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# ENVIRONMENTAL ASSESSMENT

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## LOCKPORT APPROACH DIKE

### STAGE 2 REPAIRS

### WILL COUNTY, ILLINOIS

MARCH 1992

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REPLY TO  
ATTENTION OF:

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

March 25, 1992

Planning Division

SEE DOCUMENT DISTRIBUTION LIST

Enclosed for your review is a copy of the Environmental Assessment (EA), including the Clean Water Act Section 404(b)(1) Evaluation and a draft Finding of No Significant Impact (FONSI), addressing the proposed approach dike repairs at the Lockport Lock and Dam, Will County, Illinois.

The EA is being circulated for a 30-day public review period, commencing from the date of this letter. If at the end of the 30 days, no comments are received that alter the determination that no significant environmental impact will result, the FONSI will be signed and kept on file at the office of the Rock Island District, U.S. Army Corps of Engineers.

Please send any comments to the address listed below:

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

Sincerely,

A handwritten signature in cursive script, reading "John R. Brown", is positioned above the typed name.

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

Enclosure



REPLY TO  
ATTENTION OF

**CENCR-PD-E**

**DEPARTMENT OF THE ARMY  
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS  
CLOCK TOWER BUILDING - P.O. BOX 2004  
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**ENVIRONMENTAL ASSESSMENT**

**LOCKPORT APPROACH DIKE  
STAGE 2 REPAIRS  
WILL COUNTY, ILLINOIS**

**MARCH 1992**

**ENVIRONMENTAL ASSESSMENT**

**LOCKPORT APPROACH DIKE  
STAGE 2 REPAIRS  
WILL COUNTY, ILLINOIS**

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## ENVIRONMENTAL ASSESSMENT

### LOCKPORT APPROACH DIKE STAGE 2 REPAIRS WILL COUNTY, ILLINOIS

#### I. PURPOSE AND NEED FOR ACTION

For the past 20 to 30 years, the Lockport approach dike has experienced seepage from the Chicago Sanitary and Ship Canal to the Des Plaines River. Repairs have been made, but a subsidence occurred in May 1990 with two subsequent events, the most recent in November 1990.

In the interest of safety and integrity of project operation, the U.S. Army Corps of Engineers is finalizing emergency repairs to stop the subsidence problems. These emergency repairs are considered Stage 1 of a project to raise the safety level of the approach dike.

Stage 2 repairs, although not considered to be emergency in nature, are needed to maintain the dike's safety and operation. The dike is experiencing ongoing erosion to its canal side due to canal level fluctuations and tow prop wash at the various water levels. Site investigations have revealed tension cracks on the landward side of the dike. The Corps proposes to reconstruct these slopes to prevent further erosion and rectify deficiencies in the existing approach dike.

#### II. AUTHORITY

The dike was previously owned and maintained by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), formally the Metropolitan Sanitary District of Greater Chicago. In an agreement dated January 13, 1984, the Corps took control of the dike as part of the Illinois Waterway (IWW).

Maintenance of the IWW has been addressed in the *Final Environmental Impact Statement, Operation and Maintenance of a Nine-Foot Channel in the Illinois Waterway, From the Junction of the Calumet-Sag Channel and the Chicago Sanitary and Ship Canal to the LaGrange Lock and Dam*, U.S. Army Corps of Engineers, February 1975, (EIS) which states on page ii, "Dam operating procedures are primarily aimed at the maintenance of adequate pool elevations for navigation." Further, the EIS states that to the north of Lockport Lock and Dam, the Chicago Sanitary and Ship Canal lies between high retaining walls backed by earth embankments (page 9). The approach dike is part of these embankments which are required to maintain adequate pool levels for navigation. Therefore, Stage 1 repairs of the dike have met NEPA requirements and will be completed in 1992.

Although Stage 1 work has been addressed in the EIS, Stage 2 requires NEPA compliance. Reconstructing the slopes of the dike will require fill to be placed in the Chicago Sanitary and Ship Canal and along the toe of the existing landward slope. The toe area is a wetland. It is expected that one-tenth of an acre of this toe area wetland will be impacted with fill. The fill will consist of riprap stone. This Environmental Assessment (EA) and Section 404(b)(1) Evaluation of the Clean Water Act are being initiated at this time to consider the impacts to adjacent wetlands and the entire project area.

The proposed work is designed to rectify safety deficiencies in the approach dike; no effect on navigation efficiencies will occur.

### III. PROJECT DESCRIPTION

The dike is adjacent to the Lockport Lock and Dam facilities on the Illinois Waterway. The approach dike is located on the right descending bank of the Chicago Sanitary and Ship Canal between river miles 291.3 and 292.3 (plate 1).

The dike is an earth fill embankment with rock-fill side slopes and contains a core wall for a distance of 1.02 miles upstream of the dam. In 1987, a sand/bentonite cutoff was placed above the core wall in an effort to control seepage over the top of the wall (plate 2).

Stage 1 repairs raised the existing sand/bentonite cap to elevation 583 feet MSL. Washed out monitoring weirs were replaced as well. These repairs will not be addressed in this EA.

The proposed work for Stage 2 will be to rehabilitate the side slopes to 2:1 grades. The canal side slope will be modified with random fill and a filter blanket placed to prevent the fines from being pulled out during drawdown events. A six-inch layer of bedding stone will be placed with an 18- to 24-inch layer of riprap placed on top. Riprap will be placed on the landside slope.

### IV. ALTERNATIVES

1. The slopes of the existing dike would be reconstructed to 2:H on 1:V to ensure an adequate factor of safety. Riprap also will be placed to prevent erosion and prop wash from deteriorating the river side bank. The deterioration appears to be jeopardizing the dike, and it is near the point of invading the sand/bentonite cutoff. Should it reach the sand/bentonite, the dike would be in imminent danger of failure. This is the preferred alternative.

2. No Action. No action does not address the problem at hand. Allowing the dike to continue to deteriorate may jeopardize the structure with certain failure.

3. Several design alternatives were considered, but were found to be engineeringly, environmentally, or economically unacceptable. These alternatives are discussed in Appendix A.

## V. AFFECTED ENVIRONMENT

A. Natural Resources. The Chicago Sanitary and Ship Canal is completely channelized, heavily industrialized, and urbanized, which significantly reduces the quality and quantity of habitat available for fish and wildlife resources. However, the Des Plaines River flows landward of the dike. Between the dike and the Des Plaines lies a grassy wetland with a willow/silver maple border along the river. West and adjacent to the Des Plaines River is the Lockport Prairie Nature Preserve. East of the Chicago Sanitary and Ship Canal lies the Lockport Prairie East Natural Area.

Poor water quality generally limits the aquatic resources of the canal. Point source discharges, urban runoff, and storm sewer overflows adversely impact the water quality. Fishery resources are dominated by pollution-tolerant species such as carp, carp x goldfish hybrids, goldfish, and gizzard shad. Invertebrate fauna is dominated by aquatic earthworms and midge larvae, which are also pollution-tolerant species. The Des Plaines River offers habitat for a more desired fishery. Minnows, suckers, pike, sunfish, and other species of fish inhabit the river (Smith, 1979).

Wildlife resources in this reach are generally limited to those species that have adapted to the urban environment. However, the Des Plaines River and the two aforementioned wildlife areas provide habitat for a variety of wildlife species.

B. Endangered Species. Current use of the project location is very limited to any threatened or endangered species.

Federally listed species for Will County, Illinois, are:

Indiana bat, <i>Myotis sodalis</i>	endangered
Bald eagle, <i>Haliaeetus leucocephalus</i>	endangered
Lakeside daisy, <i>Hymenoxys acaulis</i> var. <i>glabra</i>	threatened



State-listed species for Will County are:

Spotted turtle, *Clemmys guttata*  
Pied-billed grebe, *Podilymbus podiceps*  
Least bittern, *Ixobrychus exilis*  
Common moorhen, *Gallinula chloropus*  
Slender sandwort, *Arenaria patula*  
Leafy prairie clover, *Dalia foliosa*  
Crawe's sedge, *Carex crawei*

C. Cultural Resources. Early Illinois River improvements were the result of the combined efforts of the Corps of Engineers and the State of Illinois. These improvements consisted of Corps of Engineers snagging, wing dams, dikes, and dredging, while both the State of Illinois and the Corps constructed locks and dams. The construction of locks and dams at Henry in 1869, Copperous Creek in 1877, LaGrange in 1889, and Kampsville in 1893 were similar in size to contemporary locks on the Mississippi River.

Further recommendations to Congress by the Corps were relegated toward improvements of slack water navigation, and subsequent authorizations resulted in the emergence of the Illinois Waterway system with its standardized channel and locks. By 1927, the formal authorization for the Illinois Waterway Nine-Foot (200-foot-wide) Channel, by performing operational and maintenance of locks and dams, was given by the Rivers and Harbors Act, as modified by the Rivers and Harbors Act of 1935, and 1950. This legislation also authorized the transferral of the State-owned dams at the towns of Henry and Copperous Creek to the Federal Government.

By 1930, the State of Illinois enacted legislation enabling the Federal Government to assume responsibility for the project, which included construction of locks and dams at Marseilles, Dresden Island, Brandon Road, Starved Rock, and Lockport. Three years later, the Corps completed the project, combining it with the earlier authorized Federal project between Utica and Grafton. The Illinois Waterway was opened to navigation in 1933.

The lock and dam complexes are all over 50 years old and in need of repair, rehabilitation, and improvement as part of the Corps' mission to operate safe and efficient transportation systems. Sections 106 and 110 of the National Historic Preservation Act (Public Law 89-665) require that the Federal agencies take into account the effect of their proposed undertakings on properties listed in or eligible (and potentially eligible) for inclusion in the National Register of Historic Places before expending Federal funds for rehabilitation and construction projects.

On December 12, 1990, the Corps notified the Illinois State Historic Preservation Officer (SHPO) of the undertaking and extent of the proposed Corps improvements. It was documented that the proposed corrective measures will improve an existing navigation structure with construction confined to a previously disturbed ground surface.

## VI. ENVIRONMENTAL IMPACTS OF PREFERRED ACTION

Effects of the preferred action on natural and cultural resources are summarized in table EA-1.

