



AD-A219 471

# ENVIRONMENTAL ASSESSMENT

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**WATER CONTROL STRUCTURE  
IMPROVEMENTS  
IN  
MISSISSIPPI RIVER POOLS 20 & 21  
RIVER MILES 347 TO 350  
AND  
332 TO 333**

**LEWIS COUNTY, MISSOURI  
AND  
HANCOCK COUNTY, ILLINOIS**

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JULY 1987

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**US Army Corps  
of Engineers**

Rock Island District

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REPLY TO  
ATTENTION 33

NCRPD-E

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

ENVIRONMENTAL ASSESSMENT

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IN MISSISSIPPI RIVER POOLS 20 AND 21  
RIVER MILES 347 TO 350 AND 332 TO 333  
LEWIS COUNTY, MISSOURI, AND HANCOCK COUNTY, ILLINOIS

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JULY 1987



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RIVER MILES 347 TO 350 AND 332 TO 333  
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Preliminary Section 404(b)(1) Evaluation

DISTRIBUTION LIST

## ENVIRONMENTAL ASSESSMENT

### WATER CONTROL STRUCTURE IMPROVEMENTS IN MISSISSIPPI RIVER POOLS 20 AND 21 RIVER MILES 347 TO 350 AND 332 TO 333 LEWIS COUNTY, MISSOURI, AND HANCOCK COUNTY, ILLINOIS

#### PURPOSE AND NEED FOR ACTION

The U.S. Army Corps of Engineers, Rock Island District, is responsible for maintaining the Mississippi River Nine-Foot Channel Navigation Project in Pools 11 to 22. A navigation channel depth of 9 feet minimum must be maintained from early spring to winter for commercial towboat traffic. The 9-foot depth is basically maintained by the series of locks and dams along the river. The river, however, is still in a semi-natural condition in terms of sediment (bedload) transportation.

At times, this sediment accumulates at various locations in the navigation channel and must be removed by dredging in order to prevent channel closure and stoppage of commercial traffic. Sometimes this shoaling (sediment accretion) happens so rapidly that emergency dredging is required to reopen the channel where towboats run aground. This shoaling tends to occur at certain locations in the river due to a combination of factors. It is possible to reduce or eliminate the dredging at these "chronic" locations by the construction of water control structures (i.e., wing dikes and closing dikes). The purpose of these structures is to direct the flow of water away from shorelines, side channels, etc., and into the main channel. Basically, these structures constrict the river flow into a more narrow cross section. This reduced cross section causes the water velocity to increase and subsequently to transport more sediment.

Water control structures were first constructed around 1900 for the purpose of maintaining a 4-foot navigation channel. Some of these original structures are still functioning and have been rebuilt over the years. Since completion of 9-foot channel locks and dams, these structures have been modified, rebuilt, and new ones added. Because of the extreme expense involved with construction of these structures, only locations where there is a high frequency of dredging justifies their construction. At river locations that require dredging only once every few years it is less expensive to dredge the material. At locations where dredging is required annually, it is cheaper over the long term to construct new water control structures or repair existing structures.

## ALTERNATIVES

### PREFERRED PLAN

The two locations of the proposed work, Pool 20, River Mile 347-350, and Pool 21, River Mile 332-333, are chronic dredging sites (see plate 1). The Rock Island District proposes to both repair existing structures and construct new ones. Under current regulations and law, the repair of existing structures to original specifications does not require an Environmental Assessment (EA) or a Section 404 permit (repair of existing structures is covered by Nationwide permit and the Nine-Foot Channel Environmental Impact Statement). However, all new construction or modification of existing structures requires a Section 404 permit and an EA.

This EA will primarily discuss the impacts of the new work, although the discussion is applicable to the repair of existing structures as well. Tables EA-1 and EA-2 describe all work (new and repair) to be done in Pools 20 and 21, respectively. Figures 1 and 2 show the location of both new and existing structures. Structures will be constructed beginning in summer 1987 and continue through 1988. Construction will halt temporarily during the winter months. Structures will be built to the specifications indicated in tables EA-1 and EA-2. Some additional rock also will be placed on the upstream end of Huff Island to stop the severe erosion and bank undercutting occurring there.

Closing Dike No. 13 between Huff and Hunt Islands may be raised to 6 feet above the low water surface if the repair/construction of the other structures does not reduce the dredging frequency. The decision on whether or not to raise the structure probably will not be made for 2 or more years after completion of all other work. During the initial construction phase, Closing Dike No. 13 only will be repaired to existing specifications. This EA, however, intends to address the impacts of raising the dike for the purposes of National Environmental Policy Act (NEPA) and Section 404 requirements.

All structures will be built of limestone/dolomite rock ranging up to 300 pounds in size. All fill material will consist of clean, uncontaminated rock from an approved quarry source. Work will be accomplished by Rock Island District hired labor and equipment. Fill material will be transported to the construction site by barge and unloaded by either dragline or bulldozer. Before construction of each structure is complete, the tops may extend above the water surface for a short time. However, all finished structures will be no higher than the elevation given in tables EA-1 or EA-2. Except for the possible raising of Closing Dike No. 13, all structures will be at or below the low operating level of 477.2 feet Mean Sea Level (MSL). In order to prevent detachment from shore by erosion, some reshaping of the bankline will be required. This may result in the loss of an occasional tree. Extensive bankline reshaping may be required on the upstream end of Huff Island. Because of the severe erosion now occurring, however, any trees removed would have been lost naturally anyway.

TABLE EA-1

Water Control Structures to be Repaired or Constructed  
in Mississippi River Pool 20

<u>Dam No.</u>	<u>Covered By Nationwide Permit Under CWA</u>	<u>Mile</u>	<u>Year Built</u>	<u>Low Operating Level</u>	<u>Original Length</u>	<u>Original Elev.</u>	<u>Repaired Length</u>	<u>Repaired Elev.</u>	<u>Estimated Tons of Riprap (Includes Shore Protection)</u>
9	yes	348.3	1904	477.2	1,100'	475.8'	1,100'	475.8'	2,600
15	yes	348.7C	1925	477.2	145'	476.1'	145'	476.1'	1,500
16	yes	348.6	1925	477.2	1,315'	475.0'	1,315'	475.0'	6,100
17	yes	349.0	1927	477.2	900'	475.1'	900'	475.1'	9,600
13	no	349.0C	1908	477.2	600'	477.1'	800'	477.1'	4,000
8	yes	349.8	1908	477.2	1,225'	476.4'	1,225'	476.4'	9,400
					<u>SUBTOTAL</u>				<u>33,200 Tons</u>
17	no	Extension to Wing Dam #17 - 300' long			900'	475'	1,200'	475.1'	4,400
New	no	New Wing Dam @ R.M. 349.4L -			N/A	N/A	1,000'	471.0'	16,500
New	no	New Wing Dam @ R.M. 349.0R -			N/A	N/A	400'	477.0'	5,500
					<u>SUBTOTAL</u>				<u>26,400 Tons</u>
13	no	Raise Closing Dike #13 to El. 486.0 - 9'			600'	480'	800'	486'	10,500 Tons
					<u>SUBTOTAL</u>				<u>10,500 Tons</u>
					<u>TOTAL</u>				<u>70,100 Tons</u>

TABLE EA-2

Water Control Structures to be Repaired or Constructed  
in Mississippi River Pool 21

Dam No.	Covered By Nationwide Permit Under CWA	Mile	Year Built	Flat Pool Elev.	Original		Repaired		Estimated Tons of Riprap (Includes Shore Protection)
					Length	Elev.	Length	Elev.	
16	yes	332.9	1918	470.0	1,075'	469.0'	469.0'	3,000	
17	yes	332.7	1918	470.0	795'	467.8'	467.8'	2,000	
18	no	332.6	1918	470.0	100'	468.8'	468.8'	4,500	
19	no	332.5	1918	470.0	235'	468.7'	468.7'	5,000	
20	no	332.3	1918	470.0	300'	468.6'	468.6'	6,000	
24	yes	332.2	1922	470.0	350'	468.5'	468.5'	1,500	
23	yes	332.1	1923	470.0	580'	468.4'	468.4'	2,000	
22	yes	331.9	1910	470.0	730'	468.2'	468.2'	2,000	
21	yes	331.7	1919	470.0	1,050'	468.0'	468.0'	4,000	
32	yes	331.2	1932	470.0	120'	461.6'	461.6'	1,500	
9	yes	330.9	1898	470.0	500'	466.4'	466.4'	2,000	
8	yes	330.6	1898	470.0	1,560'	467.0'	467.0'	4,500	
TOTAL									38,000 Tons

