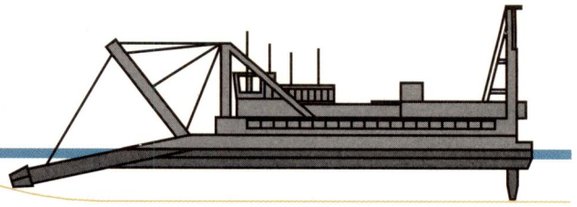
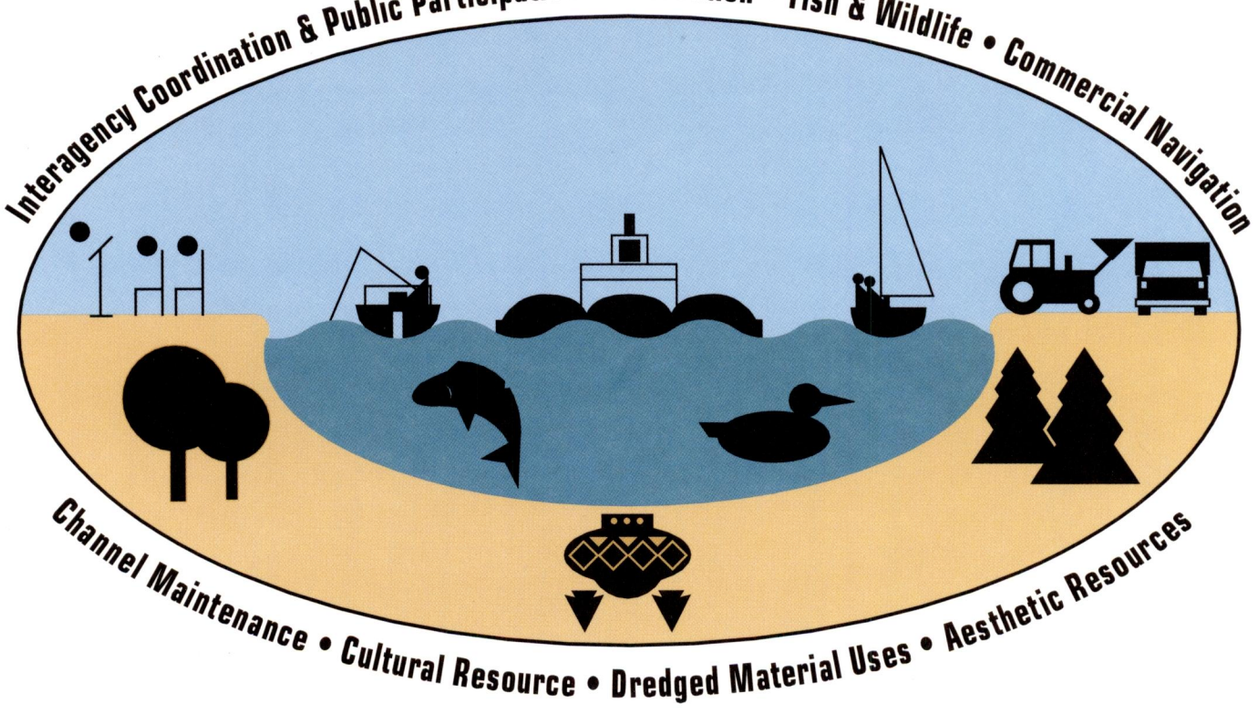
US Army Corps
of Engineers®
St. Paul District



CHANNEL MAINTENANCE MANAGEMENT PLAN



CENCS-CO-MR-Waterways 15 May 1998

MEMORANDUM FOR: Corps of Engineers, St. Paul District Channel Maintenance Management Plan (CMMP) recipients.

SUBJECT: 1998 Update of CMMP.

1. The enclosed information is provided to update pages in your CMMP. Please inspect the pages you received and contact me if you did not get all of the information. A list of pages you should have received can be found in the table on page 2 of this memorandum. Follow the actions identified in the table to update your copy of the CMMP.

2. If you received this update and do not have the original CMMP, contact me and the CMMP will be sent to you. If you know of someone who has a CMMP but did not receive the update information, contact me and the update will be sent.

