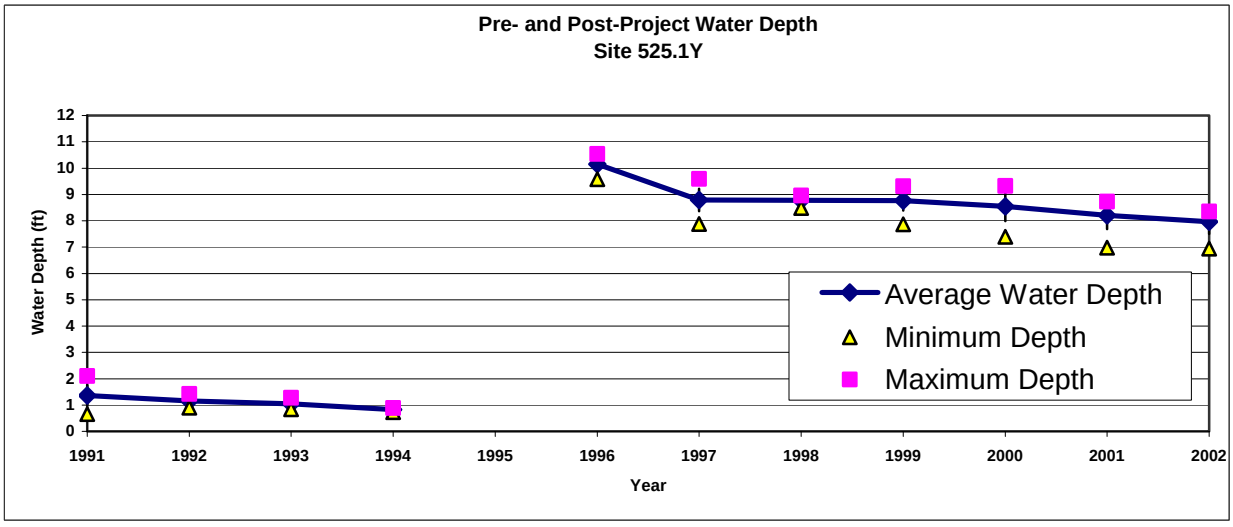
2979	1	154	35.0	6.06	.077
2980					

Appendix D

Water Quality Data


Post-Project Water Depth
Site 523.6W
Water Depth (ft)
Year
Average Water Depth
Maximum Depth
Minimum Water Depth


Pre- and Post-Project Water Depth
Site 524.1U
Water Depth (ft)
Year
Average Water Depth
Maximum Depth
Minium Depth


Pre- and Post-Project Water Depth
Site 525.1Y
Water Depth (ft)
Year
Average Water Depth
Minimum Depth
Maximum Depth

Water quality monitoring results from samples collected at site W-M523.6W

STATION	DATE	WATER DEPTH (M)	VELOCITY (CM/SEC)	WAVE HEIGHT (CM)	AIR TEMP. (°C)	CLOUD COVER (%)	WIND SPEED (MPH)
W-M523.6W	2/10/1998	3.353	0.00	**	1	100	3
W-M523.6W	3/13/1998	3.353	***	24	1	75	15
W-M523.6W	6/1/1998	3.216	6.37	6	16	10	8
W-M523.6W	6/30/1998	2.789	1.92	6	21	2	10
W-M523.6W	7/7/1998	3.414	5.61	9	27	85	7
W-M523.6W	7/17/1998	3.048	0.00	6	23	50	7
W-M523.6W	7/24/1998	3.261	-	0	23	5	2
W-M523.6W	8/4/1998	2.987	0.00	6	20	95	6
W-M523.6W	8/18/1998	3.048	3.11	6	23	100	9
W-M523.6W	9/1/1998	3.200	2.71	0	18	5	1
W-M523.6W	9/15/1998	2.987	1.92	6	20	95	10
W-M523.6W	12/17/1998	2.758	***	15	-1	10	10
W-M523.6W	1/20/1999	3.033	0.00	**	-1	100	6
W-M523.6W	2/17/1999	3.048	***	21	-3	95	12
W-M523.6W	3/18/1999	3.048	***	24	1	15	16
W-M523.6W	5/25/1999	3.200	***	30	13	2	15
W-M523.6W	6/15/1999	2.743	5.97	9	13	10	8
W-M523.6W	7/1/1999	2.835	2.47	6	18	95	6
W-M523.6W	7/20/1999	2.774	0.00	3	21	100	4
W-M523.6W	8/3/1999	2.743	1.07	3	18	100	3
W-M523.6W	8/17/1999	3.018	0.00	0	23	5	3
W-M523.6W	8/31/1999	2.728	2.53	3	14	55	6
W-M523.6W	9/14/1999	3.108	2.93	9	11	10	12
W-M523.6W	9/28/1999	2.890	***	9	12	100	14
W-M523.6W	2/1/2000	3.231	0.00	**	-7	10	3
W-M523.6W	3/2/2000	2.760	-	12	1	10	8
W-M523.6W	3/28/2000	3.000	***	40	0	99	20
W-M523.6W	6/8/2000	3.090	2.99	9	21	15	11
W-M523.6W	6/20/2000	2.600	-	10	22	100	12
W-M523.6W	7/11/2000	2.812	-	5	21	20	5
W-M523.6W	8/1/2000	2.860	-	7	18	10	8
W-M523.6W	8/15/2000	2.450	-	5	26	10	5
W-M523.6W	8/29/2000	2.850	-	4	20	100	4
W-M523.6W	9/12/2000	2.950	-	12	13	60	15
W-M523.6W	9/26/2000	2.835	-	1	10	15	4
W-M523.6W	1/31/2001	2.560	0.00	**	-1	100	11
W-M523.6W	2/27/2001	1.890	0.00	**	-4	70	9
W-M523.6W	3/27/2001	2.880	0.00	9	-6	2	3
W-M523.6W	5/30/2001	2.550	0.00	9	13	70	9
W-M523.6W	6/13/2001	2.420	***	12	29	20	10
W-M523.6W	6/26/2001	2.800	1.49	3	22	10	6
W-M523.6W	7/10/2001	2.640	0.00	3	22	10	7
W-M523.6W	7/24/2001	2.770	0.00	1	25	15	1
W-M523.6W	8/7/2001	2.900	-	7	24	5	6
W-M523.6W	8/21/2001	2.810	0.00	6	18	65	8
W-M523.6W	9/5/2001	2.760	0.00	1	17	5	2
W-M523.6W	3/6/2002	2.565	0.00	**	-2	10	3
W-M523.6W	6/11/2002	2.720	***	4	22	60	10
W-M523.6W	6/25/2002	2.680	***	0	27	10	2
W-M523.6W	7/11/2002	2.570	0.00	5	16	95	4
W-M523.6W	7/25/2002	2.650	-	5	17	98	8
W-M523.6W	8/8/2002	1.700	0.00	1	15	5	2
W-M523.6W	8/21/2002	2.650	-	8	18	90	11
W-M523.6W	9/4/2002	2.660	0.00	0	16	15	0
W-M523.6W	9/17/2002	1.800	0.00	0	15	45	1
W-M523.6W	12/12/2002	2.670	0.85	**	2	100	8
W-M523.6W	1/28/2003	2.610	1.26	**	-2	100	5
W-M523.6W	4/1/2003	2.380	-	12	14	35	5

MIN.	1.700	0.00	0	-7	2	0
MAX.	3.414	6.37	40	29	100	20
AVG.	2.804	1.23	8	14	48	7

Water quality monitoring results from samples collected at site W-M523.6W

STATION	DATE	WIND DIRECTION	WATER TEMP. (°C)	DISSOLVED OXYGEN (MG/L)	pH (SU)	TOTAL ALKALINITY (MG/L as CaCO3)
W-M523.6W	2/10/1998	SE	0.2	16.08	8.26	160
W-M523.6W	3/13/1998	W	1.0	15.49	*	132
W-M523.6W	6/1/1998	S	21.2	6.15	8.18	127
W-M523.6W	6/30/1998	NW	25.0	4.29	7.71	146
W-M523.6W	7/7/1998	NE	26.4	4.13	7.27	145
W-M523.6W	7/17/1998	NW	26.9	4.95	8.14	151
W-M523.6W	7/24/1998	N	25.6	5.69	7.87	-
W-M523.6W	8/4/1998	SE	24.2	3.17	7.30	146
W-M523.6W	8/18/1998	E	24.0	3.17	7.62	152
W-M523.6W	9/1/1998	SE	23.3	0.96	6.85	152
W-M523.6W	9/15/1998	NW	21.0	5.13	7.33	133
W-M523.6W	12/17/1998	NW	1.7	14.38	*	-
W-M523.6W	1/20/1999	S	0.1	13.67	8.00	201
W-M523.6W	2/17/1999	NW	0.3	15.00	8.20	144
W-M523.6W	3/18/1999	NW	4.2	13.09	8.90	143
W-M523.6W	5/25/1999	NW	15.5	8.28	7.32	159
W-M523.6W	6/15/1999	NE	19.8	7.16	8.20	156
W-M523.6W	7/1/1999	NW	23.5	6.99	8.30	152
W-M523.6W	7/20/1999	E	26.9	4.42	7.70	137
W-M523.6W	8/3/1999	SW	25.1	5.68	7.80	138
W-M523.6W	8/17/1999	NW	21.5	6.98	8.20	128
W-M523.6W	8/31/1999	SE	21.4	4.54	7.60	126
W-M523.6W	9/14/1999	SW	16.2	7.76	8.20	130
W-M523.6W	9/28/1999	N	16.0	7.19	8.50	126
W-M523.6W	2/1/2000	N	0.2	15.03	7.60	183
W-M523.6W	3/2/2000	N	3.3	13.15	7.90	146
W-M523.6W	3/28/2000	NW	6.1	12.64	8.20	134
W-M523.6W	6/8/2000	SW	20.0	6.22	7.60	135
W-M523.6W	6/20/2000	S	22.9	7.04	8.20	148
W-M523.6W	7/11/2000	E	25.2	4.45	7.90	147
W-M523.6W	8/1/2000	W	23.2	2.76	7.40	138
W-M523.6W	8/15/2000	W	24.8	3.66	7.30	135
W-M523.6W	8/29/2000	NE	23.8	3.69	7.30	128
W-M523.6W	9/12/2000	NW	22.2	4.34	7.50	132
W-M523.6W	9/26/2000	S	13.1	5.90	7.40	127
W-M523.6W	1/31/2001	NW	-0.1	14.80	7.60	68
W-M523.6W	2/27/2001	N	-0.1	20.18	8.30	124
W-M523.6W	3/27/2001	NW	0.3	15.41	8.40	172
W-M523.6W	5/30/2001	E	16.9	7.68	7.80	147
W-M523.6W	6/13/2001	S	23.5	8.90	8.10	156
W-M523.6W	6/26/2001	SE	23.7	7.58	8.00	148
W-M523.6W	7/10/2001	NW	26.8	5.03	8.10	151
W-M523.6W	7/24/2001	NE	27.5	4.41	7.70	130
W-M523.6W	8/7/2001	W	26.7	5.14	7.70	136
W-M523.6W	8/21/2001	SE	20.7	5.04	7.20	144
W-M523.6W	9/5/2001	E	21.6	4.81	7.40	129
W-M523.6W	3/6/2002	SW	0.2	23.85	8.40	154
W-M523.6W	6/11/2002	SW	23.6	5.36	7.80	132
W-M523.6W	6/25/2002	SW	27.4	7.39	8.70	121
W-M523.6W	7/11/2002	NE	24.3	5.06	7.40	118
W-M523.6W	7/25/2002	S	24.1	3.92	7.20	122
W-M523.6W	8/8/2002	E	22.7	3.00	7.10	138
W-M523.6W	8/21/2002	S	21.9	3.16	7.30	119
W-M523.6W	9/4/2002	-	22.5	2.43	7.10	120
W-M523.6W	9/17/2002	SE	20.3	5.15	7.50	139
W-M523.6W	12/12/2002	S	0.6	22.18	8.67	130
W-M523.6W	1/28/2003	S	0.9	31.85	8.99	186
W-M523.6W	4/1/2003	SW	8.4	13.48	8.90	-

MIN.	-	-0.1	0.96	6.85	68
MAX.	-	27.5	31.85	8.99	201
AVG.	-	16.9	8.43	-	140

Water quality monitoring results from samples collected at site W-M523.6W

STATION	DATE	SPECIFIC CONDUCTANCE (µMHOS/CM @ 25°C)	SECCHI DISK DEPTH (CM)	TURBIDITY (NTU)	SUSPENDED SOLIDS (MG/L)
W-M523.6W	2/10/1998	324	**	276.00	1.0
W-M523.6W	3/13/1998	293	**	19.70	25.0
W-M523.6W	6/1/1998	409	30.5	33.30	31.0
W-M523.6W	6/30/1998	372	53.3	16.60	120.0
W-M523.6W	7/7/1998	380	74.7	9.75	10.0
W-M523.6W	7/17/1998	362	70.1	8.73	3.0
W-M523.6W	7/24/1998	355	-	-	-
W-M523.6W	8/4/1998	361	88.4	5.05	2.0
W-M523.6W	8/18/1998	348	144.8	2.93	2.0
W-M523.6W	9/1/1998	335	83.8	3.54	3.0
W-M523.6W	9/15/1998	312	146.3	2.94	1.0
W-M523.6W	12/17/1998	384	83.8	8.20	15.0
W-M523.6W	1/20/1999	395	**	5.00	16.0
W-M523.6W	2/17/1999	375	42.7	10.10	18.0
W-M523.6W	3/18/1999	412	32.0	59.10	77.0
W-M523.6W	5/25/1999	434	18.3	13.00	80.0
W-M523.6W	6/15/1999	429	18.3	42.90	48.0
W-M523.6W	7/1/1999	425	42.7	17.70	14.0
W-M523.6W	7/20/1999	391	61.0	8.58	10.0
W-M523.6W	8/3/1999	338	70.1	10.10	9.0
W-M523.6W	8/17/1999	330	182.9	7.84	2.0
W-M523.6W	8/31/1999	311	61.0	7.96	10.0
W-M523.6W	9/14/1999	327	80.0	9.07	5.0
W-M523.6W	9/28/1999	319	90.0	7.87	7.0
W-M523.6W	2/1/2000	359	**	2.86	2.0
W-M523.6W	3/2/2000	410	55.0	19.20	20.0
W-M523.6W	3/28/2000	380	***	56.10	74.0
W-M523.6W	6/8/2000	343	22.0	57.60	40.0
W-M523.6W	6/20/2000	388	30.0	32.20	30.0
W-M523.6W	7/11/2000	376	64.1	7.01	8.0
W-M523.6W	8/1/2000	342	89.0	6.52	9.0
W-M523.6W	8/15/2000	330	104.0	3.48	<1
W-M523.6W	8/29/2000	327	140.0	3.32	<1
W-M523.6W	9/12/2000	334	90.0	5.86	2.0
W-M523.6W	9/26/2000	305	89.5	4.73	9.0
W-M523.6W	1/31/2001	291	**	5.85	4.0
W-M523.6W	2/27/2001	263	**	18.40	1.0
W-M523.6W	3/27/2001	328	47.0	17.40	9.0
W-M523.6W	5/30/2001	428	44.0	22.70	21.0
W-M523.6W	6/13/2001	405	25.0	23.20	24.0
W-M523.6W	6/26/2001	366	42.0	13.50	10.0
W-M523.6W	7/10/2001	345	66.2	6.86	7.0
W-M523.6W	7/24/2001	350	120.0	4.96	2.0
W-M523.6W	8/7/2001	353	21.0	2.45	2.0
W-M523.6W	8/21/2001	333	99.0	2.94	3.0
W-M523.6W	9/5/2001	345	87.0	5.73	2.0
W-M523.6W	3/6/2002	321	**	7.63	9.0
W-M523.6W	6/11/2002	390	17.0	87.90	66.0
W-M523.6W	6/25/2002	352	59.0	6.85	7.0
W-M523.6W	7/11/2002	346	83.0	4.31	6.0
W-M523.6W	7/25/2002	348	111.0	5.31	2.0
W-M523.6W	8/8/2002	338	119.5	2.85	2.0
W-M523.6W	8/21/2002	316	130.0	3.02	<1
W-M523.6W	9/4/2002	348	129.0	2.75	1.0
W-M523.6W	9/17/2002	360	150.0	2.02	1.0
W-M523.6W	12/12/2002	405	**	5.38	-
W-M523.6W	1/28/2003	479	**	5.91	-
W-M523.6W	4/1/2003	360	25.0	-	-

MIN.	263	17.0	2.02	1.0
MAX.	479	182.9	276.00	120.0
AVG.	358	75.2	18.62	17.3

* Meter malfunction
** Not applicable, ice cover
*** Too windy to take measurement
**** Field/Laboratory accident

Water quality monitoring results from samples collected at site W-M523.6W

STATION	DATE	CHLOROPHYLL a (MG/M3)	CHLOROPHYLL b (MG/M3)	CHLOROPHYLL c (MG/M3)	PHEOPHYTIN a (MG/M3)
W-M523.6W	2/10/1998	3.1	<1	<1	<1
W-M523.6W	3/13/1998	22.0	<1	<1	9.2
W-M523.6W	6/1/1998	16.0	<1	<1	15.0
W-M523.6W	6/30/1998	5.1	1.4	<1	2.6
W-M523.6W	7/7/1998	5.8	1.5	2.2	2.9
W-M523.6W	7/17/1998	13.0	1.8	<1	4.1
W-M523.6W	7/24/1998	-	-	-	-
W-M523.6W	8/4/1998	6.3	<1	<1	3.0
W-M523.6W	8/18/1998	6.4	<1	<1	7.5
W-M523.6W	9/1/1998	22.0	<1	<1	<1
W-M523.6W	9/15/1998	6.4	2.7	4.4	13.0
W-M523.6W	12/17/1998	<1	<1	<1	<1
W-M523.6W	1/20/1999	4.0	<1	<1	1.3
W-M523.6W	2/17/1999	2.7	<1	<1	<1
W-M523.6W	3/18/1999	130.0	<1	15.0	17.0
W-M523.6W	5/25/1999	5.0	<1	<1	4.8
W-M523.6W	6/15/1999	20.0	<1	<1	9.9
W-M523.6W	7/1/1999	8.7	1.3	<1	<1
W-M523.6W	7/20/1999	3.6	<1	<1	<1
W-M523.6W	8/3/1999	2.3	<1	<1	<1
W-M523.6W	8/17/1999	1.2	1.3	<1	<1
W-M523.6W	8/31/1999	4.9	1.0	<1	<1
W-M523.6W	9/14/1999	2.5	2.8	1.2	<1
W-M523.6W	9/28/1999	<1	<1	<1	<1
W-M523.6W	2/1/2000	2.4	<1	<1	1.3
W-M523.6W	3/2/2000	6.0	<1	<1	<1
W-M523.6W	3/28/2000	53.0	<1	4.3	13.0
W-M523.6W	6/8/2000	5.9	<1	<1	<1
W-M523.6W	6/20/2000	14.0	<1	<1	1.9
W-M523.6W	7/11/2000	2.7	1.1	1.6	12.0
W-M523.6W	8/1/2000	2.8	<1	<1	<1
W-M523.6W	8/15/2000	4.1	<1	<1	<1
W-M523.6W	8/29/2000	7.1	<1	<1	1.3
W-M523.6W	9/12/2000	5.0	<1	<1	<1
W-M523.6W	9/26/2000	2.0	<1	<1	<1
W-M523.6W	1/31/2001	<1	<1	1.0	<1
W-M523.6W	2/27/2001	3.0	<1	<1	<1
W-M523.6W	3/27/2001	7.5	<1	<1	<1
W-M523.6W	5/30/2001	5.7	<1	<1	<1
W-M523.6W	6/13/2001	4.5	<1	<1	<1
W-M523.6W	6/26/2001	<1	<1	<1	<1
W-M523.6W	7/10/2001	<1	<1	<1	<1
W-M523.6W	7/24/2001	<1	<1	<1	<1
W-M523.6W	8/7/2001	1.0	<1	<1	<1
W-M523.6W	8/21/2001	4.0	<1	<1	<1
W-M523.6W	9/5/2001	5.3	<1	<1	<1
W-M523.6W	3/6/2002	62.0	<1	4.7	10.0
W-M523.6W	6/11/2002	11.0	<1	<1	<1
W-M523.6W	6/25/2002	4.8	<1	<1	<1
W-M523.6W	7/11/2002	2.5	<1	<1	<1
W-M523.6W	7/25/2002	<1	<1	<1	<1
W-M523.6W	8/8/2002	<1	<1	<1	2.1
W-M523.6W	8/21/2002	<1	<1	<1	<1
W-M523.6W	9/4/2002	3.5	2.2	2.7	<1
W-M523.6W	9/17/2002	<1	<1	<1	<1
W-M523.6W	12/12/2002	-	-	-	-
W-M523.6W	1/28/2003	-	-	-	-
W-M523.6W	4/1/2003	-	-	-	-

MIN.	1.0	1.0	1.0	1.3
MAX.	130.0	2.8	15.0	17.0
AVG.	11.6	1.7	4.1	6.9

* Meter malfunction
** Not applicable, ice cover
*** Too windy to take measurement
**** Field/Laboratory accident

Water quality monitoring results from samples collected at site W-M524.1U

STATION	DATE	WATER DEPTH (M)	VELOCITY (CM/SEC)	WAVE HEIGHT (CM)	AIR TEMP. (°C)	CLOUD COVER (%)	WIND SPEED (MPH)
W-M524.1U	6/25/1991	0.579	2.65	0	21	10	5
W-M524.1U	7/10/1991	0.518	18.59	0	24	20	3
W-M524.1U	7/22/1991	0.518	1.31	0	29	40	15
W-M524.1U	8/5/1991	0.518	2.47	0	21	95	2
W-M524.1U	8/19/1991	0.579	6.86	3	20	100	9
W-M524.1U	8/28/1991	0.536	*	3	28	70	4
W-M524.1U	9/9/1991	0.518	*	0	24	50	5
W-M524.1U	9/23/1991	0.594	4.18	0	17	20	11
W-M524.1U	10/11/1991	0.625	3.32	3	11	5	15
W-M524.1U	10/23/1991	0.594	10.09	3	19	35	12
W-M524.1U	11/6/1991	0.686	2.23	0	-7	100	10
W-M524.1U	11/25/1991	0.488	1.31	0	-10	5	5
W-M524.1U	12/10/1991	0.549	4.51	3	9	5	15
W-M524.1U	1/30/1992	0.335	0.00	**	2	100	3
W-M524.1U	4/6/1992	0.579	*	9	14	70	15
W-M524.1U	5/4/1992	0.381	2.16	3	12	70	5
W-M524.1U	5/18/1992	0.518	3.41	9	15	5	8
W-M524.1U	7/24/1992	0.549	1.95	0	24	100	3
W-M524.1U	8/12/1992	0.518	2.74	0	18	100	0
W-M524.1U	8/28/1992	0.518	2.53	0	16	2	3
W-M524.1U	9/18/1992	0.732	1.89	0	21	15	15
W-M524.1U	10/9/1992	0.655	3.32	3	8	100	12
W-M524.1U	10/28/1992	0.549	4.63	0	10	80	5
W-M524.1U	11/30/1992	0.716	0.00	0	1	100	10
W-M524.1U	12/18/1992	BOAT WOULD NOT START					
W-M524.1U	1/19/1993	0.442	0.00	**	-11	0	0
W-M524.1U	2/23/1993	0.396	*	**	-18	0	5
W-M524.1U	3/9/1993	****	0.00	**	2	95	0
W-M524.1U	4/6/1993	0.625	1.22	0	3	95	5
W-M524.1U	9/29/1993	0.442	0.00	0	5	35	5
W-M524.1U	10/20/1993	0.305	0.00	0	11	100	3
W-M524.1U	11/3/1993	0.396	0.00	3	4	30	13
W-M524.1U	1/11/1994	0.442	0.85	**	-4	20	3
W-M524.1U	2/22/1994	1.036	0.00	**	-3	100	13
W-M524.1U	3/14/1994	0.381	**	**	3	100	12
W-M524.1U	3/29/1994	0.457	0.94	3	0	20	5
W-M524.1U	6/11/1996	2.134	0.76	3	21	98	4
W-M524.1U	6/25/1996	2.195	2.13	3	22	10	4
W-M524.1U	7/26/1996	1.875	3.35	0	24	0	0
W-M524.1U	8/8/1996	2.134	0.00	0	27	0	2
W-M524.1U	8/20/1996	2.195	0.00	0	21	90	0
W-M524.1U	9/10/1996	2.134	0.00	0	17	75	0
W-M524.1U	9/26/1996	2.134	3.75	3	12	100	2
W-M524.1U	12/4/1996	1.966	0.00	**	-12	85	2
W-M524.1U	12/17/1996	2.027	0.00	**	-8	90	4
W-M524.1U	1/20/1997	1.890	0.00	**	3	75	1
W-M524.1U	2/4/1997	1.920	0.00	**	0	100	3
W-M524.1U	3/4/1997	1.996	0.00	**	1	65	9
W-M524.1U	3/19/1997	1.951	0.00	0	1	15	3
W-M524.1U	6/10/1997	1.981	1.55	0	21	0	3
W-M524.1U	6/26/1997	2.103	1.89	0	24	15	2
W-M524.1U	7/9/1997	1.920	2.47	6	16	95	5
W-M524.1U	7/23/1997	2.042	0.00	0	21	100	3
W-M524.1U	8/5/1997	1.996	3.32	6	16	2	8
W-M524.1U	8/26/1997	2.088	0.00	3	19	95	4
W-M524.1U	9/9/1997	2.027	1.04	0	17	100	2
W-M524.1U	9/30/1997	2.103	2.47	3	13	15	4
W-M524.1U	12/16/1997	1.905	0.00	**	3	40	6
W-M524.1U	1/14/1998	1.996	0.00	**	-7	100	3
W-M524.1U	2/10/1998	1.920	0.00	**	2	100	2
W-M524.1U	3/13/1998	2.134	0.00	**	1	95	15
W-M524.1U	6/1/1998	1.920	2.29	3	16	15	4
W-M524.1U	6/30/1998	1.814	2.56	3	21	2	3
W-M524.1U	7/7/1998	2.195	1.65	3	27	80	6
W-M524.1U	7/17/1998	1.737	0.00	0	23	55	3
W-M524.1U	8/4/1998	1.981	0.00	3	21	90	7
W-M524.1U	8/18/1998	2.073	0.00	3	23	100	7

W-M524.1U	9/1/1998	1.935	0.00	0	18	5	0
W-M524.1U	9/15/1998	2.118	0.00	0	20	90	1
W-M524.1U	12/17/1998	1.951	0.00	0	0	15	5
W-M524.1U	1/20/1999	1.829	0.00	**	0	100	4
W-M524.1U	2/17/1999	2.088	***	6	-2	90	5
W-M524.1U	3/18/1999	1.859	5.76	6	1	20	9
W-M524.1U	5/25/1999	2.134	***	3	13	5	9
W-M524.1U	6/15/1999	2.012	1.31	3	13	15	8
W-M524.1U	7/1/1999	2.012	0.67	0	19	60	1
W-M524.1U	7/20/1999	1.859	0.00	3	21	100	1
W-M524.1U	8/3/1999	1.920	1.58	3	18	20	6
W-M524.1U	8/17/1999	1.920	0.00	0	23	5	1
W-M524.1U	8/31/1999	1.920	2.80	3	14	65	11
W-M524.1U	9/14/1999	1.980	4.42	3	11	25	7
W-M524.1U	9/28/1999	2.170	***	3	12	100	9
W-M524.1U	2/1/2000	1.890	0.00	**	-7	30	3
W-M524.1U	3/2/2000	1.800	-	6	2	10	11
W-M524.1U	3/28/2000	1.950	***	9	0	99	10
W-M524.1U	6/8/2000	2.050	2.13	2	21	15	8
W-M524.1U	6/20/2000	1.880	-	6	22	100	16
W-M524.1U	7/11/2000	2.000	-	1	21	20	4
W-M524.1U	8/1/2000	2.030	-	0	18	5	3
W-M524.1U	8/15/2000	2.020	-	0	26	10	5
W-M524.1U	8/29/2000	1.950	-	0	20	100	3
W-M524.1U	9/12/2000	2.100	-	5	13	60	9
W-M524.1U	9/26/2000	1.845	-	0	10	15	4
W-M524.1U	12/20/2000	1.810	-	**	-14	100	5
W-M524.1U	1/31/2001	1.790	0.00	**	-1	100	6
W-M524.1U	2/27/2001	1.795	0.00	**	-4	70	10
W-M524.1U	3/27/2001	1.650	0.00	**	-6	2	3
W-M524.1U	5/30/2001	1.800	0.00	3	13	80	6
W-M524.1U	6/13/2001	1.950	6.19	5	29	20	11
W-M524.1U	6/26/2001	2.070	0.00	3	22	10	7
W-M524.1U	7/10/2001	1.610	0.00	1	26	15	4
W-M524.1U	7/24/2001	1.920	0.00	0	26	15	1
W-M524.1U	8/7/2001	2.000	-	1	26	5	6
W-M524.1U	8/21/2001	1.778	-	3	18	75	5
W-M524.1U	9/5/2001	1.860	0.00	0	17	5	1
W-M524.1U	1/3/2002	1.715	0.00	**	-1	3	1
W-M524.1U	3/6/2002	1.420	0.00	**	-2	10	3
W-M524.1U	6/11/2002	1.850	***	3	22	60	9
W-M524.1U	6/25/2002	1.720	*	0	28	60	2
W-M524.1U	7/11/2002	1.740	0.00	1	16	90	5
W-M524.1U	7/25/2002	1.900	0.00	2	17	98	7
W-M524.1U	8/8/2002	1.700	0.00	0	16	5	1
W-M524.1U	8/21/2002	1.860	-	7	19	90	7
W-M524.1U	9/4/2002	1.760	0.00	0	18	20	0
W-M524.1U	9/17/2002	1.900	0.00	0	18	70	3
W-M524.1U	12/12/2002	1.815	0.40	**	2	100	3
W-M524.1U	1/28/2003	1.860	0.59	**	-2	100	2
W-M524.1U	4/1/2003	1.790	-	4	14	20	6