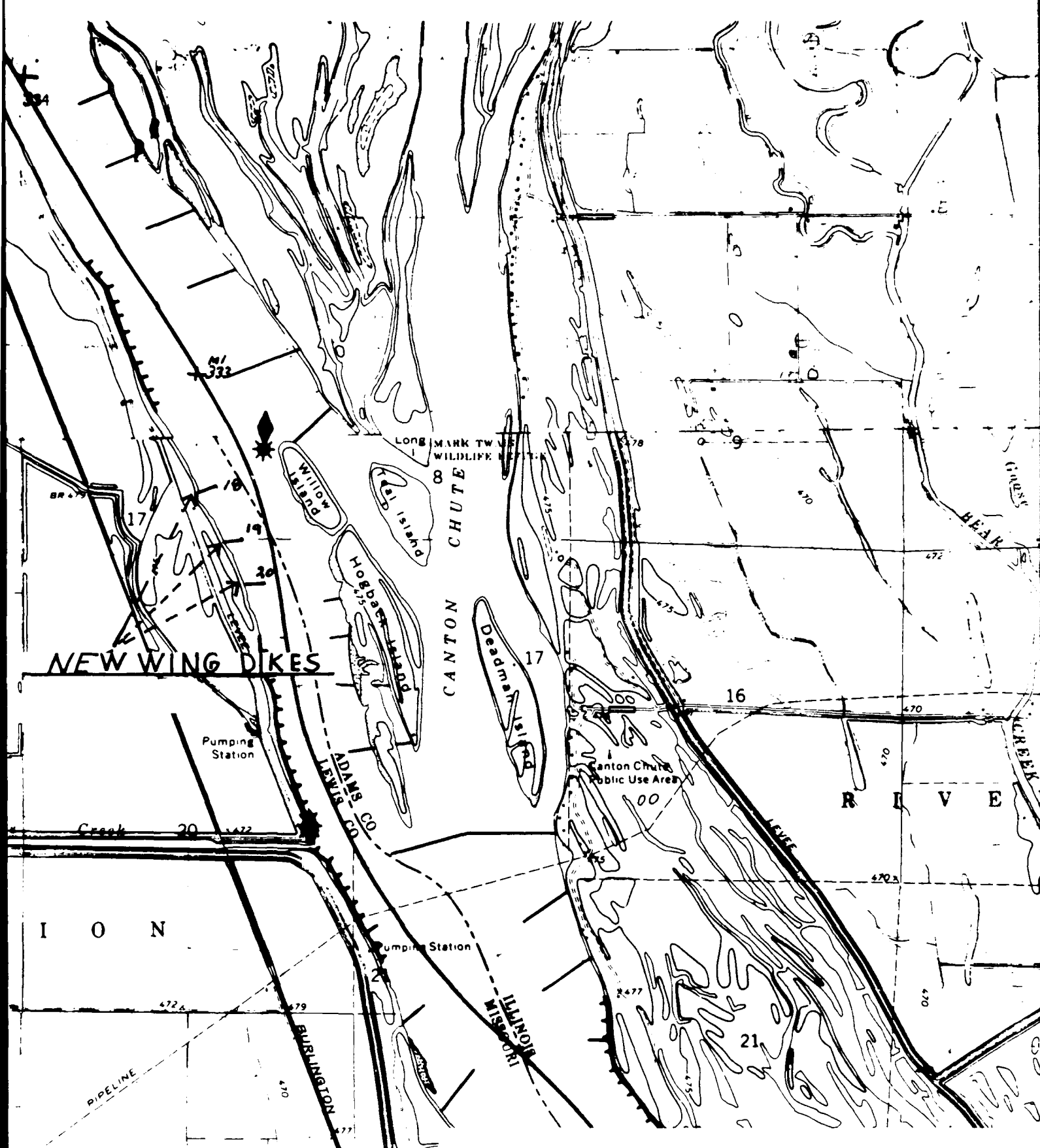
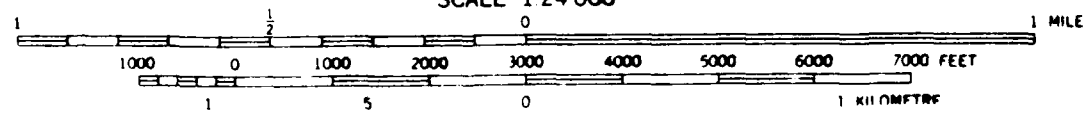


