

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

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REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
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**PEKIN LAKE STATE FISH AND WILDLIFE AREA
SOUTHERN UNIT**

**CRITICAL RESTORATION PROJECT
ILLINOIS RIVER ECOSYSTEM RESTORATION STUDY, ILLINOIS**

**ENVIRONMENTAL ASSESSMENT
APPENDIX EA-A**

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

JULY 2004

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EA APPENDIX EA-A

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SECTION 1 - PROJECT DESCRIPTION

LOCATION

The Pekin Lake State Fish and Wildlife Area (SFWA) is a backwater lake complex located adjacent to the Illinois River between approximate river miles (RM) 153 and 156. The site encompasses approximately 1,200 acres. The area of consideration for this restoration project is the Southern Unit (area downstream of the transmission line causeway) of the Pekin Lake SFWA. The Pekin Lake SFWA is located along the Illinois River immediately downstream of Peoria Lock and Dam and adjacent to and west of the communities of Pekin, North Pekin, and Marquette Heights, Illinois. The area is bounded by the Illinois River to the west, the communities mentioned above to the east, and Illinois Highway Route 9 to the south.

AUTHORITY AND PURPOSE

This feasibility study is being conducted as a critical restoration project under the authority of Section 519 with supplemental authority from the Illinois River Ecosystem Restoration Study, which is being carried out under the Corps of Engineers' General Investigations (GI) Program. That study was initiated pursuant to the provision of funds in the Energy and Water Development Appropriations Act, 1998. The study was authorized by Section 216 of the 1970 Flood Control Act.

The study purpose is to evaluate the Federal and State interest in enhancing aquatic and terrestrial habitat and reducing sediment delivery and deposition within the Pekin Lake area. The purpose of the evaluation portion of this document is to comply with Section 404 of the Clean Water Act pertaining to guidelines for the placement of dredged material into waters of the United States. This evaluation, in conjunction with the *Environmental Assessment Pekin Lake State Fish And Wildlife Area Southern Unit Critical Restoration Project, Illinois River Ecosystem Restoration Study*, will assist in analysis of alternatives for the proposed project, resulting in a preferred alternative. Further, this evaluation will

provide information and data to the state water quality certifying agency demonstrating compliance with state water quality standards.

The preferred alternative for the proposed project would deepen and add diversity to shallow open water areas of Soldwedel Lake and Lake of the Woods. It would curtail willow invasion of low terrestrial wetland areas by raising those areas enough to support a more diverse riparian forestry component and mast trees with no net loss of wetlands.

GENERAL DESCRIPTION OF DREDGED AND FILL MATERIAL

Personnel from the Rock Island District, Geotechnical Branch, and the Illinois State Water Survey (ISWS) performed subsurface exploration during April 2002. All boring locations are shown on plate C-1 and the logs are shown on plate C-2 of Appendix C - Geotechnical Considerations of the feasibility report. The exploration was done in accordance with Engineering Manual 1110-1-1804.

Nine offshore borings (PEK-02-11 through PEK-02-19) were taken by vibrocore methods in April 2002. The ISWS used a model P-3c manufactured by Rossfelder Corporation of Ponway, California. The vibrocore unit is submersible, weighs 150 lbs, and is powered by a 3-phase, 240 volt 60Hz generator. Sediment penetration was achieved through a method known as vibro-percussive, where the unit delivers 16-24 KN (1 KN= 225 lbs) of force and a vibration frequency of 3,450 vibrations per minute to the core tube. Therefore, the best results were obtained in unconsolidated, waterlogged, heterogeneous, sediments. Penetration depth prediction is difficult due to the varying subsurface conditions. However, typical lake sediments (loams or sands and gravels) generally allow for complete penetration. Complete penetration depth was not achieved for all vibrocores taken at the complex.

The results of the laboratory testing are listed with each individual boring log. All laboratory testing on samples taken from the borings located and the logs shown on plates C-1 through C-4 (Appendix C of the feasibility report). The continuous samples taken from borings PEK-02-11 through PEK-02-19 consisted almost entirely of clays (CL, CH, and CL-CH). These borings were taken from the sediment surface to depths of up to ten feet using the vibrocore. Organic layers were found throughout much of this upper stratum. The approximate average water content of clay samples taken from borings located in areas proposed for dredging is 58%. Pocket penetrometer tests were done throughout the continuous samples, and these results are shown on the boring logs. The clay consistency ranged between 'soft' and 'firm' throughout the stratum. Since these borings were taken underwater, groundwater elevation information was not available.