### A. Socioeconomic Impacts of the Preferred Action.

1. Community and Regional Growth. No significant impacts to the growth of the community or region would be realized as a direct result of the project. However, the existence of a cost-effective, efficient transportation system provided by the IWW locks and dams stimulated the growth of river communities and the entire Midwest Region. Maintenance of the dike will indirectly help provide continued growth opportunities in the local communities and the region.

2. Displacement of People. The proposed maintenance activities at the location necessitate no residential relocations.

3. Community Cohesion. No impacts to community cohesion would be realized as a result of the project, given the limited residential or other development in the project vicinity.

4. Public Facilities and Services. A failure could result in loss of the public access road that runs along the top of the dike. This road is used by Metropolitan Sanitary District employees who work at the powerhouse located next to the lock. The proposed project will prevent erosion and prop wash from deteriorating the river side bank and help prevent the possible loss of the access road.

5. Life, Health, and Safety. The operational safety of the lock and dam system is a primary consideration. A failure of the approach dike could result in personal injury to lock personnel, deck hands, or recreational craft users. A failure also could result in life and property loss downstream of the facility. The proposed maintenance activities would reduce safety threats to waterway users and to the downstream areas.

6. Property Values and Tax Revenues. Limited, short-term effects on property values or tax revenues would result from the proposed maintenance activities at the site. Long-term effects on property values and tax revenues would be related to community and regional growth.

7. Business and Industrial Growth. An increase in business and industrial activity would be noticed during construction. A portion of this increase would be attributable to purchases made for the repairs to the approach dike. The remaining increase would result from purchases made by construction workers (e.g., meals, lodging).

The proposed project will require no business relocations.

TABLE EA-1

Effects of the Recommended Plan on  
Natural and Cultural Resources

<u>Types of Resources</u>	<u>Authorities</u>	<u>Evaluation of Effects</u>
Air quality	Clean Air Act, as amended (42 U.S.C. 165h-7, et seq.)	No significant effect.
Areas of particular concern within the coastal zone	Coastal Zone Management Act of 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 significant impacts anticipated.
Fish and wildlife	Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.)	No significant effect.
Floodplains	Executive Order 11988, Flood Plain Management	No significant effect.
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.)	No significant effect.
Prime and unique farmland	CEQ Memorandum of August 1, 1980; Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act.	No significant effect.
Water quality	Clean Water Act of 1977, as amended (33 U.S.C. 1251, et seq.)	No significant effect.
Wetlands	Executive Order 11990, Protection of Wetlands, Clean Water Act of 1977, as amended (42 U.S.C. 1857h-7, et seq.)	Present in planning area; preservation anticipated.
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271, et seq.)	Not present in planning area.

The IWW is a vital segment of the inland navigation system, and numerous industrial users depend on it for their livelihood. Without repairs, the dike could eventually fail and cause economic losses for navigation-related industries. Being unable to deliver goods on time would make the industries less competitive to other regions and could result in a loss of sales and income.

3. Employment and Labor Force. Repairs of the dike temporarily would increase area employment; an average of 10 workers would be employed for the maintenance efforts, with approximately 20 workers employed during the 2 peak months of construction. Workers would be hired through labor unions near the project vicinities.

Long-term impacts to employment or the labor force in the project areas would be related to business and industrial growth.

9. Farm Displacement. No farms would be affected by the proposed construction activity at the dike.

10. Noise. Heavy machinery would temporarily increase noise levels during project construction. The immediate project area features industrial, agricultural, and low-density residential development. While construction noise potentially could disturb recreationists, it is unlikely that this noise level increase would significantly affect the surrounding population.

11. Aesthetic Values. The aesthetic appeal of any type of construction activity is low; however, construction will be temporary. The results of the proposed activity should improve aesthetic values at facilities over the long term.

#### B. Environmental Impacts of the Proposed Action.

1. Manmade Resources. The Lockport pools may be considered manmade resources since they are natural resources modified by man to facilitate waterborne commerce on the Illinois Waterway. They were created and controlled by operation of the locks and dams in concert with other components of the Illinois Waterway. The facilities are manmade resources and are a vital part of the national infrastructure.

At this time, repair of the facilities is anticipated to maintain existing navigation conditions in this pool. Completion of the project should contribute to alleviation of existing problems involving degradation of manmade resources of the Illinois Waterway.

2. Natural Resources. Changing the slope of the landward side of the dike from 1.5:1 to 2:1 will impact less than 1 acre of wetland. This wetland is inundated periodically by the Des Plaines River. It is composed of grasses, cattails (*Typha* sp.) and willows (*Salix* sp.).

A 20-foot construction zone at the base of the dike will impact the wetland as well. This area will be used to move material and equipment the entire length of the dike. Any material used for this construction zone will be removed after all repairs have been made to the dike. The site will be brought back to original contours and reseeded.

Any debris that should be removed and disposed of will be in compliance with applicable statutes. *Guide Specification Civil Works Construction for Environmental Protection*, CW-1430, July 1978, provides for submission of an environmental protection plan by successful contractors. Further guidelines in this document call for the Protection of Water Resources (Sec. 7.4) and Protection of Air Resources (Sec. 7.5). Rock Island District staff will review the Environmental Protection Plan submitted by the successful contractor prior to commencement of project activities. Corps inspectors will monitor adherence to this plan.

3. Cultural Resources. It is the Corps' policy to ensure that the overall character, integrity, and preservation of the significant qualities of the Illinois Waterway are preserved and that no significant historic properties are adversely affected. On January 14, 1991 (Appendix B), the SHPO concurred with the Corps' determination that the proposed corrective measures will improve an existing navigation structure with construction confined to a previously disturbed ground surface. Since no historic properties eligible for, or listed on, the National Register of Historic Places will be affected by the proposed undertaking, the Corps has fulfilled its requirements pursuant to Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended.

4. Air Quality. Impacts to air quality will occur from exhaust emissions, and fugitive and dust particles from construction activity.

These impacts will be temporary and will not result in significant or permanent violations of air quality standards.

5. Water Quality. Slope protection materials will consist of physically stable and chemically inert material.

While the contractor will be bound by the requirements and conditions set forth in *Guide Specification, Civil Works Construction for Environmental Protection*, CW-1430, July 1978, Section 7.3, certain loss of residue and other materials to the aquatic environment at the construction site is inevitable. Any effects, however, are anticipated to be minimal and short-term.

## VII. COMPLIANCE WITH ENVIRONMENTAL QUALITY STATUTES

Compliance is summarized in table EA-2.

TABLE EA-2

Compliance of the Preferred Plan with  
MRC-Designated Environmental Statutes

<u>Federal Policies</u>	<u>Compliance</u>
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
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, 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. 460-/-460/-11, et seq.	Not applicable
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
River 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.	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 (CEO 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.
- c. Noncompliance. Violation of a requirement of the statute.
- d. Not applicable. No requirements for the statute required; compliance for the current stage of planning.

A. Endangered Species. The proposed action has been coordinated with the U.S. Fish and Wildlife Service (USFWS). By letter dated January 17, 1991 (Appendix B), the USFWS stated that no federally listed or endangered species would be affected by this project.

Several State-listed species occur near the approach dike. Construction activity will not affect these species, nor affect their habitat after construction. Hydrology to the Lockport Prairie Nature Preserve or the Lockport Prairie East Natural Area will not change.

B. Cultural Resources. According to Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), Federal agencies are required to avoid impacts if prudent and feasible measures can be found. Likewise, Federal agencies also are required to repair and maintain significant (or potentially significant) historic properties under their jurisdiction. Overall, the major rehabilitation program has been formulated to achieve both of these mandates. Most of the rehabilitation actions are minor in scope and will not affect the appearance and operation of the Illinois Waterway as a whole or individual structures within it.

For the most part, the proposed rehabilitation actions will be unobtrusive, not visible to the public, and will not affect those characteristics which contribute to integrity, setting, workmanship, or feeling as a national transportation system. Beneficial effects that will accrue include the general upkeep of the system and the extension of its operating life. Safety, national defense, energy efficiency, and economic benefits are inherent in the continued operation and maintenance of the Illinois Waterway and are in the public interest. These benefits are those for which the system initially was constructed and are intangible elements contributing to the overall significance of the system, fulfilling the requirements set forth by the NHPA. On January 14, 1991, the Illinois State Historic Preservation Officer concurred with the proposed rehabilitation actions, which have no potential to impact significant properties (Appendix B).

C. Federal Water Project Recreational Act. The construction of the proposed project would have no effect on provisions of this act.

D. Fish and Wildlife Coordination Act. The U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, and Illinois Department of Conservation have been actively involved in this action. Letters of comment and telephone conversation records are reproduced in Appendix B.

E. Wild and Scenic Rivers Act. No rivers listed as "wild and scenic" or rivers in the inventory for listing as "wild and scenic" will be affected by the project.

F. Executive Order 11988 (Flood Plain Management). Executive Order 11988 directs Federal agencies to: (1) avoid development in the floodplain unless it is the only practical alternative; (2) reduce the hazards and risks associated with floods; (3) minimize the impact of floods on human

safety, health, and welfare; and (4) restore and preserve the natural and beneficial values of the floodplain. The proposed action is in accordance with Executive Order 11988.

G. Executive Order 11990 (Protection of Wetlands). Executive Order 11990 directs Federal agencies to minimize the destruction, loss, or degradation of wetlands, and enhance the natural and beneficial values of wetlands when a practical alternative exists. Wetland definitions may apply to bottomland and shoreline areas within the project area. Although no practical alternative could be used to avoid wetland impacts, the Corps of Engineers redesigned the slope to reduce the area of impact.

#### VIII. ENVIRONMENTAL IMPACTS OF OTHER ALTERNATIVES

Impacts caused by no action will be severe if the dike is allowed to deteriorate and break. Uncontrolled flooding caused by a dike failure would devastate man-made as well as natural resources.

Impacts caused by the alternatives found in Appendix A are similar to or of greater consequence than the preferred alternative.

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

Approximately one-tenth of an acre of the wetland along the toe of the dike will be lost. Due to the size, presence of other available wetland habitat, and quality of wetland, no mitigation of this loss will occur.

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

As a vital component in the national transportation infrastructure, the project site will continue to serve navigation interests, as well as to maintain river aquatic and terrestrial habitat.