FIGURE 2. NEW CONSTRUCTION IN MISSISSIPPI RIVER POOL 21

EA-6  
SCALE 1:24,000



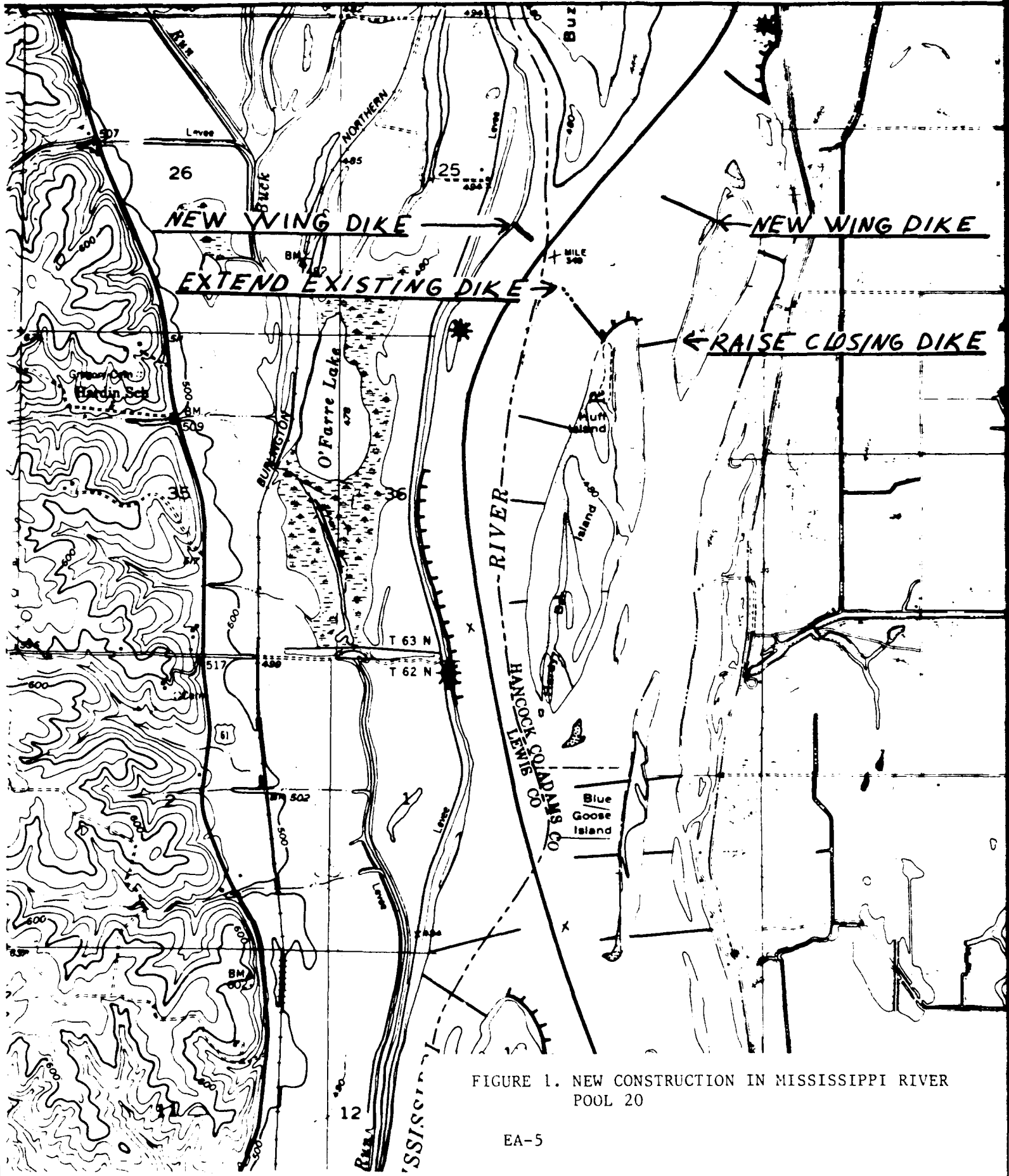


FIGURE 1. NEW CONSTRUCTION IN MISSISSIPPI RIVER POOL 20

## NO FEDERAL ACTION

No Federal action means that no new construction will occur (i.e., no new wing dams or modifications to existing structures). Repair of existing structures would proceed as planned. Without the new construction, annual dredging would still be required since repair of existing structures would most likely be insufficient to reduce dredging frequency.

## OTHER ALTERNATIVES

The design of a water control structure plan for a section of river is a very inexact science. There are no formulas for determining where, how many, how long, what elevation, etc. Based upon the fundamental hydraulics of a given reach, which is some times in itself difficult to determine, an array of structures is laid out that is expected to give the desired effect. Any number of alternatives to the preferred design are possible. If money and environmental impacts were not a consideration, the most effective design might be to put a series of control structures along both banks for several miles. However, this is an unrealistic and undesirable alternative. The preferred design is the minimum design that is likely to achieve the desired effect, which is to reduce maintenance dredging by increasing bedload transport in the main channel. If this work is not effective, additional structures may be required sometime in the future.

## AFFECTED ENVIRONMENT

### AIR AND NOISE QUALITY

The project is located in an area of little or no industry and is distant from any urban areas of significant auto emissions. Air quality appears good and there are no known air quality problems.

### WATER QUALITY

A Section 404(b)(1) evaluation has been prepared to address the project's impacts on water quality and is attached. Overall water quality in the project area is good. The only water quality problem is the rapid erosion occurring on the upstream end of Huff Island, which is introducing large amounts of sediment into the river, particularly during high river flows.

## FISHERY RESOURCES

### Existing Control Structures

Wing dikes and closing dikes provide excellent fish habitat. The rocky substrate and numerous rock crevices provide an ideal environment for many species of aquatic insects and invertebrates, which are the primary food for numerous fish species. Aside from the primary productivity provided by invertebrates, the structure itself provides a shelter from the river current. Deep scour holes often form downstream which provide resting and feeding habitat. These areas are often very important for overwintering. These conditions are present on Closing Dikes Nos. 18, 19 and 20 in Pool 21, and Closing Dike No. 13 in Pool 20.

### Locations of New Dikes

The location of the new dikes and/or extensions consists of sand/gravel substrates in approximately 10 to 20 feet of water. There is no indication that these sites (other than existing wing dams) have any special fisheries values as compared to other main channel border shorelines.

## BENTHIC RESOURCES

In April 1987, divers made a mussel survey of the project area in Pools 20 and 21. Divers searched the vicinity of wing dikes 18, 19, and 20 in Pool 21 and the entire river reach from approximately River Miles 347 to 350. No concentrations of mussels were found at any location. Overall, the mussel population was very sparse. Since the substrate consisted of predominantly sand and gravel with little silt, benthic infauna such as burrowing mayflies appeared very sparse. The predominant element of the benthic fauna consisted of aquatic invertebrates associated with the existing water control structures.

## TERRESTRIAL HABITAT AND WILDLIFE

The shoreline and river islands in the project vicinity are predominantly bottomland forest dominated by silver maple and cottonwood. Terrestrial wildlife is typical of that found elsewhere in Mississippi River bottomland forests. Common large mammals are white-tailed deer, raccoon, opossum, skunk, gray squirrel, and others. Bottomland forest also provides good habitat for several species of songbirds. Except for wood ducks, waterfowl habitat, such as shallow wetlands suitable for mallard, teal, etc., are not present.

## THREATENED AND ENDANGERED SPECIES

The following endangered and threatened species are listed as being possibly present in the project area:

### Federally Protected

<u>Classification</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat</u>
Endangered	Indiana Bat	<u>Myotis sodalis</u>	Caves and riparian habitat
Endangered	Bald Eagle	<u>Haliaeetus leucocephalus</u>	Breeding wintering
Endangered	Higgins' Eye Pearly Mussel	<u>Lampsilis higginsii</u>	Rivers
Endangered	Fat Pocketbook Pearly Mussel	<u>Potamilus capax</u>	Rivers

### State Protected

<u>Species</u>	<u>Scientific Name</u>	<u>Missouri</u>	<u>Illinois</u>
Bald eagle	<u>Haliaeetus leucocephalus</u>	Endangered	Endangered
Indiana bat	<u>Myotis sodalis</u>	Endangered	Endangered
Western sand darter	<u>Ammocrypta clara</u>	Watch list	-
Pallid shiner	<u>Notropis amnis</u>	Possibly extirpated	-

Several somewhat recently dead valves of Potamilus capax were found on Huff Island by a Missouri Department of Conservation biologist. The presence of these valves prompted a thorough mussel survey of the project vicinity. Approximately 6 days of searching by divers failed to locate any live P. capax or any concentrations of mussels. There is no evidence to indicate that any other State or federally endangered species are present in the project vicinity.

## ARCHEOLOGICAL AND CULTURAL RESOURCES

The four new wing dikes being proposed for the Missouri side of the river channel and the single new wing dike on the Illinois side will be constructed entirely below the normal water level. Therefore, no existing significant historic properties will be impacted.

## RECREATION RESOURCES

Recreational use of the Pool 20 project area is no more than moderate relative to other river locations. There are no popular beach locations nearby which tend to attract large numbers of recreational boaters. Fenway Public use area at River Mile 347.7 is the nearest public boat ramp. Fishermen undoubtedly visit the wing dikes, etc., in search of sport fish. There is also evidence (i.e., duck blinds) that duck hunting is popular between Huff Island and the Illinois shoreline.

## SOCIAL AND ECONOMIC RESOURCES

### Affected Area and Population Trends

Pools 20 and 21 are bordered by the States of Illinois, Iowa, and Missouri. The border region includes portions of six counties, as presented in table EA-3. These six counties are basically agriculturally oriented, but are influenced by the riverfront communities of Quincy, Illinois; Keokuk, Iowa; and Canton and LaGrange, Missouri. The area had a combined 1985 population of approximately 187,300. The population of six-county area is expected to increase through 1990 (table EA-3).

### Community and Regional Growth

The existence of a cost-effective, efficient transportation system provided by the Upper Mississippi River locks and dams and regulatory structures (e.g., wing dikes), as augmented by dredging, has provided stimulus for growth of the river communities and the entire Midwest region.

## ENVIRONMENTAL IMPACTS OF THE PREFERRED ALTERNATIVE

### ENVIRONMENTAL EFFECTS AND COMPLIANCE WITH FEDERAL STATUTES

Table EA-4 summarizes the project's impacts on natural and cultural resources.

### Desirable Community Growth

Maintenance of the navigation system will continue to provide growth opportunities.

