KIMLER

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT (R-6F) WITH
INTEGRATED ENVIRONMENTAL ASSESSMENT

PEORIA LAKE ENHANCEMENT

JULY 1990

US Army Corps
of Engineers
Rock Island District

PEORIA POOL
ILLINOIS WATERWAY

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:

CENCR-PD-W

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
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PEORIA LAKE ENHANCEMENT
PEORIA POOL, ILLINOIS WATERWAY, RIVER MILES 178.5 TO 181
STATE OF ILLINOIS

JULY 1990

ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

Peoria Lake, a riverine lake encompassing nearly 14,000 acres between river miles (RM) 162 and 181 on the Illinois Waterway, is subdivided into Upper and Lower Peoria Lakes by a natural constriction occurring at approximate RM 166.5 (see plates 1 and 2). Nearly 68 percent of Peoria Lake's volume has been lost to sedimentation since 1903. Shoaling has seriously impacted the lake's fish and wildlife habitat value. The existing depths are unable to maintain the dissolved oxygen levels necessary to support a diversity of fish species. In addition, the long, uninterrupted expanse of Upper Peoria Lake is conducive to wind-fetch generated wave action. Such wave action over the lake's shallow depths results in the resuspension of the upper flocculents, thereby increasing turbidity levels and reducing photosynthetic activity. Also, constant churning of the sediments prohibits consolidation. The resulting soft lake bottom is not receptive to aquatic plant rooting and survival. The lack of submergent and emergent aquatic vegetation throughout Peoria Lake is minimizing the area's ability to support historically documented fish and waterfowl populations.

Assessment of the existing resources available in the Upper Peoria Lake environs resulted in the following observations: permanent year-round aquatic and side channel habitat is limited throughout the project area; emergent wetland habitat is minimally available at this location; waterfowl food production varies annually and in general is limited; and high turbidity values and suspended solids concentrations define Peoria Lake's water quality status. Project goals that would address these conditions were developed for Upper Peoria Lake (Lower Peoria Lake was removed from consideration for rehabilitation and enhancement due to the extensive urban development along its western shore and the limited availability of public land). The project goals are the enhancement of aquatic and wetland habitats. The following objectives were determined to support the stated goals: (1) increase reliable food production and resting area for waterfowl; (2) increase diversity and areal extent of submergent and emergent vegetation for waterfowl and; (3) provide flowing side channel habitat. Multiple project sites, construction alternatives, and design configurations have been considered for the purpose of realizing the stated project goals and objectives. Thorough analysis of all options resulted in the recommendation of the following design features: construction of a forested wetland management area; creation of a barrier island; and establishment of flowing side channel and rock substrate habitat.

Of several project sites within Upper Peoria Lake considered, the Goose Lake area was found to be the only location that met all of the minimal requirements for project site selection. These requirements included available foundations capable of supporting barrier island construction; State land ownership and management; minimal or no project-related impacts to the navigation channel; natural, flowing side channel development potential; and maximum environmental enhancement opportunities.

Evaluation of the identified project alternatives was accomplished through the application of habitat value assessment methodologies. The Wildlife Habitat Appraisal Guide, a habitat assessment methodology designed by the Missouri Department of Conservation (MDOC) in cooperation with the U.S. Soil Conservation Service, was used in the analysis of wetland and terrestrial habitats. Aquatic models developed by the Waterways Experiment Station (WES) and MDOC were used to evaluate existing aquatic and benthic resources and to quantify potential project outputs. This analysis of the selected project site and the proposed project alternatives, individually and collectively, resulted in Alternatives B, C, and D being recommended and Alternative A being rejected.

Development of the selected plan will provide nearly 168 acres of manageable, forested wetlands; a 1.1-mile-long, 16-acre barrier island; and restored flow through the East River side channel; and 3,300 square yards of submerged rock substrate habitat. Implementation of these project features will enhance migratory waterfowl habitat value by increasing the seasonal availability of reliable water, food resources, and resting, loafing, and nesting opportunities. Fisheries benefits will be accrued through the addition of shoreline habitat, off-channel flowing water conditions, and preferred spawning environment. Opportunities for the establishment of mussel communities in an area currently lacking appropriate conditions also will be provided.

Minor land acquisition of approximately 57 acres by the State of Illinois prior to the initiation of project construction will assure that all proposed project features are built upon State-owned lands. All of these lands are located within or adjacent to the area of Upper Peoria Lake that is locally known as Goose Lake. The project site will lie entirely within the administrative boundaries of the Woodford County Conservation Area.

Average annual operation and maintenance costs of the project are estimated to be $19,800 per year. This cost will be shared on a 75 percent Federal/ 25 percent State basis in accordance with Section 906(e) of the 1986 Water Resources Development Act. The Illinois Department of Conservation (IDOC) will be responsible for the non-Federal cost share of project O&M, while the U.S. Army Corps of Engineers will assume responsibility for the Federal share.

Any rehabilitation of the project would be considered reconstructive work which cannot be accurately estimated. The U.S. Army Corps of Engineers will be responsible for the Federal share of any mutually agreed upon rehabilitation of the project that exceeds the annual operation and maintenance requirements identified in the Definite Project Report and that is needed as a result of specific storm or flood events.

It is proposed that selected quantitative physical, chemical, and natural resource parameter measurements, as specified in the project report, be collected following completion of construction to evaluate project performance with respect to the stated objectives. The Corps of Engineers would have responsibility for this data collection. Additional field

observations would be gathered by the IDOC and submitted to the Corps of Engineers as part of the annual project monitoring plan.

The District Engineer has reviewed the project outputs and determined that implementation of the identified plan is justified in the Federal interest. Therefore, approval for the construction of the Peoria Lake habitat rehabilitation and enhancement project is recommended by the Rock Island District Engineer at an estimated cost of $3,780,000. Total project cost, including general design, is estimated at $4,237,000. The Federal share of funds required for construction of the project is $2,708,000.

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1. INTRODUCTION.

a. Purpose. The purpose of this report is to present a detailed proposal for the enhancement of Peoria Lake. This report provides planning, engineering, and sufficient construction details for the selected plan to allow final design and construction to proceed subsequent to approval of this document.

b. Resource Problems and Opportunities. The value of the Illinois River Valley for waterfowl lies in its bottom land lakes that flank the relatively narrow river channel between Spring Valley and Meredosia and between Pearl and Grafton. These lakes originated in the most recent glaciation (Wisconsinan) which profoundly altered the ancient Mississippi and Illinois Rivers and created the unique Illinois Valley that we find today (Bellrose, et al., 1979). Pin oaks and pecans lined the valley and provided valuable food reserves for migrating waterfowl. However, the landscape was altered through the construction of the lock and dam system for navigation, the extensive network of levees and drainage systems for agriculture, and the diversion of water from Lake Michigan down the Illinois River in the early 1900's.

Sedimentation has destroyed much of the fish and wildlife value of Peoria Lake. The lake has lost approximately 68 percent of its original volume since 1903 and presently has an average depth of approximately 2.6 feet (Demissie, et al., 1986). Present depths, homogeneous bottom contours, and soft unconsolidated sediments are limited in value for aquatic species. The soft lake bottom is not conducive to the rooting and survival of submergent and emergent aquatic vegetation. Shallow depths promote wave-induced resuspension of sediments, resulting in elevated turbidity levels.

General opportunities for enhancement include construction of islands to reduce wind-driven waves with resultant reduction in bottom suspended sediments; excavation of a side channel to restore a flowing side channel habitat; creation of deepwater fisheries habitat off the main channel; and diversifying substrate characteristics to encourage colonization of benthic and macroinvertebrate populations, as well as increased fisheries utilization.

c. Scope of Study. The geographical scope of the study area is shown on plate 3. After habitat needs were assessed, emphasis was placed on developing alternatives which were located on existing State or federally owned lands. Although additional land could be purchased by non-Federal interests, alternatives involving significant land acquisition or other real estate requirements were not pursued due to policy, scheduling, and funding considerations. Alternatives involving upland erosion control to reduce sedimentation delivery to Peoria Lake were not studied due to the U.S. Soil Conservation Service having primary jurisdiction for these programs.

Field surveys were performed to plan and assess proposed project alternatives. Hydrographic surveys were conducted in 1988 and 1989 to assess present sediment elevations. Both land survey sections and hydrographic surveys will be used to evaluate post-construction performance.

Soil borings were taken to assess sediment types, to verify foundations of proposed structures, and to determine excavation/dredging constraints. Water quality sampling was initiated at the commencement of the study and will continue through construction.

Fish and waterfowl observations and biological assessment studies were conducted for the selected project site. These observations and analyses will be used in the evaluation of project performance.

The report is organized to follow a general problem-solving format. The purpose and problems are presented in Section 1. Section 2 provides an overview of how and why the Peoria Lake area was selected as a project within the Environmental Management Program (EMP). Section 3 establishes the baseline for existing resources. Section 4 provides the objectives of the project and criteria used to select proposed features. Sections 5 and 6 propose and evaluate project alternatives. Sections 7 and 8 describe the selected plan including various options within each proposed feature. Section 9 is an assessment of environmental effects from the proposed plan pursuant to the National Environmental Policy Act. Section 10 provides a summary of project accomplishments or outputs. Sections 11, 12, and 13 describe the operation and maintenance considerations, performance monitoring, and detailed cost estimates for both initial construction and annual Operation, Maintenance, and Rehabilitation. Sections 14, 15, 16, and 17 provide a summary of implementation requirements and coordination. Sections 18, 19, and 20 present the conclusions, recommendations, and Finding of No Significant Impact.

Drawings (plates) provide sufficient detail to allow review of the proposed features. Plates 1, 2, and 3 show the project location, the recommended plan, and alternative plans. Plates 4, 5, and 6 show hydraulic data from 1965 through 1988. Plate 7 shows the results of field borings and laboratory tests in classifying soil properties. Plates 8, 9, 10, and 11 present the proposed East River features with typical sections. Plates 12 through 20 present proposed features for a forested wetland management area (FWMA)

with profiles, sections, and plan views of proposed structures. Plates 21, 22, and 23 provide the monitoring plan and existing sediment elevations. Plate 24 provides the proposed plan of turbidity control during construction.

d. Authority. The authority for this report is provided by the 1985 Supplemental Appropriations Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662). The proposed project would be funded and constructed under this authorization.

Section 1103 is summarized as follows:

Section 1103. UPPER MISSISSIPPI RIVER PLAN

(a)(1) This section may be cited as the Upper Mississippi River Management Act of 1986.

(2) To ensure the coordinated development and enhancement of the Upper Mississippi River (UMR), it is hereby declared to be the intent of Congress to recognize that system as a nationally significant ecosystem and a nationally significant commercial navigation system. Congress further recognizes that the system provides a diversity of opportunities and experiences. The system shall be administered and regulated in recognition of its several purposes.

(e)(1) The Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, is authorized to undertake, as identified in the Master Plan --

(A) a program for the planning, construction, and evaluation of measures for fish and wildlife habitat rehabilitation and enhancement;

(B) implementation of a long-term resource monitoring program; and

(C) implementation of a computerized inventory and analysis system;

(f)(1) implementation of a program of recreational projects;

(2) assessment of the economic benefits generated by recreational activities in the system; and

(h)(1) monitoring of traffic movements on the system.

2. GENERAL PROJECT SELECTION PROCESS.

a. Eligibility Criteria. A design memorandum did not exist at the time of the enactment of Section 1103. Therefore, the North Central Division, U.S. Army Corps of Engineers, completed a "General Plan" for the implementation of the UMRS-EMP in January 1986. The U.S. Fish and Wildlife Service (USFWS), Region 3, and the five affected states (Illinois, Iowa, Minnesota, Missouri, and Wisconsin) participated through the Upper Mississippi River Basin Association. Programmatic updates of the General Plan for budget planning and policy are accomplished through Annual Addenda.

Coordination with the States and the USFWS during the preparation of the General Plan and Annual Addendum led to an examination of the Comprehensive Master Plan for the Management of the Upper Mississippi River System. The Master Plan, completed by the Upper Mississippi River Basin Commission in 1981, was the basis of the recommendations enacted into law in Section 1103. The Master Plan and General Plan identify examples of potential habitat rehabilitation and enhancement techniques. Consideration of the Federal interest and Federal policies has resulted in the following conclusions:

(1) First Annual Addendum. The Master Plan report ... and the authorizing legislation do not pose explicit constraints on the kinds of projects to be implemented under the UMRS-EMP. For habitat projects, the main eligibility criteria should be that a direct relationship should exist between the project and the central problem as defined by the Master Plan, i.e., the sedimentation of backwaters and side channels of the UMRS. Other criteria include geographic proximity to the river (for erosion control), other agency missions, and whether the condition is the result of deferred maintenance ....

(2) Second Annual Addendum. The types of projects that are definitely within the realm of Corps of Engineers implementation authorities include the following:

- backwater dredging
- dike and levee construction
- island construction
- bank stabilization
- side channel opening/closures
- wing and closing dam modifications
- aeration and water control systems
- waterfowl nesting cover (as a complement to one of the other project types)
- acquisition of wildlife lands (for wetland restoration and protection.) Note: By letter of February 5, 1988, the Office of the Chief of Engineers directed that such projects not be pursued.

A number of innovative structural and non-structural solutions which address human-induced impacts, particularly those related to navigation traffic and operation and maintenance of the navigation system, could result in significant long-term protection of UMRS habitat. Therefore, proposed projects which include such measures will not be excluded categorically from consideration, but the policy and technical feasibility of each of these measures will be investigated on a case-by-case basis and recommended only after consideration of system-wide effects.

b. General Selection Process. The following steps provide an overview of the process of project selection. The steps are interactive with communication in both directions and occur through a continual process.

(1) State/USFWS Project Nomination. Projects are nominated for inclusion in the Rock Island District's habitat program by the respective State conservation agencies and the USFWS based on agency management objectives. Rock Island District assists the States and USFWS agencies with proposing habitat projects through an in-house task force that includes members from the Design, Hydraulics, Channel Maintenance, Environmental, and Waterway Planning Branches. As projects are being conceptualized, this group meets on-site with State and USFWS personnel to examine as fully as possible what site-specific enhancements would be both desirable and engineeringly feasible.

(2) Fish and Wildlife Interagency Committee (FWIC) Ratings. To assist in the project formulation process, the FWIC, a group composed of State and Federal biologists who are assigned to aquatic and terrestrial projects (refuges, wildlife areas) along the Mississippi River and Illinois Waterway, has convened a series of meetings starting in 1986 to consider critical habitat needs along the Mississippi and Illinois Rivers. At these meetings, the available habitat is evaluated on a pool-by-pool basis. These analyses reveal deficiencies (such as feeding, resting, and loafing areas for migratory waterfowl, absence of deep water off the main channel for diving ducks and fish) as well as types of habitat in abundant supply (e.g., mature bottom land hardwood). (With this information, projects being considered can most accurately reflect broader regional needs in addition to representing the best site-specific choices.)

Projects are then ranked by the FWIC according to the biological benefits that they could provide. Each project is considered and evaluated relative to increasing habitat benefits for fish, waterfowl, and other wildlife. Every project is ranked according to the benefits provided as high, medium, or low.

(3) River Resources Coordinating Team (RRCT) Rankings. The FWIC rankings also are forwarded to the RRCT, an interagency policy group which meets to coordinate Mississippi and Illinois River activities. The RRCT examines the FWIC rankings and includes consideration of the broader policy perspectives of the agencies submitting the projects. The RRCT makes a recommended ranking.

(4) U.S. Army Corps of Engineers District Ranking. The FWIC and RRCT recommended rankings are evaluated by the District. The District then formulates a recommended program consistent with the EMP program guidance and District requirements.

(5) U.S. Army Corps of Engineers, North Central Division Prioritizing. The District then submits a recommended program to the North Central Division. Additional coordination by the Division through the Environmental Management Program Coordinating Committee is effected. North Central Division then submits project fact sheets to the Chief of Engineers and Assistant Secretary of the Army for Civil Works for approval. Fact sheets and schedules are subsequently published in the annual addendums, thereby completing the project selection process.

Projects consequently have been screened by biologists and managers closely acquainted with the rivers. Resource needs and deficiencies have been considered on a pool-by-pool basis to ensure that regional needs are met and that the best expertise and analytical tools available are used to optimize the habitat benefits created at the most suitable locations.

c. Specific Site Selection. Recognition of the changes occurring in habitat composition, and declines in habitat quality and availability all along the Illinois Waterway by the Illinois Department of Conservation (IDOC) and other State agencies prompted their proposal of several habitat rehabilitation and enhancement projects for design and implementation under the Environmental Management Program. Four of these projects have been elevated to design status through the ranking and recommendation process presented in Section 2.b. of this report. Three of these projects, the Rice Lake Complex (RM 135), Banner Marsh State Wildlife Area (RM 141), and Chautauqua National Wildlife Refuge (RM 127), encompass sites adjacent to the LaGrange Pool of the Illinois Waterway. The Peoria Lake project (RM 162-181) is located within the Peoria Pool environs (see plates 1 and 2).

All four of these proposed projects address the specific need for enhanced aquatic and wetland habitat along the central reach of the Illinois River. The extensive conversion of wetlands to farmlands throughout central Illinois has greatly reduced the availability of prime waterfowl habitat in this region. In addition, increased sedimentation resulting from expanded agricultural activities has brought about tremendous changes in the morphology of the Illinois River, with the primary impact being the loss of aquatic habitat depth and diversity off the main river channel.

The Upper and Lower Peoria Lakes area historically provided extensive resting and feeding habitat for migratory waterfowl and notable fisheries diversity and productivity up through the mid-1960's. Sediment accumulation in these riverine lakes over the past two decades has resulted in their shoaling, to a point where wind fetch-generated wave action is capable of resuspending the bottom flocculents. The soft bottom sediments are not allowed to compact due to this constant churning. The resulting increase in turbidity levels has reduced photosynthetic activities within

the lake. Submergent and emergent vegetation that does develop under these conditions is unable to anchor itself to the lake bed, thereby allowing natural buoyancy to defeat its establishment.

The Peoria Pool encompasses nearly 73 miles of the Illinois Waterway. Several riverine lake features lie along this distance. Of these lakes, Upper Peoria has been the most severely degraded. The extremely low river gradient through this reach in combination with its parallel adjacency with respect to the main river channel has resulted in a sediment trap condition. This problem is intensified on Upper Peoria Lake by hydraulic dynamics that exist in response to the narrow neck that separates Upper Peoria Lake from Lower Peoria Lake as well as the lake's greater width and length.

Peoria Lake encompasses several sites which possess the fundamental areal extent and ownership/management requirements necessary for the development of a multiple element habitat project. The State of Illinois owns significant lands at three sites. These sites, which are shown on plate 3, consist of approximately 1,056 acres near Mossville, 1,766 acres in the vicinity of Spring Bay, and 2,776 acres in the vicinity of Goose Lake (Woodford County Conservation Area). These three sites were evaluated during the study from a viewpoint of enhancing habitat for both waterfowl and fisheries, and with regard to engineering parameters and potential operation and maintenance concerns.

3. ASSESSMENT OF EXISTING RESOURCES.

a. Related Studies and Reports.

(1) The Illinois State Water Survey has been conducting on-going Peoria Lake sediment investigations. A summary of relevant conclusions from Peoria Lake Sediment Investigations (Demissie, et al., 1986) is presented below:

(a) Peoria Lake is one of the most important water resources in central Illinois. It provides many benefits to the citizens of Illinois such as opportunities for recreation, fishing, and boating, and a channel for navigation. Most of the benefits were taken for granted for many years. However, continuous sedimentation over the years is threatening the existence of the lake. At the present time the lake has lost 68 percent of its original volume. The situation is even worse when the navigation channel, defined as that part of the lake which is 9 feet or deeper, is excluded from the lake volume. Outside of the navigation channel, Peoria Lake has lost 77 percent of its original volume. The average depth of the lake is only 2.6 feet and the average depth of Upper Peoria Lake is only 2 feet.

(b) Sediment load samples were collected during 1985 and correlated with water discharge data. The maximum sediment load measured was approximately 40,800 tons per day on February 27, 1985. Analysis of the suspended sediment samples indicated that over 95 percent of the suspended sediment in the river was silt and clay.

(c) Bedload measurements were also conducted. It was concluded that the bedload in the river consists principally of fine sediment and organic material and not coarse sediments such as sand or gravel.

(d) A total of 18 cross-sectional profiles was measured from the Franklin Street Bridge (RM 162.3) to Chillicothe (RM 182). At RM 164, approximately 14 feet of sediment accumulation had occurred. At RM 175, most of the lake had filled in with the exception of the navigation channel. The average depth at this location was approximately 2 feet at normal pool (440). At RM 179, the average depth of the lake was approximately 1 foot at normal pool with sediment depths of approximately 7 feet.

(e) The original deeper parts of the Peoria Lake are becoming shallower with the lake bed becoming very flat and uniform. There were few deep areas outside of the navigation channel.

(f) This report concluded that the sediment was very soft and could not provide proper habitat for fish and other aquatic organisms. Also, because the lake is very shallow and the bottom sediments soft, wave action causes resuspension of sediment leading to turbidity of the lake water.

(g) Sedimentation rates within both Lower and Upper Peoria Lakes were evaluated. Upper Peoria Lake had a sedimentation rate approximately 1.5 times that of the Lower Peoria Lake.

(h) It was estimated that 28 percent of the Illinois River sediment load is trapped in Peoria Lake. This amounts to approximately 1.2 million tons of sediment per year, which represents approximately 60 percent of the total annual sediment accumulation in the lake. It was further estimated that approximately 0.8 million tons per year, or about 40 percent of the total annual sediment accumulation of the lake, occurs from tributary streams.

(i) The report presented four main alternatives to affect lake sedimentation. These alternatives were: (1) control sediment input; (2) manage in-lake sediment; (3) hydraulically manipulate the Illinois River through Peoria Lake and (4) do nothing -- let the river establish its own dynamic equilibrium.

(j) The primary sources of sediment into Peoria Lake are: (1) the Upper Illinois River watershed; (2) watersheds of tributary streams which drain directly into Peoria Lake; and (3) shoreline erosion.

(2) A related report entitled Hydraulic Investigation for the Construction of Artificial Islands in Peoria Lake (Demissie, et al., 1988) studied the feasibility of the construction of islands in Peoria Lake. Conceptual designs studied included development of side channels along with islands to maximize environmental benefits. Hydraulic analyses indicated that the construction of islands was feasible from a hydraulic viewpoint.

(3) The Peoria Lakes River Planning Committee and the Peoria Lakes River Technical Committee prepared the Peoria Lakes River Basin Resource Plan (1989). More than 30 agencies and organizations were involved in this effort. The report presented an inventory of 45 basin problems and needs relative to soil, water, plants, and animals. A plan of action with priorities also was developed.

b. Resource History. Peoria Lake is the largest and deepest bottom land lake in the Illinois River Valley. It is located between RM 162 and 182 on the Illinois River. The bottom land lakes are remnants of a much larger glacial river system that occupied the Illinois River Valley. This larger river carried much greater flow than the present Illinois River and occupied much of the valley. Reduction in drainage area and changes in the flow regime of the old Illinois River resulted in the present Illinois River, which is smaller and more sluggish than the old river. The present Illinois River could not transport the sediment delivered by tributary streams, which resulted in the formation of alluvial fans and deltas near the mouths of the tributary streams. These fans and deltas created narrow and shallow segments in the river valley, which held back water in the deeper channels to form the bottom land lakes.

Peoria Lake was formed by the alluvial fan from Farm Creek at RM 162. Further upstream at River Mile 166.5, another alluvial fan deposited by Tenmile Creek divides the lake into two segments: Lower Peoria Lake and Upper Peoria Lake. This constricted segment of the Illinois River is referred to as the Narrows.

Initially four low dams were built on the Illinois River to provide a 7-foot navigation channel for large steamboats from the Mississippi River to LaSalle, Illinois. The dams were built at Henry in 1872, Copperas Creek in 1877, LaGrange in 1883, and Kampsville in 1893. In 1919, construction started on the Illinois Waterway, a project designed to provide a navigation channel with a minimum depth of 9 feet and a minimum width of 300 feet from the Mississippi River to Lake Michigan. This project required the construction of locks and dams along the Illinois River in the 1930's. The construction of the Peoria Lock and Dam in 1938 created the present day Peoria Lake system.

Peoria Lake has been relatively free of recent maintenance dredging in the navigation channel. (Off-channel sedimentation has been a major problem as described in Section 3.a.) Table 3-1 presents a summary of historical dredging.

TABLE 3-1

Peoria Lake Navigation Maintenance Dredging
1940-1987

Dredge Cut	Year Dredged	Amount Dredged (Cubic Yards)	Dredging Site (River Mile)	Placement Site (River Mile)
161.0-163.0				
Peoria Bridges/	1942	45,930	161.8-162.0	--
Farm Creek	1944	70,640	161.8-162.1	--
	1948	32,685	161.7-162.1	--
	1950	48,279	161.7-162.0	--
	1953	17,800	161.6-162.0	--
	1977	64,079	162.0-162.9	163.0L
	1979	34,551	163.0	163.0L
		313,964		

TABLE 3-1 (Cont'd)

Dredge Cut	Year Dredged	Amount Dredged (Cubic Yards)	Dredging Site (River Mile)	Placement Site (River Mile)
166.0-168.4				
Ten-Mile Creek	1946	187,863	167.6-168.4	--
	1948	31,041	167.8	--
	1969	41,217	166.8	166.8L
		260,121		
173.9-178.0				
Blue Creek/	1944	234,295	174.5-175.8 &	--
Rome Light			175.8-176.6	--
	1946	153,517	173.3-174.8 &	--
			176.4-178.3	--
	1949	242,225	174.9-176.6	--
	1954	309,532	174.1-178.4	--
	1959	125,981	174.0-177.0	--
		1,065,550		
180.8-181.8				
Senachwine Creek	1966	5,198	181.8	181.8R
	1968	70,893	180.5 & 181.8	180.5R & 181.8L/R
	1971	64,142	181.8	181.8R
	1973	57,422	181.8	181.8L
		197,655		

c. Land Use. Little property beyond the ordinary high water (OHW) mark of each pool remains in fee title ownership by the Corps. As noted above, management of most public land for wildlife and fish is the responsibility of the State of Illinois.

The existing land use for three State-owned study sites is summarized in table 3-2.

TABLE 3-2

Land Classification [1]

Resource Type	Acres		
	Goose Lake	Spring Bay	Mossville
Wetlands			
Palustrine			
Unconsolidated bottom	2,196	1,730	991
Forested	546	36	0
Developed	40	0	65
Total Wetland	2,782	1,766	1,056

1 Classification according to USFWS definitions.
2 Goose Lake is within the Woodford County Conservation Area

d. Aquatic Resources. Permanent year-round aquatic habitat within the project boundary is extremely limited and shallow. Any areas greater than 3 feet deep are located in the upper East River channel or immediately adjacent to the main navigation channel. As with most of Illinois River aquatic habitats, those of the Peoria Lake area are being lost to sedimentation. Overland flows during flood events carry sediments into isolated areas and have turned occasionally flooded remnants of channels or sloughs into ephemeral wetlands.

Non-forested or emergent wetlands, as typified by cattail, arrowhead, smartweed, or bulrush, are highly limited in the project site. Wind and wave action has tended to maintain turbidity in excess of tolerance levels that limit plant germination and growth. Colonization of aquatic vegetation is limited through simple mechanical disturbance of sprouts and substrate. The substrate in the project area is extremely soft, such that should germination occur, the plant will either be lifted from the bottom by wave action, or in some cases, by its own buoyancy (Roseboom, personal communication).

Elsewhere in the Peoria Pool, studies have been conducted which demonstrate that by reducing wave action and mechanical disruption, plants such as arrowhead can be established. In addition to mechanical disruption from wave action, waterfowl depredation also limits reestablishment of rooted aquatic vegetation. Due to a paucity of aquatic vegetation in the Peoria Pool, experimental sites have been heavily grazed by ducks and geese, further complicating the cause and effect analysis of limiting factors for aquatic vegetation in the Illinois River.

While aquatic vegetation is limited within the open water zones of Peoria Lake, valuable food resources for waterfowl are produced annually by the surrounding waterfowl hunting clubs. Both native and cultivated crops actively managed within the boundaries of leveed moist soil units provide a predictable food supply.

Aquatic resources in addition to non-forested wetlands include those of the Illinois River channel, channel border, and side channel environs. Side channel habitat is extremely limited in the project area. In recognition of this condition, the reopening of the East River side channel was identified as a priority by Illinois fisheries biologists. A review of fisheries data collected by the IDOC fisheries biologists over the past 5 years in the vicinity of the East River channel suggests the potential for improvement in the area. Thirty-nine species of fish from 10 families were collected in the area, indicating the need for several habitat types in the immediate vicinity to fulfill the life requisites of each species. While common species (gizzard shad, carp, drum, and emerald shiner) tolerant to the turbid waters of Peoria Lake were collected annually, other species (redhorse and logperch) intolerant to such conditions were collected far less frequently.

Flooded bottom lands provide low velocity refuge during high flows, and often serve as spawning areas for a wide variety of sport and commercial fish, depending on the depth and duration of flooding. As floodwaters recede, fish larvae and fry are either carried into slough, side channel, or channel border habitats or are trapped in permanent isolated waters or ephemeral ponds. These habitats can be beneficial during summer months as brooding cover, in spite of wide diurnal swings in dissolved oxygen levels. Generally during the summer, fish are eliminated from isolated waters by a combination of temperature and low dissolved oxygen.

With winter ice cover, any areas still holding water and that have not frozen solid display very little habitat value due primarily to reduced oxygen levels brought on by decaying vegetation and low light conditions. In low or no velocity habitats, decaying vegetation creates oxygen demands beyond levels that can be replaced through photosynthesis or inflow. In areas where fish cannot escape these conditions, winter fish kills result.

e. Terrestrial and Wetland Resources. Existing terrestrial habitat in the project area is typical of silver maple association bottom land forest. Considered wetland by definition of soils, hydrology, and plant species, the bottom land forest community of Peoria Lake today lacks the pin oaks that were once so abundant in the valley until the diversion of Lake Michigan in the early 1900's. The loss of the pin oaks had a detrimental effect on the valuable food resources once provided for migrating waterfowl. Today, the remaining bottom land forests supply an abundant source of invertebrates and sheltered refuge to migrating waterfowl, but only during periods of fall flooding. Unless flooded, much of the food production from the bottom land forest and cultivated areas cannot be used by waterfowl.

In addition to their value for migrating waterfowl, wildlife values associated with the above habitat also include feeding, resting, and nursery cover for a number of other species. White-tailed deer and furbearers, like raccoon and muskrat, are typical mammals found in the bottom land habitats. Along with the many game species, nongame species

alike, from hawks and owls to the smaller songbird species, share in the resource.

f. Water Quality. Water quality conditions throughout Peoria Lake are dominated by the shallow nature of the lake and the soft, unconsolidated sediments found throughout the lake. Siltation over the years has severely impaired several beneficial uses of the lake. The majority of the water quality problems observed at Peoria Lake are related to high turbidity values and suspended solids concentrations. These elevated values are a result of agricultural nonpoint runoff and resuspension of sediments due to the wave action from the wind and barge traffic. A lack of rooted aquatic vegetation throughout the lake also has contributed to the high turbidity and suspended solids values.

The majority of water quality information available for the Illinois River is from samples collected from the channel, not the backwater areas. In a 1988 publication, the Illinois Environmental Protection Agency rated the Illinois River (255 river miles) as "partially supporting aquatic life uses with minor impairment." This rating was primarily a result of elevated turbidity values and, to a lesser degree, high nutrient concentrations.

Two studies assessing water quality in the backwater areas of Peoria Lake have been performed recently. In conjunction with an aquatic plant reestablishment study, the Illinois State Water Survey (ISWS) measured several water quality variables on a weekly basis, from June 1986 through December 1988, in the lower portion of Peoria Lake. Results of this study indicated that comparatively high turbidity values and suspended solids concentrations were common at the study site. Turbidity values greater than 100 NTU and suspended solids concentrations exceeding 100 mg/l were observed on several occasions. In an effort to assess existing water quality conditions in the vicinity of the proposed Peoria Lake project, a monitoring program was initiated in 1989 by Rock Island District personnel. Low water levels made the sites inaccessible much of the time, allowing only a limited number of samples to be collected. Similar to the ISWS results, these tests showed relatively high suspended solids and turbidity values.

In order to predict the impact of proposed construction activities on water quality, on December 22, 1988, sediment samples were collected at three sites in the vicinity of the areas proposed for dredging. Results of bulk sediment and elutriate analyses indicate that ammonia nitrogen and suspended solids would be the parameters of concern should dredging occur; however, should the proper dredging and dredged material disposal management techniques be utilized, there will be little impact on the water quality of Peoria Lake. Any impacts seen would be temporary in nature. Additional discussion of testing and results is presented in Appendix B. Further consideration for water quality during construction is presented in Section 8.e.

g. Endangered Species. Three species potentially occurring in the Goose Lake area that are listed as federally endangered under the Endangered Species Act of 1973, as amended, are the Indiana bat (Myotis

sodalis), the bald eagle (Haliaeetus leucocephalus), and the Higgins' eye pearly mussel (Lampsilis higginsi). The Indiana bat typically frequents riparian habitats. Roosting and rearing areas for young are usually under loose bark or in cavities of dead or dying trees. However, no hibernacula are known from the immediate study area.

The bald eagle is a transient wintering species of the study area. It is usually found perched in large trees along the river bank. Feeding usually occurs in ice-free areas, and roosting is typically in heavily forested ravines. However, no resident nesting population of eagles is known for the Peoria Lake area.

The Higgins' eye pearly mussel, while once widely distributed in the Illinois River, has been all but eliminated by the effects of pollution and siltation occurring in the early 1900's.

As a result, the USFWS has determined that the proposed project will have no effect on the above federally endangered species.

h. Cultural Resources. For more than 70 years, the Illinois River has been known for its high frequency of prehistoric cultural resources and major archeological investigations. Although Illinois River Valley cultural resources have been extensively investigated, no major archeological excavations in the vicinity of the Woodford County Conservation Area/Peoria Lake Enhancement project have been conducted. Since the area lacks archeological investigation, assessing the potential for undiscovered cultural resources required extensive documentation and exploration.

Coordination with the Illinois State Historic Preservation Officer (SHPO) was initiated. With a letter dated June 6, 1989, the SHPO stated that no documented sites are located within the Peoria Lake Enhancement project, although a historic property is located one-half mile upstream on the Illinois River (appendix A, page A-10). Due to the proximity of this historic property, the SHPO recommended a Phase I archeological survey to search for cultural resources.

In order to assess the potential impact of the proposed project on significant buried or inundated cultural resources, a Phase I archeological survey contract was awarded to Stanley Consultants, Inc. The Phase I archeological survey was conducted in compliance with the National Historic Preservation Act (as amended in 1980); the Archeological and Historic Preservation Act of 1974; Executive Order 11593; and Title 36 of the Code of Federal Regulations, Parts 60-66 and 800 (as appropriate).

The major objectives of the Phase I survey were to: (1) conduct an archeological reconnaissance sufficient to determine the location of historic properties potentially eligible to the National Register of Historic Places (NRHP); (2) provide documentation based upon archival sources, subsurface testing, and visual sampling sufficient to determine project impacts; and (3) prepare a high quality technical report on the

results of the investigations with any recommendations for Phase II archeological testing procedures for NRHP eligibility determinations.

i. Sedimentation. Sedimentation has been studied and quantified as stated in Section 3.a. Additional soundings were taken in 1988 and 1989 for the entire Peoria Lake area. A comparison of 1988 sediment levels versus 1903 topographic map levels is shown on plates 20, 21, and 22. The average sedimentation rate for RM 178 to 180 has been approximately 1.5 inches per year. This rate was determined by evaluating the difference between the 1988 soundings and the 1903 elevations. As discussed in Section 3.a., the sedimentation rate has corresponded to changed lake inflow and watershed conditions.

Although there has been significant lake sedimentation, there has been no historical maintenance dredging within Peoria Lake.

4. PROJECT OBJECTIVES AND CRITERIA.

a. Objectives and Potential Enhancement. The project goals, objectives, and enhancement potential are summarized in table 4-1. Potential alternatives were developed in consideration of improving existing habitat weaknesses and utilizing resource opportunities. Detailed development of alternatives is presented in section 5.

b. Criteria for Potential Alternatives. Table 4-2 presents general and specific criteria developed to evaluate potential alternatives. Potential alternatives are presented in section 5 and evaluated in section 6.

TABLE 4-1

Project Goals, Objectives, and Enhancement Potential

			Enhancement Potential						
			Habitat Value Based				Physical Value Based		
				Without Alternative		With Alternative		Without Alternative	With Alternative
Goal	Objective	Potential Alternative	Unit	Year 0	Year 50	Year 50	Unit	Year 0	Year 50
Enhance Wetland Habitat	Increase reliable food production and resting area for waterfowl	Forested Wetland Management Area [1]	Habitat Unit	79	79	137	Acres of Vegetation	0	168
	Increase diversity and areal extent of submergent and emergent vegetation for waterfowl	Barrier Island [2]	Habitat Unit	15	15	69	Acres of Aquatic Vegetation	0	100
Enhance Aquatic Habitat	Provide flowing side channel aquatic habitat area	Side Channel Excavation [3]	Habitat Unit	5	3	15	Surface Acres of Flowing Channel	0	20

[1] A Forested Wetland Management Area (FWMA) would consist of an area bounded and divided by levees which would accommodate controlled ponding. During seasonal waterfowl migrations, this area would provide resting and feeding habitat.

[2] A Barrier Island would consist of a formed embankment which would function as a breakwater to dampen wave action and reduce re-suspension of sediment.

TABLE 4-2

Potential Alternatives Development Criteria

Item	Purpose of Criteria
A. General Criteria	
Locate and construct features consistent with EMP directives.	Comply with Public Law 99-662 regarding enhancement of fish and wildlife habitat.
Construct features consistent with Federal, State, and local laws.	Comply with environmental laws.
Develop features that can be monitored.	Provide baseline of project effects (e.g., sedimentation, stability, water quality).
Locate and construct features consistent with best engineering practice.	Provide basis for project evaluation and alternative selection.
B. Forested Wetland Management Area Location Criteria	
Locate on lands that enhance waterfowl support.	Improves existing habitat suitability for waterfowl.
Locate on lands connected to mainland.	Allow low-cost operation and maintenance.
Locate on lands with nearby IDOC field management personnel.	Utilize existing personnel resources for minimal cost increase of operation.
C. Barrier Island Location Criteria	
Locate island on lands that enhance waterfowl support.	Improves existing habitat suitability for waterfowl.
Locate island and other features on State-owned land.	Meet program objectives and provide clear ownership of off-shore islands.
Locate island on historical high ground.	Provide optimum island foundation.
Locate island in low energy river area.	Minimize erosion and subsequent soil movement.

TABLE 4-2 (Cont'd)

Item	Purpose of Criteria
Locate island close or connected to main navigation channel.	Minimize access channel excavation.
Locate and design island using the following priorities: a. Ensure geotechnical stability; b. Minimize hydraulic impacts to adjacent private lands and navigation channel; c. Maximize aquatic and terrestrial habitat improvement.	Ensure sound design approach.
Construct island with 6-8 feet of elevation above flat pool.	Provide consistency with other natural islands in the lake; island stability.
Construct island with native sediment.	Provide most economical method; demonstrate usability of material.
Protect island slopes with vegetation.	Provide optimum biological benefits; minimize initial and annual maintenance cost of riprap revetment; aesthetic considerations.
Align island to eliminate waves produced by south, southwesterly winds.	Allow bottom consolidation from resuspending waves generated by the seasonal predominant winds during the normal summer growing season.
D. Side Channel Excavation Site Criteria	
Locate channel to enhance aquatic habitat.	Improves existing habitat suitability for fish.
Locate channel diversion point to provide stable flows.	Ensure navigation channel is not affected.
Locate site on State-owned lands.	Meet program objectives and provide clear ownership of off-shore material placement sites.

TABLE 4-2 (Cont'd)

Item	Purpose of Criteria
Locate close to navigation channel	Minimize construction access.
Locate channel entrance in stable river zone.	Minimize additional bank stabilization and diversion structure.

5. ALTERNATIVES. Habitat enhancement alternatives consist of construction features in combination with appropriate resource management that meet specific habitat goals and objectives. Alternatives were developed using the following process: (1) Existing habitat weaknesses and opportunities were identified through existing data or use of habitat appraisal guides; (2) goals and objectives were then developed in response to these habitat weaknesses/opportunities; and (3) alternatives were then developed to meet specific objectives. Alternatives normally should be measurable from both a physical sense (acres, velocity change, etc.) and from a habitat value sense (habitat suitability index, habitat unit, etc.). Table 5-1 presents a summary of alternatives which meet project goals and objectives. These alternatives are subsequently described in this section.

TABLE 5-1

Summary of Project Alternatives

Goals	Objectives	Alternatives
Enhance Wetland Habitat	Increase reliable food production and resting area for waterfowl	A. No Federal action B. Forested Wetland Management Area (FWMA) (1) Location Options (a) Spring Bay (b) Goose Lake (2) Size Options (a) 50 acres (1 cell) (b) 100 acres (2 cells) (c) 150 acres (3 cells) (3) Additional Options (a) Clearing for construction (b) Tree plantings
	Increase diversity and areal extent of submergent and emergent vegetation for waterfowl	C. Barrier Island (1) Location Options (a) Spring Bay (b) Mossville (c) Partridge Creek (d) Goose Lake (2) Length Options (a) 0.5 mile (b) 0.8 mile (c) 1.1 miles

TABLE 5-1 (Cont'd)

Goals	Objectives	Alternatives
		(3) Additional Options (a) Floating vegetated islands (b) Revegetation
Enhance Aquatic Habitat	Provide flowing side channel aquatic habitat area	D. Side Channel Excavation (1) Location Options (a) Spring Bay (b) Goose Lake (2) Dimensional Options (3) Additional Options (a) Submerged rock substrate (b) Revegetation

a. Alternative A - No Federal Action. This alternative would consist of no Federal funds being provided to meet the project purposes. State and/or local funds would be required to enhance the Peoria Lake system.

b. Alternative B - Forested Wetland Management Area. This alternative consists of the construction of earthen levees with controlled water levels to support resting and feeding migratory waterfowl. Controlled water levels within an existing FWMA would provide both cover and shelter and an available source of desired invertebrates as a food source for migratory waterfowl.

(1) Location Options. Wetland habitat providing reliable waterfowl food production and resting areas could be substantially increased at two sites. These two sites meet project development criteria, as presented in table 4-2.

(a) Spring Bay. This site is located on the left bank at RM 170 and is presently used by the IDOC as a nature preserve, as shown on plate 3. Approximately 50 acres would be developable.

(b) Goose Lake. The site is located on the left bank at RM 179 and is presently managed by the IDOC as a wildlife refuge (Woodford County Conservation Area), as shown on plate 3. Approximately 178 acres would be developable.

(2) Size Options. In consideration of the available potential development at the Spring Bay and Goose Lake sites, options of approximately 50, 100, and 150 acres were considered. These sizes were selected based on lands available and existing slope to provide a maximum pond depth of 2 feet.

(3) Additional Options.

(a) Clearing for Construction. Additional ponded acres could be achieved by obtaining borrow for the levee from areas in elevation above and connected to the ponded area. These additional acres would be cleared and excavated to ensure that approximately 0.5 foot of water depth would be available during water control operations.

(b) Tree Plantings. Tree plantings would consist of planting selected mast tree species in suitable areas to provide additional waterfowl food resources.

c. Alternative C - Barrier Island. This alternative consists of the construction of an earthen embankment which would function as a breakwater. Wind-generated waves would subsequently be prevented from reaching the lee side of the island. With the elimination of significant waves, unconsolidated bottom sediments would consolidate and provide suitable substrate for the spread of introduced plant propagules started at the barrier island. Growth of an aquatic bed would improve the virtual nonexistent aquatic resources in the shallow backwater areas of the lake.

(1) Location Options. Wetland habitat, supporting submergent and emergent vegetation, could be increased substantially at four sites. These sites meet the project development criteria as presented in table 4-2.

(a) Spring Bay. This location is the same as the FWMA as presented previously. (See plate 3 for location.) The island would commence near the Blue Creek outlet and proceed downstream. This site is immediately adjacent to the navigation channel.

(b) Mossville. The Mossville site is shown on plate 3. The island would commence at RM 175 and proceed downstream.

(c) Partridge Creek. The Partridge Creek site is shown on plate 3. The island would commence at RM 177.4 and proceed downstream.

(d) Goose Lake. This location is the same as the FWMA as presented previously. (See plate 3 for location.) The island would connect to an existing island (Chillicothe Island), commence at RM 179.5, and proceed southwesterly.

(2) Length Options. In consideration of potential island alignments with resultant affected areas, island lengths of 0.5, 0.9, and 1.1 miles were considered.

(3) Additional Options.

(a) Floating Vegetated Islands. Floating vegetated islands would consist of floating modules with soil fill to support growth of wetland vegetation. These islands initially would be deployed on the

predominant wind side to enhance initial vegetation startup for select reaches.