Without the short-term use of the environment for the dike repairs, the dike will continue to deteriorate, eventually reaching an unsalvageable condition.

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

Construction materials such as concrete, bedding material, and riprap will be unavailable for other uses. The commitment of material is not



irreversible since the material could be reused if the dike were to be abandoned or removed.

Manpower and fuel expended would be irretrievably lost.

#### XII. RELATIONSHIP OF THE PROPOSED PROJECT TO LAND-USE PLANS

The operation and maintenance of the approach dike does not conflict with any known Federal, State, or local land-use plans.

#### XIII. CONCLUSIONS, CONTRIBUTIONS TO CUMULATIVE SYSTEM EFFECTS

Environmental effects should not be significant. The project design will incorporate features to minimize or avoid impacts to natural and cultural resources. No project activities will take place prior to certification, or waiver of certification, under applicable purviews of the Clean Water Act.

Cumulative impacts to the system-wide environment will not be significant. The proposed activity involves flattening the slopes of the Lockport approach dike from 1.5:1 to 2:1 slopes. This activity will not only maintain the integrity of the overall Upper Mississippi River Navigation System, but will do so in a safer fashion.

#### XIV. COORDINATION

Coordination for the project has been, and will be maintained, with the following State and Federal agencies:

- U.S. Coast Guard
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Advisory Council on Historic Preservation
- Illinois Department of Conservation
- Illinois Department of Transportation
- Illinois Environmental Protection Agency
- Illinois Historic Preservation Officer

The USFWS and U.S. EPA raised concern over the loss of 1 acre of wetland as originally coordinated. The Corps redesigned the slopes so that the area of impact was reduced to one-tenth of an acre. After a subsequent site visit between the Corps and USFWS, it was decided that avoidance and minimization will occur through this new design and that no further mitigation was required.

The Illinois Department of Conservation raised concern about the effect of the project on nearby nature preserves. Because the hydrology into these preserves will not be changed, impacts to these areas or their inhabitants will be nonexistent.

XV. REFERENCES

Smith, Philip Wayne. 1979. The Fishes of Illinois. University of Illinois Press. 314pp.

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT

LOCKPORT APPROACH DIKE  
STAGE 2 REPAIRS  
WILL COUNTY, ILLINOIS

I have reviewed the information provided by this Environmental Assessment, along with data obtained from Federal and State agencies having jurisdiction by law or special expertise, and from the interested public. I find that repairs to the Lockport approach dike will not significantly affect the quality of the human environment. Therefore, it is my determination that an Environmental Impact Statement is not required. This determination will be reevaluated if warranted by later development.

Alternatives considered include: (a) changing the dike's slope from 1.5:1 to 2:1 (the preferred alternative); (b) no action; and (c) a variety of alternatives (Appendix A of the EA) found to be engineeringly unacceptable.

Factors considered in making a determination that an EIS was not required were as follows:

a. No long-term adverse impacts to natural or cultural resources are anticipated. No endangered species, either State or Federal, will be affected by the project action.

b. No expansion in tow traffic or the navigation capacity of the Illinois Waterway 9-foot channel will result from the proposed activity.

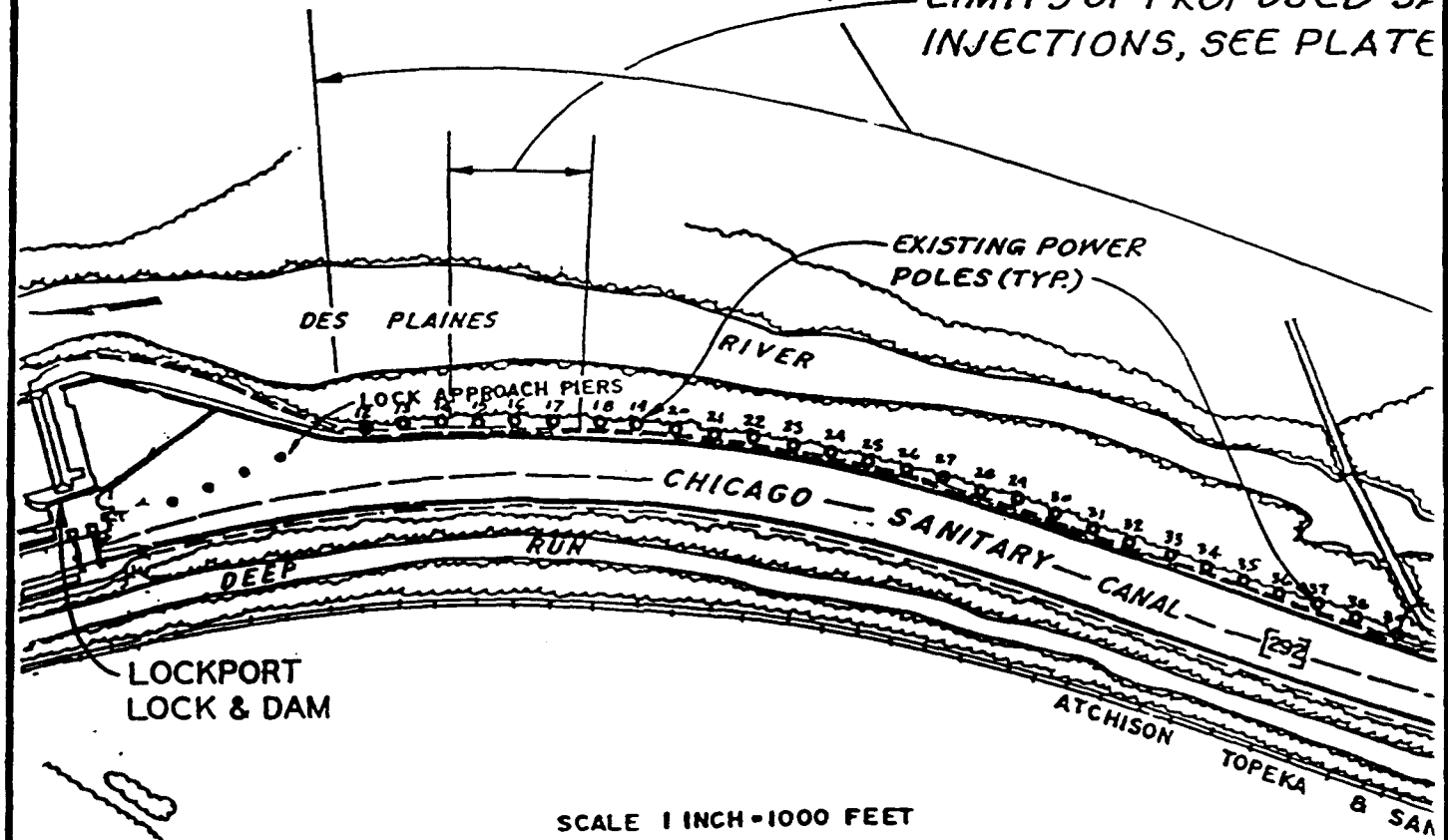
c. Land use after the project should remain unaltered, and no economic impacts to the project area are anticipated.

\_\_\_\_\_  
Date

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

LIMITS OF PROPOSED IMPROV  
SEE PLATE 2.

LIMITS OF PROPOSED SA  
INJECTIONS, SEE PLATE



LOCKPORT  
LOCK & DAM

DES PLAINES

RIVER

EXISTING POWER  
POLES (TYP.)