TABLE EA-3

Population Trends for Areas  
Bordering Pools 20 and 21 1/ 2/ 3/ 4/ 5/

Area	POPULATION				
	1980	1985	1990	1980-1985	1985-1990
State of Illinois	11,430,600	11,584,900	11,687,700	1.3	0.9
Adams County	71,700	71,700	74,500	0.0	3.9
City of Quincy	42,600	42,900	43,200	0.7	0.7
Hancock County	23,900	23,900	23,600	0.0	-1.3
State of Iowa	2,913,800	2,905,400	2,913,500	-0.3	0.3
Lee County	43,100	42,700	42,600	-0.9	-0.2
City of Keokuk	13,500	13,500	13,500	0.0	0.0
State of Missouri	4,916,700	5,023,700	5,175,500	2.1	3.0
Clark County	8,500	8,700	8,800	2.4	1.1
Lewis County	10,900	11,100	11,300	1.8	1.8
City of Canton	2,400	2,700	2,700	12.5	0.0
City of LaGrange	1,200	1,300	1,400	8.3	7.7
Marion County	28,600	29,200	29,800	2.1	2.1
Six-County Area	186,700	187,300	190,600	0.3	1.8

1/ Claritas, REZIDE, 1980 and 1985, The National Encyclopedia of Residential ZIP Code Demography.

2/ Iowa Development Commission, 1986 Statistical Profile of Iowa.

3/ State of Illinois, Bureau of the Budget, Illinois Population Trends from 1970-2025.

4/ U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population.

5/ U.S. Department of Commerce, Bureau of Economic Analysis, 1985 OBERS BEA Regional Projections, Volume 1, "State Projections to 2035."

TABLE EA-4

Effects of the Preferred  
Plan on Natural and Cultural Resources

<u>Types of Resources</u>	<u>Authorities</u>	<u>Measurements of Effects</u>
Air quality	Clean Air Act, as amended (42 U.S.C. 165h-7, et seq.)	No effect.
Areas of particular concern within the coastal zone	Coastal Zone Management Act in 1972, as amended (16 U.S.C. 1451, et seq.)	Not present in planning area.
Endangered and threatened species critical habitat	Endangered Species Act of 1973, as amended (16 U.S.C. 1531, et seq.)	No effect.
Fish and wildlife habitat	Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.)	No permanent adverse effects. Some temporary impacts during construction.
Floodplains	Executive Order 11988, Flood Plain Management	No effect.
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.)	No effect.
Prime and unique farmland	CEQ Memorandum of 1 August 1980; Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	Not present in planning area.
Water quality	Clean Water Act of 1977, as amended (33 U.S.C. 1251, et seq.)	Temporary increase in turbidity during construction.
Wetlands	Executive Order 11990, Protection of Wetlands, Clean Water Act of 1977, as amended (42 U.S.C. 1857h-7, et seq.)	No effect.
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271, et seq.)	Not present in planning area.

### Displacement of People

No relocations would be necessitated by the proposed channel maintenance activities.

### Community Cohesion

Due to the limited area of influence associated with the proposed maintenance activities, no significant impacts to community cohesion would result. Land bordering the river along Pools 20 and 21 is used for agricultural, commercial, residential, or recreational purposes. The proposed channel maintenance activities primarily involve maintenance of existing structures. The addition of two wing dikes on the extension or raising of five others would improve the channel for commercial and recreational boating and would add or improve prime fishing areas.

It should be noted that Closing Dike No. 13 may eventually be raised to a height 6 feet above flat pool (standard water elevation under non-flood conditions). This action would close one of the upstream river accesses to the a side channel between Huff Island and the Illinois shoreline. While river access to the side channel would remain available from both the upstream and the downstream ends, the flow of water through this side channel would be slightly reduced. A small number of dwellings exist along the shoreline of this side channel; residents of these year-round and seasonal homes would likely react negatively to this action.

### Property Values and Tax Revenues

No significant impacts on property values or tax revenues in the entire project area would result from the proposed channel maintenance activities. Impacts would be more pronounced for the immediate Illinois shoreline area across from Huff Island, where the flow of water through the side channel side channel may eventually be reduced. Any loss in aesthetic appeal caused by increased sedimentation or pollution or the water in this side channel might lower property values and related tax revenues.

### Public Facilities and Services

The proposed regulatory structure repairs and constructions would help maintain that the 9-foot channel alignment. By repairing degraded regulatory structures and extending or adding structures where appropriate, both short-term and long-term dredging requirements may be reduced.

## Employment and Labor Force

Implementation of the proposed channel maintenance activities would have limited short-term impacts on employment in the six-county area. Based on the scale of the project, few additional employees would be required; the surrounding communities have a labor pool of large enough size to absorb project needs without noticeable impact. The project would not affect the permanent employment of labor force of the counties or communities in the project vicinity.

## Business and Industrial Development

During the rehabilitation and construction process, an increase in business and industrial activity would be noticed. This increased activity would be attributable to the purchases made for the maintenance of the existing wing dikes and the extension or addition of wing dikes. The increased business activity occurring from the temporary infusion of a small number of construction workers would be absorbed into the area without noticeable effect. No long-term effects on business or industrial activity would result from the project. The channel maintenance activities would require no business relocations.

## Farm Displacement

No farm land would be affected by the proposed project.

## Noise Levels

Heavy machinery would generate a temporary increase in noise during the construction/maintenance process. This could impact recreational boaters and persons at nearby recreation areas. The project area is primarily rural in nature, featuring large spans of open fields and low density residential and commercial areas. It is, therefore, unlikely that this noise level increase would significantly affect the surrounding population.

## Aesthetics

The proposed maintenance and construction activities primarily deal with submerged structures. The raising of Closing Dike No. 13 to 6 feet above flat pool would negatively affect area aesthetics. However, the emerged dike would be relatively difficult to see from shoreline areas.

### Recreation

The raising of Closing Dike No. 13 between Hunt and Huff Islands would deny small boats passage. Access to the side channel between the islands and the Illinois shoreline is still possible at River Mile 349.6 or downstream at Blue Goose Island. The closure of this chute to small boats would have no significant local effects.

### Terrestrial Resources

No terrestrial resources will be affected by the project. The replacement of riprap on the head end of Huff Island will halt the loss of trees and soil now eroding into the river.

### Manmade Resources

Construction of this project will maintain the 9-foot navigation channel. The anticipated decrease in dredging will reduce the likelihood of traffic delays associated with channel closures and groundings.

### Water Quality

Impacts to water quality are discussed in the attached Section 404(b)(1) Evaluation Report.

### Air Quality

The ambient levels of certain air quality parameters would increase during construction, but these effects would be temporary. Exhaust emissions from construction equipment should only slightly increase ambient levels of carbon monoxide, hydrocarbons, and oxides of nitrogen. No long-term air quality impacts are expected.

### Aquatic Life

Fish populations may be temporarily disturbed at locations where excavated material is placed in the water. Placement of this material in areas currently devoid of good habitat structure, however, should result in an overall increase of fish and associated aquatic life. (See section on Environmental Enhancement.)

### Threatened and Endangered Species

The failure to locate any individuals of P. capax during the mussel survey implies that P. capax will not be affected by the proposed project. Threatened or endangered species in the States of Missouri and Illinois were not found at the project site, and, therefore, no adverse impacts are anticipated. Bald eagles or habitat used by them will not be affected by the proposed project since they are unlikely to be present during construction.

### Archeological and Historical

Because the project area is totally below the normal water level of the Mississippi River channel, there is no potential for the area to contain significant historic properties. Therefore, the proposed project will have no impact on historic properties.

### ENVIRONMENTAL IMPACTS OF NONPREFERRED ALTERNATIVE

Failure to complete this project will result in the continued dredging and disposal of sand from the river. Disposal of this sand is a problem at this location because of a lack of environmentally suitable sites. Continued dredging will likely cause a continued deterioration of terrestrial habitat at the present disposal site located on the right bank (River Mile 349).

### COMPLIANCE WITH ENVIRONMENTAL QUALITY STATUTES

#### Executive Order 11988, Flood Plain Management

The proposed action would not encourage further development in the floodplain.

#### Fish and Wildlife Coordination Act, 16 U.S.C.

The Rock Island District has appointed a special interdisciplinary committee, known as CARS (Committee to Assess Regulatory Structures), to study the various engineering, hydraulic, and environmental aspects of water control structure needs in the District. A representative of the U.S. Fish and Wildlife Service attends all CARS meetings in order to coordinate District projects like this one.

Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251, et seq.