(b) Revegetation. Revegetation could be allowed to occur naturally or could be implemented during construction. A construction phase revegetation plan would consist of several steps, including immediate seeding, anchored mats, aquatic plant sprigging, and woody tree cuttings.

d. Alternative D - Flowing Side Channel. This alternative consists of the excavation of lake sediments in a configuration that forms flowing side channel habitat. This type of habitat is considered desirable to improve fishery resources. A sufficient length of side channel is needed to ensure that a water level gradient is available at normal pool to cause water to flow continuously. The side channel must connect to the main navigation channel for the water source and eventually reconnect downstream to the navigation channel to ensure flow-through.

(1) Location Options: Flowing side channel habitat could be increased substantially at two sites. These sites meet the project development criteria presented in table 4-2.

(a) Spring Bay. This location is the same as the proposed FWMA and the barrier as presented previously. (See plate 3 for location.) The channel would require an adjacent island mass to ensure a positive water gradient. Connection to the navigation channel would require an armored connection for flow diversion.

(b) Goose Lake. This location is the same as the proposed FWMA and the barrier island as presented previously. (See plate 3 for location.) A portion of an existing side channel (East River) currently blocked by debris and sediment could be excavated to establish flowing side channel habitat. The existing mouth of the East River as the side channel diversion point is stable and well vegetated with willows.

(2) Dimensional Options. Once the site has been selected, hydraulic analyses would dictate side channel length, cross-sectional dimensions, diversion points, and reconnection points to the main navigation channel. Side channel benefits then would be derived from these characteristics.

(3) Additional Options.

(a) Submerged Rock Substrate. Submerged rock substrate would consist of placing graded rock at select flowing water locations to promote the colonization of mussel and other aquatic species.

(b) Revegetation. Revegetation could be allowed to occur naturally or could be implemented during construction. A construction phase revegetation plan would consist of several steps, including immediate seeding, aquatic plant sprigging, and woody tree cuttings.

6. EVALUATION OF ALTERNATIVES.

The alternatives listed in Section 5 were evaluated based on engineering considerations, ownership of lands, local restrictions or constraints, and their ultimate contribution to the project goals and objectives. This development criteria is summarized in table 4-2. Alternatives that were not feasible for engineering or other considerations were not subject to further evaluation. Once this screening was completed, the remaining alternatives were evaluated from an incremental cost viewpoint, comparing average annualized costs against average annualized habitat units to determine the optimum size and configuration of the alternative.

A numerical habitat appraisal methodology was used to evaluate existing conditions, to predict the future with- and without-project conditions, and to ultimately derive the habitat unit (HU) values that were used in the incremental analysis procedure. The selected methodology was developed by the Missouri Department of Conservation (MDOC) and the Soil Conservation Service and is known as the Wildlife Habitat Appraisal Guide (WHAG). WHAG incorporates concepts from a similar technique known as HEP (Habitat Evaluation Procedures) developed by the USFWS, whereby wildlife habitat characteristics can be described numerically.

Qualitative and quantitative assessment of the habitat types was accomplished by the WHAG study team comprised of members from the IDOC, USFWS, and the Corps of Engineers. The team developed Habitat Suitability Indices (HSIs) for each habitat type based on the numeric ranking of site characteristics. The HSI values provide an indicator of the habitat quality for a particular target species based on the life requisites (food, cover, etc.) of that target species. HUs then were generated by multiplying HSI values by the acreage of that particular habitat type.

The annual calculated HUs for each alternative are subsequently annualized over the 50-year life of the project and compared to the summation of the annualized first cost and the estimated annual operation and maintenance costs. The increment with the minimum cost per HU then was identified.

a. Alternative A - No Federal Action. Alternative A, no Federal Action, would not meet project goals and objectives of enhancing wetland and aquatic habitat for Peoria Lake.

b. Alternative B - Forested Wetland Management Area. The Goose Lake site located within Woodford County Conservation Area was more favorable over the location in the Spring Bay area for three primary reasons. The Goose Lake site has the potential for development and subsequent management of approximately 178 acres, whereas the Spring Bay location has only 50 acres. In addition, the Goose Lake site is an existing State-owned wildlife refuge with a resident field office and staff operated by the IDOC. No additional land would need to be acquired for the development of an FWMA.

While a numerical habitat assessment system (i.e., WHAG) could have been used to further evaluate the two locations, it was concluded that the above reasons were enough justification for support of the Goose Lake site.

A WHAG analysis of HSI and HU values for bottom land hardwoods habitat at the Goose Lake site indicate that the existing conditions in the area of the proposed FWMA have a fair habitat value for waterfowl, but that water level control is a limiting factor. Construction of an FWMA thus becomes a feasible alternative.

Incremental analysis of one-, two-, and three-celled FWMA options determined the optimum size and configuration. Table 6-1 presents a tabular analysis of the annualized HUs versus the annualized costs of the FWMA options. The analysis indicated that the three-celled configuration encompassing approximately 168 ponded acres is the optimum size from a cost per HU basis.

c. Alternative C - Barrier Island. Table 6-2 summarizes the evaluation of the four site location options.

Two sites, Spring Bay and Mossville, were determined not to be feasible locations for a barrier island due to the high recreational activity in the area and the proximity to a populated shoreline. Of the two remaining sites, the Goose Lake site was more favorable over the Partridge Creek location principally due to shorter construction access from the main channel for a large floating plant (6-foot draft). Therefore, the Goose Lake site was considered to be the most favorable location for the island construction.

Once it was determined that the island would be most feasible at the Goose Lake site, the exact placement within the Goose Lake site was dependent on extensive geotechnical and hydraulic considerations. As presented in table 4-2, the configuration would be based on maximum geotechnical foundation stability and minimum impacts to the navigation channel.

HSI and HU calculations were performed for the barrier island construction at the Goose Lake site using the WHAG methodology for non-forested wetland habitat. The results indicated that the habitat is very poor in quality for the mallard target species. This fact is substantiated by the lack of aquatic vegetation in Upper Peoria Lake in general. Although limited in food value, Goose Lake functions as a critical resting and loafing area for migrating waterfowl. Without the construction of a barrier island, the Goose Lake area in the future would remain limited in food resources but would still function as a critical refuge area. However, with the construction of the island, the qualitative improvements to Goose Lake would be significant. The area would not only function as a refuge complex, but also would provide additional available food resources in terms of aquatic vegetation. Therefore, construction of the island was considered to be a feasible alternative.

TABLE 6-1

Comparison of Alternatives and Incremental Analyses

		Annual Cost		Habitat Value Gain		Cost Per Gained Habitat Value	
Alternative	Increment	Total Annual $	Incremental $	AAHU*	Incremental AAHU*	$/AAHU*	Incremental $/AAHU*
Forested Wetland Management Area	50 Acres (cell B)	39,900		1,090		36.61	
			21,600		1,070		20.19
	99 Acres (cells B+C)	61,500		2,160		28.47	
			25,900		1,340		19.33
	168 Acres (cells A+B+C)	87,400		3,500		24.97	
Barrier Island	.5 Mile	91,900		1,500		61.27	
			48,900		890		54.94
	.8 Mile	140,800		2,390		58.91	
			40,200		890		45.17
	1.1 Miles	181,000		3,280		55.18	

AAHU* = Total AAHU = AAHU x 60-day migration

TABLE 6-2

Evaluation of Barrier Island Site Location

Site Option	Evaluation
Spring Bay	- Located in vicinity of a high recreational boating area. - More embankment needed due to existing deeper water (3-4 feet). - Potential navigation concerns with diverted water.
Mossville	- Minimum biological benefits due to proximity of populated shoreline.
Partridge Creek	- 2,000 feet from navigation channel for construction access. - Orientation of island on existing State-owned lands would produce minimal wave-free zone.
Goose Lake	- Close to main navigation channel for construction access. - Minimum embankment due to 1-2 feet of existing water depth. - Connection to existing island (Chillicothe) would enhance stability and revegetation.

The final island length was sized by an incremental analysis comparison of the annualized HUs versus the annualized costs for three different lengths of island. The results are presented in table 6-1. The optimum island length was found to be approximately 1.1 miles. Additional longer island lengths were not evaluated due to budgetary constraints.

d. Alternative D - Flowing Side Channel. Table 6-3 summarizes the evaluation of the two site location options.

The establishment of a flowing side channel at the Spring Bay site was determined to be not feasible for several reasons. The Spring Bay side channel's close proximity to the navigation channel could have potential negative impacts on the navigation channel. This major concern, along with additional hydraulic considerations and potential maintenance dredging requirements (due to the heavy Blue Creek sediment deposits), made the Goose Lake site appear to be more advantageous. In addition, the East River was a historic side channel presently blocked at the end by a silt plug.

The WHAG habitat assessment for the East River side channel was conducted using a newly developed aquatic component for Habitat Appraisal Guide methodology. The experimental target species for the side channel habitat evaluation was the channel catfish. The results indicated that both qualitative and quantitative improvements could be made to the East River channel by the excavation of the silt plug. As a result, the East River channel cleanout was considered to be a feasible alternative.

An incremental analysis was not performed on the side channel restoration because the configuration of the outlet channel was ultimately determined by the hydraulic requirements dictated by channel geometry (presented in Section 5.d.). However, see table 9-1 for habitat unit analysis of the side channel excavation and comparison with no action.

TABLE 6-3

Evaluation of Flowing Side Channel Site Location

Site Option	Evaluation
Spring Bay	- Side channel water control needed to divert flows. - Success depends on flowing side channel water. - Potential navigation concerns with diverted flows. - Sediment load from Blue Creek (adjacent tributary) probable maintenance problem.
Goose Lake	- Open existing East River channel presently blocked by sediment. - Existing Chillicothe Island should provide natural water diversion to East River with minimal navigation effects. - Concern for long-term sedimentation in outlet channel.

7. SELECTED PLAN WITH DETAILED DESCRIPTION.

a. General Description. The alternatives of an FWMA, a barrier island, and the restoration of a flowing side channel were selected. These alternatives were individually evaluated relative to project goals and objectives as presented in Section 6. It was concluded that these alternatives could be best located in the Goose Lake area. This site, with the proposed alternatives and construction features, is shown on plate 2.

An FWMA would provide cover, shelter, and food sources for migratory waterfowl. This alternative will increase the existing wetland value for mallards by approximately 74 percent. Construction of the FWMA at the Goose Lake site meets project objectives, is on land presently operated by the IDOC as the Woodford County Conservation Area, would be operated by IDOC site personnel already assigned, and is part of an area currently managed as a refuge.

The barrier island alternative would provide a protected, wave-free zone to promote establishment of an aquatic bed. Aquatic beds are virtually nonexistent in Peoria Lake due to shallow water, soft sediment bottoms, high turbidity levels, and uprooting waves. Establishment of aquatic beds would provide both a food source and resting area for migratory waterfowl. The aquatic bed also would increase the existing wetland value for mallards by approximately 360 percent.

It was concluded that the Goose Lake site best supported the construction of a barrier island from several viewpoints. This area of upper Peoria Lake has received the greatest quantity of sedimentation and continues to receive the highest rate of sedimentation. Field investigations have revealed that much of Goose Lake is not a favorable aquatic habitat due to these bottom sediments being resuspended by wave action. Construction of a barrier island in this area would protect a portion of Goose Lake from wind-driven waves, resulting in the establishment of rooted submergent and emergent vegetation.

Furthermore, the location of the proposed barrier island provides good construction access, will require minimum embankment quantities due to existing shallow water conditions (1-2 feet), and can be located on a firm foundation associated with historical high ground. This site's location within the Woodford County Conservation Area would minimize the need for additional IDOC management personnel and therefore operation and maintenance costs. This site will support an island of approximately 1.1 miles in length, which will provide maximum enhancement benefits consistent within budgetary constraints.

Construction of a flowing side channel was selected to provide side channel aquatic habitat in Peoria Lake. Side channel habitat is one of the most productive aquatic habitats for fishery resources. This alternative will improve the existing aquatic habitat by approximately 200 percent.

It was concluded that side channel excavation in the vicinity of the East River by Chillicothe Island would meet project objectives. Because the East River was a flowing side channel prior to sediment blocking the outlet, the existing Chillicothe Island will provide a natural water diversion point without additional construction features.

Mast tree plantings would be possible within the FWMA and on the adjacent raised embankments of the East River excavation. Placement of rock substrate at selected locations within the East River channel would provide habitat for mussel and other aquatic species. Floating vegetated islands anchored in the vicinity of the barrier island would provide both a breakwater effect for island stabilization and additional wetland habitat.

The following paragraphs present detailed descriptions of the proposed project features that resulted in their recommendations.

b. Forested Wetland Management Area. The FWMA consists of an area bounded and divided by levees which form controlled ponding units. The proposed site plan of the forested wetland area is shown on plate 13. The principal components of this development are described in the following paragraphs.

(1) Water Control Plan. A schematic of the proposed water control plan is shown on plate 17. Because it was desired to have ponding depths of approximately 2 feet, a 3-cell unit was designed to take advantage of the existing topography. Water will be pumped from a new pump station into Cell A. Water then can be ponded in Cell A or allowed to run directly into Cell B. Water will continue to run into Cell B where it may be ponded or allowed to run into Cell C. The purpose of the stoplog structures in Cells A, B, and C, is to allow flexible and independent operation of each cell. As shown on plate 17 and described in detail in table 11-2, the proposed 3-cell structure will meet operational requirements.

(2) Water Supply. It was desired to fill cells A, B, C within an approximate 10-day pumping period. Taking into account seepage and evaporation/transpiration effects, a water supply of approximately 6,000 gpm was selected.

Two options for a water source were considered. One option consisted of using surface water from an existing side channel adjacent to the project site. This option would consist of a concrete structure with intake trash rack, turbine electric pump, approximately 400 feet of discharge pipe, and a discharge structure. The second option for a water source consists of the construction of a new well. This option was determined to be not feasible due to lack of aquifer capacity and potential negative influence on area wells.

Water would be pumped from a surface intake pump station using a 30-horsepower submersible pump having a capacity of approximately 6,000 gpm against a total dynamic head of approximately 12 feet. A proposed pump station is shown on plate 18. Water will be pumped through a 24-inch

concrete pipe into a discharge assembly. The purpose of the discharge assembly is to dissipate exit velocity and to prevent vandalism to the pipe. Water from this point will flow overland into Cell A as previously described.

(3) Water Control Structures. Proposed water control structures are shown on plate 19. All structures will be the same type as shown on this plate and have four 5-foot openings for a total hydraulic opening of 20 feet.

The structures consist of a concrete sill with concrete dividing walls and abutments that incorporate stoplog recesses. The stoplog recesses would be used for water control of Cells A, B, and C as previously described. A heavy duty grating would be provided across the structure to allow vehicular access.

The hydraulic opening of these structures has been determined based on hydrologic simulation of Illinois Waterway flood events. The hydraulic opening size was finalized after a selected river event overtopped the proposed levees with approximately 1 foot of head differential still remaining on the interior of the cells. This sizing method was chosen to minimize overtopping damage. The opening width in the water control structures is sufficient to allow the interior cells to rapidly fill such that at the overtopping point, the head differential between the exterior and the interior is approximately 1.0 foot.

(4) Levees. Proposed sections of the levee embankments are shown on plate 16. The river side of Cell A embankment has been provided with a 6:H to 1:V slope to prevent high water wave erosion damage. All other embankment slopes are 3:1 which will facilitate levee maintenance. The top width of the levee is 12 feet in order to facilitate access to the stoplog structures and other operational requirements.

The average height of the levees is approximately 5 feet. The levees would be excavated from an adjacent borrow source as shown by use of a dragline or backhoe for cells B and C and by scraper for cell A. The typical levee sections have been developed to minimize clearing operations.

(5) Site Access. Site access is required as shown on plate 13. Crushed stone surfaces have been provided to facilitate operation, maintenance, and inspection. Turnarounds also have been provided to facilitate these uses.

c. Barrier Island. The proposed site plan of the barrier island is shown on plate 8. Significant studies and site investigations were conducted to determine the island location, construction methods, island geometry, bank stabilization measures, and other features. These aspects will be addressed in the following paragraphs.

Typical sections of the proposed barrier island are shown on plate 9. The proposed island will have an approximate 50-foot-wide crown, with an

overall width of approximately 182 feet at elevation 435. This width was based on foundation stability and is consistent with other similar projects. The top of the island was established at elevation 446 which was consistent with project objectives and geotechnical stability. The borrow material for the island embankment will be excavated from an adjacent borrow area. The borrow site will require approximately 226 feet at the top, sloping to approximately 135 feet at the bottom of the borrow area. The bottom elevation of the borrow will be approximately elevation 425, which represents 15 feet below Peoria flat pool. Horizontal geometry and side slopes have been fixed to be consistent with foundation and embankment stability.

(1) Location. Foundation considerations were the principal reasons for locating the island as shown. The proposed island follows historical high ground that was depicted on 1903 surveys. Once optimum foundation support was established, the island was further shifted to minimize hydraulic impacts. This site also was chosen because it is adjacent to the proposed East River side channel excavation which provides navigation channel construction access.

(2) Hydraulic Assessment. Hydraulic modeling was conducted by the Waterways Experiment Station for both the proposed barrier island and side channel excavation. It was concluded that the barrier island would not raise water surface elevations. The island functioned as a submerged weir for which all hydraulic control was eliminated because of the high water service elevation. One critical hydraulic condition is at initial overtopping. However, the modeling test showed that the existing islands would be stable under such a condition because of the cohesive sediments used. The presence of the island and excavation in the side channel area had no discernable impact on the current patterns or magnitudes in the navigation channel. The study also concluded that the barrier island would not cause any significant change in sediment patterns on adjacent privately owned lands.

(3) Construction Methods. Two principle island construction methods were evaluated. A mechanical excavation option consists of mechanically excavating adjacent soft sediments with gentle placement on adjacent sites using multiple passes to ensure island stability. Hydraulic dredging also was considered. This method consists of hydraulically dredging adjacent or nearby sand borrow sources to form a confined material placement facility in Peoria Lake with subsequent soft sediment hydraulic dredging to fill the interior of the island. The advantages and disadvantages of the two construction methods are presented in table 7-1.

TABLE 7-1

Construction Options for Embankments Constructed in Water on Soft Foundations

Construction Option	Advantages	Disadvantages
Mechanical excavation using only adjacent soft sediments.	- Maximize sediment removed. - More cost-effective method. - Excavated sediment material greatly promotes re-establishment of vegetation for habitat enhancement due to high nutrients.	- Potential erosion preventing vegetation establishment. - Potential water quality issues during excavation. - Potential problems with disposition of soft (undesired) overburden overlying firmer (desired) material.
Hydraulic dredging using sand as a containment facility with subsequent soft sediment hydraulic dredging for inner island fill.	- Probably minor water quality issues. - More conventional design and construction approach.	- More expensive method. - Only small amounts of soft sediment could be pumped into the interior due to slope angle of sand. - Island banks would require mechanical placement of soft sediments to promote vegetation and enhance habitat development.

Similar, mechanically excavated islands have been constructed in southern Louisiana as part of a marsh management program. Side slopes of these islands were approximately 10:1. These islands were constructed with a 7-cubic-yard clamshell at a cost of $1.05 per cubic yard in 1986. The constructed islands were about 4 to 6 feet above water and were formed in 2 to 3 passes. Approximately 15 days between passes was necessary to allow crust formation on the previous pass. This method of excavation was successful due to the use of a large bucket with bucket loads placed gently, as opposed to high drops or sidecasting. Firmer material was placed near the outside, with less firm material inside.

The mechanical excavation option was selected because it utilizes the adjacent sediment as a borrow source rather than imports sand for levee embankment.

(4) Island Geometry. After geotechnical and hydraulic considerations were established, natural resource considerations were incorporated to ensure greatest habitat enhancement. The present alignment, as shown on plate 8, was selected over a crescent or irregular alignment.

(5) Bank Stabilization. Two principal options for bank stabilization were evaluated. Bank protection is required subsequent to placement to minimize erosion from wind-driven waves, flood currents, and navigation vessel waves. The standard option of riprap on a geotextile fabric as bedding/separation layer is not as cost effective as the second option. The second option consists of planting vegetation on the flattened slopes to prevent erosion.

The vegetation option was selected. Table 7-2 provides a summary of the revegetation steps and construction sequences.

TABLE 7-2

Barrier Island Revegetation Steps

Step	Item	Construction Sequence
1	Provide temporary seed cover. [1]	Place by hydro-seed approximately 7 days after embankment placement.
2	Provide and anchor biodegradable erosion control matting 12 feet in width on outer slope extending horizontally 4 feet into the water. [2]	Place approximately 2 months after embankment placement. Mat placement and anchoring should occur as soon as the embankments sufficiently crust to allow foot traffic and anchor methods.
3	Plant individual sprigs at 18-inch centers through cut slits in the mat from the submerged edge to just above elevation 440 (approximately 4.5 feet in width) and similarly into natural ground on the inside slope. [3]	Place immediately after anchoring of erosion control mat.
4	Plant tree cuttings on 18-inch centers through slits in the mat on the outer slope from the edge of the plant sprigs (approximately 7.5 feet in width) and similarly	Place immediately after anchoring of control mat and after placement of plant sprigs through the mat.

TABLE 7-2 (Cont'd)

Step	Item	Construction Sequence
	into natural ground on the inside slope.[4]	
5	Place aquatic plant propagules on inside of barrier island on 18-inch centers.[5]	Place approximately 12 months after embankment placement.
6	Provide herbaceous seed cover on the island above the tree cuttings.[6]	Place in the spring of the second growing season.

[1] Reed canary grass, fescue, prairie cord grass, and winter wheat
[2] Mat from horse hair, and coconut and wood fibers
[3] Arrowhead plants
[4] Cottonwood and willow cuttings from adjacent Woodford County Conservation Area lands, 0.5 to 1.5 inches in diameter, 15- to 18-inch lengths
[5] Illinois pond weed, water lilies, pickerelweed, arrowhead, and bulrush
[6] White Dutch clover, timothy, and other suitable legumes

The need for a separate breakwater was evaluated. Based on wave analysis and the wave dampening effects of both the soft sediment placed adjacent to the borrow source and the sediment displacement wave caused by the new embankment placement, it was determined that a breakwater was not required. The above natural revegetation techniques were selected and are consistent with other field sites.

(6) Other Features. Construction access for the proposed Goose Lake site was evaluated. Excavation of the East River side channel provides deep water access for required construction equipment.

The relative location upstream or downstream of the proposed barrier island borrow source was also evaluated. The downstream side was selected as the borrow site principally due to the following: (1) waves would be dampened to some degree; (2) because firmer material would be placed adjacent to the borrow site, a more durable erosion protected slope would occur; and (3) the desirable rooted plants established on the upstream side could then propagate into Goose Lake without interruption.

d. Side Channel Excavation.

(1) General Description. The proposed side channel excavation is located in the historic East River channel as shown on plate 8. Field reports indicate that the East River was a flowing side channel until circa 1965. At that time, a logjam became entrapped on top of accreted sediments, and willow growth soon followed. Site soil borings conducted in 1989 reveal subsurface deposited sediments with only surficial logjam debris. It appears that the East River channel was blocked by gradual sediment accumulation until an eventual logjam made final the top closure, accelerating remaining deposition.

The excavation area is divided into two separate reaches as shown on plate 8. The first reach consists of an approximate 2,250 feet of channel which will have a bottom width of approximately 95 feet. Excavation from this reach will be placed on adjacent banks with 6:1 side slopes to approximate elevation 447. An adjacent strip of tree clearing will be required as shown approximately 172 feet in width. After construction, these embankments will be seeded and revegetated similar to the barrier island as previously discussed, except that matting will not be required..

The second reach of the East River excavation consists of an approximate 1,300-foot outlet channel as shown. This channel section also will have an approximate 95-foot bottom width with excavation placed on adjacent sides to elevation 441.5.

Both reaches will be excavated to elevation 433, a clear water depth of 7 feet from flat pool. This depth was principally selected to allow excavation equipment access to the East River construction site. However, the long-term project depth in the East River area is 4 feet from flat pool which accounts for expected sedimentation. Similar construction methods as described in the barrier island section will be used to excavate this area. The construction will consist of multiple passes using a large clamshell bucket gently placing excavated material on both sides.

Minor land acquisition by the State of Illinois is required as shown on plate 11. Lands of approximately 57 acres are needed for the side channel excavation and placement, the rock fill of the upper cut, and for the placement of the rock substrate.

(2) Hydraulic Assessment. The proposed excavation was modeled similar to the barrier island placement methods. Based on historic sedimentation rates as influenced by the proposed measures to ensure side channel flow, it was determined that this area would require re-excavation of deposited sediments in approximately 25 years. This re-excavation maintenance cost has been shown in table 13-2.

The downstream reach of the excavated channel was studied carefully to ensure no navigation impacts. The side-placed embankments with elevation 441.5 will not encroach or affect navigation. Excavation for the first

100 feet into the outlet channel will be placed to ensure that wave attack will not cause sloughing into the main channel.

e. Tree Plantings. Tree plantings are proposed for both the FWMA, the barrier island crest, and the elevated East River embankments. The tree planting plan and vegetation management will be coordinated with the cooperating agencies.

f. Submerged Rock Substrate. Placement of two rock substrate beds has been proposed, as shown on plate 8. This location was chosen based on estimated channel velocities at various river stages. It was desirable to locate this bed in a stable bottom zone and with velocities exceeding approximately 1 foot per second. The East River area was the only such location within the project site.

Each rock bed will consist of an approximate 2-foot-thick rock blanket about 50 feet wide by 300 feet long. This configuration was chosen based on field experience (WES) for establishment of habitat diversity and measureable responses. Each bed will be of specific gradations. One bed will be a 50:50 mixture of medium sand and gravel 1 to 3 inches in diameter. The other bed will be a 50 percent mixture of medium sand, 25 percent 1- to 3-inch gravel, and 25 percent cobble or rock (particles up to 10 to 12 inches in diameter. Placement of the gravel bars will be directly related to the current velocity in the East River channel. The more coarser-grained material should be in the higher velocity currents, whereas the finer-grained material should be in the lesser velocity currents.

g. Floating Vegetated Islands. Floating islands are a natural phenomenon that occur in bogs and marshland over a wide geographic range. These floating mats of vegetation result from air trapped within the various parts of the plants, thus making the entire mass highly buoyant. The islands serve a variety of functions, from improvements in water quality to habitat for wildlife. Thus, the concept of floating islands has been incorporated into artificial floating modules that have been tested and implemented in small lakes and ponds in Europe.

An experimental pilot project consisting of two islands, each composed of four modules, will be tested in Peoria Lake. The location of the proposed islands is shown on plate 8 with typical sections shown on plate 12. The soil-filled modules will be planted with vegetation and anchored to allow full vertical movement from flat pool (440) to an approximate 100-year event (460).

8. DESIGN AND CONSTRUCTION CONSIDERATIONS.

a. Construction Equipment. Both land-based and floating plant equipment will be required for this project. Conventional excavation equipment such as crawlers, scrapers, and draglines would be used for the FWMA.

Because of geotechnical considerations presented in Section 7.c., a minimum clamshell bucket size of 7 cubic yards will be required. The boom length of this clamshell must be approximately 180 feet. The estimated production rate of this equipment is 4,000 cubic yards per day, based on a 24-hour operating day. Approximate water draft required for this equipment is 6 feet.

b. Barrier Island Foundation. A review of the soil strength data indicated that the island can be constructed by the soil displacement method without the benefit of geotechnical fabrics. Soil displacement is a method of foundation or levee construction where volumes of material are simply dumped or placed on soft soils until the weaker soil has been displaced to the depth where the soil beneath the fill becomes stable. In many cases, four to five volumes of fill below grade are required before one volume is stable above grade. Soil displacement is the least costly alternative if the volume of material displaced is not excessive and if the material could be placed to design heights. Using the soil displacement method, fill is gently side cast to the placement site and spread progressively beginning from one end of the embankment.

However, savings may be realized by the use of a geotechnical fabric as a foundation separation layer and to increase subgrade strength. It is proposed that a short reach of the barrier island use geotechnical fabric to evaluate this technique.

c. Construction Sequence. A construction sequence for the island and East River excavation is shown on plate 10. A summary of this sequence is as follows: (A) The contractor starts at the mouth of the new East River outlet channel and excavates 800 feet to the beginning of the barrier island; (B) then proceeds for the first pass to the end of the barrier island; (C) then the next 500 feet of the entrance channel; (D) then the first pass of the East River; (E) then the second pass of the first 800 feet of the entrance channel; (F) then the second pass of the next 500 feet of the entrance channel; (G) then the second (and last) pass of the East River; (H) then the second pass of the barrier island; and (I) then the third (and last) pass of the barrier island.

The time intervals shown are minimums in which the project could be completed. It is noted that soft soil construction is difficult and that the soil strength increases with time as it is allowed to consolidate. Time between passes must be field monitored with soil testing between passes to assure that minimum stability requirements are met. The contractor should not be allowed to throw the material from the clamshell but must place the clamshell and then release the material to retain maximum strength from the

in situ borrow material. This strength is essential because placement of the succeeding layers for the island will be on previously placed borrow material. Further consideration will be given to time between passes as a contractual requirement. Operating distances from the barge (or borrow area) to the toe of the island should be strictly maintained to avoid stability failures.

d. East River Hydraulic Considerations. The final alignment and length of the outlet channel, as shown on plate 8, may be modified without hydraulic, sediment, or navigation effects. The goal of the outlet channel alignment is to provide a stable side channel without sediment accretion.

To enhance East River channel velocities with subsequent sediment scour, an existing breach, as shown on plate 8, is proposed for filling. Additionally, the entrance to the barrier island borrow site should be filled as construction is completed when equipment leaves the site. The height of this fill should be approximately 438.

e. Lake Water Quality During Construction. This section addresses lake water quality issues during the construction of the barrier island and the East River cleanout. The construction process consists of using a 7-cubic-yard clamshell bucket (minimum) for excavation with gentle placement on the adjacent placement sites.

The mechanical method of excavation (as opposed to hydraulic dredging) was selected for several reasons, which included most cost effective, utilizing available resources, and providing substrate for immediate revegetation. These reasons are discussed in Section 7.c.

The clamshell bucket was selected for two reasons: (1) This bucket can excavate large soil masses without significantly disturbing/destroying the internal strength properties of the soil; and (2) this bucket produces the least turbidity compared to other bucket types (i.e., dragline, backhoe).

Two principal water quality parameters need consideration during the construction process: ammonia nitrogen and suspended solids. The elutriate test results indicated the potential for ammonia nitrogen to exceed State water quality standards. Additionally, the suspended solids typically produced during the excavation process also require consideration.

(1) Suspended Solids. Regarding the suspended solids (turbidity plume), it is proposed that no specific treatment measures (such as turbidity curtains) be required to control the turbidity. This proposal is based on the following: (1) The clamshell produces the least turbidity of existing, available bucket types; (2) ambient suspended solids have varied from 25 to 225 milligrams per liter due to existing waves, shallow water, and unconsolidated sediments during the study phase; (3) because of the large project site, control (for treatment purposes) of contaminated water is technically and practically infeasible; and (4) the short-term construction impacts on localized water quality should be considered relative to the project benefits which are environmental enhancement of Peoria Lake.

For project development purposes, an alternate proposal for turbidity control will be presented. This plan consists of using floating baffles that either will encircle the excavation site or be placed downstream. This concept is shown on plate 24. The construction sequence will consist of anchor placement, as shown, followed by attachment of the floating baffles. The floating baffle consists of a flotation collar which supports an impermeable skirt or curtain. The curtain bottom is weighted by a chain ballast which prevents significant underflow.

The sizing of the containment system is based on estimated retention time. Depending on actual inflow velocities, which may vary from 0 to 0.1 foot per second during low flows, retention time will vary from days to approximately 3 hours. Column settling tests indicated that zone settling is clearly occurring between 2 to 4 hours.

After placement of the island and completion of the East River cleanout, an extensive seeding and revegetation plan will be immediately implemented, as described in table 7-2 to ensure minimal shoreline erosion.

(2) Ammonia Nitrogen. Regarding ammonia nitrogen, a study was conducted to evaluate methods of controlling and possibly removing a portion of the ammonia nitrogen from the discharge plume. The principal sources of this nitrogen are from the application of fertilizers on a basin-wide agricultural area, from the natural decomposition of organic matter, and from anaerobic bacterial denitrification. This dissolved ammonia (NH_3 and NH_4^+) is released during normal dredging operations. Elutriate testing has indicated that high levels of ammonia are likely to occur.

The elutriate testing performed to date is representative of the top 1 to 3 feet. However, the borrow site will reach approximately 15 feet in depth (elevation 425). Although a portion of this deeper borrow still will be sediments, most will be either from virgin ground or from old, substantially compressed sediments. Soil borings and vane shear tests have confirmed these properties. As presented in Section 7.c., the island site was principally selected due to such foundation stability. Therefore, it is estimated that the subject elutriate testing represents worst case ammonia levels from worst case soils and worst case dredging methods (hydraulic dredging). In other words, ammonia levels during excavation at the deeper elevations should be substantially less than predicted due to: (1) the small amount of contaminated surficial sediment relative to the total amount of material to be excavated and (2) the method of excavation will be by clamshell with gentle placement rather than by hydraulic cutterhead.

Although use of the above construction methods supports that ammonia should not be a problem, an evaluation of potential treatment methods was conducted. The results are summarized in table 8-1.

In summarizing these potential ammonia removal methods, there are four general processes: (1) breakpoint chlorination; (2) selective ion exchange;

(3) air stripping; and (4) oxidation ponds (spraying). The first three methods were determined to be not feasible principally due to off-shore logistics and cost. Although the oxidation pond (spraying) method is technically feasible, the amount of ammonia removed makes this process impractical and not cost effective.

Table 8-2 was prepared to show the results of ammonia removal using spraying and stripping tower methods at ambient pH. These processes were evaluated at ambient pH (as opposed to elevating pHs to 11) because of substantial reduction in treatment costs due to raising and lowering of the pH. Un-ionized NH_3 always is in equilibrium with NH_4^+. Efficient stripping using a tower will reduce the un-ionized NH_3 fraction by approximately 75 percent. However, the NH_4^+ fraction then will form additional un-ionized NH_3 in re-establishing equilibrium. The overall un-ionized NH_3 reduction is then very small at this point (20 percent). [It is noted that the conventional ammonia stripping process first elevates the pH to approximately 11 and converts all ammonia (NH_3 and NH_4^+) to the un-ionized form (NH_3), which is then easily strippable.] See footnote 3 of table 8-2 for example calculation explaining the above process.

Consideration also was given to restricting the contractor excavation to when the water temperature is cold. This time historically occurs during early spring, late fall, and winter. However, in attempts to minimize turbidity travel and to allow the greatest soil consolidation time, excavation should not be performed during known (forecasted) significant flood events. Although early spring does have colder water temperatures, it also (on the average) has significant flood events. In view of the last 24 years of river hydrographs (plates 4 through 6), excavation should not commence until July.

A prudent contractor normally would stop work in December to prevent equipment from being stranded and from possible ice damage during winter ice conditions. Therefore, the average potential construction season normally will begin in July and terminate in December, for a period of approximately 6 months. The estimated excavation time is about 12 months, based on 2,000 cubic yards per day and 12 hours per day. Consequently, <u>two</u> construction seasons will be required if each season is approximately 6 months; or <u>four</u> construction seasons will be required if the summer season is excluded due to warm water temperatures.

For the above reasons and considering that present elutriate tests are worst case from several viewpoints, attempts to collect, contain, and treat for ammonia removal appear impractical and infeasible. Although dilution is not an acceptable measure to achieve water quality standards, dilution inevitably will occur due to the lake/river environment.

It is therefore proposed that water sampling for compliance monitoring be placed approximately 600 feet downstream from the borrow site at the edge of the project site, as shown on plate 24. A background site also will be monitored upstream as shown. It also is proposed that no water temperature restrictions be placed on the contractor. Should monitoring measurements

exceed the standard, contractor options would include: modify excavation and placement methods, reduce rate of excavation, or stop work. Agency coordination would be initiated if standards are exceeded.

f. Permits. The requirements of Section 404 of the Clean Water Act will be completed as presented in the appendix B, including Section 401 Water Quality Certification. An additional construction in the floodplain permit from the Illinois Department of Transportation, Division of Water Resources also will be completed.

TABLE 8-1

Summary of Potential Ammonia Removal Methods During Lake Excavation

Method	Process	Pros	Cons	Cost	Remarks
Breakpoint Chlorination	Chlorine oxidizes ammonia to nitrogen gas	Can achieve very high ammonia removal rate (95-99%)	Must oxidize all organic matter and reducing agents. Chlorine residual may require dechlorination to prevent toxic aquatic effects. Process will consume existing alkalinity with probable pH decrease. Acidity normally requires neutralization (lime or soda ash).	$116,000 [1,2]	Not feasible due to: Inability to reliably contain and collect contaminated water. Low water depths (less than 2 feet) which prevent access by work vessels to supply chlorine (420 lb/d), power (diesel, gasoline), and other plant logistics.
Selective Ion Exchange	Ammonia is adsorbed in ion exchanger bed.	Can achieve very high ammonia removal rate (95-99%).	Influent must be filtered to prevent bed fouling. Backwash from bed requires ammonia treatment.	$230,000 [1]	Not feasible due to: Inability to reliably contain and collect contaminated water. Low water depths prevent access by work vessels to furnish sand filter (22 tons), exchanger bed (2 tons), treatment of ammonia brine, and other plant logistics.
Air Stripping	Ammonia is removed by raising pH to 11 (to convert all ammonia to the unionized form) passing through an air stripping tower, then lowering pH.	Can achieve high ammonia removal (60-90%)	Must raise pH to effectively strip, then must lower pH. High chemical solids handling due to required pH changes.	$185,000 [1]	Not feasible due to: Inability to contain and collect contaminated water. Low water depths prevent access by work vessels to supply lime (625 lb/d), carbon dioxide (125 lb/d), power, and other plant requirements.

TABLE 8-1 (Cont'd)

Method	Process	Pros	Cons	Cost	Remarks
Oxidation Ponds (Spraying)	Uses same principle as air stripping except uses ambient pH; uses spraying to strip rather than tower. (This process normally treats an elevated pH water from another process.	Minimal plant requirement.	Only partial removal (10-20%) of un-ionized ammonia. Needs holding times of days (typ) and recycle.	$ 71,000 [3]	Not selected due to: Inability to reliably contain and collect contaminated water. High cost relative to treatment efficiency. Impracticality of placing spray piping in containment zone.

[1] Estimated cost from EM 1110-2-501, escalated to present. Cost does not include operation, power, or special handling due to off-shore requirements.

[2] Cost includes chlorination and neutralization.

[3] Excludes operating cost and special off-shore equipment handling.

TABLE 8-2

Comparison of Un-Ionized Ammonia Nitrogen Removal Methods with Initial Total Ammonia = 15 mg/l and Use of Ambient pH

Ambient pH	Method	Un-Ionized Ammonia Nitrogen Remaining at Ambient pH and Temperature, mg/l 10°C (50°F)	20°C (68°F)	30°C (86°F)
7	Untreated	.03	.06	.13
	Spraying [1]	.03	.06	.13
	Stripping Tower [2]	.03	.06	.13
8	Untreated	.29	.60	1.18
	Spraying	.29	.59	1.17
	Stripping Tower	.29	.59	1.11
9	Untreated	2.47	4.43	6.90
	Spraying	2.43	4.30	6.57
	Stripping Tower	2.16	3.45 [3]	4.51
10	Untreated	9.95	12.11	13.42
	Spraying	9.29	11.14	12.22
	Stripping Tower	5.00	4.78	4.41

[1] Spraying: 10 percent ± removal efficiency.

[2] Stripping Tower: 75 percent ± removal efficiency.

[3] Example: Initial concentration of 15 mg/l NH_3-N at pH 9 and temperature of 20°C has an un-ionized NH_3 fraction of 4.43 mg/l. A 75 percent removal of this fraction (4.43 x .75 = 3.32) removes approximately 3.32 of total NH_3-N, which leaves a balance of 15.0 - 3.32 = 11.68. This 11.68 then will re-establish equilibrium between NH_3 and NH_4^+ with a total of 3.45 un-ionized NH_3 remaining. The net reduction efficiency of this process is then only 22 percent (4.43 - 3.45/4.43).

9. ENVIRONMENTAL EFFECTS.

a. Summary of Effects. This project is consistent with the goals of the North American Waterfowl Plan signed into effect in May 1986. As a joint effort between the United States and Canada, the Plan focuses on the value of maintaining enough high quality habitat to ensure the abundance of North American ducks, geese, and swans. Generally, no single habitat type provides all of the life requisites (i.e., food, cover, nesting, etc.) for a particular species. Therefore, a unique opportunity exists within a small portion of Peoria Lake to modify existing habitats and to create additional, yet diverse, habitat for waterfowl and aquatic species.

The effects of FWMA construction involve the conversion of existing habitat which is subject to periodic uncontrolled inundation into habitats which can be managed by controlled inundation for the purpose of providing food and resting habitat for migratory waterfowl. While still subject to flooding by the Illinois River, the FWMA will provide reliable water level control over the area in those years without a fall flood.

About 20 acres of forested wetland will be converted to grassed berm or levee, enclosing the three cells of the FWMA. The remaining interior of the FWMA will retain existing bottom land forest composition. Water level control will be provided to approximately 168 acres of forested area, facilitating operation as a green tree reservoir (Fredrickson and Taylor, 1982).

About 13 surface acres of Upper Peoria Lake will be converted to shelter island construction and should provide approximately 130 acres of emergent and submergent wetland vegetation in the wind shadow of the island. The wind shadow effect is anticipated to grow as the project matures and willow, cottonwood, and silver maple colonize the island.

About 7 surface acres of the East River side channel will be restored and opened to the main channel. As part of the side channel restoration, rock substrate will be placed over a section of the side channel to provide aquatic habitat diversity. Approximately 3,000 square yards of fine substrate, rock, and cobble will facilitate colonization by aquatic invertebrates, including mussels.

b. Economic and Social Impacts. This analysis examines the socio-economic effects associated with the proposed habitat rehabilitation project.

(1) Community and Regional Growth. No impacts to the growth of the community or region would be realized as a result of the project.

(2) Displacement of People. No residential displacements would be necessitated by the proposed environmental enhancement project.

(3) Community Cohesion. The project would result in a slight, positive impact to community cohesion; residents in the Peoria area have actively solicited the cleanup of Peoria Lake and would likely view the environmental enhancement project as a positive first step toward their goals.

(4) Property Values and Tax Revenues. The potential value of property within the project area could increase slightly as a result of the proposed project. However, upon completion of 57 acres of land acquisition by the State of Illinois, all land will be in Federal and State ownership, and an increase in its value would not affect local tax revenues.

(5) Public Facilities and Services. The proposed environmental enhancement project would maintain and enhance natural resources within the Peoria Pool, between RM 162 and 182 on the Illinois Waterway. These lands are held in public trust by the Federal Government and the State of Illinois; Federal lands are maintained for the Federal navigation project, while State lands are managed by the IDOC and zoned for wildlife management.

(6) Life, Health, and Safety. Currently, Peoria Lake poses no threats to life, health, or safety of recreationists or others in the vicinity. The proposed project would not impact current conditions in regard to these areas of concern.

(7) Employment and Labor Resources. Project construction would slightly increase short-term employment opportunities in the Peoria area. The project would not affect the permanent employment or labor resources in the community or region.

(8) Business and Industrial Development. Changes in business and industrial activity during project construction would not be noticed. The project would require no business relocations.

(9) Farm Displacement. No farms or farm lands would be affected by the project. The project will be located entirely on lands owned by the State of Illinois and managed by the IDOC.

(10) Noise Levels. Heavy machinery would generate a temporary increase in noise during the construction period. This increase would disturb wildlife and recreationists in the vicinity. However, the project site is located in an area removed from residential or other development. No significant long-term impacts to noise levels would result.

(11) Aesthetics. The project would involve the creation of a barrier island to impede wave action on a portion of Peoria Lake. The new island will ultimately display similar vegetation and aesthetic attributes to existing river conditions. Therefore, the project should not result in negative impacts to area aesthetics.

c. Natural Resource Impacts. The anticipated effects to natural resources within the Goose Lake site were quantified using modified habitat and species characteristic matrices addressed in Section 6. The primary project objective is enhancement of wetland values for migratory waterfowl, so the mallard was selected as a target species for WHAG application. An additional objective of flowing (lotic) aquatic habitat enhancement was identified, and the channel catfish was selected as a target species for evaluation of side channel restoration. A summary of HU improvements for the selected target species within the Goose Lake site is presented in table 9-1 and summarized in figure 10-1.

Other non-target species used for evaluation of secondary wetland values included the green heron, wood duck, beaver, northern parula warbler, and prothonotary warbler. Other non-target species used for evaluation of secondary aquatic values include guilds represented by northern pike, bluegill, and the johnny darter.

(1) Aquatic System.

(a) Forested Wetland Management Area. Consideration was given to the forested areas and their value to the fishery resource of the Illinois River. It is known that periodically flooded bottom land forest has value as cover, spawning, and nursery habitat, and that such wetlands import, produce, store, recycle, and export biotic and abiotic materials that are used in food chains on-site or at sites downstream.