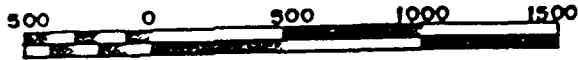
LOCK APPROACH PIERS

CHICAGO — SANITARY — CANAL —

DEEP  
RUN

ATCHISON  
TOPEKA & SAN  
TAFE

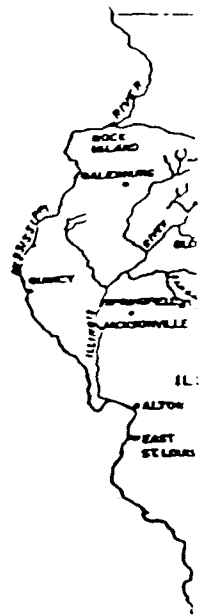
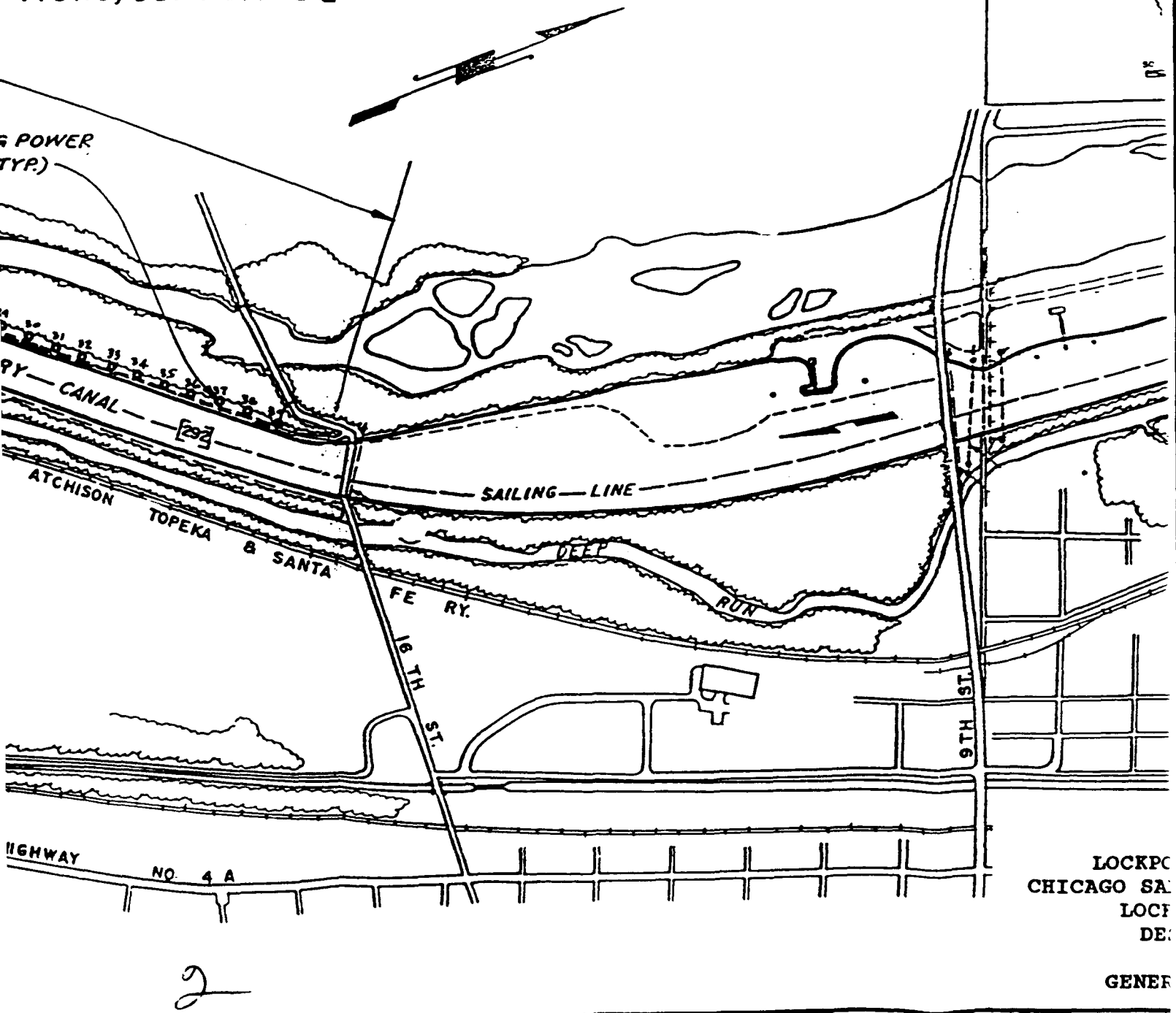
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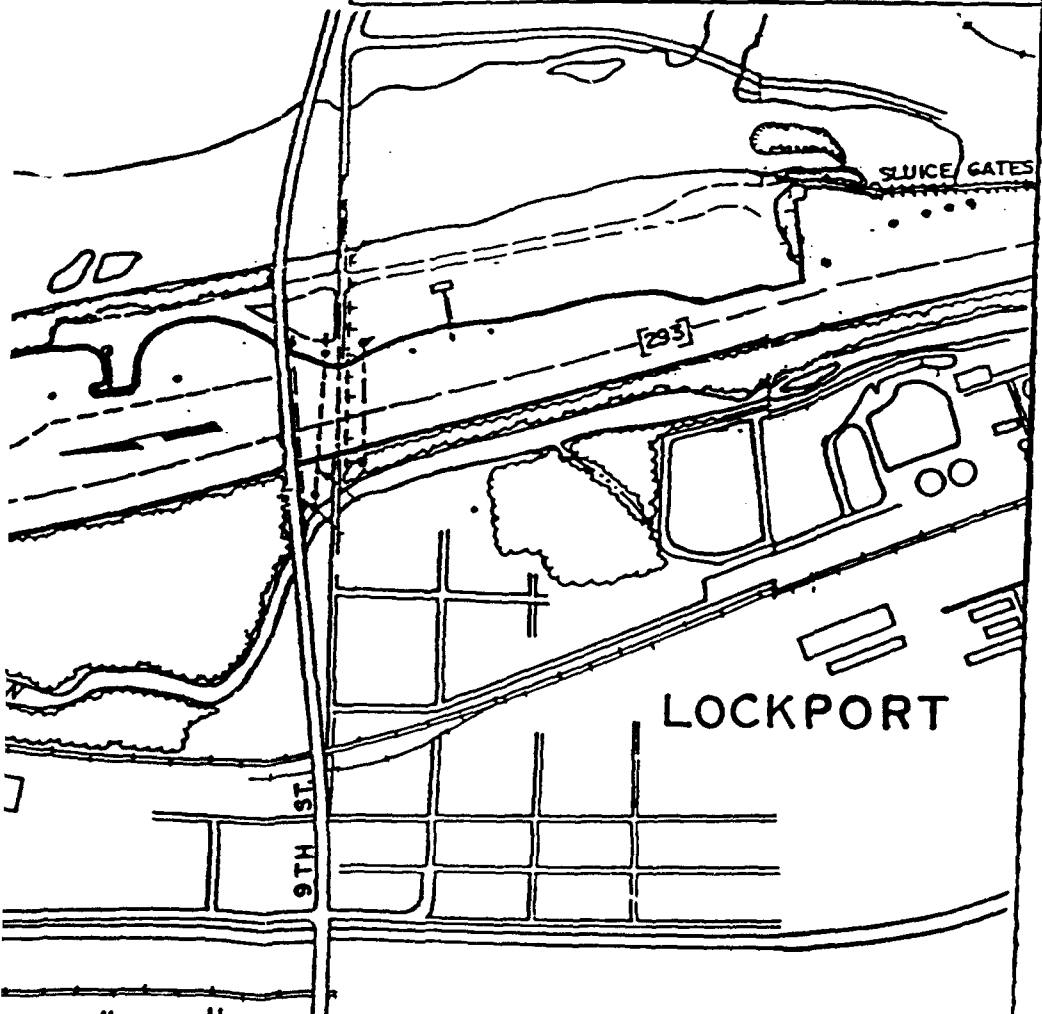
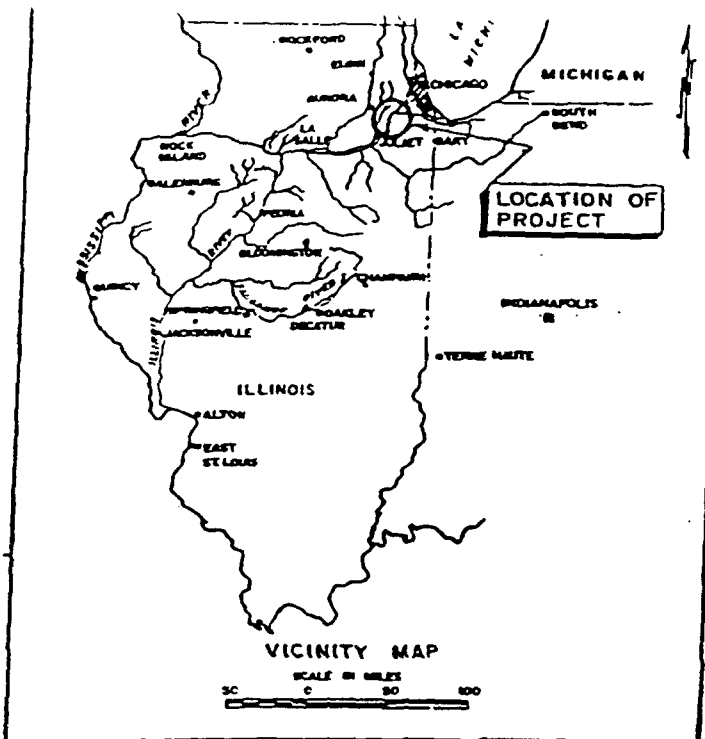


STATE  
HIGHWAY  
NO. 4 A

PROPOSED IMPROVEMENTS,  
2.

PTS OF PROPOSED SAND  
CTIONS, SEE PLATE 2





LOCKPORT APPROACH DIKE  
CHICAGO SANITARY AND SHIP CANAL  
LOCKPORT, ILLINOIS  
DESIGN ANALYSIS

3

GENERAL LOCATION MAP

RAISE SAND BENTONITE TO EL. 583.0 (+3.5 CCD).  
FOR LOCATION, SEE PLATE 1.

PROPOSED 18"-24" RIPRAP  
ON 6" BEDDING STONE  
AND FILTER FABRIC.

PROPOSED  
ROCKFILL

SPOIL SHALL BE PLACED ON  
THE WEST SLOPE OF THE  
EMBANKMENT.

BACK SLOPE VARIES ALONG  
THE EMBANKMENT.

1

2

EXISTING  
POWER POLE

EXISTING  
ACCESS  
ROAD  
VARIES

EL. 585.0 (+5.5 CCD)

EL. 577.0 - 580.0 (-2.5 - +1.5 CCD)

FILTER FABRIC (EXIST.)

EL. 579.3 (+2.3 CCD)

EL. 572.2 (-7.3 CCD)

EXISTING PERVIOUS  
EARTH & ROCK  
FILL

EXISTING  
CLAY/EARTH  
FILL

EXISTING BROKEN ROCK

TOP OF ROCK

EST. TOP OF ROCK

EXISTING  
IMPERVIOUS FILL  
(SAND  
BENTONITE)

EXISTING  
CLAY/EARTH  
FILL

EXISTING  
CORE WALL

EXISTING PERVIOUS  
EARTH AND ROCK  
FILL

PROPOSED RANDOM  
OR ROCKFILL

TYPICAL SECTION

NO SCALE

LOCKPORT APPROACH DIKE  
CHICAGO SANITARY AND SHIP CANAL  
LOCKPORT, ILLINOIS  
DESIGN ANALYSIS

TYPICAL CROSS SECTION

**NONPREFERRED ALTERNATIVES**

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LOCKPORT APPROACH DIKE  
STAGE 2 REPAIRS  
WILL COUNTY, ILLINOIS

APPENDIX A  
NONPREFERRED ALTERNATIVES

1. Slurry Trench Cutoff Wall. This alternative consists of excavating into the bedrock and using a bentonite slurry to prevent the trench from collapsing. The backfill can consist of an impervious clay mixed with the bentonite to form a soil-bentonite cutoff wall. This procedure is not recommended for open-jointed bedrock foundations. This alternative was rejected because the Lockport Dike has this type of a foundation.
2. Concrete Cutoff Wall. This alternative is used for open-jointed bedrock. Two possible procedures can be used. The first procedure is dewatering the dam and excavating to bedrock under dry conditions. This procedure is not practical at this site because of barge traffic. The second procedure considered is using a slurry trench to excavate into the bedrock. Concrete is used to displace the slurry to form a concrete cutoff wall. This alternative was rejected because of its high cost.
3. Grout Curtain. Grouting was considered as an alternative. The technique involves drilling into the bedrock and grouting the entire dike. This would be done on 2.5- to 5.0-foot centers with one or more lines, depending on what is needed to control seepage. The major difficulty is grouting under flowing water conditions. For this reason and the high cost, this alternative was rejected.
4. Steel Sheetpile Cutoff Wall. This alternative requires driving steel sheetpile into the bedrock. This generally is not used in fractured bedrock unless done in conjunction with grouting to prevent seepage from occurring at the interface between the rock and the sheetpile. The top 6 feet of Lockport Dike is a random fill with very large rocks. These rocks would have to be excavated prior to driving sheetpile. Sheetpile also can leak at the joints, and corrosion can limit its functional life. For these reasons and the high cost, this alternative was rejected.
5. Sand Injection. This alternative consists of drilling the downstream side of the embankment and injecting sand into the holes in order to completely fill the voids with a filter material along the clay and rockfill contact. The sand will have the proper gradation to perform as a filter. Although this procedure is difficult, it has been accomplished with good results. The Baltimore District, Corps of Engineers, developed the technique for remedial repairs to the Waterbury Dam in Vermont. The procedure also was used by the Corps' New England Division for the remedial repairs to the dam at Hop Brook Lake. Both projects have achieved good results. A 500-foot section of the dike (between poles 15 and 17) will

be injected with sand. Most of the subsidence has occurred in this reach of the dike.