Those aspects of the proposed project falling under Section 404 jurisdiction have been evaluated in the attached Section 404(b)(1) Evaluation Report. A Section 404 Public Notice is being issued concurrently with this report. State 401 Certification also is being requested from the Missouri Department of Natural Resources and the Illinois Environmental Protection Agency. Therefore, the proposed project is in compliance with this law at this time.

Other Statutes

Table EA-5 lists other applicable environmental statutes and the projects compliance with those statutes.

Public Facilities and Services

Public facilities and services in the local area would not be affected. However, modification of the navigation channel would provide a safer channel and would reduce delays to navigation. During times of underwater blasting, all boat traffic may be delayed up to several hours while explosives are being placed.

Regional Growth

Because of the small scale of the proposed project, no effects on regional growth are anticipated.

Noise

The proposed project is situated in a densely populated metropolitan area. Most of the development within 1 mile of the possible blasting sites consists of moderate to heavy industry, which are noise generators themselves. Blasting noise is likely to have no effect on these establishments. Campbell's Island, however, is one-fourth of a mile from the project location, and there are numerous private homes along the shoreline. These residences are most likely to experience increased noise levels.

Precise information on the predicted levels of noise has been difficult to obtain. It is apparent from discussions with blasting experts that noise levels can vary considerably according to factors such as how charges are placed, composition of the substrate, explosive size and type, water depth,

TABLE EA-5

Compliance of the Preferred Plan with WRC  
Designated Environmental Statutes

Federal Policies

Archaeological 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
Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Not applicable
Endangered Species Act, 16 U.S.C. 1531 et seq.	Full compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not applicable
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. 1401, et seq.	Full compliance
Marine Protection Research and Sanctuary Act, 33 U.S.C. 1401, 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
Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Full compliance
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Not applicable
Flood Plain Management (Executive Order 11988)	Full compliance
Protection of Wetlands (Executive Order 11990)	Full compliance
Analysis of Impacts Upon Prime and Unique Farmlands	Not applicable

## 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.

and atmospheric conditions. In general, it is the experts' opinion that noise (and vibration effects) impacts will be minimal, based on the fact that: (1) the blasting will be under water and (2) material will be removed laterally from an existing rock face, as opposed to blasting a deeper cut, which would require more explosives.

#### Displacement of People

Homes or other living dwellings, and establishments and/or land being used by agricultural, commercial, industrial, or public enterprise would not be displaced due to the proposed project.

#### Aesthetic Values

The aesthetic environment would be temporarily affected during construction of the proposed project.

#### Employment/Labor Force

The proposed project would not affect the permanent employment/labor force of the Quad Cities area. The relatively low dollar volume of labor involved would result in few, if any, additions to the existing labor force.

#### Business and Industrial Activities

Business and industrial activities would, for the most part, remain unchanged.

#### PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The localized disturbance to benthic substrate and any fish that may be present during placement of rock fill cannot be avoided. A localized increase in turbidity also cannot be avoided during construction.

#### RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The project will enhance the value of the nine-foot navigation channel and improve its efficiency by reducing dredging maintenance costs.

ANY IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IF THE PROPOSED ACTION SHOULD BE IMPLEMENTED

Fuel consumed, manpower expended, and the commitment of construction materials are considered irretrievable.

PUBLIC INVOLVEMENT AND COORDINATION

Required coordination for this EA is being accomplished by circulating it for review and comment by various individuals, and local, State and Federal agencies, as shown on the distribution list.

Comments from the Illinois and Missouri State Historic Preservation Officers (SHPO's) are solicited by receipt of this document.

## FINDING OF NO SIGNIFICANT IMPACT

Having reviewed the information contained in this Environmental Assessment, I find that construction of the water control structures in Pools 20 and 21 will have no significant adverse effects on the environment. This project is not a major Federal action and therefore preparation of an Environmental Impact Statement (EIS) is not required. This determination may be reevaluation if warranted by later developments.

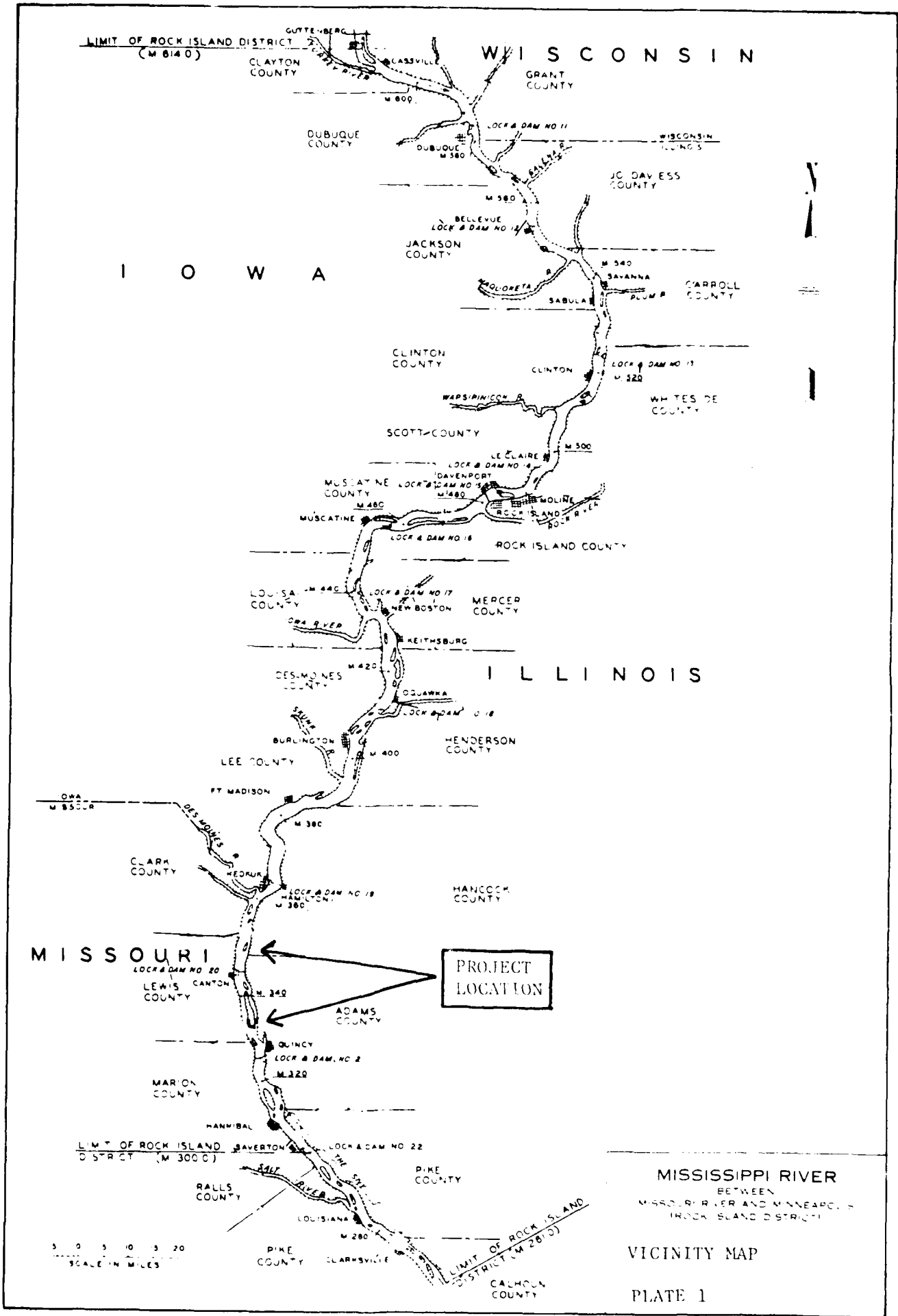
Factors that were considered in making this determination that an EIS is not required were:

- a. The project will likely decrease the amount of dredging and associated disposal impacts now occurring.
- b. Efficiency of the navigation system will improve with less likelihood of a channel closure.
- c. Impacts to aquatic organisms will be minimal and temporary.