A 15-gallon composite bucket sample was taken from borings PEK-02-12, 13, 15, 16, 17, 18, and 19 and sent to an independent laboratory for flocculent and zone/compression settling analyses. The analyses were conducted in accordance with procedures outlined in EM-1110-2-5027, and the results are presented on PLATES C-3 and C-4 (Appendix C of the feasibility report). The composite sand content was 3.2%.

DESCRIPTION OF PROPOSED DISCHARGE SITES

The project would take place in the Southern Unit of the Pekin Lake SFWA in Soldwedel Lake and Lake of the Woods (see **Plate EA-2**). The proposed project features include the following:

Dredging:

- 15.2 acres of 50-foot wide channels from the Illinois River into Soldwedel Lake and Lake of the Woods from 432 NGVD (National Geodetic Vertical Datum) to approximately 420 NGVD (channels **a-d** and **c-f**).
- 2.1 acres of deep holes to 420 NGVD (areas **4** and **7**).
- Finger channels to 420 NGVD (channel **g-h**), and shallow shelves to 424 (areas **6** and **3**) and to 428 NGVD (areas **1**, **2** and **5**) over approximately 39 acres in Soldwedel Lake and Lake of the Woods.

Placement:

- Approximately 13,000 CY (cubic yards) of dredged material on 1.6 acres at **Site E** to roughly 443 NGVD (a 7-foot raise).
- Approximately 320,720 CY of dredged material on 30 acres at **Site B** to roughly 448 NGVD (a 12-foot raise).
- Construct one 1-acre island (**C-3**) in Soldwedel Lake to approximately 454 feet NGVD
- Construct four 0.25-acre islands (**C-1**, **C-2**, **C-4** and **C-5**) in Soldwedel Lake and Lake of the Woods.

Placement of the dredged material would impact roughly 38.5 acres of wetland/willow scrub shrub between Lake of the Woods and Soldwedel Lake at **Site B** and **Site E**. This placement area currently has an elevation of around 436 NGVD, which has allowed willows to grow but frequent water level fluctuation and inundation currently prevents the establishment of most other trees. The average annual high water level is 446.8 feet NGVD, and the 90% and 10% exceedances are 442.7 and 452.1 feet. High water events last for days and even weeks. Willows survive these events and currently provide wetland scrub shrub habitat on the site. Sedimentation from frequent flooding would eventually raise the elevation of the area and a bottomland forest would ultimately develop at the site, but that would likely take several generations to accomplish.

All five islands would be constructed in open water areas of the two lower lakes. Two islands would be by using DRE (dry) dredge to fill geotubes to form a circle with the center areas filled hydraulically. As the Hydraulic material dewater and settles the middle of the islands would form a depression where a perched wetland would form. Construction of the other two islands would be done by mechanical dredging to stack material to form the islands. One type of each island would be constructed in Lake of the Woods and Soldwedel Lake.

Full details of the proposed placement sites can be found in the accompanying Environmental Assessment (EA) sections **II. Project Location and Description** and section **V. Environmental Impacts of the Preferred Alternative**.

DESCRIPTION OF PLACEMENT METHOD

Mechanically dredged material in channel **a-b** would be placed on a barge and transported to **Site E** and/or **B** and offloaded onto the site. Mechanically dredged material to construct channels **b-d** and **c-f** would be sidecast to form berms along the bankline of the adjacent placement sites. Mechanically dredged material would also be placed into two islands designed to be perched wetland areas utilizing geotubes, two islands designed to be nesting habitat, and one larger island designed to be high enough to support mast tree growth. The two nesting islands would be a maximum of 1/4 acre per island.

Hydraulic dredging would be used to sculpt and construct deep holes and shelf areas of Soldwedel Lake and Lake of the Woods (approximately 30 acres) with the dredged material being placed behind the mechanically placed berms at **Site E** and **Site B**. Return water would be contained by constructed berms on the west side of **Site E** and the berms and old IDNR levee would form a confined placement area at **Site B**.