6. Lower the Canal Level. For a navigational mission, the pool can be lowered to -4.0 CCD (575.5 MSL). There is a definite relationship between pool level and seepage. The Corps has investigated the procedures and legal ramifications of lowering the canal. This alternative was rejected for legal reasons.

7. Rebuild the Dike. This is the only way to ensure the composition of the dike and its performance. The dike was originally completed in 1907, and the Corps of Engineers has original design drawings from 1905. From the Corps' geotechnical investigation, it was discovered that the dike is not of the original composition as shown in the drawings due to erosion of materials and reconstruction over the years. The following three construction alternatives could be used:

7a. Earth Dike. This alternative involves dewatering and removing the dike down to bedrock. Also, the bedrock would be grouted, and the dike would be rebuilt to current Corps requirements. Filters and drains would be incorporated in the new embankment to prevent material from piping out of the dike. This alternative was rejected because of the high cost.

7b. Concrete Retaining Wall. The procedure for this alternative is to construct a reinforced concrete retaining wall on the upstream side for the entire length of the dike. The excavation would extend to bedrock, and the foundation would be grouted. Construction could be completed behind a cofferdam with minimal delays to barge traffic. This alternative was rejected because of the high cost.

7c. New Construction on the Landside. The procedure for this alternative is to use the existing dike as the construction dewatering cofferdam. A dike or retaining wall could be constructed under dry conditions on the landside. The bedrock would be grouted to prevent underseepage. After construction is completed, the existing dike could be removed. Alternatively, the void between the existing dike and the new construction could be filled with a pervious material. This alternative was rejected because of the high cost.

8. Sand Filter. This option conforms to current engineering practice in dam design. The procedure is to excavate the landside down to the bedrock and back to the clay core. A filter fabric is laid down, and a sand filter is constructed over the top of the fabric. Drains are constructed and drained into a collection ditch. A random fill is placed over the sand, and the toe has rock protection to prevent erosion. However, excavating the landside down to the clay core without lowering the pool can jeopardize the stability of the dam. For this reason and the high cost, this alternative was rejected.

**PERTINENT CORRESPONDENCE**

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**B**



REPLY TO  
ATTENTION OF:

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

RECEIVED JAN 04 1991

092  
JAW

December 12, 1990

Planning Division

Mr. Theodore H. Hild  
State Historic Preservation  
Office  
Illinois Historic Preservation  
Agency  
Old State Capitol  
Springfield, Illinois 62704

RECEIVED  
DEC 21 1990  
0922/90  
PRESERVATION SERVICES  
02

INRA REVIEW  
H/A Sawyer 12/26  
AC \_\_\_\_\_  
AR 503 way 1-11-91gn  
File Will County

Dear Mr. Hild:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) proposes corrective measures on the Lockport Approach Dike (Dike) to stop seepage and subsidence deficiencies. The Dike is located in Will County, Lockport, Illinois, on the Chicago Sanitary and Ship Canal (Canal) between river miles 291.3 and 292.3 adjacent to the Des Plains River (enclosure 1). The Canal was opened to the Des Plaines River at Lockport in 1900 to reverse the flow of the Chicago River and to prevent contamination of the Lake Michigan water supply.

The Dike was originally completed in 1907 by the Chicago Sanitary District, and the Metropolitan Sanitary District of Greater Chicago (MSDGC) later maintained the structure and a road located on top of it. In 1984, the MSDGC relinquished authorization of the Dike to the Corps as part of the Illinois Waterway, although it does not meet federally recommended design and plan specifications.

Recently, subsidence of the Dike from Canal seepage has resulted in continual water flow to the Des Plains River and road damage. To prevent eventual failure of the Dike and its road, the Corps proposes to raise the interior sand and bentonite core wall and to inject sand into extant voids. Then, slopes will be changed from 1V:1H to 1V:2H and riprapped, and the access road will be constructed in its original location (enclosure 2).

These proposed corrective measures will improve an existing navigation structure with construction confined to a previously disturbed ground surface (see enclosed

photographs). We request your comments concerning this project within 30 days. If you have any questions or require additional information, please call Mr. Ron Deiss of our Environmental Analysis Branch at 309/788-6361, Ext. 6185, or you may write to the following address:

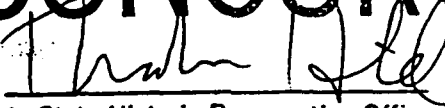
District Engineer  
U.S. Army Engineer District, Rock Island  
ATTN: Planning Division (Deiss)  
Clock Tower Building - P.O. Box 2004  
Rock Island, Illinois 61204-2004

Sincerely,

  
Dudley M. Hanson, P.E.  
Chief, Planning Division

Enclosures

**CONCUR**

By:   
Deputy State Historic Preservation Officer

Date: 1/14/91



## 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

January 17, 1991

Dudley M. Hanson  
Chief, Planning Division  
U.S. Army Engineer District  
Rock Island  
Clock Tower Building, P.O. Box 2004  
Rock Island, Illinois 61204-2004

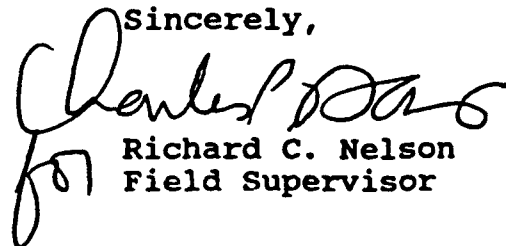
Dear Mr. Hanson:

This is in response to your letter dated January 8, 1991, requesting our comments on your plans to repair the approach dike at the Lockport Lock and Dam on the Illinois Waterway, Lockport, Illinois. The dike will also be raised to 583 MSL. A second phase of the project contemplates erosion control measures to the sides of the dike which will require filling of approximately one acre of wetland.

There are no federally-listed threatened or endangered species that would be affected by this project. We have no objection to Phase 1 of the project, i.e. the repair of the dike. However, should Phase 2 be implemented, we would insist that mitigation for the loss of any wetlands be incorporated into project plans.

This letter provides comment under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act of 1973, as amended.

Sincerely,



for Richard C. Nelson  
Field Supervisor

cc: IDOC (Lutz)

GB:hw



# Illinois Department of Transportation

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

January 29, 1991

District Engineer  
U.S. Army Corps of Engineers, R.I.  
Attention: Planning Division  
Clock Tower Building  
P.O. Box 2004  
Rock Island, Illinois 61204-2004

RE: Approach Dike Repairs/Modifications  
Lockport Lock and Dam

Gentlemen:

This is in response to your January 11, 1991 letter requesting comments on the proposed repair work. The problems at the approach dikes were documented in the 1979 National Dam Safety Program Inspection Report. The proposed repairs/modifications seem to be consistent with the identified deficiencies and recommended remedial measures in that report.

As this Division is charged with the protection of the health, safety and welfare of the citizens of the State of Illinois as part of the Illinois Dam Safety Program, we appreciate the opportunity to review and comment on the final design plans. When such final plans are available, please forward a copy to this office.

If you have any questions regarding this letter, please contact me at 217/782-3863.

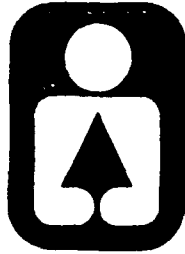
Sincerely,

A handwritten signature in cursive script that reads "Martin J. Stralow".

Martin J. Stralow, P.E.  
Chief, Dam Safety Section

MJS:PM:pw/2009R

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 - KATHY SELCKE, ASSISTANT DIRECTOR

January 29, 1991

Mr. Dudley M. Hanson, P.E.  
Chief, Planning Division  
Rock Island Corps of Engineers  
Clock Tower Building - P.O. Box 2004  
Rock Island, IL 61204-2004

Dear Mr. Hanson:

Thank you for your January 11, 1991 letter concerning the Corps' plans to repair the approach dike at Lockport Lock and Dam on the Illinois Waterway.

The project area for the proposed repair work at the Lockport Lock & Dam extends between the Lockport Prairie Nature Preserve and the Lockport Prairie East Natural Area. The preserve is located west of the Des Plaines River and the natural area is located between the Chicago Sanitary and Ship Canal and the Illinois and Michigan Canal.

Phase 1 work is described as being within the limits of the existing dike and includes no fill in wetlands along the dike. This poses no apparent threat to the preserve and natural area or the endangered and threatened species which occur within them. The Department has no objection to Phase 1 work.

The Corps' description of Phase 2 includes plans for increasing the toe width of the dike and filling portions of the adjacent wetlands. The fill will not extend into the nature preserve or natural area. The Environmental Assessment being prepared by the Corps for Phase 2 should include an evaluation of potential effects of the proposed work on the hydrology of the vicinity. Changes in movement of water through the preserve or natural area could affect the several state-listed species which occur there.