4. It is very important that you **update your CMMP each year**. If it is not updated, future updates may not make sense. If you have any questions regarding the CMMP or on the actions required to update your copy, let me know. I can be contacted as follows:

Phone: ..... (608) 687-3011
Fax: ..... (608) 687-8753
Internet:..... steven.d.tapp@usace.army.mil
Mail:..... U.S. Army Corps of Engineers
Attn: Steven D. Tapp
431 North Shore Drive
P.O. Box 397
Fountain City, WI 54629-0397



STEVEN D. TAPP
Channel Maintenance Coordinator

Enclosure	Action Required
GENERAL INFORMATION TAB – Addendum to section 6.0.	Insert the addendum after page 14 in the GENERAL INFORMATION TAB.
TAB 1 – PROJECT INFORMATION Pages 1-4 of TAB 1-3 (April 1998).	Replace Pages 1-4 of TAB 1-3 (April 1997) with Pages 1-4 of TAB 1-3 (April 1998).
TAB 2 – ANNUAL SUMMARIES Pages 23-24.	Replace page 23 (April 1997) with page 23 (April 1998) and add page 24 (April 1998) after new page 23.
TAB 3 – SITE INFORMATION Pages 1-6 of TAB 3-1 (April 1998).	Replace Pages 1-6 of TAB 3-1 (April 1997) with Pages 1-6 of TAB 3-1 (April 1998).
TAB 3 – SITE INFORMATION Pages 1-8 of TAB 3-3 (April 1998).	Replace Pages 1-8 of TAB 3-3 (April 1997) with Pages 1-8 of TAB 3-3 (April 1998).
TAB 3 – SITE INFORMATION Page 2 of TAB 3-4 (April 1998).	Replace Page 2 of TAB 3-4 (April 1997) with Page 2 of TAB 3-4 (April 1998).
TAB 4 – CUT INFORMATION Pages 1-2 of TAB 4-1 (April 1998).	Replace Pages 1-2 of TAB 4-1 (April 1997) with Pages 1-2 of TAB 4-1 (April 1998).
TAB 4 – CUT INFORMATION Pages 7-12 of TAB 4-2 (April 1998).	Replace Pages 7-12 of TAB 4-2 (April 1997) with Pages 7-12 of TAB 4-2 (April 1998).
TAB 6 – PLACEMENT SITE PLAN Pages 1-3 of TAB 6 (April 1998).	Replace Pages 1-3 of TAB 6 (April 1997) with Pages 1-3 of TAB 6 (April 1998).

CENCS-CO-MR-Waterways 14 May 1999

MEMORANDUM FOR: Corps of Engineers, St. Paul District Channel Maintenance Management Plan (CMMP) recipients.

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Mail:.....U.S. Army Corps of Engineers
Attn: Steven D. Tapp
431 North Shore Drive
P.O. Box 397
Fountain City, WI 54629-0397

STEVEN D. TAPP
Channel Maintenance Coordinator

DONE

Enclosure	Action Required
TAB 2 – ANNUAL SUMMARIES Page 25.	Add page 25 (April 1999) after page 24.
TAB 3 – SITE INFORMATION Pages 1-8 of TAB 3-3 (April 1999).	Replace Pages 1-8 of TAB 3-3 (April 1998) with Pages 1-8 of TAB 3-3 (April 1999).
TAB 3 – SITE INFORMATION Page 2 of TAB 3-4 (April 1999).	Replace Page 2 of TAB 3-4 (April 1998) with Page 2 of TAB 3-4 (April 1999).
TAB 4 – CUT INFORMATION Pages 1-3 of TAB 4-1 (April 1999).	Replace Pages 1-2 of TAB 4-1 (April 1998) with Pages 1-3 of TAB 4-1 (April 1999).
TAB 4 – CUT INFORMATION Pages 1-16 of TAB 4-2 (April 1999).	Replace Pages 1-12 of TAB 4-2 (April 1997 & 1998) with Pages 1-16 of TAB 4-2 (April 1999).
TAB 6 – PLACEMENT SITE PLAN Pages 1-3 of TAB 6 (April 1999).	Replace Pages 1-3 of TAB 6 (April 1998) with Pages 1-3 of TAB 6 (April 1999).
TAB 7 – CHANNEL MANAGEMENT PLAN Pages 5-6 of TAB 7 (April 1999).	Replace Pages 5-6 of TAB 7 (April 1996) with Pages 5-6 of TAB 7 (April 1999).