---

Date

Neil A. Smart  
Colonel, U.S. Army  
District Engineer



LIMIT OF ROCK ISLAND DISTRICT (M 8140)

W I S C O N S I N

I O W A

I L L I N O I S

M I S S O U R I

PROJECT LOCATION

MISSISSIPPI RIVER  
BETWEEN  
MISSOURI RIVER AND MINNEAPOLIS  
(ROCK ISLAND DISTRICT)

VICINITY MAP

PLATE 1

0 5 10 15 20  
SCALE IN MILES

LIMIT OF ROCK ISLAND DISTRICT (M 3000)

LIMIT OF ROCK ISLAND DISTRICT (M 2610)



REPLY TO  
ATTENTION OF

NCRPD-E

DEPARTMENT OF THE ARMY  
ROCK ISLAND DISTRICT CORPS OF ENGINEERS  
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ROCK ISLAND ILLINOIS 61204 2004

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

WATER CONTROL STRUCTURE IMPROVEMENTS  
IN MISSISSIPPI RIVER POOLS 20 AND 21  
RIVER MILES 347 TO 350 AND 332 TO 333  
LEWIS COUNTY, MISSOURI, AND HANCOCK COUNTY, ILLINOIS

JULY 1987

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

WATER CONTROL STRUCTURE IMPROVEMENTS  
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CLEAN WATER ACT  
SECTION 404(b)(1) EVALUATION

WATER CONTROL STRUCTURE IMPROVEMENTS  
IN MISSISSIPPI RIVER POOLS 20 AND 21  
RIVER MILES 347 TO 350 AND 332 TO 333  
LEWIS COUNTY, MISSOURI, AND HANCOCK COUNTY, ILLINOIS

SECTION 1 - PROJECT DESCRIPTION

LOCATION

The project is located at two places in Pools 20 and 21 of the Mississippi River between River Miles 347 to 350 and 332 to 333, which includes Lewis County, Missouri, and Hancock County, Illinois.

GENERAL DESCRIPTION

The proposed work involves the rehabilitation of existing water control structures and the construction of new structures for the Mississippi River Nine-Foot Channel Navigation Project (the Rivers and Harbors Acts of 3 July 1950 and 30 August 1935, respectively).

The two proposed project locations are chronic dredging areas that require the yearly removal of shoaling sand. This procedure is expensive and environmentally undesirable. It is predicted that the high frequency of dredging now being performed can be significantly reduced by upgrading existing water control structures and constructing additional ones. Tables 1 and 2 show the locations of both new construction and structures to be repaired to original specifications.

Approximately 38,000 tons of clean, uncontaminated limestone will be placed on 12 structures in Pool 21. Only three of the structures require new construction. Closing Dikes Nos. 18, 19, and 20 will be lengthened to their pre-1957 length. The remaining nine structures will be repaired to the as-built condition. Initially Closing Dike No. 13 (Pool 20) will be repaired to the original elevations of 477.1 feet Mean Sea Level (MSL). If the dredging frequency is not reduced, it may be elevated to 486 feet MSL at some time in the future.

In Pool 20, about 70,100 tons of clean, uncontaminated limestone will be placed on 10 structures. Six of these structures will be repaired to original specifications and four will require new construction.

Although tables 1 and 2 list work to be performed on all structures, only the new construction requires the preparation of an Environmental Assessment. The existing structures also qualify under terms of the Nationwide

Permit for the Clean Water Act and do not require a Section 404 permit or a State water quality certification (Section 401 certification). Structures which are exempt from Section 401 certification and qualify under Nationwide Permit are noted in tables 1 and 2. Work is scheduled to begin during June 1987, repairing existing structures in Pool 21 first. Rock Island District hired labor (Channel Maintenance crew) will perform the work, which will continue into 1988 or until completed.

#### AUTHORITY AND PURPOSE

Authority for the proposed improvements is given in Section 1 of Public Law 520, 71st Congress, H.R. 11781, and Section 1 of Public Law 409, 74th Congress, H.R. 6732 (the Rivers and Harbors Acts of 3 July 1950 and 30 August 1935, respectively).

#### GENERAL DESCRIPTION OF FILL MATERIAL

Fill material will consist of approximately 108,100 tons of inert and uncontaminated limestone/dolomite rock obtained from an approved source. Rock of up to the 400-pound size will be used for all structures.

#### DESCRIPTION OF THE PROPOSED DISCHARGE SITES

Tables 1 and 2 describe the dimensions of the new construction and existing structures. Figures 1 and 2 show locations of the new and existing construction. Discharge sites for new wing dikes in Pools 20 and 21 were examined by divers searching for possible mussel beds. All sites consisted of sand and (or) gravel ranging from 100 percent sand to a sand/gravel mixture.

### SECTION 2 - FACTUAL DETERMINATIONS

#### PHYSICAL SUBSTRATE DETERMINATIONS

The elevation and slope of all discharge sites will change as indicated in tables 1 and 2. New wing dikes will raise the substrate elevation 10 feet or more above the existing river bottom. The actual increase varies from site to site depending upon depth. The existing bottom elevations also vary according to movement of the river's bedload. Substrates may accrete or degrade, depending on the river's discharge stage. Although the completed structures will remain at the constructed elevation indicated in tables 1 and 2, adjacent and nearby bottom substrates will likely change. As intended, the structures will probably cause a decrease in bottom elevation in the river thalweg (or main channel) and (or) prevent the shoaling (addition) of new sediments which would require dredging. Placing the newly constructed features hopefully will eliminate the shoaling which now occurs regularly.

TABLE 1

Water Control Structures to be Repaired or Constructed  
in Mississippi River Pool 20

Dam No.	Covered By Nationwide Permit Under CWA	Mile	Year Built	Low Operating Level	Original Length	Original Elev.	Repaired Length	Repaired Elev.	Estimated Tons of Riprap (Includes Shore Protection)
9	yes	348.3	1904	477.2	1,100'	475.8'	1,100'	475.8'	2,600
15	yes	348.7C	1925	477.2	145'	476.1'	145'	476.1'	1,500
16	yes	348.6	1925	477.2	1,315'	475.0'	1,315'	475.0'	6,100
17	yes	349.0	1927	477.2	900'	475.1'	900'	475.1'	9,600
13	no	349.0C	1908	477.2	600'	477.1'	800'	477.1'	4,000
8	yes	349.8	1908	477.2	1,225'	476.4'	1,225'	476.4'	9,400
					SUBTOTAL				<u>33,200 Tons</u>
17	no	Extension to Wing Dam #17 - 300' long			900'	475'	1,200'	475.1'	4,400
New	no	New Wing Dam @ R.M. 349.4L -			N/A	N/A	1,000'	471.0'	16,500
New	no	New Wing Dam @ R.M. 349.0R -			N/A	N/A	400'	477.0	5,500
					SUBTOTAL				<u>26,400 Tons</u>
13	no	Raise Closing Dike #13 to El. 486.0 - 9'			600'	480'	800'	486'	10,500 Tons
					SUBTOTAL				<u>10,500 Tons</u>
					TOTAL				<u>70,100 Tons</u>

TABLE 2

Water Control Structures to be Repaired or Constructed  
in Mississippi River Pool 21

Dam No.	Covered By Nationwide Permit Under CWA	Mile	Year Built	Flat Pool Elev.	Original Length Elev.	Repaired Length Elev.	Estimated Tons of Riprap (Includes Shore Protection)	
16	yes	332.9	1918	470.0	1,075' 469.0'	469.0'	3,000	
17	yes	332.7	1918	470.0	795' 467.8'	467.8'	2,000	
18	no	332.6	1918	470.0	100' 468.8'	468.8'	4,500	
19	no	332.5	1918	470.0	235' 468.7'	468.7'	5,000	
20	no	332.3	1918	470.0	300' 468.6'	468.6'	6,000	
24	yes	332.2	1922	470.0	350' 468.5'	468.5'	1,500	
23	yes	332.1	1923	470.0	580' 468.4'	468.4'	2,000	
22	yes	331.9	1910	470.0	730' 468.2'	468.2'	2,000	
21	yes	331.7	1919	470.0	1,050' 468.0'	468.0'	4,000	
32	yes	331.2	1932	470.0	120' 461.6'	461.6'	1,500	
9	yes	330.9	1898	470.0	500' 466.4'	466.4'	2,000	
8	yes	330.6	1898	470.0	1,560' 467.0'	467.0'	4,500	
TOTAL								38,000 Tons