Water control structures have been designed to minimize trapping of adult and early life stage fish, as well as allowing off-site transport of other food chain components. Therefore, no significant adverse effects to fish production or the aquatic food chain are expected to result from project construction and operation.

(b) East River Channel. Due to the lack of side channel habitat in the project area and along the Illinois River in general, the objective to restore side channel habitat became a high priority in the overall enhancement potential of Peoria Lake. Application of Aquatic Habitat Appraisal Guide (AHAG) determined that the existing conditions within the East River side channel had limited value for the channel catfish target species (HSI=0.41).

Side channel flow presently is limited by the silt plug at the end of the channel with flow being redirected through the two cuts in the adjacent island. However, excavating the silt plug, closing the lower cut (Mt. Hope cut), and restricting flow through the Upper Cut will boost the HSI value to 0.62. Additional habitat value is created by selective placement of the rock blankets in the upper portion of the East River. An overall improvement to an HSI value of 0.77 is realized. In addition, approximately 7 acres of new side channel habitat will be created by removing the silt plug.

TABLE 9-1

Tabular Summary of Habitat Unit Improvements

Alternative	Action	Acreage	Target Species	HSI Values for Target Years = 0	1	5	25	50	AAHU	Percent Improvement
FWMA	No Action	183	Mallard	.43	.43	-	.43	.43	79	-
	Construct Cells A+B+C	165	Mallard	.43	.79	-	.85	.85	137	74
Barrier Island	No Action	133	Mallard	.11	.11	.11	-	.11	15	-
	Construct 1.1 Mile	133	Mallard	.11	.12	.45	-	.65	69	360
Side Channel Excavation	No Action	13	Catfish	.41	.41	-	.41	.41	5	-
	Excavate Side Channel	20	Catfish	.41	.77	-	.77	.77	15	200

The increased substrate diversity, improved dissolved oxygen levels, and increased flow through the channel will generate secondary benefits for the aquatic community in general. Aquatic insects like caddisflies, mayflies, and midges will rapidly colonize the rock substrate. Fisheries diversity will increase with species like darters and redhorse that prefer gravel bar habitats. The eventual colonization of the gravel bars by mussel species is anticipated. An existing mussel bed near Rome Point will serve as a source for natural colonization.

(c) Barrier Island. The primary objective of the barrier island is to create a relatively wave-free environment in the shadow of the leeward side of the island. Although existing and predicted future conditions ranked extremely low in HSI value (0.11) for mallard due to the absence of aquatic vegetation, the Goose Lake site is a critical resting and refuge area for migrating waterfowl.

Construction of the barrier island and subsequent implementation of the aquatic revegetation plan will enhance the Goose Lake site gradually over the 50-year project life. In Target Year 5, HSI values will have increased to 0.45 in the estimated 1,000-foot wind shadow zone behind the island; ultimately to 0.65 by Target Year 50. This results in an AAHU gain of 69 for the 130-acre wind shadow. Natural colonization of the leeward side of the island will be accelerated by the planting of plant propagules, primarily arrowhead and cattail, along the shallow water zone of the island. While a 1,000-foot shadow zone was utilized for calculation purposes, ideally the zone of submergent and emergent vegetation would continue to spread within the Goose Lake area as more and more of the leeward side of the island becomes established. The wind shadow effect will be magnified further as the bottom land forest community becomes established on the crest of the barrier island and the trees reach a mature height.

To further dampen wind and wave effects, two experimental floating vegetated islands will be tested in the Goose Lake site. While documented use under reservoir conditions has proven to be successful, the Illinois River may prove to be a much harsher environment. In addition to the dampening effect, the islands, which are composed of four separate modules attached together, will be planted with cattails or bullrush to function as resting and/or nesting sites for a variety of wildlife species. Several modules may be filled with gravel to serve as sunning areas for turtles or other species in addition to waterfowl. Presently, the experiment has been designed with both islands placed on the windward side of the island in the much harsher conditions of Peoria Lake.

The construction of the barrier island will require excavation and dredging of approximately 500,000 cubic yards of material from the adjacent river bottom. This will result in a 1.1-mile linear increase in deep water along the northern base of the island, creating critical deepwater habitat. The borrow area, in conjunction with the aquatic vegetation beds behind the island, will be used by commercial and sport fish species alike as a seasonal spawning, nursery, refuge, and wintering area away from the main channel of the river. However, due to the elevated sediment trapping capacity of such

an area, it is projected that this deep water area will gradually fill in over time and return to habitat values similar to existing values.

(2) Terrestrial/Wetland System.

(a) Forested Wetland Management Area. The Woodford County Conservation Area presently functions as a stopover and refuge area for migrating waterfowl. The area serves to concentrate ducks even under hunting pressures during the migration season. The adjacent bottom land forest provides a sheltered windbreak where waterfowl will retreat when the Peoria Lake winds become severe. Food plots in the surrounding duck clubs supply a predicable source of food.

Results of the WHAG analysis indicate that existing habitat values generated for the Goose Lake site will continue over the projected 50-year period even without implementation of the proposed alternatives. However, without control over water level fluctuation, the availability of food, primarily invertebrates due to limited mast tree species, will remain unpredictable and limited and dependent on fall floods. Therefore, construction of the FWMA and the associated vegetative changes in habitat will result in almost a 100-percent increase in the quality of the habitat (HSI values change from 0.43 to 0.85 by Target Year 50) for migrating waterfowl. Translated into AAHUs, this represents a net gain of 58 AAHUs.

Secondary benefits to the overall wetland system also were considered. Species such as the green heron and warblers reflect year-round conditions, as opposed to conditions during waterfowl migration. A consideration during the planning of improvements to migratory waterfowl habitat is to avoid impacts to those species whose life requisites involve habitat for nesting and brooding. The results of the WHAG analysis projected improvements in the habitat values for the green heron and northern parula with the construction of the FWMA. The levees will create 18 to 20 acres of grassland habitat as well as woodland edges within the FWMA. The shallow drainage ditches may facilitate emergent vegetation like cattails and sedges to further diversify the area.

Additional secondary benefits result from the proposed mast tree plantings in the borrow area of Cell A. Between 7 and 10 acres of Cell A will be available for reforestation with up to 1,000 mast tree (e.g., pin oak) seedlings. Although it may take 25 plus years for the trees to produce mast, acorns are a highly valued food resource for waterfowl. Active management of the site will be necessary to maximize the survival of the seedlings and to reduce competition from other tree species like silver maple and cottonwood.

(b) East River Channel. Terrestrial effects resulting from the East River aquatic enhancement include dredged material placement along the banks of the East River. The slopes of the newly placed berms will be stabilized with willow cuttings and seeded to reduce impacts from erosion. While subsequent elevation of the forest floor is expected to result in reestablishment of similar bottom land forest species, higher quality mast

species such as oak, northern pecan, or hickory will be planted on the crests of the berms. Improved drainage with the increased elevation on the crests will create 2 to 3 acres of suitable soils for bottom land hardwood species.

The restored side channel may require maintenance dredging 25 years which may further lend to habitat diversity along the East River. First-phase dredging will involve selective sidecasting to avoid a uniform appearance and resultant even-aged forest development. At the time of the next dredging event, material will be placed in areas of overmature timber to allow previously disturbed areas to attain maturity. Over the project life, therefore, the area along the restored side channel will provide age-diversified forest habitat.

(c) Barrier Island. As part of the wetland enhancement objective, approximately 16 acres of extremely shallow aquatic habitat will be converted for island construction. Although functioning primarily as a wind and wave barrier to enhance aquatic habitat values mentioned above, the island also will generate secondary terrestrial and wetland habitat values for game and nongame species alike. An intensive bank stabilization and revegetation plan will be implemented both during and upon completion of island construction. A summary of revegetation steps was presented in table 7-2. Techniques including a combination of hydro- and hand seedings, woody cuttings of willows and cottonwoods, and placement of erosion control matting will accelerate the stabilization of the island. The new island will create additional age-diversified bottom land forest along the Illinois River while providing temporary grassland habitat until the natural succession of bottom land trees colonizes the crest island.

(3) Mineral Resources. No effects to the mineral resources of the area are expected to result from project construction or operation.

d. Cultural Resources. The results of the Stanley Consultants, Inc., Phase I investigations indicated that no historic properties were located within the Peoria Lake Enhancement project, although very deep testing was conducted. Geomorphological evidence documented that the prehistoric settlement surface (1 to 2 meters below the present surface) was wet and probably not suited to permanent occupations. This assessment and evaluation was conducted in compliance with the National Historic Preservation Act (as amended in 1980); the Archeological and Historic Preservation Act of 1974; Executive Order 11593; and Title 36 of the Code of Federal Regulations, Parts 60-66 and 800 (as appropriate). Based upon the Phase I survey, consisting of the records and literature review, the field investigations, and the extent of the proposed impacts, it was recommended that construction proceed with a finding of no historic properties.

The archeological report entitled Phase I Archaeological Reconnaissance for Historic Properties Within the Peoria Lake Environmental Management Program, Habitat Rehabilitation Enhancement Project, Woodford County Conservation Area, Chillicothe, Illinois, was accepted by the Corps and provided to the Illinois State Historic Preservation Officer (SHPO). The SHPO concurred on November 30, 1989, with the Corps' finding of no historic properties, pending revisions to the draft report (appendix A, page A-12). The Corps received final report SHPO concurrence on January 19, 1990 (appendix A, page A-24).

e. Adverse Effects That Cannot Be Avoided. The loss of trees and understory associated with levee construction and disposal site preparation is unavoidable. Temporary elevations in turbidity/suspended solids during construction of the island and excavation of the side channel are unavoidable but will be minimized through the use of a turbidity curtain. Minor increases in dust, noise, and equipment exhaust levels also are temporary and unavoidable. No significant historical, archeological, or architectural resources are known to be present in the project area.

f. Short-Term Use Versus Long-Term Productivity. The project is intended to increase the long-term ecological productivity of the Upper Peoria Lake area on the Illinois River. Therefore, the short-term effects resulting from project construction are considered to be inconsequential.

g. Irreversible or Irretrievable Resource Commitments. Time, labor, fuel, and other necessary construction materials are considered to be irretrievable. The conversion of bottom land elevations resulting from levee vegetational components will be irreversible, considering the shift in vegetational components.

h. Compliance with Environmental Quality Statutes. Compliance is summarized in table 9-2.

TABLE 9-2

Relationship of Plans to Environmental Protection Statutes and Other Environmental Requirements

Federal Policies	Compliance
Archeological and Historic Preservation Act, 16 U.S.C. 469, et seq.	Full compliance
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Full compliance
Clean Water Act (Federal Water Pollution Control Act) 33 U.S.C. 1251, et seq.	Full compliance
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full compliance
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), et seq.	Full compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 601, et seq.	Full compliance
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, et seq.	Not applicable
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full compliance
National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Full compliance
National Wildlife Refuge System Administration Act (16 U.S.C. 668DD-668EE)	Full compliance
River and Harbors Act, 33 U.S.C. 403, et seq.	Full compliance
UMR Wildlife and Fish Refuge Act, 16 U.S.C. 721, et seq.	Full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Not applicable
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Full compliance
Flood Plain Management (Executive Order 11988)	Full compliance
Protection of Wetlands (Executive Order 11990	Full compliance
Environmental Effects Abroad of Major Federal Actions (Executive Order 12114)	Not applicable
Farmland Protection Act	Full compliance
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum, 11 Aug 80)	Full compliance

NOTES:

a. Full compliance. Having met all requirements of the statute for the current stage of planning (either preauthorization or postauthorization).

b. Partial compliance. Not having met some of the requirements that normally are met in the current stage of planning. Partial compliance entries should be explained in appropriate places in the report and referenced in the table.

c. Noncompliance. Violation of a requirement of the statute. Noncompliance entries should be explained in appropriate places in the report and referenced in the table.

d. Not applicable. No requirements for the statute required; compliance for the current stage of planning.

10. SUMMARY OF PROJECT ACCOMPLISHMENTS.

The proposed project consists of the construction of a 168-acre FWMA, a 1.1-mile-long barrier island, and flowing side channel with submerged rock substrate. The FWMA will provide a reliable water level controlled resting and feeding area for migratory waterfowl. Mast trees will supplement this construction to increase food source.

The proposed barrier island would improve water quality in the vicinity of the island by stabilizing bottom sediments. Proposed plant propagules would accelerate the growth of an aquatic bed.

Reestablishment of the East River as a flowing channel will create an approximate 9,500-foot flowing side channel which is presently a blocked slough with no outlet. Fishery side channel benefits will be enhanced further by the placement of two submergent rock substrate beds. Planting of additional mast trees on adjacent excavation material placement sites also will provide an added food source for waterfowl.

A summary of habitat unit improvement for the proposed alternatives is presented in figure 10-1.

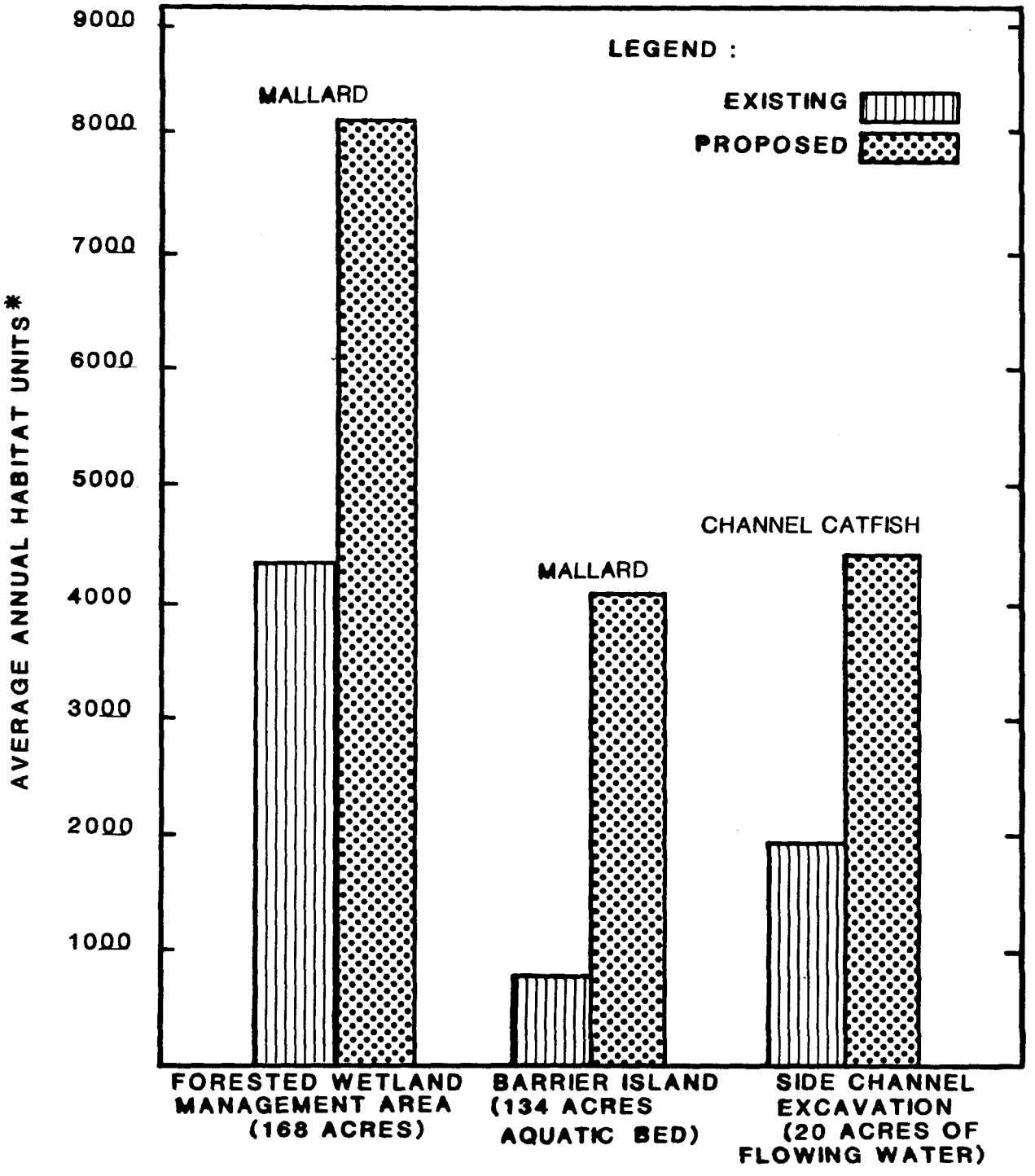

FIGURE 10-1

SUMMARY OF HABITAT UNITS IMPROVEMENTS
DUE TO PROPOSED PROJECT ALTERNATIVES

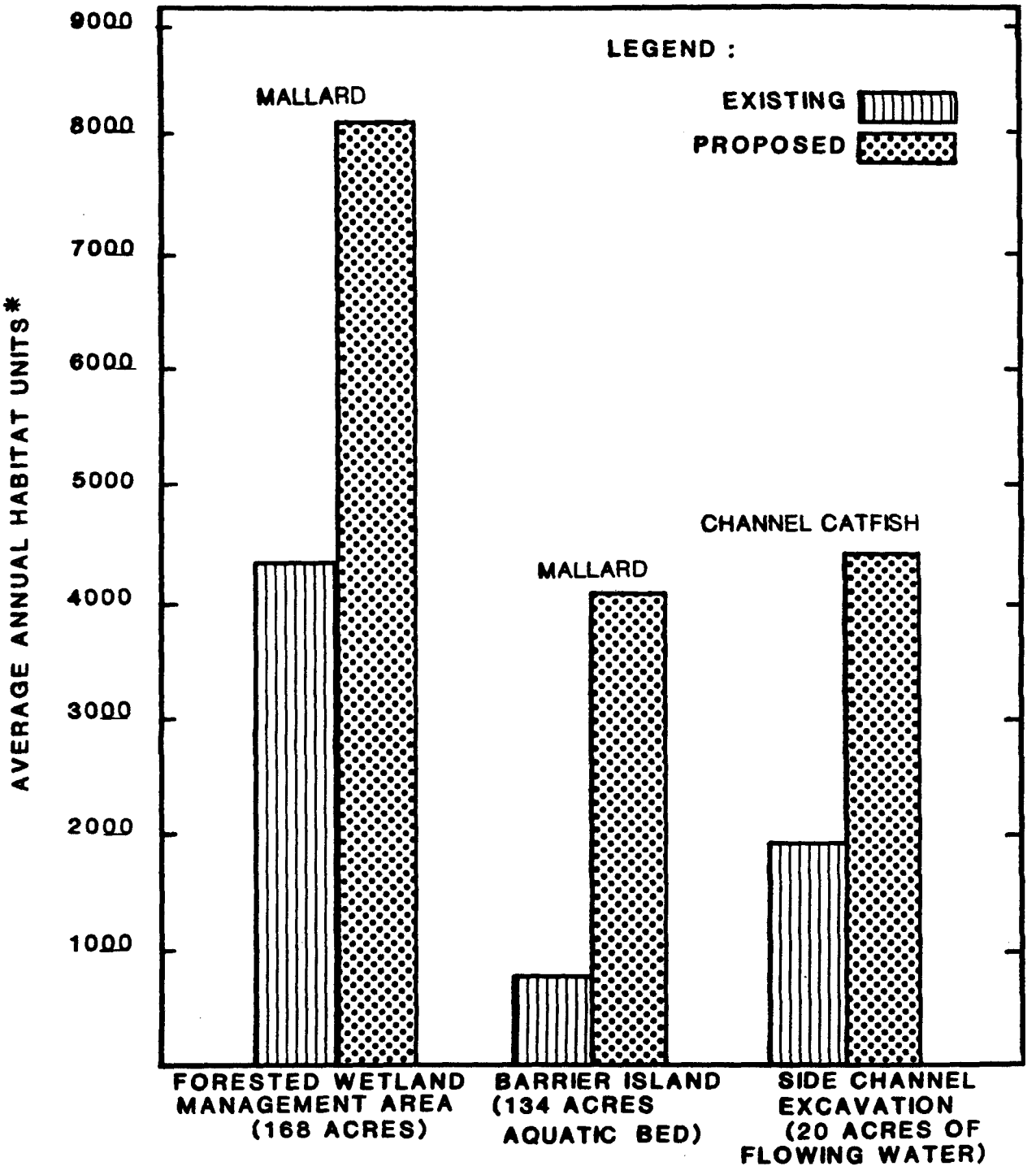

FIGURE 10-1

SUMMARY OF HABITAT UNITS IMPROVEMENTS
DUE TO PROPOSED PROJECT ALTERNATIVES

11. OPERATION, MAINTENANCE, AND REHABILITATION.

a. Project Data Summary. Table 11-1 presents a summary of project data. This table is provided to show principal features of the selected project which will require operation, maintenance, and rehabilitation.

TABLE 11-1

Project Data Summary

Feature	Measurement	Unit of Measure
Forested Wetland Management Area		
General		
Levee Embankment	56,000	Cubic Yards
Levee Length	18,585	Feet
Ponding Area	168	Acres
Crushed Stone Surface Length	8,700	Feet
Cell A		
Levee Embankment	21,000	Cubic Yards
Levee Length	7,720	Feet
Top Width	12	Feet
Top Elevation	450	MSL
Side Slopes	3:1	Horizontal:Vertical
Ponding Depths	0-2	Feet (from Elevation 446-448)
Ponding Area	69	Acres
Stoplog Water Control Structure		
Hydraulic Opening	20	Lineal Feet (4-5 foot bays)
Concrete Sill Elevation	443	MSL
Cell B		
Levee Embankment	16,000	Cubic Yards
Levee Length	5,810	Feet
Top Width	12	Feet
Top Elevation	448	MSL
Side Slopes	3:1	Horizontal:Vertical
Ponding Depths	0-2	Feet (from Elevation 444-446)
Ponding Area	50	Acres
Stoplog Water Control Structure		
Hydraulic Opening	20	Lineal Feet (4-5 foot bays)
Concrete Sill Elevation	441	MSL

TABLE 11-1 (Cont'd)

Feature	Measurement	Unit of Measure
Cell C		
Levee Embankment	19,000	Cubic Yards
Levee Length	5,055	Feet
Top Width	12	Feet
Top Elevation	446	MSL
Side Slopes	6:1	Horizontal:Vertical, along river, river side only
	3:1	Horizontal:Vertical, all other locations
Ponding Depths	0-2	Feet (from Elevation 442-444)
Ponding Area	49	Acres
Stoplog Water Control Structure		
Hydraulic Opening	20	Lineal Feet (4-5 foot bays)
Concrete Sill Elevation	439	MSL
Water Supply		
Pump Station		
Submersible Pump	1	6,000 gpm at 12 ft TDH
Station Invert	434	MSL
Trash Rack	1	Each, 2-inch spacing between bars
Electric Power Source	1	Phase, 7600/120-240 volt transformer, 30 KVA; with 30 hp phase converter, 1-phase/240 volt input, 3-phase/480 volt output
Pressure Supply Pipe		
Length	400	Feet
Diameter	24	Inch, reinforced concrete pipe with sealed and restrained joints
Discharge Assembly		
Discharge Elevation	449	MSL
Tree (Seedlings)	1,100	Each
Barrier Island		
Length	1.1	Miles
Width	50	Feet at crest elevation of 446

TABLE 11-1 (Cont'd)

Feature	Measurement	Unit of Measure
Aquatic Bed Establishment	134	Acres (1,000 feet on island lee side)
Surface Area	16	Acres at Flat Pool Elevation of 440
Embankment Fill	482,000	Cubic Yards
Revegetation	1	Job, temp. seed followed by anchored mat, sprigs, tree cuttings, tree seedlings
Borrow		
Depth	15	Feet from flat pool
Width	135	Feet at bottom elevation of 425
Floating Vegetated Islands		
No. of Islands	2	Each
No. of Modules per Island	4	Each
Module Length	16	Feet
Module Width	8	Feet
East River Side Channel Excavation		
Length		
Actual Excavation	3,550	Feet
Opened Side Channel	9,500	Feet
Project Depth	4	Feet from flat pool elevation 440
Project Width	95	Feet
Surface Area of Flowing Water		
Excavated Area	7	Acres
Opened Side Channel	20	Acres
Excavation Volume	104,000	Cubic yards
Revegetation	1	Job, seed, tree cuttings, tree seedlings
Tree Plantings	250	Each
Rock Fill	1,200	Tons (upper cut fill)
Rock Substrate Habitat		
No. of Sites	2	Each
Dimensions Each Site		
Length	300	Feet
Width	50	Feet
Thickness	2	Feet
Habitat Substrate Material Gradation	1-3	Inches, crushed stone, varying gradations

b. Operation. The estimated costs for Operation, Maintenance and Rehabilitation of the selected plan are presented in table 13-2. General operating instructions for the FWMAs are provided in table 11-2. There are not specific features for the barrier island and East River side channel excavation which require operation.

TABLE 11-2

Stoplog Placement Instructions

Scenario	Instructions	Remarks
Fill cells A,B,C to normal operating levels of 448, 446, & 444, respectively.	1) Place 5 feet of stoplogs in stoplog structures A, B, and C, respectively. 2) Start pump. 3) Stop pump once water overflows stoplog structure C.	Provides ponding level from 0-2 feet in each cell.
Drain all cells leaving water in adjacent drainage ditches.	Remove 2 feet of stoplogs from stoplog structures A, B, and C.	Provides approximately 3 feet of water in all adjacent drainage ditches.
Drain all cells including water in adjacent ditches to extent possible.	Remove all stoplogs in all structures.	With Peoria Lake at 440, drainage ditches A and B will be dry; C will have 1 foot of water.
Fill Cell A only to normal operating level of 448.	1) Place 5 feet of stoplogs in structure A. Place 3 feet of stoplogs in B and C, if water in adjacent ditches is desired. If water in ditches is not desired, do not place any stoplogs in structures B and C. 2) Start pump. 3) Stop pump and water overflows stoplog structure A.	Provide Cell A with ponding level of 0-2 feet. Cells B and C are dry.
Fill Cell B only to normal operating level of 446.	1) Place 0-3 feet of stoplogs in structure A, depending on depth of desired water in drainage ditch A. Place 5 feet of stoplogs in structure B. Place 0-3 feet of stoplogs in C, depending on	Provide Cell B with ponding level of 0-2 feet. Cells A and C are dry.

TABLE 11-2 (Cont'd)

Scenario	Instructions	Remarks
	depth of water desired in drainage ditch C. 2) Start pump. 3) Stop pump once water overflows stoplog structure B.	
Fill Cell C only to normal operating level of 444.	1) Place 0-3 feet of stoplogs in structures A and B depending on depth of desired water in drainage ditches A and B. Place 5 feet of stoplogs in structure C. 2) Start pump. 3) Stop pump when water overflows stoplog structure C.	Provide Cell C with ponding level of 0-2 feet. Cells A and B are dry.

c. Maintenance and Rehabilitation. The proposed features have been designed to ensure low annual maintenance requirements with the estimated annual maintenance and rehabilitation costs presented in table 13-2. These quantities and costs may change during final design.

12. PROJECT PERFORMANCE ASSESSMENT.

The purpose of this section is to summarize monitoring and data collection aspects of the project. Table 12-1 presents the principal types, purposes, and responsibility of monitoring and data collection. Table 12-2 provides a summary of actual monitoring and data parameters grouped by project phase and also shows data collection intervals.

Table 12-3 presents the post-construction evaluation plan. The monitoring parameters of this plan were developed to measure the effectiveness of the stated goals and objectives. As shown in table 12-1, these post-construction quantitative measurements will be the responsibility of the Corps of Engineers. The IDOC field personnel also should follow table 12-3, as shown, to make annual qualitative field observations. The annual qualitative field observations and the quantitative monitoring parameters will form the basis of project evaluation.

TABLE 12-1

Monitoring and Performance Evaluation Matrix

Project Phase	Type of Activity	Purpose	Responsible Agency	Implementing Agency	Funding Source	Remarks
Pre-Project	Sedimentation Problem Analysis	System-wide problem definition. Evaluates planning assumptions.	USFWS	USFWS (EMTC)	LTRM	--
	Pre-project Monitoring	Identifies and defines problems at HREP site. Establishes need of proposed project features.	Sponsor	Sponsor	Sponsor	--
	Baseline Monitoring	Establishes baselines for performance evaluation.	Corps	Field station or sponsor thru Cooperative Agreements or Corps.	LTRM	See Table 12-2.
Design	Data Collection for Design	Includes quantification of project objectives, design of project, and development of performance evaluation plan.	Corps	Corps	HREP	See Table 12-2.
Construction	Construction Monitoring	Assess 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) and sponsor (field observations).	Field station or sponsor thru Cooperative Agreement, sponsor thru O&M, or Corps.	LTRM	See Table 12-3.
	Analysis of Biological Responses to Projects	Evaluate predictions and assumptions of habitat unit analysis. Studies beyond scope of performance evaluation, or if projects do not have desired biological results.	USFWS	USFWS (EMTC)	LTRM	--

TABLE 12-2

Resource Monitoring and Data Collection Summary

Type Measurement	WATER QUALITY DATA						ENGINEERING DATA			NATURAL RESOURCE DATA			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	
POINT MEASUREMENTS	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR							
Stations UPL-A, B, C													
Turbidity	2W	M	2W	M	2W	M							
Photosynthetically Active Radiation	2W	M	2W	M	2W	M							
Secchi Disk Transparency	2W	M	2W	M	2W	M							
Dissolved Oxygen	2W	M	2W	M	2W	M							
Specific Conductance	2W	M	2W	M	2W	M							
Water Temperature	2W	M	2W	M	2W	M							
Velocity	M	M	M	M	M	M							
Water Depth	2W	M	2W	M	2W	M							
Water Elevation	2W	M	2W	M	2W	M							
Percent Ice Cover	-	M	-	M	-	M							
Ice Depth	-	M	-	M	-	M							
Percent Snow Cover	-	M	-	M	-	M							
Snow Depth	-	M	-	M	-	M							
Substrate Particle Presence	6M	6M	6M	6M	6M	6M							
Substrate Hardness	6M	6M	6M	6M	6M	6M							
pH	2W	M	2W	M	2W	M							
Chlorophyll	2W	M	2W	M	2W	M							
Suspended Solids	2W	M	2W	M	2W	M							
Wind Direction	2W	M	2W	M	2W	M							
Wind Velocity	2W	M	2W	M	2W	M							
Wave Height	2W	M	2W	M	2W	M							

TABLE 12-2 (Cont'd)

Type Measurement	WATER QUALITY DATA						ENGINEERING DATA			NATURAL RESOURCE DATA			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							
Stations UPL-1, 2, 3, 4													
Elutriate			1										
Bulk Sediment			1										
Column Settling (except UPL-3, 4)								1					
Select Point Locations													
Soil Borings [2]							1	1					
Nutrient Analyses UPL-3, 4											1		
Seed Bank Analyses UPL-3, 4											1		
Floating Islands Inspection									5Y				
TRANSECT MEASUREMENTS													
Transects C, D, E, H, (East River only) Hydrographic Soundings and Velocities							M	M	5Y				
Transects A, B, C, D, E													
Hydrographic Soundings								1	5Y				
Vegetation (Aquatic)										1	1	2Y	
Transects C, F, G													
Vegetation (Understory and Timber)										1	1	5Y	
Transect I													
Vegetation												2Y	

TABLE 12-2 (Cont'd)

Type Measurement	WATER QUALITY DATA						ENGINEERING DATA			NATURAL RESOURCE DATA			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							
AREA MEASUREMENTS													
Vertical Stereo Areal Photographs (1:5000)											1	5Y	
Land Topographic Mapping (1' contours)								1					
Rock Substrate (East River) Mussel Survey											1	5Y	
Rome Point Mussel Survey											1	1	

Legend

W = Weekly
M = Monthly
Y = Yearly
nW = n-Week interval
nY = n-Year interval
1, 2, 3 --- = number of times data is collected within designated project phase

[1] See plate 21 for locations of sampling points, transects, areas except as noted.

[2] Soil borings (see plates 2 and 7).

TABLE 12-3

Post-Construction Evaluation Plan

Goal	Objective	Alternative	Enhancement Feature	Enhancement Potential: Unit	Year 0 Without Alternative	Year X With Alternative[1]	Year 50 Target With Alternative	Feature Measurement Reference Table 12-2	Annual Field Observations by Site Manager
Enhance wetland habitat	Increase reliable food production and resting area	Forested Wetland Management Area	Water control	Acres of vegetation	0	--	168	Perform Transects C, F, G vegetation (understory) survey	Estimate numbers of waterfowl
			Mast tree area	Acre	0	--	10	Perform Transects C, F, G vegetation (timber) survey	Estimate survival of plantings
	Increase diversity and areal extent of submergent and emergent vegetation for waterfowl	Barrier Island	Aquatic vegetation bed	Acres of aquatic vegetation	0	--	100	Perform Transects A, B, C, D, E vegetation (aquatic) survey	Estimate acres of emergent/submergent and floating vegetation
								Perform Transects A, B, C, D, E hydrographic soundings	Record erosional deposition patterns
								Perform Rome Point mussel survey	Describe presence of mussels
			Floating vegetated islands	Each (8'x16')	0	--	8	Inspect number and condition of islands	Count number of individual modules and describe structural deficiencies; Describe presence of attached vegetation; Estimate waterfowl usage
			Island vegetation	Acre	0	--	16	Perform Transect I vegetation survey	Describe condition of shoreline erosion, sprigs, mat, cuttings, seedlings, cover

TABLE 12-3 (Cont'd)

Goal	Objective	Alternative	Enhancement Feature	Enhancement Potential: Unit	Year 0 Without Alternative	Year X With Alternative[1]	Year 50 Target With Alternative	Feature Measurement Reference Table 12-2	Annual Field Observations by Site Manager
			Improved water quality	mg/l suspended solids	100	--	50	Perform water quality tests at stations UPL-A, UPL-B, and UPL-C	Describe presence of resuspended sediments on lee side of island
Enhance aquatic habitat	Provide flowing side channel aquatic habitat	Flowing side channel	Side channel excavation	Surface acres of flowing channel	0	--	20	Perform Transect H (East River) hydrographic sounding	Describe presence of snags, channel sedimentation, or vegetation
				Cross-sectional sq ft of flowing channel	0	--	500	Perform Transects C, D, E (East River) hydrographic soundings	--
				Velocity of flowing channel feet/sec	0	--	1	Perform Transects C, D, E (East River) velocity measurements	--
			Mast trees	Acre	0	--	2	Perform Transect I vegetation survey	Describe condition of shoreline, cuttings, sprigs, and seedlings
			Rock substrate	Mussel species	0	--	5	Perform mussel survey	Describe presence of mussels

[1] This column is completed for the year the enhancement feature is monitored.

13. COST ESTIMATES.

A detailed estimate of initial construction costs is presented in table 13-1. A detailed estimate of operation, maintenance, and rehabilitation costs is presented in table 13-2. Table 13-3 presents the estimated annual monitoring cost as described in Section 12. Quantities may vary during final design and construction.

TABLE 13-1

PEORIA LAKE
REHABILITATION AND ENHANCEMENT EMP
PEORIA POOL, ILLINOIS WATERWAY

PROJECT COST SUMMARY
DIVISION OF COST

FEBRUARY 1990

ACCOUNT	FEATURE	CURRENT WORKING ESTIMATE (CWE)		FULLY FUNDED ESTIMATE (FFE)	
		FEDERAL	NON-FEDERAL	FEDERAL	NON-FEDERAL
01.	LANDS AND DAMAGES	7,200	17,520	7,200	17,520
06.	FISH AND WILDLIFE FACILITIES	3,477,000		3,828,177	
30.	PLANNING, ENGINEERING AND DESIGN	560,000		560,000	
31.	CONSTRUCTION MANAGEMENT	175,000		175,000	
	SUBTOTAL	4,219,200	17,520	4,570,377	17,520

SUMMARY OF COST APPORTIONMENT

	CWE	FFE
1. TOTAL COST SUMMARY		
TOTAL PROJECT COSTS	4,236,720	4,587,897
NON-FEDERAL LANDS & DAMAGES	(17,520)	(17,520)
TOTAL PROJECT COSTS, SUBJECT TO COST SHARING (NOTE 1.)	4,219,200	4,570,377
2. NON-FEDERAL COSTS		
REQUIRED NON-FEDERAL CASH CONTRIBUTION	1,054,800	1,142,594
NON-FEDERAL LANDS & DAMAGES	17,520	17,520
TOTAL NON-FEDERAL COST	1,072,320	1,160,114
3. FEDERAL COST		
TOTAL FEDERAL COSTS	3,164,400	3,427,783
GENERAL DESIGN, DEFINITE PROJECT REPORT	(457,000)	(457,000)
REMAINING FEDERAL COSTS	2,707,400	2,970,783

NOTES:

1. TOTAL PROJECT COST, SUBJECT TO COST SHARING, IS COST SHARED 75% FEDERAL AND 25% NON-FEDERAL.
2. CONSTRUCTION SCHEDULED FOR MAY 91 - SEP 93. FULLY FUNDED ESTIMATE (FFE) IS BASED ON MIDPOINT OF CONSTRUCTION DATE OF JUL 92, RESULTING IN INFLATION FACTOR OF 1.101, PER EC 11-2-156, DATED 31 MAR 89. AND MEMORANDUM DATED 12 FEB 90, SUB: 92INFLAT. (ACCOUNT 06 ONLY)

TABLE 13-1 (Cont'd)

PEORIA LAKE
REHABILITATION AND ENHANCEMENT EMP
PROJECT COST ESTIMATE
FEBRUARY 1990 PRICE LEVEL

ACCOUNT CODE	FEATURE	FEDERAL		NON-FEDERAL	
		COST	CONTINGENCY	COST	CONTINGENCY
01.	LANDS AND DAMAGES				
01.B.	POST-AUTHORIZATION PLANNING	$1000	$200	$1000	$200
01.C.	LOCAL COOPERATION AGREEMENT	4000	800	1000	200
01.D.	ACQUISITIONS	-----	-----	3000	600
01.F	APPRAISAL	1000	200	600	120
01.M	REAL ESTATE PAYMENTS	-----	-----	9000	1800
	SUB-TOTAL	6000	1200	14600	2920
01.	TOTAL, LANDS AND DAMAGES	$7200		$17520	

TABLE 13-1 (Cont'd)

PEORIA LAKE
REHABILITATION AND ENHANCEMENT EMP
PROJECT COST ESTIMATE
FEBRUARY 1990 PRICE LEVEL

ACCOUNT CODE	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTINGENCY	CON %	REASONS
06.	FISH AND WILDLIFE FACILITIES							
06.-.-.-	FORESTED WETLAND MANAGEMENT AREA (FWMA) LEVEES							
06.0.A.-	MOB AND DEMOB	1	LS	19000.00	19,000	1,900	10.0%	1
06.0.C.B	ROAD SURFACING	2750	TON	20.40	56,100	8,415	15.0%	2
06.0.1.B	CLEARING	41	ACR	2350.00	96,350	14,453	15.0%	1
06.0.1.B	EXCAVATION/STRIPPING	13600	CY	1.70	23,120	2,312	10.0%	1
06.0.1.B	EMBANKMENT, CELL A	21000	CY	3.90	81,900	12,285	15.0%	1
06.0.1.B	EMBANKMENT, CELLS B&C	35000	CY	4.35	152,250	22,838	15.0%	1
06.0.1.B	SEEDING	41	ACR	1140.00	46,740	7,011	15.0%	1
06.0.1.B	8 IN. NON-PERF. DRAIN PIPE	530	LF	6.30	3,339	668	20.0%	3
06.3.3.B	TREE SEEDLINGS	1100	EA	11.10	12,210	1,832	15.0%	3
06.-.-.-	FORESTED WETLAND MANAGEMENT AREA (FWMA) STOPLOG STRUCTURES, 3 TOTAL							
06.0.5.-	DEWATERING	1	LS	13500.00	13,500	2,025	15.0%	1
06.0.5.B	EXCAVATION	825	CY	3.80	3,135	314	10.0%	1
06.0.5.B	STRUCTURAL BACKFILL	627	CY	12.00	7,524	1,129	15.0%	3
06.0.5.C	STRUCTURAL CONCRETE	198	CY	380.00	75,240	11,286	15.0%	2
06.0.5.E	GRATING	828	SF	34.80	28,814	5,763	20.0%	3
06.0.5.E	STEEL GUARDRAIL	264	LF	32.75	8,646	1,729	20.0%	3
06.0.5.-	STOP LOGS, WOOD	720	LF	2.75	1,980	396	20.0%	3
06.0.5.-	RIPRAP	360	TON	26.40	9,504	1,426	15.0%	2
06.-.-.-	FORESTED WETLAND MANAGEMENT AREA (FWMA) WATER SUPPLY PUMP STATION							
06.0.5.B	EXCAVATION	65	CY	3.80	247	25	10.0%	1
06.0.5.B	DEWATERING	1	LS	5150.00	5,150	773	15.0%	1
06.0.5.B	STRUCTURAL BACKFILL	30	CY	12.00	360	54	15.0%	3
06.0.5.C	STRUCTURAL CONCRETE	20	CY	380.00	7,600	1,140	15.0%	2
06.0.5.B	CRUSHED STONE BEDDING	6	TON	22.50	135	20	15.0%	2
06.0.5.E	TRASH RACK, MISC. METALS	1	LS	4000.00	4,000	800	20.0%	4
06.0.5.Q	PUMP,MOTOR,DISCHARGE PIPE	1	LS	64215.00	64,215	9,632	15.0%	3
06.0.5.R	BURIED PRIMARY ELECT. FEEDER	800	LF	11.55	9,240	1,386	15.0%	3
06.0.5.R	TRANSFORMER	1	EA	9065.00	9,065	1,813	20.0%	1
06.0.5.R	PHASE CONVERTER	1	EA	11850.00	11,850	2,370	20.0%	1
06.0.5.R	MISC. ELECTRICAL	1	LS	3300.00	3,300	495	15.0%	4
06.0.5.R	ELECTRICAL PLATFORM ASSEMBLY	1	LS	2950.00	2,950	443	15.0%	1

TABLE 13-1 (Cont'd)

PEORIA LAKE
REHABILITATION AND ENHANCEMENT EMP
PROJECT COST ESTIMATE
FEBRUARY 1990 PRICE LEVEL

ACCOUNT CODE	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTINGENCY	CON %	REASONS
06.-.-.-	FORESTED WETLAND MANAGEMENT AREA (FWMA) WATER SUPPLY PRESSURE PIPE							
06.0.5.B	WATER SUPPLY PRESSURE PIPE	400	LF	52.00	20,800	2,080	10.0%	1
06.-.-.-	FORESTED WETLAND MANAGEMENT AREA (FWMA) WATER SUPPLY DISCHARGE ASSEMBLY							
06.0.5.B	EXCAVATION	30	CY	3.80	114	11	10.0%	1
06.0.5.B	STRUCTURAL BACKFILL	22	CY	12.00	264	40	15.0%	3
06.0.5.C	STRUCTURAL CONCRETE	13	CY	380.00	4,940	741	15.0%	2
06.0.5.B	CONCRETE PIPE RISER	1	LS	420.00	420	63	15.0%	4
06.0.5.E	MISC. METALS	1	LS	315.00	315	47	15.0%	4
	SUBTOTAL, FORESTED WETLAND MANAGEMENT AREA				784,317			
	CONTINGENCIES; AVERAGE OF 15%					117,715		
	TOTAL, FORESTED WETLAND MANAGEMENT AREA				902,032			
06.-.-.-	BARRIER ISLAND (DREDGE)							
06.0.A.-	MOB AND DEMOB	1	LS	77,200.00	77,200	7,720	10.0%	1
06.0.1.B	DIKE CON/BCKT SLOPE SHP	482000	CY	2.50	1,205,000	180,750	15.0%	1
06.0.1.B	RIPRAP	5200	TON	26.30	136,760	20,514	15.0%	2
06.0.1.B	GEOTEXTILE FABRIC	20000	SY	1.60	32,000	4,800	15.0%	1
06.0.1.B	TEMP. SEED COVER	16	ACR	1,115.00	17,840	2,676	15.0%	1
06.0.1.B	TURBIDITY CONTROL	1	LS	12,900.00	12,900	1,290	10.0%	1
06.0.1.B	EROSION CONTROL MAT, OUTSIDE	7800	SY	7.30	56,940	5,694	10.0%	1
06.0.1.B	PLANT SPRIG. THRU MAT, OUTSIDE	12000	EA	1.05	12,600	2,520	20.0%	3
06.0.1.B	PLANT SPRIGGING INSIDE	12000	EA	0.70	8,400	1,680	20.0%	3
06.0.1.B	WOODY CUTTINGS THRU MAT, OUTSIDE	19400	EA	1.65	32,010	4,802	15.0%	1
06.0.1.B	WOODY CUTTINGS, INSIDE	19400	EA	1.00	19,400	2,910	15.0%	1
06.0.1.B	GRASS/LEGUME PLANTING	14	ACR	1,280.00	17,920	2,688	15.0%	1
06.0.1.B	TREE SEEDLINGS	500	EA	11.10	5,550	833	15.0%	3
06.0.1.B	TURBIDITY CURTAIN, ANCHORS	135	EA	232.00	31,320	6,264	20.0%	3
06.0.1.B	TURBIDITY CURT. SKRT & HNDLG	1600	LF	21.25	34,000	6,800	20.0%	3
06.0.1.B	FLOATING VEGETATED ISLANDS	8	EA	4,200.00	33,600	3,360	10.0%	1
	SUBTOTAL, BARRIER ISLAND				1,733,440			
	CONTINGENCIES; AVERAGE OF 14.7%					255,301		
	TOTAL, BARRIER ISLAND				1,988,741			

TABLE 13-1 (Cont'd)

PEORIA LAKE
REHABILITATION AND ENHANCEMENT EMP
PROJECT COST ESTIMATE
FEBRUARY 1990 PRICE LEVEL

ACCOUNT CODE	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTINGENCY	CON %	REASONS
06.-.-.-	SIDE CHANNEL RESTORATION							
06.0.A.-	MOB AND DEMOB	1	LS	15,450.00	15,450	1,545	10.0%	1
06.0.1.B	CLEARING	11	ACR	2,350.00	25,850	3,878	15.0%	1
06.0.1.B	EXCA./BCKT. SLOPE SHPNG	104000	CY	2.50	260,000	39,053	15.0%	1
06.0.1.B	ROCK FILL	1200	TON	24.25	29,100	4,365	15.0%	2
06.0.1.B	SEEDING	24	ACR	1,280.00	30,720	4,608	15.0%	1
06.0.1.B	WOODY CUTTINGS	15000	EA	1.00	15,000	2,250	15.0%	1
06.0.1.B	TREE SEEDLINGS	250	EA	11.10	2,775	416	15.0%	3
06.0.1.B	TURBIDITY CURTAIN, ANCHORS	36	EA	232.00	8,352	1,670	20.0%	3
06.0.1.B	TURBIDITY CURT. SKRT & HNDLG	1600	LF	21.25	34,000	6,800	20.0%	3
06.0.1.B	ROCK SUBSTRATE	3600	TON	24.25	87,300	13,095	15.0%	2
	SUBTOTAL, SIDE CHANNEL RESTORATION				508,547			
	CONTINGENCIES; AVERAGE OF 15.3%					77,680		
	TOTAL, SIDE CHANNEL RESTORATION				586,227			
06.	TOTAL, FISH AND WILDLIFE FACILITIES				3,477,000			

REASONS FOR CONTINGENCIES

1. UNKNOWN SITE CONDITIONS
2. UNKNOWN HAUL DISTANCE
3. UNIT PRICE UNKNOWN
4. QUANTITY UNKNOWN

30.	PLANNING, ENGINEERING AND DESIGN		560,000
	DEFINITE PROJECT REPORT	457,000	
	PLANS AND SPECIFICATIONS	97,000	
	ENGINEERING DURING CONSTRUCTION	6,000	
31.	CONSTRUCTION MANAGEMENT		175,000
	CONTRACT ADMINISTRATION	68,000	
	REVIEW OF SHOP DRAWINGS	2,000	
	INSPECTION AND QUALITY ASSURANCE	105,000	

REVISED JUN 90

TABLE 13-2

Peoria Lake Enhancement Cost Estimate
Annual Operation, Maintenance and Rehabilitation
(February 1990 Price Levels)

	Qty	Unit	Unit Cost ($)	Total Cost ($)
Operation				
Moist Soil Unit				
Pump Energy	6,900	kWh	.16	1,104
Water Control	20	Hr	17.00	340
Barrier Island	-	-	-	-
East River Sed Exc	-	-	-	-
Maintenance				
Moist Soil Unit				
Pump	8	Hr	30.00	240
Pump replacement ($75,000 in year 25, annualized)	1	Job	SUM	900
Water Control Structures	24	Hr	30.00	720
Levee Mowing (once/yr min.)	20	Ac	35.00	700
Embankment erosion	30	CY	15.00	450
Riprap replacement	10	Ton	24.00	240
Debris removal	8	Hr	50.00	400
Vegetative Management (mowing, herbicides)	7	Ac	60.00	420
Barrier Island				
Riprap replacement	40	Ton	24.00	960
Floating islands repair	20	Hr	45.00	900
East River Sed Exc				
Debris removal	40	Hr	100.00	4,000
Sediment excavation	1,700	CY	3.50	5,950
Vegetative Management (both embankments: mowing, herbicides)	4	Ac	90.00	360
Rehabilitation [1]				
Subtotal				17,684
Contingencies				2,116
Total				19,800

[1] Rehabilitation cannot be accurately estimated. Rehabilitation is reconstructive work that significantly exceeds the annual operation and maintenance requirements identified above and which is needed as the result of major storms or flood events.