Listed species in the vicinity of this project include:

Spotted Turtle  
Pied-billed Grebe  
Least Bittern

Clemmys guttata  
Podilymbus podiceps  
Ixobrychus exilis



Common Moorhen  
Slender Sandwort  
Leafy Prairie Clover  
Crawe's Sedge

Gallinula chloropus  
Arenaria patula  
Dalea foliosa  
Carex crawei

Thank you for the opportunity to comment.

Sincerely,

*Mark Frech*

Mark Frech  
Director

MF:RWL:ts

cc: USFWS, Marion



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

230 SOUTH DEARBORN ST.

CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

MAR 29 1991

MAR 29 1991

Dudley M. Hanson  
Chief, Planning Division  
District Engineer  
U.S. Army Engineer District,  
Rock Island  
Clock Tower Building  
P.O. Box 2004  
Rock Island, Illinois 61204-2004

Dear Mr. Hanson:

We are in receipt of your letter of January 11, 1991 requesting comments on Stage 2 of the Lockport Lock and Dam approach dike reparation project to control erosion to the sides of the dike. Based on the information provided we have no objections to Stage 2 of the proposed project; however, there are a few issues that need to be addressed.

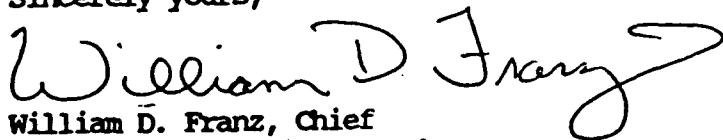
We understand from your letter that the material to be removed from the dike in Stage 1 will either be placed in a landfill or will be used as bedding material for reshaping the slopes in Stage 2. Information on the physical and chemical characteristics of this material must be provided to determine its suitability for use as bedding material. If the material is contaminated, it should not be used as bedding material.

You also indicated in your letter that implementation of Stage 2 includes the placement of fill along the slopes of the dike, one acre of which is a wetland. The Environmental Assessment (EA) and the Section 404(b) (1) Evaluation, which are being prepared to consider impacts to the adjacent wetlands and the entire project area, should address this impact. Mitigation for ecological effects should be considered in the EA. Also, please state what impacts to the surrounding environment may occur as a result of implementation of Stage 2, including whether aquatic and wildlife resources, or threatened or endangered species would be adversely affected.

Finally, implementation of Stage 2 of the project may result in adverse impacts on water quality at the project site due to erosion of fill material, and the movement of construction equipment which may cause an increase in erosion and sedimentation into the canal. The EA should specify what measures will be taken to prevent such material from entering the waterway.

Thank you for the opportunity to review your letter regarding the Lockport Lock and Dam approach dike reparation project. Please address the above-mentioned issues, and if you have any questions or comments please contact Holly Wirick at (312) 353-6704.

Sincerely yours,

A handwritten signature in cursive script that reads "William D. Franz". The signature is written in black ink and is positioned above the typed name and title.

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

TRIP REPORT

1. WHERE: Lockport Lock and Dam, Illinois Waterway, Will County, Illinois

WHEN: 11 September 1991

PURPOSE: Assess the project's impacts to local wetlands

2. ATTENDEES Joe Jordan, PD-E  
Gene Rand, ED-G  
Gerry Bade, USFWS, Rock Island

3. AGENDA:


- a. Introduction
- b. View the project site

4. CONCLUSIONS AND RECOMMENDATIONS FOR ACTION AND PERSONS RESPONSIBLE FOR ACTION, WITH SUSPENSE DATES, CHARGE NUMBER, AND COST LIMITATIONS:

After viewing the site it was concluded that the project will not require mitigation for two reasons:

- a. Project design has reduced the area of wetland impact significantly,
- b. wetland quality is low.

Work will continue on the environmental assessment.

  
JOSEPH W. JORDAN  
General Biologist

CF:  
PD (Dist File)  
PD-E  
ED-G  
ED-DM

Gerry Bade, USFWS  
Holly Wirick USEPA

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

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REPLY TO  
ATTENTION OF

CENCR-PD-E

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

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

LOCKPORT APPROACH DIKE  
STAGE 2 REPAIRS  
WILL COUNTY, ILLINOIS

MARCH 1992

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

LOCKPORT APPROACH DIKE  
STAGE 2 REPAIRS  
WILL COUNTY, ILLINOIS

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2	General Plan



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

LOCKPORT APPROACH DIKE  
STAGE 2 REPAIRS  
WILL COUNTY, ILLINOIS

SECTION 1 - PROJECT DESCRIPTION

LOCATION

The dike is adjacent to the Lockport Lock and Dam facilities on the Illinois Waterway in Will County, Illinois. The approach dike is located on the right descending bank of the Chicago Sanitary and Ship Canal between river miles 291.3 and 292.3 (plate 1).

GENERAL DESCRIPTION

For the Lockport approach dike repairs, the following activities require assessment in this Section 404(b)(1) Evaluation. The proposed work for Stage 2 will be to rehabilitate the side slopes to 2:1 grades. The canal side slope will be modified with random fill and a filter blanket placed to prevent the fines from being pulled out during drawdown events. A 6-inch layer of bedding stone will be placed with an 18- to 24-inch layer of riprap on top. Riprap will be placed on the landside slope (plate 2).

AUTHORITY AND PURPOSE

The dike was previously owned and maintained by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), formally the Metropolitan Sanitary District of Greater Chicago. In an agreement dated January 13, 1984, the Corps of Engineers took control of the dike as part of the Illinois Waterway (IWW).

Maintenance of the IWW has been addressed in the *Final Environmental Impact Statement, Operation and Maintenance of a Nine-Foot Channel in the Illinois Waterway, From the Junction of the Calumet-Sag Channel and the Chicago Sanitary and Ship Canal to the LaGrange Lock and Dam*, U.S. Army Corps of Engineers, February 1975, (EIS) which states on page 11, "Dam operating procedures are primarily aimed at the maintenance of adequate pool elevations for navigation." Further, the EIS states that to the north of Lockport Lock and Dam, the Chicago Sanitary and Ship Canal lies between high retaining walls backed by earth embankments (page 9). The approach

dike is part of these embankments and is required to maintain adequate pool levels for navigation.

Stage 1 of this project will be completed in 1992. This work involved interior repairs to the dike to prevent seepage. This work has met NEPA compliance in the EIS.

In Stage 2 repairs, the slopes of the existing dike would be reconstructed to 2:H on 1:V to ensure an adequate factor of safety. Riprap also will be placed to prevent erosion and prop wash from deteriorating the riverside bank. The deterioration is jeopardizing the dam, and it is near the point of invading the sand/bentonite cutoff. Should it reach the sand/bentonite, the dam would be in imminent danger of failure.

Increasing the slopes of the dike will require fill to be placed in the Chicago Sanitary and Ship Canal (Canal) and along the toe of the existing landward slope. The toe area is a wetland. It is expected that one-tenth of an acre of this toe area wetland will be impacted with fill. The fill will consist of riprap stone. This Clean Water Act, Section 404(b)(1) Evaluation is being initiated to consider the impacts caused by the fill placement in this wetland and into the Canal.

The proposed work is designed to rectify safety deficiencies in the approach dike; no effect on navigation efficiencies will occur.

#### GENERAL DESCRIPTION OF DREDGED AND FILL MATERIAL

The Canal slope will be modified with random fill and a filter blanket placed to prevent the fines from being pulled out during drawdown events. A 6-inch layer of bedding stone will be placed with an 18- to 24-inch layer of riprap on top. Riprap will be placed on the landward slope (table 1).

#### DESCRIPTION OF PROPOSED DISCHARGE SITES

The Canal is completely channelized, heavily industrialized, and urbanized, which significantly reduces the quality and quantity of habitat available for fish and wildlife resources. However, the Des Plaines River flows landward of the dike. Between the dike and the Des Plaines lies a grassy wetland with a willow/silver maple border along the river. West and adjacent to the Des Plaines River is the Lockport Prairie Nature Preserve. East of the Chicago Sanitary and Ship Canal lies the Lockport Prairie East Natural Area.

**TABLE 1**

*Fill Material Requirements*

Canal Side Slope

Random Fill	42,000 cubic yards
Filter Fabric	24,500 square feet
Bedding Stone	4,500 cubic yards
Riprap	15,000 cubic yards

Landward Slope

Riprap	34,500 cubic yards
--------	--------------------

DESCRIPTION OF PLACEMENT METHOD

Placement of material for slope protection typically involves using cranes and endloaders. Materials are dumped to alignment and spread to profile. Large grade stone is placed by crane.

**SECTION 2 - FACTUAL DETERMINATIONS**

PHYSICAL SUBSTRATE DETERMINATIONS

The toe of the landward slope is composed of alluvium deposited by the Des Plaines River and rock that has sloughed off the slope. The Canal's slope and substrate are composed of the same material caused by fill migration off the slope. Fill movement should cease on both slopes with a change in slope and materials used.

Impacts to wetlands will occur at the toe of the landward slope. One tenth of an acre will be filled. At this site, benthic organisms are only present during high water events from the Des Plaines River. Virtually no aquatic impacts will occur on the Canal side due to low water quality in the Canal; few benthic organisms inhabit this area of the Illinois Waterway.

Early design proposals included the loss of a total of 1 acre of wetland on the landward side of the dike. To minimize impacts but raise the slope to a 2:1 grade, the Corps of Engineers redesigned the slope so that it began

closer to the road that runs on top of the dike. This allowed the toe to be nearer to the original toe and reduced the use of the wetland.

#### WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

##### WATER

Clarity and turbidity of the river varies with seasonal flow. Placement sites and methods have been selected to minimize impacts to clarity, color, odor, taste, dissolved gas levels, nutrients, and biochemical oxygen demand in the riverine environment.

Non-riverine originated components such as rock fill, which may be placed temporarily or permanently during construction, will be physically stable and chemically noncontaminating.

##### CURRENT PATTERNS AND CIRCULATION

Placement of rock fill for slope protection is not anticipated to negatively affect the current patterns, velocity, stratification, and hydrologic regime in the river or canal systems.

Terrestrial discharge of material deposited on the landward side of the dike should have no effect on hydraulic or hydrologic conditions in the project area. Aquatic placement of material in the Canal should not affect hydrologic or hydraulic conditions in the project area.