MIN.	0.305	0.00	0	-18	0	0
MAX.	2.195	18.59	9	29	100	16
AVG.	1.526	1.49	2	12	53	5

Water quality monitoring results from samples collected at site W-M524.1U

STATION	DATE	WIND DIRECTION	WATER TEMP. (°C)	DISSOLVED OXYGEN (MG/L)	pH (SU)	TOTAL ALKALINITY (MG/L as CaCO3)
W-M524.1U	6/25/1991	SE	25.9	9.82	7.96	163
W-M524.1U	7/10/1991	NE	26.9	5.02	7.05	175
W-M524.1U	7/22/1991	SW	27.9	2.53	7.50	182
W-M524.1U	8/5/1991	E	22.2	3.16	7.42	189
W-M524.1U	8/19/1991	N	21.0	4.86	7.49	192
W-M524.1U	8/28/1991	SE	26.8	3.55	7.30	197
W-M524.1U	9/9/1991	SW	22.0	3.13	7.29	194
W-M524.1U	9/23/1991	NW	14.2	4.88	7.51	150
W-M524.1U	10/11/1991	NW	13.5	8.28	7.84	161
W-M524.1U	10/23/1991	S	13.9	9.38	8.35	162
W-M524.1U	11/6/1991	NW	0.3	12.40	8.36	166
W-M524.1U	11/25/1991	W	0.2	13.19	*	147
W-M524.1U	12/10/1991	S	1.7	12.79	7.50	144
W-M524.1U	1/30/1992	SW	1.0	11.59	7.30	199
W-M524.1U	4/6/1992	SW	10.8	12.71	8.87	107
W-M524.1U	5/4/1992	NW	17.0	11.05	9.29	119
W-M524.1U	5/18/1992	NE	19.8	8.43	7.84	146
W-M524.1U	7/24/1992	SW	20.9	2.17	7.14	167
W-M524.1U	8/12/1992	-	20.7	1.49	7.19	177
W-M524.1U	8/28/1992	NW	17.3	2.75	7.12	178
W-M524.1U	9/18/1992	N	21.7	4.69	*	155
W-M524.1U	10/9/1992	S	10.4	6.53	7.95	149
W-M524.1U	10/28/1992	SW	10.3	10.57	9.00	145
W-M524.1U	11/30/1992	SW	1.3	11.40	8.10	177
W-M524.1U	12/18/1992	BOAT WOULD NOT START				
W-M524.1U	1/19/1993	-	0.2	22.50	8.67	201
W-M524.1U	2/23/1993	W	0.1	18.78	7.61	139
W-M524.1U	3/9/1993	-	1.0	10.42	8.03	94
W-M524.1U	4/6/1993	NW	6.1	15.58	9.09	112
W-M524.1U	9/29/1993	NW	10.0	9.62	9.43	****
W-M524.1U	10/20/1993	N	12.9	7.52	9.14	132
W-M524.1U	11/3/1993	SE	3.1	12.79	9.35	135
W-M524.1U	1/11/1994	NE	0.2	0.25	7.51	213
W-M524.1U	2/22/1994	NE	0.3	8.98	7.71	147
W-M524.1U	3/14/1994	S	0.8	4.78	7.46	144
W-M524.1U	3/29/1994	SW	3.2	13.24	9.26	137
W-M524.1U	6/11/1996	N	19.2	8.87	8.17	124
W-M524.1U	6/25/1996	NE	25.1	10.59	8.68	130
W-M524.1U	7/26/1996	-	-	-	-	147
W-M524.1U	8/8/1996	NW	-	-	-	144
W-M524.1U	8/20/1996	-	23.2	3.87	*	142
W-M524.1U	9/10/1996	-	22.6	2.28	7.55	161
W-M524.1U	9/26/1996	NE	15.0	6.08	7.60	155
W-M524.1U	12/4/1996	E	2.0	13.78	*	119
W-M524.1U	12/17/1996	W	2.6	14.27	*	110
W-M524.1U	1/20/1997	SW	1.1	11.10	*	173
W-M524.1U	2/4/1997	N	1.0	19.03	8.11	143
W-M524.1U	3/4/1997	W	2.3	13.20	7.09	67
W-M524.1U	3/19/1997	W	2.0	13.05	*	137
W-M524.1U	6/10/1997	NW	21.9	7.13	7.95	135
W-M524.1U	6/26/1997	NW	26.5	4.74	7.48	128
W-M524.1U	7/9/1997	NE	22.6	6.57	8.09	137
W-M524.1U	7/23/1997	N	23.3	1.16	7.34	143
W-M524.1U	8/5/1997	NE	24.0	3.73	7.39	142
W-M524.1U	8/26/1997	SE	21.2	5.18	7.55	140
W-M524.1U	9/9/1997	N	21.0	3.36	7.49	147
W-M524.1U	9/30/1997	W	16.6	7.52	7.94	143
W-M524.1U	12/16/1997	SW	2.7	17.40	*	163
W-M524.1U	1/14/1998	SE	2.5	*	*	153
W-M524.1U	2/10/1998	SE	1.4	27.50	*	135
W-M524.1U	3/13/1998	SW	2.9	20.51	*	132
W-M524.1U	6/1/1998	S	22.5	6.36	8.21	122
W-M524.1U	6/30/1998	NW	25.5	1.79	7.24	152
W-M524.1U	7/7/1998	NE	26.2	3.42	7.13	150
W-M524.1U	7/17/1998	NW	26.3	4.70	7.46	165
W-M524.1U	8/4/1998	SE	23.9	3.79	7.27	155
W-M524.1U	8/18/1998	E	23.8	2.28	7.23	150

W-M524.1U	9/1/1998	-	23.0	2.93	6.96	153
W-M524.1U	9/15/1998	NW	21.2	3.27	7.11	141
W-M524.1U	12/17/1998	NW	1.7	14.50	*	-
W-M524.1U	1/20/1999	S	0.3	13.33	8.10	189
W-M524.1U	2/17/1999	NW	0.3	14.48	8.30	148
W-M524.1U	3/18/1999	NW	5.7	11.88	8.80	139
W-M524.1U	5/25/1999	NW	14.8	7.34	7.03	134
W-M524.1U	6/15/1999	NE	20.9	6.19	7.60	165
W-M524.1U	7/1/1999	NW	23.3	5.06	7.40	152
W-M524.1U	7/20/1999	SE	26.0	2.68	7.30	154
W-M524.1U	8/3/1999	SW	24.7	1.63	7.10	148
W-M524.1U	8/17/1999	NW	21.3	4.06	7.30	132
W-M524.1U	8/31/1999	SE	20.6	1.82	7.20	144
W-M524.1U	9/14/1999	SW	15.6	3.87	7.40	133
W-M524.1U	9/28/1999	N	15.3	4.82	7.70	134
W-M524.1U	2/1/2000	N	0.8	21.44	8.00	181
W-M524.1U	3/2/2000	NE	5.3	9.91	7.70	128
W-M524.1U	3/28/2000	NW	7.1	10.96	8.20	142
W-M524.1U	6/8/2000	SW	20.8	7.39	8.30	125
W-M524.1U	6/20/2000	S	23.0	6.70	8.40	131
W-M524.1U	7/11/2000	E	24.4	2.24	7.20	134
W-M524.1U	8/1/2000	SW	22.7	1.88	7.10	141
W-M524.1U	8/15/2000	SW	24.6	1.40	7.10	141
W-M524.1U	8/29/2000	NE	22.9	0.73	7.10	138
W-M524.1U	9/12/2000	N	21.7	2.00	7.20	143
W-M524.1U	9/26/2000	S	12.8	4.96	7.30	140
W-M524.1U	12/20/2000	S	0.4	12.78	7.80	167
W-M524.1U	1/31/2001	NW	1.3	6.48	7.40	152
W-M524.1U	2/27/2001	N	0.2	18.25	7.80	134
W-M524.1U	3/27/2001	NW	1.2	13.24	7.80	116
W-M524.1U	5/30/2001	SE	18.9	6.48	7.60	149
W-M524.1U	6/13/2001	S	-	6.70	7.70	146
W-M524.1U	6/26/2001	S	23.9	8.44	7.80	147
W-M524.1U	7/10/2001	NW	26.9	7.84	7.60	171
W-M524.1U	7/24/2001	E	27.4	5.72	7.60	144
W-M524.1U	8/7/2001	W	26.4	4.69	7.50	138
W-M524.1U	8/21/2001	S	20.5	7.43	7.50	152
W-M524.1U	9/5/2001	E	20.7	2.50	7.10	147
W-M524.1U	1/3/2002	SE	1.0	22.32	8.10	194
W-M524.1U	3/6/2002	SW	1.3	19.96	8.20	163
W-M524.1U	6/11/2002	SW	23.6	4.84	8.50	119
W-M524.1U	6/25/2002	W	27.3	3.08	7.40	132
W-M524.1U	7/11/2002	NE	23.4	2.08	6.90	132
W-M524.1U	7/25/2002	S	23.6	5.47	7.10	136
W-M524.1U	8/8/2002	E	22.5	5.34	7.10	148
W-M524.1U	8/21/2002	S	21.9	2.90	7.00	133
W-M524.1U	9/4/2002	-	22.1	1.49	6.90	132
W-M524.1U	9/17/2002	S	19.3	1.88	7.00	145
W-M524.1U	12/12/2002	SW	3.9	22.98	8.63	160
W-M524.1U	1/28/2003	S	3.9	18.30	7.97	233
W-M524.1U	4/1/2003	SW	9.5	9.23	7.70	-

MIN.	-	0.1	0.25	6.90	67
MAX.	-	27.9	27.50	9.43	233
AVG.	-	14.5	8.18	-	149

Water quality monitoring results from samples collected at site W-M524.1U

STATION	DATE	SPECIFIC CONDUCTANCE (µMHOS/CM @ 25°C)	SECCHI DISK DEPTH (CM)	TURBIDITY (NTU)	SUSPENDED SOLIDS (MG/L)
W-M524.1U	6/25/1991	378	24.4	23.00	-
W-M524.1U	7/10/1991	434	47.2	13.00	-
W-M524.1U	7/22/1991	463	45.7	6.00	-
W-M524.1U	8/5/1991	456	51.8	16.00	-
W-M524.1U	8/19/1991	420	48.8	21.00	-
W-M524.1U	8/28/1991	435	53.6	8.00	-
W-M524.1U	9/9/1991	447	51.8	6.00	-
W-M524.1U	9/23/1991	410	41.1	12.00	-
W-M524.1U	10/11/1991	377	41.1	5.00	-
W-M524.1U	10/23/1991	395	39.6	8.00	-
W-M524.1U	11/6/1991	336	35.1	14.00	-
W-M524.1U	11/25/1991	282	27.4	24.00	-
W-M524.1U	12/10/1991	313	47.2	5.00	<6.0
W-M524.1U	1/30/1992	384	**	8.00	21.0
W-M524.1U	4/6/1992	291	27.4	21.00	43.0
W-M524.1U	5/4/1992	290	30.5	14.00	40.0
W-M524.1U	5/18/1992	360	27.4	18.00	34.0
W-M524.1U	7/24/1992	364	33.5	22.00	17.0
W-M524.1U	8/12/1992	362	51.8	10.00	7.6
W-M524.1U	8/28/1992	365	51.8	9.00	16.9
W-M524.1U	9/18/1992	407	73.2	5.00	8.4
W-M524.1U	10/9/1992	341	65.5	7.00	10.7
W-M524.1U	10/28/1992	303	36.6	18.00	45.5
W-M524.1U	11/30/1992	360	48.8	11.00	13.4
W-M524.1U	12/18/1992	BOAT WOULD NOT START			
W-M524.1U	1/19/1993	390	**	11.00	12.0
W-M524.1U	2/23/1993	255	**	8.00	12.7
W-M524.1U	3/9/1993	201	**	18.00	8.3
W-M524.1U	4/6/1993	242	38.1	14.00	27.1
W-M524.1U	9/29/1993	252	44.2	14.00	8.7
W-M524.1U	10/20/1993	292	30.5	7.00	<2.5
W-M524.1U	11/3/1993	280	30.5	18.00	34.0
W-M524.1U	1/11/1994	300	**	8.00	****
W-M524.1U	2/22/1994	251	**	29.00	42.5
W-M524.1U	3/14/1994	289	**	9.00	3.0
W-M524.1U	3/29/1994	273	30.5	21.00	94.0
W-M524.1U	6/11/1996	323	33.5	17.00	30.0
W-M524.1U	6/25/1996	347	32.0	18.00	29.0
W-M524.1U	7/26/1996	-	68.6	10.00	-
W-M524.1U	8/8/1996	-	103.6	9.00	11.0
W-M524.1U	8/20/1996	375	111.3	10.00	4.0
W-M524.1U	9/10/1996	340	155.4	7.00	<1
W-M524.1U	9/26/1996	345	115.8	7.00	4.0
W-M524.1U	12/4/1996	274	**	11.60	2.0
W-M524.1U	12/17/1996	357	**	4.57	4.0
W-M524.1U	1/20/1997	361	**	3.70	1.0
W-M524.1U	2/4/1997	300	**	12.40	14.0
W-M524.1U	3/4/1997	139	**	12.70	15.0
W-M524.1U	3/19/1997	254	27.4	33.40	34.0
W-M524.1U	6/10/1997	392	38.1	18.40	20.0
W-M524.1U	6/26/1997	361	51.8	12.70	8.0
W-M524.1U	7/9/1997	355	70.1	10.30	12.0
W-M524.1U	7/23/1997	354	143.3	4.21	1.0
W-M524.1U	8/5/1997	361	121.9	5.10	8.0
W-M524.1U	8/26/1997	343	137.2	3.14	2.0
W-M524.1U	9/9/1997	354	137.2	4.28	2.0
W-M524.1U	9/30/1997	360	114.3	3.30	4.0
W-M524.1U	12/16/1997	332	**	4.49	4.0
W-M524.1U	1/14/1998	328	**	6.38	4.0
W-M524.1U	2/10/1998	282	**	8.57	6.0
W-M524.1U	3/13/1998	291	**	17.60	21.0
W-M524.1U	6/1/1998	386	61.0	9.28	6.0
W-M524.1U	6/30/1998	375	91.4	7.01	6.0
W-M524.1U	7/7/1998	381	125.0	3.66	3.0
W-M524.1U	7/17/1998	391	68.6	7.86	3.0
W-M524.1U	8/4/1998	371	89.9	3.10	6.0
W-M524.1U	8/18/1998	353	169.2	2.83	1.0

W-M524.1U	9/1/1998	345	112.8	1.44	2.0
W-M524.1U	9/15/1998	323	149.4	2.00	1.0
W-M524.1U	12/17/1998	362	47.2	15.00	13.0
W-M524.1U	1/20/1999	382	**	4.00	5.0
W-M524.1U	2/17/1999	301	57.9	13.60	8.0
W-M524.1U	3/18/1999	387	24.4	39.30	51.0
W-M524.1U	5/25/1999	413	18.3	33.60	23.0
W-M524.1U	6/15/1999	396	39.6	18.90	23.0
W-M524.1U	7/1/1999	402	82.3	6.69	5.0
W-M524.1U	7/20/1999	396	146.3	2.60	3.0
W-M524.1U	8/3/1999	366	121.9	3.89	2.0
W-M524.1U	8/17/1999	341	121.9	4.29	1.0
W-M524.1U	8/31/1999	336	118.9	3.95	1.0
W-M524.1U	9/14/1999	282	160.6	3.38	2.0
W-M524.1U	9/28/1999	349	150.0	3.20	<1
W-M524.1U	2/1/2000	374	**	4.91	8.0
W-M524.1U	3/2/2000	327	28.5	28.80	25.0
W-M524.1U	3/28/2000	384	30.0	31.60	37.0
W-M524.1U	6/8/2000	318	38.0	21.80	19.0
W-M524.1U	6/20/2000	327	43.0	18.40	16.0
W-M524.1U	7/11/2000	314	164.8	2.36	3.0
W-M524.1U	8/1/2000	338	190.0	1..72	4.0
W-M524.1U	8/15/2000	332	161.0	3.10	3.0
W-M524.1U	8/29/2000	344	174.5	1.55	<1
W-M524.1U	9/12/2000	353	90.0	5.41	4.0
W-M524.1U	9/26/2000	347	149.5	3.24	2.0
W-M524.1U	12/20/2000	340	**	3.65	7.0
W-M524.1U	1/31/2001	399	**	8.51	5.0
W-M524.1U	2/27/2001	275	**	8.21	<1
W-M524.1U	3/27/2001	222	28.0	36.60	30.0
W-M524.1U	5/30/2001	406	38.3	19.50	20.0
W-M524.1U	6/13/2001	409	37.0	24.60	22.0
W-M524.1U	6/26/2001	391	71.0	4.90	7.0
W-M524.1U	7/10/2001	393	124.8	2.48	9.0
W-M524.1U	7/24/2001	338	128.0	2.48	1.0
W-M524.1U	8/7/2001	340	83.0	2.02	4.0
W-M524.1U	8/21/2001	344	177.8	3.82	4.0
W-M524.1U	9/5/2001	357	159.0	2.55	2.0
W-M524.1U	1/3/2002	503	**	7.83	<1
W-M524.1U	3/6/2002	355	**	18.60	17.0
W-M524.1U	6/11/2002	308	40.0	21.50	8.0
W-M524.1U	6/25/2002	326	81.0	3.19	1.0
W-M524.1U	7/11/2002	349	117.0	4.85	<1
W-M524.1U	7/25/2002	344	127.0	4.27	3.0
W-M524.1U	8/8/2002	344	158.0	2.62	2.0
W-M524.1U	8/21/2002	335	160.0	1.76	<1
W-M524.1U	9/4/2002	336	160.0	2.28	1.0
W-M524.1U	9/17/2002	348	190.0	1.52	<1
W-M524.1U	12/12/2002	436	**	4.10	-
W-M524.1U	1/28/2003	586	**	3.20	-
W-M524.1U	4/1/2003	378	30.0	-	-

MIN.	139	18.3	1.44	1.0
MAX.	586	190.0	39.30	94.0
AVG.	349	82.3	10.62	13.0

Water quality monitoring results from samples collected at site W-M524.1U

STATION	DATE	CHLOROPHYLL a (MG/M3)	CHLOROPHYLL b (MG/M3)	CHLOROPHYLL c (MG/M3)	PHEOPHYTIN a (MG/M3)
W-M524.1U	6/25/1991	-	-	-	-
W-M524.1U	7/10/1991	-	-	-	-
W-M524.1U	7/22/1991	-	-	-	-
W-M524.1U	8/5/1991	-	-	-	-
W-M524.1U	8/19/1991	-	-	-	-
W-M524.1U	8/28/1991	-	-	-	-
W-M524.1U	9/9/1991	-	-	-	-
W-M524.1U	9/23/1991	-	-	-	-
W-M524.1U	########	-	-	-	-
W-M524.1U	########	-	-	-	-
W-M524.1U	11/6/1991	-	-	-	-
W-M524.1U	########	-	-	-	-
W-M524.1U	########	7.0	2.8	9.7	<1.0
W-M524.1U	1/30/1992	20.0	5.6	23.0	<1.0
W-M524.1U	4/6/1992	73.0	<1.9	5.6	61.0
W-M524.1U	5/4/1992	62.0	22.0	27.0	20.0
W-M524.1U	5/18/1992	54.0	10.0	13.0	24.0
W-M524.1U	7/24/1992	16.0	<6.8	17.0	<9.8
W-M524.1U	8/12/1992	11.5	<6.6	<7.8	<9.5
W-M524.1U	8/28/1992	6.8	<2.1	<2.4	67.4
W-M524.1U	9/18/1992	4.9	1.1	56.1	9.2
W-M524.1U	10/9/1992	21.0	15.7	29.1	59.5
W-M524.1U	########	132.0	30.4	40.4	184.0
W-M524.1U	########	9.5	9.9	12.2	<1.9
W-M524.1U	########	BOAT WOULD NOT START			
W-M524.1U	1/19/1993	22.0	4.8	38.1	14.7
W-M524.1U	2/23/1993	39.5	50.4	99.8	17.1
W-M524.1U	3/9/1993	14.4	21.2	31.6	14.7
W-M524.1U	4/6/1993	58.5	15.2	16.6	27.0
W-M524.1U	9/29/1993	12.3	6.2	6.9	<2.7
W-M524.1U	########	4.2	<1.4	<1.6	<2.7
W-M524.1U	11/3/1993	103.0	13.9	14.4	<2.7
W-M524.1U	1/11/1994	****	****	****	****
W-M524.1U	2/22/1994	4.7	5.5	11.5	<2.7
W-M524.1U	3/14/1994	<1	<1	<1	<1
W-M524.1U	3/29/1994	170.0	2.2	18.0	<1
W-M524.1U	6/11/1996	67.0	<1	<1	14.0
W-M524.1U	6/25/1996	75.0	<1	3.3	13.0
W-M524.1U	7/26/1996	-	-	-	-
W-M524.1U	8/8/1996	32.0	14.0	15.0	<1
W-M524.1U	8/20/1996	28.0	<1	2.5	<1
W-M524.1U	9/10/1996	9.9	<1	<1	<1
W-M524.1U	9/26/1996	12.0	<1	<1	<1
W-M524.1U	12/4/1996	4.2	<1	<1	<1
W-M524.1U	########	3.8	1.8	2.3	<1
W-M524.1U	1/20/1997	8.4	<1	<1	<1
W-M524.1U	2/4/1997	4.7	<1	<1	<1
W-M524.1U	3/4/1997	15.0	<1	<1	<1
W-M524.1U	3/19/1997	42.0	<1	3.5	12.0
W-M524.1U	6/10/1997	66.0	<1	8.7	13.0
W-M524.1U	6/26/1997	32.0	<1	<1	2.4
W-M524.1U	7/9/1997	19.0	<1	<1	3.6
W-M524.1U	7/23/1997	6.1	<1	<1	1.1
W-M524.1U	8/5/1997	19.0	<1	<1	1.0
W-M524.1U	8/26/1997	6.2	<1	<1	<1
W-M524.1U	9/9/1997	5.2	<1	<1	<1
W-M524.1U	9/30/1997	4.8	<1	<1	<1
W-M524.1U	########	6.6	<1	<1	1.4
W-M524.1U	1/14/1998	14.0	<1	1.4	8.6
W-M524.1U	2/10/1998	4.3	<1	<1	<1
W-M524.1U	3/13/1998	54.0	<1	5.0	11.0
W-M524.1U	6/1/1998	15.0	<1	<1	2.1
W-M524.1U	6/30/1998	13.0	3.3	3.3	5.3
W-M524.1U	7/7/1998	5.8	<1	<1	1.8
W-M524.1U	7/17/1998	19.0	<1	<1	18.0
W-M524.1U	8/4/1998	12.0	<1	<1	7.5
W-M524.1U	8/18/1998	9.6	<1	<1	1.1

W-M524.1U	9/1/1998	14.0	<1	<1	<1
W-M524.1U	9/15/1998	9.4	<1	<1	3.9
W-M524.1U	########	11.0	<1	<1	<1
W-M524.1U	1/20/1999	2.6	<1	<1	<1
W-M524.1U	2/17/1999	9.4	<1	<1	4.9
W-M524.1U	3/18/1999	110.0	<1	13.0	1.3
W-M524.1U	5/25/1999	11.0	<1	<1	8.2
W-M524.1U	6/15/1999	40.0	<1	<1	<1
W-M524.1U	7/1/1999	22.0	2.7	4.4	<1
W-M524.1U	7/20/1999	7.6	3.9	3.3	7.9
W-M524.1U	8/3/1999	3.1	1.6	<1	<1
W-M524.1U	8/17/1999	2.7	3.4	3.6	<1
W-M524.1U	8/31/1999	3.4	1.5	<1	<1
W-M524.1U	9/14/1999	<1	1.5	<1	<1
W-M524.1U	9/28/1999	2.1	<1	<1	<1
W-M524.1U	2/1/2000	7.1	<1	1.6	<1
W-M524.1U	3/2/2000	19.0	<1	<1	5.5
W-M524.1U	3/28/2000	84.0	<1	8.8	9.5
W-M524.1U	6/8/2000	16.0	<1	<1	8.0
W-M524.1U	6/20/2000	18.0	<1	<1	4.4
W-M524.1U	7/11/2000	<1	<1	<1	<1
W-M524.1U	8/1/2000	<1	<1	<1	<1
W-M524.1U	8/15/2000	2.9	<1	<1	<1
W-M524.1U	8/29/2000	7.6	<1	<1	<1
W-M524.1U	9/12/2000	3.3	<1	<1	<1
W-M524.1U	9/26/2000	1.9	<1	<1	<1
W-M524.1U	########	1.6	<1	<1	<1
W-M524.1U	1/31/2001	3.3	<1	<1	<1
W-M524.1U	2/27/2001	3.7	<1	<1	<1
W-M524.1U	3/27/2001	18.0	<1	<1	<1
W-M524.1U	5/30/2001	34.0	<1	<1	1.9
W-M524.1U	6/13/2001	33.0	3.0	<1	<1
W-M524.1U	6/26/2001	2.1	<1	<1	<1
W-M524.1U	7/10/2001	7.6	1.3	<1	<1
W-M524.1U	7/24/2001	12.0	2.4	<1	<1
W-M524.1U	8/7/2001	13.0	5.5	7.6	<1
W-M524.1U	8/21/2001	10.0	<1	<1	<1
W-M524.1U	9/5/2001	1.9	<1	<1	<1
W-M524.1U	1/3/2002	<1	<1	<1	1.3
W-M524.1U	3/6/2002	95.0	<1	6.1	21.0
W-M524.1U	6/11/2002	8.1	<1	<1	<1
W-M524.1U	6/25/2002	13.0	<1	<1	<1
W-M524.1U	7/11/2002	12.0	2.6	<1	<1
W-M524.1U	7/25/2002	15.0	<1	<1	<1
W-M524.1U	8/8/2002	8.4	<1	<1	<1
W-M524.1U	8/21/2002	4.1	<1	<1	<1
W-M524.1U	9/4/2002	7.9	<1	<1	7.4
W-M524.1U	9/17/2002	4.0	<1	<1	<1
W-M524.1U	########	-	-	-	-
W-M524.1U	1/28/2003	-	-	-	-
W-M524.1U	4/1/2003	-	-	-	-

MIN.	1.6	1.1	1.4	1.0
MAX.	170.0	50.4	99.8	184.0
AVG.	22.9	8.8	16.1	17.1

Water quality monitoring results from samples collected at site W-M525.1Y

STATION	DATE	WATER DEPTH (M)	VELOCITY (CM/SEC)	WAVE HEIGHT (CM)	AIR TEMP. (°C)	CLOUD COVER (%)	WIND SPEED (MPH)
W-M525.1Y	5/13/1991	0.335	1.62	3	22	70	3
W-M525.1Y	6/25/1991	0.533	3.02	0	21	10	5
W-M525.1Y	7/10/1991	0.518	3.35	0	24	20	0
W-M525.1Y	7/22/1991	0.427	2.16	0	29	40	5
W-M525.1Y	8/5/1991	0.396	5.33	0	21	98	5
W-M525.1Y	8/19/1991	0.716	6.58	6	20	75	11
W-M525.1Y	8/28/1991	0.579	*	0	27	20	1
W-M525.1Y	9/9/1991	0.411	-	0	24	60	3
W-M525.1Y	9/23/1991	0.655	1.49	0	16	20	5
W-M525.1Y	10/11/1991	0.411	2.29	3	10	5	15
W-M525.1Y	10/23/1991	0.427	2.59	0	18	35	10
W-M525.1Y	11/6/1991	0.701	1.58	0	-7	100	20
W-M525.1Y	11/25/1991	0.579	1.77	**	-11	5	3
W-M525.1Y	12/10/1991	0.457	0.00	**	8	5	5
W-M525.1Y	1/30/1992	0.213	0.00	**	2	100	3
W-M525.1Y	4/6/1992	0.472	0.00	6	13	60	13
W-M525.1Y	5/4/1992	0.518	2.59	0	12	20	2
W-M525.1Y	5/18/1992	0.488	3.02	3	14	0	5
W-M525.1Y	7/24/1992	0.381	0.00	0	24	95	2
W-M525.1Y	8/12/1992	0.366	1.07	0	17	100	7
W-M525.1Y	8/28/1992	0.351	0.00	0	16	0	6
W-M525.1Y	9/18/1992	0.533	2.16	0	20	20	20
W-M525.1Y	10/9/1992	0.518	3.41	0	8	95	5
W-M525.1Y	10/28/1992	0.472	2.16	0	10	60	0
W-M525.1Y	11/30/1992	0.594	0.00	0	1	100	5
W-M525.1Y	12/18/1992	0.427	**	**	-2	100	12
W-M525.1Y	1/11/1993	0.183	0.00	**	-7	100	7
W-M525.1Y	2/23/1993	0.229	*	**	-18	10	5
W-M525.1Y	3/9/1993	0.396	0.00	**	2	95	0
W-M525.1Y	4/6/1993	0.671	2.83	0	3	98	3
W-M525.1Y	9/29/1993	0.305	0.00	0	4	5	10
W-M525.1Y	10/20/1993	0.381	0.00	0	11	100	0
W-M525.1Y	11/3/1993	0.335	0.00	0	4	45	7
W-M525.1Y	1/11/1994	0.274	**	**	-3	25	8
W-M525.1Y	2/22/1994	****	****	****	****	****	****
W-M525.1Y	3/14/1994	0.594	0.00	**	3	100	5
W-M525.1Y	3/29/1994	0.351	0.00	3	0	25	3
W-M525.1Y	6/11/1996	3.200	3.57	3	21	100	3
W-M525.1Y	6/25/1996	3.353	0.00	3	22	10	1
W-M525.1Y	7/26/1996	3.124	0.00	0	26	0	0
W-M525.1Y	8/8/1996	3.139	0.00	0	27	0	2
W-M525.1Y	8/20/1996	2.865	1.37	0	20	100	5
W-M525.1Y	9/10/1996	3.063	1.04	0	16	100	0
W-M525.1Y	9/26/1996	3.094	0.00	3	12	100	6
W-M525.1Y	12/4/1996	3.109	0.00	**	-12	90	0
W-M525.1Y	12/17/1996	3.139	0.00	**	-8	65	3
W-M525.1Y	1/20/1997	2.850	0.00	**	3	15	5
W-M525.1Y	2/4/1997	2.810	0.00	**	0	100	2
W-M525.1Y	3/4/1997	2.987	0.00	**	2	95	3
W-M525.1Y	3/19/1997	2.560	0.00	**	1	20	1
W-M525.1Y	6/10/1997	2.713	0.67	0	19	0	3
W-M525.1Y	6/26/1997	2.743	3.51	3	22	10	5
W-M525.1Y	7/9/1997	2.682	0.76	3	16	95	5
W-M525.1Y	7/23/1997	2.835	3.17	3	20	100	5
W-M525.1Y	8/5/1997	2.499	0.00	3	15	0	4
W-M525.1Y	8/26/1997	2.697	0.00	0	18	100	1
W-M525.1Y	9/9/1997	2.789	0.00	0	17	98	1
W-M525.1Y	9/30/1997	2.850	***	9	13	5	5
W-M525.1Y	12/16/1997	2.697	0.00	**	3	20	1
W-M525.1Y	1/14/1998	2.652	0.00	**	-7	100	4
W-M525.1Y	2/10/1998	2.682	0.00	**	1	100	2
W-M525.1Y	3/13/1998	2.804	0.00	**	1	90	3
W-M525.1Y	6/1/1998	2.697	1.19	3	16	5	2
W-M525.1Y	6/30/1998	2.652	2.35	6	22	5	8
W-M525.1Y	7/7/1998	2.957	0.00	0	27	70	2
W-M525.1Y	7/17/1998	2.560	0.00	3	23	55	5
W-M525.1Y	8/4/1998	2.652	0.00	0	20	100	1