TABLE 13-3

Estimated Post-Construction Annual Monitoring Costs ($)
(February 1990 Price Level)

Item	Annual Cost ($)
Water Quality Data [1]	6,400
Engineering Data [1]	3,000
Natural Resource Data [1]	4,000
Subtotal	13,400
Contingencies	2,000
Subtotal	15,400
Planning, Engineering, Design [2]	1,600
Contract Management	1,000
Total	18,000

[1] Reference tables 12-2 and 2-3.

[2] Includes cost of annual evaluation report.

14. REAL ESTATE REQUIREMENTS.

a. General. All project features will be located on State of Illinois owned lands. The State presently owns the majority of lands proposed for project development. Minor additional land acquisition of approximately 57 acres in the vicinity of the East River excavation are required as shown on plate 11. These additional lands are needed for initial construction and for operation and maintenance. The State of Illinois will purchase or acquire appropriate easements for these lands prior to initiation of construction. Management of this project after construction will be by the State of Illinois, Department of Conservation.

b. Local Cooperation Agreement. A draft local cooperation agreement is included as appendix C. The agreement principally states that the first cost of the proposed construction will be cost-shared 75 percent Federal/25 percent State. Initial cost-sharing is required because the project lands are not managed as a National Wildlife Refuge as prescribed by Section 906(e) of the Water Resources Development Act of 1986 (Public Law 99-662).

Operation, maintenance, and rehabilitation will be cost-shared 75 percent Federal/25 percent State in accordance with Section 906(e) and the Corps of Engineers policy letter dated February 5, 1988.

c. Construction Easements. Construction easements are presently not required for this project.

15. SCHEDULE FOR DESIGN AND CONSTRUCTION.

Table 15-1 presents the schedule of project completion steps.

TABLE 15-1

Project Implementation Schedule

Requirement	Scheduled Date
Project Approval	
Submit Draft DPR to CENCD and participating agencies	(Oct 89)
Distribute revised DPR to public	(Mar 90)
Submit public reviewed DPR to CENCD	(Jul 90)
Receive approval of DPR through CENCD, HQUSACE, from ASA(CW)	Dec 90
Plans, Specifications, Award	
Receive plans and specifications funds	Jul 90
Execute LCA with State	Mar 91
Submit plans, specifications, and design analyses to CENCD and participating agencies for review	Apr 91
Complete right-of-way acquisition by State	Apr 91
Receive approval of plans, specifications, and design analyses from CENCD	May 91
Advertise contract	May 91
Award contract	Jul 91
Complete construction	Dec 93

16. IMPLEMENTATION, RESPONSIBILITIES, AND VIEWS

a. Corps of Engineers. The Corps of Engineers, Rock Island District, is responsible for project management and coordination with the USFWS, the IDOC, and other affected agencies. The Rock Island District will prepare and submit the final DPR; program funds; finalize plans and specifications; complete all National Environmental Policy Act requirements and other permit requirements; advertise and award a contract; perform construction contract supervision and inspections; and perform post-construction project evaluations.

b. U.S. Fish and Wildlife Service. The USFWS will produce a Coordination Act Report (CAR) for this project. In addition, the USFWS should ensure that all proposed features are compatible with regional refuge objectives and management strategies.

c. Illinois Department of Conservation. The IDOC, the non-Federal sponsor, has provided technical and other advisory assistance during all phases of project development and will continue to provide assistance during project implementation. In accordance with Section 906(e) of the Water Resources Development Act of 1986, the IDOC is responsible for the non-Federal share of construction and annual operation, maintenance, and rehabilitation as estimated in tables 13-1 and 13-2, respectively. Further IDOC requirements are specified in Appendix C - Local Cooperation Agreement.

17. COORDINATION, PUBLIC VIEWS, AND COMMENTS.

a. Coordination Meetings. Coordination meetings have been conducted with members present from the organizations shown in table 17-1.

TABLE 17-1

Peoria Lake Enhancement Participating Agencies

Name	Acronym
U.S. Fish and Wildlife Service	USFWS
U.S. Environmental Protection Agency	EPA
Illinois Department of Conservation	IDOC
Illinois Department of Energy and Natural Resources	IENR
Illinois State Water Survey	ISWS
Illinois State Environmental Protection Agency	IEPA
Illinois State Department of Transportation/Division of Water Resources	IDOT/DWR
Illinois River Coalition/Father Marquette Compact	IRC/FMC
Tri-County Regional Planning Commission	TCRPC
Heartland Water Resources Council	HWRC
University of Illinois	UI
Illinois Natural History Survey	INHS
U.S. Army Corps of Engineers, Waterways Experiment Station	CEWES
U.S. Army Corps of Engineers, Rock Island District	CENCR

The following coordination meetings have been conducted:

(1) 30 Nov 87. USFWS, IDOC, ISWS, CENCR.
(2) 26 Feb 88. USFWS, IDOC, ISWS, UI, CEWES, CENCR.
(3) 10 Mar 88. USFWS, IDOC, ISWS, ISWS, CENCR.
(4) 2 Sep 88. USFWS, IDOC, ISWS, TCRPC, HWRC, CENCR.
(5) 1 Nov 88. USFWS, ISWS, IDOC, CEWES, CENCR.
(6) 10-11 May 89. USFWS, IDOC, ISWS, IEPA, EPA, INHS, IDOT/DWR, CEWES, CENCR.
(7) 7 Sep 89. IDOC, ISWS, CEWES, CENCR, HWRC, UI, USFWS.
(8) 7 Sep 89. Public meeting conducted at Peoria Medical Center, Peoria.
(9) 27 Nov 89. IDOC, ISWS, IDOT/DWR, USFWS, IEPA, CENCR, EPA.

b. Environmental Review Process. This project meets the requirements of the National Environmental Policy Act, as evidenced by the Environmental Assessment which is an integral part of this report and a Finding of No Significant Impact. This project was fully coordinated with the Illinois State Historic Preservation Officer, who, by letter dated January 19, 1990, concurred that the project would not affect significant historic properties.

18. CONCLUSIONS.

Upper Peoria Lake has experienced tremendous deterioration in its habitat value as a result of sedimentation. Waterfowl usage of this area has declined. Commercial and sport fisheries in the area have been severely impacted by the loss of important aquatic habitat due to reduced lake depths and the termination of flow through the East River channel. The lake's benthic communities have lost prime habitat as a result of sediment accumulation and associated burial of preferred substrates. In addition, the broad, unobstructed expanse of the lake promotes wind fetch-generated turbidity, thereby inhibiting photosynthetic activity and lake bed consolidation. This, in turn, precludes aquatic vegetation rooting, growth, and survival.

By interrupting the wind fetch, reestablishing side channel flow, developing rock habitat, and providing reliable forested wetland habitat, the project area and its environs should realize improved fisheries and expanded waterfowl usage throughout the 50-year project life expectancy.

The proposed construction includes: creation of a 1.1-mile-long barrier island; development of a 168-acre FWMA; placement of two 1,500-square-foot submerged rock substrate habitats; excavation of a 3,550-foot cut through an existing blocked side channel; construction of floating vegetated islands; and revegetation actions as specified in this document.

Complete implementation of these project features will result in the following habitat outputs: reestablishment of side channel flow through the East River channel; littoral zone development on the lee side of the barrier island; increased availability of food resources and resting, loafing, and nesting habitat for waterfowl; and rock substrate habitat development. The benthic, aquatic, and wetland habitat currently available at this location will be diversified and enhanced as a result of the construction and operation of the proposed project features.

The total project cost, including General Design, is $4,237,000 (February 1990 price level). This project shall be cost-shared in accordance with Section 906(e) of Public Law 99-662. Non-Federal lands and damages cost is not subject to cost-sharing. All remaining project costs are to be cost-shared between the Federal Government and the State of Illinois at a ratio of 75 percent/25 percent, respectively.

19. RECOMMENDATIONS.

I have weighed the accomplishments to be obtained from this habitat rehabilitation and enhancement project against its cost and have considered the alternatives, impacts, and scope of the prepared project. In my judgment, this project, as proposed, justifies expenditure of Federal funds. I recommend that the Secretary of the Army for Civil Works approve construction to include: construction of an approximate 1.1-mile-long barrier island; development of an approximate 168-acre FWMA; and excavation of approximately 3,550 feet through an existing blocked side channel with placement of submerged rock substrate.

The estimated construction cost for this project is $3,780,000. Total project cost estimate, including general design, is $4,237,000. Non-Federal lands and damages cost is not subject to cost-sharing. All remaining project costs are to be cost-shared between the Federal Government and the non-Federal sponsor (State of Illinois) at a ratio of 75 percent/25 percent, respectively. The non-Federal cash contribution is estimated to be $1,055,000. The Federal share of funds required for construction of the project is $2,708,000. The basis for this cost-sharing is Section 906(e) of Public Law 99-662, the Water Resources Development Act of 1986.

At this time, I further recommend that funds in the amount of $97,000 be allocated as scheduled for the preparation of plans and specifications.

John R. Brown
Colonel, U.S. Army
District Engineer

FINDING OF NO SIGNIFICANT IMPACT

Having reviewed the information contained in this environmental assessment, I find that construction of the Peoria Lake Enhancement project will have no significant adverse impacts on the environment; therefore, preparation of an Environmental Impact Statement (EIS) is not required. This determination may be reevaluated if warranted by later developments. Factors that were considered in making this determination were:

a. The project will improve the quality of fish and wildlife habitat through habitat restoration and enhancement.

b. Aside from the conversion of shallow aquatic habitat to deep water and island habitat, this project will have negligible adverse effects on existing natural resources.

c. Public review of this document has resulted in no significant comments.

d. The project is in compliance with Sections 401 and 404 of the Clean Water Act.

6 Jun 90
Date

John R. Brown
Colonel, U.S. Army
District Engineer

LITERATURE CITED

Bellrose, F. C., F. L. Paveglio, Jr., and D. W. Steffeck. 1979. Waterfowl Populations and the Changing Environment of the Illinois River Valley. Illinois Natural History Survey Bulletin 32(1):1.

Demissie, Misqanaw and Bhowmik, Nani G., "Peoria Lake Sediment Investigation," Illinois Department of Energy and Natural Resources, State Water Survey Division, SWS Contract Report 371, Champaign, Illinois. January 1986.

Demissie, Misqanaw; Soong, Ta Wei; and Bhowmik, Nani G., "Hydraulic Investigation for the Construction of Artificial Islands in Peoria Lake," Illinois Department of Energy and Natural Resources, State Water Survey Division, Champaign, Illinois. 1988.

Fredrickson, L. H., and T. S. Taylor. 1982. Management of Seasonally Flooded Impoundments for Wildlife. U.S. Fish and Wildlife Service Resource Publication No. 148.

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Roseboom, D., Personal Communication. Illinois State Water Survey.

APPENDIX A

CORRESPONDENCE

Illinois Department of Conservation
life and land together

LINCOLN TOWER PLAZA • 524 SOUTH SECOND STREET • SPRINGFIELD 62701-1787
CHICAGO OFFICE • ROOM 4-300 • 100 WEST RANDOLPH 60601
MARK FRECH, DIRECTOR

March 22, 1988

Colonel Neil A. Smart
District Engineer
U.S. Army Corps of Engineers
Rock Island District
ATTN: Andy Bruzewicz
PO Box 2004
Rock Island, Il 61204-2004

Dear Mr. Bruzewicz:

In an effort to identify habitat benefits of the proposed EMP project for Peoria Lake, the following met on March 14, 1988, and reached a consensus on a revised Scope of Work:

Steve Havera, NHS	Herman Hier, DOC	Dick Brooks, DOC
Richard Sparks, NHS	Dan Sallee, DOC	Fred Davidson, DOC
Don Roseboom, NHS	Max Runkle, DOC	Bill Donels, DOC

Working within the proposed funding level for the project, all concurred that the following elements would provide maximum habitat benefits for fish and wildlife in upper Peoria Lake:

- Construction of a crescent-shaped barrier island and associated improvements near the Blue Creek confluence. The improvements would provide habitat benefits of side channel habitat, deeper water, wind fetch abatement and possible waterfowl wind protection as staff discussed with you on March 10, 1988 in Peoria.

- Removal of the silt plug at the lower end of East River opposite Chillicothe. The material removed would be placed along the left bank to close the existing gap and to continue the present peninsula that is forming and curving back into Goose Lake. This barrier island effect would provide more side channel habitat, some wind fetch protection, back water habitat for aquatic plants and side channel habitat for potential mussel bed creation.

- Creation of a floodplain forest management area within the Woodford State Fish and Wildlife Area, located east of the East River project site. See attached scope for this portion of the project for which engineering has been completed. The habitat benefits for this portion of the project would provide quality, reliable forage habitat for both waterfowl and upland wildlife. This habitat type has become astonishingly limited in this traditionally renowned valley.

Plat maps showing departmental ownership at the three project locations are also attached. The revised scope will be forthcoming.

If you have any questions, please give Bill Donels, our program coordinator, a call.

Sincerely,

Mark Frech

Mark Frech
Director

RHT:jmt

cc: John W. Comerio
Chuck Davis
Leroy Sowl
John Tranquilli

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGMENT PROGRAM

Woodford State FWA
Wodford County

PROJECT TYPE: Levee Construction — Dist Prior. 3
Water control impondment on land above low-water-datum, at Elev. 443-447 MSL

PROJECT LOCATION/SIZE:

Location - Sec 16, T28N - R3W, Woodford County
River Miles 178 - 179

Size - State Site, 2,200 acres
Project Site, 140+- acres

RESOURCE PROBLEMS:

The much acknowledged and documented siltation and synergistic effects of commercial traffic have rendered once prolific, quality aquatic habitats within the Illinois River Valley, at a premium. Quality, reliable forage habitat has become, aston-ishingly, a limiting factor for waterfowl in this tradiltion-ally renown valley.

PROPOSED EFFORT and CONTRIBUTION:

Construction of 37,000 cu. yards of reasonably low-profile levees, with attendant water source facility of 6-8,000 gpm capacity, upon State owned grounds would supplement this important concentration/refuge area - on which dabling duck food sources are extremely limited - with 140+- acres of water-controled, flooded timber, forage habitat. These levees should find good protection set-back within timber placement and should accordingly demand minimal maintenance.

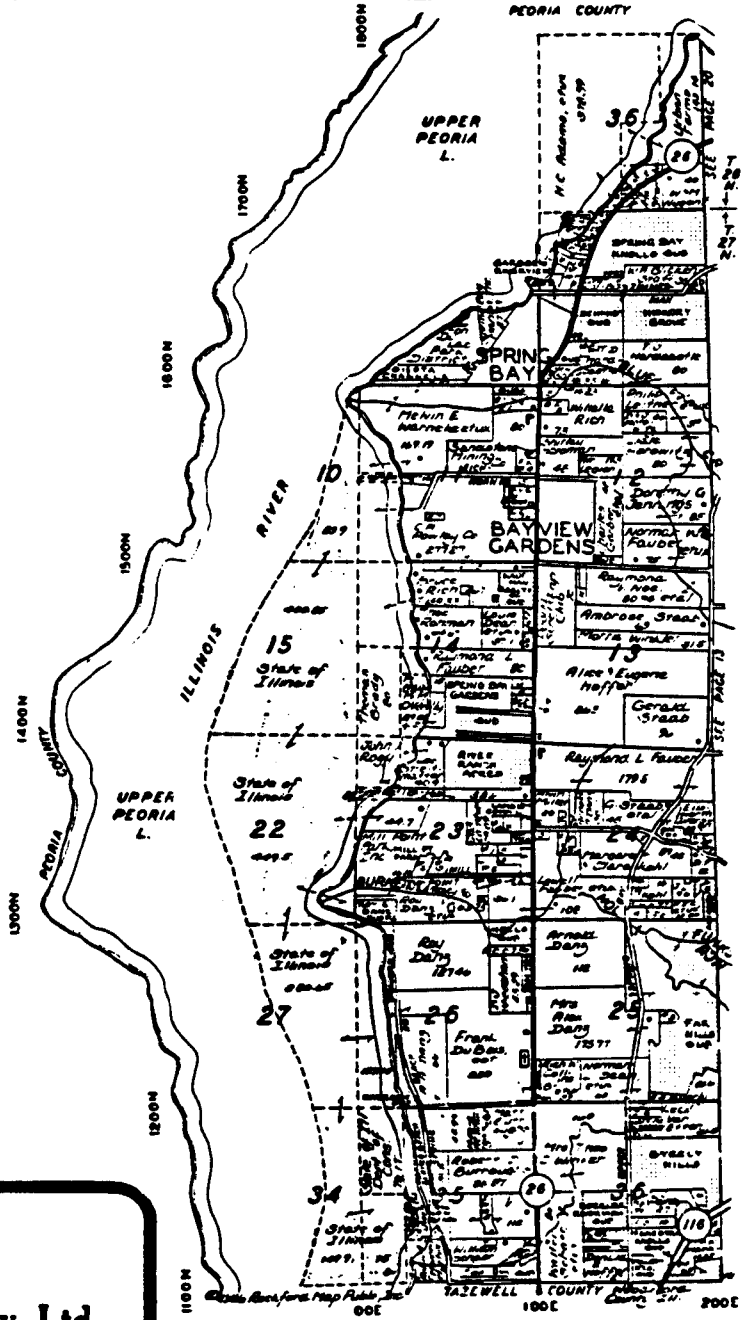
ESTIMATED IMPLENMENTATION COST:

Excerpted from IDOC Engineering studies - 5/84

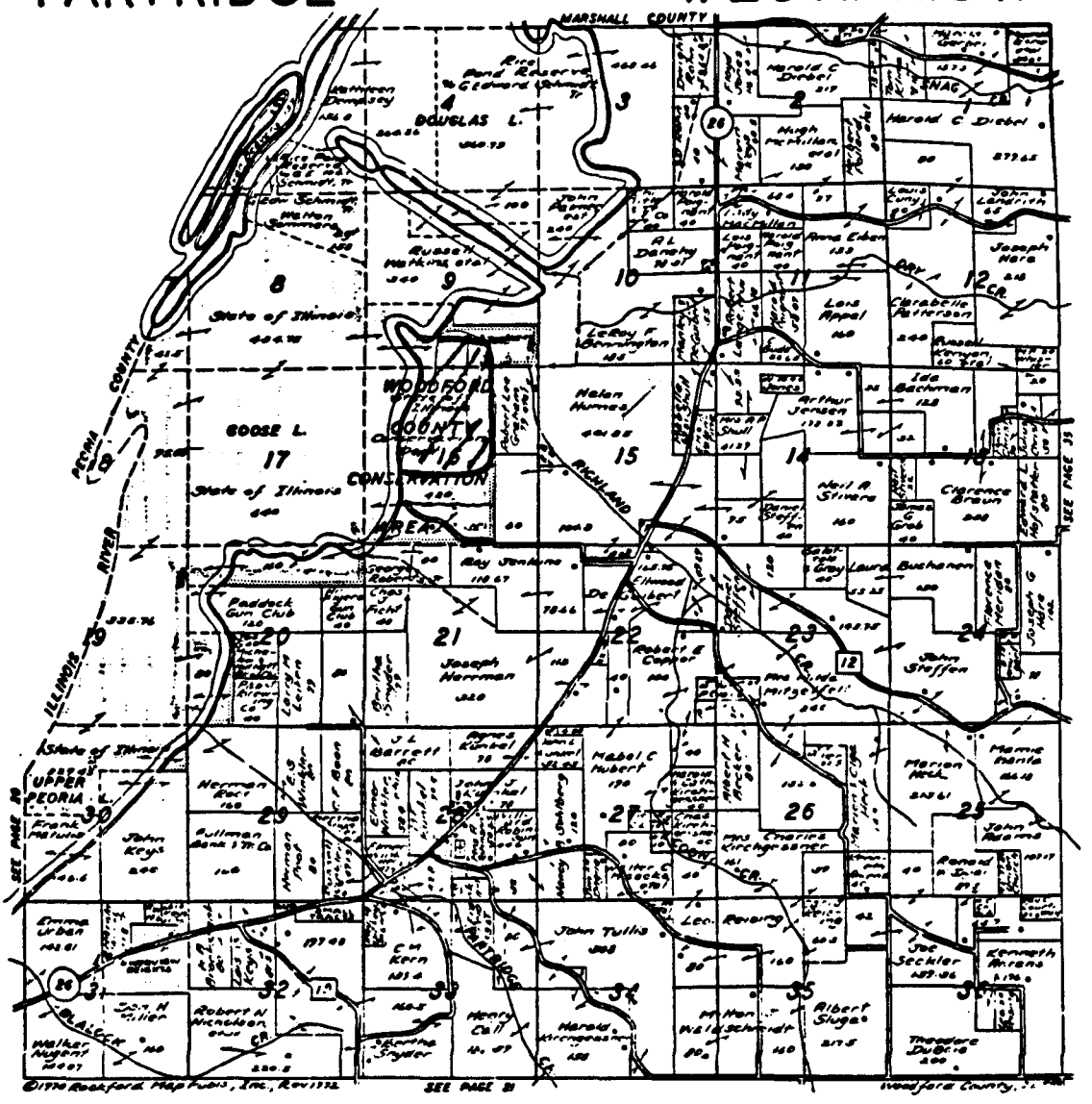
Clearing/earthwork	$234.5
Spillways	90.0
Pump	35.0
Armoring, structures, etc	181.6
TOTAL	$547.1

ATTACHMENT: location map (3-1)

SPRING BAY T. 27-28N.-R.4 W.



PARTRIDGE T. 28 N.–R. 3 W



TRI-COUNTY REGIONAL PLANNING COMMISSION

632 WEST JEFFERSON STREET MORTON, ILLINOIS 61550-1540
PHONE (309) 694-4391 or (309) 266-9941

September 9, 1988

Colonel Neil Smart
District Engineer
Rock Island District
U.S. Army Corps of Engineers
Clock Tower Building P.O. Box 2004
Rock Island, Illinois 61204-2004

RE: Peoria Lake Habitat Rehabilitation Project

Dear Colonel Smart:

I am pleased to enclose herewith a resolution in support of the above referenced project.

On behalf of the Commission, I wish to express our appreciation to the individuals, that came to Peoria last Friday, from the Corps fo Engineers, Illinois Department of Conservation, Illinois Division of Water Resources, and Illinois State Water Survey to participate in the presentation of the rehabilitation project.

Sincerely,

Ronald N. Marshall
Chairman

DGM:RNM:jr

enclosure

cc: Robert Michel, Congressman
Don Vonnahme, DWR
Mark Frech, DOC
Nani Bhowmik, State Water Survey
Senator Carl E. Hawkinson
Senator Richard Luft
Rep. Fred Tuerk
Senator Robert Madigan
Rep. John C. Ackerman
Rep. Thomas Homer
Rep. David Hultgren
Rep. Robert F. Olson
Rep. Donald Saltsman

RESOLUTION # 88-20

RESOLUTION IN SUPPORT OF THE PEORIA LAKE HABITAT REHABILITATION PROJECT.

WHEREAS, the Tri-County Regional Planning Commission, hereafter referred to as the Commission, serving as the designated Metropolitan Planning Organization for the tri-county area, has been diligently working to develop and implement, in cooperation with other responsible organizations and agencies, a series of strategies to contend with the siltation problem plaguing Peoria Lake; and

WHEREAS, the U.S. Army Corps of Engineers working in concert with the Illinois Department of Conservation, has proposed a habitat rehabilitation project involving the building of two artifical islands of silt dredged from Peoria Lake; and

WHEREAS, the Commission envisions the island project as an urgent need and an important step, along with the control of soil erosion from the upland area, toward the saving of Peoria Lake as an invaluable natural resource for present and future generations to enjoy.

NOW THEREFORE BE IT RESOLVED, that the Commission supports the Peoria Lake Habitat Rehabilitation Project and extends its continued service and cooperation to the governmental units involved to assure expedient implementation of the project.

Presented this 8th day of September, 1988.

Adopted this 8th day of September, 1988.

Ronald N. Marshall, Chairman
Tri-County Regional Planning Commission

ATTEST:

Donald G. Meinen, Interim Director
Tri-County Regional Planning Commission

Illinois Department of Conservation
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CHICAGO OFFICE • ROOM 4-300 • 100 WEST RANDOLPH 60601
MARK FRECH, DIRECTOR

February 21, 1989

Mr. Andy Bruzewicz
U.S. Army Engineer District
Clock Tower Building
Rock Island, IL 61204-2004

Dear Andy:

We have reviewed the Peoria Lake DPR outline that you submitted January 13, 1989 and would offer the following concerns and comments.

- At this time we are uncertain which source of water (well or river) would be most cost effective for the moist soil unit. We need to know well potential to determine if unit can be filled within optimum time of 5 to 10 days.

- Size of spillway in levees need to be adequate to allow river flooding to take place without pressure on the levees.

- Can silt plug disposal be used as part of the island construction?

- Why does the cost of clam shell construction of the island continue to increase?

- We will need to assure concerns of sediment resuspension during construction.

We look forward to your continued cooperation on this project.

Sincerely,

William R. Donels
Division of Planning

WRD:lw

Illinois Historic
Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4997

WOODFORD COUNTY
Peoria Lake Enhancement
Environmental Management Project
Chillicothe

IHPA LOG #89052603

June 6, 1989

Mr. Ron Deiss
District Engineer
U.S. Army Engineer District, Rock Island
Attn: Planning Division
Clock Tower Building - Post Office Box 2004
Rock Island, Illinois 61204-2004

Dear Sir:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

The map enclosed was sent to us to locate known archaeological sites in the project area. There are no sites indicated on our site files. However, a site is located one half mile above the project area. In light of this, our Agency would require that a Phase I survey be done for the area.

If you have any further questions, please contact Ms. Joyce A. Williams, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-1279.

Sincerely,

Theodore Hild

Theodore W. Hild
Deputy State Historic
Preservation Officer

THH:JAW:bv

Enclosure: Chillicothe Quad 7.5' map

HEARTLAND WATER RESOURCES COUNCIL
of Central Illinois

Save the Illinois River

5823 Forest Park Drive
Peoria, Illinois 61614
(309) 688 Lake (5253)

September 14, 1989

Mr. Andy Bruzewicz, Manager
EMP Habitat Projects
U.S. Army Corps of Engineers
Rock Island District
Clock Tower Building, P.O. Box 2004
Rock Island, IL 61204-2004

Dear Andy:

Your involvement and continued interest in the public meeting regarding the construction of the habitat island and its various elements in Peoria Lakes was excellent. I greatly appreciate your cooperation and interest in attacking the problems associated with the Illinois River and Peoria Lakes.

If the Heartland Water Resources Council or I can be of service in your endeavors in any way, please let me know. I feel the Peoria area is supportive of this project and we look forward to working with you in the future.

Sincerely,

Bonnie W. Noble

Bonnie W. Noble
Executive Director

BWN/pjb

Illinois Historic
Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4997

WOODFORD COUNTY
Peoria Lake Enhancement
Environmental Management Project
Chillicothe

IHPA LOG #89040304 (89052603)

November 30, 1989

Mr. J. Paul VanHoorebeke
Authorized Representative
of the Contracting Officer
District Engineer, US Corps of Engineers
Rock Island District
Clock Tower Building
Post Office Box 2004
Rock Island, Illinois 61204-2004

Dear Sir:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

Our staff has reviewed the report titled "Phase I Archaeological Reconnaissance For Historic Properties Within The Peoria Lake Environmental Management Program, Habitat Rehabilitation Enhancement Project, Woodford County Conservation Area, Chillicothe, Illinois" by Michael J. McNerney, Steve Titus, and Jeffrey D. Anderson.

The Phase I survey and assessment of the archaeological resources appear to be adequate. No archaeological material was recorded within the boundaries of the proposed Peoria Lake Environmental Management Program, Habitat Rehabilitation Enhancement Project. Accordingly, we have determined, based upon this report, that no significant historic, architectural, and archaeological resources are located in the 190 acre project area.

Illinois Historic
Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

We do recommend that the report be revised to include a more thorough description of the project activities with appropriate project maps.

Please retain this letter in your files as evidence of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any further questions, please contact Paula G. Cross, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-4998.

Sincerely,

Theodore W. Hild
Deputy State Historic
Preservation Officer

TWH:PGC:bv

cc: Bill Callahan

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

28 DEC 1989

REPLY TO ATTENTION OF:

Colonel John R. Brown
District Engineer
Department of the Army
Rock Island District, Corps of Engineers
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Brown:

We have reviewed the Environmental Assessment for Peoria Lake Enhancement Peoria Pool, Illinois Waterway, River Miles 178.5 to 181 in Woodford County in Illinois. The purpose of the project is to enhance Peoria Lake and the surrounding aquatic and wetland environments. The project would consist of the construction of a 160 acre forested wetland management area 1.3 mile long island, mussel beds, and the particle removal of a silt plug from East End River. Both the Forested Wetland Management area and the areas adjacent to the site of silt plug removal will be planted with mast trees.

The Forested Wetland Management Area would consist of three cells that would incorporate a series of levees and water control structures. The purpose of the unit is to provide resting and feeding area for migrating waterfowl. Using groundwater, the unit would be flooded in the fall of each year to depth of about two feet. Approximately 80,500 cubic yards of material would be need to construct the 20,275 feet of berm.

The location of the island to be constructed would begin at the southern tip of the east island. The island would have a S shape taper into the upper Peoria Lake. The length of this island would be 1.3 miles. The island would be constructed using sediment from adjacent lake bottom. The construction of the island would require approximately 483,00 cubic yards of material. While placing the material in position, the method of construction that would utilize mechanical methods to provide the stability to maintain the physical characteristics. The material would be allowed to condense between each cut. After construction has been completed, to protect against erosion the island will be covered with a biologically degradable blanket and seeded with a variety of wetland plants. In addition to seeding, floating islands will be placed on the wind ward side of the island. These islands would also have various wetland vegetation planted.

The particle removal of the silt plug would have a channel depth of 7 feet, bottom width of 95 feet with a 24 foot slide slope. The excavated material would be side cast along both sides of the channel. The total affected width including disposal sites would be 487 feet. The material would be placed in the formation of berm on both sides of the channel. After dredging has been completed, the berm would be planted with mast trees.

At the upper end of East River channel, two 300 foot by 50 foot rock substrate with a depth of two feet would be put in place. This would provide a diverse benthic habitat suitable for macroinvertebrates,fishes,and benthic organisms. The material would be barged to the site and offloaded using a clam shell.

Our Agency is concerned that the project may adversely impact water quality due to the construction of the island. This concern centers around the high concentration of ammonia nitrogen present in the sediments. This concentration could be detrimental to the surrounding and downstream aquatic ecosystems. The draft EA did not to provide sufficient information on the mitigation measures that would be implemented to minimize the adverse impacts. As agreed at the interagency meeting held November 29, 1989, your agency should provide additional information on the mitigation plan. After reviewing this information and the Final Environmental Assessment, our Agency will provide our formal decision on the adequently of the mitigation plan.

We further recommend that the use of all or a portion of the cells be converted to fisheries in the spring. The surrounding fisheries should be contacted to the availability of the cells. The hatcheries could use this area for the seasons that have an over abundant amount of fry.

Thank you for the opportunity to comment on the EA for Peoria Lake. If you have any questions or comments please contact Al Fenedick at 312/886-6872.

Sincerely yours,

William D. Franz

William D. Franz, Chief
Environmental Review Branch
Planning and Management Division

Illinois Department of Conservation
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MARK FRECH, DIRECTOR - KATHY SELCKE, ASSISTANT DIRECTOR

January 2, 1990

Colonel John R. Brown
U.S. Army District Engineer
Clock Tower Building
P.O.Box 2004
Rock Island, Il 61204-2004

Dear Colonel Brown:

With this letter of intent, I wish to confirm that the Illinois Department of Conservation will be the nonfederal sponsor for the Peoria Lake Enhancement Project, located in the Peoria Pool of the Illinois River, in the Upper Mississippi River Environmental Management Program.

In accordance with Section 906(e) of the Water Resources Development Act of 1986, project funding will be 75% Federal government and 25% nonfederal sponsor. Legislation for our funding will be in place for the proposed construction start in Fiscal Year 1991.

We wish to compliment your Environmental Management Program task force staff on their exemplary effort for the project and look forward to completing it and others with them.

Sincerely

Mark Frech

Mark Frech
Director

MF:BD:paf

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ROCK ISLAND FIELD OFFICE (ES)
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

IN REPLY REFER TO:
COM: 309/793-5800
FTS: 782-5800

February 2, 1990

Colonel John R. Brown
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Brown:

This constitutes our draft Fish and Wildlife Coordination Act report on the Peoria Lake Habitat Rehabilitation and Enhancement Project (HREP), Illinois Waterway, Peoria and Woodford Counties, Illinois. The project is a component of the Upper Mississippi River System Environmental Management Program authorized by the 1985 Supplemental Appropriation Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662). The authority for this report is contained in Section 2 of the Fish and Wildlife Coordination Act of 1958 (Public Law 85-624).

BACKGROUND

The goal of the Upper Mississippi River System Environmental Management Program is to implement "...numerous enhancement efforts...to preserve, protect, and restore habitat that is deteriorating due to natural and man-induced activities." The objective of these enhancement efforts is to recover some of the riparian habitat diversity that has been lost due to construction of the navigation project and the effects of sedimentation.

The Illinois River Basin served as an important fishery and migration path for waterfowl until the mid 1900's. An extensive system of backwater lakes, side channels and islands provided diverse aquatic and terrestrial habitats. The development of extensive levee systems, intensified agricultural practices, wetland fills and a system of locks and dams has greatly reduced fish and wildlife values along extensive reaches of the river. Water quality in the river has been improving in recent years, but contaminants from urban and agricultural developments eliminated some important invertebrate species, such as fingernail clams, in the early 1900's. These species may be returning to river in areas where habitats are suitable.

PROJECT DESCRIPTION

The Peoria Lake HREP is sponsored by the Illinois Department of Conservation (IDOC) and consists of four components. In order to improve fisheries habitat a plug in the East River channel would be removed to restore flows. Secondly, two small areas of rock substrate will be established in the newly opened channel to provide habitat for mussels. The third feature would consist of using dredged material to construct an island 1.3 miles in length that would serve to reduce wave induced turbidity in the State-owned portion of the pool known as Goose Lake. The fourth feature would consist of a three-celled forested moist soil unit in the Woodford County Conservation Area on the south side of Peoria Lake.

METHODOLOGY

In order to quantify the existing habitat and the impacts of the proposed features on the Peoria Lake project area a habitat evaluation was performed at the site. The methodology selected was the Missouri Habitat Appraisal Guide (WHAG) procedures developed by the Missouri Department of Conservation and the Soil Conservation Service. A list of variables for each habitat are measured on site. Habitat suitability indices (HSI's) are calculated for an evaluation species by totalling the appropriate variables and dividing by the maximum potential score for that species. The index for each species is then multiplied by the acres of available habitat to determine habitat units (HU's).

Changes in the habitat variables are projected for selected target years during the 50-year period of analysis, and average annual habitat units (AAHU's) are established for each species of concern. Once the without project habitat values are established the anticipated conditions for each alternative are calculated in the same manner. The beneficial or adverse impacts of each alternative to a particular evaluation species is determined by subtracting the without project AAHU's from the AAHU value anticipated with the alternative in place.

The WHAG software calculates projected HSI's and HU's for a number of evaluation species. These species have been selected to represent groups of species (i.e., mallards represent dabbling duck values). The terrestrial objectives for the Peoria Lake project are to enhance dabbling duck habitat, so the only the mallard output from the software is presented below.

The current WHAG models address only terrestrial values. A channel catfish model is currently under development, and was used in this project analysis for evaluation of the aquatic impacts associated with the opening of the side channel. In this case, the HSI portion of the calculations were deemed sufficient

to indicate the extent of improvement with versus without the channel feature.

We wish to acknowledge the WHAG team efforts provided by Joe Slater and Tim Feavel of your staff, and Dick Brooks, Fred Davidson, Max Runkle, and Dan Sallee of the Illinois Department of Conservation. Mr. Dave Urich of the Missouri Department of Conservation provided valuable guidance on use of the WHAG software and development of the draft catfish model.

EXISTING FISH AND WILDLIFE RESOURCES

Peoria Lake was originally a river lake component of the Illinois River. The lake's surface area was expanded in the 1920's by construction of a lock and dam. The pool has lost 68 percent of its volume to sedimentation since the earliest recorded data was collected in 1903. The north/south orientation of the pool creates long wind fetch conditions, and the fine silt fluff bottom of upper Peoria Lake contributes to constant high turbidities. This has virtually eliminated submerged and emergent aquatic plant growth throughout the lake, except in protected areas. Another impact of long term sedimentation has been the leveling of the lake bottom, as soft sediments tend to fill in low areas first. This has resulted in a lack of diversity in underwater habitats. Fish species composition in the lake reflects these high turbidities and lack of structure and plant growth (i.e., carp, gizzard shad). Habitat for mussels is also limited, though a bed was discovered in the southern portion of Goose Lake during project investigations. The extent of this bed will be determined prior to construction to avoid impacting that resource.

The study area in upper Peoria Lake includes the East River on the opposite side of Chillicothe Island from the navigation channel. The East River channel has been plugged with silt since the late 1960's and sedimentation has reduced depths in the side channel to less than three feet over half of its approximate one-mile length. The channel currently provides some habitat for species such as catfish, but shallow conditions and lack of flow result in extremely low dissolved oxygen levels in the summer. Ice conditions also can render the channel unusable by most fish during winter.

Over 2,000 acres of upper Peoria Lake are within the Goose Lake portion of the Woodford County Conservation Area, and is under the ownership of the IDOC. Virtually all of this wind-swept area is less than three feet deep, and has an unconsolidated bottom consisting of silt fluff. Submerged and emergent plant growth cannot become established in the soft sediments and highly turbid conditions. Carp, shad and catfish would be the main species using this part of the lake.

Terrestrial habitats in the study area consists of the silver maple bottomland forests established on Chillicothe Island and along the East River. Waterfowl, particularly mallards, utilize Goose Lake primarily as a resting area during fall and spring migrations. The Woodford County Conservation Area also includes a silver maple bottomland forest on the east shore of the lake that provides important feeding habitat for waterfowl when infrequent fall floods inundate the area.

The bald eagle and Indiana bat are the only Federally listed threatened or endangered species that would potentially inhabit the study area. The proposed project features would have no effect on these species.

FUTURE WITHOUT THE PROJECT

If special measures are not implemented the fish and wildlife values at Peoria Lake will continue to decline in the future. The East River will continue to silt in, as will the entire Goose Lake complex. Within 50 years upper Peoria Lake will consist of partially vegetated mudflats. The silver maple forest on the eastern shore will continue to sporadically provide waterfowl habitat when flood conditions exist during migration seasons.

FUTURE WITH THE PROJECT.

East River Channel.- The data displayed in figure 1 below provides a comparison of the with and without benefits to channel catfish if the side channel is opened, dredged and riprapped where required. It is recognized that the construction of this feature will have beneficial impacts to most fish species, especially games species such as bass and other sunfish. However, the catfish model is currently the farthest along in development, and is the only one used for this study. This feature is a "go/no go" proposal, and therefore no incremental analysis was developed. Likewise, the rock substrate feature for mussel habitat is an experimental proposal, and no further analysis is presented here. Monitoring of these features following construction will provide valuable information regarding the effectiveness of these measures for habitat improvement.

The channel catfish model used for this analysis is described in detail in Technical Appendix K. The variables that were affected by the opening of the side channel include:

- Streambank conditions (percent cutback per 500 feet increases)
- Substrate (armoring of channel and placing of rock in channel enhances catfish habitat)

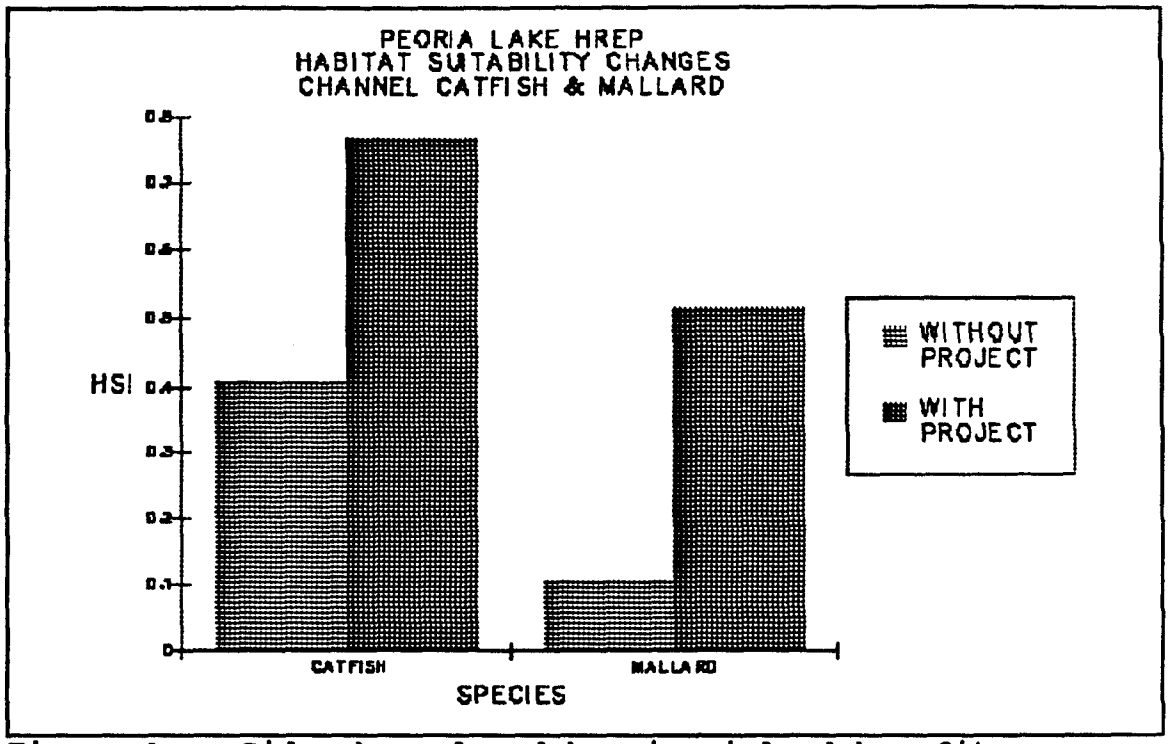

Figure 1.- Side channel and barrier island benefits.