SECTION 2 - FACTUAL DETERMINATIONS

PHYSICAL SUBSTRATE DETERMINATIONS

a. **Substrate Elevation and Slope.** The Pekin Lake SFWA is a relatively flat area with an average terrestrial elevation of 436 NGVD. The hydrologic conditions in the Pekin Lake SFWA project area are essentially determined by the Illinois River water level. River water enters the lakes through a connection at the southern end of the site when river water surface elevations exceed the high-point channel bottom elevation of 431 feet NGVD. It also enters the lakes via overland flood flow when it exceeds approximately 440 feet NGVD.

b. **Sediment Type.** Dredging and placement for the Pekin Lake SFWA project would disturb fine bottom sediments that are mostly clay with very little sand (less than 4%) content. Personnel from the Rock Island District's Geotechnical Branch performed subsurface exploration in April 2002. More detailed information can be found in Appendix C of the main feasibility report.

c. **Dredged/Fill Material Movement.** Placement of hydraulically dredged material would be contained by berms to restrict movement of the material.

d. **Physical Effects on Benthos.** Construction activities would temporarily disrupt the aquatic and terrestrial environments. Placement on 31.6 acres of wetlands would disrupt the wetland environment, however, even with the elevation raise at **Sites B and E**, hydrologic data show that the areas would be inundated enough to maintain a wetland hydrogeology and a more diverse population of wetland vegetation would populate the sites. In any event, the benefits gained from improved habitat and water quality within Pekin Lake SFWA would far outweigh any temporary loss due to project construction.

e. **Actions Taken to Minimize Impacts.** Berms would be constructed to confine material in the floodway. Elevations would not exceed those necessary to maintain wetland functions and values.

WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

a. **Water.** Water quality conditions throughout Pekin Lake SFWA are dominated by the shallow nature of the lakes. Dredging to deepen the interior lakes would greatly improve water quality and fisheries habitat.

b. **Current Patterns and Circulation.** Because this is a backwater lake complex, there would be no significant changes to water current patterns or circulation.

c. **Normal Water Level Fluctuations.** The Illinois River is typified by wide fluctuations in water levels during flood events. The Southern Unit Project would not influence those water level fluctuations. Overall, the project would have minimal effect on

the water surface elevation of the Illinois River, nor would it significantly increase flood heights.

d. Salinity Gradients. The proposed action would take place in and around an inland freshwater stream system. Therefore, no consideration of salinity gradients is warranted for these actions.

e. Actions Taken to Minimize Impacts. Berms would be constructed to confine material in the floodway.

SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

a. Effects on Physical and Chemical Properties of the Water Column. Dredging and construction activities would marginally increase turbidity caused by sediment in the water of the backwater area. Some of this may reach the main river channel, but would be considerably reduced by the time it reaches that water column. However, any turbidity **would be short term** and the benefits to be gained for this reach of the Illinois River would far outweigh any temporary impacts. The project **would not increase pollutant loading** to any part of the river system.

b. Effects on Biota. While the aquatic biota within the Pekin Lake SFWA is some of the best within that reach of the river, it is still not the best that it could be and is degrading at a fairly rapid rate. If steps are not taken to improve this backwater complex, open water and marsh portions could be reduced by as much as 50% and replaced by scrub-shrub (willow) within the next 50 years. Impacts from the project would positively affect the total wildlife area (aquatic and terrestrial). However, the advantages to be gained by the improved habitat after project completion far outweigh any disadvantages occurring during project construction. Selected areas would be elevated to promote bottomland hardwood tree development, aquatic areas would be deepened to improve fish habitat, scrub-shrub willow invasion areas would be reduced and would improve the overall general quality of the Southern Unit's aquatic and terrestrial environments.

c. Actions Taken to Minimize Impacts. Berms would be constructed to minimize movement of dredged material.

CONTAMINANT DETERMINATIONS

A Phase I & IIA Environmental Site Assessment (ESA) was conducted for the proposed project location in the Southern Unit of Pekin Lake SFWA (see Appendix B). The review discovered no potential HTRW issues at the proposed placement sites.

AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

a. Effects on Plankton, Nekton, and Benthos. The project is anticipated to improve the quality of the aquatic habitat within Pekin Lake SFWA.

b. Effects on Aquatic Food Web. The filling of terrestrial wetlands would only have a minor negative effect on the aquatic food web. However, because there would be no net loss of wetlands, the disruption would be temporary and the quality of the wetland is expected to improve overall. In addition, dredging to provide deepwater and overwintering aquatic habitat would improve the overall health and food web of the Pekin Lake SFWA. Fisheries would increase as well as benthic organisms as water quality and habitat diversity are improved by the project.

c. Effects on Special Aquatic Sites. The project would convert approximately 32 acres of wetland from a monoculture of invading willows to a diverse riparian wetland with mast trees. There would also be improvement to fish spawning habitat. No mussel beds, mudflats, vegetated shallows, coral reefs or riffle and pool complexes would be affected by the proposed actions.

d. Threatened and Endangered Species. There would be no adverse impacts to threatened and/or endangered species in the project area. See Section V. **Environmental Impacts of the Preferred Alternative, C. Endangered Species** of the EA.

e. Other Wildlife. Other fish and wildlife associated with the aquatic ecosystem are expected to be positively impacted by increased habitat benefits as a result of this project.

f. Actions Taken to Minimize Impacts. Early and open coordination with State and Federal resource agencies helps to minimize potential adverse impacts to aquatic, wetland, and terrestrial ecosystems.

PROPOSED PLACEMENT SITE DETERMINATIONS

a. Mixing Zone Determinations. A mixing zone is that volume of water at a placement site or discharge site required to dilute contaminant concentrations associated with a discharge of dredged material to an acceptable level. No violation of any standard would result during placement of the dredged/fill material.

b. Determination of Compliance with Applicable Water Quality Standards. This Clean Water Act Section 404(b)(1) provides the necessary compliance required by law. Section 401 Water Quality certification in compliance with the Clean Water Act, and all other permits necessary for the completion of the project, would be obtained prior to project construction.

c. Potential Effects on Human-Use Characteristics. Implementation of the proposed project would have no effect on municipal or private water supplies; parks; national monuments or other similar preserves. The project would have a positive effect on an Illinois state-owned wildlife area. The project is anticipated to improve commercial or recreational fishery, hunting, bird watching, as well as other active and passive recreational activities in the wildlife area.

DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

The project is designed for a minimum life of 50 years. Dredging and placement activities are anticipated to produce improvements on the aquatic and terrestrial ecosystem over the life of the project and possibly longer. The project would improve long-term water quality by increasing deepwater habitat as well as improving fisheries. Additional recreational benefits also would be provided for hunters, boaters, and fishermen.

DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

No adverse secondary effects on the aquatic ecosystem are anticipated. Improved water quality, as well as improved fisheries, waterfowl and wetland habitat are the goals of this ecosystem restoration project. Flood heights have been evaluated, and construction is designed to meet state requirements. This determination is subject to reevaluation, if warranted by Federal, State, or local agency comment, as well as input from the general public.

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

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1. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.
2. Evaluation of Practicable Alternatives. Refer to Section 2 - Plan Formulation of the feasibility report.
 - a. **No Federal Action.** This alternative was not selected because sedimentation within the Pekin Lake SFWA has reduced its effectiveness as a backwater fisheries resource that is currently unacceptable.
 - b. **Proposed Action.** The proposed action is considered to be environmentally and economically acceptable and operationally feasible as planned. The proposed dredging and placement activities as proposed in this document, the Environmental Assessment, and feasibility report have been selected to reduce water quality impacts as well as impacts to the riverine system. Materials hydraulically discharged would be contained, and have been evaluated and have been determined to be acceptable for the environment.
3. Section 401 certification of the Clean Water Act will be obtained prior to project implementation. The project will be in compliance with water quality requirements of the State of Illinois.
4. The project is not anticipated to introduce toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.
5. No adverse impact to Federal or State-listed endangered species would result from the proposed actions.
6. No municipal or private water supplies would be affected by the proposed actions. The conversion of 38.5 acres of scrub-shrub (willow invasion) wetlands to more diverse riparian habitat with mast trees is deemed to be a desirable improvement by the Illinois Department of Natural Resources staff.
7. Removal of sediments to construct deep water would provide improved water quality and habitat diversity to Pekin Lake SFWA and is deemed beneficial for the environment.

8. No other practicable alternatives have been identified. The proposed actions are in compliance with Section 404(b)(1) of the Clean Water Act, as amended. The proposed actions would not adversely impact water quality and would improve habitat diversity in Pekin Lake SFWA.

Date

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