W-M525.1Y	8/18/1998	2.804	***	3	23	100	6
W-M525.1Y	9/1/1998	2.530	0.00	0	17	5	1
W-M525.1Y	9/15/1998	2.835	0.00	3	20	90	3
W-M525.1Y	12/17/1998	2.682	3.99	3	0	20	5
W-M525.1Y	1/20/1999	2.728	-	**	0	100	3
W-M525.1Y	2/17/1999	2.682	0.00	**	-2	80	5
W-M525.1Y	3/18/1999	2.850	***	9	1	45	10
W-M525.1Y	5/25/1999	2.713	***	6	14	2	10
W-M525.1Y	6/15/1999	2.850	0.00	3	14	15	4
W-M525.1Y	7/1/1999	2.819	1.65	3	19	65	2
W-M525.1Y	7/20/1999	2.713	0.00	3	21	100	4
W-M525.1Y	8/3/1999	2.728	0.00	3	19	15	3
W-M525.1Y	8/17/1999	2.697	2.83	3	23	5	5
W-M525.1Y	8/31/1999	2.713	0.00	3	15	75	6
W-M525.1Y	9/14/1999	2.834	0.00	3	12	30	1
W-M525.1Y	9/28/1999	2.740	0.00	3	12	100	5
W-M525.1Y	2/1/2000	2.896	0.00	**	-7	90	3
W-M525.1Y	3/2/2000	2.790	-	2	2	10	4
W-M525.1Y	3/28/2000	2.800	***	24	0	99	15
W-M525.1Y	6/8/2000	2.810	3.54	1	21	15	2
W-M525.1Y	6/20/2000	2.765	-	12	22	100	13
W-M525.1Y	7/11/2000	2.418	-	0	22	15	2
W-M525.1Y	8/1/2000	2.660	-	2	19	10	3
W-M525.1Y	8/15/2000	2.716	-	0	27	10	0
W-M525.1Y	8/29/2000	2.306	-	1	21	100	5
W-M525.1Y	9/12/2000	2.800	-	9	15	40	10
W-M525.1Y	9/26/2000	2.610	-	0	11	20	1
W-M525.1Y	1/31/2001	2.600	0.00	**	0	100	3
W-M525.1Y	2/27/2001	2.770	0.00	**	-3	70	5
W-M525.1Y	3/27/2001	2.565	0.00	**	-5	0	3
W-M525.1Y	5/30/2001	2.680	-	3	14	85	6
W-M525.1Y	6/13/2001	2.700	-	5	29	20	13
W-M525.1Y	6/26/2001	2.950	1.62	2	23	5	6
W-M525.1Y	7/10/2001	2.100	-	6	27	6	6
W-M525.1Y	7/24/2001	2.670	0.00	2	27	15	3
W-M525.1Y	8/7/2001	2.785	-	1	26	5	1
W-M525.1Y	8/21/2001	2.430	-	7	18	85	9
W-M525.1Y	9/5/2001	2.360	0.00	0	18	5	2
W-M525.1Y	3/6/2002	2.405	0.00	**	1	98	4
W-M525.1Y	6/11/2002	2.625	***	1	23	50	4
W-M525.1Y	6/25/2002	2.540	*	0	28	60	4
W-M525.1Y	7/11/2002	2.220	0.00	1	17	90	3
W-M525.1Y	7/25/2002	2.645	-	4	18	95	6
W-M525.1Y	8/8/2002	2.370	0.00	0	16	5	2
W-M525.1Y	8/21/2002	2.630	-	4	19	90	6
W-M525.1Y	9/4/2002	2.600	0.00	0	19	20	0
W-M525.1Y	9/17/2002	2.600	0.00	0	19	65	1
W-M525.1Y	12/12/2002	2.460	0.90	**	3	100	5
W-M525.1Y	1/28/2003	2.470	0.24	**	-1	100	2
W-M525.1Y	4/1/2003	2.525	-	1	15	35	4

MIN.	0.183	0.00	0	-18	0	0
MAX.	3.353	6.58	24	29	100	20
AVG.	2.016	0.94	2	12	54	5

Water quality monitoring results from samples collected at site W-M525.1Y

STATION	DATE	WIND DIRECTION	WATER TEMP. (°C)	DISSOLVED OXYGEN (MG/L)	pH (SU)	TOTAL ALKALINITY (MG/L as CaCO3)
W-M525.1Y	5/13/1991	N	23.9	5.12	7.78	-
W-M525.1Y	6/25/1991	SE	24.9	4.24	7.60	141
W-M525.1Y	7/10/1991	-	26.9	6.20	7.39	154
W-M525.1Y	7/22/1991	SW	28.2	2.05	7.38	176
W-M525.1Y	8/5/1991	SE	22.2	1.92	7.42	178
W-M525.1Y	8/19/1991	N	21.0	7.92	8.35	160
W-M525.1Y	8/28/1991	SE	35.2	11.50	8.48	173
W-M525.1Y	9/9/1991	SW	23.0	5.28	7.67	173
W-M525.1Y	9/23/1991	NW	14.4	7.62	7.95	142
W-M525.1Y	10/11/1991	NW	13.2	9.06	8.06	157
W-M525.1Y	######	S	13.8	9.43	8.37	165
W-M525.1Y	11/6/1991	NW	2.1	12.15	8.21	167
W-M525.1Y	######	W	0.6	12.12	*	143
W-M525.1Y	######	S	2.3	10.65	7.20	121
W-M525.1Y	1/30/1992	NW	0.7	9.55	7.22	142
W-M525.1Y	4/6/1992	SW	8.8	12.89	8.81	137
W-M525.1Y	5/4/1992	NW	14.9	12.13	8.60	124
W-M525.1Y	5/18/1992	NE	19.8	10.25	8.74	152
W-M525.1Y	7/24/1992	NE	20.6	3.95	7.43	132
W-M525.1Y	8/12/1992	N	20.2	0.85	7.19	193
W-M525.1Y	8/28/1992	NW	22.4	1.44	7.28	151
W-M525.1Y	9/18/1992	N	20.2	1.64	*	155
W-M525.1Y	10/9/1992	S	11.3	5.11	7.63	152
W-M525.1Y	######	-	10.5	11.17	8.87	144
W-M525.1Y	######	NW	1.8	10.50	7.67	164
W-M525.1Y	######	SW	1.0	10.63	7.89	-
W-M525.1Y	1/11/1993	NE	0.3	5.50	7.04	127
W-M525.1Y	2/23/1993	W	0.5	*	8.96	137
W-M525.1Y	3/9/1993	-	0.7	9.60	7.90	101
W-M525.1Y	4/6/1993	NW	5.6	12.32	7.32	133
W-M525.1Y	9/29/1993	N	9.6	5.25	7.60	****
W-M525.1Y	######	-	12.6	5.60	8.01	152
W-M525.1Y	11/3/1993	SE	3.8	16.07	9.42	155
W-M525.1Y	1/11/1994	NE	**	**	**	**
W-M525.1Y	2/22/1994	****	****	****	****	****
W-M525.1Y	3/14/1994	S	1.8	9.24	7.78	142
W-M525.1Y	3/29/1994	NW	2.9	15.73	9.21	160
W-M525.1Y	6/11/1996	NW	18.8	9.55	8.78	147
W-M525.1Y	6/25/1996	SE	24.1	5.96	8.08	147
W-M525.1Y	7/26/1996	-	-	-	-	169
W-M525.1Y	8/8/1996	NW	-	-	-	157
W-M525.1Y	8/20/1996	NW	23.2	3.79	*	143
W-M525.1Y	9/10/1996	-	23.5	1.70	7.33	197
W-M525.1Y	9/26/1996	SE	15.2	3.92	7.82	158
W-M525.1Y	12/4/1996	-	0.6	14.14	*	120
W-M525.1Y	######	NW	0.6	14.18	*	140
W-M525.1Y	1/20/1997	SE	0.8	11.07	*	156
W-M525.1Y	2/4/1997	N	0.8	14.72	7.28	135
W-M525.1Y	3/4/1997	W	1.2	10.88	7.14	78
W-M525.1Y	3/19/1997	W	2.3	17.00	*	131
W-M525.1Y	6/10/1997	SE	20.9	4.44	7.64	135
W-M525.1Y	6/26/1997	NW	26.7	3.74	7.25	144
W-M525.1Y	7/9/1997	NE	24.0	5.54	7.82	146
W-M525.1Y	7/23/1997	NW	24.2	1.60	7.42	147
W-M525.1Y	8/5/1997	N	25.4	3.39	7.49	162
W-M525.1Y	8/26/1997	SE	21.6	2.96	7.47	165
W-M525.1Y	9/9/1997	N	21.8	3.15	7.48	156
W-M525.1Y	9/30/1997	NW	16.9	4.56	7.41	162
W-M525.1Y	######	SE	1.7	19.00	7.71	148
W-M525.1Y	1/14/1998	SE	1.4	*	*	166
W-M525.1Y	2/10/1998	SE	0.3	23.46	8.88	125
W-M525.1Y	3/13/1998	S	1.9	17.22	*	92
W-M525.1Y	6/1/1998	SE	21.5	5.11	7.62	135
W-M525.1Y	6/30/1998	NW	26.3	3.98	7.43	159
W-M525.1Y	7/7/1998	NE	26.3	5.16	7.38	147
W-M525.1Y	7/17/1998	NW	27.4	3.93	7.56	149
W-M525.1Y	8/4/1998	NW	24.4	3.01	7.29	164
W-M525.1Y	8/18/1998	SE	25.0	2.23	7.29	170
W-M525.1Y	9/1/1998	SE	24.3	2.99	7.09	156
W-M525.1Y	9/15/1998	NW	22.0	3.95	7.19	159
W-M525.1Y	######	NW	1.2	14.63	*	-
W-M525.1Y	1/20/1999	S	0.7	8.77	8.00	203
W-M525.1Y	2/17/1999	NW	0.7	14.38	8.20	152
W-M525.1Y	3/18/1999	NW	4.5	13.78	8.80	137
W-M525.1Y	5/25/1999	NW	15.6	7.80	6.97	161
W-M525.1Y	6/15/1999	NW	21.7	5.74	7.80	154

W-M525.1Y	7/1/1999	NW	24.1	6.07	7.80	153
W-M525.1Y	7/20/1999	SE	27.1	3.20	7.60	180
W-M525.1Y	8/3/1999	SE	26.1	4.81	7.80	142
W-M525.1Y	8/17/1999	NW	22.7	6.21	7.90	142
W-M525.1Y	8/31/1999	SE	21.4	3.02	7.50	152
W-M525.1Y	9/14/1999	SW	17.7	4.39	7.80	143
W-M525.1Y	9/28/1999	N	16.4	6.09	8.00	128
W-M525.1Y	2/1/2000	N	1.0	13.34	7.50	173
W-M525.1Y	3/2/2000	NE	5.8	11.38	8.10	143
W-M525.1Y	######	NW	5.5	12.88	8.20	141
W-M525.1Y	6/8/2000	S	20.5	4.11	7.40	134
W-M525.1Y	######	S	21.2	3.67	7.60	145
W-M525.1Y	7/11/2000	NE	25.3	3.37	7.40	159
W-M525.1Y	8/1/2000	N	25.0	4.03	7.60	214
W-M525.1Y	8/15/2000	-	26.4	5.09	7.80	160
W-M525.1Y	######	N	23.9	2.70	7.40	149
W-M525.1Y	9/12/2000	NW	22.0	3.38	7.30	137
W-M525.1Y	######	S	14.0	4.31	7.30	138
W-M525.1Y	1/31/2001	W	0.4	10.50	7.00	35
W-M525.1Y	2/27/2001	N	1.0	15.90	7.40	67
W-M525.1Y	3/27/2001	NW	0.4	15.20	8.40	160
W-M525.1Y	5/30/2001	SE	17.3	3.69	7.40	152
W-M525.1Y	6/13/2001	S	22.5	4.50	7.60	146
W-M525.1Y	6/26/2001	SE	23.6	3.53	7.40	145
W-M525.1Y	7/10/2001	NW	28.3	5.80	7.70	182
W-M525.1Y	7/24/2001	NE	29.1	3.45	7.50	169
W-M525.1Y	8/7/2001	SW	29.3	7.02	8.30	156
W-M525.1Y	8/21/2001	SE	22.7	4.30	7.40	175
W-M525.1Y	9/5/2001	NE	22.7	1.79	7.20	152
W-M525.1Y	3/6/2002	NE	1.2	28.28	8.70	157
W-M525.1Y	6/11/2002	S	23.4	4.67	7.60	140
W-M525.1Y	######	SE	27.6	11.40	8.40	134
W-M525.1Y	7/11/2002	NE	24.6	1.07	7.00	127
W-M525.1Y	######	S	24.4	1.40	7.10	122
W-M525.1Y	8/8/2002	E	24.2	3.01	7.20	127
W-M525.1Y	8/21/2002	S	22.5	2.14	7.00	121
W-M525.1Y	9/4/2002	-	23.5	1.78	7.00	129
W-M525.1Y	9/17/2002	SW	20.7	3.16	7.10	141
W-M525.1Y	######	S	1.4	14.38	8.60	144
W-M525.1Y	1/28/2003	SE	1.3	18.10	8.20	182
W-M525.1Y	4/1/2003	NW	8.5	17.32	9.10	-

MIN.	-	0.3	0.85	6.97	35
MAX.	-	35.2	28.28	9.42	214
AVG.	-	15.3	7.66	-	148

Water quality monitoring results from samples collected at site W-M525.1Y

STATION	DATE	SPECIFIC CONDUCTANCE (µMHOS/CM @ 25°C)	SECCHI DISK DEPTH (CM)	TURBIDITY (NTU)	SUSPENDED SOLIDS (MG/L)
W-M525.1Y	5/13/1991	364	24.4	46.00	122.0
W-M525.1Y	6/25/1991	385	18.3	39.00	-
W-M525.1Y	7/10/1991	418	18.3	29.00	-
W-M525.1Y	7/22/1991	468	22.9	19.00	-
W-M525.1Y	8/5/1991	428	27.4	19.00	-
W-M525.1Y	8/19/1991	409	24.4	15.00	-
W-M525.1Y	8/28/1991	371	32.6	13.00	-
W-M525.1Y	9/9/1991	433	30.5	17.00	-
W-M525.1Y	9/23/1991	324	19.8	30.00	-
W-M525.1Y	10/11/1991	376	24.4	19.00	-
W-M525.1Y	10/23/1991	387	30.5	20.00	-
W-M525.1Y	11/6/1991	344	**	17.00	-
W-M525.1Y	11/25/1991	290	**	26.00	-
W-M525.1Y	12/10/1991	319	**	3.00	<10
W-M525.1Y	1/30/1992	324	**	4.00	<4.8
W-M525.1Y	4/6/1992	353	24.4	25.00	62.0
W-M525.1Y	5/4/1992	291	27.4	20.00	39.0
W-M525.1Y	5/18/1992	385	24.4	25.00	42.0
W-M525.1Y	7/24/1992	336	38.1	11.00	64.1
W-M525.1Y	8/12/1992	332	36.6	8.00	11.9
W-M525.1Y	8/28/1992	317	35.1	9.00	33.8
W-M525.1Y	9/18/1992	358	53.3	7.00	108.0
W-M525.1Y	10/9/1992	337	51.8	5.00	8.9
W-M525.1Y	10/28/1992	328	41.1	12.00	32.6
W-M525.1Y	11/30/1992	352	32.0	22.00	31.3
W-M525.1Y	12/18/1992	307	**	-	-
W-M525.1Y	1/11/1993	262	**	16.00	17.7
W-M525.1Y	2/23/1993	290	**	10.00	10.4
W-M525.1Y	3/9/1993	279	**	10.00	13.8
W-M525.1Y	4/6/1993	283	41.1	14.00	20.8
W-M525.1Y	9/29/1993	321	30.5	8.00	33.3
W-M525.1Y	10/20/1993	350	38.1	7.00	<4.0
W-M525.1Y	11/3/1993	302	33.5	18.00	4.0
W-M525.1Y	1/11/1994	**	**	**	**
W-M525.1Y	2/22/1994	****	****	****	****
W-M525.1Y	3/14/1994	280	**	8.00	1.0
W-M525.1Y	3/29/1994	322	25.9	26.00	78.0
W-M525.1Y	6/11/1996	378	36.6	19.00	29.0
W-M525.1Y	6/25/1996	418	30.5	18.00	26.0
W-M525.1Y	7/26/1996	-	45.7	17.00	-
W-M525.1Y	8/8/1996	-	45.7	15.00	14.0
W-M525.1Y	8/20/1996	375	100.6	11.00	6.0
W-M525.1Y	9/10/1996	360	102.1	10.00	7.0
W-M525.1Y	9/26/1996	372	68.6	12.00	17.0
W-M525.1Y	12/4/1996	263	**	5.23	<1
W-M525.1Y	12/17/1996	282	**	8.41	6.0
W-M525.1Y	1/20/1997	336	**	3.00	<1
W-M525.1Y	2/4/1997	296	**	7.00	9.0
W-M525.1Y	3/4/1997	182	**	19.00	9.0
W-M525.1Y	3/19/1997	256	**	10.00	7.0
W-M525.1Y	6/10/1997	399	21.3	42.00	45.0
W-M525.1Y	6/26/1997	387	42.7	18.00	13.0
W-M525.1Y	7/9/1997	384	30.5	29.80	48.0
W-M525.1Y	7/23/1997	404	57.9	11.00	9.0
W-M525.1Y	8/5/1997	408	48.8	13.00	12.0
W-M525.1Y	8/26/1997	422	74.7	7.00	6.0
W-M525.1Y	9/9/1997	407	67.1	11.00	8.0
W-M525.1Y	9/30/1997	402	39.6	17.00	19.0
W-M525.1Y	12/16/1997	309	**	3.00	2.0
W-M525.1Y	1/14/1998	349	**	6.38	5.0
W-M525.1Y	2/10/1998	263	**	4.38	2.0
W-M525.1Y	3/13/1998	285	**	16.70	18.0
W-M525.1Y	6/1/1998	429	41.1	19.10	17.0
W-M525.1Y	6/30/1998	397	56.4	15.90	14.0
W-M525.1Y	7/7/1998	385	77.7	7.88	8.0
W-M525.1Y	7/17/1998	380	30.5	25.50	30.0
W-M525.1Y	8/4/1998	411	88.4	4.93	5.0

W-M525.1Y	8/18/1998	405	105.2	4.69	3.0
W-M525.1Y	9/1/1998	381	54.9	6.89	11.0
W-M525.1Y	9/15/1998	393	57.9	9.40	12.0
W-M525.1Y	12/17/1998	363	51.8	13.00	12.0
W-M525.1Y	1/20/1999	379	**	5.00	3.0
W-M525.1Y	2/17/1999	345	**	18.00	10.0
W-M525.1Y	3/18/1999	412	29.0	46.00	58.0
W-M525.1Y	5/25/1999	428	18.3	46.60	24.0
W-M525.1Y	6/15/1999	434	29.0	40.40	44.0
W-M525.1Y	7/1/1999	449	54.9	15.50	14.0
W-M525.1Y	7/20/1999	418	67.1	11.60	14.0
W-M525.1Y	8/3/1999	377	61.0	13.40	14.0
W-M525.1Y	8/17/1999	378	61.0	8.52	7.0
W-M525.1Y	8/31/1999	367	70.1	8.53	8.0
W-M525.1Y	9/14/1999	326	47.0	26.90	11.0
W-M525.1Y	9/28/1999	365	52.0	16.20	4.0
W-M525.1Y	2/1/2000	365	**	4.08	5.0
W-M525.1Y	3/2/2000	405	28.0	41.10	27.0
W-M525.1Y	3/28/2000	352	35.0	35.50	40.0
W-M525.1Y	6/8/2000	356	21.0	55.50	48.0
W-M525.1Y	6/20/2000	382	35.0	37.80	31.0
W-M525.1Y	7/11/2000	396	50.6	10.20	11.0
W-M525.1Y	8/1/2000	395	91.4	7.56	10.0
W-M525.1Y	8/15/2000	396	79.4	7.99	1.0
W-M525.1Y	8/29/2000	382	96.5	11.30	5.0
W-M525.1Y	9/12/2000	366	70.0	8.78	5.0
W-M525.1Y	9/26/2000	359	40.5	15.70	23.0
W-M525.1Y	1/31/2001	169	**	4.16	2.0
W-M525.1Y	2/27/2001	194	**	34.10	3.0
W-M525.1Y	3/27/2001	324	**	14.00	10.0
W-M525.1Y	5/30/2001	425	27.2	34.10	38.0
W-M525.1Y	6/13/2001	418	27.0	40.10	36.0
W-M525.1Y	6/26/2001	383	21.0	36.80	34.0
W-M525.1Y	7/10/2001	398	34.8	16.60	21.0
W-M525.1Y	7/24/2001	410	71.0	6.76	4.0
W-M525.1Y	8/7/2001	404	91.5	5.46	6.0
W-M525.1Y	8/21/2001	381	88.5	3.95	2.0
W-M525.1Y	9/5/2001	399	109.0	5.41	3.0
W-M525.1Y	3/6/2002	357	**	11.70	15.0
W-M525.1Y	6/11/2002	373	24.0	11.60	32.0
W-M525.1Y	6/25/2002	382	52.5	9.54	10.0
W-M525.1Y	7/11/2002	385	108.0	4.23	3.0
W-M525.1Y	7/25/2002	377	102.5	6.30	2.0
W-M525.1Y	8/8/2002	358	79.5	3.68	6.0
W-M525.1Y	8/21/2002	348	132.0	3.72	2.0
W-M525.1Y	9/4/2002	376	116.0	3.46	<1
W-M525.1Y	9/17/2002	386	95.0	3.51	5.0
W-M525.1Y	12/12/2002	434	**	7.02	-
W-M525.1Y	1/28/2002	465	**	5.27	-
W-M525.1Y	4/1/2003	380	45.0	-	-

MIN.	169	18.3	3.00	1.0
MAX.	468	132.0	55.50	122.0
AVG.	362	51.1	15.77	19.7

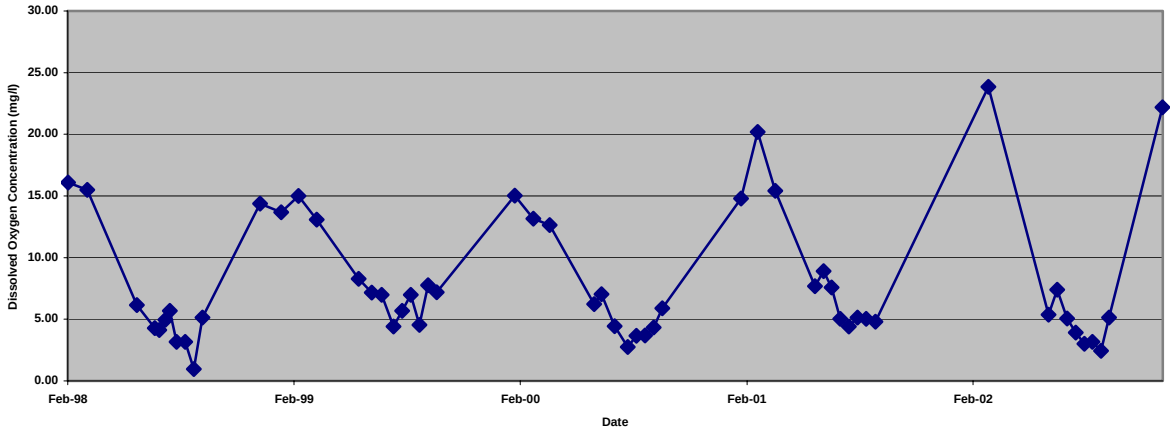
Water quality monitoring results from samples collected at site W-M525.1Y

STATION	DATE	CHLOROPHYLL a (MG/M3)	CHLOROPHYLL b (MG/M3)	CHLOROPHYLL c (MG/M3)	PHEOPHYTIN a (MG/M3)
W-M525.1Y	5/13/1991	-	-	-	-
W-M525.1Y	6/25/1991	-	-	-	-
W-M525.1Y	7/10/1991	-	-	-	-
W-M525.1Y	7/22/1991	-	-	-	-
W-M525.1Y	8/5/1991	-	-	-	-
W-M525.1Y	8/19/1991	-	-	-	-
W-M525.1Y	8/28/1991	-	-	-	-
W-M525.1Y	9/9/1991	-	-	-	-
W-M525.1Y	9/23/1991	-	-	-	-
W-M525.1Y	########	-	-	-	-
W-M525.1Y	########	-	-	-	-
W-M525.1Y	11/6/1991	-	-	-	-
W-M525.1Y	########	-	-	-	-
W-M525.1Y	########	3.1	2.0	2.8	<1.0
W-M525.1Y	1/30/1992	15.0	18.0	22.0	27.0
W-M525.1Y	4/6/1992	65.0	<2.1	7.7	45.0
W-M525.1Y	5/4/1992	98.0	13.0	29.0	17.0
W-M525.1Y	5/18/1992	64.0	15.0	7.4	<1.9
W-M525.1Y	7/24/1992	65.0	14.0	19.0	63.0
W-M525.1Y	8/12/1992	<5.3	<6.7	<7.9	<9.6
W-M525.1Y	8/28/1992	46.9	22.9	9.8	230.0
W-M525.1Y	9/18/1992	<1.0	<1.3	<1.5	<1.8
W-M525.1Y	10/9/1992	15.2	20.5	10.5	140.0
W-M525.1Y	########	160.0	<1.3	19.8	116.0
W-M525.1Y	########	10.3	<1.3	19.0	12.3
W-M525.1Y	########	-	-	-	-
W-M525.1Y	1/11/1993	****	****	****	****
W-M525.1Y	2/23/1993	18.8	41.6	71.9	75.0
W-M525.1Y	3/9/1993	11.8	14.7	19.8	9.5
W-M525.1Y	4/6/1993	42.7	31.8	42.6	25.3
W-M525.1Y	9/29/1993	32.8	13.9	3.3	<2.7
W-M525.1Y	########	32.9	2.1	<1.6	36.0
W-M525.1Y	11/3/1993	158.0	11.8	11.6	<2.7
W-M525.1Y	1/11/1994	**	**	**	**
W-M525.1Y	2/22/1994	****	****	****	****
W-M525.1Y	3/14/1994	7.5	<1	<1	<1
W-M525.1Y	3/29/1994	150.0	<1	14.0	1.3
W-M525.1Y	6/11/1996	31.0	<1	1.2	<1
W-M525.1Y	6/25/1996	31.0	<1	<1	4.5
W-M525.1Y	7/26/1996	-	-	-	-
W-M525.1Y	8/8/1996	34.0	9.5	3.1	5.7
W-M525.1Y	8/20/1996	6.9	<1	<1	6.3
W-M525.1Y	9/10/1996	11.0	<1	<1	3.4
W-M525.1Y	9/26/1996	4.2	<1	<1	7.0
W-M525.1Y	12/4/1996	3.1	<1	<1	<1
W-M525.1Y	########	<1	<1	<1	1.8
W-M525.1Y	1/20/1997	<1	<1	<1	<1
W-M525.1Y	2/4/1997	<1	<1	<1	<1
W-M525.1Y	3/4/1997	<1	<1	<1	<1
W-M525.1Y	3/19/1997	11.0	<1	<1	1.7
W-M525.1Y	6/10/1997	27.0	<1	<1	5.9
W-M525.1Y	6/26/1997	23.0	<1	<1	6.7
W-M525.1Y	7/9/1997	8.8	<1	<1	<1
W-M525.1Y	7/23/1997	2.2	<1	<1	<1
W-M525.1Y	8/5/1997	10.0	<1	<1	4.3
W-M525.1Y	8/26/1997	3.0	<1	<1	<1
W-M525.1Y	9/9/1997	4.0	<1	<1	2.4
W-M525.1Y	9/30/1997	8.7	<1	<1	2.6
W-M525.1Y	########	5.4	<1	<1	<1
W-M525.1Y	1/14/1998	24.0	<1	2.0	6.1
W-M525.1Y	2/10/1998	1.1	<1	<1	<1
W-M525.1Y	3/13/1998	7.5	<1	<1	<1
W-M525.1Y	6/1/1998	9.8	<1	<1	4.3
W-M525.1Y	6/30/1998	13.0	<1	<1	14.0
W-M525.1Y	7/7/1998	7.1	<1	<1	3.1
W-M525.1Y	7/17/1998	18.0	5.2	5.2	6.9
W-M525.1Y	8/4/1998	3.0	<1	<1	<1

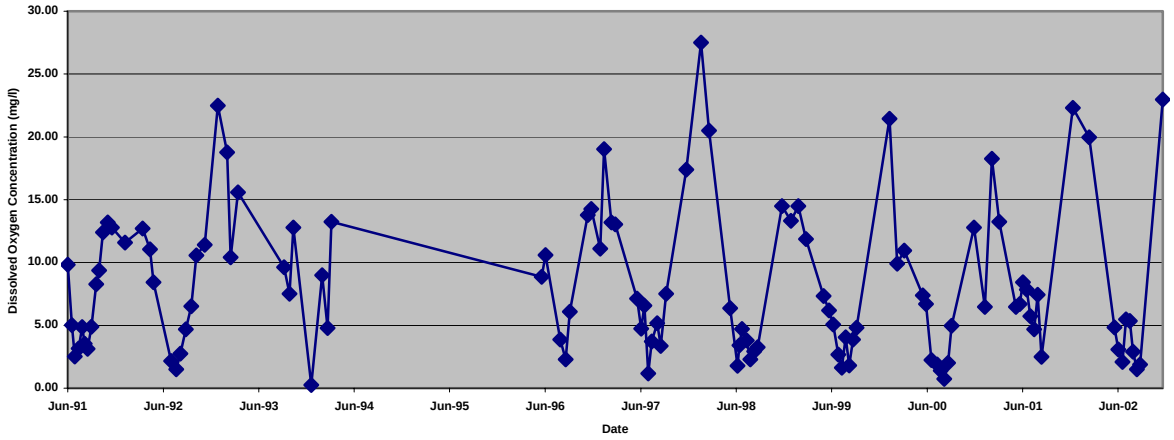
W-M525.1Y	8/18/1998	9.1	<1	<1	1.7
W-M525.1Y	9/1/1998	32.0	<1	<1	4.2
W-M525.1Y	9/15/1998	8.2	<1	<1	<1
W-M525.1Y	########	15.0	<1	<1	1.4
W-M525.1Y	1/20/1999	1.3	<1	<1	<1
W-M525.1Y	2/17/1999	5.9	<1	<1	<1
W-M525.1Y	3/18/1999	130.0	<1	11.0	2.4
W-M525.1Y	5/25/1999	6.0	<1	<1	<1
W-M525.1Y	6/15/1999	15.0	<1	<1	<1
W-M525.1Y	7/1/1999	17.0	<1	<1	2.5
W-M525.1Y	7/20/1999	8.6	<1	<1	<1
W-M525.1Y	8/3/1999	6.9	<1	<1	<1
W-M525.1Y	8/17/1999	16.0	<1	<1	<1
W-M525.1Y	8/31/1999	8.6	<1	<1	<1
W-M525.1Y	9/14/1999	7.4	<1	<1	5.6
W-M525.1Y	9/28/1999	1.0	<1	<1	<1
W-M525.1Y	2/1/2000	21.0	<1	2.4	2.5
W-M525.1Y	3/2/2000	16.0	<1	<1	<1
W-M525.1Y	3/28/2000	43.0	<1	4.5	3.3
W-M525.1Y	6/8/2000	12.0	<1	<1	2.5
W-M525.1Y	6/20/2000	14.0	<1	<1	11.0
W-M525.1Y	7/11/2000	15.0	<1	<1	<1
W-M525.1Y	8/1/2000	3.9	<1	<1	<1
W-M525.1Y	8/15/2000	25.0	<1	3.6	<1
W-M525.1Y	8/29/2000	17.0	1.7	3.8	<1
W-M525.1Y	9/12/2000	5.1	<1	<1	<1
W-M525.1Y	9/26/2000	<1	<1	<1	4.2
W-M525.1Y	1/31/2001	<1	<1	<1	<1
W-M525.1Y	2/27/2001	7.4	<1	<1	<1
W-M525.1Y	3/27/2001	<1	<1	<1	<1
W-M525.1Y	5/30/2001	15.0	<1	<1	<1
W-M525.1Y	6/13/2001	15.0	<1	<1	<1
W-M525.1Y	6/26/2001	12.0	<1	<1	1.9
W-M525.1Y	7/10/2001	22.0	<1	<1	6.1
W-M525.1Y	7/24/2001	11.0	<1	<1	<1
W-M525.1Y	8/7/2001	46.0	<1	<1	1.7
W-M525.1Y	8/21/2001	24.0	<1	<1	<1
W-M525.1Y	9/5/2001	11.0	<1	<1	<1
W-M525.1Y	3/6/2002	96.0	<1	<1	<1
W-M525.1Y	6/11/2002	10.0	<1	<1	<1
W-M525.1Y	6/25/2002	97.0	<1	3.5	<1
W-M525.1Y	7/11/2002	4.3	<1	<1	<1
W-M525.1Y	7/25/2002	7.7	<1	<1	<1
W-M525.1Y	8/8/2002	7.0	<1	<1	<1
W-M525.1Y	8/21/2002	5.7	<1	<1	<1
W-M525.1Y	9/4/2002	<1	<1	<1	<1
W-M525.1Y	9/17/2002	15.0	<1	<1	<1
W-M525.1Y	########	-	-	-	-
W-M525.1Y	4/1/2003	-	-	-	-
W-M525.1Y					