- o Percent of channel greater than five feet deep increases, thus improving conditions for the evaluation species.

Barrier Island.- Placement of the barrier island would provide an opportunity for submerged and emergent aquatic vegetation to become established on the lee side of the structure. The area impacted by these plant beds would provide considerable habitat value improvements for mallards, as shown in figure 1 above. The waterfowl benefits provided by this feature were determined to be linear (i.e., the HU value increases in proportion to increases in the length of the island). Therefore, a comparison of benefits accrued by increment is not appropriate.

Forested Wetland Management Unit.- The proposal to develop a levee system for water control in the Woodford County Conservation area was analyzed in five increments. The topography of the site dictates that several cells be used to provide optimum water depths of between one to 18 inches. Flooding these units in the fall will attract waterfowl in search of invertebrates and mast. Alternatives with from one to three cells were designed and mallard average annual habitat unit values for the total 183-acre site were determined for each plan. Figure 2 indicates the results of this analysis, which indicates that a three-cell alternative would provide the greatest percent

increase in average annual benefits over without project conditions.

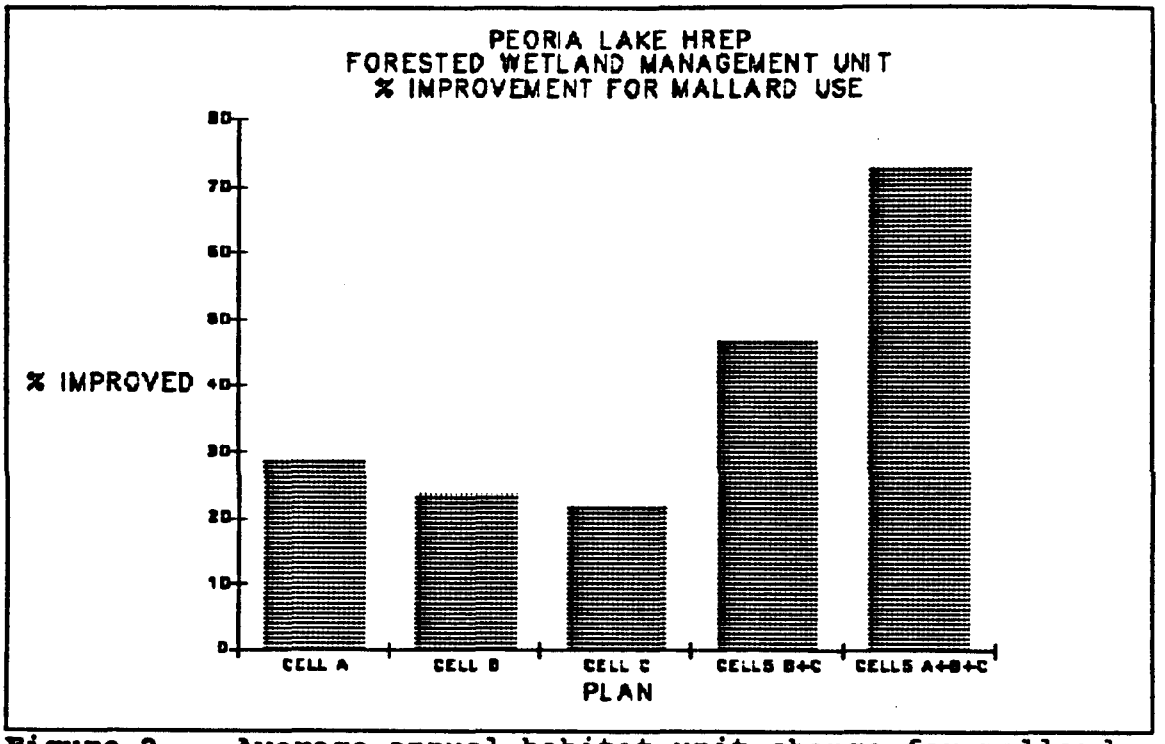

Figure 2.- Average annual habitat unit change for mallards.

CONCLUSIONS AND RECOMMENDATIONS

The proposed features for the Peoria Lake HREP will provide considerable habitat improvement for the upper lake. The reopening of the East Channel will result in reclamation of scarce side channel habitat, and the rock substrate should attract mussels and many fish species. The barrier island will provide conditions conducive to establishment of aquatic plant beds, and thus attract more migratory waterfowl and game fish to the Goose Lake area.

The forested moist soil management units will ensure that conditions can be established every year to attract migrating waterfowl to the forested habitat on the Woodford County Conservation Area. The WHAG analysis indicates that the optimum design would include three units to best utilize the topography of the site.

We look forward to working with your staff during the development of plans and specifications, and during construction of these worthwhile features. If you have any questions regarding this report please do not hesitate to contact Mr. Chuck Davis of my staff.

Sincerely,

Richard C. Nelson
Field Supervisor

cc: IL DOC (Brooks)
IL DOC (Donels)
IL DOC (Runkle)
AFWE-FA
AWR (Gibbons)

Illinois Historic
Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4512

Woodford County
Peoria Lake Enhancement
Environmental Management Project
Chillicothe
IHPA Log #89040304 & 89052603

January 19, 1990

Department of the Army
Rock Island District, Corps of Engineers
Attn: Dudley M. Hanson
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Sir:

Thank you for the opportunity to review the final draft of the report titled "Phase I Archaeological Reconnaissance for Historic Properties within the Peoria Lake Environmental Management Program, Habitat Rehabilitation Enhancement Project, Woodford County Conservation Area, Chillicothe, Illinois" by Michael McNerney, Steve Titus, and Jeffrey D. Anderson of American Resources Group, Ltd. of Carbondale, Illinois.

The revision recommendations in our letter dated November 30, 1989 have been adequately addressed in this final report.

If you have any further questions, please contact Paula G. Cross, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-4998.

Sincerely,

Theodore W. Hild
Deputy State Historic
Preservation Officer

TWH:PGC:kh

cc: McNerney, Arch., Ltd.

Illinois Historic Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4997

WOODFORD COUNTY
Peoria Lake Enhancement
Environmental Management Project
Chillicothe

March 27, 1990

District Engineer
U.S. Army Engineer District, Rock Island
Attention: Planning Division
Clock Tower Building - Post Office Box 2004
Rock Island, Illinois 61204-2004

Gentlemen:

Thank you for the opportunity to comment on the Upper Mississippi River System Environmental Management Program Definite Project Report (R-6PR) with Integrated Environmental Assessment. Our staff has reviewed this document and has determined that adequate consideration was given to cultural resources in the planning stages of this project. As presently proposed, no significant historic, architectural, and archaeological resources are located within the areas to be impacted by construction activities as stated in our previous correspondence dated November 30, 1989 and January 19, 1990.

If you have any further questions, please contact Paula G. Cross, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-4998.

Sincerely,

Theodore Hild

Theodore W. Hild
Deputy State Historic
Preservation Officer

TWH:PGC:bb

United States Department of the Interior

OFFICE OF ENVIRONMENTAL AFFAIRS
230 S. DEARBORN, SUITE 3422
CHICAGO, ILLINOIS 60604

TAKE PRIDE IN AMERICA

ER-90/246

April 30, 1990

Colonel John R. Brown
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Brown:

The Department of the Interior has reviewed the Environmental Assessment and Project Report for Peoria Lake Enhancement, Woodford County, Illinois, and concurs with the recommended plan.

Thank you for the opportunity to provide comments.

Sincerely,

Sheila Minor Huff

Sheila Minor Huff
Regional Environmental Officer

Illinois Environmental Protection Agency · P. O. Box 19276, Springfield, IL 62794-9276

217/782-1696

U.S. Army Corps of Engineers (Woodford County)
Peoria Lake Enhancement (Illinois River)
Log #C-308-89 [CoE Appl. 18820Z]

May 3, 1990

Mr. James H. Blanchar, P.E.
Chief, Operations Division
Rock Island District
Corps of Engineers
Clock Tower Building
Rock Island, Illinois 61201

Dear Mr. Blanchar:

This Agency received a request on April 5, 1989, from the U.S. Army Corps of Engineers requesting necessary comments for environmental consideration concerning the construction of a 168 acre ponded forested wetland management area, excavation of the silt plug in the East River channel to re-establish flow, and construction of a 1.1 mile long barrier island in upper Peoria Lake. The proposed project, known as the Peoria Lake Enhancement, is located on the Illinois River (river miles 178.5-181) within the boundaries of the Woodford County Conservation Area, Woodford County, Illinois. We offer the following comments.

Based on the information included in this submittal, it is our engineering judgment that the proposed project may be completed without causing water pollution as defined in the Illinois Environmental Protection Act, provided the project is carefully planned and supervised.

These comments are directed at the effect on water quality of the construction procedures involved in the above described project and is not an approval of any discharge resulting from the completed facility, nor an approval of the design of the facility. These comments do not supplant any permit responsibilities of the applicant towards this Agency.

This Agency hereby issues certification under Section 401 of the Clean Water Act (PL 95-217), subject to the applicant's compliance with the following conditions:

1. The applicant shall not cause:

   a. violation of applicable water quality standards of the Illinois Pollution Control Board, Title 35, Subtitle C: Water Pollution Rules and Regulations;

   b. water pollution as defined and prohibited by the Illinois Environmental Protection Act; and

   c. interference with water use practices near public recreation areas or water supply intakes.

2. The applicant shall provide adequate planning and supervision during the project construction period for implementing construction methods, processes and cleanup procedures necessary to prevent water pollution and control erosion.

3. All areas affected by construction shall be mulched and seeded as soon after construction as possible. The applicant shall undertake necessary measures and procedures to reduce erosion during construction. Interim measures to prevent erosion during construction shall be taken and may include the installation of staked straw bales, sedimentation basins and temporary mulching. All construction within the waterway shall be conducted during zero or low flow conditions.

4. The applicant shall implement erosion control measures consistent with the "Standards and Specifications for Soil Erosion and Sediment Control" (IEPA/WPC/87-012).

5. The applicant shall provide product specifications for the proposed sediment control system of floating curtains to this Agency prior to the initiation of construction. The sediment control system will be considered the impermeable curtains and anchors used to restrict the movement of sediment.

6. The applicant shall configure the sediment control system based on Option 2 as illustrated on Plate 24 of the Integrated Environmental Assessment of the Peoria Lake Enhancement (R-6PR; March 1990).

7. Installation and configuration of the sediment control system may be modified if necessary through consultation between the U.S. Army Corps of Engineers, Illinois Environmental Protection Agency, and the project contractor.

8. In the event that water levels exceed the height of the sediment control system construction of the barrier island shall cease immediately. Construction shall not recommence until such time as the sediment control system regains its function.

9. Water quality monitoring for total suspended solids, pH, temperature, phosphorous and ammonia nitrogen shall be conducted approximately 600 feet downstream from the borrow site for the barrier island portion of this project. The Agency recommends a background site be monitored upstream of the borrow area. Samples will be taken on a weekly basis.

10. Following completion of the first construction season, water quality monitoring data collected pursuant to this certification shall be evaluated to determine the effectiveness of the sediment control system and the project's impact on water quality in Peoria Lake and the Illinois River. This evaluation shall be forwarded to IEPA.

11. This certification becomes effective when the Department of the Army, Corps of Engineers, includes the above conditions #1 through 10 as conditions of the requested permit issued pursuant to Section 404 of PL. 95-217.

This certification does not grant immunity from any enforcement action found necessary by this Agency to meet its responsibilities in prevention, abatement, and control of water pollution.

Very truly yours,

Thomas G. McSwiggin, P.E.
Manager, Permit Section
Division of Water Pollution Control

TGM:JCH:sap/1383n,93-95

cc: IEPA, DWPC, Records Unit
DWPC, Field Operations Section, Region 3
IDOT, Division of Water Resources, Springfield
USEPA, Region V
CoE, Rock Island District, Attn: Dan Holmes

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

18 MAY 1990

Colonel John R. Brown
District Engineer
Department of the Army
Rock Island District, Corps of Engineers
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Brown:

We have reviewed the Final Environmental Assessment for Peoria Lake Enhancement Project, River Mile 178.5 to 181 in Woodford County, Illinois. The purpose of the project is to enhance Peoria Lake and the surrounding aquatic and wetland environments. The project would consist of the construction of a 160 acre forested wetland management area, 1.3 mile long island, mussel beds, and partial removal of a silt plug from East End River. The Forested Wetland Management area and the areas adjacent to the site of the silt plug removal will be planted with mast trees.

In our Agency's letter of December 28, 1989, we stated that there were concerns with the potential degradation of water quality due to the construction of the barrier island, which could release a high concentration of ammonia nitrogen from the sediment. We have reviewed the additional information on the proposed mitigation to offset the potential adverse impacts, that could result in an increase in turbidity and ammonia nitrogen. The present mitigation proposal would require that floating baffles be used during island construction to increase the detention time of water flowing through the project site thus reducing the turbidity and allowing the ammonia nitrogen levels to be reduced to an acceptable concentration. This baffle system would consist of a floatation collar that supports an impermeable skirt or curtain. The curtain bottom would be weighed by a chain ballast which prevents significant underflow. The proposed mitigation plan will also require that compliance monitoring be placed approximately 600 feet downstream from the borrow site. This will be approximately at the edge of the project area. If water samples exceed the ammonia nitrogen and turbidity standards, the contractor will have three options. These three options would be modify excavation and placement methods, reduce rate of excavation, or stop work.

At this time, it is not proposed that a water temperature restriction will be placed on the contractor. Our Agency recommends that there be a restriction of operations due to elevated water temperature. This restriction would aid in controlling the level of ammonia nitrogen in the aquatic environment. The increase in temperature combined with the decrease in flow rates during the summer season for the Illinois River could lead to adverse water conditions.

This restriction would be in addition to the condition to stop dredging operations when unacceptable ammonia concentration exist. We recommend that the monitoring program include flow rates, air, and water temperatures. This information could prove to be valuable in future projects that would require the same scope of work. Finally, the Final EA states that the contractor will have the option to modify excavation and placement methods. The range of acceptable options for modification should be disclosed and not conflict with other alternatives.

Our Agency agrees that there should not be any significant adverse impacts to water quality from construction operations, with the inclusion of the above recommendations. Over all, the proposed project will provide precious wildlife habitat that has become rare in the Illinois River system. Thank you for the opportunity to comment on the Final EA for Peoria Lake Enhancement Project in Woodford County, Illinois. If you have any questions or comments please contact Al Fenedick at 312/FTS/886-6872.

Sincerely yours,

William D. Franz

William D. Franz, Chief
Environmental Review Branch
Planning and Management Division

Illinois Department of Conservation
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MARK FRECH, DIRECTOR - KATHY SELCKE, ASSISTANT DIRECTOR

May 22, 1990

Colonel John R. Brown
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building
Rock Island, Illinois 61204-2004

Dear Colonel Brown:

On May 14, 1990 staff representatives from Natural Heritage, Wildlife, Land Management and Planning accompanied representatives of your staff and the Fish and Wildlife Service on an inspection of the Woodford County Fish and Wildlife Area, affected by the Forested Wetland Management Area of the Peoria Lake Project in the Environmental Management Program.

Based on the inspection, the Department of Conservation has no objection to the completion of the projects, described in the Definite Project Report. Construction of the levees as designed should have no significant adverse effects on endangered, threatened or other sensitive nongame species.

During the field inspection, discussion occurred concerning final alignment of levees which will be determined as project plans progress. We look forward to being a part of that process in the field when final alignments are determined.

Your cooperation and your staff's effort in this matter are appreciated.

Sincerely,

Mark Frech

Mark Frech
Director

MF:BD:mip

Illinois Department of Transportation
Division of Water Resources
2300 South Dirksen Parkway/Springfield, Illinois/62764

May 25, 1990

SUBJECT: Permit No. 20215

U. S. Army Corps of Engineers
Rock Island District
Rock Island, Illinois 61201-2004

Attention: Robert E. Kelley, P.E.
Chief, Engineering Division

Gentlemen:

We are enclosing Permit No. 20215 authorizing the construction of a wetland management area and a barrier island and the removal of sediment from a side channel within the Illinois River in Woodford County. This approval is based on the determination that the project is in the public interest, and on the results of a worst-case analsyis demonstrating that the project will not singularly or cumulatively cause flood damages.

As indicated by general condition (d), this permit does not supersede any other federal, state or local requirements for your activities nor relieve you from the responsibilities of meeting them.

If any changes in the plans or location of the work are found necessary, revised plans should be submitted promptly to this office so that they may receive approval before work thereon is begun. When the work is done, please provide written notification that the project has been completed in accordance with the approved plans and conditions of the permit.

Please acknowledge receipt of this permit by having the attached acceptance blank properly executed and returned to us within sixty (60) days from the date of the permit.

Sincerely,

David R. Boyce, P.E.
Chief Floodplain Management
Engineer

DRB:MLD:lmt
Enclosure

STATE OF ILLINOIS

Permit
Nº 20215

Department of Transportation

Division of Water Resources
2300 South Dirksen Parkway
Springfield, Illinois 62764

Permission Is Hereby Granted, this 25th day of May 19 90

To

U. S. Army Corps of Engineers
Rock Island District
Rock Island, Illinois 61201-2004

To construct a wetland management area and a barrier island and to remove sediment from a side channel within the Illinois River floodplain in Sections 5, 8, 16 & 17, Township 28 North, Range 3 West of the 3rd Principal Meridian in Woodford County,

in accordance with an application dated Nov. 9, 1989, and the specifications and plans entitled

PEORIA LAKE ENHANCEMENT, UPPER MISSISSIPPI RIVER SYSTEM, ENVIRONMENTAL MANAGEMENT PROGRAM, DEFINITE PROJECT REPORT (R-6PR) WITH INTEGRATED ENVIRONMENTAL ASSESSMENT, DATED: MARCH 1990

filed with the Department of Transportation and made a part hereof, and subject to the terms and special conditions contained herein:

Examined and Recommended:

Neil R. Fulton
Chief, Bureau of Resource Management.
Neil R. Fulton

Approval Recommended:

Donald R. Vonnahme Director

APPROVED:

Michael P. Lane Secretary

DNR IDOT IEPA Woodford County Zoning Administrator Project File

(20193—5M Sets—12-83) 5

(over)

THIS PERMIT is subject to the following conditions:

(a) This permit is granted in accordance with an act entitled: "AN ACT in relation to the regulation of the rivers, lakes and streams of the State of Illinois," approved June 10, 1911, as amended. (Ill. Rev. Stat., ch. 19, par. 52, et. seq.)

(b) This permit does not convey title to the permittee or recognize title of the permittee to any submerged or other lands, and furthermore, does not convey, lease or provide any right or rights of occupancy or use of the public or private property on which the project or any part thereof will be located, or otherwise grant to the permittee any right or interest in or to the property, whether the property is owned or possessed by the State of Illinois or by any private or public party or parties.

(c) This permit does not release the permittee from liability for damage to persons or property resulting from the work covered by this permit, and does not authorize any injury to private property or invasion of private rights.

(d) This permit does not relieve the permittee of the responsibility to obtain other federal, state or local authorizations required for the construction of the permitted activity; and if the permittee is required by law to obtain approval from any federal agency to do the work, this permit is not effective until the federal approval is obtained.

(e) The permittee shall, at his own expense, remove all temporary piling, cofferdams, false work, and material incidental to the construction of the project, from the floodway, river, stream or lake in which the work is done. If the permittee fails to remove such structures or materials, the state may have removal made at the expense of the permittee. If future need for public navigation or public interests of any character, by the state or federal government, necessitates changes in any part of the structure or structures, such changes shall be made by and at the expense of the permittee or his successors as required by the Department of Transportation or other properly constituted agency, within sixty (60) days from receipt of written notice of the necessity from the Department or other agency, unless a longer period of time is specifically authorized.

(f) The execution and details of the work authorized shall be subject to the supervision and approval of the Department. Department personnel shall have right of access to accomplish this purpose.

(g) The permittee shall file with the Department a properly executed acceptance of all terms and conditions of the permit within sixty (60) days of receipt of the permit; however, starting work on the construction authorized will be considered full acceptance by the permittee of the terms and conditions of the permit.

(h) The Department in issuing this permit has relied upon the statements and representations made by the permittee; if any statement or representation made by the permittee is found to be false, the permit may be revoked at the option of the Department; and when a permit is revoked all rights of the permittee under the permit are voided.

(i) If the project authorized by this permit is located in or along Lake Michigan or a meandered lake, the permittee and his successors shall make no claim whatsoever to any interest in any accretions caused by the project.

(j) In issuing this permit, the Department does not approve the adequacy of the design or structural strength or the structure or improvement.

(k) Noncompliance with the conditions of this permit will be considered grounds for revocation.

(l) If the work permitted is not completed on or before December 31 1993 this permit shall be void.

THIS PERMIT is subject to further special conditions as follows:

Illinois Department of Conservation
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CHICAGO OFFICE • ROOM 4-300 • 100 WEST RANDOLPH 60601
MARK FRECH, DIRECTOR - KATHY SELCKE, ASSISTANT DIRECTOR

July 10, 1990

Colonel John R. Brown
District Engineer
U. S. Army Corps of Engineers
Rock Island District
Clock Tower Building
Rock Island IL 61204

Dear Colonel Brown:

As the nonfederal sponsor of the Peoria Lake Enhancement Project in the Environmental Management Program for the Upper Mississippi River System, I wish to confirm that the Department has programmed the necessary funds for it.

In accordance with Section 906(e) of the Water Resources Development Act of 1986, the Department will provide 25% of total project cost, estimated to be $4,571,000. The Departmental share will be $1,142,600, exclusive of lands and damages.

Our FY91 budget includes $945,000 for this project and funds in FY92 are reprogrammed by $196,600 to make up the difference; see attachment 1.

The Department will operate and maintain the project; however, the Corps of Engineers will provide 75% of the operation and maintenance costs, estimated to be $19,800 annually, to the state. The Department's share will be $4950 per year. Operation and maintenance will be performed over the 50-year project life.

All funding however is subject to legislative appropriation.

We look forward to the completion of this project.

Sincerely,

Mark Frech

Mark Frech
Director

cc: John W. Comerio

Illinois Department of Conservation
life and land together

memorandum

to: Jay Johnson, John Tranquilli, John Comerio

from: Jim Hoffman

date: June 1, 1990 reference:

subject: Add/Drop/Change Request
Peoria Lake EMP Project Funds

The Division of Planning requests that $197,600 of FY'92 PC2 funds be reprogrammed from the Alton Pool EMP project to the Peoria Lake project.

The Army Corps of Engineer's Rock Island District has requested a letter of financial intent and capability from the Department in support of the Peoria Lake's EMP project for their Definite Project Report. This letter needs to commit the Department, subject to appropriation, to the mid project construction estimate recently furnished by the Corps. That estimate increased our local share from $945,000 to $1,142,600. Conservation has requested an FY'91 PC2 appropriation for the $945,000. The additional $197,600 will not be needed until construction during FY'92.

In order to meet this increase of $197,600, Planning recommends that the funds be transferred from the FY'92 EMP Alton Pool Side Channel project. That project was budgeted for $231,000. Although this reduction in funding would shorten the Alton Pool project considerably, those funds will not be needed in FY'92. The St. Louis Corps has programmed the Alton project for FY'94. This should provide us ample time to identify new funding strategies with other projects and/or additional federal funding.

If you approve of this request, please affix your signatures below. Upon your approval, the Peoria Lake EMP project will be added to the FY'92 PC2 capital request for $197,600. The Alton Pool EMP project for FY'92 will be reduced to $33,400. The original request should be routed from Mr. Johnson, Mr. Tranquilli, to Mr. Comerio.

Approved/Disapproved _____ 6/7/90
Jay Johnson Date
Director
Office of Management & Enforcement

Approved/Disapproved _____ 6/8/90
John Tranquilli Date
Director
Office of Resource Management

Approved/Disapproved _____ 6/13/90
John W. Comerio Date
Director
Office of Planning & Development

JDH:kgn

cc: Bob Corrigan
Gary McCandless
Bob Roads
Larry Kennedy
Bill Donels
Hal Hassen
Ellen Gambach
John Bandy
Kathleen Darden
Charlene Lewis

APPENDIX B

SECTION 404(b)(1) EVALUATION

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:

CENCR-PD-E

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-6F)

PEORIA LAKE ENHANCEMENT
PEORIA POOL, ILLINOIS WATERWAY, RIVER MILES 178.5 TO 181
STATE OF ILLINOIS

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

JULY 1990

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-6F)

PEORIA LAKE ENHANCEMENT
PEORIA POOL, ILLINOIS WATERWAY, RIVER MILES 178.5 TO 181
STATE OF ILLINOIS

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PEORIA POOL, ILLINOIS WATERWAY, RIVER MILES 178.5 TO 181
STATE OF ILLINOIS

APPENDIX B
CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

SECTION 1 - PROJECT DESCRIPTION

LOCATION

The proposed project is located on the Illinois River (River Miles 178.5-181) within the boundaries of the Woodford County Conservation Area. The 2,900-acre conservation area is managed by the Illinois Department of Conservation (IDOC). (See plates 1 and 2 in the preceding Definite Project Report (DPR).)

GENERAL DESCRIPTION

By definition and Federal regulatory jurisdiction, the entire site is classified as wetland or as "waters of the United States" and is therefore subject to evaluation under Section 404 of the Clean Water Act.

The proposed project can be divided into three separate project features involving: (1) the construction of a 168 ponded-acre forested wetland management area (FWMA); (2) excavation of the silt plug in the East River channel to re-establish flow; and (3) the construction of a 1.1-mile-long barrier island in Upper Peoria Lake.

Under management by the ILDOC, the FWMA is intended to provide water level control over 168 acres of bottom land forest for waterfowl habitat enhancement. The ability to control water levels (the range from 1 to 2 feet of water) allows managers to flood the leveed cells in the fall to create additional habitat for migrating waterfowl. Wetland food plants, either natural or planted, will be inundated to provide an accessible food source for the dabbler duck species in the area. The levee construction required for the FWMA will create open grassland areas, further increasing the diversity of habitats within the Woodford County Conservation Area. Additional enhancement is possible through implementation of a forest

management plan that incorporates clearing and replanting within each of the three cells. The existing forest community is approaching old growth status and eventually will begin to decline.

The dredging of the East River channel to remove the silt and debris blocking the mouth of the channel will re-establish flow conditions through the old side channel. Presently, water does flow through the upper reach of the channel, but the flow is diverted by the silt plug through an outlet (Mt. Hope cut) into Goose Pond. The proposed dredging will include using the dredged material to close the Mt. Hope cut opening. In addition, the Upper Cut of the East River channel will be constricted to a notched opening with rock fill. An access channel from the Illinois River to the silt plug will be required to get the dredging equipment into the East River channel as well as to construct the barrier island.

The construction of the barrier island will create 16 acres of new terrestrial habitat in Upper Peoria Lake. However, the primary purpose of the island is to create an effective wind and wave barrier against the predominantly southwesterly winds. The long and narrow configuration of Peoria Lake, in combination with its overall shallow depth, is conducive to generation of high wind and wave energies producing considerable fetch along its length. The barrier island will significantly and effectively reduce these wind and wave energies upon completion. In addition, as successional vegetative changes occur on the new land with trees becoming established, the effect of the wind shadow behind the island will be magnified even further.

AUTHORITY AND PURPOSE

The authority for this action is provided by the 1985 Supplemental Appropriations Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act (Public Law 99-662). Section 1103 is summarized in the DPR.

The purpose of this project, under Section 1103, is "to ensure the coordinated development and enhancement of the Upper Mississippi River (UMR), which includes the Illinois River. This project is the result of a coordinated planning effort between the IDOC, the U.S. Fish and Wildlife Service (USFWS), and the U.S. Army Corps of Engineers, including the research and development branch of the Corps, the Waterways Experiment Station in Vicksburg, Mississippi.

GENERAL DESCRIPTION OF THE DREDGED AND FILL MATERIAL

The dredged material within the confines of the FWMA consists of 4 to 5 feet of recent alluvium deposits overlying the original bottom land wetland soils below. The dredged material to be removed from the silt plug in the

East River channel is a composition of fine-grained silts and clays that have been deposited at the mouth of the channel. In 1965, a log and debris jam permanently blocked the mouth of the channel, which further facilitated accretion of material. The site currently has young willows colonizing the earlier zones of deposition.

Construction of the barrier island will require excavation of adjacent material to a depth of approximately 15 feet. The sediment composition is soft, fluffy clays and silts overlying stiffer clays below. Portions of the alignment will result in excavation of material from the 1903 island remnants that were inundated upon completion of the Peoria Lock and Dam.

Placement of gravel fill material in the East River channel to diversify benthic habitat also is included in the project design. Two separate gravel bars will be created in the upper end of the side channel. The gradations of the rock substrate are as follows: 50-50 medium sand and gravel for one bar and 50 percent medium sand; 25 percent 1- to 3-inch gravel; and 25 percent cobble or rock for the other bar. The Upper Cut in the East River channel will be closed off, except for a notched opening to allow boats to pass. Approximately 1,600 tons of rock fill will be placed in the opening. Additional fill material consists of crushed stone for road surfacing on the FWMA levees and quarry run riprap for bank protection in the East River channel and selective placement along reaches of the barrier island to armor areas that are highly susceptible to wave-generated erosion. Approximately 6,200 tons of clean, quarry run riprap will be utilized. The rock will be obtained from an approved quarry site and will be physically and chemically stable. Therefore, no toxic substances will be introduced into the Illinois River system as a result of this action.

DESCRIPTION OF THE PROPOSED DISCHARGE SITES

The proposed FWMA encompasses approximately 200 acres of the mature bottom land forest (silver maple, ash, and elm) adjacent to the Illinois River. Evidence of high water marks on many of the trees indicates that the area is flooded quite regularly and to significant elevations above flat pool. The levees for the FWMA are aligned to follow existing contours to minimize the amount of fill material needed for construction. Each levee will be approximately 4 to 5 feet high and have a top width of 12 feet. The side slopes will be 3H on 1V for a total toe-to-toe width of 42 feet (the most riverward levee slope will be 6 on 1 to reduce erosion impacts). A 15-foot working distance for the dragline will remain between the toe of the uphill levee and the excavated borrow channels in Cells B and C. The borrow areas will be excavated to a 38-foot bottom width, 2:1 side slopes (total width 50 feet), and will be approximately 3 feet deep. The borrow area in Cell A will be configured to allow scraping higher ground contours in the upper end of the cell down to an elevation that can be flooded, therefore maximizing the surface area flooded within Cell A. The estimated total clearing required prior to levee construction is the equivalent of approximately 36 acres.

Sedimentation, logs, and debris have blocked the mouth of the East River side channel since the 1960's. The proposed project includes re-opening this side channel to restore lost aquatic habitat. The channel will be restored to a 7-foot-deep, 95-foot-wide (bottom width) dimension with 24-foot side slopes. The excavated material will be side cast along both sides of the channel. The total affected width of the channel restoration is 487 feet, including the disposal sites. Excavation will extend from an access channel into the Illinois River channel so that construction equipment can reach the project location. The material will be side cast into berms on both sides of the access channel.

A 1.1-mile-long barrier island will be constructed from adjacent excavated bottom sediments. Island configuration will be slightly S-shaped, originating just off the tip of Chillicothe Island and paralleling the Illinois River channel. The island dimensions will be a 50-foot top width with 6H on 1V side slopes and a total width of 182 feet toe to toe. The island will create approximately 16 acres of additional surface area in Upper Peoria Lake. A working distance of 31 feet will be maintained between the borrow area and the toe of the island. The borrow area will be 12 feet deep with a 140-foot bottom width.

Establishment of two gravel bars in the upper end of the East River channel has been proposed to diversify the benthic habitat in the area. A total surface area of 3,000 square yards will be created. The rock will be of the specific gradations mentioned earlier to provide enough habitat diversity for communities of benthic organisms, macroinvertebrates, and fishes. The material will be barged to the site and off-loaded by clamshell into two bars, each 300 by 50 feet in size, with a uniform thickness of 2 feet.

DESCRIPTION OF DISPOSAL METHOD

Levee construction of the three-celled FWMA will require initial clearing of trees and understory vegetation. Once the alignment has been cleared, a dragline will excavate adjacent borrow for construction of the berms in Cells B and C. However, the borrow site and the alignment for Cell A will be two separate clearings with the subsequent levee construction being done with a scraper/earthmover. The three-celled FWMA configuration will require approximately 56,000 cubic yards of material for the 18,585 feet of FWMA berms. Additional construction equipment will be used to shape and finish grade the berms to specifications.

Prior to excavation of the silt plug and construction of the disposal site in the East River channel, the pioneer vegetation (primarily willow growth) on the plug and the adjacent mature silver maple trees and understory vegetation will be cleared. It is estimated that approximately 104,000 cubic yards of material will be excavated to restore the East River channel dimensions and to create an access channel to the Illinois River. The large floating plant employed for the island construction also will

facilitate the silt plug removal. The dredged material will be placed on both banks adjacent to the new channel opening. The higher elevations created by the dredged material berms will be utilized to replant mast trees (i.e, pin oaks) which were once abundant in the river valley. These plantings will help to diversify the monotypic silver maple forest community currently dominating the area.

The berms will have 100-foot top widths and 36-foot side slopes. The total width (outside toe to outside toe), including the channel excavation, is 487 feet. The crest of the berms will be 7 feet above existing ground elevation to provide better drainage for vegetation to be planted upon completion of the project.

The 7-foot deep access channel for the floating plant equipment to get from the Illinois River channel to the silt plug will have a 95-foot bottom width with adjacent berms constructed as disposal sites. The berms may be up to 3 feet in height above the bottom elevation (2 feet below flat pool).

The construction of a 1.1-mile-long barrier island will require a large floating plant operation with 3-to 7-cubic-yard bucket capacity and a minimum boom reach of 180 feet. The island will require 482,000 cubic yards of material excavated from adjacent borrow areas. The placement of the excavated material is critical to maintain the integrity of the in situ stability. The full clamshell will be lowered and gently opened to release the load in place. Side-casting is not allowed. The island will be constructed in passes to allow time for the soils to consolidate and form a crust. The crest elevation of the island will be 6 feet above flat pool (440 feet NGVD).

SECTION 2 - FACTUAL DETERMINATIONS

PHYSICAL SUBSTRATE DETERMINATIONS

Geomorphological investigations and geotechnical surveys determined that the soils within the limits of the FWMA are recent alluvial deposits over 5 feet deep in places. The below surface water level ranges from 1 to 9 feet over the range of elevations in the FWMA.

The substrate of Peoria Lake is covered with a layer of extremely fine sediments. Sieve size grain analysis (1988) indicated that 3 out of 4 samples had greater than 80 percent passage through a #230 Sieve. Geotechnical investigations determined that this layer of extremely fine-grained sediments (fluff) overlies medium to stiff clays beneath. These underlying clays are suitable for stacking and island construction. During construction, the medium to stiff material would be excavated and stacked to form the island configuration. The overlying fine-grained sediments

would be stirred up, with some being carried away while the majority would probably re-settle into the borrow area.

WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

WATER

Water quality conditions throughout Peoria Lake are dominated by the shallow nature of the lake and the soft, unconsolidated sediments found throughout the lake. The majority of the water quality problems observed at Peoria Lake are related to high turbidity values and suspended solids concentrations. These elevated values are a result of agricultural non-point runoff and resuspension of sediments due to wave action from the wind and barge traffic. A secondary impact of the high turbidity values and soft unconsolidated sediments is the virtual absence of rooted aquatic plants throughout the lake. According to Twait, et al. (unpublished report), these types of plants were once present throughout the Illinois River Valley. A major problem encountered in reestablishing aquatic vegetation is uprooting the plants from the soft sediments by wave action. Twait, et al. (unpublished report), are currently studying the reestablishment of rooted aquatic plants behind a tire breakwater in the lower portion of Peoria Lake. Preliminary data indicate the tire breakwater has been effective in protecting the aquatic plants from uprooting due to wave action.

CURRENT PATTERNS AND CIRCULATION

Changes in current patterns of the Illinois River will occur when the flow is re-established in the East River channel. At present, there is an outlet for the water that flows into the East River channel. The project includes closing the Mt. Hope cut (the present outlet) and, therefore, little or no change in velocity is expected through the newly excavated channel.

Minor changes in current patterns will also will result from construction of the barrier island. Waterways Experiment Station (WES) hydraulic engineers indicated that the island would function as a weir to direct flows around the island. However, the minor vector changes occur within the immediate vicinity of the island and will have no overall effect on the Illinois River current patterns.

NORMAL WATER LEVEL FLUCTUATIONS

The Illinois River is typified by wide fluctuations in water levels during flood events. Analysis by WES hydraulic engineers indicated that no change in flood heights would occur by the construction of the barrier island or the FWMA. The barrier island and East River disposal site berms will overtop at the 2-year frequency which is characteristic of the existing islands in the area.

SALINITY GRADIENTS

The Illinois River is an inland freshwater system. Therefore, salinity gradients were not considered on this project.

ACTIONS TAKEN TO MINIMIZE IMPACTS

Several measures to minimize impacts at each of the project features will be implemented during and after construction.

During the construction of the barrier island, 1,400 feet of turbidity curtain will be utilized to reduce water quality impacts. The excavated material will be allowed to consolidate and form a crust between passes of the floating plant to improve the overall stability of the island. A vegetation planting scheme will be initiated as soon as the stability of the island surface will permit. In addition to the vegetation, an organic erosion mat will be anchored along the windward slope and 5 feet into the water. The configuration of the island is designed with shallow slopes to minimize erosional impacts from wind and wave action.

Clearing and grubbing of trees and understory vegetation within the FWMA will be kept to a minimum. The berms will be reseeded with native grass mixtures upon completion of the FWMA. The grassland habitat created will diversify the habitat types in the conservation area. Cleared trees could be pushed into brushpiles to provide habitat for numerous wildlife species.

The berms created as disposal sites for the material excavated from the East River channel will be planted with native grasses and mast-producing trees. Planting the grass on the side slopes will reduce the amount of material eroding back into the channel. The higher ground elevations created by the berms will provide a good location to reintroduce some of the mast trees that were once so common in the Illinois River Valley. A mixture of pin oak, hickory, and northern pecan would be suitable species to transplant along the crest of the berms.

SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

The majority of water quality information available for the Illinois River is from samples collected from the main channel. The Illinois Environmental Protection Agency (EPA) rated the Illinois River (255 river miles) as "partially supporting aquatic life uses with minor impairment." This rating was primarily a result of elevated turbidity values and, to a lesser degree, high nutrient concentrations.

Two studies assessing water quality in off-channel areas of Peoria Lake have been performed recently. In conjunction with their aquatic plant reestablishment study, Twait, et al. (unpublished report), measured several water quality variables from June 1986 through December 1988 in the lower portion of Peoria Lake. Samples were collected on approximately a weekly basis. Results of this study indicated that comparatively high turbidity values and suspended solids concentrations were common at the study site. Turbidity values greater than 100 NTU and suspended solids concentrations exceeding 100 mg/l were observed on many occasions. In an effort to further assess existing water quality conditions in the vicinity of the proposed Peoria Lake project, a monitoring program was initiated in 1989 by Corps Water Quality and Sedimentation Section (ED-HQ) personnel. The monitoring program called for the collection of water samples on a biweekly basis at two Peoria Lake sites. Low water levels made the sites inaccessible much of the time; therefore, only a limited number of samples were collected.

In order to predict the impact of proposed construction activities on water quality, on December 22, 1988, sediment and water samples were collected. Sediment samples were collected at three sites in the vicinity of the area proposed for dredging for the purpose of performing grain size, bulk sediment, and elutriate analyses. Water samples were collected at one site for use in the elutriate test and for ambient water analyses.

Grain Size Analyses. Grain size analyses were performed on sediment samples collected at each site on December 22, 1988. The percent sediment passing a No. 230 sieve for each sample is given in table B-1. The samples collected at UPL-1 and UPL-2 consisted primarily of clay, while the sample from UPL-3 consisted approximately of equal amounts of fine sand and clay.

Elutriate and Ambient Water Analyses. Elutriate analyses were performed on samples collected at each site on December 22, 1988, while ambient water was analyzed from a sample collected at the surface at UPL-1. Table B-2 contains the results from ambient water analyses and also lists the applicable Illinois General Use Water Quality Standards. The elutriate analysis results, as shown in table B-3, were also evaluated against these standards. The only elutriate parameter to exceed its standard was ammonia nitrogen. Three of the four samples analyzed had ammonia nitrogen concentrations greater than the state standard of 15 mg/l. The sample from

Table B-1. Bulk sediment (mg/kg) and grain size (percent sediment passing a #230 sieve) analysis results from three Peoria Lake sites sampled on December 22, 1988, including a duplicate sample at UPL-1

	LOCATION			
PARAMETER	UPL-1	(Duplicate) UPL-1	UPL-2	UPL-3
Arsenic	2.6	2.8	2.2	2.2
Barium	89	93	81	47
Cadmium	3.2	4.0	3.0	1.4
Chromium	35	34	38	20
Copper	24	23	24	14
Lead	19	19	22	14
Mercury	.26	.37	.23	.32
Nickel	27	28	31	21
Selenium	<.90	<.87	<.76	<.78
Zinc	160	170	160	110
Ammonia Nitrogen	200	52	67	22
Total Volatile Solids	5.8 %	5.2 %	4.7 %	2.6 %
Total Solids	61 %	56 %	65 %	76 %
Oil and Grease	60	650	200	200
Total Organic Carbon	9,000	8,200	9,100	8,600
Cyanide	<.21	.39	<.21	<.21
Iron	15,000	15,000	14,000	10,000
Manganese	340	320	390	350
Aldrin	<.05	<.05	<.05	<.05
Chlordane	<.05	<.05	<.05	<.05
DDD	<.05	<.05	<.05	<.05
DDE	<.05	<.05	<.05	<.05
DDT	<.05	<.05	<.05	<.05
Dieldrin	<.05	<.05	<.05	<.05
Endrin	<.05	<.05	<.05	<.05
Heptachlor	<.05	<.05	<.05	<.05
Heptachlor Epoxide	<.05	<.05	<.05	<.05
Lindane	<.05	<.05	<.05	<.05
Methoxychlor	<.05	<.05	<.05	<.05
Toxaphene	<.05	<.05	<.05	<.05
PCBs	<.05	<.05	<.05	<.05
Grain Size	93.1 %	91.7 %	85.3 %	47.8 %

Table B-2. Illinois General Use Water Quality Standards and ambient water analysis results, in mg/l, from a sample collected at UPL-1 on December 22, 1988

PARAMETER	STATE STANDARD	AMBIENT WATER UPL-1
Arsenic	1.0	<.003
Barium	5.0	.04
Cadmium	.05	<.005
Chromium	-	.03
Copper	.02	<.009
Lead	.1	.10
Mercury	.0005	<.0002
Nickel	1.0	<.025
Selenium	1.0	<.005
Zinc	1.0	<.009
Ammonia Nitrogen	*	.25
Total Volatile Solids	-	21
Total Suspended Solids	-	22
Total Solids	-	540
Oil and Grease	-	8.8
Total Organic Carbon	-	61
Cyanide	.025	.005
Iron	1.0	.97
Manganese	1.0	.04
Aldrin	-	<.05
Chlordane	-	<.05
DDD	-	<.05
DDE	-	<.05
DDT	-	<.05
Dieldrin	-	<.05
Endrin	-	<.05
Heptachlor	-	<.05
Heptachlor Epoxide	-	<.05
Lindane	-	<.05
Methoxychlor	-	<.05
Toxaphene	-	<.5
PCBs	-	<.5
pH (-log[H+])	6.5 - 9.0	**
Temperature (C)	-	1.0

* Ammonia nitrogen shall never exceed 15 mg/l. If ammonia nitrogen is less than 15 mg/l and greater than or equal to 1.5 mg/l, then un-ionized ammonia nitrogen shall not exceed 0.04 mg/l

** Meter malfunction

Table B-3. Elutriate analysis results, in mg/l, from three Peoria Lake sites sampled on December 22, 1988, including a duplicate sample at UPL-1

	LOCATION			
PARAMETER	UPL-1	(Duplicate) UPL-1	UPL-2	UPL-3
Arsenic	<.003	<.003	<.003	<.003
Barium	.12	.11	.13	.13
Cadmium	<.005	<.005	<.005	.01
Chromium	.02	.03	.02	<.009
Copper	.01	.01	<.009	<.009
Lead	.002	<.002	<.002	<.002
Mercury	.0003	<.0002	.0004	<.0002
Nickel	.03	<.025	.03	<.025
Selenium	<.005	<.005	<.005	<.005
Zinc	<.009	<.009	<.009	<.009
Ammonia Nitrogen	16 *	19 *	21 *	14 **
Total Volatile Solids	46	56	130	66
Total Solids	860	710	1,300	790
Oil and Grease	1.6	2.4	5.6	12
Total Organic Carbon	120	91	120	110
Cyanide	<.005	<.005	<.005	<.005
Iron	<.05	.07	<.05	<.05
Manganese	.99	.96	.78	.71
Aldrin	<.05	<.05	<.05	<.05
Chlordane	<.05	<.05	<.05	<.05
DDD	<.05	<.05	<.05	<.05
DDE	<.05	<.05	<.05	<.05
DDT	<.05	<.05	<.05	<.05
Dieldrin	<.05	<.05	<.05	<.05
Endrin	<.05	<.05	<.05	<.05
Heptachlor	<.05	<.05	<.05	<.05
Heptachlor Epoxide	<.05	<.05	<.05	<.05
Lindane	<.05	<.05	<.05	<.05
Methoxychlor	<.05	<.05	<.05	<.05
Toxaphene	<.5	<.5	<.5	<.5
PCBs	<.5	<.5	<.5	<.5

* Exceeds Illinois General Use Water Quality Standard

** Exceeds un-ionized ammonia nitrogen standard if a pH of 8.0 is assumed

site UPL-3 had an ammonia nitrogen concentration of 14 mg/l. According to Illinois General Use Water Quality Standards, ammonia nitrogen concentrations less than 15 mg/l and greater than or equal to 1.5 mg/l are lawful if the un-ionized ammonia nitrogen concentration does not exceed .04 mg/l. Temperature and pH values are required to determine the unionized ammonia nitrogen concentration. Since the pH meter malfunctioned on sampling day, a pH value of 8.0 was assumed when calculating the un-ionized ammonia nitrogen concentration. The concentration determined was greater than .04 mg/l; therefore, it is assumed that the UPL-3 sample also violates the ammonia nitrogen standard.