##### NORMAL WATER LEVEL FLUCTUATIONS

No effects on normal seasonal river stages are anticipated by the proposed actions.

##### SALINITY GRADIENTS

The proposed actions take place in and around an island freshwater stream system. Therefore, no consideration of salinity gradients is warranted for these actions.

### ACTIONS TAKEN TO MINIMIZE IMPACTS

The use of chemically stable materials and physical stabilization of materials by design are actions intended to reduce impacts to the riverine system.

Reduction in required area needed for slope repairs also has been designed into the project to reduce impacts to the landward wetland.

### SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

The discharge of rock for slope protection is anticipated to have only a minor temporary effect as the material is placed and spread to design elevation.

Effects on the water column of the canal system regarding light penetration, dissolved oxygen, toxic metals and organics, pathogens, and aesthetics are anticipated to be minimal and localized for a nominal distance downstream during the term of project construction.

### DREDGING AND PLACEMENT

Effects on biota, including primary producers, i.e., zoo and phytoplankton, suspension/filter feeders, and sight feeders, are anticipated to be temporary and localized. Because the duration of increased turbidity levels is expected to be minimal, localized, and temporary, impacts to the aquatic community are anticipated to be negligible. The project component which will produce a habitat alteration, i.e., slope protection, is anticipated to provide long-term benefit by stabilizing finer sediments and protecting against a catastrophic impacts to man-made and natural resources caused by dike failure.

Impacts are anticipated to be minimized by placement site selection, placement methodology, and the use of chemically noncontaminating and physically stable materials for project construction.

### CONTAMINANT DETERMINATIONS

Materials used in this project will be chemically noncontaminating and physically stable. It is expected that construction will not contribute significantly or free any contaminants currently at the site.

## AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

Because the likelihood of contamination by pollutants is generally low for projects involving rock placement, impacts to the aquatic ecosystem are anticipated to be negligible.

Effects on plankton are expected to be minimal. Effects on benthos will be limited to elimination of those organisms currently inhabiting the area adjacent to the canal side of the dike. The placement of rock fill for slope protection should provide interstitial spaces for invertebrate population production and limited vertebrate spawning potential. Effects on nekton will be limited to displacement and temporary disruption of foraging patterns. Because the proposed activities are generally held to low-flow (hence, nonspawning seasons), impacts to spawning species should be negligible. Effects on the aquatic food web are expected to be negligible. Effects on special aquatic sites should be negligible in the project area; no sanctuaries or refuges will be affected by the project action. No mudflats will be affected by the project actions. No vegetated shallows, coral reefs, or riffle and pool complexes will be affected by the proposed actions.

Threatened and endangered species use of, or existence in, the project area is discussed in the environmental assessment. No impacts or effects to endangered species are anticipated.

Other wildlife, such as the muskrat and beaver which would move through and around the project areas, should only be affected to the extent of travel disruption. No food chain or critical habitat requirements will be affected by the proposed actions.

## PROPOSED PLACEMENT SITE DETERMINATIONS

The mixing zone for discharge of rock fill will be the water column, approximately 20 feet deep in the Canal immediately adjacent to the dike. Depending on river and canal conditions, this discharge may take several weeks to complete. The lack of fine particulates typically contained in rock fill indicates negligible chemical or turbidity effects resulting from this action.

The proposed project should have no effect on municipal or private water supplies, recreational or commercial fisheries, or water-related recreation. Aesthetics are generally negatively affected by any type of construction activity; however, for this project, no permanent effects are anticipated due to the nature of the project (maintenance and repair) and the location of placement sites.

No violations to water quality standards will occur. The Clean Water Act, Section 401 Water Quality Certification, or waiver thereof, has been applied for from the State of Illinois.

#### DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

Due to the inhospitable benthic environment adjacent to the Canal, the placement of rock fill in this area is expected to stabilize part of the local substrate. This stabilization effort should provide crevices and interstices in which certain aquatic organisms can feed and reproduce. In terms of habitat diversity, therefore, slope protection will have a net positive effect on the aquatic ecosystem.

#### DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

No secondary effects on the aquatic ecosystem are anticipated. 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 WITH THE RESTRICTIONS ON DISCHARGE

1. No significant adaptations of the 404(b)(1) guidelines were made relative to this evaluation.

2. Evaluation of Practicable Alternatives. Refer to Environmental Assessment Sections III and VII.

A. No Federal Action. This alternative was not selected because this alternative does not address the problem at hand; if the dike is allowed to deteriorate beyond repair, failure of the dike may occur.

B. Proposed Actions. The proposed actions are considered environmentally and economically acceptable as planned. Placement sites and methodology have been selected to reduce water quality impacts, as well as impacts to the riverine system. Materials discharged will be chemically and physically stable.

3. Permits, certification, or waiver of certification under Section 404 of the Clean Water Act will be obtained before a Finding of No Significant Impact is signed. The projects will be in compliance with water quality requirements of the State of Illinois.

4. The project is not anticipated to introduce any toxic substances into nearby waters or result in increases in existing levels of toxic materials.
5. No significant impact to Federal or State-listed endangered species will result from the proposed actions.
6. The project is situated along an inland freshwater stream system. No marine sanctuaries are involved or would be affected by the proposed actions.
7. No municipal water supplies will be affected by the proposed actions, and no degradation of waters of the United States is anticipated to result from the proposed actions.
8. The materials used for construction will be chemically and physically stable and noncontaminating.
9. No other practical 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 will not significantly impact water quality and will improve the integrity of an authorized navigation system.

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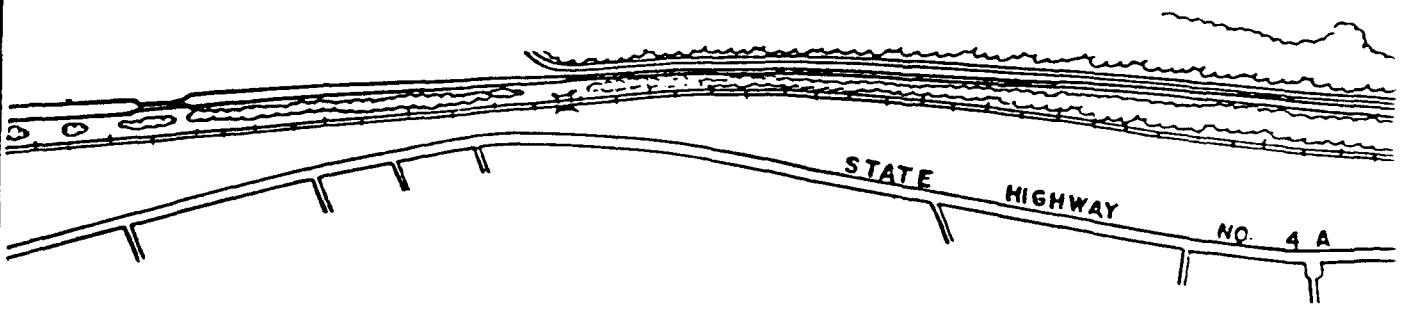
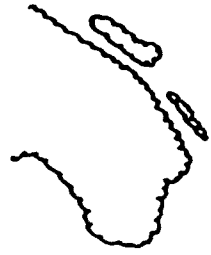
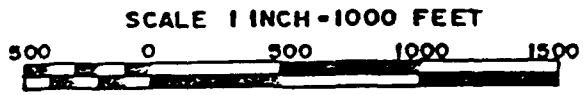
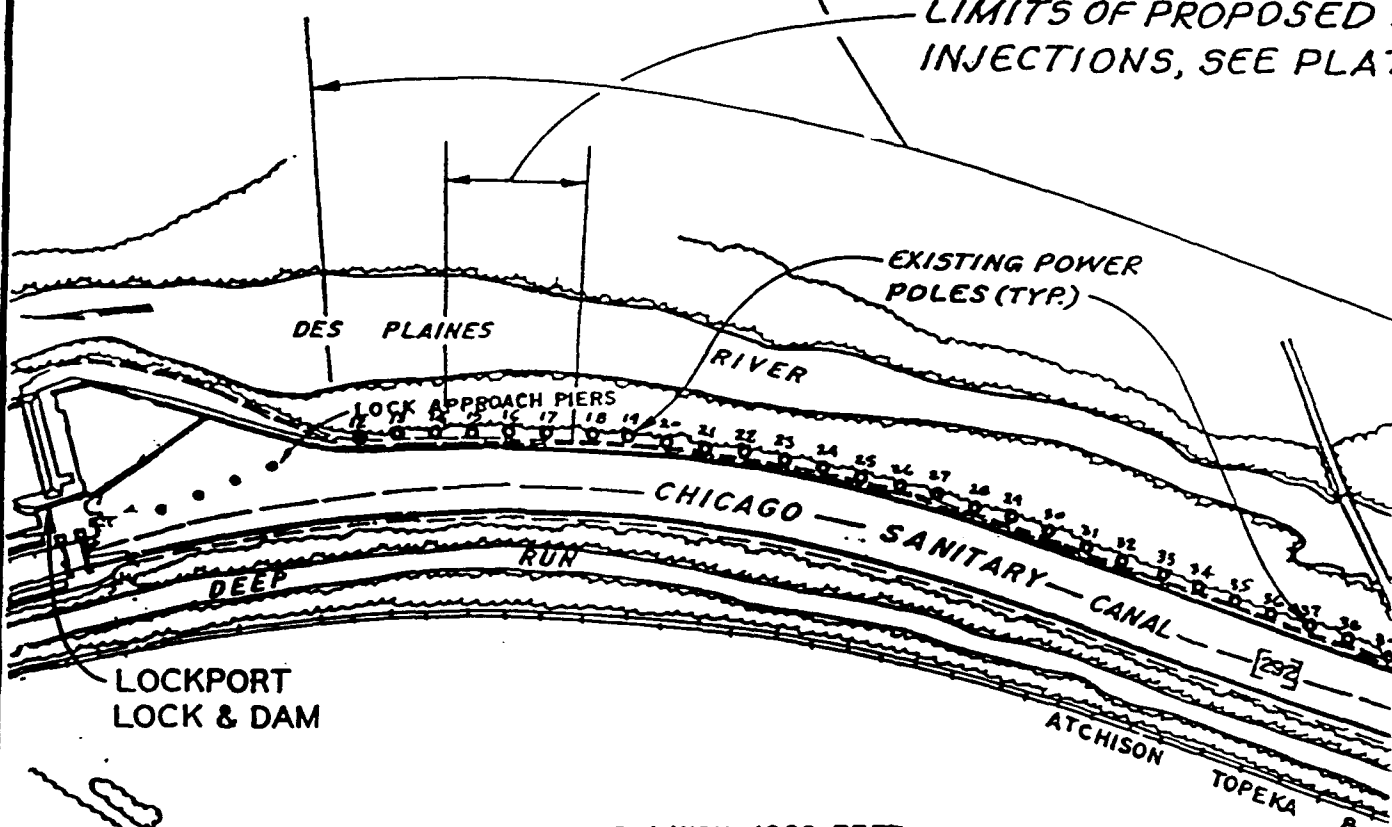
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District Engineer