MIN.	1.0	1.7	1.2	1.3
MAX.	160.0	41.6	71.9	230.0
AVG.	25.2	14.9	13.5	21.3

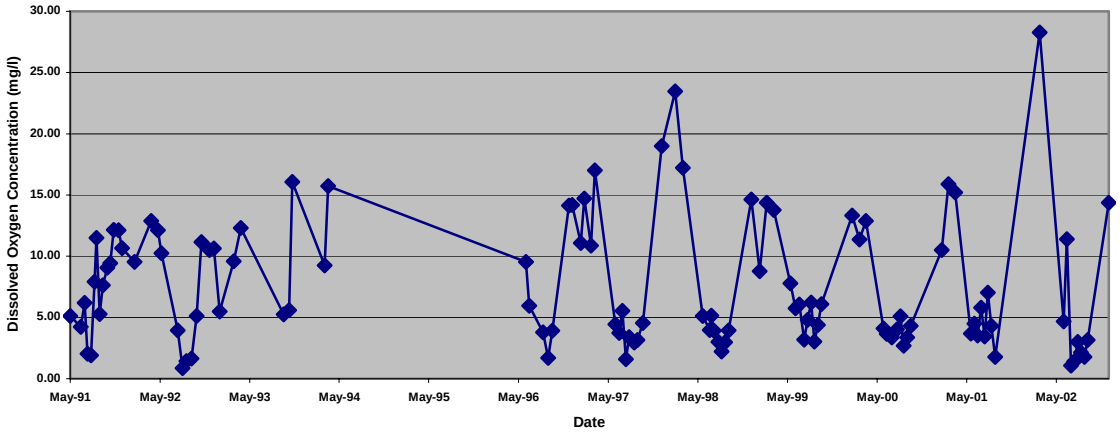
Surface Dissolved Oxygen Concentrations
(Station 523.6W)

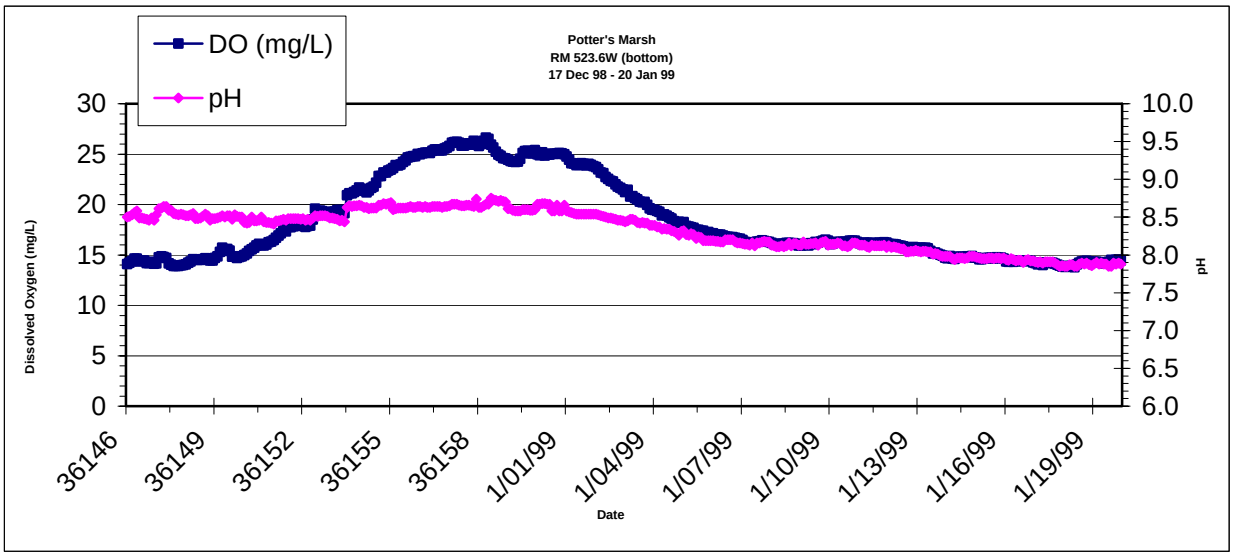


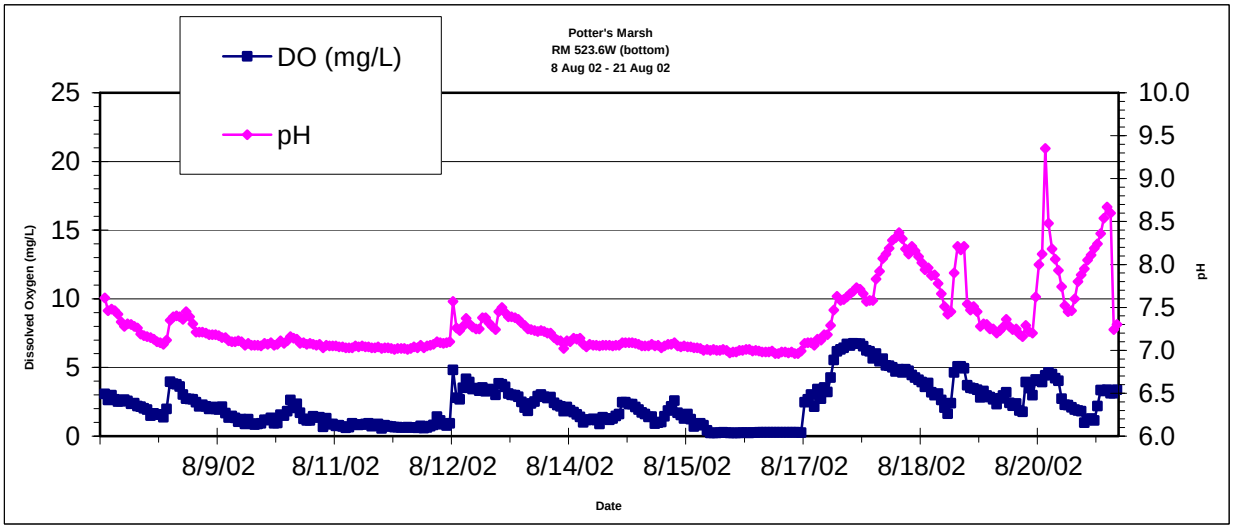
Surface Dissolved Oxygen Concentration
(Station 524.1U)

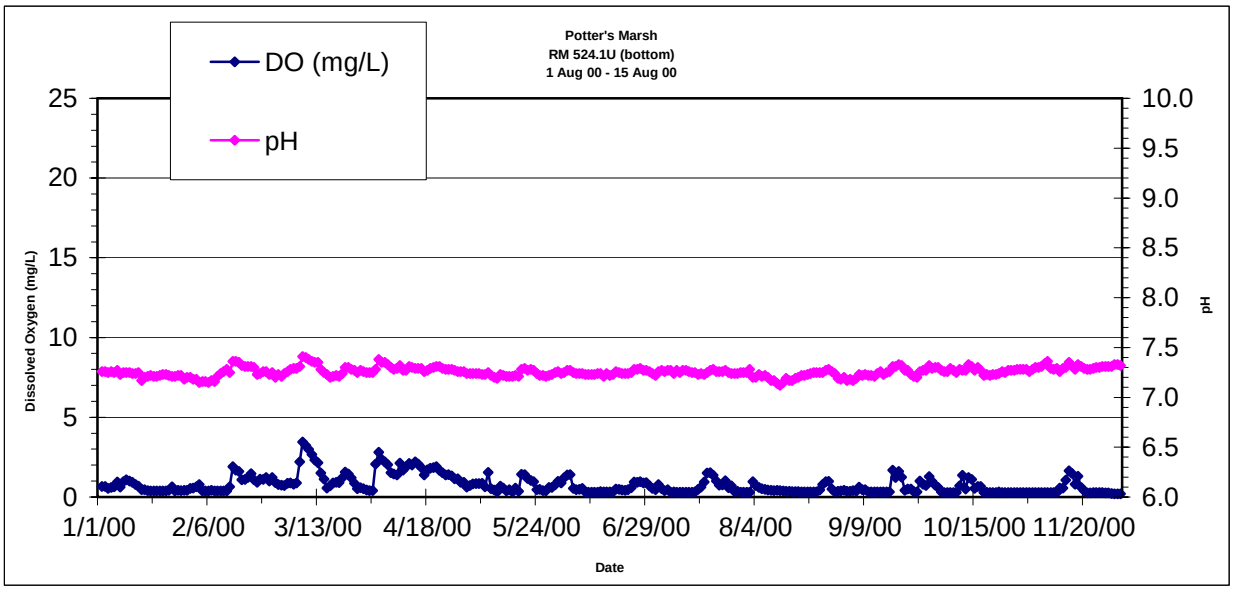


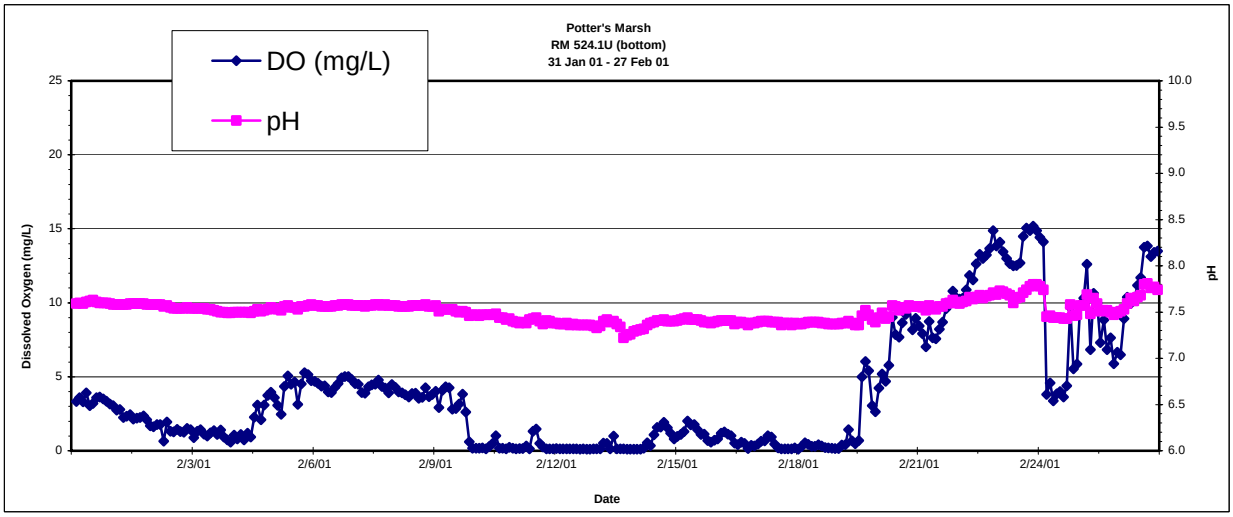
Surface Dissolved Oxygen Concentrations
(Station 525.1Y)

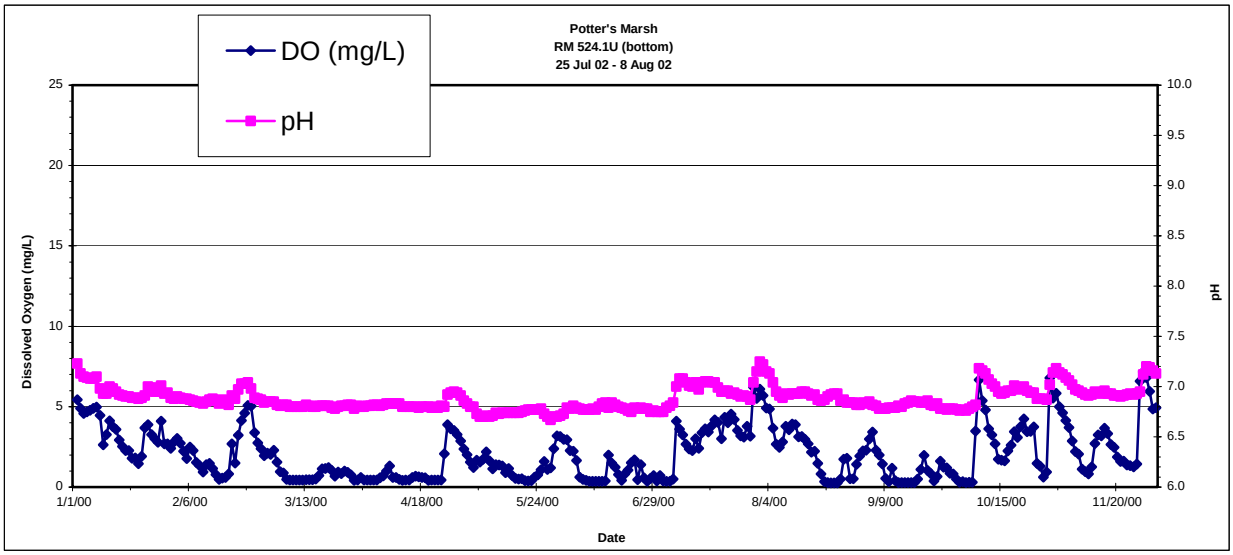


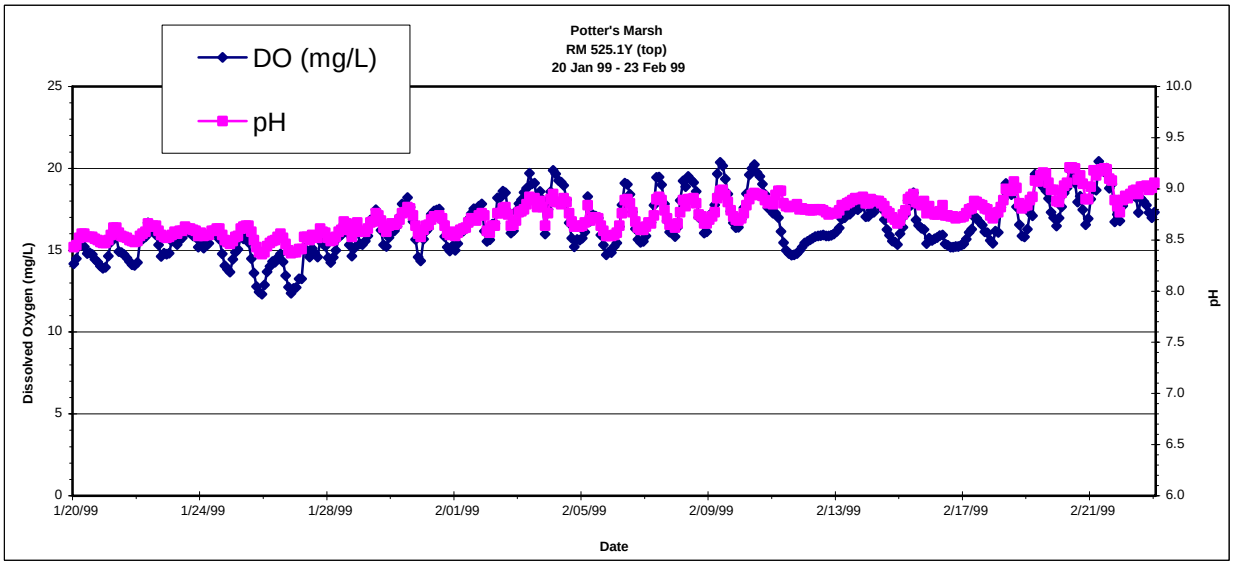

DO (mg/L)
pH
Potter's Marsh
RM 523.6W (bottom)
17 Dec 98 - 20 Jan 99
Dissolved Oxygen (mg/L)
pH
Date
30
25
20
15
10
5
0
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
36146
36149
36152
36155
36158
1/01/99
1/04/99
1/07/99
1/10/99
1/13/99
1/16/99
1/19/99

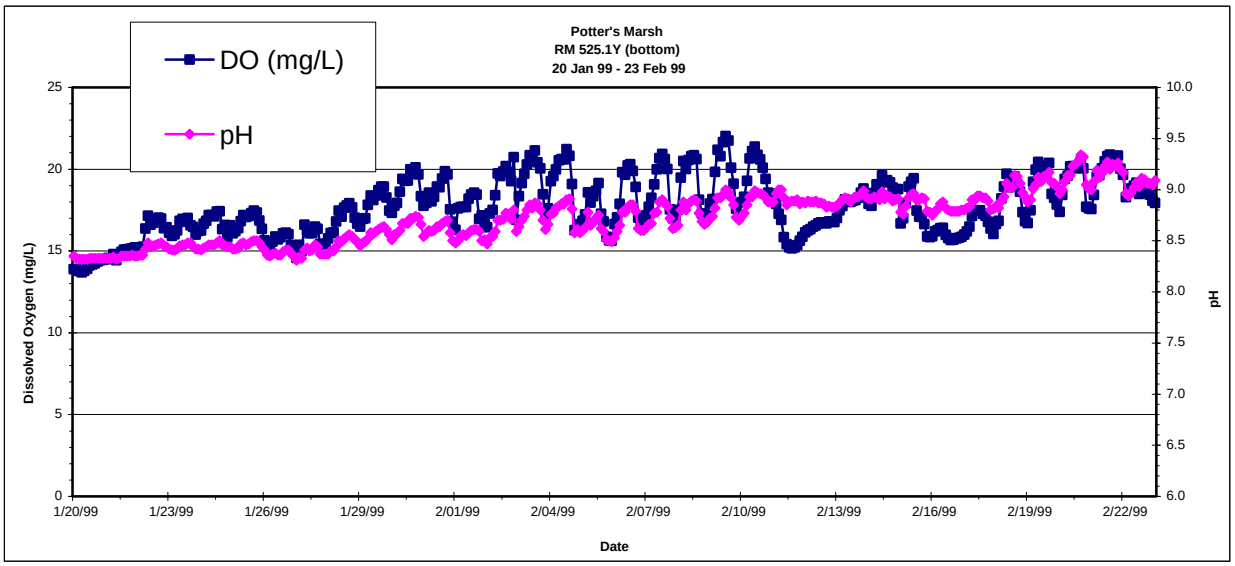

DO (mg/L)
pH
Potter's Marsh
RM 523.6W (bottom)
8 Aug 02 - 21 Aug 02
Dissolved Oxygen (mg/L)
pH
Date
25
20
15
10
5
0
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
8/9/02
8/11/02
8/12/02
8/14/02
8/15/02
8/17/02
8/18/02
8/20/02

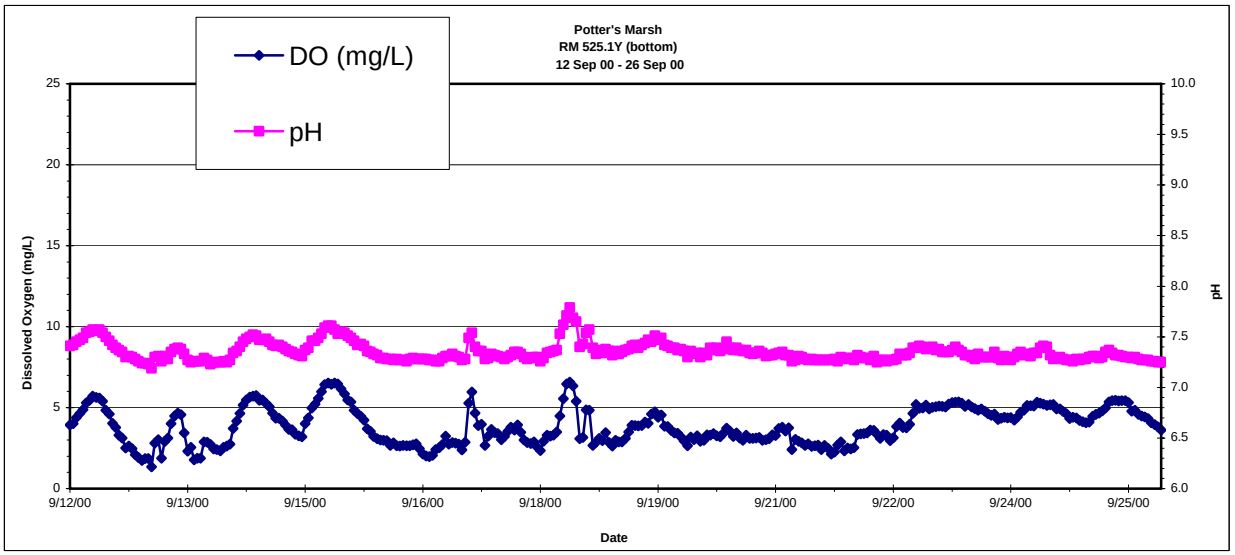

Potter's Marsh
RM 524.1U (bottom)
1 Aug 00 - 15 Aug 00
DO (mg/L)
pH
Dissolved Oxygen (mg/L)
pH
25
20
15
10
5
0
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
1/1/00
2/6/00
3/13/00
4/18/00
5/24/00
6/29/00
8/4/00
9/9/00
10/15/00
11/20/00
Date

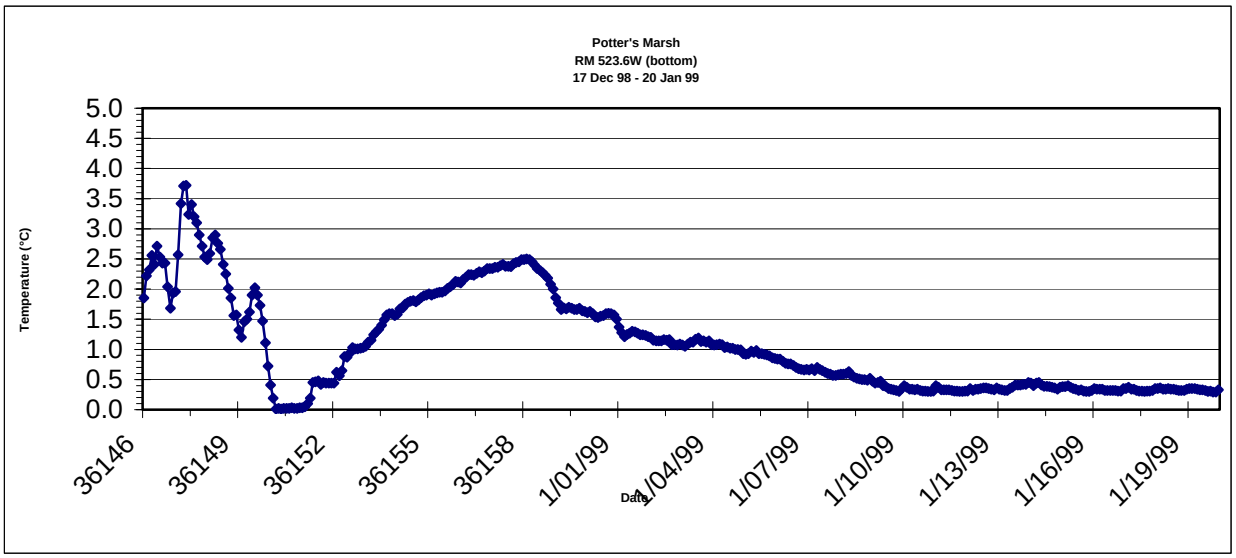

Potter's Marsh
RM 524.1U (bottom)
31 Jan 01 - 27 Feb 01
DO (mg/L)
pH
Dissolved Oxygen (mg/L)
pH
25
20
15
10
5
0
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
2/3/01
2/6/01
2/9/01
2/12/01
2/15/01
2/18/01
2/21/01
2/24/01
Date

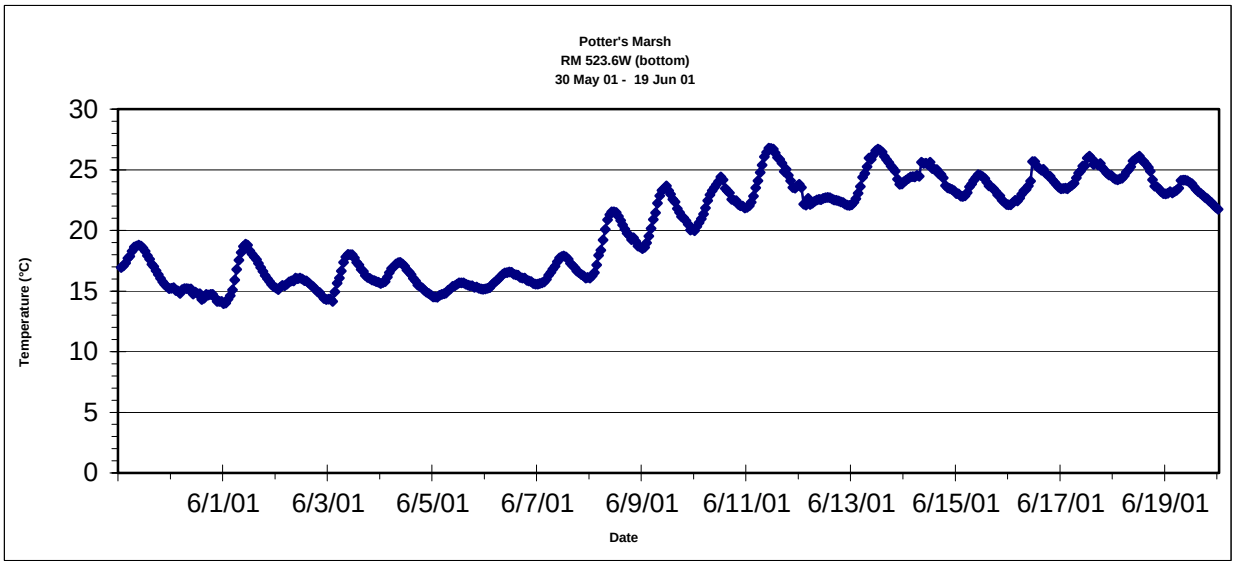

Potter's Marsh
RM 524.1U (bottom)
25 Jul 02 - 8 Aug 02
DO (mg/L)
pH
Dissolved Oxygen (mg/L)
pH
Date
1/1/00
2/6/00
3/13/00
4/18/00
5/24/00
6/29/00
8/4/00
9/9/00
10/15/00
11/20/00

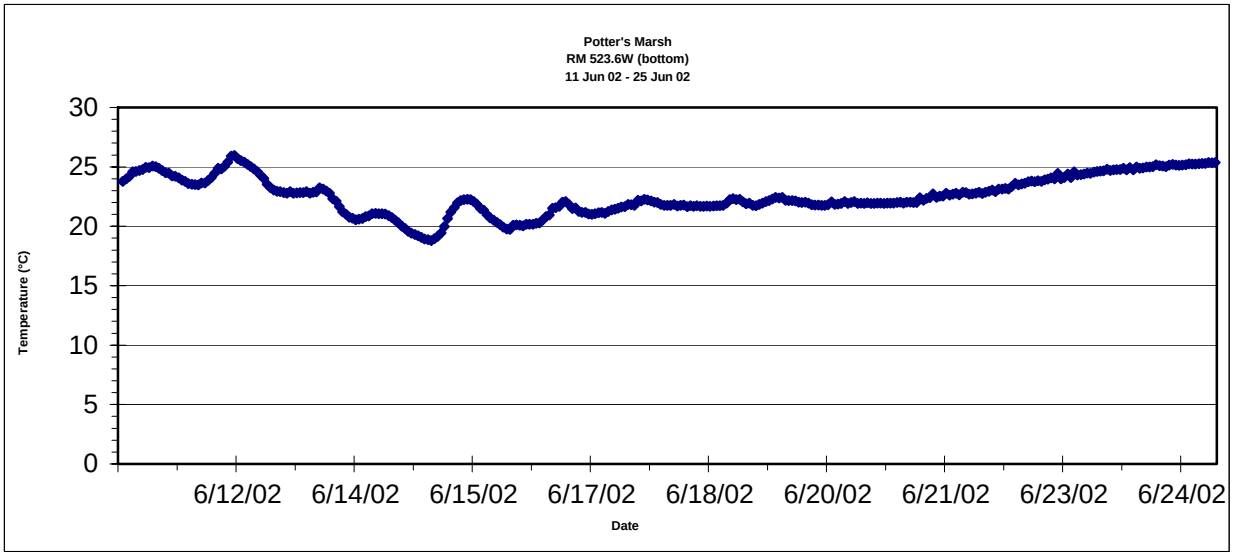

Potter's Marsh
RM 525.1Y (top)
20 Jan 99 - 23 Feb 99
DO (mg/L)
pH
Dissolved Oxygen (mg/L)
pH
Date
1/20/99
1/24/99
1/28/99
2/01/99
2/05/99
2/09/99
2/13/99
2/17/99
2/21/99