A parameter for which there is no Illinois General Use Water Quality Standard but which had significantly greater concentrations in the elutriate samples relative to the ambient water sample was total suspended solids. The ambient water concentration was 22 mg/l on the sample date, while the elutriate concentrations ranged from 210 mg/l at UPL-1 to 750 mg/l at UPL-2. However, previous sampling by the Illinois State Water Survey (Twait) yielded values from 28 mg/l to 696 mg/l.

Baseline Water Quality Monitoring. The results from ambient water samples collected at two Peoria Lake sites during 1989 are given in tables B-4 and B-5. The only parameter to violate Illinois General Use Water Quality standards was dissolved oxygen. On June 20, 1989, the dissolved oxygen concentration at site UPL-A was 3.70 mg/l, which is below the State standard of 5.0 mg/l. Turbidity values and suspended solids concentrations were relatively high at each site on several occasions.

The results from the analysis of water and sediment samples collected from Peoria Lake on December 22, 1988, indicate that ammonia nitrogen and total suspended solids would be the parameters of concern should dredging occur. Given an initial, minimal mixing zone, ammonia nitrogen concentrations outside of this zone are estimated to be less than the State standard. Total suspended solids concentrations are expected to increase during dredging and disposal operations. The use of a clamshell bucket with gentle placement of material, together with a 1,400-foot-long turbidity curtain downstream of the excavation site, would minimize increases in total suspended solids concentrations. Total suspended solids concentrations during dredging and disposal operations would probably be similar to ambient water concentrations observed during high flow periods.

It appears that should the proper dredging and dredged material disposal management techniques be utilized, there will be little impact on the water quality of Peoria Lake. Any impacts that are noted would be temporary in nature.

Table B-4. Ambient water analysis results from Peoria Lake site UPL-A

PARAMETER	SAMPLING DATE 06/07	06/20	06/27	08/08	08/24	09/19
Depth (ft)	3.5	0.6	0.7	1.3	0.9	5.0
Secchi Disk Depth (ft)	0.8	0.5	0.5	0.8	0.5	1.0
Temperature (C)	25.4	28.5	30.1	28.0	24.9	22.2
pH (-log[H+])	7.91	8.44	7.45	8.78	8.54	**
Specific Conductance (micromhos/cm @ 25 C)	607	774	799	685	695	593
Dissolved Oxygen (mg/l)	7.20	3.70*	10.6	12.85	7.78	7.46
Turbidity (NTU)	61	134	82	65	62	32
Total Alkalinity (mg/l)	139	202	191	167	167	**
Nitrate Nitrogen (mg/l)	8.0	3.78	2.96	2.28	1.56	6.0
Ammonia Nitrogen (mg/l)	<0.04	0.04	<0.04	<0.04	0.11	<0.04
Total Phosphate (mg/l)	0.27	0.54	0.42	0.47	0.41	0.28
Suspended Solids (mg/l)	38	223	104	84	96	24
Chlorophyll a (mg/m3)	11	7	10	<1	3.1	2.2
Chlorophyll b (mg/m3)	123	131	143	3	2.8	<1.0
Chlorophyll c (mg/m3)	154	167	181	5	3.0	2.2
Pheophytin a (mg/m3)	149	175	186	12	2.7	<1.0

* Less than the Illinois General Use Water Quality Standard of 5.0 mg/l for dissolved oxygen

** Meter malfunction

Table B-5. Ambient water analysis results from Peoria Lake site UPL-B

PARAMETER	SAMPLING DATE 06/07	08/08	08/24	09/19
Depth (ft)	3.6	2.2	1.6	5.5
Secchi Disk Depth (ft)	0.7	0.6	0.6	1.1
Temperature (C)	25.5	28.0	21.9	22.4
pH (-log[H+])	7.93	8.92	8.36	*
Specific Conductance (micromhos/cm @ 25 C)	606	675	596	601
Dissolved Oxygen (mg/l)	7.40	14.24	7.71	9.12
Turbidity (NTU)	74	84	94	34
Total Alkalinity (mg/l)	148	171	148	*
Nitrate Nitrogen (mg/l)	8.60	2.10	1.20	6.0
Ammonia Nitrogen (mg/l)	0.04	<0.04	0.16	<0.04
Total Phosphate (mg/l)	0.32	0.59	0.44	0.27
Suspended Solids (mg/l)	52	97	101	24
Chlorophyll a (mg/m3)	10	4	1.9	2.2
Chlorophyll b (mg/m3)	136	3	2.2	1.0
Chlorophyll c (mg/m3)	171	5	3.2	1.2
Pheophytin a (mg/m3)	178	4	4.5	<1.0

* Meter malfunction

CONTAMINANT DETERMINATIONS

Bulk Sediment Analyses. Bulk sediment analyses were performed on samples collected at each site on December 22, 1988. The results from these analyses are given in table B-1. Bulk sediment values were evaluated using a 1977 U.S. EPA publication entitled Guidelines for the Pollutional Classification of Great Lakes Harbor Sediments. These tests were performed as a screening of potentially polluted sediments. Barium, chromium, nickel, zinc, ammonia nitrogen, total volatile solids, cyanide, and manganese exceeded the nonpolluted guidelines. Additional elutriate testing was then performed to further evaluate these sediments. Ammonia nitrogen was the only parameter which exceeded water quality standards as discussed in the previous section. The concentrations of several bulk sediment parameters were similar to those observed in Peoria Lake sediments by Demissie and Bhowmik (1986).

AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

Review and consideration of 40 CFR, Section 230, Subparts D, E, F, and G involved analysis of the following effects:

A. Effects on Plankton.
B. Effects on Benthos.
C. Effects on Nekton.
D. Effects on Aquatic Food Web (refer to Section 230.31).
E. Effects on Special Aquatic Sites Found in Project Area or Disposal Site.
   (1) Sanctuaries and Refuges (refer to Section 230.40).
   (2) Wetlands (refer to Section 230.41).
   (3) Mud Flats (refer to Section 230.42).
   (4) Vegetated Shallows (refer to Section 230.43).
   (5) Coral Reefs (not found in Project Area).
   (6) Riffle and Pool Complexes (refer to Section 230.45) were not considered for this project.
F. Threatened and Endangered Species (refer to Section 230.30).
G. Other Wildlife (refer to Section 230.32).

The project's effects on A through E above are anticipated to be of overall benefit. One of the primary purposes of the project is to restore aquatic habitat lost to sedimentation. Dredging will recreate deep and shallow water habitat, resulting in increased diversity in plankton, benthos, and the aquatic food web in the project area. Nekton, primarily fish, will benefit from increased available habitats.

E(1) through (4) are found in the project area. The project site is part of the Woodford County Conservation Area, managed by the Illinois Department of Conservation (IDOC). The project was coordinated with IDOC staff and has been found to be compatible with their objectives.

Corps wetland regulatory jurisdiction applies to the project site, as the three-point (soils, vegetation, and hydrology) wetland analysis reveals the entire project area to be a Illinois River adjacent wetland.

In the project area, existing wetland types include palustrine forested (silver maple-elm association forest), emergent (cattail, arrowhead, and lotus vegetated shallows), and mudflats (shorelines and dried shallow aquatic areas).

Endangered species for the project area include the bald eagle, Indiana bat and the Higgins' eye pearly mussel. State-listed species, besides the preceding, are not anticipated to occur in the project area, unless as transients, and are not anticipated to be affected beyond disruption of travel patterns. Due to its location, timing, and nature, the proposed project is anticipated to have no effect on either State or federally listed endangered species. This determination is supported by both the State of Illinois and the U.S. Fish and Wildlife Service.

Other wildlife in the project area includes both game and non-game species such as white-tailed deer, squirrel, waterfowl, numerous songbirds, small mammals, and furbearers. The proposed project is anticipated to contribute to overall habitat diversity in the project area, and thus will be of benefit to most species currently found in the project area. A cursory survey of the Goose Lake area near Rome Point discovered remnants of a once commercial mussel bed just off shore of Rome Point. A formal survey will be conducted prior to construction of the barrier island to determine the extent and the health of the bed. The bed also will be monitored after construction to determine the impacts, if any, of constructing the barrier island.

Through the planning, coordination, and design process, wetland impacts were considered and minimized to the extent possible.

PROPOSED DISPOSAL SITE DETERMINATIONS

Fine substrates in shallow backwater areas typically support a variety of invertebrate life, including mussel species such as three-ridge, paper-shells, and floaters. The area planned for island construction is currently subject to substantial wave action and resuspension of sediments. This has precluded the establishment of aquatic vegetation during normal seasonal low-flow periods. Also, elevated turbidity levels associated with sediment resuspension typically reduce the abundance and diversity of aquatic organisms, including fish. Therefore, because the proposed placement area does not display significant aquatic resource value, the conversion of aquatic habitat to terrestrial habitat, in the form of a barrier island, is considered to be of net overall benefit to the remaining aquatic habitat in Peoria Lake.

Revegetation of the dredged material placement sites for the side channel excavation and FWMA (berms) will help to diversify the existing monotypic silver maple community.

DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

The channel restoration and construction of the access channel to the river will re-establish flows. The conditions will then be suitable for colonization by mussels, fish, and benthic organisms adding to the diversity of the Peoria Lake ecosystem.

Both terrestrial and aquatic effects are expected as a result of construction of the barrier island. Vegetation will be planted as soon as possible once the island is constructed. This vegetation will be allowed to colonize and grow through successional changes naturally (willows, cottonwoods, silver maple, etc.). The end result in 25 to 50 years will most likely be a well-established silver maple and cottonwood bottom land forest community.

Aquatic vegetation is extremely limited in the Upper Peoria pool. An experiment underway by the Illinois State Water survey has preliminary data that indicates that aquatic vegetation will grow if offered some protection from the wind and wave action. Construction of the barrier island will create the quiet littoral zone on the leeward side of island. This wind shadow effect will be conducive to establishment of both emergent and submergent vegetation. As trees and other woody vegetation become dominant, the effect of the wind shadow will be magnified even further.

Two floating vegetated islands will be constructed in proximity to the barrier island. The island prototype, currently being evaluated by the Corps staff, will be a modular type design with four modules to an island. The islands will be anchored in a manner to allow fluctuations with river stages. Aquatic vegetation (cattails) will be planted within the modules which will enhance waterfowl nesting on the structures. In addition to predicted waterfowl usage, the floating island's effectiveness as a breakwater is another parameter to be evaluated.

DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

Secondary effects generated as a result of construction of this project include short-termed fisheries benefits in the borrow area for the island. While the project will have no effect on the overall rate of sediment accumulation in Peoria lake, it is estimated that current rates of sedimentation will fill the borrow areas before the 50-year life of the project. Therefore, fisheries and benthic benefits will be generated initially but will decline over the life of the project.

Additional secondary benefits will result from the creation of the two berms during the excavation of the East River channel. Since these berms will be of higher elevations than the surrounding islands, an active management scheme of hardwood reforestation may be possible. The soils will be better drained and more conducive to oak tree species, like pin oaks, which were once abundant in the Illinois Valley.

SECTION 3 - FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

1. No significant adaptations of the guidelines were made relating to this evaluation.

2. Alternatives which were considered in addition to the proposed action were as follows:

a. No Federal Action

b. Four site locations were evaluated in the Upper Peoria Lake area for the project features: Mossville, Spring Bay, Partridge Creek, and Goose Lake (the selected location).

c. Individual project features were evaluated independently of each other. The individual features were the FWMA, the barrier island, and side channel restoration.

3. Certification under Section 401 of the Clean Water Act has been obtained from the State Department of Natural Resources by letter dated May 3, 1990. The project will thus be in compliance with the water quality requirements of the State of Illinois.

4. The project would not introduce toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.

5. No significant impact to federally listed endangered species will result from this project. This determination is supported by personal communications with Mr. Charles Davis of the U.S. Fish and Wildlife Service, Ecological Services Office.

6. The project is located along a freshwater inland river system. No marine sanctuaries are involved or would be affected.

7. No municipal or private water supplies would be affected. There will be no adverse impact to recreational fishing and no unique or special aquatic sites are located in the project location. No long-term adverse changes to the ecology of the river system will result from this action.

8. Project construction materials will be chemically and physically stable. No contamination of the river is anticipated.

9. The placement of construction material into the water is necessary to fulfill the project objectives of habitat enhancement. No other practical alternatives have been identified. The proposed project is in compliance with the guidelines for Section 404(b)(1) of the Clean Water Act, as amended.

The proposed project will not significantly impact water quality or the integrity of the aquatic ecosystem.

6 June 90
Date

John R. Brown
Colonel, U.S. Army
District Engineer

APPENDIX C

DRAFT LOCAL COOPERATION AGREEMENT

D R A F T

LOCAL COOPERATION AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE STATE OF ILLINOIS
FOR CONSTRUCTION OF THE
PEORIA LAKE HABITAT REHABILITATION PROJECT
PEORIA AND WOODFORD COUNTIES, ILLINOIS

THIS AGREEMENT, entered into this _____ day of _____, 19_____, by and between the DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government"), acting by and through the Rock Island District, U.S. Army Corps of Engineers, and the STATE OF ILLINOIS (hereinafter referred to as the "State"), acting by and through the Illinois Department of Conservation,

WITNESSETH, that:

WHEREAS, construction of the Peoria Lake Habitat Rehabilitation Project at Peoria Lake in Peoria and Woodford Counties, Illinois (hereinafter referred to as the "Project", as defined in Article I.a of this Agreement), was approved under the terms of the Upper Mississippi River System Environmental Management Program, as authorized by the Water Resources Development Act of 1986 (Public Law 99-662); and

WHEREAS, Section 906(e) of the Water Resources Development Act of 1986, Public Law 99-662, as amended, specifies the cost-sharing requirements applicable to the Project; and

WHEREAS, Section 221 of the Flood Control Act of 1970, Public Law 91-611, as amended, provides that the construction of any water resources project by the Secretary of the Army shall not be commenced until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the Project; and

WHEREAS, the State has the authority and capability to furnish the cooperation hereinafter set forth and is willing to participate in cost-sharing and financing in accordance with the terms of this Agreement;

NOW THEREFORE, the parties agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this Agreement:

a. The term "Project" shall mean construction of an approximate 1.1 mile-long barrier island; development of an approximate 168-acre forested wetland management area; and excavation of approximately 3,550 feet through an existing blocked side channel with placement of submerged rock substrate.

b. The term "total project costs" shall mean all costs incurred by the State and the Government directly related to construction of the Project. Such costs shall include, but not necessarily be limited to, costs of applicable engineering and design (including the Definite Project Report); actual construction costs; supervision and administration costs; costs of contract dispute settlements or awards; and the value of utility and facility alterations or relocations, provided for the Project by the State, but shall not include any costs for betterments, operation, maintenance, or rehabilitation.

c. The term "operation, maintenance, and rehabilitation" (OM&R) shall mean all costs of operating, maintaining, and rehabilitating the Project facilities after construction has been completed, as further estimated in the Definite Project Report and as specified in the Operation & Maintenance Manual. Rehabilitation is defined as reconstructive work that significantly exceeds the estimated annual operation and maintenance requirements identified in the Definite Project Report, Peoria Lake Enhancement, dated _____, and which is needed as the result of major storm or flood events.

d. The term "period of construction" shall mean the time from the advertisement of the first construction contract to the time of acceptance of the Project by the Contracting Officer.

e. The term "Contracting Officer" shall mean the U.S. Army District Engineer for the Rock Island District, or his designee.

f. The term "fiscal year" shall mean one fiscal year of the United States Government, unless otherwise specifically indicated. The Government fiscal year begins on October 1 and ends on September 30.

g. The term "functional portion of the Project" shall mean a completed portion of the Project as determined by the Contracting Officer to be suitable for tender to the State to operate and maintain in advance of completion of construction of the entire Project.

ARTICLE II - OBLIGATIONS OF THE PARTIES

a. The Government, subject to and using funds provided by the State and appropriated by the Congress of the United States, shall expeditiously construct the Project (including relocations of railroad bridges and approaches thereto), applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. The State shall be afforded the opportunity to review and comment on all contracts, including relevant plans and specifications, prior to the issuance of invitations for bid. The State will be afforded the opportunity to review and comment on all modifications and change orders prior to the issuance to the contractor of a Notice to Proceed. The Government will consider the comments of the State, but award of the contracts, modifications or change orders, and performance of all work on the Project (whether the work is performed under contract or by Government personnel), shall be exclusively within the control of the Government.

b. When the Government determines that the Project or a functional portion of the Project is complete, the Government shall turn the completed Project or functional portion over to the State, which shall accept the Project or functional portion and be solely responsible for operating, maintaining, and rehabilitating the Project or functional portion in accordance with Article VII hereof.

c. As further specified in Article V hereof, the State shall provide, during the period of construction, a cash contribution of 25 percent of total project costs.

d. As further specified in Article III hereof, the State shall provide all lands, easements, rights-of-way, and dredged material disposal areas.

e. As further specified in Article VII, the Government shall, after completion of construction, provide to the State a cash payment in the amount of the present worth of 75 percent of the estimated cost of operation and maintenance, in consideration of the State's assumption of Federal operation and maintenance responsibilities.

f. In the event that the Government and the State mutually agree that rehabilitation is necessary, the Government shall provide payment in an amount equal to 75 percent of the cost of such rehabilitation to the State.

g. No Federal funds may be used to meet the State share of project costs under this Agreement unless the expenditure of such funds is expressly authorized by statute as verified in writing by the granting agency.

ARTICLE III - LANDS, FACILITIES, AND PUBLIC LAW 91-646 RELOCATION ASSISTANCE

a. The State shall furnish to the Government all lands, easements, and rights-of-way, including suitable borrow and dredged material disposal areas, as may be determined by the Government to be necessary for the construction, operation, and maintenance of the Project, and shall furnish to the Government evidence supporting the State's legal authority to grant rights-of-entry to such lands. The necessary lands, easements, and rights-of-way may be provided incrementally, but all lands, easements, and rights-of-way determined by the Government to be necessary for work to be performed under a construction contract must be furnished prior to the advertisement of the construction contract.

b. The State shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements, and rights-of-way for construction and subsequent operation and maintenance of the Project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - CONSTRUCTION PHASING AND MANAGEMENT

a. To provide for consistent and effective communication between the State and the Government during the period of construction, the State and the Government shall appoint representatives to coordinate on scheduling, plans, specifications, modifications, contract costs, and other matters relating to construction of the Project. The State will be informed of any changes in cost estimates.

b. The representatives appointed above shall meet as necessary during the period of construction and shall make such recommendations as they deem warranted to the Contracting Officer.

c. The Contracting Officer shall consider the recommendations of the representatives in all matters relating to construction of the Project, but the Contracting Officer, having ultimate responsibility for construction of the Project, has complete discretion to accept, reject, or modify the recommendations.

ARTICLE V - METHOD OF PAYMENT

a. The State shall provide, during the period of construction, the cash payments required under Article II of this Agreement. Total project costs are presently estimated to be

$ 4,571,000. In order to meet its share, the State must provide a cash contribution presently estimated to be $ 1,143,000. The dollar amounts set forth in this Article are based upon the Government's best estimates which will reflect projection of costs, price level changes, and anticipated inflation. Such cost estimates are subject to adjustments based upon costs actually incurred and are not to be construed as the total financial responsibilities of the Government and the State.

b. The State shall provide its required cash contribution in proportion to the rate of Federal expenditures during the period of construction in accordance with the following provisions:

1. For purposes of budget planning, the Government shall notify the State by _____ of each year of the estimated funds that will be required from the State to meet its share of total project costs for the upcoming fiscal year.

2. No later than 60 calendar days prior to the award of the first construction contract, the Government shall notify the State of the State's share of total project costs, including its share of costs attributable to the Project incurred prior to the initiation of construction, for the first fiscal year of construction. No later than 30 calendar days thereafter, the State shall verify to the satisfaction of the Government that it has deposited the requisite amount in an escrow account acceptable to the Government, with interest accruing to the State.

3. For the second and subsequent fiscal years of project construction, the Government shall, no later than 60 calendar days prior to the beginning of the fiscal year, notify the State of the State's share of total project costs for that fiscal year. No later than 30 calendar days prior to the beginning of the fiscal year, the State shall make the necessary funds available to the Government through the funding mechanism specified in Article V.b.2 of this Agreement. As construction of the Project proceeds, the Government shall adjust the amounts required to be provided under this paragraph to reflect actual costs.

4. If at any time during the period of construction the Government determines that additional funds will be needed from the State, the Government shall so notify the State, and the State, no later than 45 calendar days from receipt of such notice, shall make the necessary funds available through the funding mechanism specified in Article V.b.2. of this Agreement.

c. The Government will draw on the escrow account provided by the State such sums as the Government deems necessary to cover contractual and in-house fiscal obligations attributable to the Project as they are incurred, as well as costs incurred by the Government prior to the initiation of construction.

d. Upon completion of the Project and resolution of all relevant contract claims and appeals, the Government shall compute the total project costs and tender to the State a final accounting of the State's share of total project costs. In the event the total contribution by the State is less than its minimum required share of total project costs, the State shall, no later than 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet its minimum required share of total project costs.

e. In the event the State has made cash contributions in excess of 25 percent of total project costs which result in the State's having provided more than its required share of total project costs, the Government shall, no later than 90 calendar days after the final accounting is complete, subject to the availability of appropriations, return said excess to the State.

f. The State and the Government shall each pay its share of operation, maintenance and rehabilitation costs in accordance with the terms of Article VII of this Agreement.

ARTICLE VI - DISPUTES

Before any party to this Agreement may bring suit in any court concerning an issue relating to this Agreement, such party must first seek in good faith to resolve the issue through negotiation or other forms of nonbinding alternative dispute resolution mutually acceptable to the parties.

ARTICLE VII - OPERATION, MAINTENANCE AND REHABILITATION

a. After the Government has turned the completed Project, or functional portion of the Project, over to the State, the State shall operate and maintain the completed Project, or functional portion of the Project, in accordance with regulations or directions prescribed by the Government. In the event of damage to the project from major storm or flood events, the Government and the State will discuss the need for and efficacy of rehabilitation of the Project.

b. The State hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land which it owns or controls for access to the Project for the purpose of inspection, and, if necessary, for the purpose of operating, maintaining, or rehabilitating the Project. If an inspection shows that the State for any reason is failing to fulfill its obligations under this Agreement without receiving prior written approval from the Government, the Government will

send a written notice to the State. If the State persists in such failure for 30 calendar days after receipt of the notice, then the Government shall have a right to enter, at reasonable times and in a reasonable manner, upon lands the State owns or controls for access to the Project for the purpose of operating, maintaining, or rehabilitating the Project. No operation, maintenance, or rehabilitation by the Government shall operate to relieve the State of responsibility to meet its obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

ARTICLE VIII - RELEASE OF CLAIMS

The State shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the Project, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE IX - HAZARDOUS SUBSTANCES

a. After execution of this Agreement and upon direction by the Contracting Officer, the State shall perform, or cause to be performed, such environmental investigations as are determined necessary by the Government or the State to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, on lands necessary for Project construction, operation, and maintenance. All actual costs incurred by the State which are properly allowable and allocable to performance of any such environmental investigations shall be included in total project costs and cost-shared as a construction cost in accordance with Public Law 99-662.

b. In the event it is discovered through an environmental investigation or other means that any lands, easements, rights-of-way, or disposal areas to be acquired or provided for the Project contain any hazardous substances regulated under CERCLA, the State and the Government shall provide prompt notice to each other, and the State shall not proceed with the acquisition of lands, easements, rights-of-way, or disposal areas until mutually agreed.

c. The Government and the State shall determine whether to initiate construction of the Project, or, if already in construction, to continue with construction of the Project, or to terminate construction of the Project for the convenience of the Government in any case where hazardous substances regulated under CERCLA are found to exist on any lands necessary for the Project. Should the Government and the State determine to proceed or continue with construction after considering any liability that may arise under CERCLA, as between the Government and the State, the State shall be responsible for any and all necessary clean up and response costs, to include the costs of

any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of total project costs as defined in this Agreement. In the event the State fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge its responsibilities under this paragraph upon direction by the Government, the Government may either terminate or suspend work on the Project or proceed with further work as provided in Article XVI.

d. The State and the Government shall consult with each other under the Construction Phasing and Management Article of this Agreement to assure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph c. of this Article shall not relieve any party from any liability that may arise under CERCLA.

e. The State shall operate, maintain, repair, replace, and rehabilitate the Project in a manner so that liability will not arise under CERCLA.

ARTICLE X - MAINTENANCE OF RECORDS

The Government and the State shall keep books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to this Agreement to the extent and in such detail as will properly reflect total project costs. The Government and the State shall maintain such books, records, documents, and other evidence for a minimum of three years after completion of construction of the Project and resolution of all relevant claims arising therefrom, and shall make available at their offices at reasonable times, such books, records, documents, and other evidence for inspection and audit by authorized representatives of the parties to this Agreement.

ARTICLE XI - GOVERNMENT AUDIT

The Government shall conduct an audit when appropriate of the State's records for the Project to ascertain the allowability, reasonableness, and allocability of its costs for inclusion as credit against the non-Federal share of project costs.

ARTICLE XII - FEDERAL AND STATE LAWS

In acting under its rights and obligations hereunder, the State agrees to comply with all applicable Federal and State laws and regulations, including Section 601 of Title VI of the Civil Rights Act of 1964, Public Law 88-352, and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

ARTICLE XIII - RELATIONSHIP OF PARTIES

The parties to this Agreement act in an independent capacity in the performance of their respective functions under this Agreement, and neither party is to be considered the officer, agent, or employee of the other.

ARTICLE XIV - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE XV - COVENANT AGAINST CONTINGENT FEES

The State warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the State for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in its discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE XVI - TERMINATION OR SUSPENSION

a. If at any time the State fails to make the payments required under this Agreement, the Secretary of the Army shall terminate or suspend work on the Project until the State is no longer in arrears, unless the Secretary of the Army determines that continuation of work on the Project is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with the Project. Any delinquent payment shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13-week Treasury Bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3-month period if the period of delinquency exceeds 3 months.

b. If the Government fails to receive annual appropriations for the Project in amounts sufficient to meet project expenditures for the then-current or upcoming fiscal year, the Government shall so notify the State. After 60 calendar days either party may elect without penalty to terminate this Agreement pursuant to this Article or to defer future performance hereunder; however, deferral of future performance under this Agreement shall not affect existing obligations or relieve the parties of liability for any obligation previously

incurred. In the event that either party elects to terminate this Agreement pursuant to this Article, both parties shall conclude their activities relating to the Project and proceed to a final accounting in accordance with Article V of this Agreement. In the event that either party elects to defer future performance under this Agreement pursuant to this Article, such deferral shall remain in effect until such time as the Government receives sufficient appropriations or until either party elects to terminate this Agreement.

ARTICLE XVII - NOTICES

a. All notices, requests, demands, and other communications required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally, given by prepaid telegram, or mailed by first-class (postage pre-paid), registered, or certified mail, as follows:

If to the State:

Director
Illinois Department of Conservation
Lincoln Tower Plaza
524 South 2nd Street
Springfield, Illinois 62701-1787

If to the Government:

District Engineer
U.S. Army Engineer District, Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

b. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

c. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at such time as it is personally delivered or seven calendar days after it is mailed, as the case may be.

ARTICLE XVIII - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Engineer.

THE DEPARTMENT OF THE ARMY	THE STATE OF ILLINOIS DEPARTMENT OF CONSERVATION
By: _____ John R. Brown Colonel, U.S. Army District Engineer	By: _____ Director
Date: _____	Date: _____

CERTIFICATE OF AUTHORITY

I, _____, do hereby certify that I am the Attorney General for the State of Illinois, that the State of Illinois is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the State of Illinois in connection with a Habitat Rehabilitation Project at Peoria Lake in Peoria and Woodford Counties, Illinois, and to pay damages, if necessary, in the event of the failure to perform, in accordance with Section 221 of Public Law 91-611, as amended, and that the person who has executed this Agreement on behalf of the State of Illinois has acted within his statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this _____ day of _____, 19_____.

_____
Attorney General for the
State of Illinois

ATTACHMEMENT TO THE LOCAL COOPERATION AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE STATE OF ILLINOIS
FOR CONSTRUCTION OF THE
PEORIA LAKE HABITAT REHABILITATION PROJECT
PEORIA AND WOODFORD COUNTIES, ILLINOIS

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the

required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

THE STATE OF ILLINOIS
DEPARTMENT OF CONSERVATION

By _____

Director

Date: _____

DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB
0348-0046

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

1. Type of Federal Action:	2. Status of Federal Action:	3. Report Type:
☐ a. contract b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	☐ a. bid/offer/application b. initial award c. post-award	☐ a. initial filing b. material change For Material Change Only: year _____ quarter _____ date of last report _____

4. Name and Address of Reporting Entity:	5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime:
☐ Prime ☐ Subawardee Tier _____, *if known:* Congressional District, *if known:*	Congressional District, *if known:*
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA Number, *if applicable:* _____
8. Federal Action Number, *if known:*	9. Award Amount, *if known:* $
10. a. Name and Address of Lobbying Entity (*if individual, last name, first name, MI*):	b. Individuals Performing Services (*including address if different from No. 10a*) (*last name, first name, MI*):

(attach Continuation Sheet(s) SF-LLL-A, if necessary)

11. Amount of Payment (*check all that apply*):	13. Type of Payment (*check all that apply*):
$ _____ ☐ actual ☐ planned	☐ a. retainer ☐ b. one-time fee ☐ c. commission ☐ d. contingent fee ☐ e. deferred ☐ f. other; specify: _____
12. Form of Payment (*check all that apply*): ☐ a. cash ☐ b. in-kind; specify: nature _____ value _____	

14. Brief Description of Services Performed or to be Performed and Date(s) of Service, including officer(s), employee(s), or Member(s) contacted, for Payment Indicated in Item 11:

(attach Continuation Sheet(s) SF-LLL-A, if necessary)

15. Continuation Sheet(s) SF-LLL-A attached: ☐ Yes ☐ No

16.	
Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____

Federal Use Only:

Authorized for Local Reproduction
Standard Form - LLL

REVISED JUN 90

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.

    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).

11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.

12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.

13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.

14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.

15. Check whether or not a SF-LLL-A Continuation Sheet(s) is attached.

16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

DISCLOSURE OF LOBBYING ACTIVITIES
CONTINUATION SHEET

Approved by OMB
0348-0046

.eporting Entity: _____ Page _____ of _____

REVISED JUN 90

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APPENDIX D

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UMRS-EMP
PEORIA LAKE ENHANCEMENT

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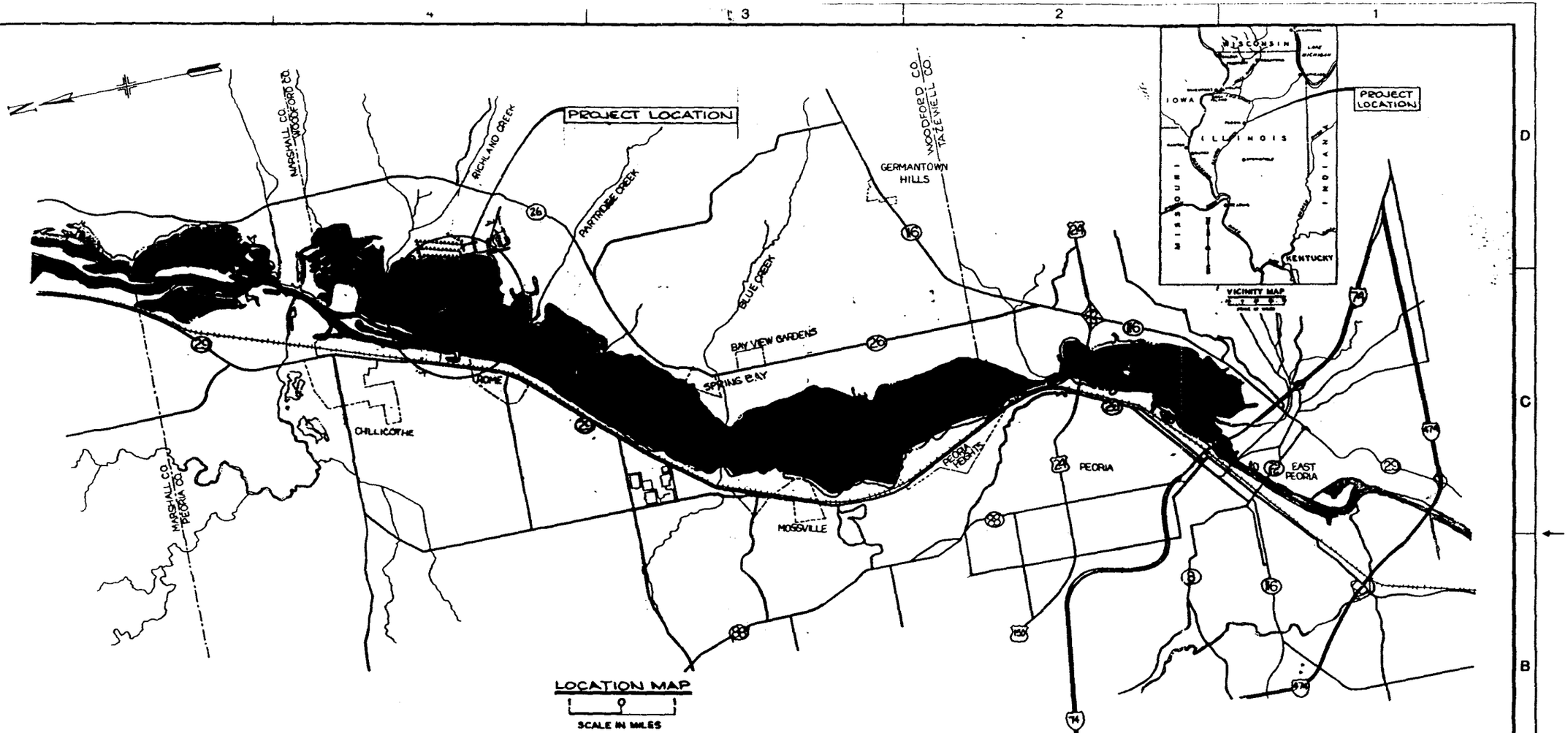

LOCATION MAP

1 0 1

SCALE IN MILES

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9	EAST RIVER / BARRIER ISLAND TYPICAL SECTIONS
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22	SEDIMENTATION MONITORING RANGES RIVER MILE 179.5 to 180.4

SIGNATURES AFFIXED BELOW INDICATE OFFICIAL RECOMMENDATION AND APPROVAL OF ALL DRAWINGS IN THIS SET AS INDICATED ON EACH INDIVIDUAL TITLE BLOCK.

Proposed by:
U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND
Submitted by:
CHIEF, DESIGN BR.
CHIEF, HYDRAULICS BR.
CHIEF, GEOTECHNICAL BR.
Recommended by:
CHIEF, ENGINEERING DIV.
Approved by:
COL, CORPS OF ENGINEERS Date:

Revisions			
Symbol	Description	Date	Approved

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CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

Designed by:
Drawn by:
Checked by:
Reviewed by:
Approved by:

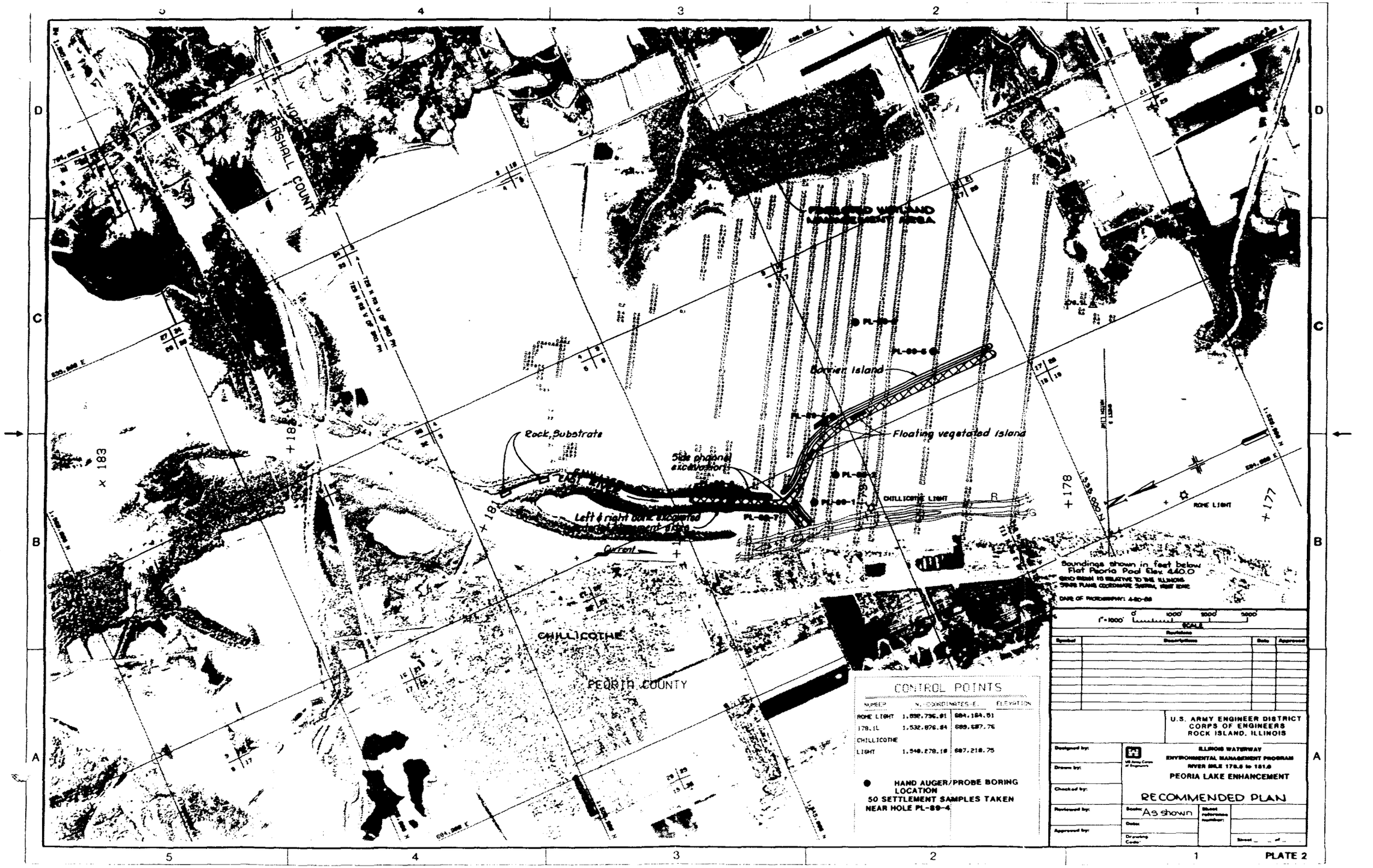
US Army Corps of Engineers

ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.9
PEORIA LAKE ENHANCEMENT

LOCATION MAP AND INDEX

Scale: As shown
Sheet reference number:
Date:
Drawing Code:
Sheet _ of _

PLATE 1


PROPOSED WETLAND
MANAGEMENT AREA
PL-89-8
PL-89-6
Bowen Island
PL-89-5
Floating vegetated island
Rock Substrate
Side channel excavation
PL-89-1
CHILLICOTHE LIGHT
Left & right bank excavated
PL-89-7
Current
ROME LIGHT
MARSHALL COUNTY
PEORIA COUNTY
CHILLICOTHE
+ 183
+ 181
+ 178
+ 177
Soundings shown in feet below
Flat Peoria Pool Elev. 440.0
DATE OF HYDROGRAPHY: 4-20-88
1"=1000'
0
1000'
2000'
5000'
SCALE
CONTROL POINTS
NUMBER
N. COORDINATES E.
ELEVATION
ROME LIGHT
1,532,796.91
684,184.51
178.1L
1,532,876.84
688,687.76
CHILLICOTHE LIGHT
1,548,278.18
687,218.75
HAND AUGER/PROBE BORING LOCATION
50 SETTLEMENT SAMPLES TAKEN NEAR HOLE PL-89-4
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CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.8 to 181.8
PEORIA LAKE ENHANCEMENT
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Scale: As shown
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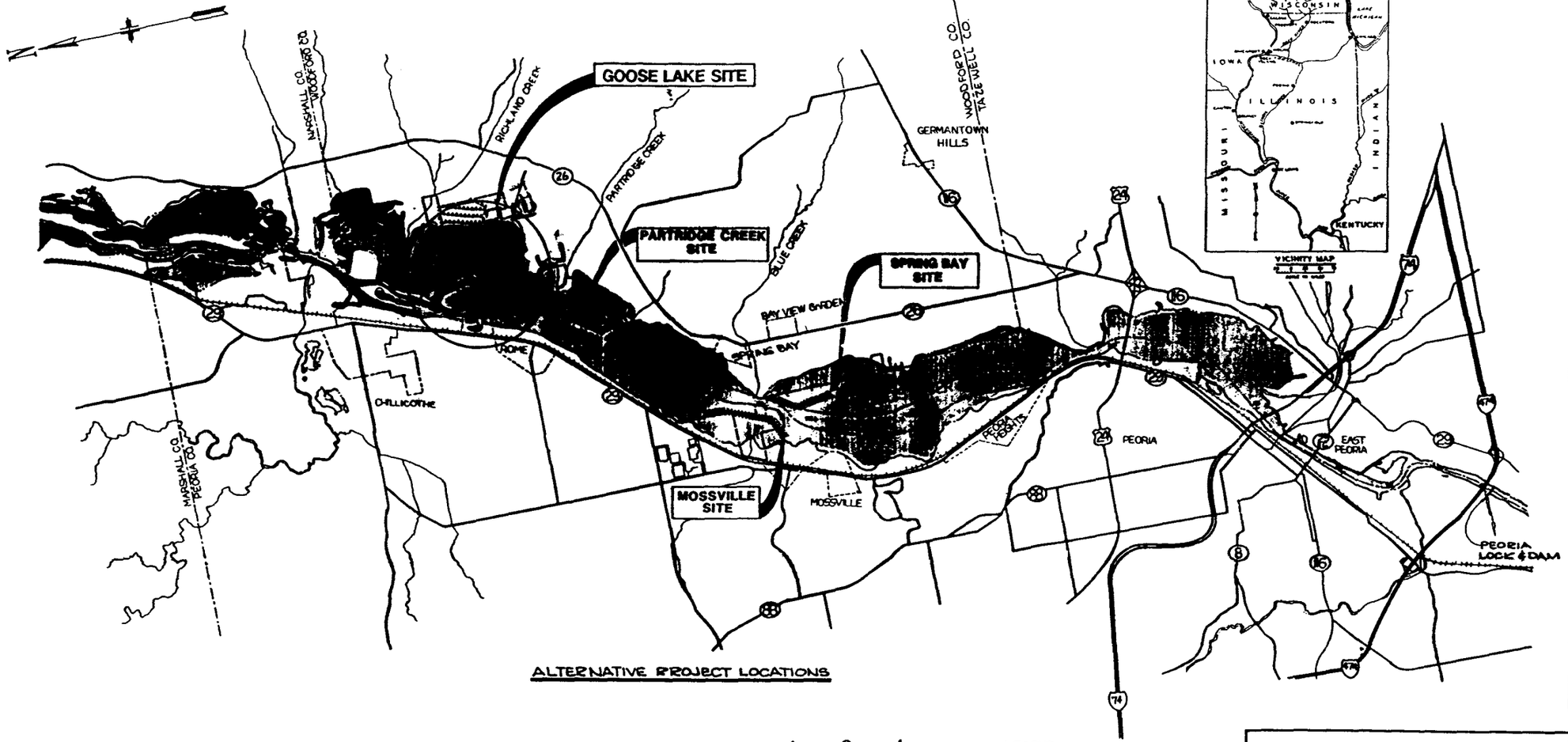
PLATE 2