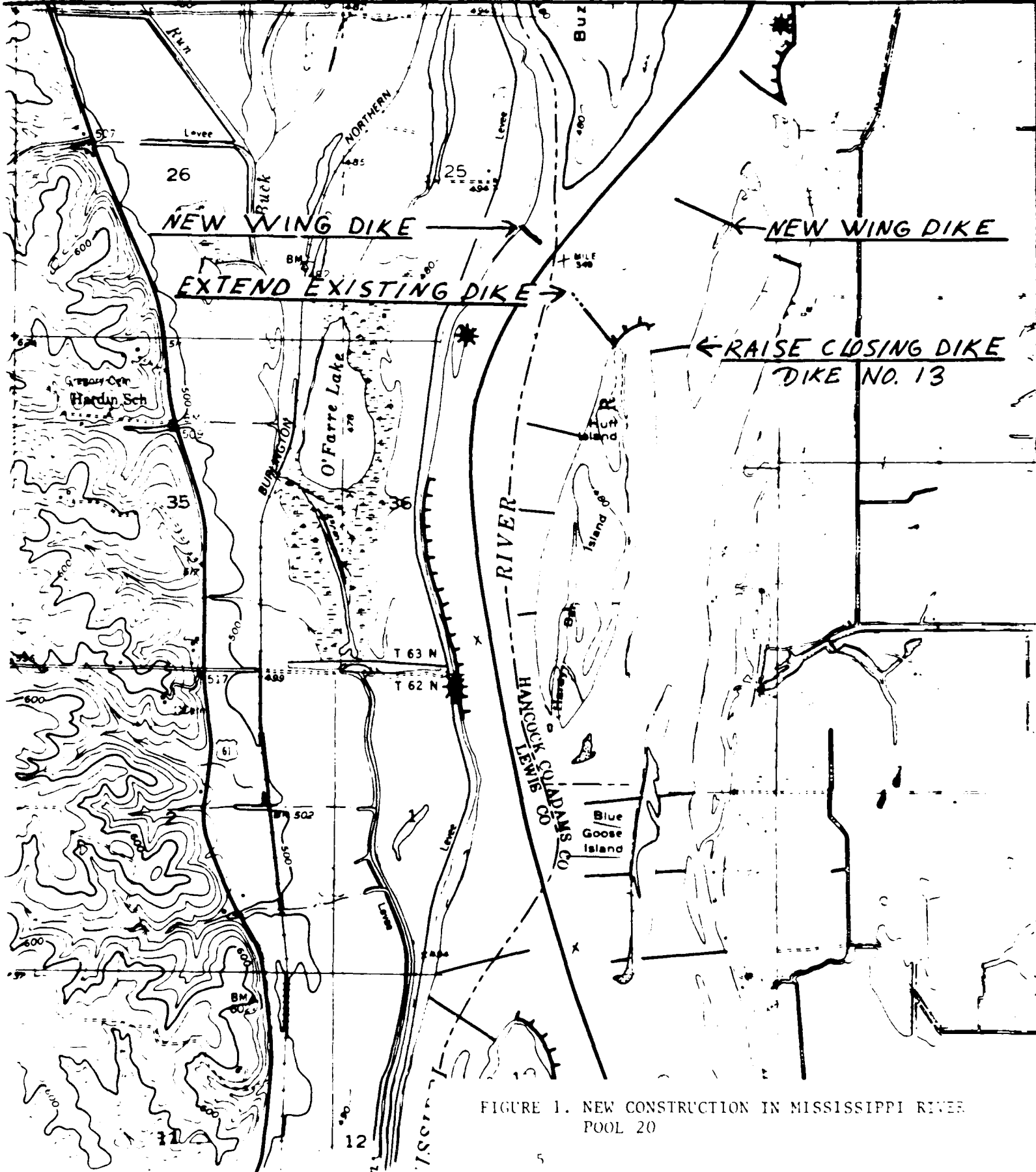


FIGURE 1. NEW CONSTRUCTION IN MISSISSIPPI RIVER POOL 20

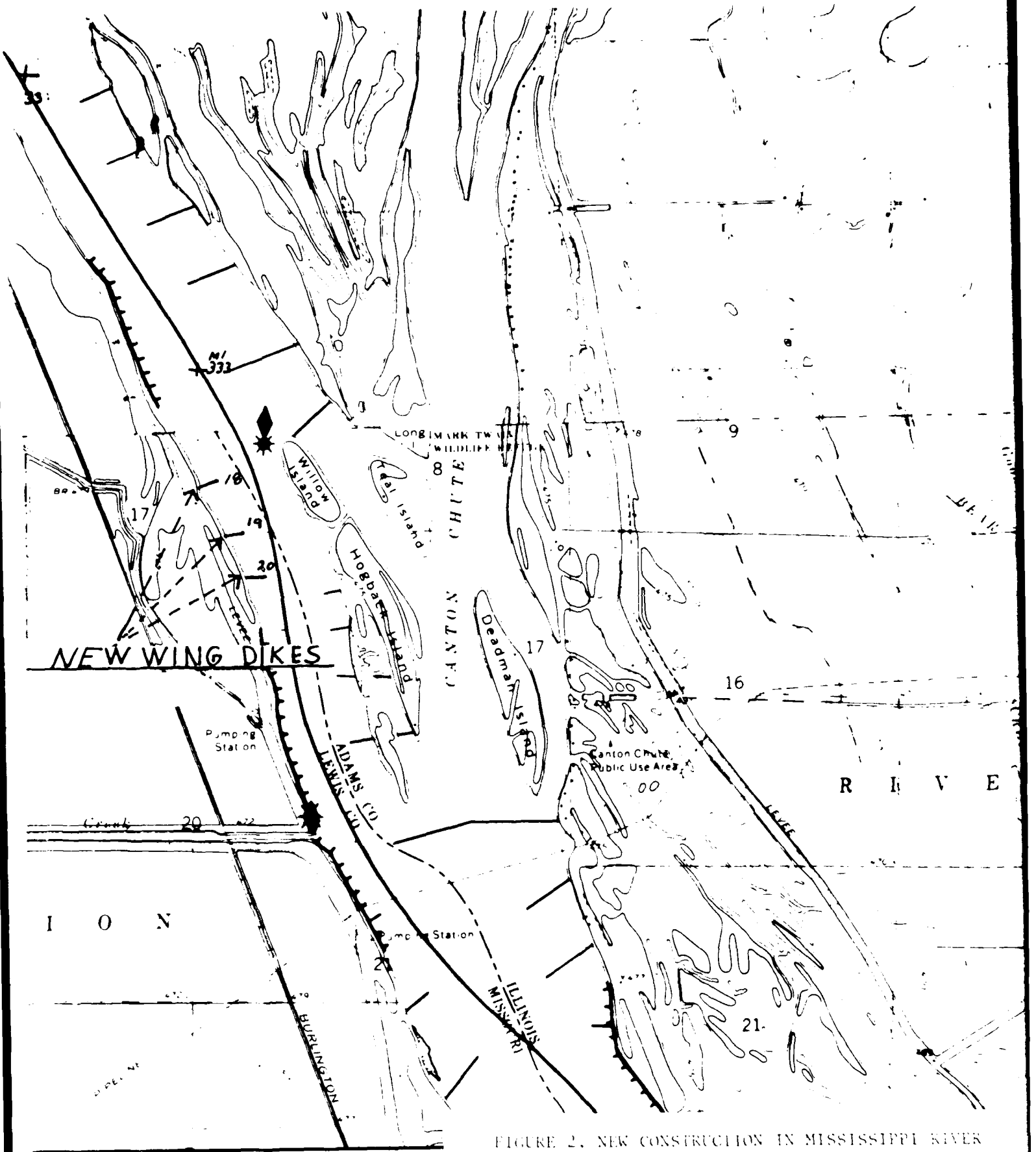
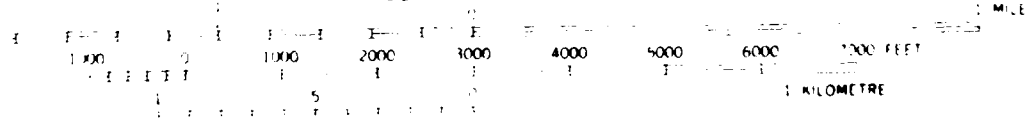


FIGURE 2. NEW CONSTRUCTION IN MISSISSIPPI RIVER POOL 21

6

SCALE 1:24 000



Besides deeping the main channel, submerged wing dams and closing dikes tend to cause a deeping of the river bottom immediately downstream of the structure. These "scour holes" are often 30 to 40 feet deep.