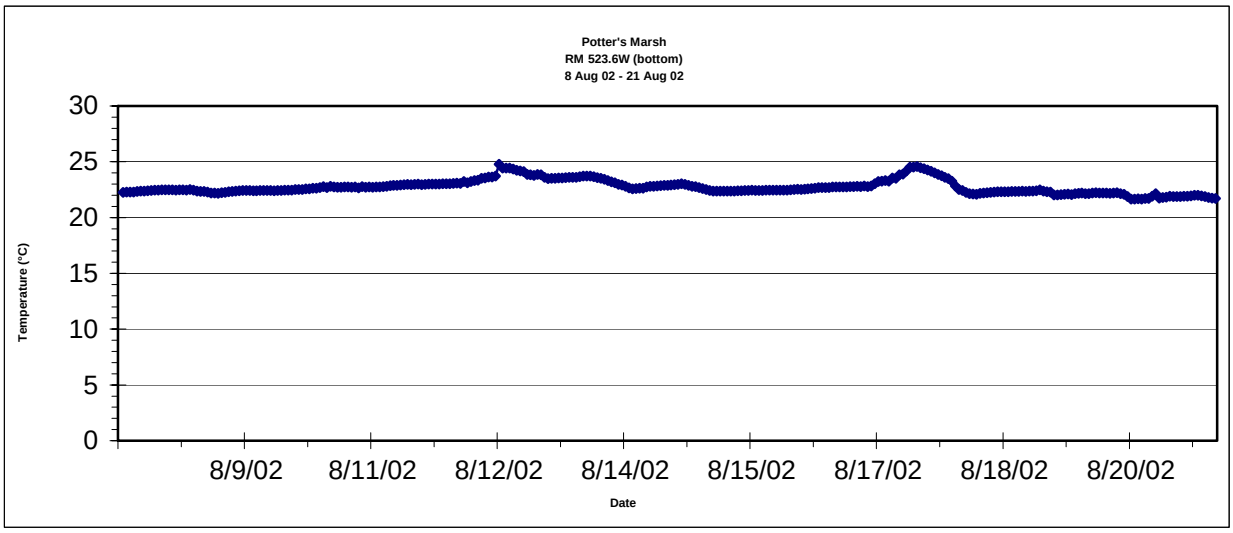

Potter's Marsh
RM 525.1Y (bottom)
20 Jan 99 - 23 Feb 99
DO (mg/L)
pH
Dissolved Oxygen (mg/L)
pH
Date
1/20/99
1/23/99
1/26/99
1/29/99
2/01/99
2/04/99
2/07/99
2/10/99
2/13/99
2/16/99
2/19/99
2/22/99

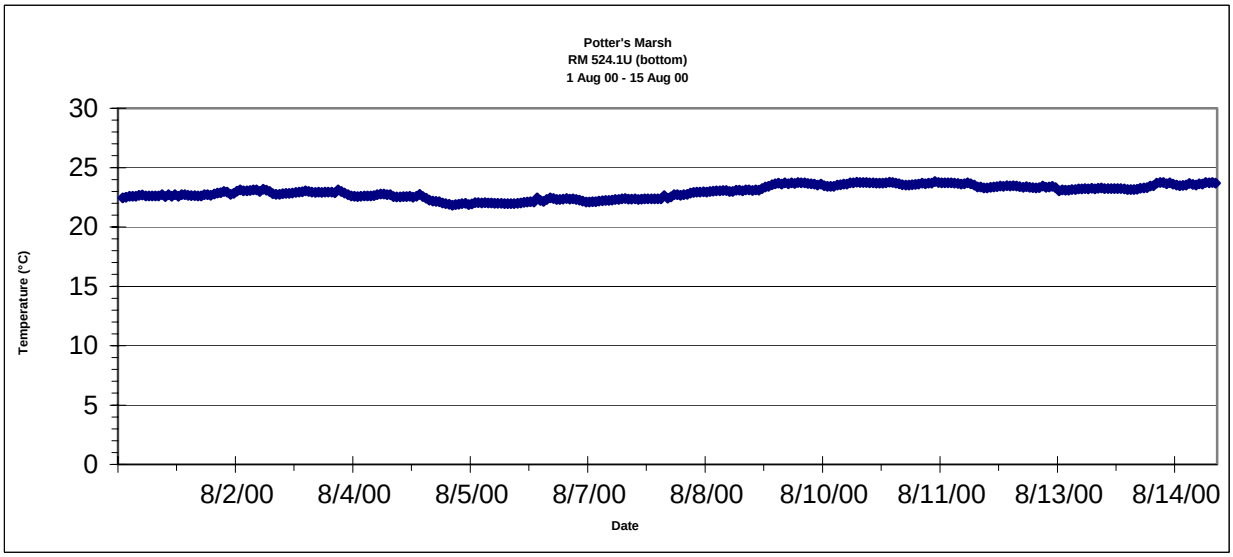

Potter's Marsh
RM 525.1Y (bottom)
12 Sep 00 - 26 Sep 00
DO (mg/L)
pH
Dissolved Oxygen (mg/L)
pH
Date
9/12/00
9/13/00
9/15/00
9/16/00
9/18/00
9/19/00
9/21/00
9/22/00
9/24/00
9/25/00

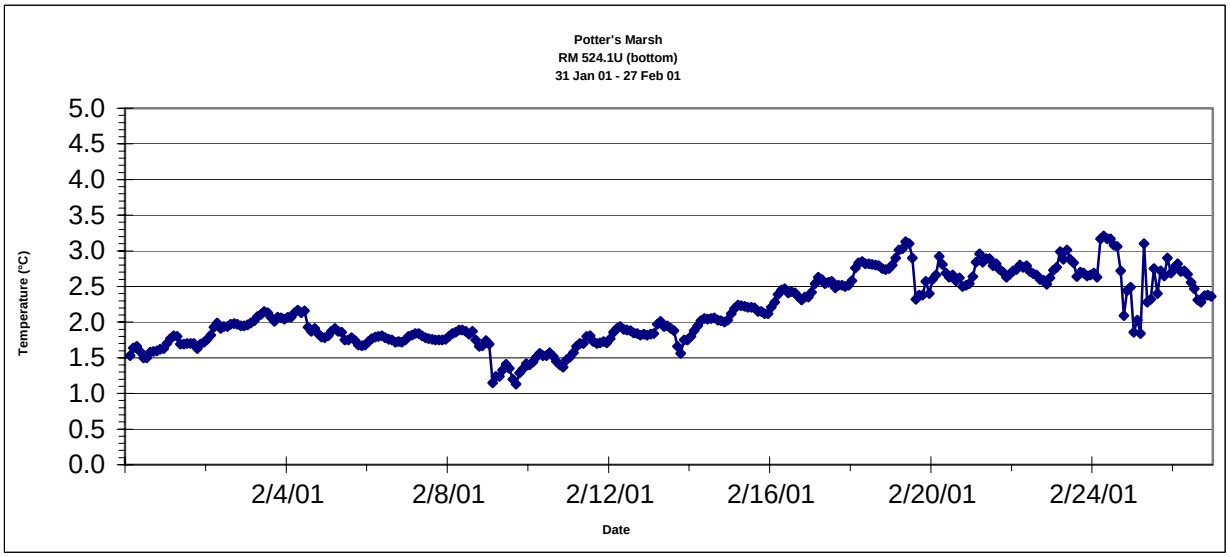

Potter's Marsh
RM 523.6W (bottom)
17 Dec 98 - 20 Jan 99
Temperature (°C)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
36146
36149
36152
36155
36158
1/01/99
1/04/99
1/07/99
1/10/99
1/13/99
1/16/99
1/19/99
Date

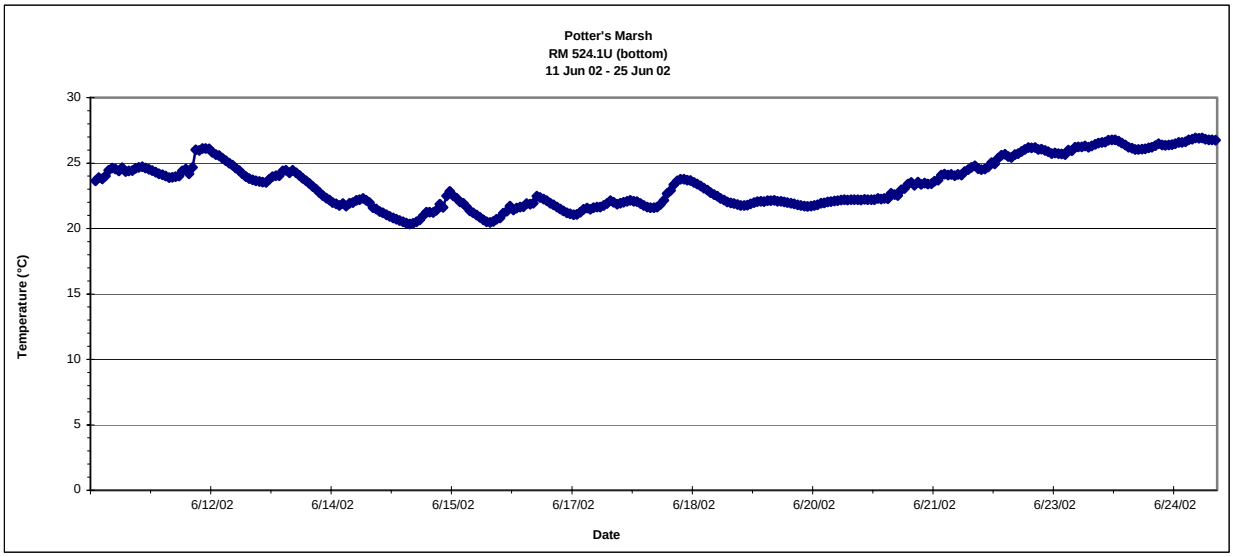

Potter's Marsh
RM 523.6W (bottom)
30 May 01 - 19 Jun 01
Temperature (°C)
30
25
20
15
10
5
0
6/1/01
6/3/01
6/5/01
6/7/01
6/9/01
6/11/01
6/13/01
6/15/01
6/17/01
6/19/01
Date

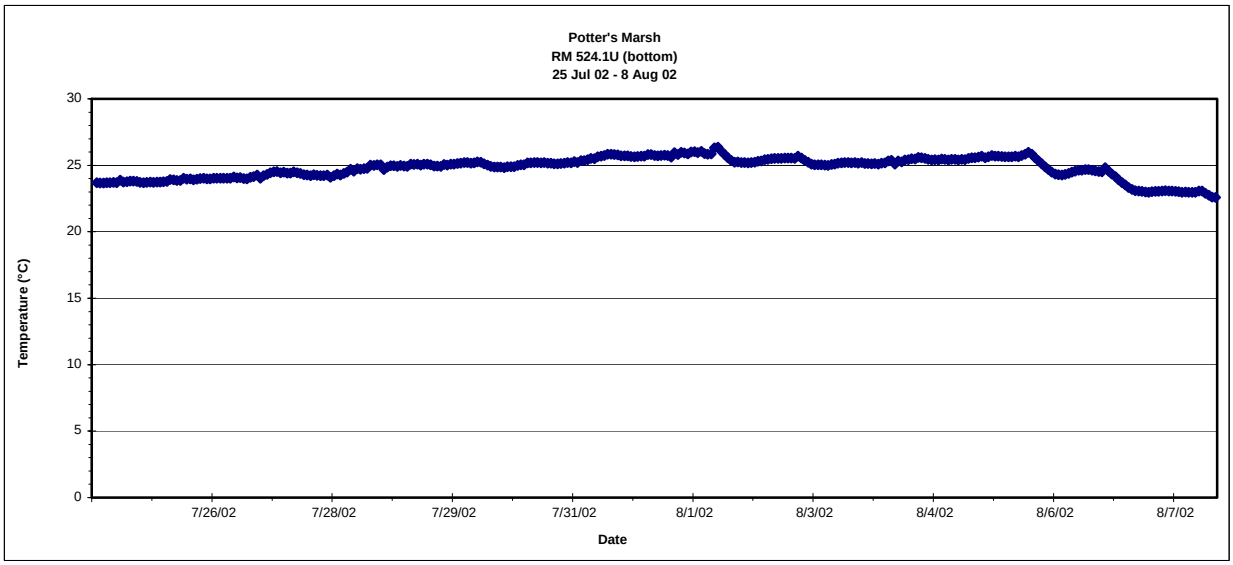

Potter's Marsh
RM 523.6W (bottom)
11 Jun 02 - 25 Jun 02
Temperature (°C)
30
25
20
15
10
5
0
6/12/02
6/14/02
6/15/02
6/17/02
6/18/02
6/20/02
6/21/02
6/23/02
6/24/02
Date

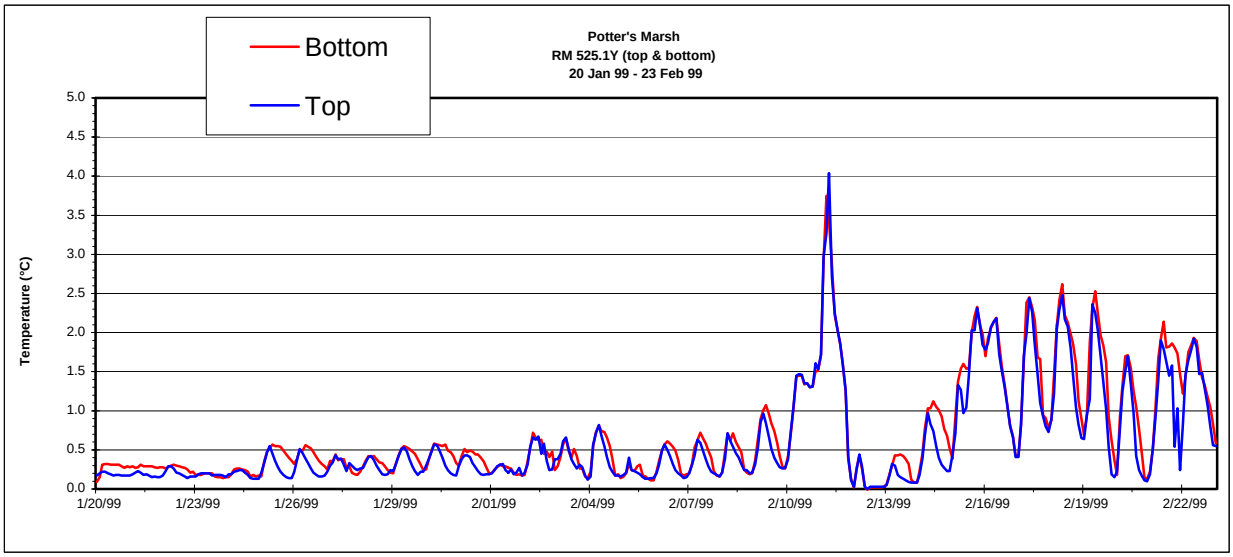

Potter's Marsh
RM 523.6W (bottom)
8 Aug 02 - 21 Aug 02
Temperature (°C)
30
25
20
15
10
5
0
8/9/02
8/11/02
8/12/02
8/14/02
8/15/02
8/17/02
8/18/02
8/20/02
Date

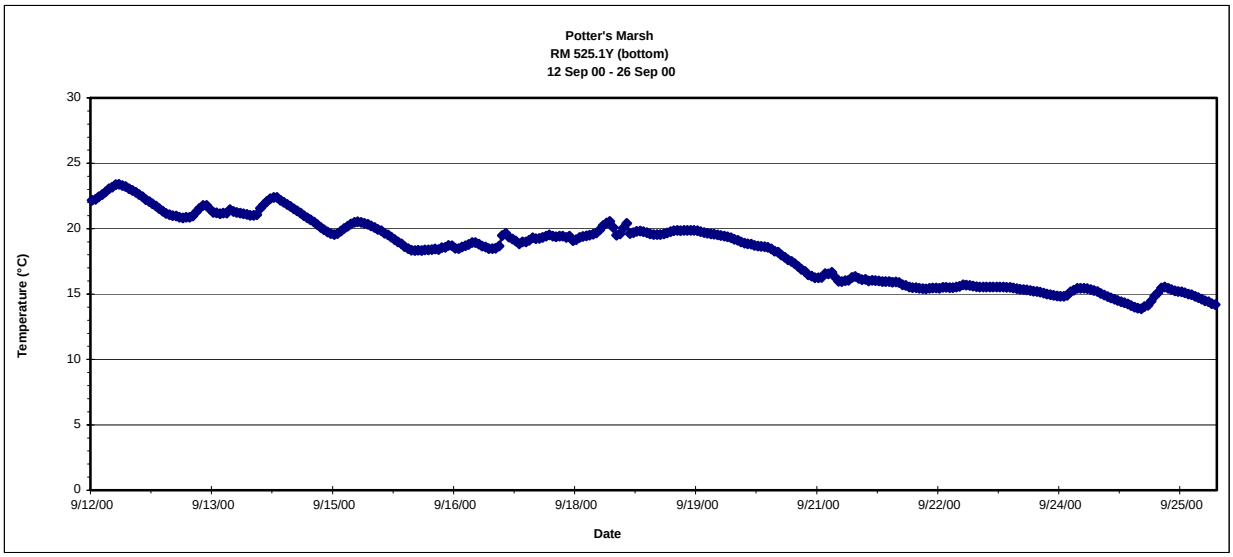

Potter's Marsh
RM 524.1U (bottom)
1 Aug 00 - 15 Aug 00
Temperature (°C)
30
25
20
15
10
5
0
8/2/00
8/4/00
8/5/00
8/7/00
8/8/00
8/10/00
8/11/00
8/13/00
8/14/00
Date

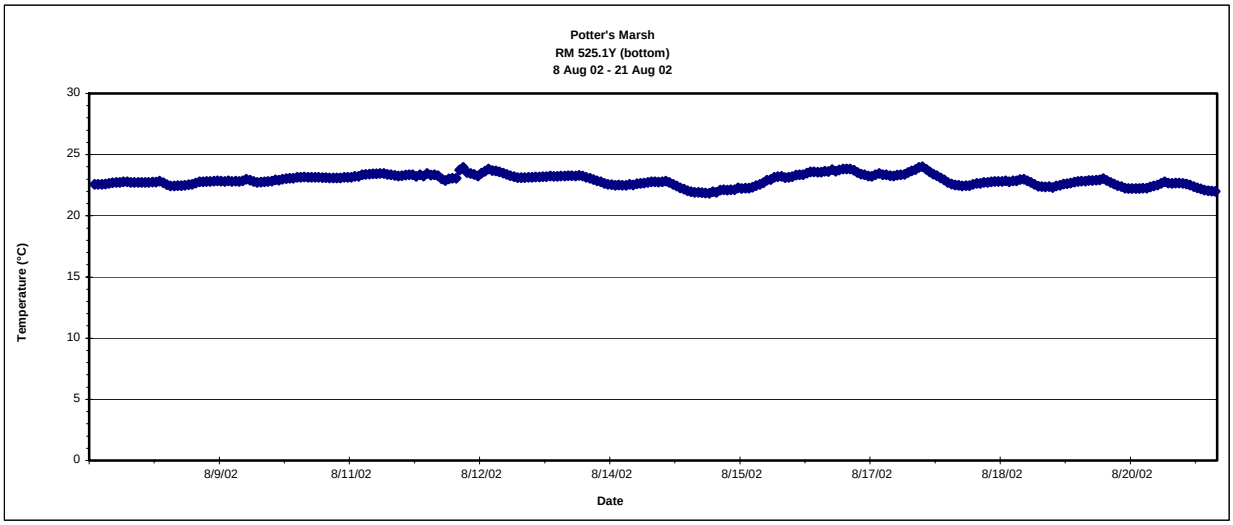

Potter's Marsh
RM 524.1U (bottom)
31 Jan 01 - 27 Feb 01
Temperature (°C)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2/4/01
2/8/01
2/12/01
2/16/01
2/20/01
2/24/01
Date


Potter's Marsh
RM 524.1U (bottom)
11 Jun 02 - 25 Jun 02
Temperature (°C)
30
25
20
15
10
5
0
6/12/02
6/14/02
6/15/02
6/17/02
6/18/02
6/20/02
6/21/02
6/23/02
6/24/02
Date


Potter's Marsh
RM 524.1U (bottom)
25 Jul 02 - 8 Aug 02
Temperature (°C)
30
25
20
15
10
5
0
7/26/02
7/28/02
7/29/02
7/31/02
8/1/02
8/3/02
8/4/02
8/6/02
8/7/02
Date


Potter's Marsh
RM 525.1Y (top & bottom)
20 Jan 99 - 23 Feb 99
Bottom
Top
Temperature (°C)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/20/99
1/23/99
1/26/99
1/29/99
2/01/99
2/04/99
2/07/99
2/10/99
2/13/99
2/16/99
2/19/99
2/22/99

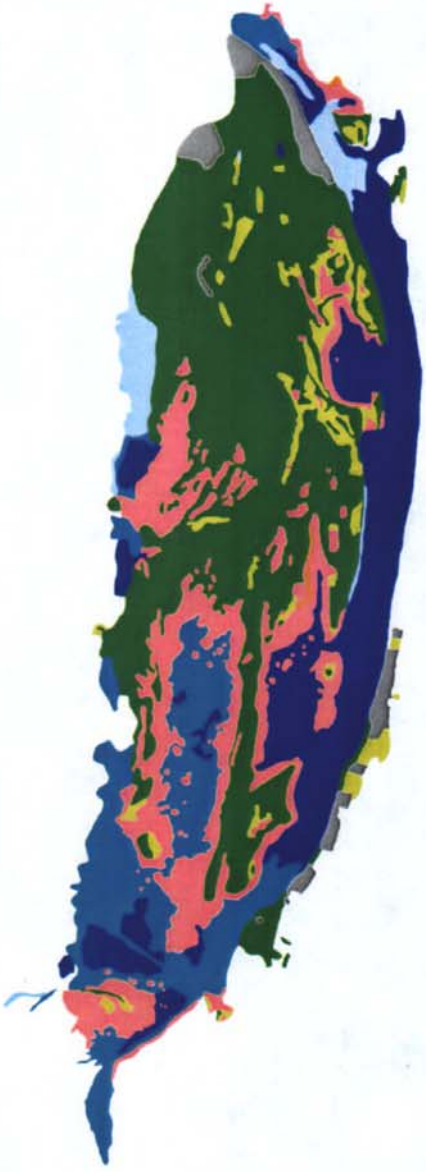

Potter's Marsh
RM 525.1Y (bottom)
12 Sep 00 - 26 Sep 00
Temperature (°C)
30
25
20
15
10
5
0
9/12/00
9/13/00
9/15/00
9/16/00
9/18/00
9/19/00
9/21/00
9/22/00
9/24/00
9/25/00
Date


Potter's Marsh
RM 525.1Y (bottom)
8 Aug 02 - 21 Aug 02
Temperature (°C)
30
25
20
15
10
5
0
8/9/02
8/11/02
8/12/02
8/14/02
8/15/02
8/17/02
8/18/02
8/20/02
Date

Appendix E

Land Cover/Land Use Mapping

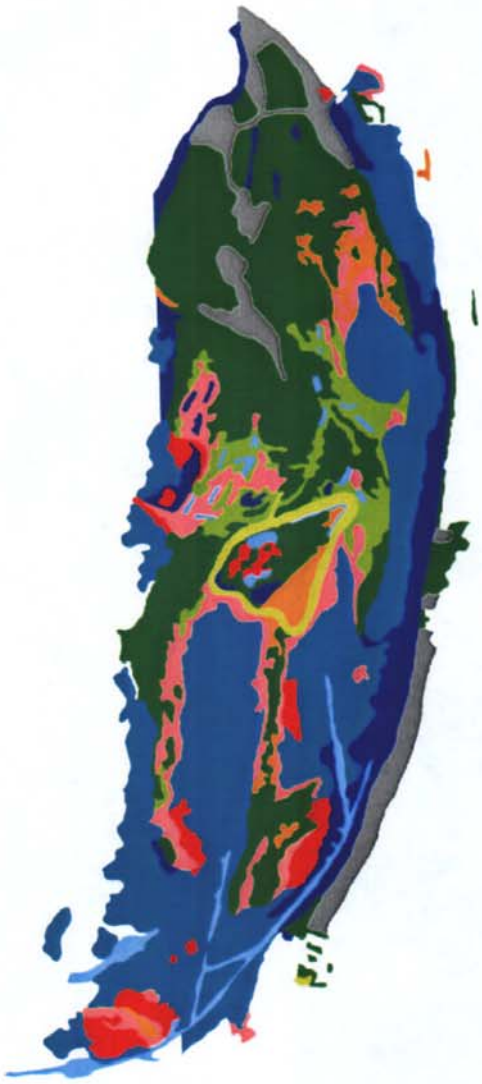
1989 POTTERS MARSH LANDCOVER



LEGEND:

- Submerg-Rooted Floating Aqua, 240.64 AC
- Rooted Floating Aquatics, 171.58 AC
- Submergents, 39.52 AC
- Emergents, 206.87 AC
- Emergents-Grasses/Forbs, 2.15 AC
- Grasses/Forbs, 45.31 AC
- Woody Terrestrial, 482.76 AC
- Urban/Developed, 36.22 AC

2000 POTTERS MARSH LANDCOVER USE



LEGEND:

- Open Water, 38.47 AC
- Submerged Aquatic Vegetation, 101.24 AC
- Rooted Floating Aquatics, 371.18 AC
- Deep Marsh, 37.36 AC
- Shallow Marsh, 86.38 AC
- Wet Meadow, 31.94 AC
- Grass/Forbs, 16.74 AC
- Wet Shrub, 54.13 AC
- Wet Forest, 341.93 AC
- Developed, 76.17 AC

500 0 500 1000 Feet

Land Cover Land Use Mapping Classes

An explanation of the 2000 land cover classes (with 1989 land cover classes) identified for the Potters Marsh HREP project area are given as follows:

Open Water: All non-vegetated bodies of water, including channels, backwaters, lakes and ponds.

Submergent Aquatic Vegetation (1989 "Submergents"): All submersed aquatic vegetation; often found growing with duckweed.

Rooted Floating Aquatics (including 1989 "Submerg-Rooted Floating Aqua"): Dominated by species such as lotus and white or yellow water lily, may include <50% perennial or annual emergents, often grows with submersed vegetation when density of rooted floating is <50%.

Deep Marsh (1989 "Emergents"): Semi-permanently flooded persistent emergent vegetation, dominated by species such as cattail, bur-reed, arrowhead, and pickerelweed.

Shallow Marsh (1989 "Emergents"): Seasonally flooded persistent emergent vegetation, dominated by bulrush, but can include giant reed grass, cattail and arrowhead.

Wet Meadow (1989 "Emergents-Grasses/Forbs"): Temporarily or seasonally flooded vegetation dominated by species such as reed canary grass, rice cutgrass, goldenrod, loosestrife, smartweed, and other mixed emergents/grasses/forbs.

Grass/Forbs: Drier, infrequently flooded grasses or grass/forb mixtures, e.g. fallow fields, sand prairies; may contain less than 25% shrubs.

Wet Shrub (1989 "Woody Terrestrial"): Consists of mixed shrubby (woody species <12 feet tall) vegetation >25%, typically species such as alder, elder, false indigo, dogwood, or willow, usually with an understory of sedge/grass/forbs ("Woody terrestrial" category from 1989 LCLU would include this cover type).

Wet Forest (1989 "Woody Terrestrial"): Predominately silver maple, but may include ash, elm, cottonwood, black willow, and river birch; usually subject to seasonal flooding or found near the water table.

Developed: Areas that are predominately artificial in nature such as urban areas, large farmsteads, and industrial complexes.