ALTERNATIVE PROJECT LOCATIONS

SCALE IN MILES

LEGEND

PROPOSED LEVEES

PROPOSED BARRIER ISLAND

STATE OWNED LANDS

Revisions			
Symbol	Description	Date	Approved

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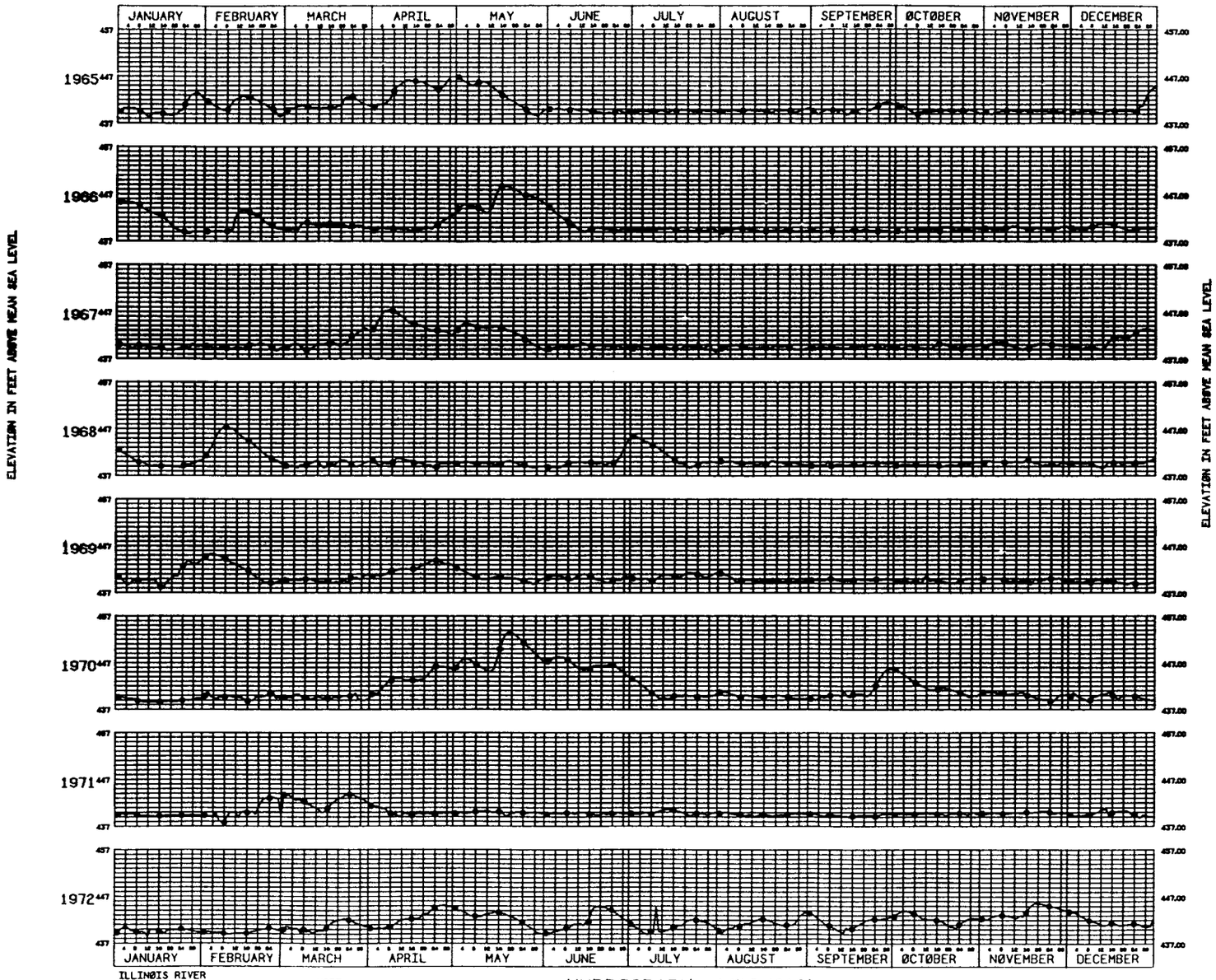
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.8 to 181.0
PEORIA LAKE ENHANCEMENT

ALTERNATIVE PROJECT LOCATIONS

Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 3



HYDRØGRAPH - MILE 164.2±
PEØRIA BØATYARD

RIVER MILE 179.0

Flat Pool	= 440.0
Q_2	= 449.7
Q_5	= 452.8
Q_{10}	= 453.6
Q_{50}	= 457.9
Q_{100}	= 459.4

Revisions			
Symbol	Description	Date	Approved

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

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Reviewed by:
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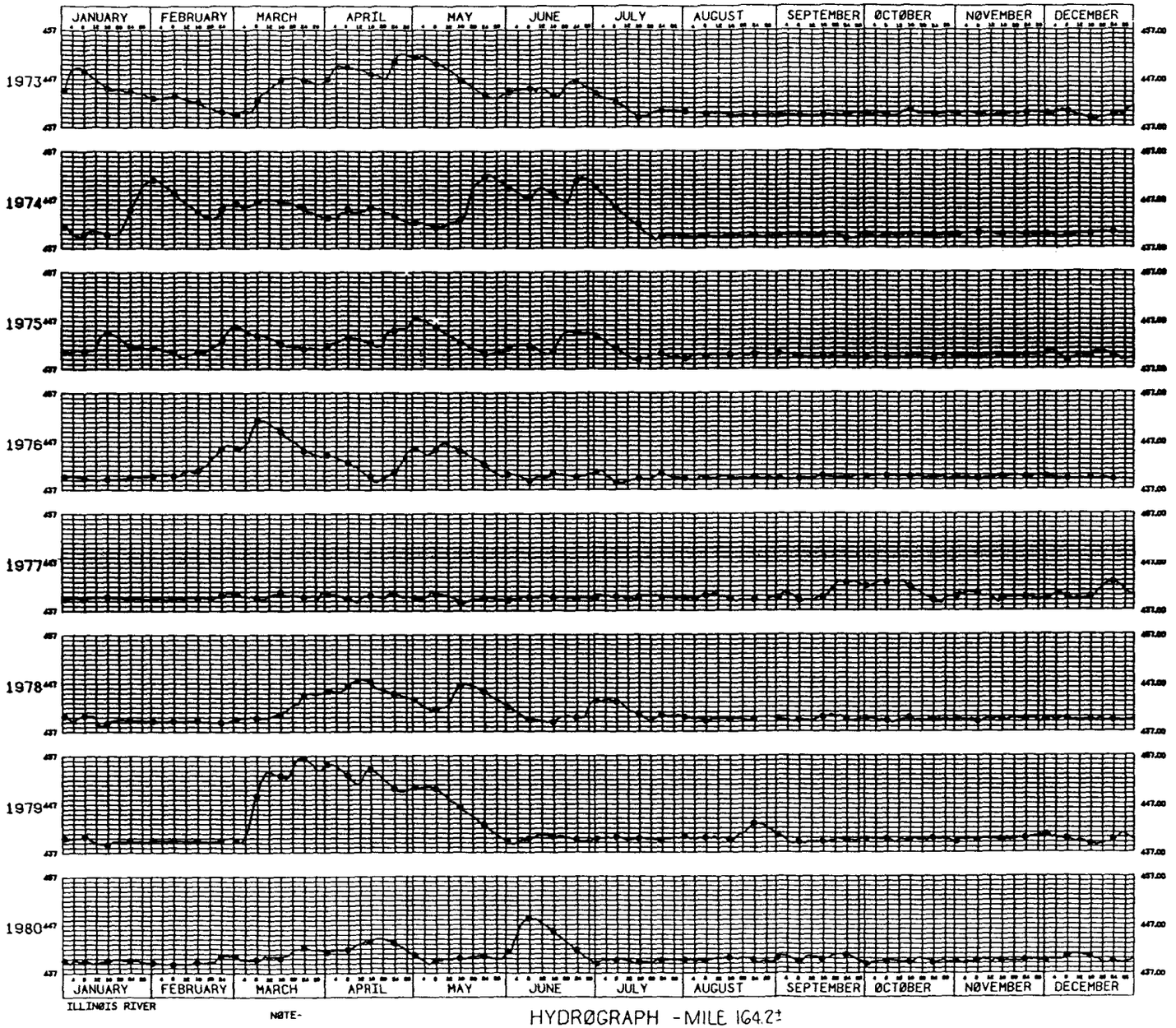
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT

HYDRAULIC DATA I

Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 4



ILLINØIS RIVER

NØTE-

HYDRØGRAPH -MILE 164.2±
PEØRIA BØATYARD

Symbol	Revisions Description	Date	Approved

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

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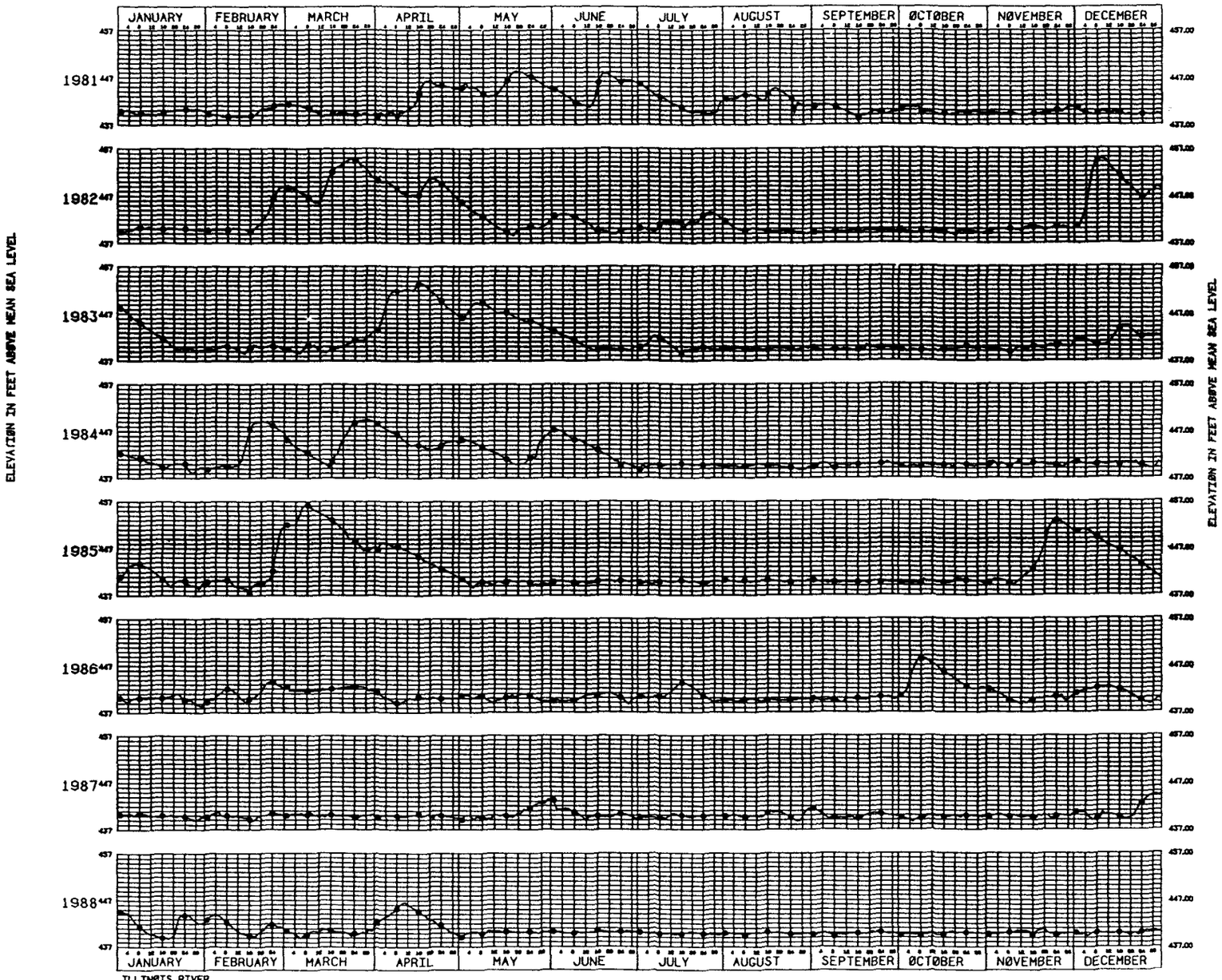
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.6 to 161.9
PEORIA LAKE ENHANCEMENT

HYDRAULIC DATA II

Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet _ _ of _

PLATE 5



ILLINØIS RIVER

NØTE-

HYDRØGRAPH -MILE 164.2±
PEØRIA BØATYARD

Revisions			
Symbol	Description	Date	Approved

U.S. ARMY ENGINEER DISTRICT
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ROCK ISLAND, ILLINOIS

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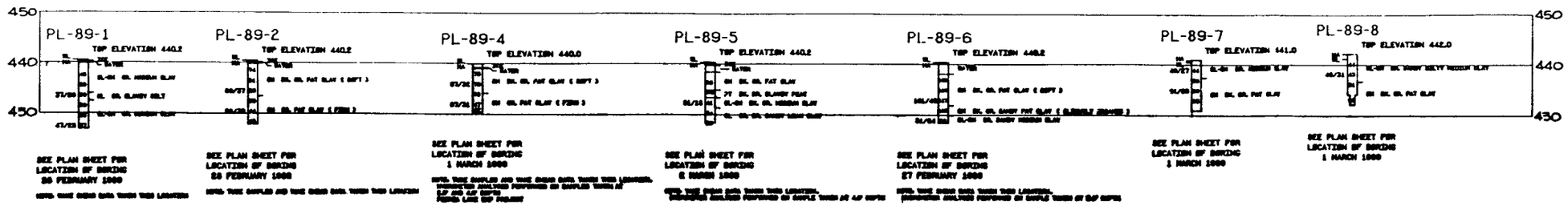
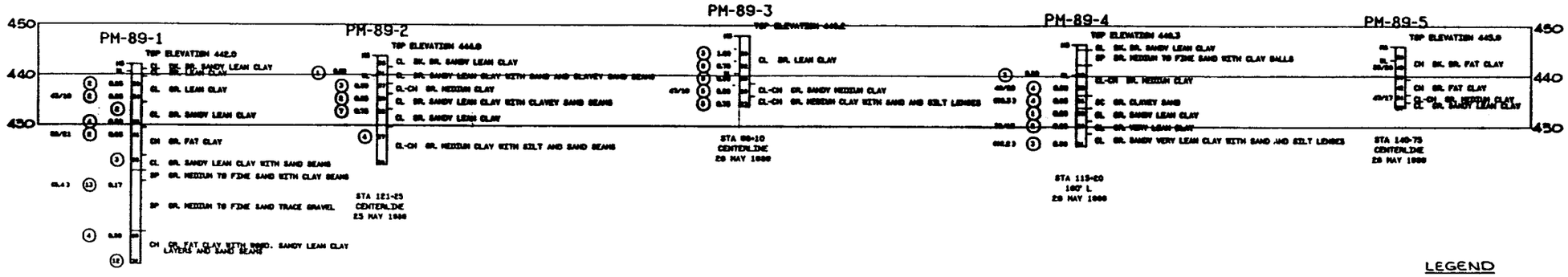
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 161.9
PEORIA LAKE ENHANCEMENT

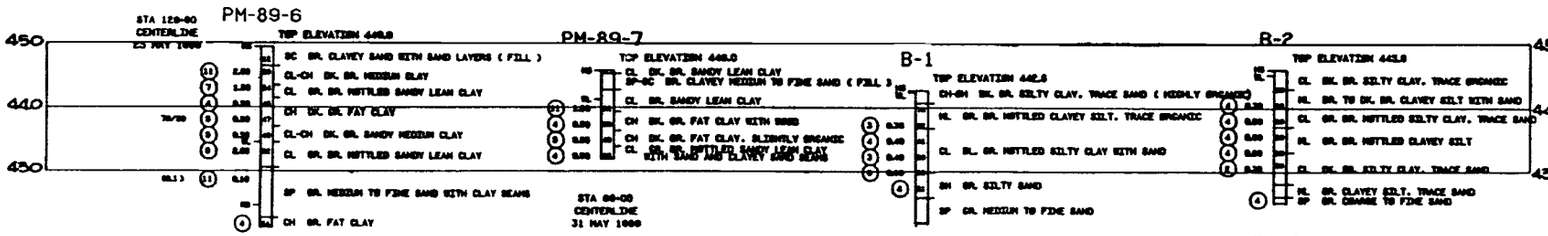
HYDRAULIC DATA III

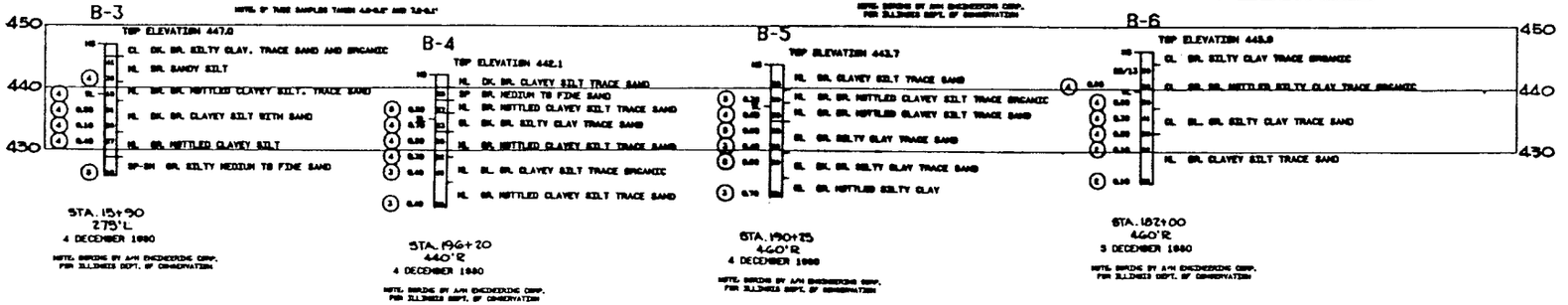
Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 6









LEGEND

BORING NUMBER

HOLE ADVANCED BY HOLLOW STEM AUGER
HOLE ADVANCED BY ROLLER BIT
HOLE ADVANCED BY HAND BAND AUGER
WATER LEVEL
LIQUID & PLASTIC LIMIT
NO. COHESIVE SOILS, D_{10} SIZE (MM)
NO COHESIVE SOILS, STANDARD PENETROMETER READING (T/SF)
PERCENT PASSING #200 SIEVE
NUMBER OF BLOWS TO DRIVE STANDARD SPLIT SPOON (2"O.D.) ONE FOOT W/ 140 LB. HAMMER & 30 INCH DROP

NATURAL MOISTURE CONTENT IN PERCENT DRY WEIGHT

MAJOR STRATA CHANGE

MINOR STRATA CHANGE

HOLE EXTENDED BY DRIVING 2 INCH PIPE

⊕ AUGER, PEBBLE OR SPLIT SPOON REFUSAL

LOCATION OF BORING
JULY 4, 1976 APPROXIMATE DATE OF DRILLING
ALSO DATE WHERE LEVEL NOTED

Revisions			
Symbol	Descriptions	Date	Approved

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

ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 170.5 to 181.0
PEORIA LAKE ENHANCEMENT

BORING LOGS

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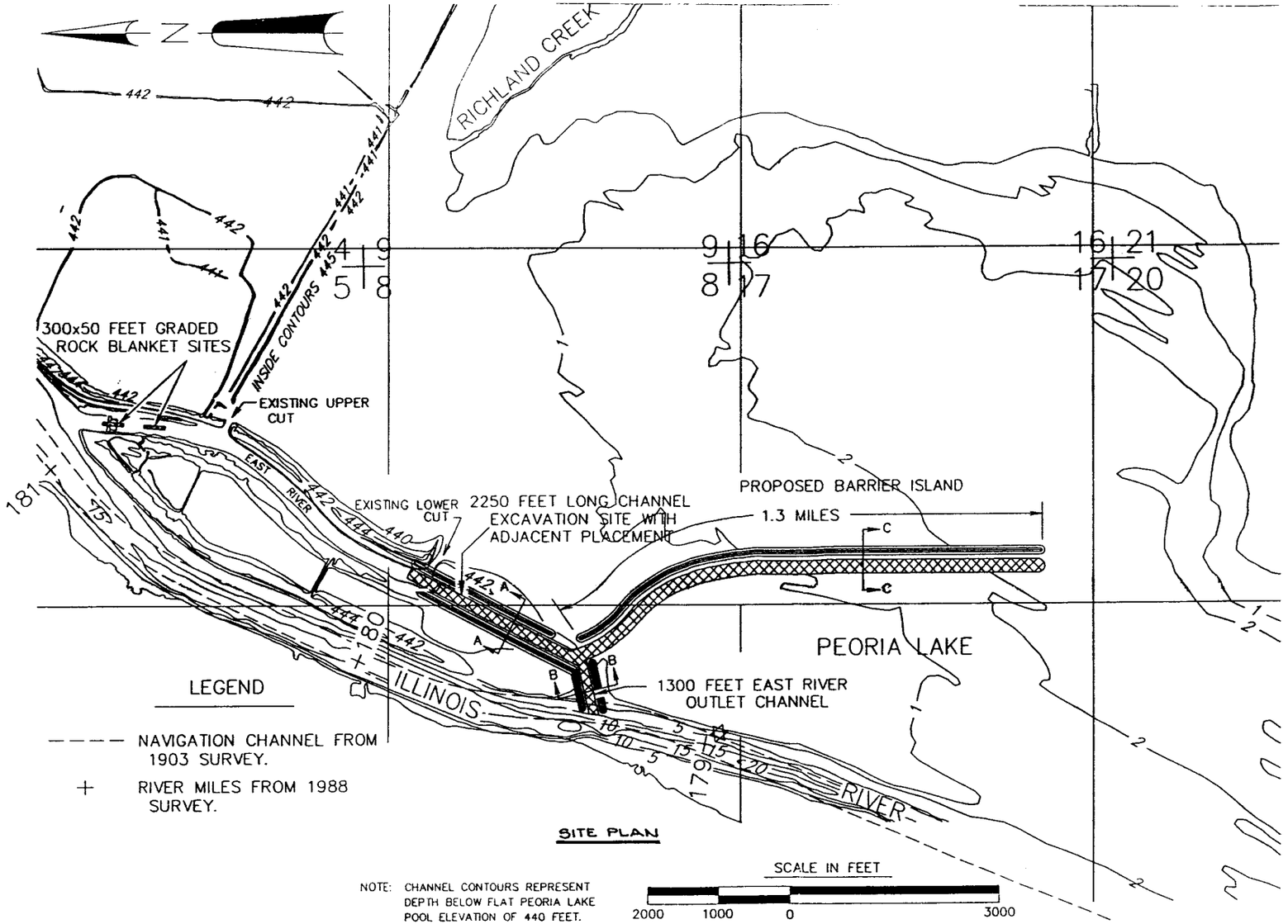
Drawn by:
Checked by:
Reviewed by:
Approved by:

Scale: As shown
Date:
Drawing Code:
Sheet reference numbers:
Sheet __ of __

PLATE 7



SITE PLAN

Note:
For Sections, See Plate 9.

Revisions			
Symbol	Descriptions	Date	Approved

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

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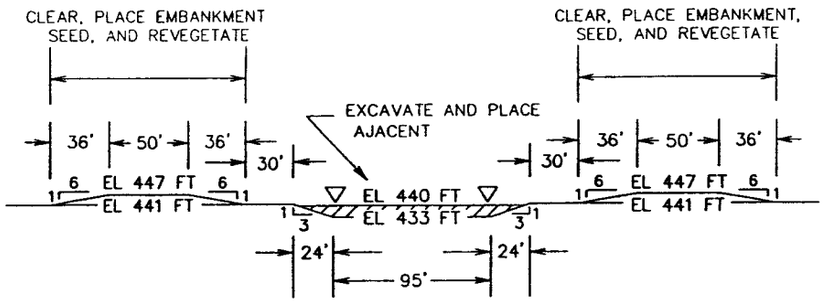
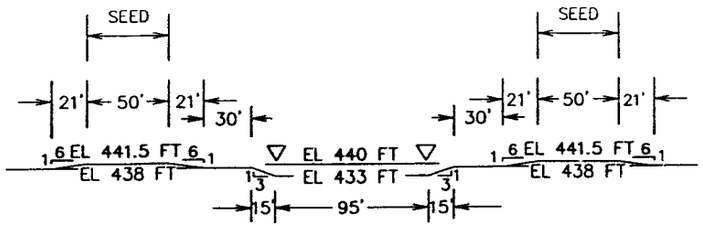
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 176.8 to 181.0
PEORIA LAKE ENHANCEMENT
EAST RIVER / BARRIER ISLAND
SITE PLAN

Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet _ of _

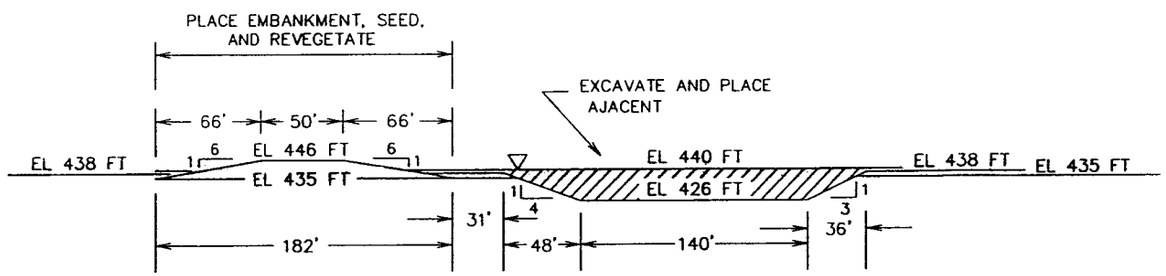
PLATE 8



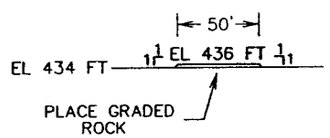
SECTION A–A
EAST RIVER EXCAVATION



SECTION B–B
EAST RIVER OUTLET CHANNEL



SECTION C–C
BARRIER ISLAND CONSTRUCTION



SECTION D–D
GRADED ROCK BLANKET

SCALE IN FEET
0 50 100 150

Symbol	Descriptions	Date	Approved

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

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ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.8 to 181.0
PEORIA LAKE ENHANCEMENT
EAST RIVER / BARRIER ISLAND
TYPICAL SECTIONS

Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet __ of __

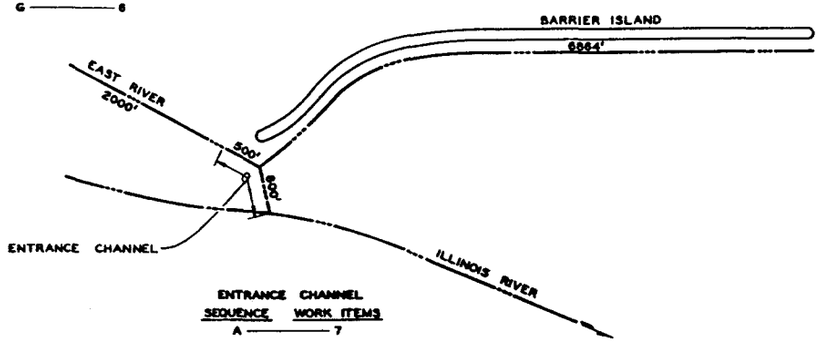
PLATE 9

BARRIER ISLAND

SEQUENCE	WORK ITEMS
B	4,1
H	2
I	3

EAST RIVER

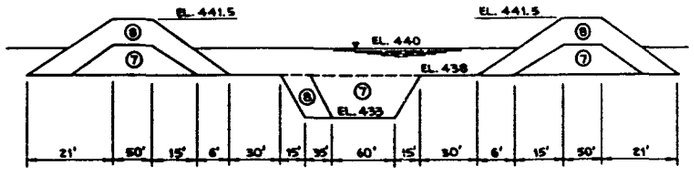
SEQUENCE	WORK ITEMS
D	5
G	6



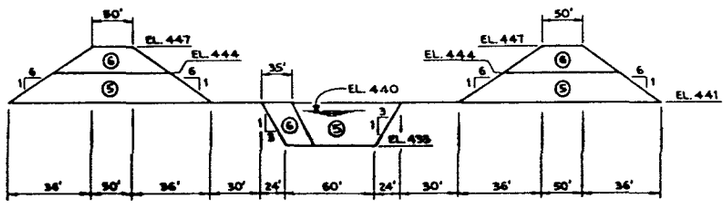
ENTRANCE CHANNEL

SEQUENCE	WORK ITEMS
A	7
C	7
E	8
F	8

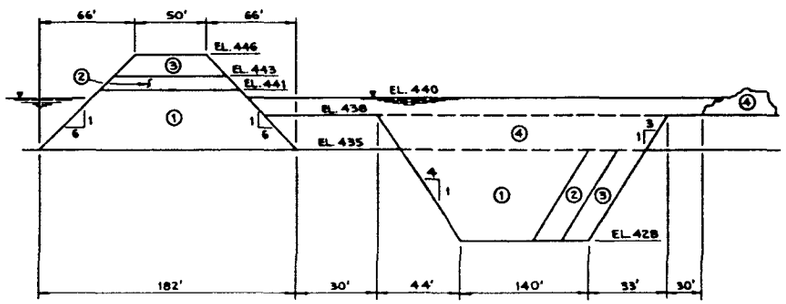
CONSTRUCTION SEQUENCE PLAN



ENTRANCE CHANNEL WORK ITEMS



EAST RIVER WORK ITEMS



BARRIER ISLAND WORK ITEMS

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ROCK ISLAND, ILLINOIS

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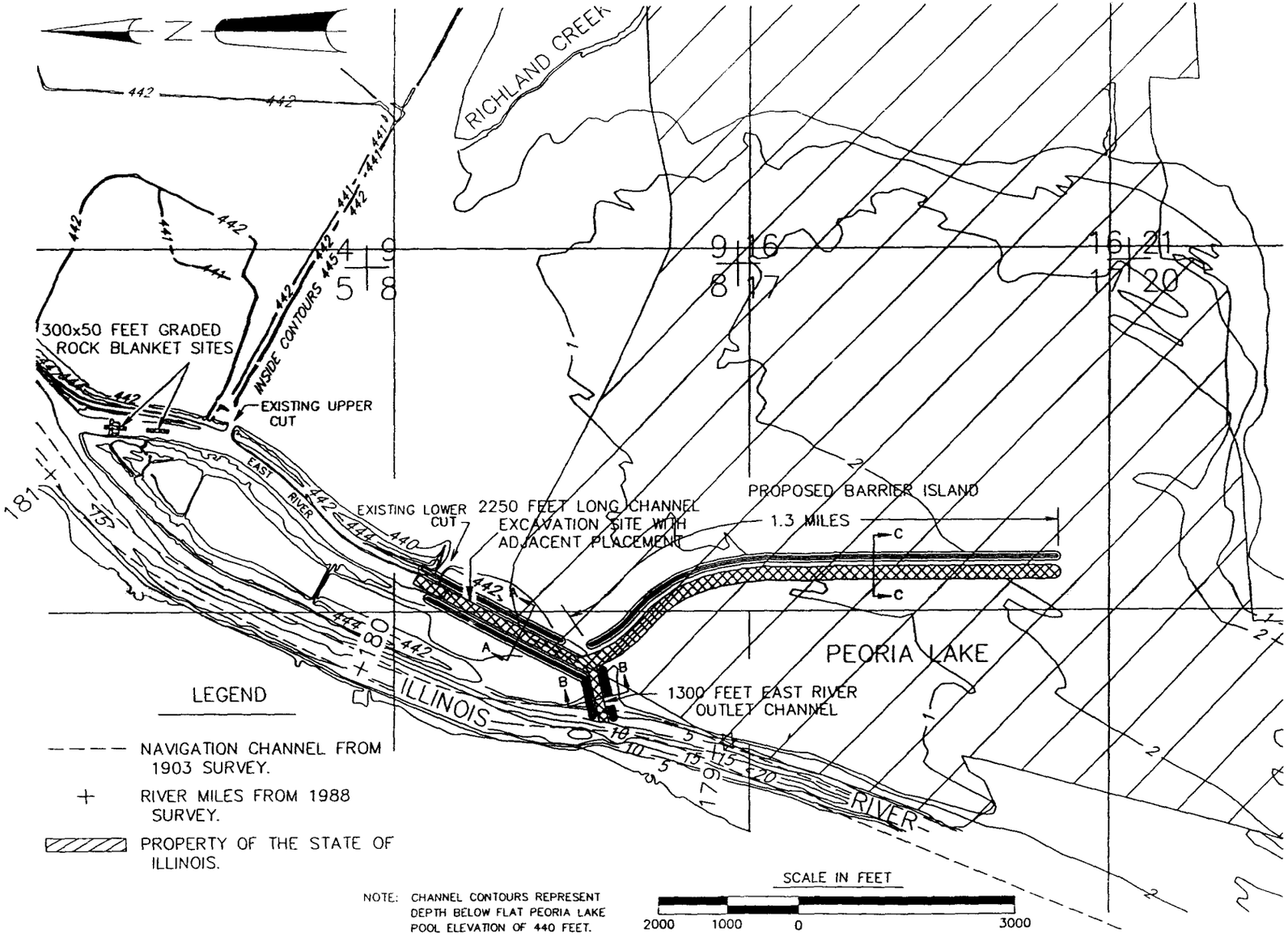
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT

EAST RIVER / BARRIER ISLAND
CONSTRUCTION SEQUENCE

Scales: NO SCALE
Dates:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 10



Revisions			
Symbol	Descriptions	Date	Approved

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

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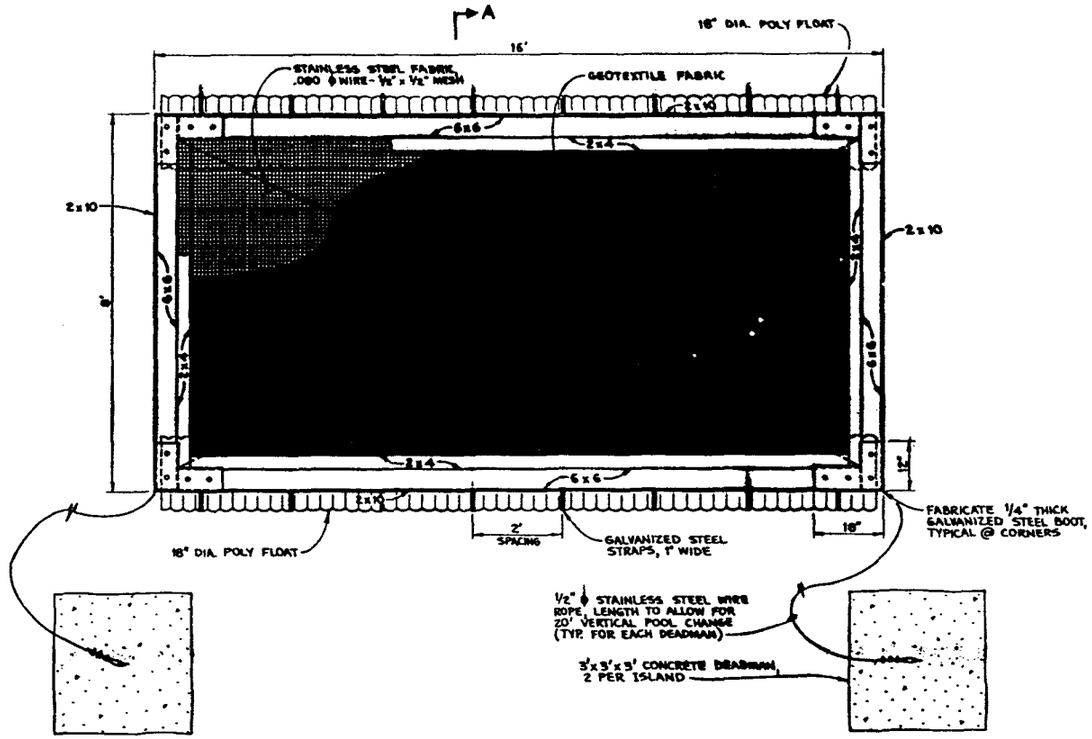
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.6 to 181.0

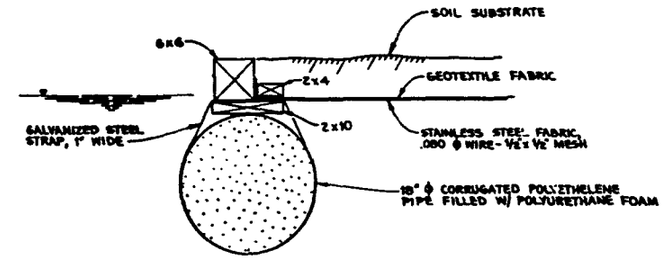
PEORIA LAKE ENHANCEMENT
EAST RIVER / BARRIER ISLAND STATE OWNED LANDS

Scale: As shown
Sheet reference number:
Date:
Drawing Code:
Sheet _ of _

PLATE 11



PLAN



SECTION A-A

NOTES:
1. ALL METAL BOLTS AND FASTENERS SHALL BE GALVANIZED STEEL.
2. ALL WOOD MEMBERS ARE PRESSURE TREATED.

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

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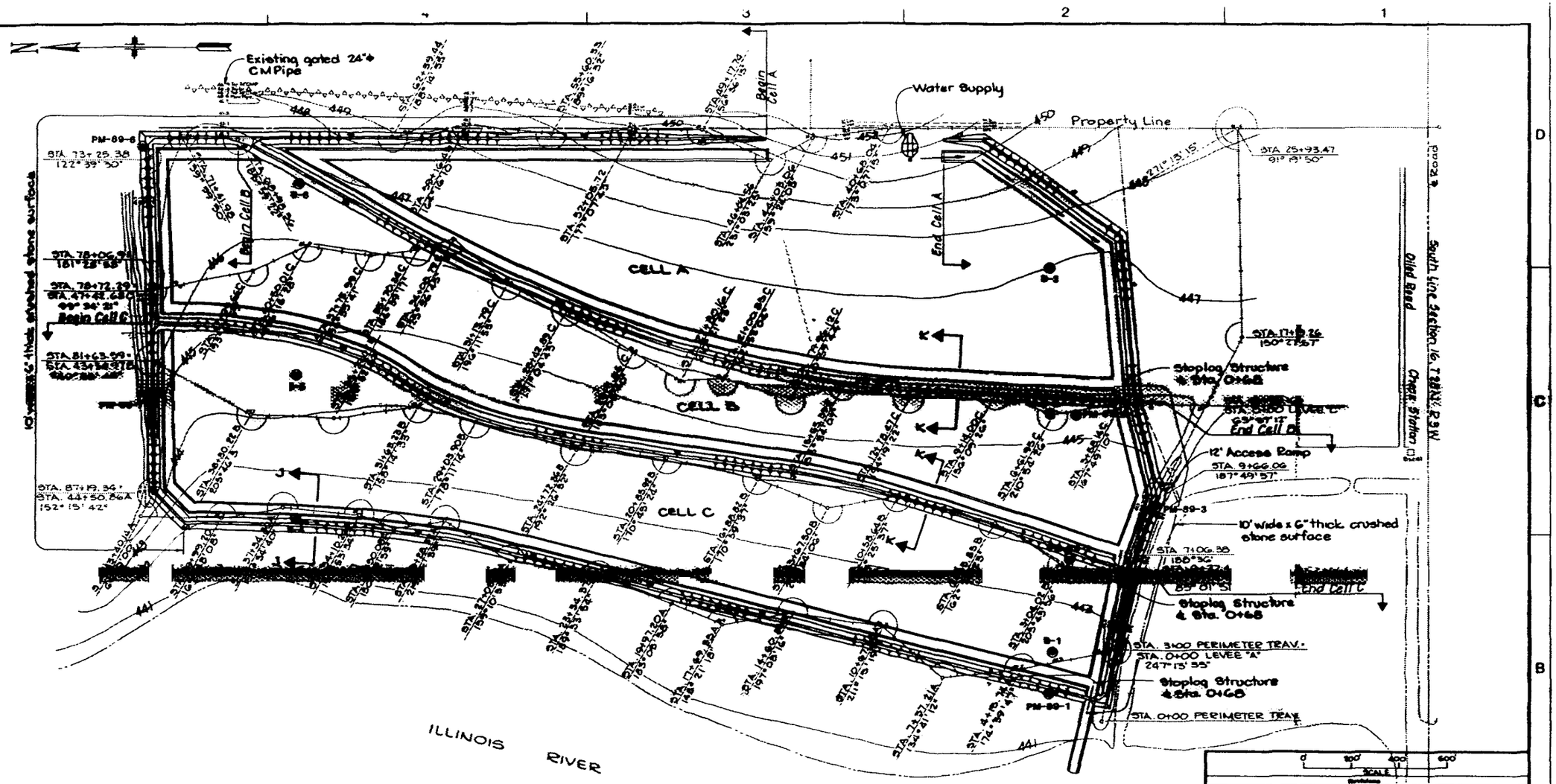
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0

PEORIA LAKE ENHANCEMENT

FLOATING VEGETATED ISLAND
PLAN AND DETAILS

Scale: None
Date:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 12



Field Book
FC-89-49 pgs. 1-10, Traverse
FC-89-49 pgs. 12-17, "X" Sections
FC-89-49 pgs. 19-22, Profile Levee "B"
FC-89-49 pgs. 23-26, Profile Levee "C"

SCALE 0 200' 400' 600'

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ROCK ISLAND, ILLINOIS

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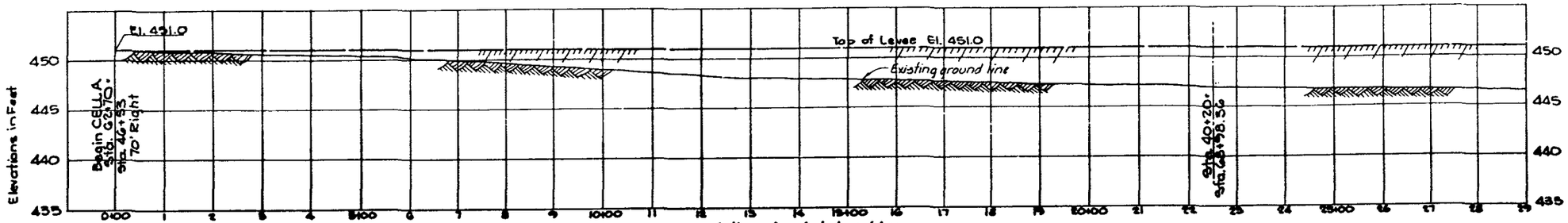
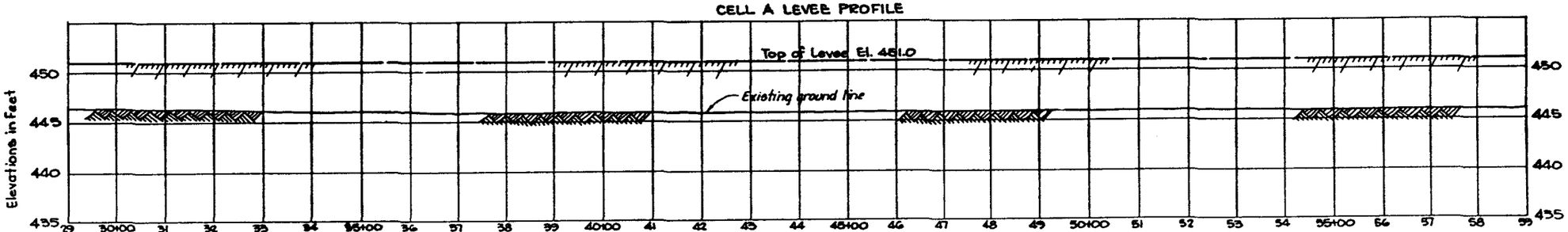
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT
FORESTED WETLAND MANAGEMENT AREA
SITE PLAN