The head end of Huff Island is eroding at a very rapid rate. Undercutting of the bank is causing tons of sediment and toppled trees to re-enter the river. Replacement of previous riprap on the shoreline will prevent further degradation.

#### SEDIMENT TYPE

Limestone quarried stone, up to 400-pound size, will be used for all new and existing structures. For areas of new construction, this will be a change from the existing sand and gravel composition.

#### DREDGED/FILL MATERIAL MOVEMENT

Off-site migrations of rock will be negligible due to the large-sized rock used for construction.

#### PHYSICAL EFFECTS ON BENTHOS

Existing benthos populations in areas of new construction are minimal because of the unstable sand/gravel substrate. The newly deposited rock will provide a stable, permanent substrate that will increase benthos populations.

#### ACTIONS TAKEN TO MINIMIZE ADVERSE EFFECTS

A mussel survey of all new construction sites and adjacent areas was performed to ensure that no adverse effects on mussels or other aquatic organisms would result.

#### WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATION

##### WATER

Salinity - No effect

Water Chemistry - No effect

Clarity - There will be minor and temporary increases in turbidity during construction. The completed structure will not affect water clarity.

Color - No effect

Odor - No effect

Taste - No effect

Dissolved Gas Levels - No effect

Nutrients - No effect

Eutrophication - No effect

#### CURRENT PATTERNS AND CIRCULATION

Current Pattern and Flow - The proposed structures will have an effect on currents and flow. The purpose in constructing the new structures is to direct water that now flows through side channels and along shorelines into the main channel (thalweg). In the immediate vicinity of the structures, flows along the shoreline and in side channels will decrease. There would not be any noticeable changes in flow patterns upstream or downstream of the project. The most noticeable decrease in flow would be behind Huff Island when Closing Dike No. 13 is raised. Changes in aquatic resources are difficult to predict, but there may be a trend toward a more backwater type environment.

Velocity - Current velocity will decrease behind Huff Island. Water velocity over wing dams will increase because of the increased vertical construction. Main channel velocities also will increase in the immediate project vicinity.

Stratification - Not applicable

Hydrologic Regime - As described in previous paragraphs, there will tend to be an increased flow and resultant scouring in the main channel. The nearshore and sidechannel behind Huff Island will have decreased flows. These effects tend to become less noticeable as river discharge stages rise. Also, these effects are usually local and will not have any effect a mile or so upstream and downstream of the project.

NORMAL WATER LEVEL FLUCTUATIONS. No effect

SALINITY GRADIENT. Not applicable

## ACTIONS TAKEN TO MINIMIZE IMPACTS

Except for the possible future elevation of Closing Dike No. 13, all structures will be below flat pool or low operating level. This will decrease hazards to boaters and prevent formation of fast land on or below structures.

## SUSPENDED PARTICULATE/TURBIDITY DETERMINATION

### EXPECTED CHANGES IN SUSPENDED PARTICULATES AND TURBIDITY IN VICINITY OF DISPOSAL SITE

Rock placement on the head of Huff Island will decrease the suspended particulates now originating from the ongoing shoreline erosion. All other completed structures will have negligible effects on turbidity and suspended particulates.

### EFFECTS ON CHEMICAL AND PHYSICAL PROPERTIES OF WATER COLUMN

Light Penetration - No effect

Dissolved Oxygen - No effect

Toxic Metals and Organics - No effect

Pathogens - No effect

Aesthetics - No effect

### EFFECTS ON BIOTA

Primary Production Photosynthesis - No effect

Suspension/Filter Feeders - Invertebrate populations of mayflies, caddis flies, stoneflies and other aquatic insects will increase significantly on the rock substrate provided.

Sight Feeders - No significant effect

## ACTIONS TAKEN TO MINIMIZE IMPACTS

No special actions are needed.

## CONTAMINANT DETERMINATION

Fill material will be clean, uncontaminated limestone from an approved source.

## AQUATIC ECOSYSTEM AND ORGANISM DETERMINATION

EFFECTS ON PLANKTON - No effect

EFFECTS ON BENTHOS

Invertebrate organisms will colonize the solid substrate provided by the riprap and closing dikes. The substrate may become more stable in some locations because of decreased flow. This may cause increased benthic populations. The type of benthos present in some areas may change toward species preferring quiet waters, since flows will be diminished. A mussel survey of the proposed discharge locations (new construction) did not reveal any concentrations of mussels.

EFFECTS ON NEKTON

Fish populations will benefit from the riprap, closing dikes, and decreased flow in Cassville Slough. Riprap, through invertebrate colonization, will provide an excellent food source and provide possible spawning sites. The closing dikes also will provide these benefits in addition to forming deep scour holes downstream from each structure. These scour holes are used by some fishes for resting, feeding, and as overwintering sites in some cases. The more quiet water will favor species such as crappie, bluegill, and bass.

EFFECTS ON AQUATIC FOOD WEB

The project will have an overall beneficial effect on the food web by increasing production at the lower trophic levels.

## EFFECTS ON SPECIAL AQUATIC SITES

Sanctuaries and Refuges - No effect

Wetlands - No effect

Threatened and Endangered Species - Recently dead valves of the federally endangered mussel Proptera capax were found on Huff Island in August 1986. This evidence was sufficient to warrant a mussel survey of the project area to determine if there were any local extant populations. The mussel survey was performed by divers from Missman, Stanley and Associates, Muscatine, Iowa, in April 1987. The survey failed to locate any concentrations of mussels which may include P. capax.

## PROPOSED DISPOSAL SITE DETERMINATION

The fill material is inert and will not mix with water.

## DETERMINATION OF COMPLIANCE WITH APPLICABLE WATER QUALITY STANDARDS

Due to the nature of the fill material, all discharges are anticipated to be in compliance with State standards.

## POTENTIAL EFFECTS ON HUMAN USE CHARACTERISTICS

Municipal and Private Water Supply - No effect

Recreational and Commercial Fisheries - The project is expected to benefit sport and commercial fisheries.

Water Related Recreation - Recreation will not be affected except that the small-boat access between Huff and Hunt Islands will be closed if Closing Dike No. 13 is raised.

Aesthetics - Newly deposited riprap will be a stark contrast to the natural shoreline. Eventually the rock will weather and blend in with the surrounding vegetation and sediment.

Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves - No effect

DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

No detrimental cumulative impacts are anticipated because of the project.

DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

No adverse secondary effects on aquatic resources are anticipated. Several beneficial secondary effects, as already discussed, are likely to occur.

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

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

The "No Action" alternative would result in continued dredging and disposal operations which is extremely costly and causes environmental impacts from disposal.

The proposed discharge will comply with applicable State water quality standards.

There will be no significant adverse effects on aquatic resources, endangered species, recreational opportunity, aesthetics, economic values, or human health and welfare.

The closing dikes have been designed to benefit (or mitigate impacts to) aquatic resources and recreation.

On the basis of the 404(b)(1) guidelines, the proposed disposal site for the discharge of fill material is in compliance.

\_\_\_\_\_  
date

Neil A. Smart  
Colonel, U.S. Army  
District Engineer

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Water Control Structure Improvements  
In Mississippi River Pools 20 & 21  
River Miles 347 to 350 and 332 to 333

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