Appendix F

Photos

Photo F-1. Monarda fistulosa

Photo F-2. Purple Prairie Clover

Photo F-3. Little Bluestem on the containment dike

Photo F-4. Bush's Poppy Mallow

Photo F-5. Indian Grass near Pump Station

Photo F-6. Beaver activity in the managed marsh

Appendix G

Site Manager's Project Inspection and Monitoring Results

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 10-23-02

Type of Inspection: ☒ annual ( ) emergency-disaster ( ) other

1. PROJECT INSPECTION.

Item	Condition
a. Containment Dike	
(✓) Settlement, sloughs or loss of section	OK
(✓) Wavewash, scouring	Ramp wash on South End - Schedule for Repair 2003
(✓) Overtopping erosion	none
(✓) Vegetative cover (mowing)	Mowed 8-20-02
(✓) Burrowing animals	None Noted
(✓) Unauthorized grazing or traffic	None
(✓) Encroachments	None
(✓) Unfavorable tree/shrub growth	Heavy Growth of Cottonwood & willow on Edges
(✓) Other	Maintaining high water inside is killing undesireable growth
b. Stoplog Structure	
(✓) Stoplogs, stoplog keepers, stoplog slots	ok
(✓) Concrete	ok
(✓) Steel rails, rail posts, grating, fasteners	ok
(✓) Displaced/missing riprap	ok
(✓) Erosion adjacent to structure	None Noted
(✓) Sedimentation (culverts/approaches)	- Beaver keeps inside of structure full of mud & sticks up to level of Stoplogs. Have cleaned out many times.
( ) Other	

B-1

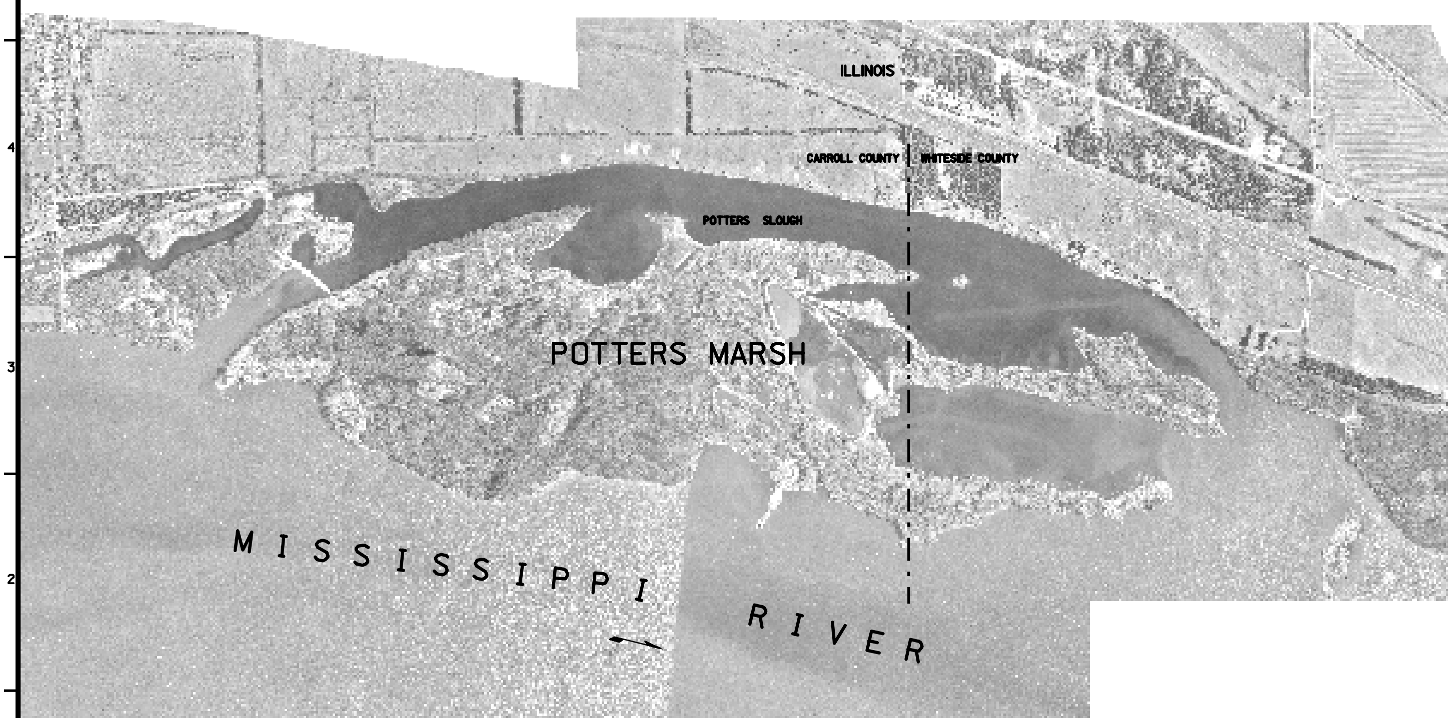
Item	Condition
c. Well	
(✓) Protective casing	good
(✓) Bollards	ok — were painted 2002
(✓) Outlet pad	ok
(✓) Displaced/missing riprap	ok
(✓) Electrical controls	ok
(✓) Pump	ok
( ) Other	
d. Potholes	
(✓) Debris	none noted
(✓) Woody vegetation encroachment on banks	some regrowth on edges
( ) Other	
e. Vegetation - Grassland Planting	
(✓) Grassland and forb species	becoming choked out due to
(✓) Woody vegetation encroachment	increasing Encroachment of Cottonwood,
( ) Other	willow.
f. Access	
(✓) Road - granular surfacing, etc.	ok Rock bladed in 3rd May & 5th July
(✓) Drainage - CMP	ok

2. COMMENTS.

Ed Britton
Site Manager

Appendix H

Plates



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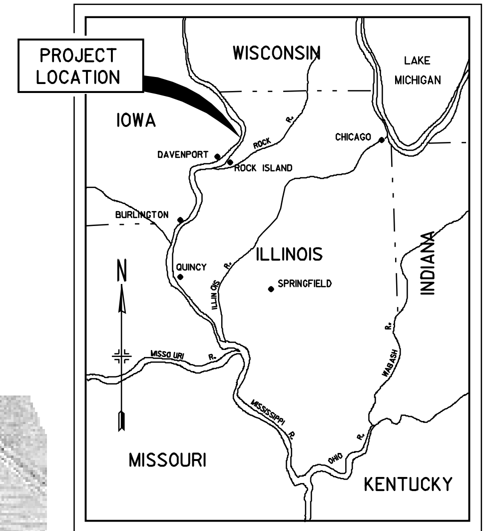


VICINITY MAP

25 0 25 50 75
SCALE IN MILES

US Army Corps of Engineers Rock Island District

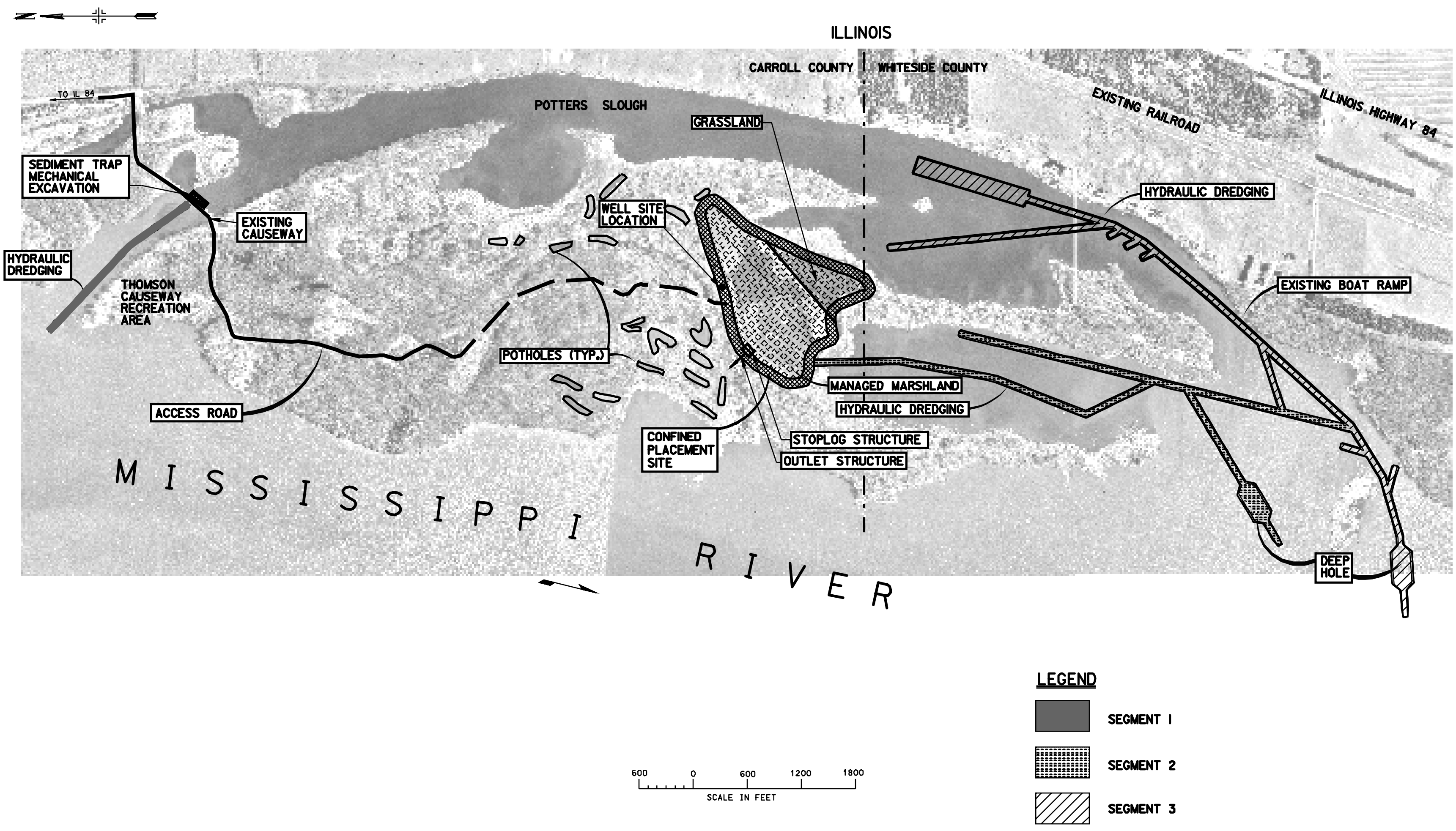
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

Designed by: MSZ	Date: X SEPT 2002
Drawn by: SDB	Scale: AS SHOWN
Checked by: AAE	Drawing Code:
Reviewed by: DJH	Solicitation Number:

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT
POOL 13-RIVER MILE 523.5-526.5
POTTERS MARSH

GENERAL PLAN & VICINITY MAP

PLATE 1



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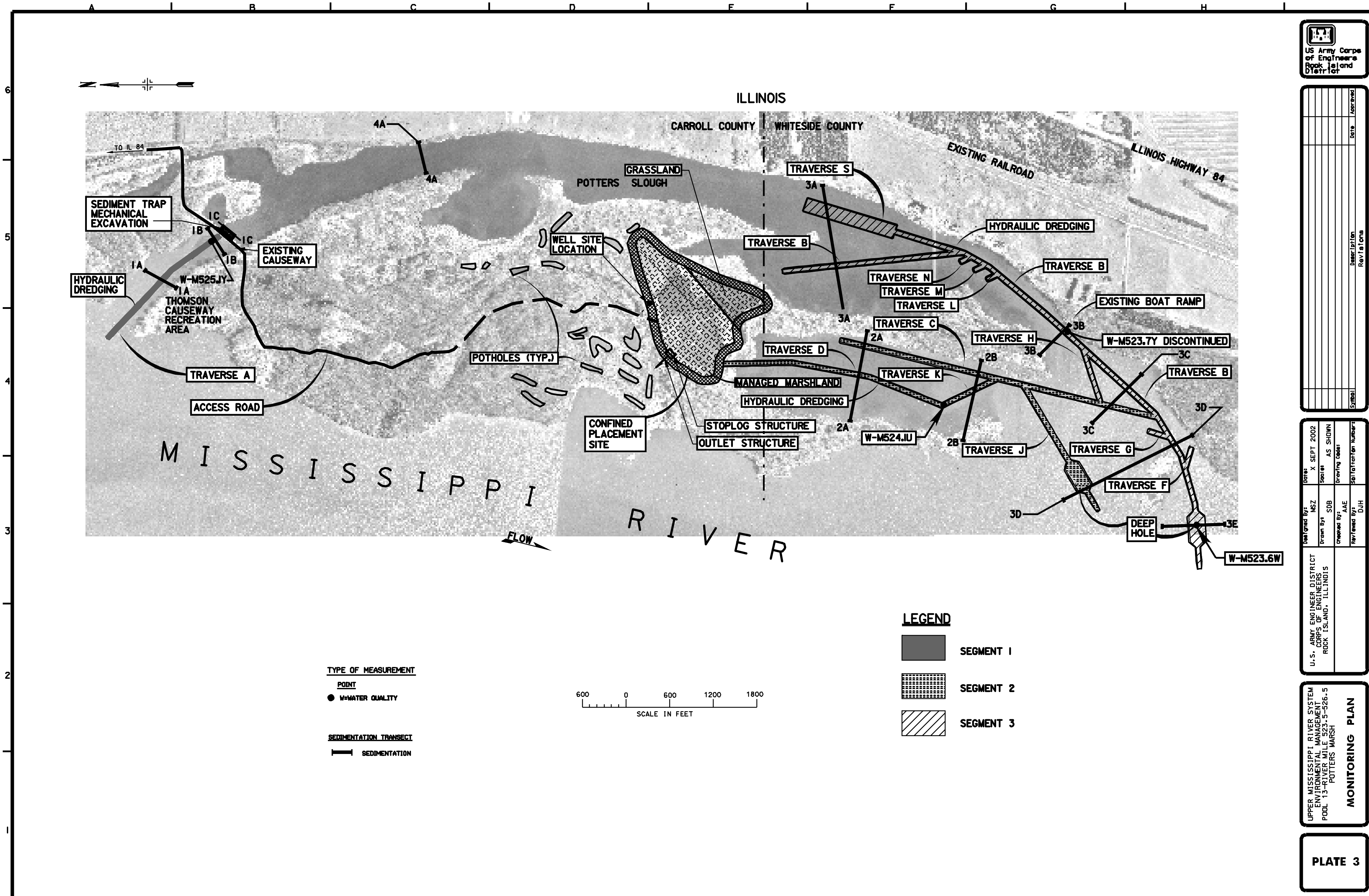
ROCK ISLAND, ILLINOIS

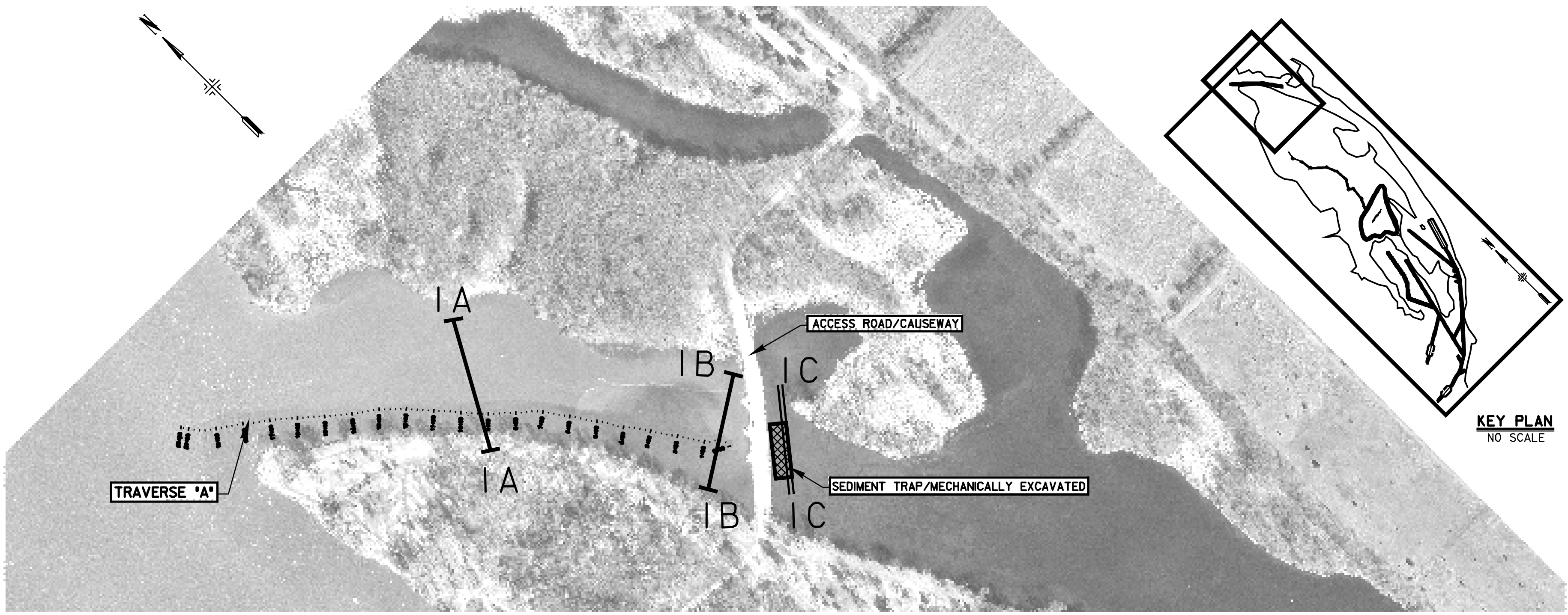
UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT
POOL 13-RIVER MILE 523.5-526.5
POTTERS MARSH

PROJECT FEATURES

PLATE 2

16-SEP-2003 12:35


ILLINOIS
CARROLL COUNTY
WHITESIDE COUNTY
TO IL 84
4A
POTTERS SLOUGH
GRASSLAND
EXISTING RAILROAD
ILLINOIS HIGHWAY 84
TRAVERSE S
3A
SEDIMENT TRAP MECHANICAL EXCAVATION
1C
1B
EXISTING CAUSEWAY
WELL SITE LOCATION
HYDRAULIC DREDGING
TRAVERSE B
TRAVERSE N
TRAVERSE M
TRAVERSE L
1A
W-M525JY
THOMSON CAUSEWAY RECREATION AREA
EXISTING BOAT RAMP
TRAVERSE C
2A
TRAVERSE D
TRAVERSE H
3B
W-M523.7Y DISCONTINUED
POTHOLES (TYP.)
2B
3C
TRAVERSE K
MANAGED MARSHLAND
TRAVERSE A
ACCESS ROAD
CONFINED PLACEMENT SITE
STOPLOG STRUCTURE
OUTLET STRUCTURE
W-M524.IU
TRAVERSE J
TRAVERSE G
3D
TRAVERSE F
DEEP HOLE
3E
W-M523.6W
MISSISSIPPI RIVER
FLOW
LEGEND
SEGMENT 1
SEGMENT 2
SEGMENT 3
TYPE OF MEASUREMENT
POINT
W=WATER QUALITY
SEDIMENTATION TRANSECT
SEDIMENTATION
600 0 600 1200 1800
SCALE IN FEET
US Army Corps of Engineers Rock Island District
Designed by: MSZ
Drawn by: SDB
Checked by: AAE
Reviewed by: DJH
Date: X SEPT 2002
Scale: AS SHOWN
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS
UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT POOL 13-RIVER MILE 523.5-526.5 POTTERS MARSH
MONITORING PLAN
PLATE 3



PLAN

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SCALE

KEY PLAN
NO SCALE

US Army Corps of Engineers Rock Island District

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Revisions

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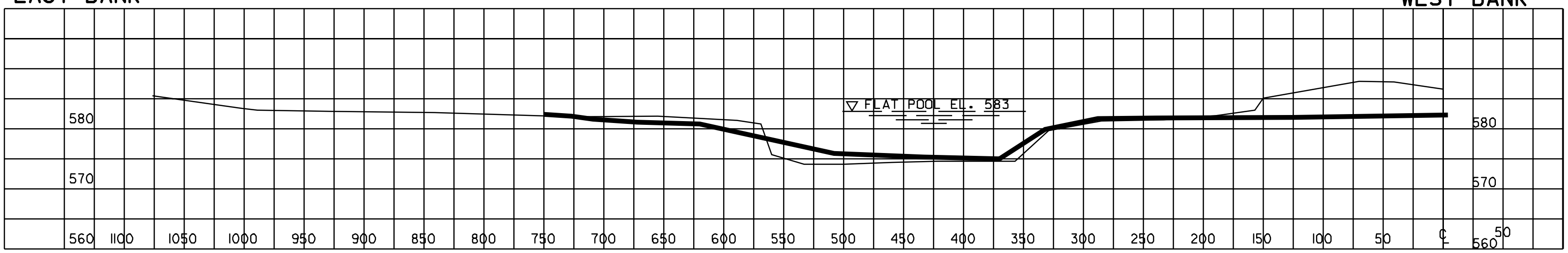
ROCK ISLAND, ILLINOIS

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT
POOL 13-RIVER MILE 523.5-526.5
POTTERS MARSH

DREDGE PLAN AND PROFILE STA. 0+00A TO STA. 21+53A

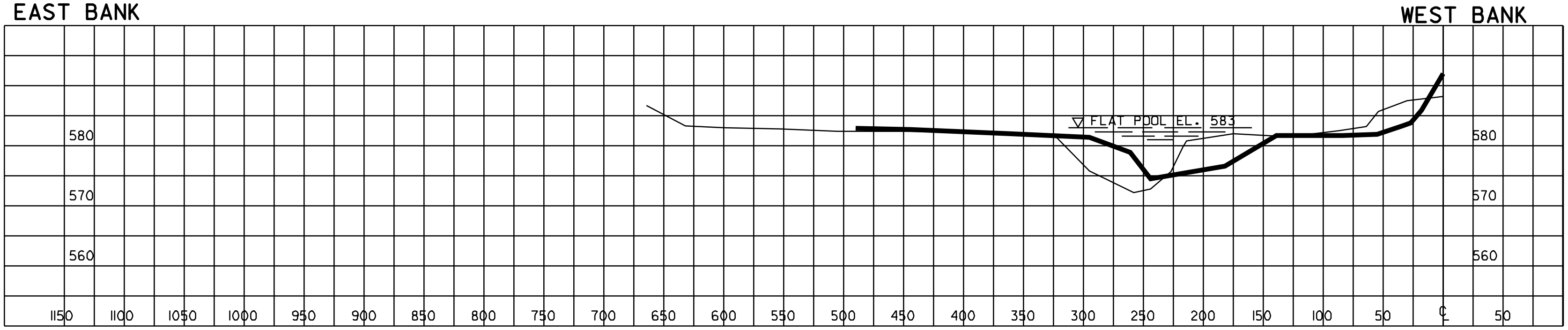
PLATE 4

EAST BANK WEST BANK



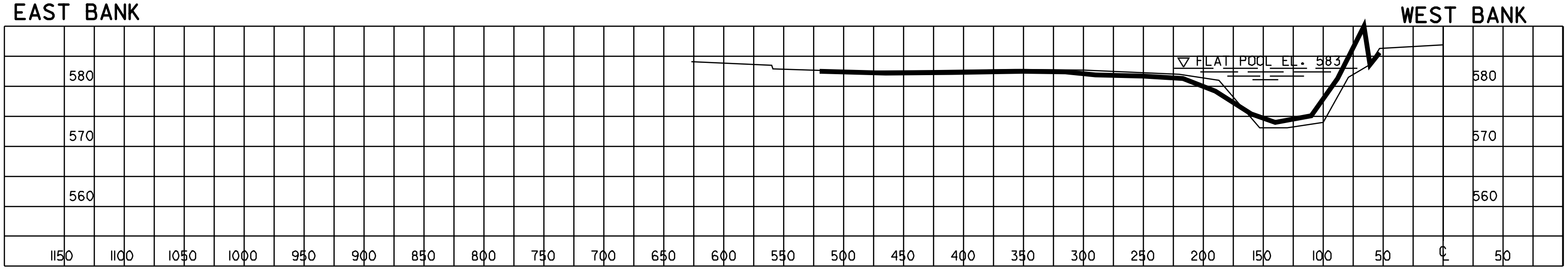
SECTION 1C - SEDIMENT TRAP

EAST BANK WEST BANK



SECTION 1B

EAST BANK WEST BANK



SECTION 1A

LEGEND:

1A — SEDIMENTATION CROSS SECTION REFERENCE NUMBER

——— 1998 SURVEY

━━━ 2002 SURVEY

NOTES:

1. POTTERS' MARSH EMP RANGES, MARCH 1998.
2. PROFILES LOOKING DOWNSTREAM.
3. FLAT POOL ELEVATION 583.0.

US Army Corps of Engineers Rock Island District

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Reviewed by: DJH | Solicitation Number:

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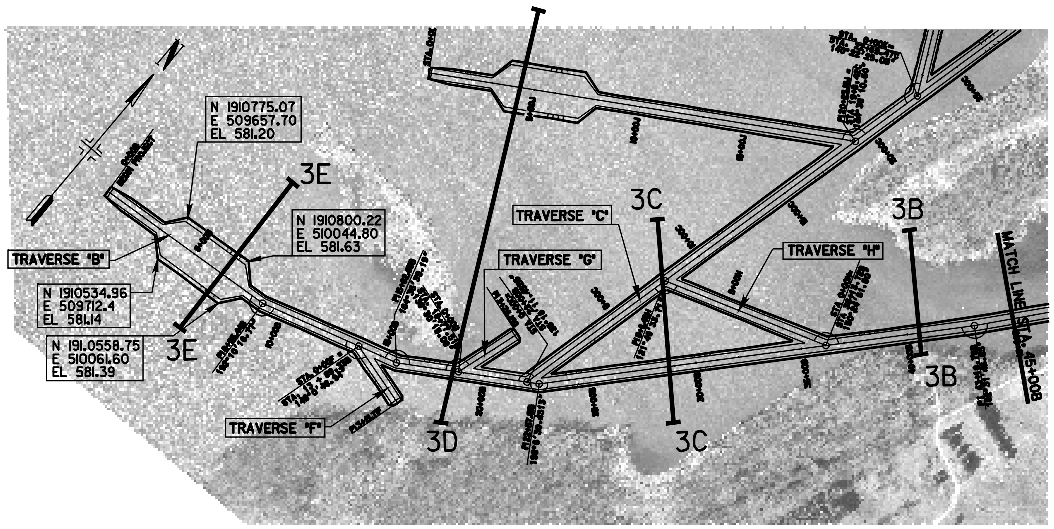
UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT POOL 13-RIVER MILE 523.5-526.5 POTTERS MARSH

COMPOSITE SEDIMENTATION CROSS SECTIONS I

PLATE 5



PLAN

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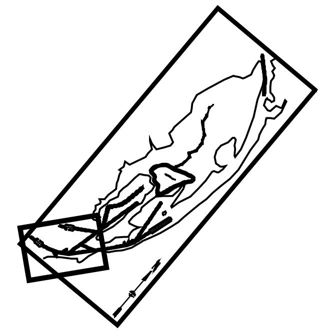

KEY PLAN

NO SCALE

US Army Corps of Engineers Rock Island District

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	Revisions		

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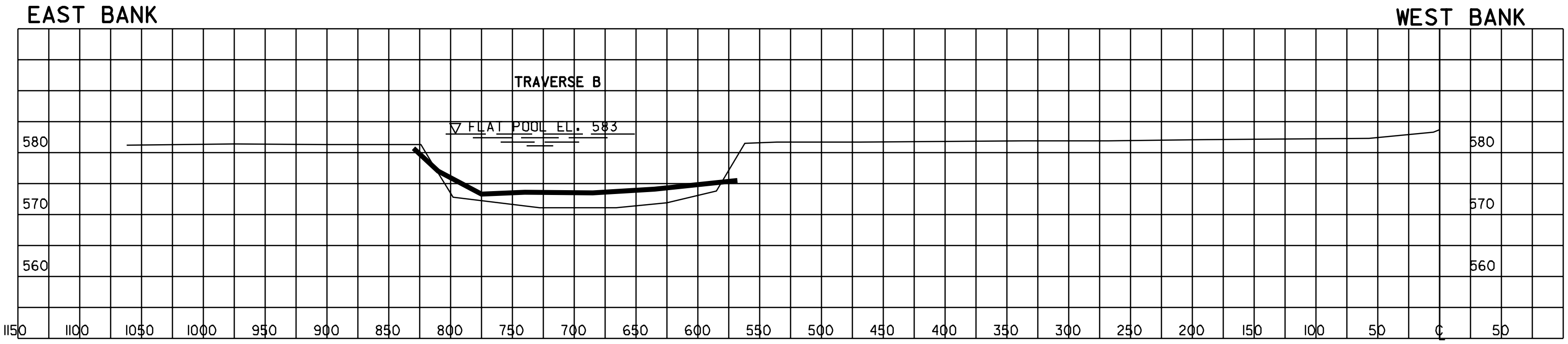
	Checked by: AAE	Drawing Code:
	Reviewed by: DJH	Solicitation Number:

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT
POOL 13-RIVER MILE 523.5-526.5
POTTERS MARSH

DREDGE PLAN AND PROFILE STA. 0+00B TO STA. 45+00B

PLATE 6



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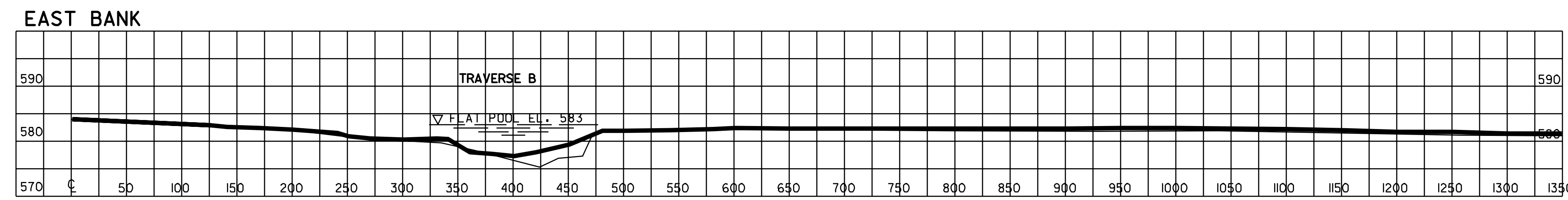

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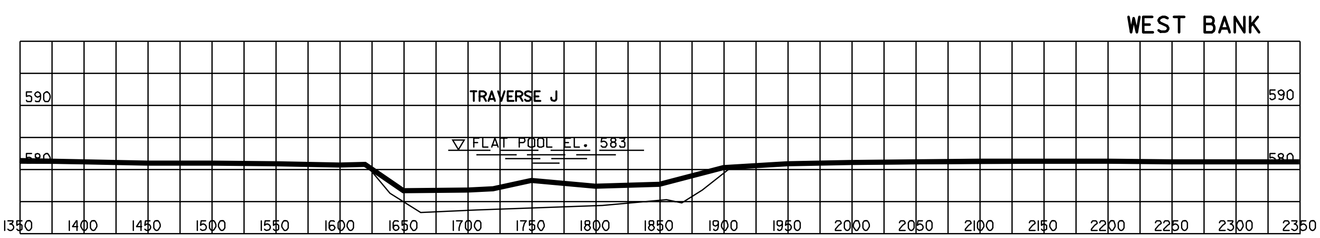

SECTION 3D

NOTES:

1. POTTERS' MARSH EMP RANGES, MARCH 1998.
2. PROFILES LOOKING DOWNSTREAM.
3. FLAT POOL ELEVATION 583.0.

LEGEND:

1A — SEDIMENTATION CROSS SECTION REFERENCE NUMBER
(thin line) — 1998 SURVEY
(thick line) — 2002 SURVEY

US Army Corps of Engineers Rock Island District

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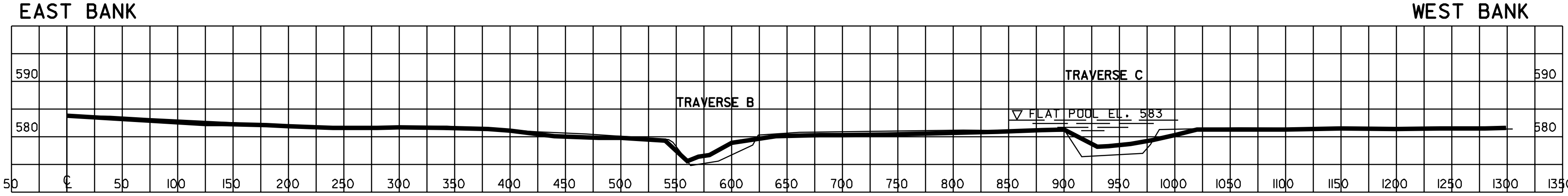
Scale: AS SHOWN

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT POOL 13-RIVER MILE 523.5-526.5 POTTERS MARSH

COMPOSITE SEDIMENTATION CROSS SECTION

PLATE 7



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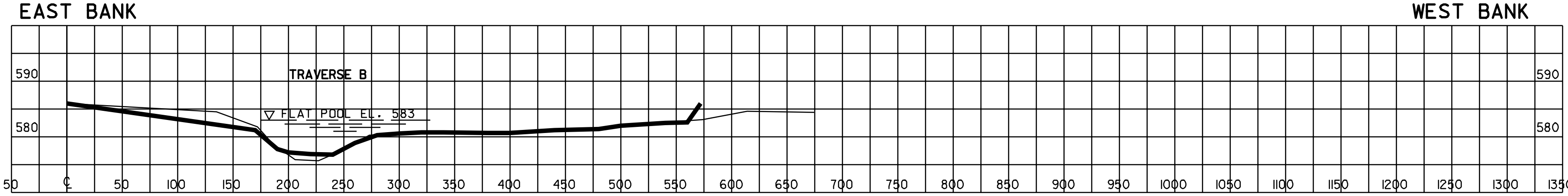

SECTION 3B

NOTES:

1. POTTERS' MARSH EMP RANGES, MARCH 1998.
2. PROFILES LOOKING DOWNSTREAM.
3. FLAT POOL ELEVATION 583.0.

LEGEND:

1A — SEDIMENTATION CROSS SECTION REFERENCE NUMBER

——— 1998 SURVEY

━━━ 2002 SURVEY

US Army Corps of Engineers Rock Island District

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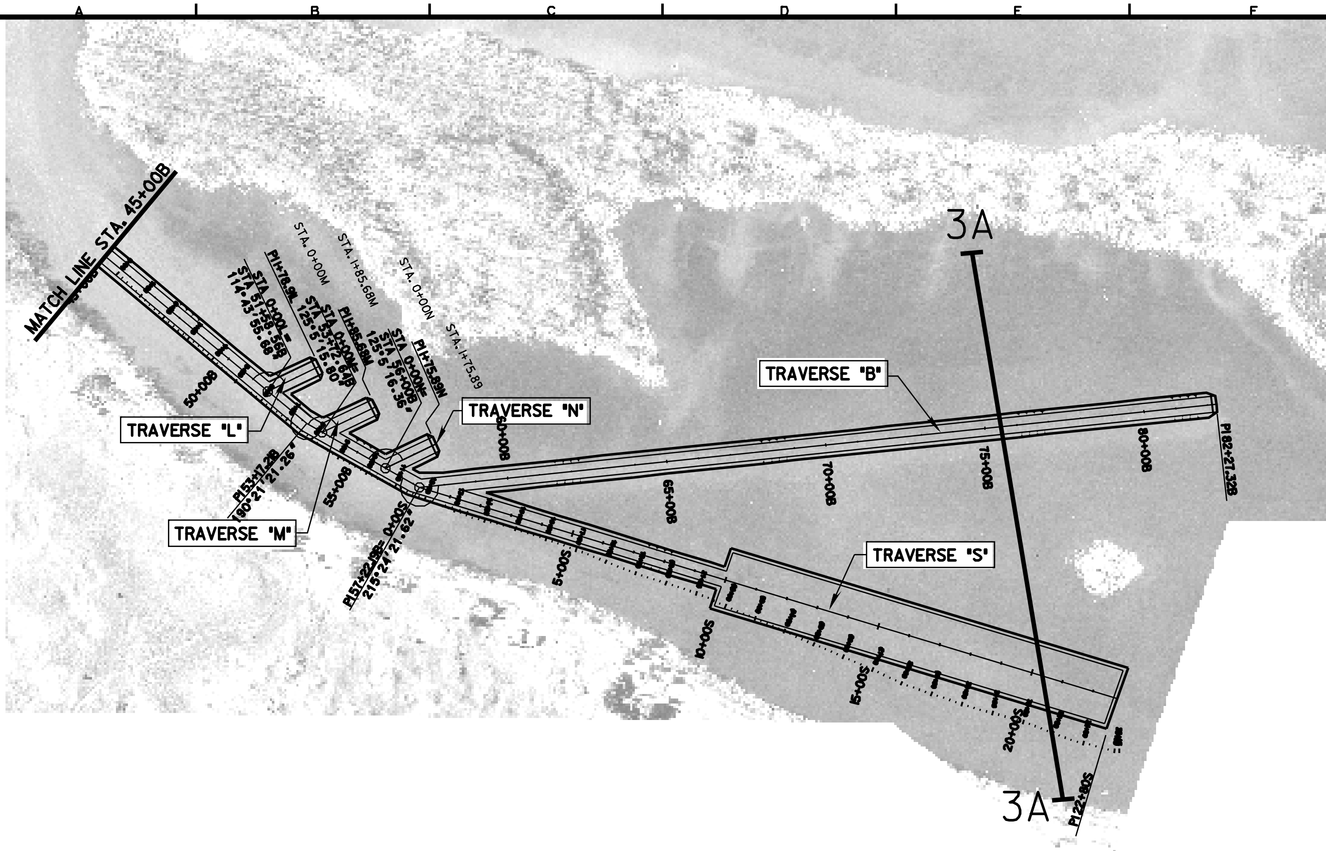
Date: X SEPT 2002 | Scale: AS SHOWN | Drawing Code: | Solicitation Number:

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT POOL 13-RIVER MILE 523.5-526.5 POTTERS MARSH

COMPOSITE SEDIMENTATION CROSS SECTIONS

PLATE 8



PLAN

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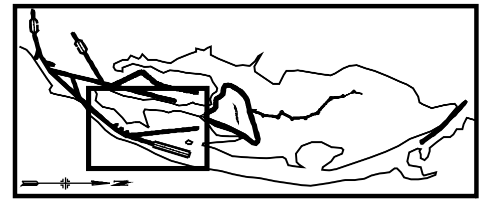

KEY PLAN
NO SCALE

US Army Corps of Engineers Rock Island District

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	Revisions		

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ROCK ISLAND, ILLINOIS

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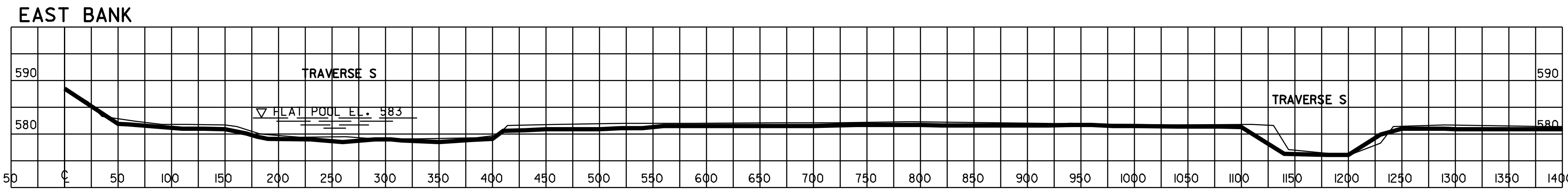
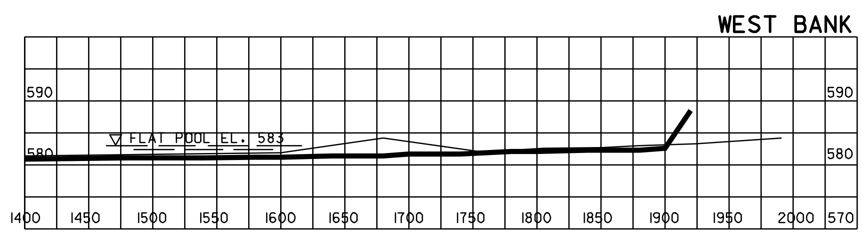
UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT
POOL 13-RIVER MILE 523.5-526.5
POTTERS MARSH

DREDGE PLAN AND PROFILE TRAVERSES B,L,M,N,AND S

PLATE 9



SECTION 3A



SECTION 3A

NOTES:

1. POTTERS' MARSH EMP RANGES, MARCH 1998.
2. PROFILES LOOKING DOWNSTREAM.
3. FLAT POOL ELEVATION 583.0.

LEGEND:

1A	SEDIMENTATION CROSS SECTION REFERENCE NUMBER
——— (thin line)	1998 SURVEY
━━━ (heavy line)	2002 SURVEY

US Army Corps of Engineers Rock Island District

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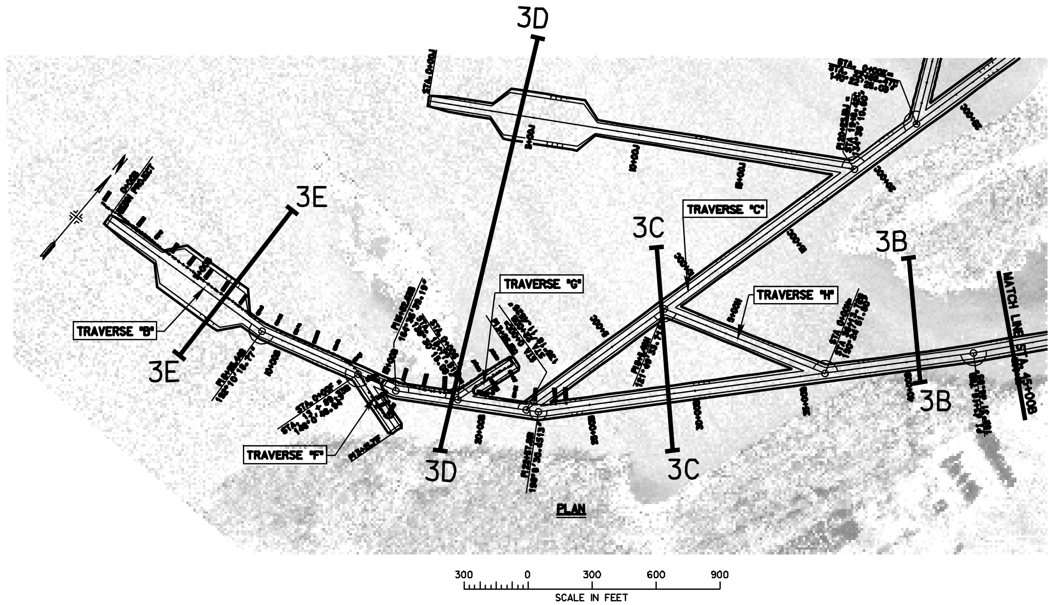
Solicitation Number:

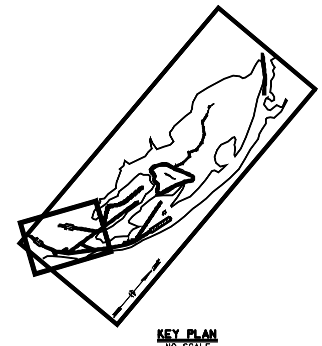
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT POOL 13-RIVER MILE 523.5-526.5 POTTERS MARSH

COMPOSITE SEDIMENTATION CROSS SECTION

PLATE 10





NOTE:
FOR SEDIMENTATION CROSS SECTIONS, SEE PLATES 7 AND 8.

US Army Corps of Engineers
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

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

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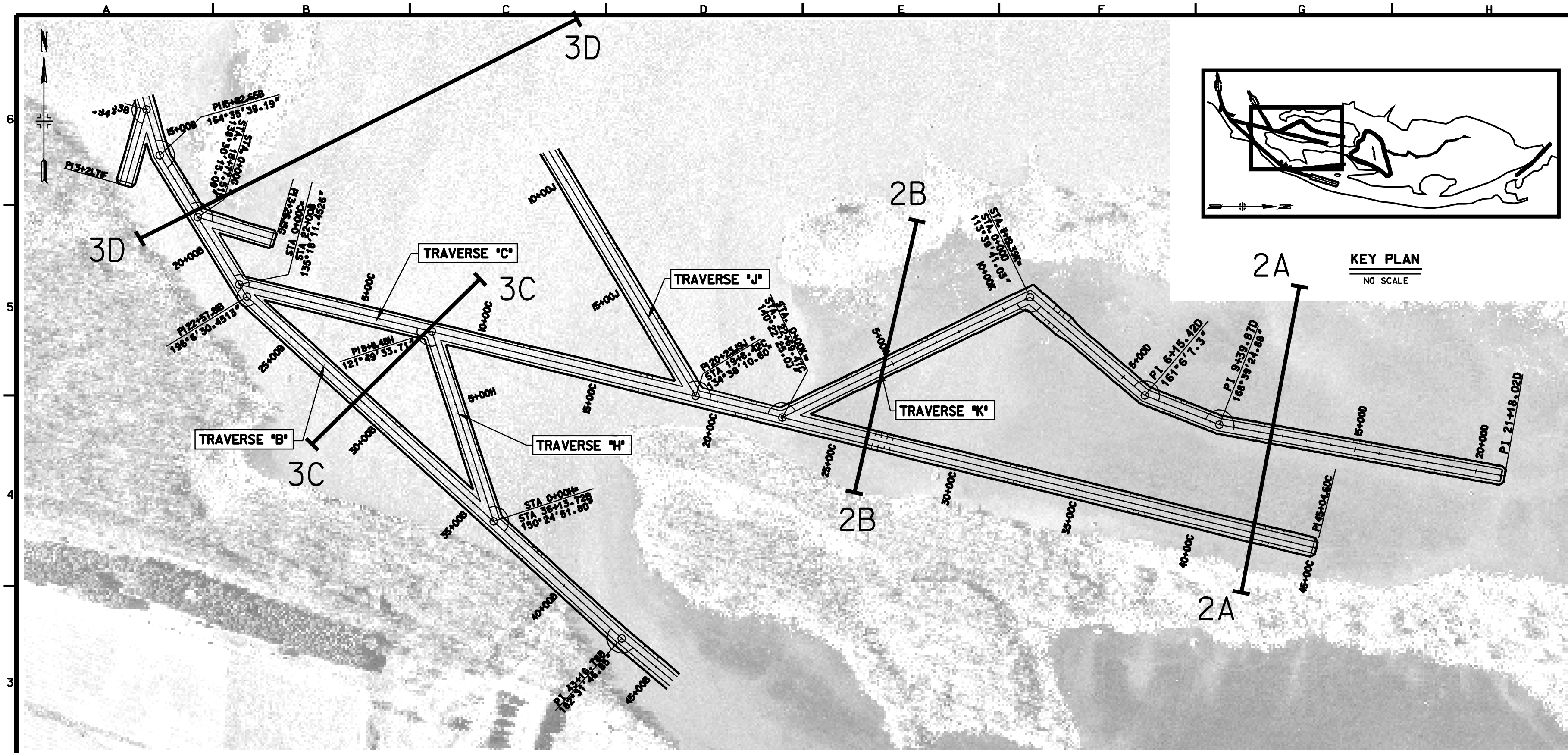
Drawn by: SDB
Checked by: AAE
Reviewed by: DJH
Date: X SEPT 2002
Scale: AS SHOWN
Drawing Code:
Solicitation Number:

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT
POOL 13-RIVER MILE 523.5-526.5
POTTERS MARSH

DREDGE PLAN AND PROFILE TRAVERSES F,G,AND H

PLATE 11



PLAN

200 100 0 200 400FT
SCALE

US Army Corps of Engineers Rock Island District

Revisions

Symbol	Description	Date	Approved

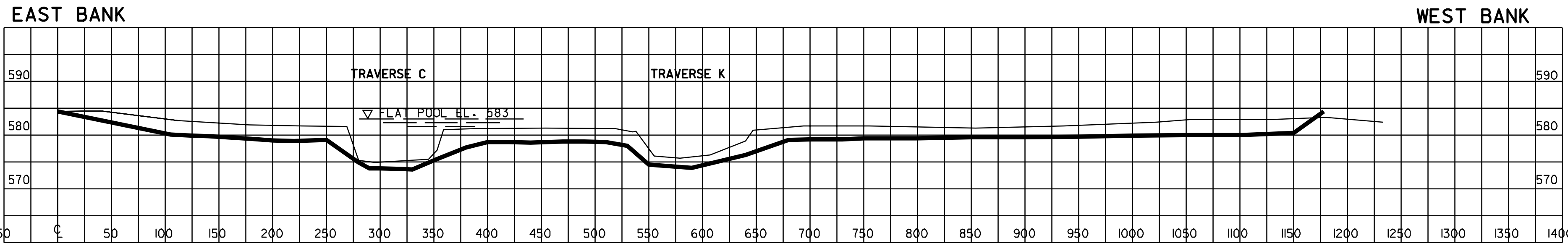
Designed by: CCK/KJD
Drawn by: SDB
Checked by: CCK/KJD
Reviewed by: BLK
Date:
Scale: AS SHOWN
Drawing Code:
Solicitation Number:

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

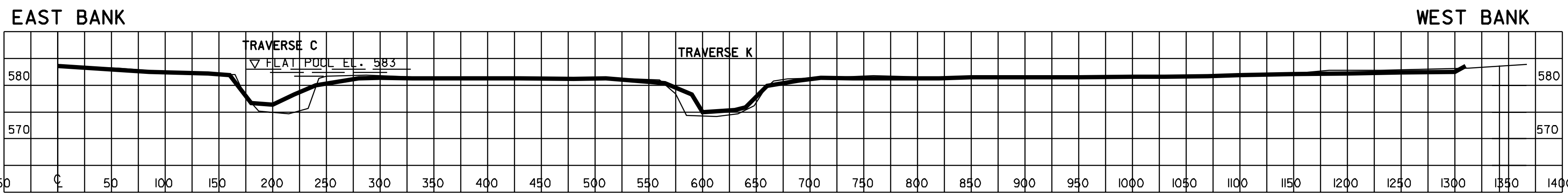
UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MANAGEMENT PROGRAM
POOL 13, RIVER MILE 523.5-526.5
POTTERS MARSH

DREDGE PLAN AND PROFILE TRAVERSE C

PLATE 12



SECTION 2B



SECTION 2A

LEGEND:

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(thin line)	1998 SURVEY
(thick line)	2002 SURVEY

NOTES:

1. POTTERS' MARSH EMP RANGES, MARCH 1998.
2. PROFILES LOOKING DOWNSTREAM.
3. FLAT POOL ELEVATION 583.0.

US Army Corps of Engineers Rock Island District

Symbol | Description Revisions | Date | Approved

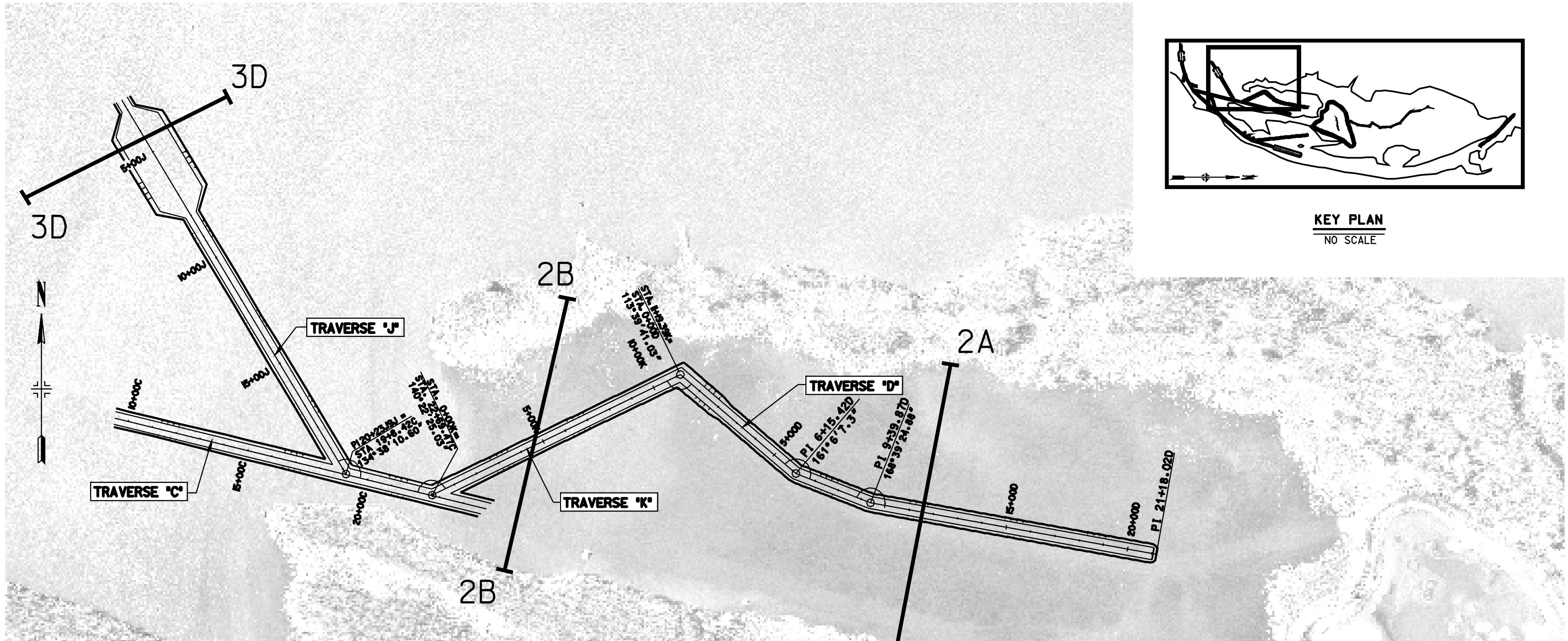
Designed By: MSZ
Drawn By: SDB
Checked By: AAE
Reviewed By: DJH
Date: X SEPT 2002
Scale: AS SHOWN
Drawing Code:
Solicitation Number:

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

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT
POOL 13-RIVER MILE 523.5-526.5
POTTERS MARSH

COMPOSITE SEDIMENTATION CROSS SECTIONS

PLATE 13



PLAN

200 100 0 200 400FT
SCALE

KEY PLAN
NO SCALE

US Army Corps of Engineers Rock Island District

Symbol	Description	Date	Approved
	Revisions		

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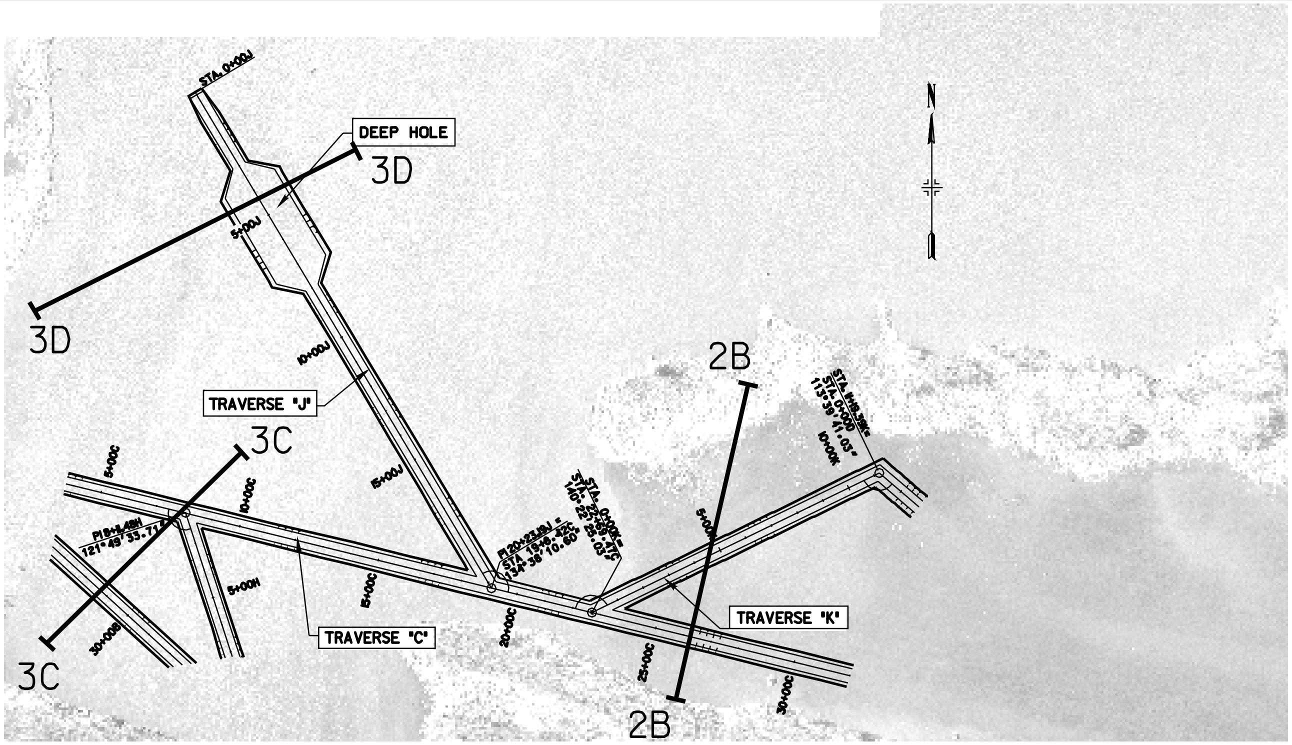
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MANAGEMENT PROGRAM
POOL 13, RIVER MILE 523.5-526.5
POTTERS MARSH

DREDGE PLAN AND PROFILE TRAVERSE D

PLATE 14



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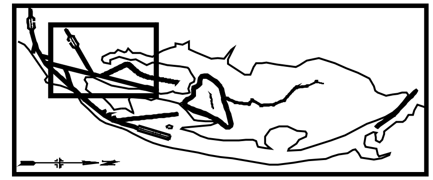

KEY PLAN
NO SCALE

US Army Corps of Engineers Rock Island District

Symbol	Description	Date	Approved
	Revisions		

U.S. ARMY ENGINEER DISTRICT
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ROCK ISLAND, ILLINOIS

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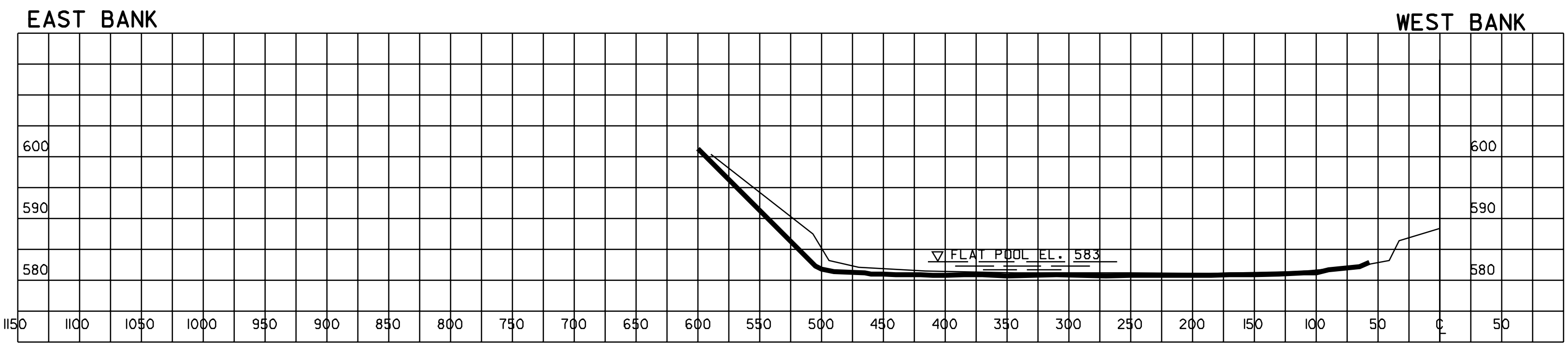
Reviewed By: BLK	Solicitation Number:

UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MANAGEMENT PROGRAM
POOL 13, RIVER MILE 523.5-526.5
POTTERS MARSH

DREDGE PLAN AND PROFILE TRAVERSES J AND K

PLATE 15

16-SEP-2003



SECTION 4A

LEGEND:

1A	SEDIMENTATION CROSS SECTION REFERENCE NUMBER
(thin line)	1998 SURVEY
(thick line)	2002 SURVEY

NOTES:

1. POTTERS' MARSH EMP RANGES, MARCH 1998.
2. PROFILES LOOKING DOWNSTREAM.
3. FLAT POOL ELEVATION 583.0.

US Army Corps of Engineers Rock Island District

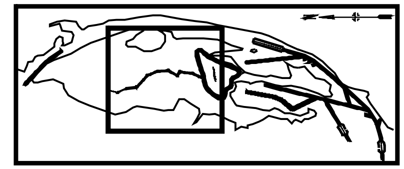
Date: X SEPT 2002
Scale: AS SHOWN
Designed By: MSZ
Drawn By: SDB
Checked By: AAE
Reviewed By: DJH

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

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT POOL 13-RIVER MILE 523.5-526.5 POTTERS MARSH

COMPOSITE SEDIMENTATION CROSS SECTIONS

PLATE 16



KEY PLAN

LEGEND

BLASTED POHOLES

MECHANICALLY EXCAVATED POTHOLES

US Army Corps of Engineers Rock Island District

Symbol	Description	Date	Approved

Revisions

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ROCK ISLAND, ILLINOIS

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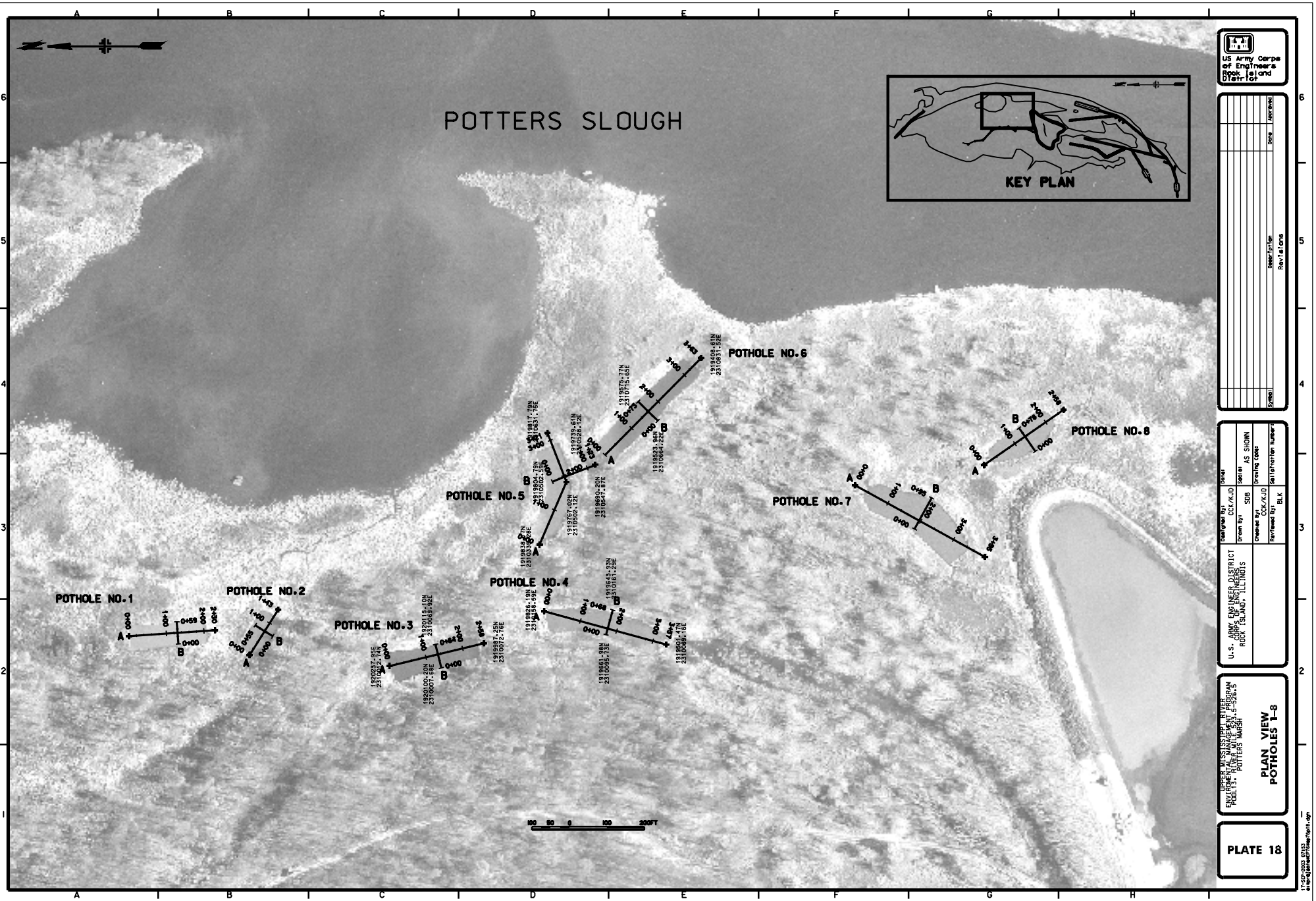
Reviewed By: BLK	Solicitation Number:

UPPER MISSISSIPPI RIVER
ENVIROMENTAL MANAGEMENT PROGRAM
POOL13, RIVER MILE 523.5-526.5
POTTERS MARSH

POTHOLE PLAN

PLATE 17



US Army Corps of Engineers
Rock Island District

Symbol	Date/Initials	Description	Approved
		Revisions	

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

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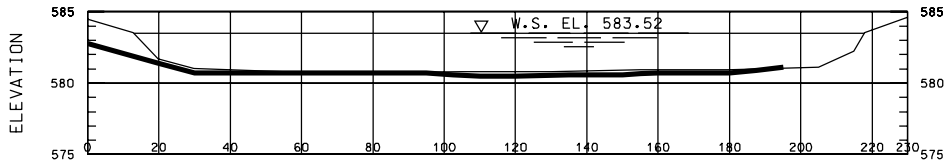
Solicitation Number:

UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MANAGEMENT PROGRAM
POOL 13: RIVER MILE 523.5-526.5
POTTERS MARSH

PLAN VIEW POTHOLES 1-8

PLATE 18

17-SEP-2003 07:53
drawings\potholes\PotPlanView1to8.dgn



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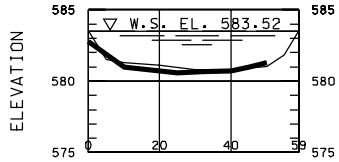

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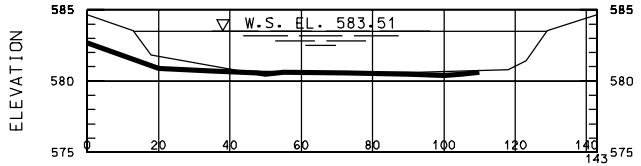
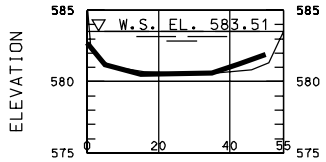


POTHOLE 2A



POTHOLE 2B

LEGEND:

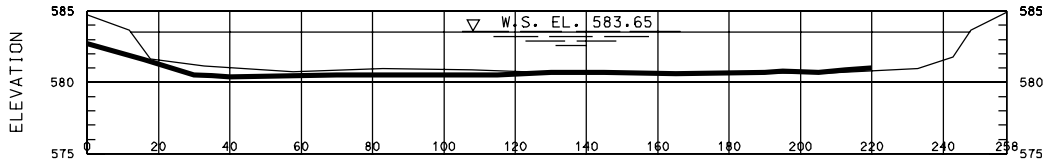
1A SEDIMENTATION CROSS SECTION REFERENCE NUMBER.