Scale: As shown
Sheet reference number:
Sheet:
Drawing Code:
Sheet _ _ of _

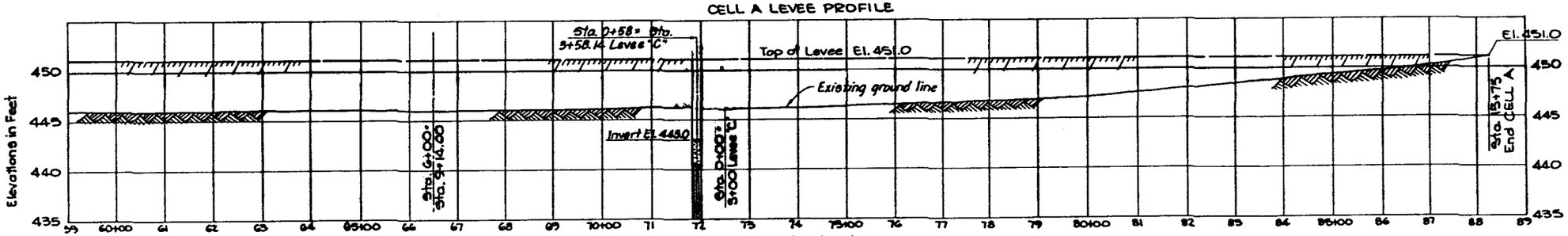
PLATE 13



CELL A LEVEE PROFILE



CELL A LEVEE PROFILE



CELL A LEVEE PROFILE

Revisions			
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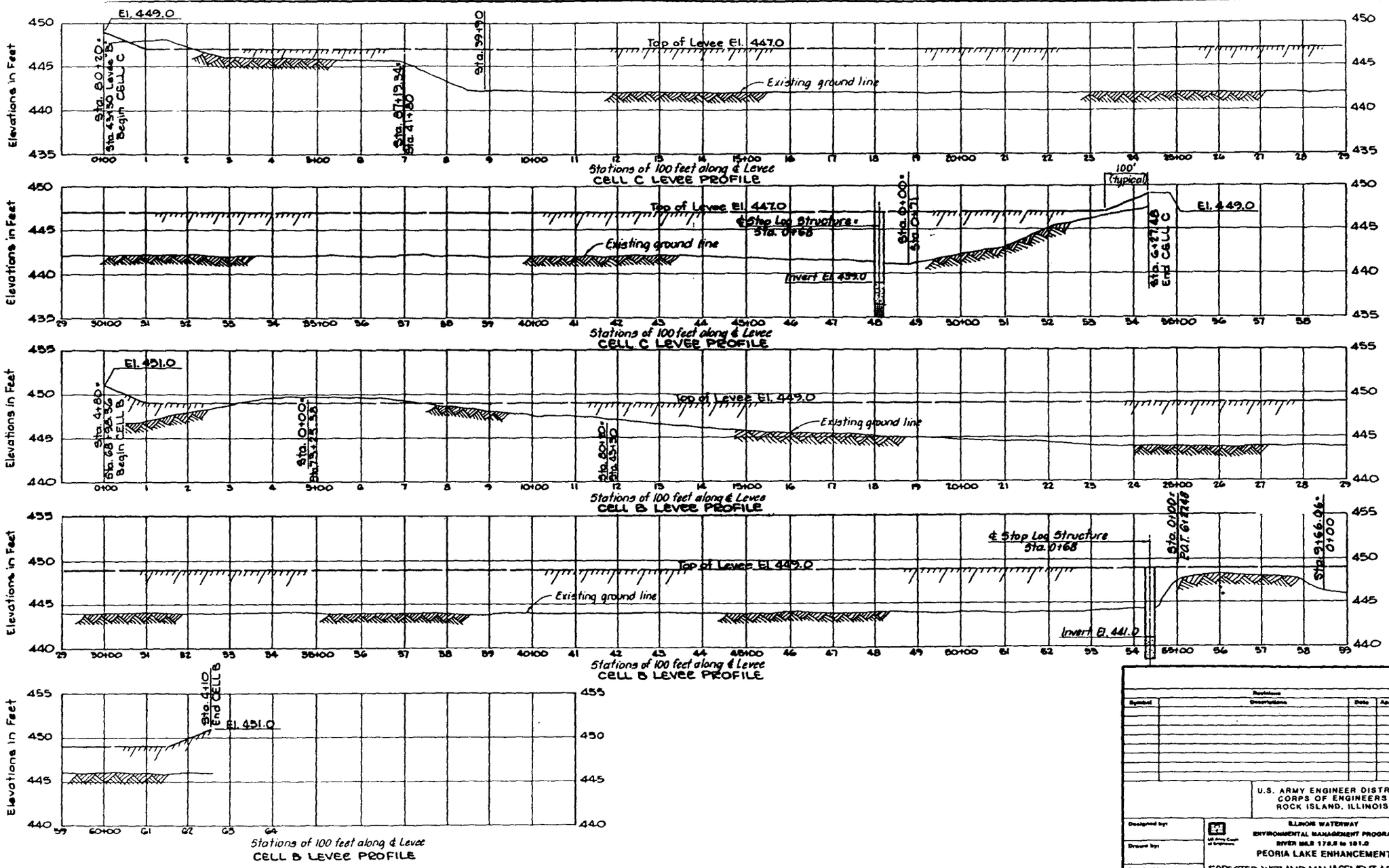
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT
FORESTED WETLAND MANAGEMENT AREA
PROFILES I

Scales: As shown
Dates:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 14



Revisions			
Symbol	Descriptions	Date	Approved

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

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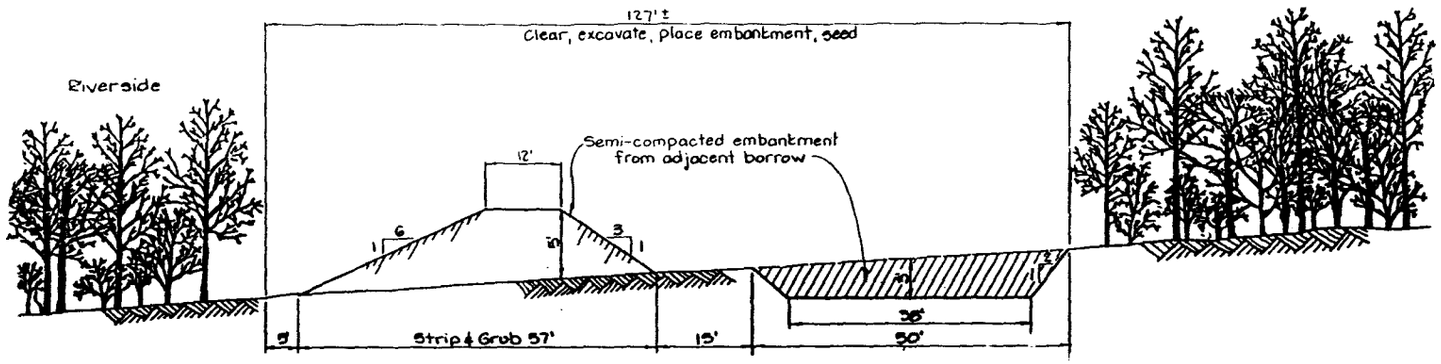
US Army Corps of Engineers

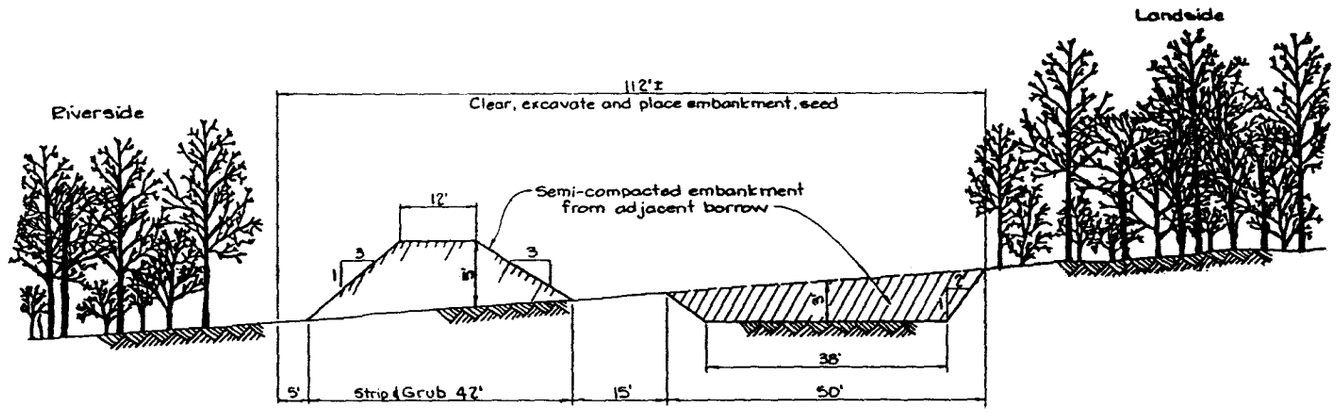
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 170.5 to 181.0
PEORIA LAKE ENHANCEMENT
FORESTED WETLAND MANAGEMENT AREA
PROFILES II

Scales: As shown
Sheet reference number:
Dates:
Drawing Code:
Sheet _ of _

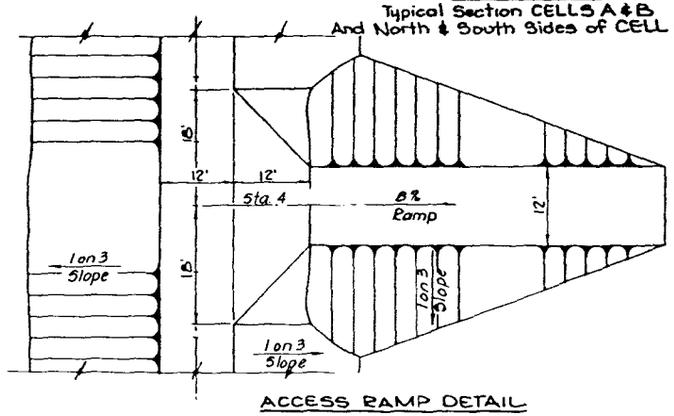
PLATE 15



SECTION J-J
Typical Section CELL C
Riverside Sta. 44+50.86A to Sta. 0+71.0



SECTION K-K
Typical Section CELLS A & B
And North & South Sides of CELL C



ACCESS RAMP DETAIL

Revisions			
Symbol	Description	Date	Approved

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

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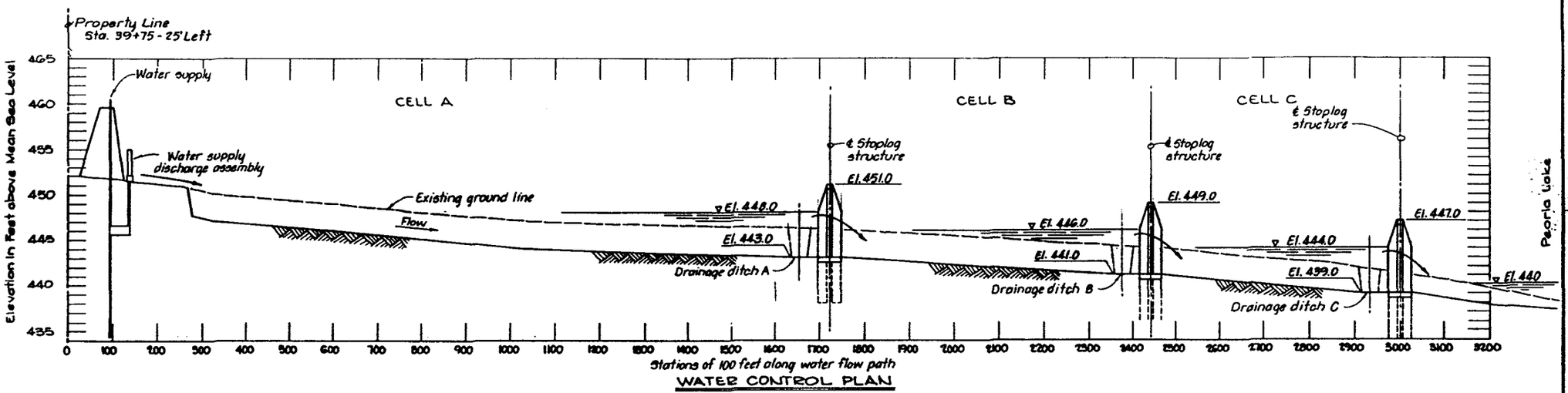
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 170.5 to 181.0
PEORIA LAKE ENHANCEMENT
FORESTED WETLAND MANAGEMENT AREA
TYPICAL SECTIONS

Scales: No scale
Dates:
Drawing Code:
Sheet reference numbers:
Sheet _ of _

PLATE 16



WATER CONTROL PLAN

Revisions			
Symbol	Descriptions	Date	Approved

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

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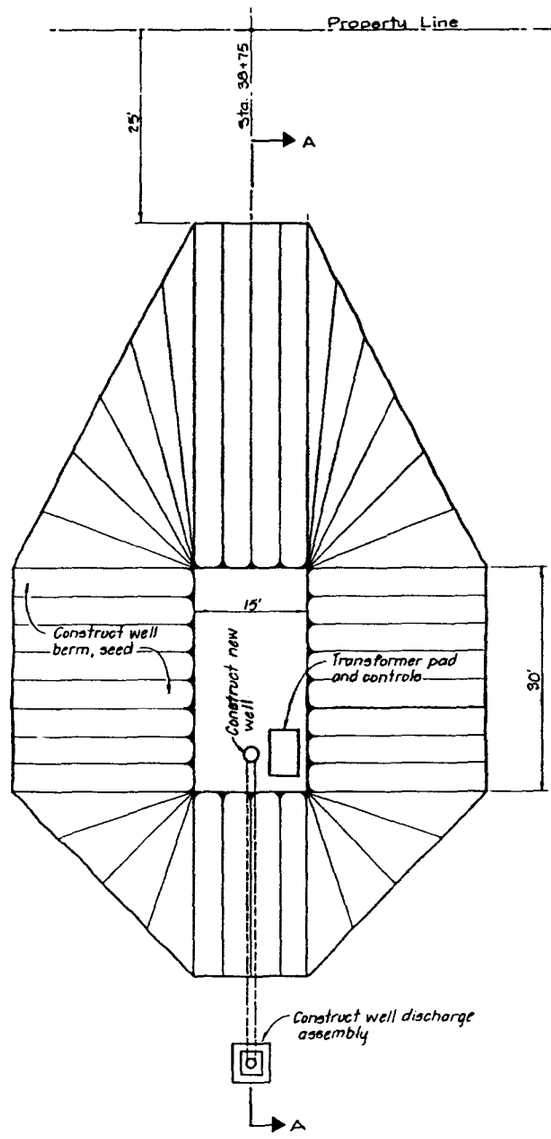
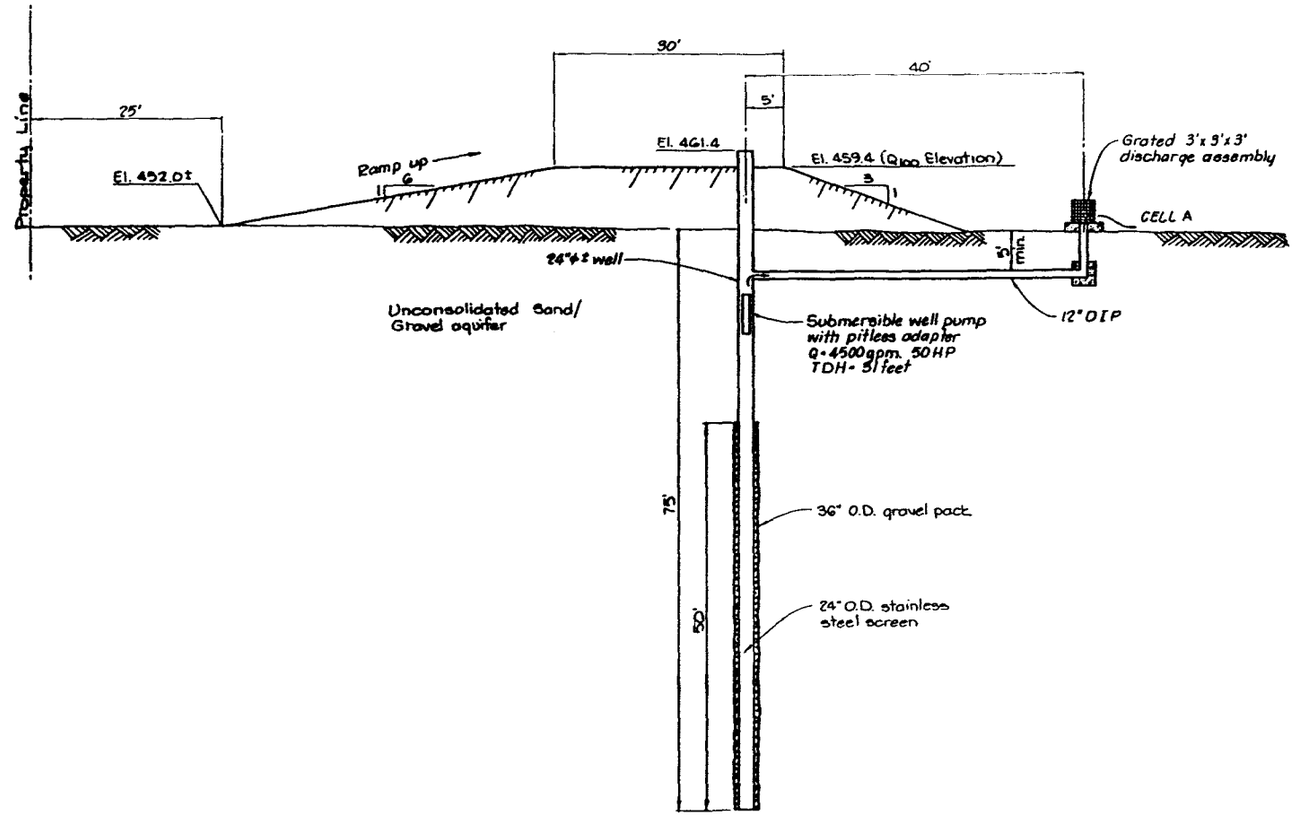
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.6 to 181.9
PEORIA LAKE ENHANCEMENT
FORESTED WETLAND MANAGEMENT AREA
WATER CONTROL PLAN

Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet __ of __

PLATE 17



WATER SUPPLY



SECTION A-A

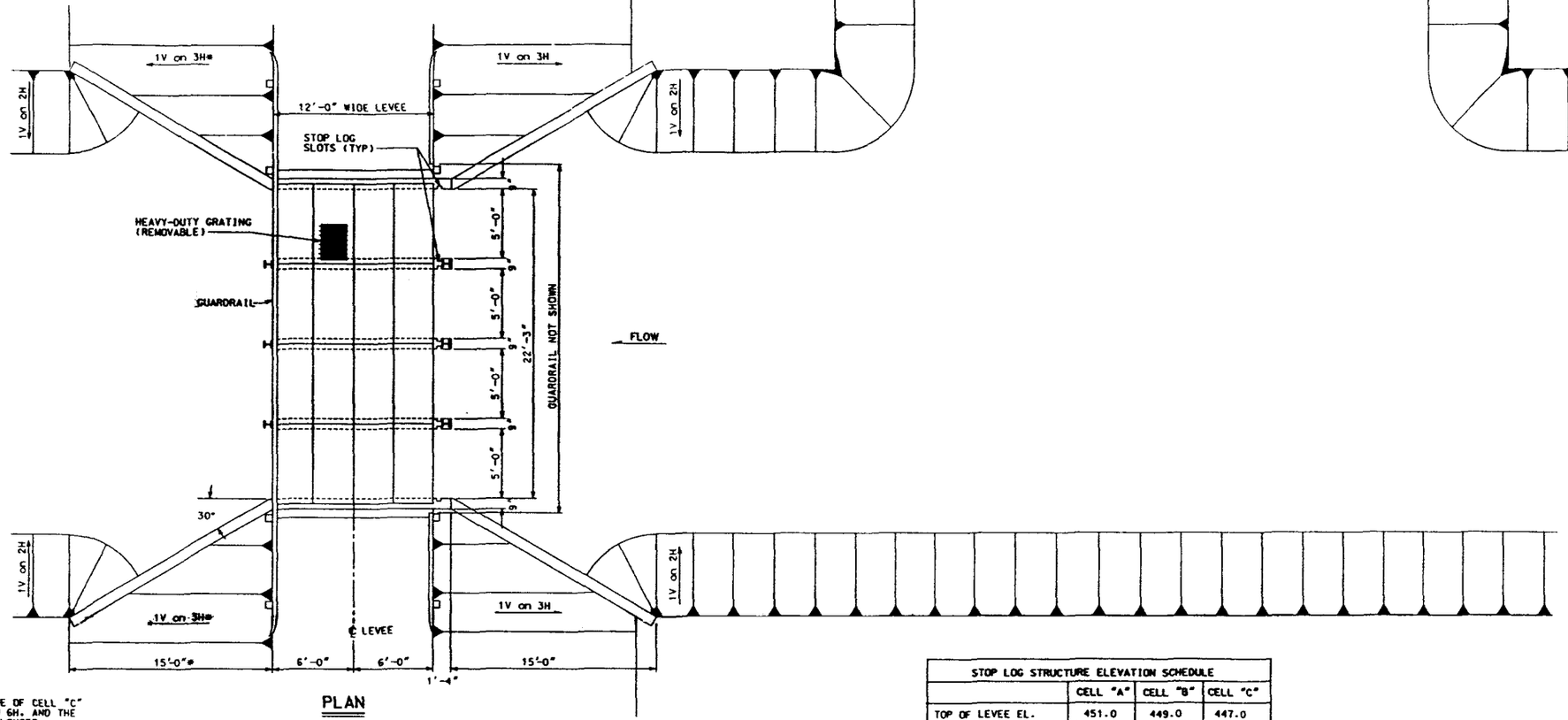
Revisions			
Symbol	Description	Date	Approved

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

ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT
FORESTED WETLAND MANAGEMENT AREA
WATER SUPPLY

Designed by:
Drawn by:
Checked by:
Reviewed by:
Approved by:
Scale:
Date:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 18

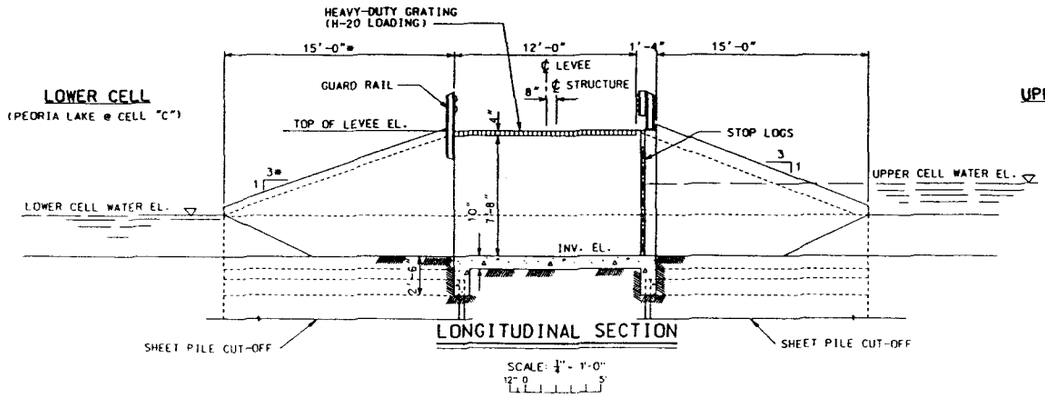


PLAN

SCALE: 1" = 1'-0"

*ON THE OUTFLOW SIDE OF CELL "C" THE SLOPE IS 1V ON 6H, AND THE WING WALL WILL BE LONGER.

STOP LOG STRUCTURE ELEVATION SCHEDULE			
	CELL "A"	CELL "B"	CELL "C"
TOP OF LEVEE EL.	451.0	449.0	447.0
INVERT EL.	443.0	441.0	439.0
UPPER CELL WATER EL.	448.0	446.0	444.0
LOWER CELL WATER EL.	446.0	444.0	442.0



LONGITUDINAL SECTION

SCALE: 1" = 1'-0"

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

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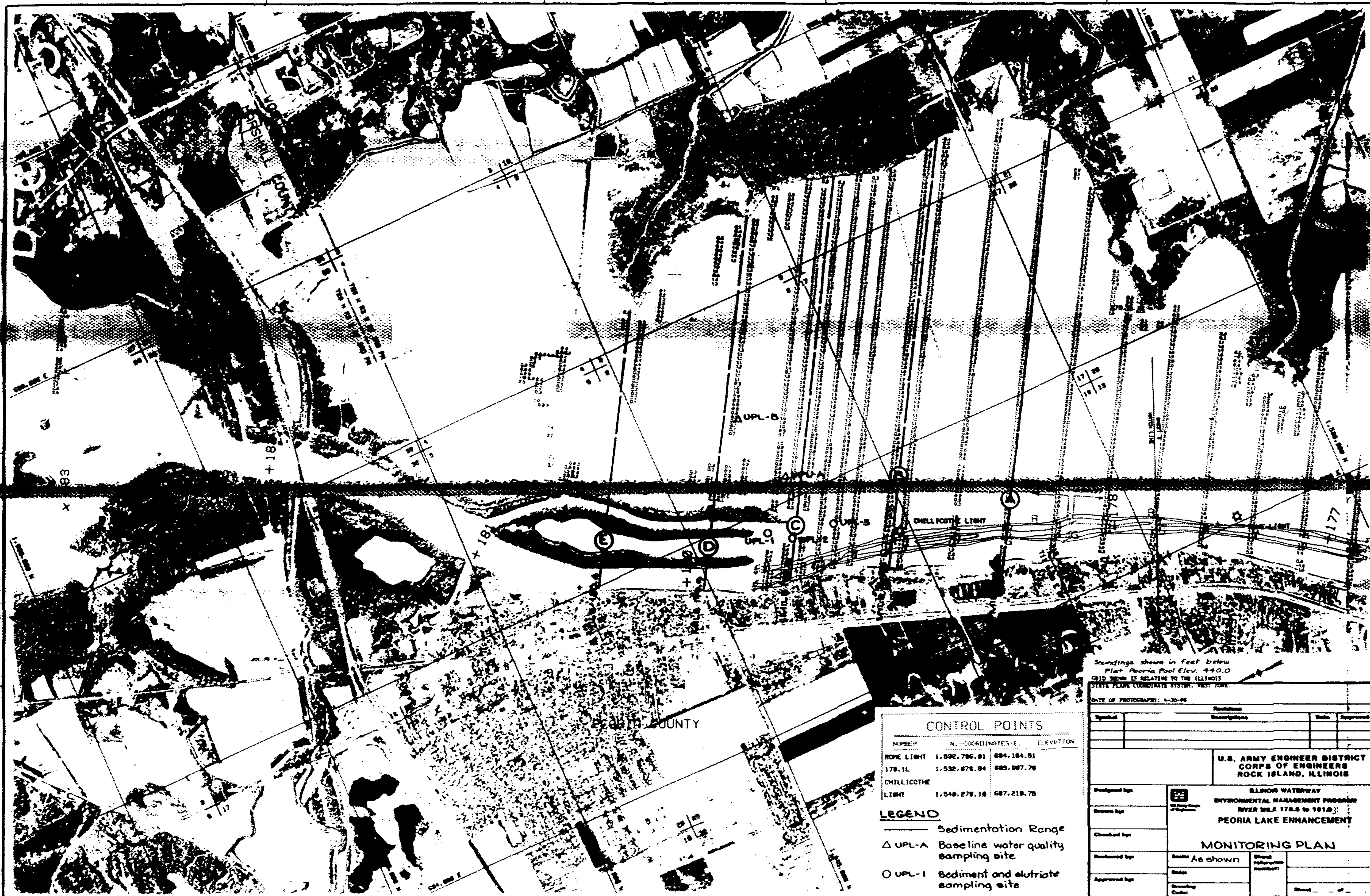
US Army Corps of Engineers

ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 TO 181.0
PEORIA LAKE ENHANCEMENT

FORESTED WETLAND MANAGEMENT AREA
STOP LOG STRUCTURE

Scale: AS SHOWN
Date:
Drawing Code:
Sheet reference number:
Solicitation Number:
Sheet of

PLATE 19



CONTROL POINTS

NUMBER	N. - COORDINATES - E.		ELEVATION
ROME LIGHT	1,592,796.81	694,164.51	
178.1L	1,532,076.84	685,667.76	
CHILLICOTHE LIGHT	1,549,270.18	687,218.78	

LEGEND

———	Sedimentation Range
△ UPL-A	Baseline water quality sampling site
○ UPL-1	Sediment and elutriate sampling site

Revisions			
Symbol	Descriptions	Date	Approved

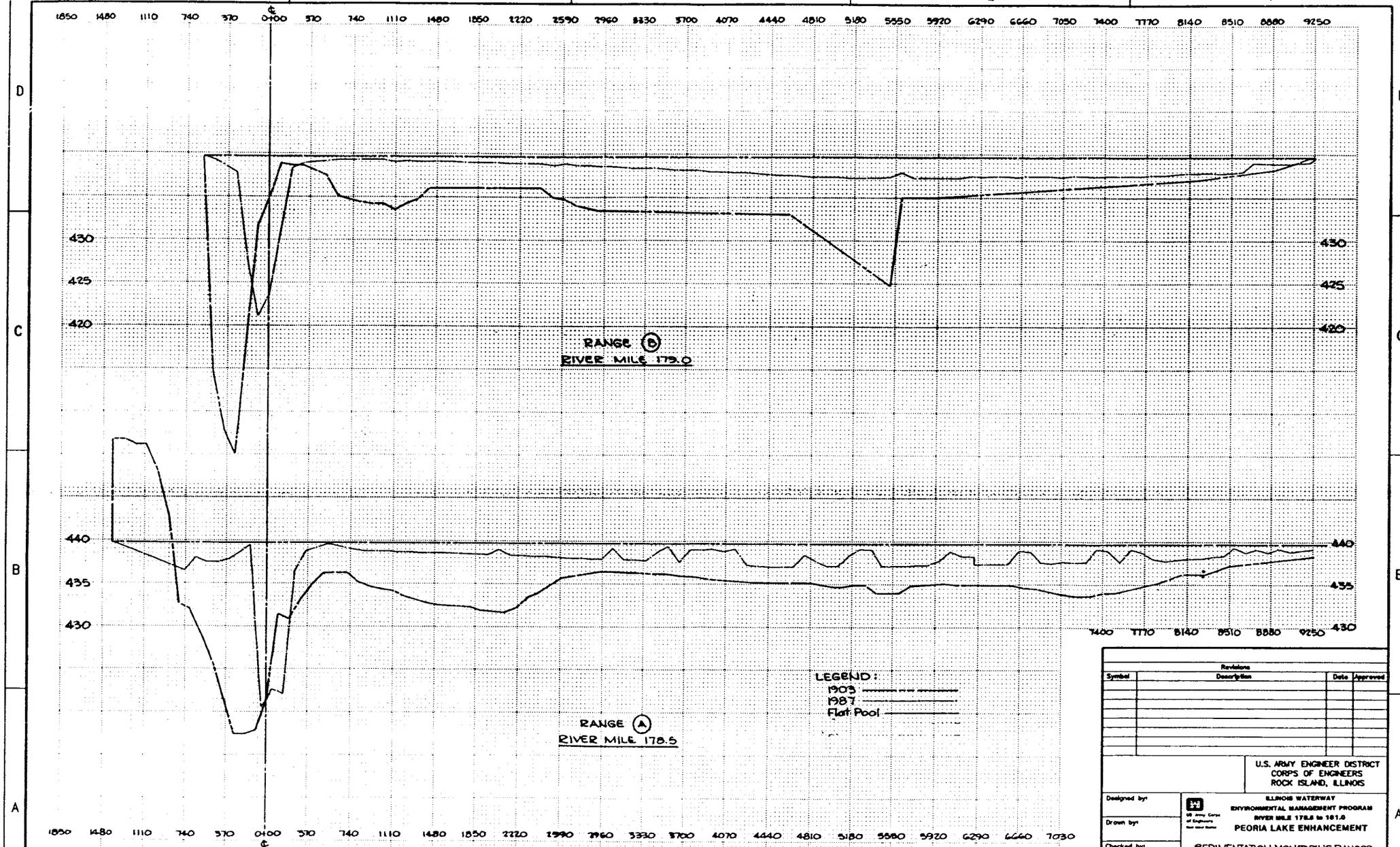
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.6 to 181.0
PEORIA LAKE ENHANCEMENT

MONITORING PLAN

Designed by:
Drawn by:
Checked by:
Reviewed by:
Approved by:
Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Sheet _ of _

PLATE 20



Revisions			
Symbol	Description	Date	Approved

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

Designed by:
Drawn by:
Checked by:
Reviewed by:
Approved by:

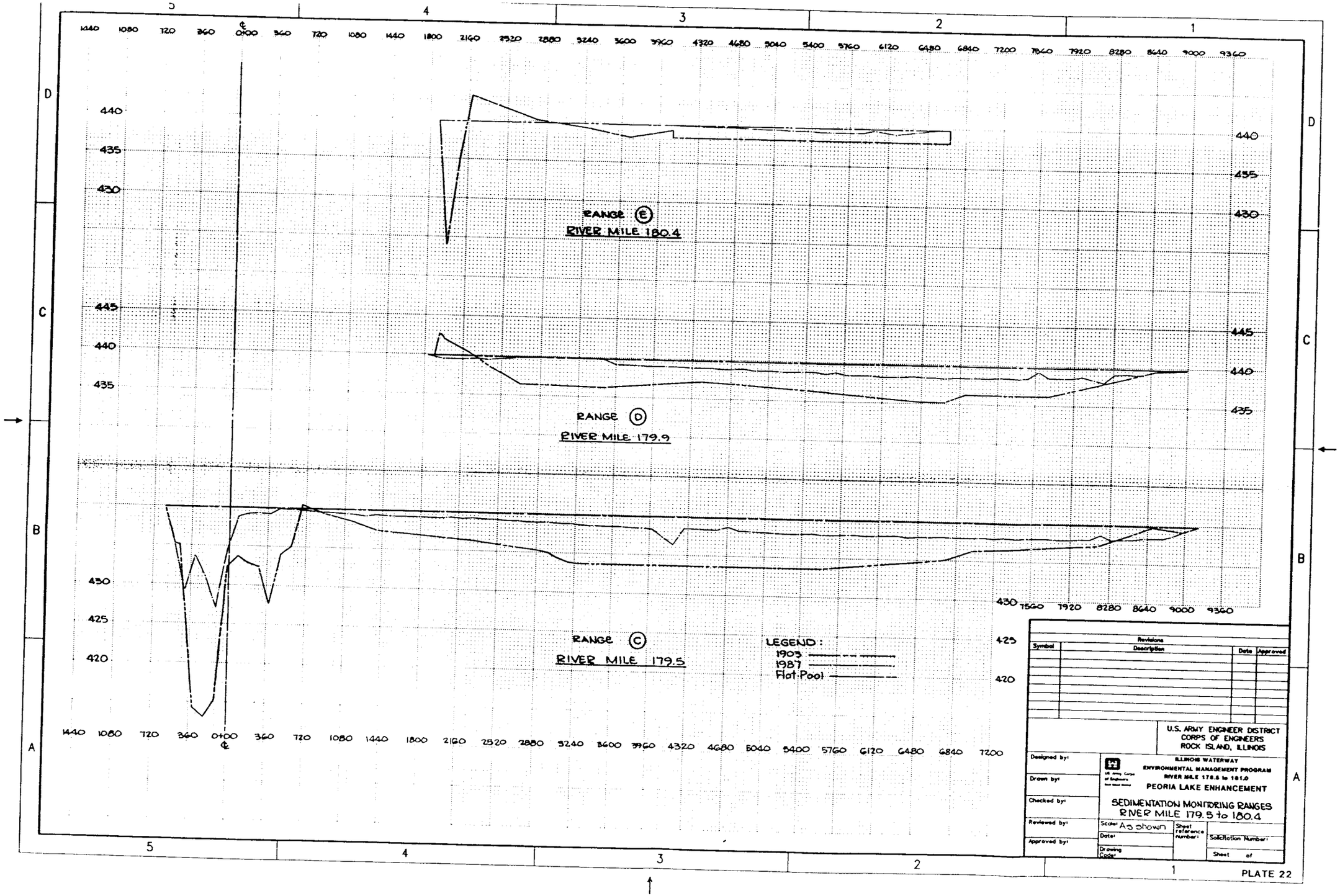
US Army Corps of Engineers

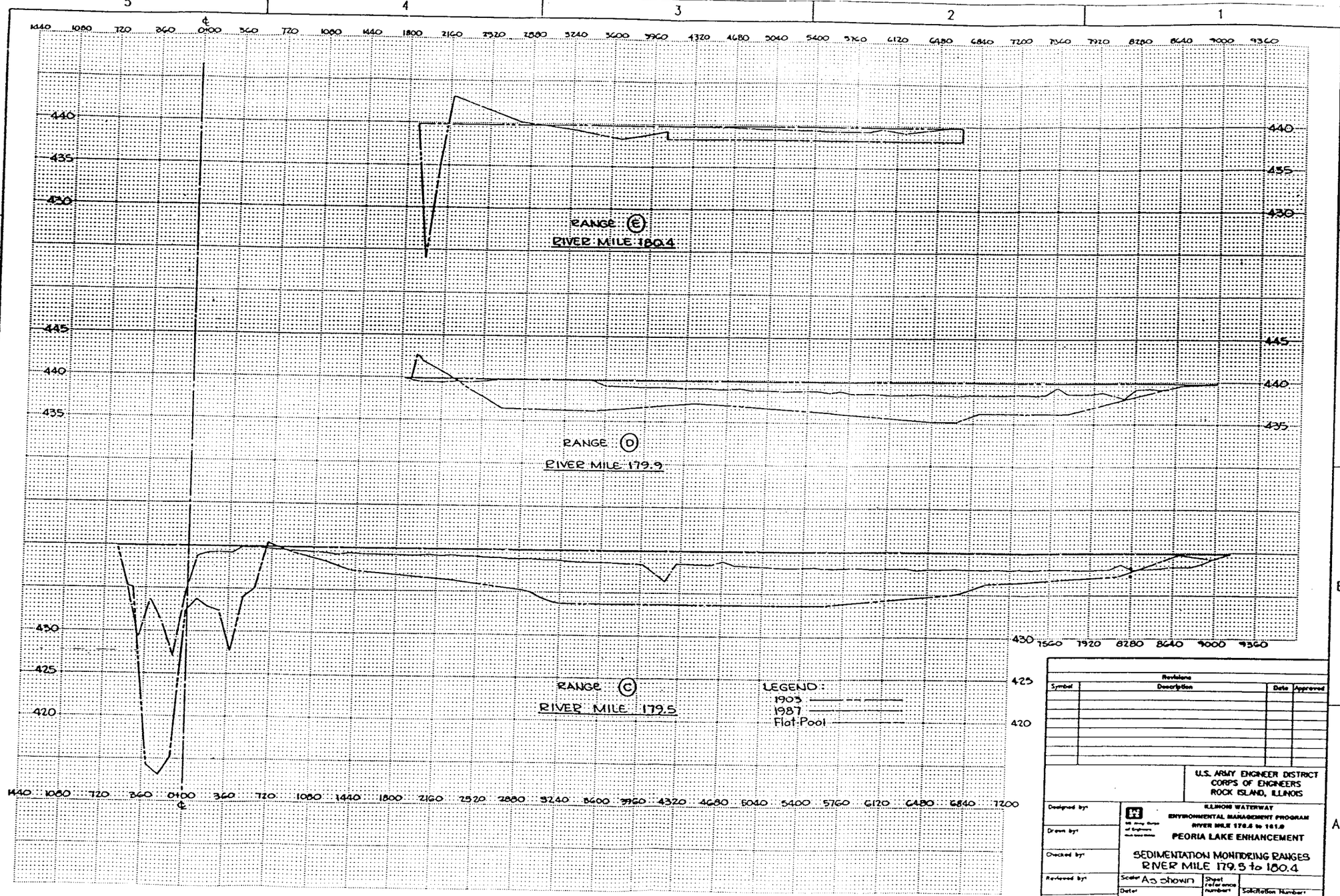
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT

SEDIMENTATION MONITORING RANGES
RIVER MILE 178.5 to 179.0

Scale:
Date:
Drawing Code:
Sheet reference number:
Solicitation Number:
Sheet of

PLATE 21


RANGE (E)
RIVER MILE 180.4
RANGE (D)
RIVER MILE 179.9
RANGE (C)
RIVER MILE 179.5
LEGEND:
1903
1987
Flat Pool
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS
ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT
SEDIMENTATION MONITORING RANGES
RIVER MILE 179.5 to 180.4
Scale: As shown
PLATE 22



Revisions			
Symbol	Description	Date	Approved

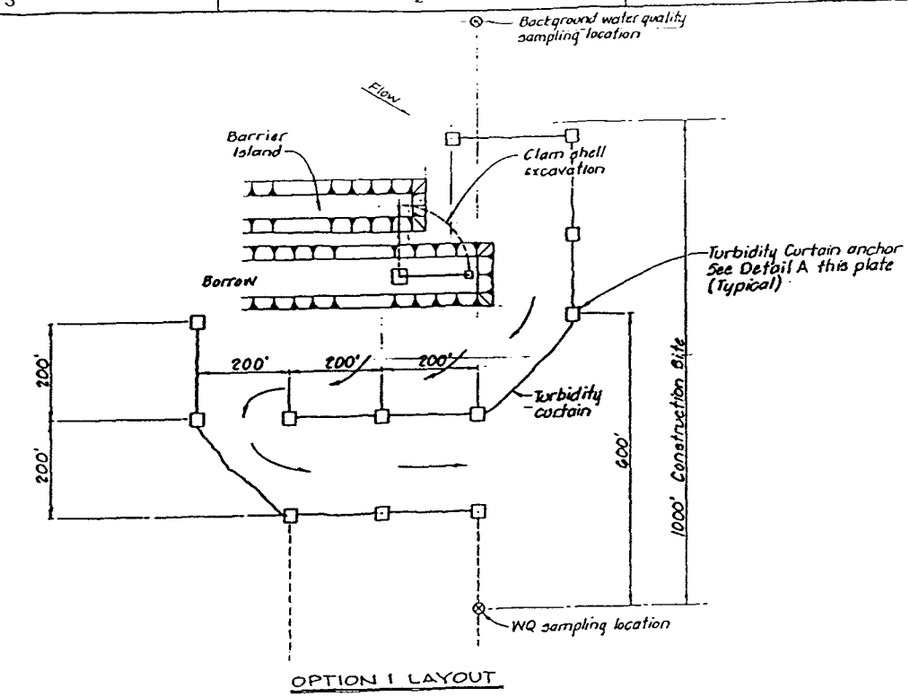
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 178.5 to 181.0
PEORIA LAKE ENHANCEMENT

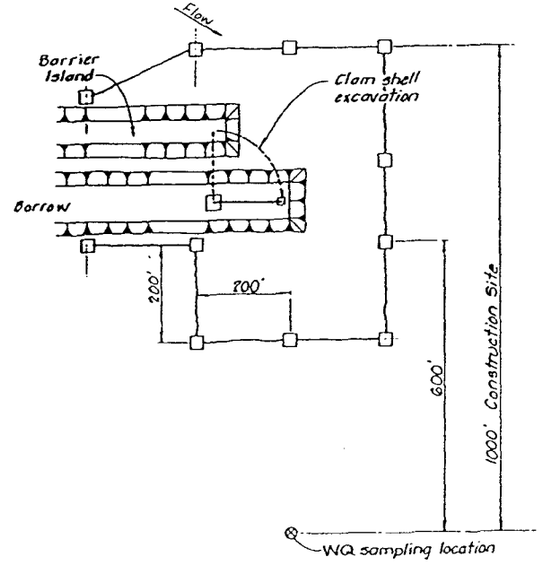
SEDIMENTATION MONITORING RANGES
RIVER MILE 179.5 to 180.4

Designed by:
Drawn by:
Checked by:
Reviewed by:
Approved by:
Scale: As shown
Date:
Drawing Code:
Sheet reference number:
Solicitation Number:
Sheet of

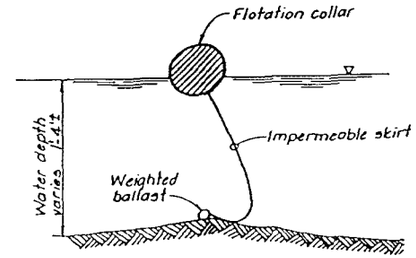
PLATE 23



OPTION 1 LAYOUT



OPTION 2 LAYOUT



TURBIDITY CURTAIN DETAIL A
NO SCALE

Symbol	Revisions Description	Date	Approved

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

ILLINOIS WATERWAY
ENVIRONMENTAL MANAGEMENT PROGRAM
RIVER MILE 176.5 to 181.0
PEORIA LAKE ENHANCEMENT

BARRIER ISLAND CONSTRUCTION
TURBIDITY CONTROL

Designed by:
Drawn by:
Checked by:
Reviewed by:
Approved by:
Scale: As shown
Date:
Drawing Code:
Sheet reference numbers:
Sheet _ of _

PLATE 24