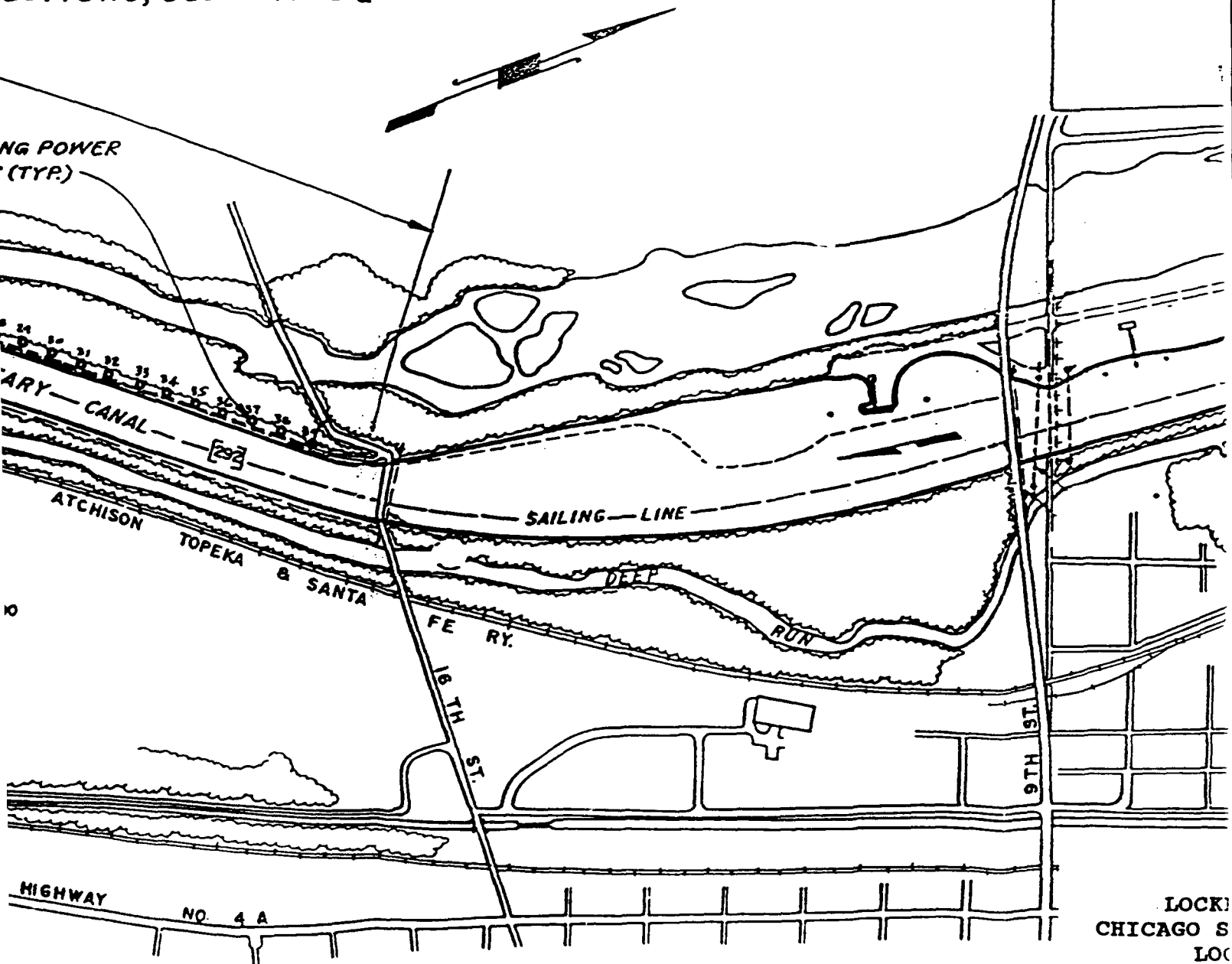
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SEE PLATE 2.

LIMITS OF PROPOSED  
INJECTIONS, SEE PLATE 7



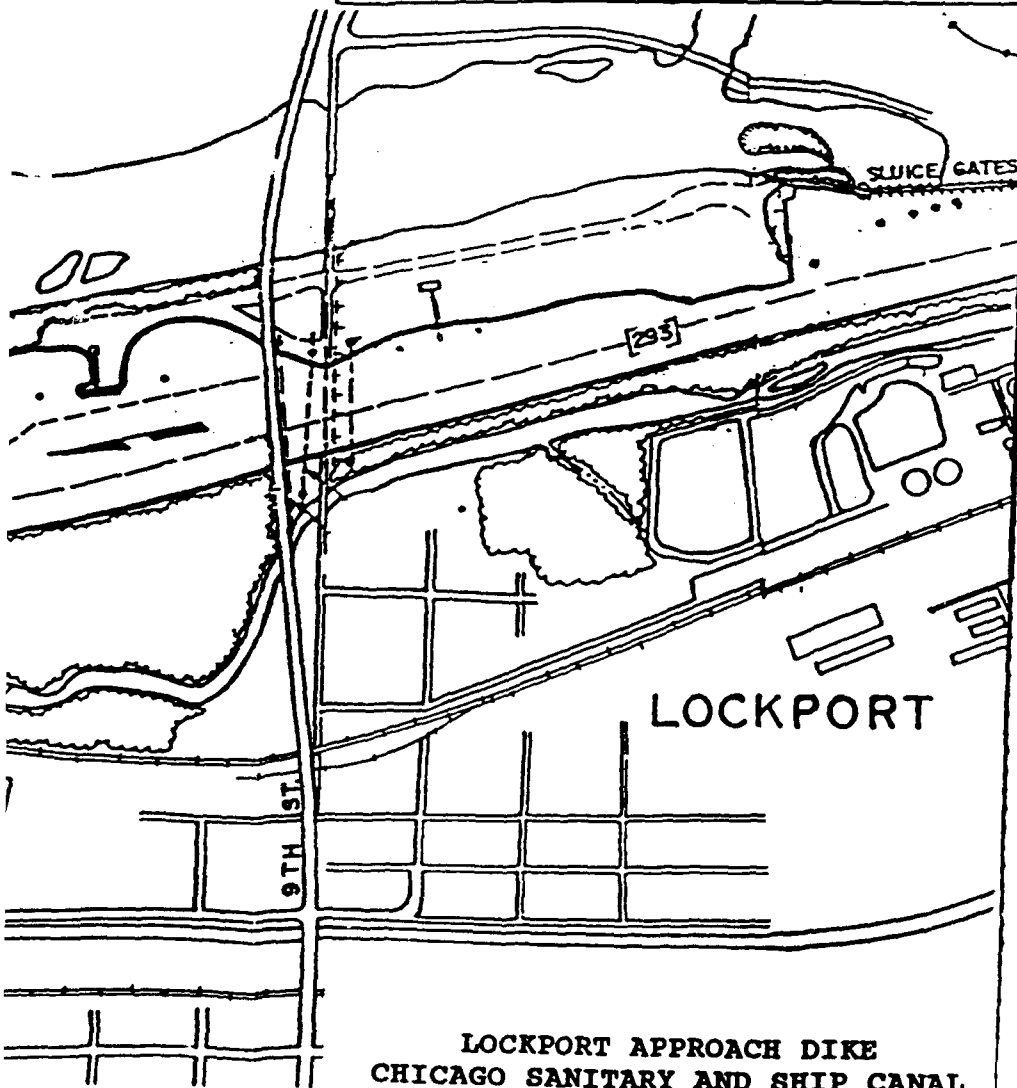
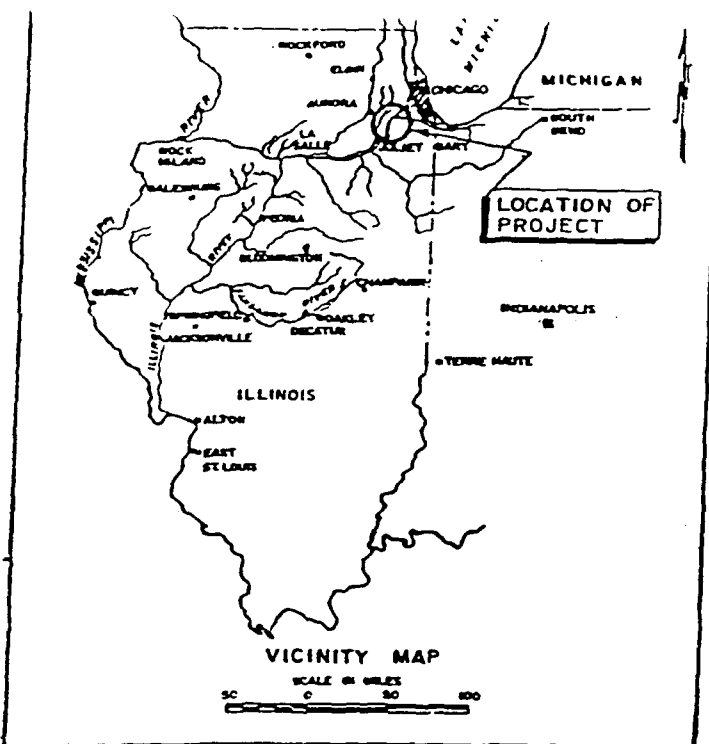
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LOCKPORT APPROACH DIKE  
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GENERAL LOCATION MAP

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