1998 SURVEY

2002 SURVEY

NOTES:

1. 1989 FIELD BOOK FC-89-44,
   1990-1991 FIELD BOOK FC-90-1,
   FEB 4,1997 OD FIELD BOOK.
   1997 FIELD BOOK FC-97-4,
   2000 FIELD BOOK FC-00-5



POTHOLE 3A

POTHOLE 3B

US Army Corps of Engineers Rock Island District

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		Revisions	

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ROCK ISLAND, ILLINOIS

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Reviewed By: BLK
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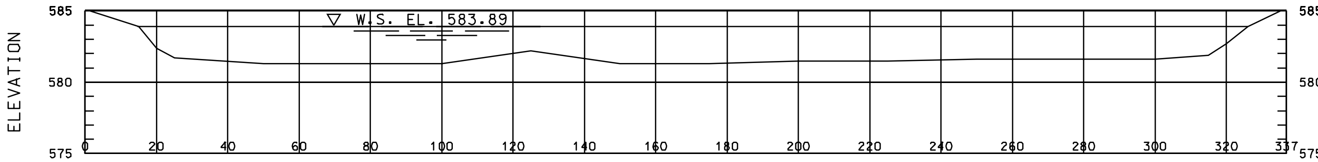
Drawing Code:
Solicitation Number:

UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MANAGEMENT PROGRAM
POOL 13, RIVER MILE 523.5-526.5
POTTERS MARSH

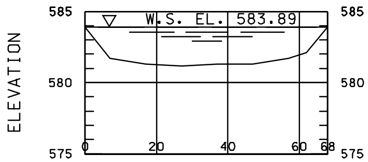
SEDIMENTATION TRANSECTS MECHANICALLY EXCAVATED POTHOLES 1-3

PLATE 19

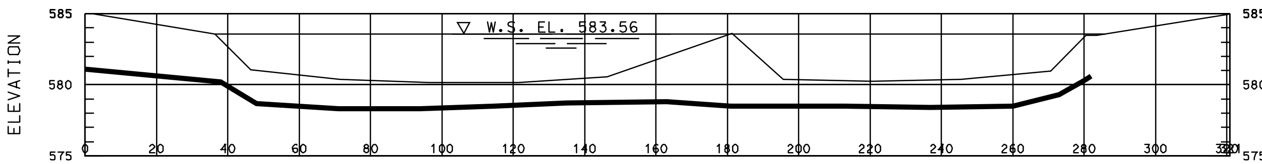
16-SEP-2003 13:45
d:\projects\potholes\Potholes.dgn



POTHOLE 4A



POTHOLE 4B



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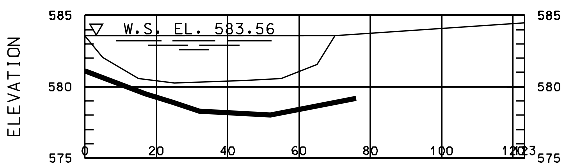
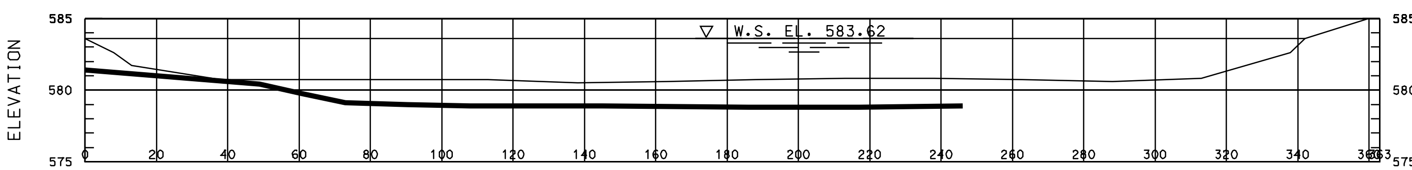
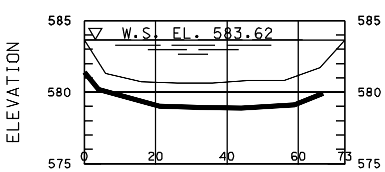


POTHOLE 5B



POTHOLE 6A



POTHOLE 6B

LEGEND:

1A	SEDIMENTATION CROSS SECTION REFERNENCE NUMBER.
———	1998 SURVEY
———	2002 SURVEY

NOTES:

1. 1989 FIELD BOOK FC-89-44,
   1990-1991 FIELD BOOK FC-90-1,
   FEB 4,1997 OD FIELD BOOK,
   2002 FIELD BOOK FC-00-5

US Army Corps of Engineers Rock Island District

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U.S. ARMY ENGINEER DISTRICT
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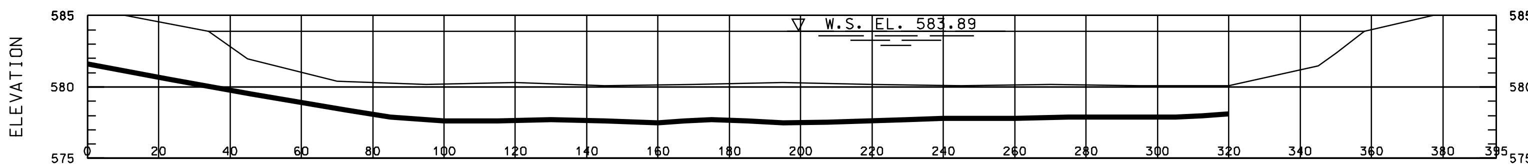
UPPER MISSISSIPPI RIVER
ENVIROMENTAL MANAGEMENT PROGRAM
POOL13, RIVER MILE 523.5-526.5
POTTERS MARSH

SEDIMENTATION TRANSECTS MECHANICALLY EXCAVATED POTHOLES 4-6

PLATE 20

16-SEP-2003 13:46



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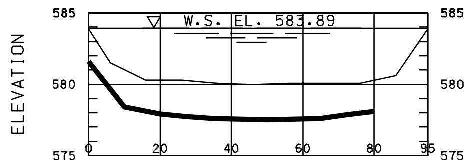
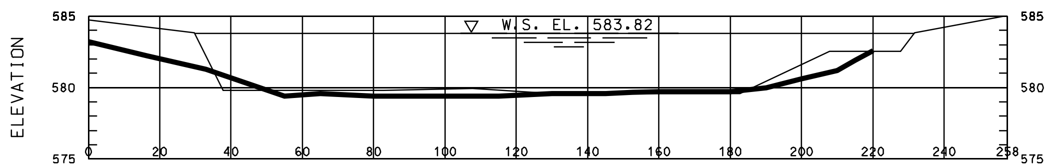
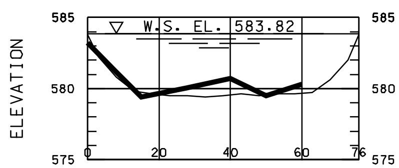


POTHOLE 7B



POTHOLE 8A



POTHOLE 8B

LEGEND:

1A	SEDIMENTATION CROSS SECTION REFERNENCE NUMBER.
(thin line)	1998 SURVEY
(heavy line)	2002 SURVEY

NOTES:

1. 1989 FIELD BOOK FC-89-44,
1990-1991 FIELD BOOK FC-90-1,
FEB 4,1997 OD FIELD BOOK,
1997 FIELD BOOK FC-97-4

US Army Corps of Engineers Rock Island District

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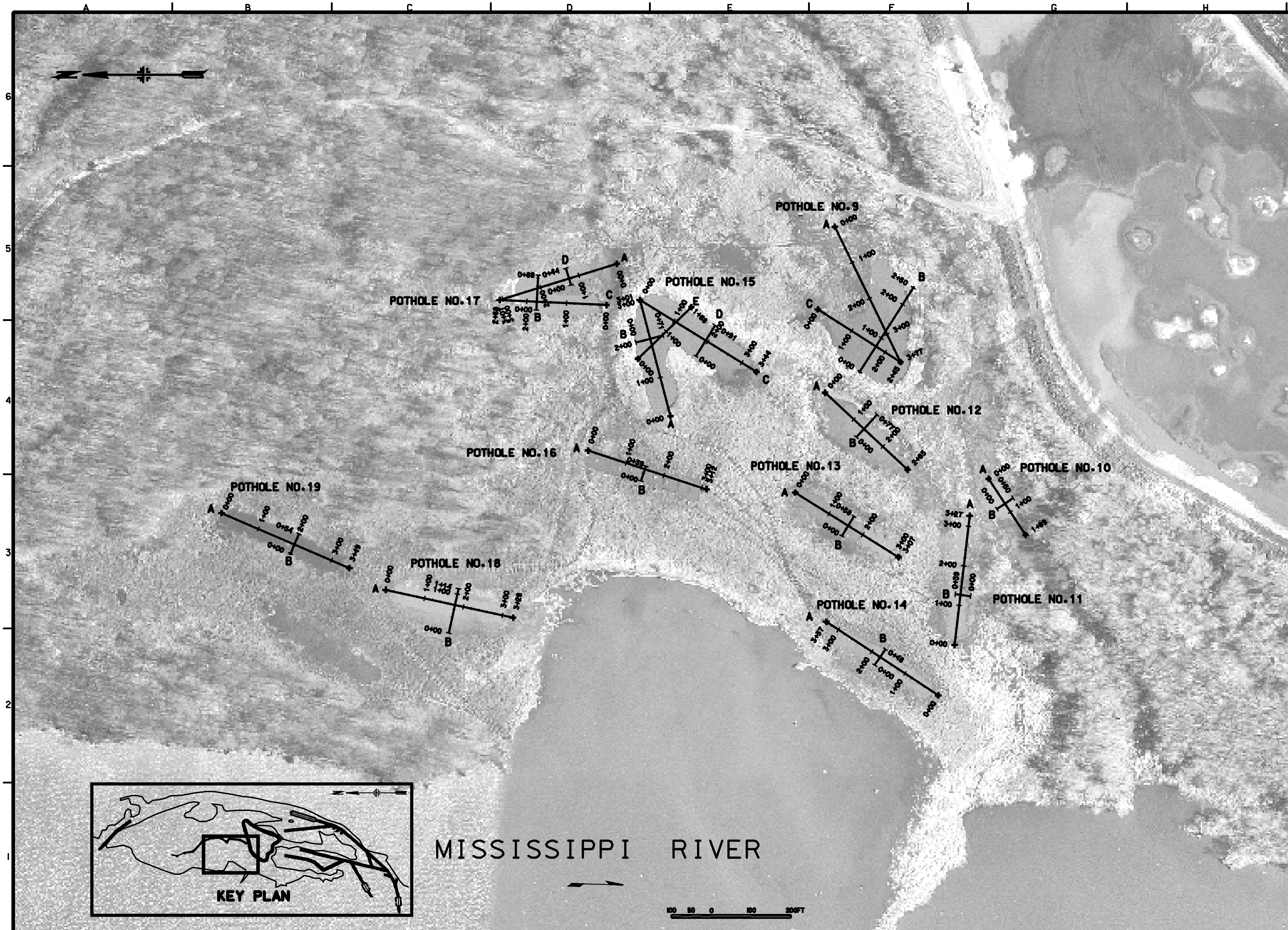
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

UPPER MISSISSIPPI RIVER
ENVIRONMENTAL MANAGEMENT PROGRAM
POOL13, RIVER MILE 523.5-526.5
POTTERS MARSH

SEDIMENTATION TRANSECTS MECHANICALLY EXCAVATED POTHOLES 7,8

PLATE 21



US Army Corps of Engineers Rock Island District

Symbol	Description	Date	Approved
	Revisions		

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

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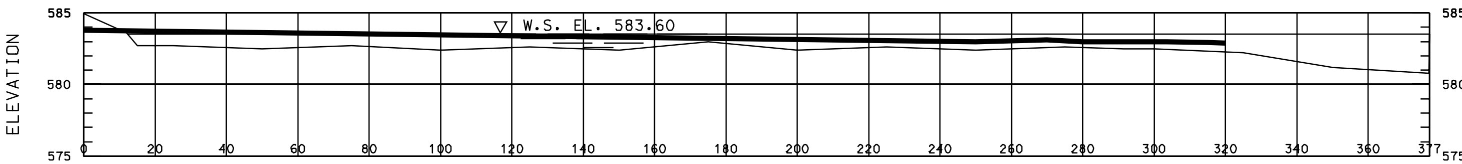
Reviewed By: BLK	Solicitation Number:

UPPER MISSISSIPPI RIVER
ENVIROMENTAL MANAGEMENT PROGRAM
POOL13. RIVER MILE 523.5-526.5
POTTERS MARSH

PLAN VIEW
POTHOLES 9-19

PLATE 22

17-SEP-2003 08:14



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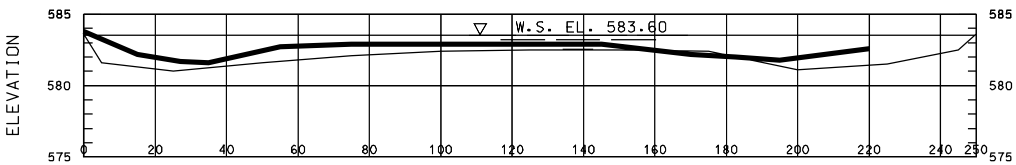

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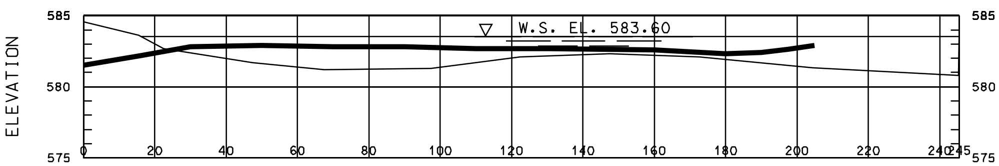

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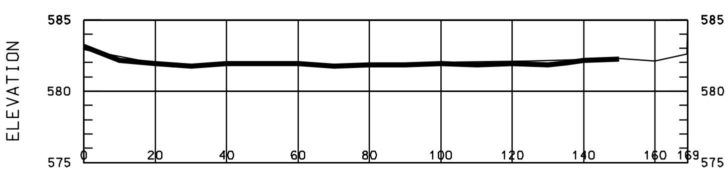
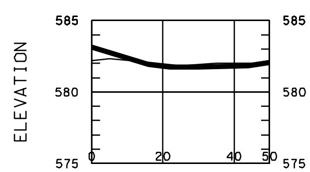
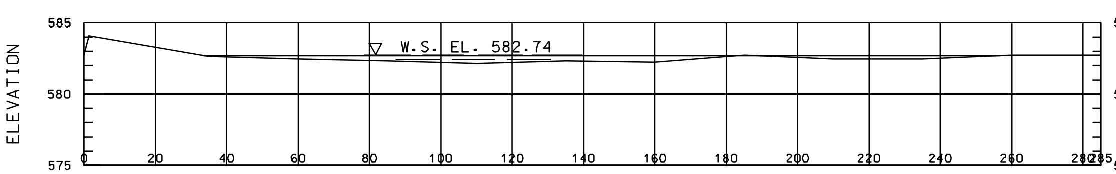


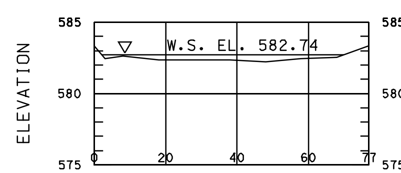
POTHOLE 10A - SEE NOTE 2



POTHOLE 10B



POTHOLE 12A



POTHOLE 12B

LEGEND:

1A SEDIMENTATION CROSS SECTION REFERNENCE NUMBER.

1998 SURVEY (thin line)

2002 SURVEY (thick line)

NOTES:

1. 1989 FIELD BOOK FC-89-44,
   1990-1991 FIELD BOOK FC-90-1,
   FEB 4,1997, OD FIELD BOOK,
   1997 FIELD BOOK FC-97-4,
   2000 FIELD BOOK FC-00-5
2. NO WATER PRESENT IN POTHOLE 10 DURING 2/6/97 SURVEY.

US Army Corps of Engineers Rock Island District

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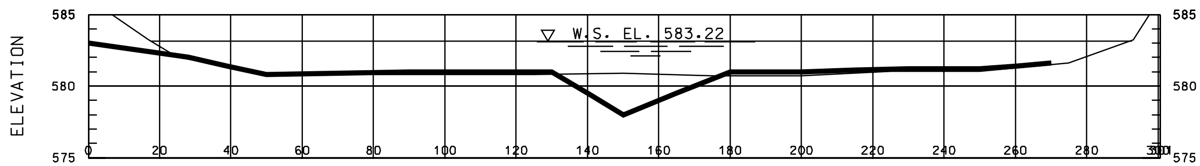
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS

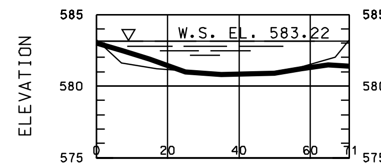
UPPER MISSISSIPPI RIVER ENVIRONMENTAL MANAGEMENT PROGRAM POOL 13, RIVER MILE 523.5-526.5 POTTERS MARSH

SEDIMENTATION TRANSECTS MECHANICALLY EXCAVATED POTHOLES 9,10,12

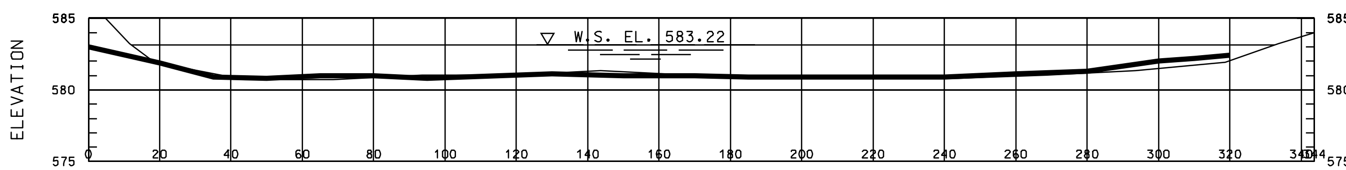
PLATE 23



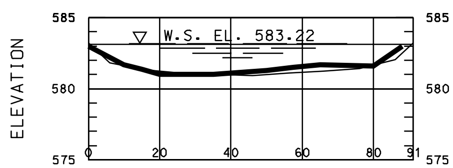
POTHOLE 15A



POTHOLE 15B



POTHOLE 15C



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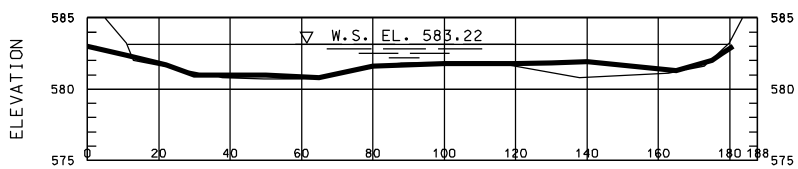

POTHOLE 15E

LEGEND:

1A	SEDIMENTATION CROSS SECTION REFERNENCE NUMBER.
(thin line)	1998 SURVEY
(thick line)	2002 SURVEY

NOTES:

1. 1989 FIELD BOOK FC-89-44, 1990-1991 FIELD BOOK FC-90-1, FEB 4,1997 OD FIELD BOOK, 1997 FIELD BOOK FC-97-4

US Army Corps of Engineers Rock Island District

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

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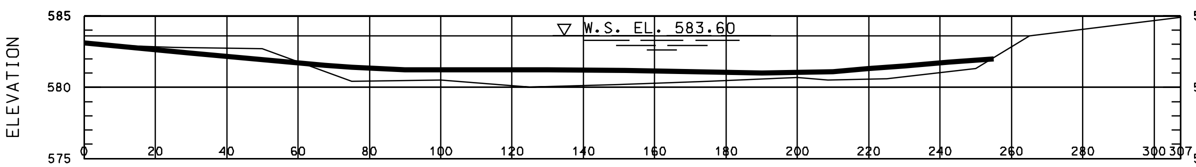
Scale: AS SHOWN

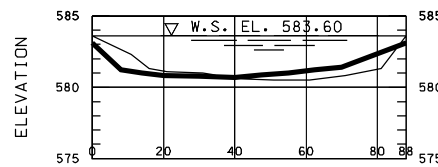
UPPER MISSISSIPPI RIVER ENVIRONMENTAL MANAGEMENT PROGRAM POOL 13, RIVER MILE 523.5-526.5 POTTERS MARSH

SEDIMENTATION TRANSECTS MECHANICALLY EXCAVATED POTHOLE 15

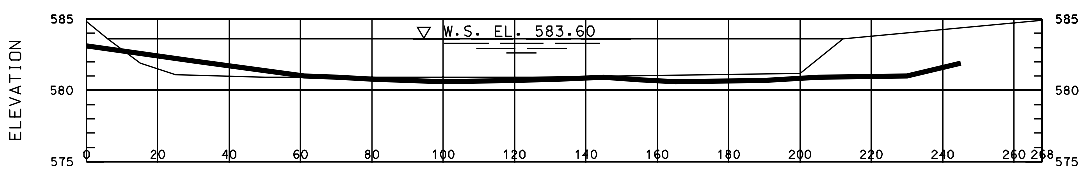
PLATE 24



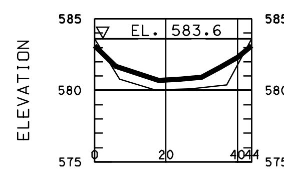
POTHOLE 17A



POTHOLE 17B



POTHOLE 17C



POTHOLE 17D

LEGEND:

1A SEDIMENTATION CROSS SECTION REFERNENCE NUMBER.

——— 1998 SURVEY

━━━ 2002 SURVEY

NOTES:

1. 1989 FIELD BOOK FC-89-44,
   1990-1991 FIELD BOOK FC-90-1,
   FEB 4,1997 OD FIELD BOOK,
   1997 FIELD BOOK FC-97-4,
   2002 FIELD BOOK FC-02-3

US Army Corps of Engineers Rock Island District

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ROCK ISLAND, ILLINOIS

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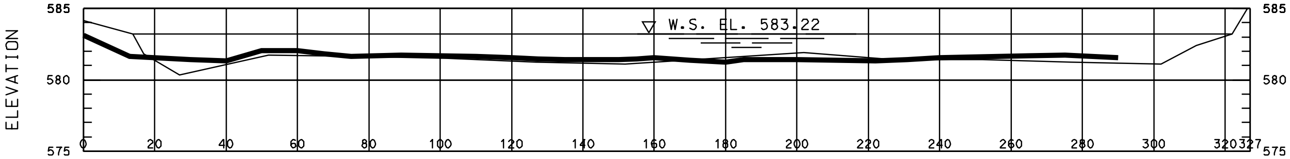
Reviewed By: BLK	Solicitation Number:

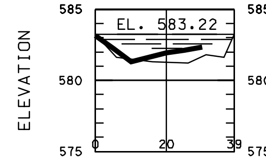
UPPER MISSISSIPPI RIVER
ENVIROMENTAL MANAGEMENT PROGRAM
POOL13, RIVER MILE 523.5-526.5
POTTERS MARSH

SEDIMENTATION TRANSECTS MECHANICALLY EXCAVATED POTHOLE 17

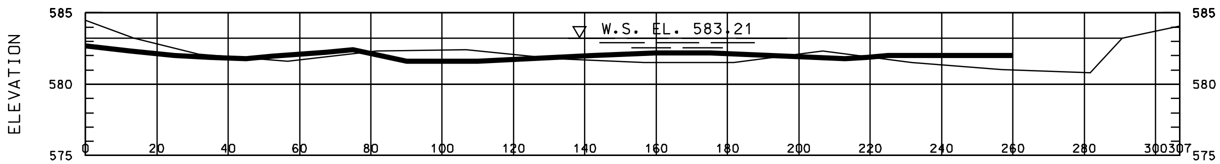
PLATE 25



POTHOLE 11A



POTHOLE 11B



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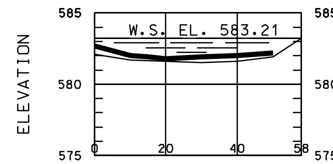
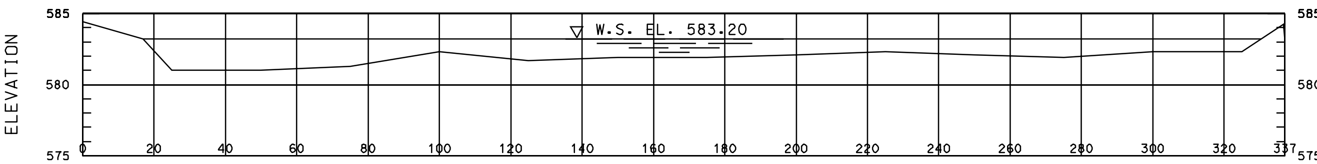
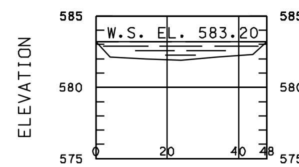


POTHOLE 13B



POTHOLE 14A



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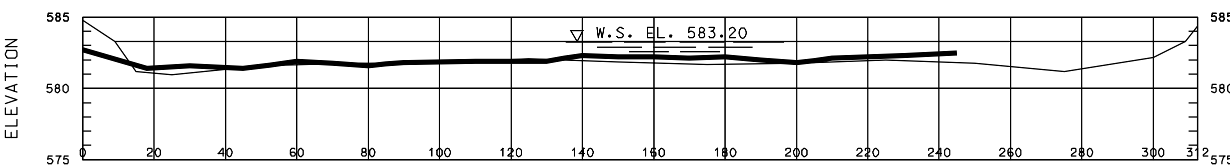

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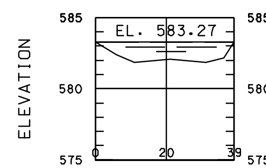


POTHOLE 16B

LEGEND:

1A	SEDIMENTATION CROSS SECTION REFERNENCE NUMBER.
——— (thin line)	1998 SURVEY
━━━ (thick line)	2002 SURVEY

NOTES:

1. 1989 FIELD BOOK FC-89-44,
   1990-1991 FIELD BOOK FC-90-1,
   FEB 4,1997 OD FIELD BOOK,
   1997 FIELD BOOK FC-97-4

US Army Corps of Engineers Rock Island District

Symbol	Description	Date	Approved

Revisions

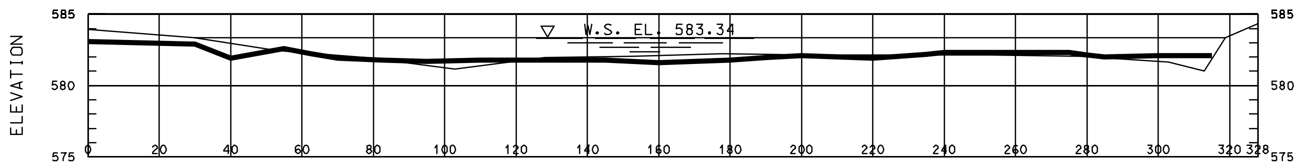
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

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

UPPER MISSISSIPPI RIVER
ENVIROMENTAL MANAGEMENT PROGRAM
POOL13, RIVER MILE 523.5-526.5
POTTERS MARSH

SEDIMENTATION TRANSECTS
BLASTED POTHOLES
11, 13, 14, 16

PLATE 26



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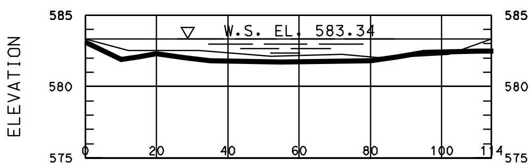

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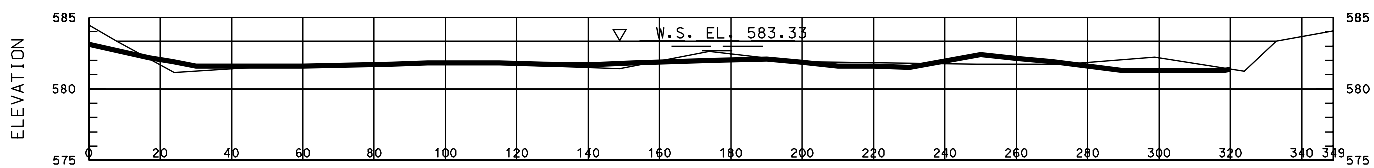

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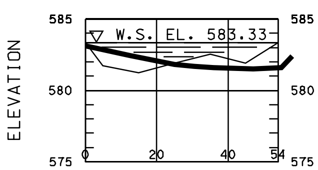

POTHOLE 19B

LEGEND:

1A SEDIMENTATION CROSS SECTION REFERNENCE NUMBER.

1998 SURVEY

2002 SURVEY

NOTES:

1. 1989 FIELD BOOK FC-89-44,
   1990-1991 FIELD BOOK FC-90-1,
   FEB 4,1997 OD FIELD BOOK,
   1997 FIELD BOOK FC-97-4

US Army Corps of Engineers Rock Island District

Symbol | Description | Date | Approved — Revisions

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

UPPER MISSISSIPPI RIVER ENVIRONMENTAL MANAGEMENT PROGRAM POOL 13, RIVER MILE 523.5-526.5 POTTERS MARSH

SEDIMENTATION TRANSECTS BLASTED POTHOLES 18, 19

PLATE 27

Appendix I

Distribution List

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