CEMVP-CO-CH

31 May ~~1999~~ 2000

MEMORANDUM FOR: Corps of Engineers, St. Paul District Channel Maintenance Management Plan (CMMP) recipients.

SUBJECT: 2000 Update of CMMP.

1. The enclosed information is provided to update pages in your CMMP. Please inspect the pages you received and contact me if you did not get all of the information. A list of pages you should have received can be found in the table on page 2 of this memorandum. Follow the actions identified in the table to update your copy of the CMMP.

2. If you received this update and do not have the original CMMP, contact me and the CMMP will be sent to you. If you know of someone who has a CMMP but did not receive the update information, contact me and the update will be sent.

4. It is very important that you **update your CMMP each year**. If it is not updated, future updates may not make sense. If you have any questions regarding the CMMP or on the actions required to update your copy, let me know. I can be contacted as follows:

Phone: .....(608) 687-3011
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Mail:.....U.S. Army Corps of Engineers
Attn: Steven D. Tapp
431 North Shore Drive
P.O. Box 397
Fountain City, WI 54629-0397

STEVEN D. TAPP
Channel Maintenance Coordinator

Enclosure	Action Required
TAB 2 – ANNUAL SUMMARIES Pages 26 & 27 (April 2000).	Add pages 26 & 27 (April 2000) after page 25.
TAB 3 – SITE INFORMATION Pages 1-8 of TAB 3-3 (April 2000).	Replace Pages 1-8 of TAB 3-3 (April 1999) with Pages 1-8 of TAB 3-3 (April 2000).
TAB 3 – SITE INFORMATION Page 2 of TAB 3-4 (April 2000).	Replace Page 2 of TAB 3-4 (April 1999) with Page 2 of TAB 3-4 (April 2000).
TAB 4 – CUT INFORMATION Pages 1-3 of TAB 4-1 (April 2000).	Replace Pages 1-2 of TAB 4-1 (April 1999) with Pages 1-3 of TAB 4-1 (April 2000).
TAB 4 – CUT INFORMATION Pages 1-16 of TAB 4-2 (April 2000).	Replace Pages 1-16 of TAB 4-2 (April 1999) with Pages 1-16 of TAB 4-2 (April 2000).
TAB 6 – PLACEMENT SITE PLAN Pages 1-3 of TAB 6 (April 2000).	Replace Pages 1-3 of TAB 6 (April 1999) with Pages 1-3 of TAB 6 (April 2000).
TAB 7 – CHANNEL MANAGEMENT PLAN Page 5 of TAB 7 (April 1996).	Replace Pages 5-6 of TAB 7 (April 1996 & 1999) with Page 5 of TAB 7 (April 1996).
TAB 7 – CHANNEL MANAGEMENT PLAN Page 1 of TAB 7-1 (April 2000).	Add Page 1 of TAB 7-1 (April 2000) after Page 5 of TAB 7 (April 1996).
TAB 7 – CHANNEL MANAGEMENT PLAN Page 1 of TAB 7-2 (April 2000).	Add Page 1 of TAB 7-2 (April 2000) after Page 1 of TAB 7-1 (April 2000).

CEMVP-CO-CH 8 June 2001

MEMORANDUM FOR: Corps of Engineers, St. Paul District Channel Maintenance Management Plan (CMMP) recipients.

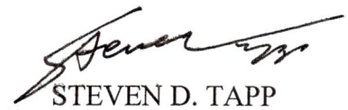
SUBJECT: 2001 Update of CMMP.

1. The enclosed information is provided to update pages in your CMMP. Please inspect the pages you received and contact me if you did not get all of the information. A list of pages you should have received can be found in the table on page 2 of this memorandum. Follow the actions identified in the table to update your copy of the CMMP.

2. If you received this update and do not have the original CMMP, contact me and the CMMP will be sent to you. If you know of someone who has a CMMP but did not receive the update information, contact me and the update will be sent. If you are receiving updates to your CMMP and do not wish to receive further updates, contact me and I will remove you from the distribution list.

4. It is very important that you **update your CMMP each year**. If it is not updated, future updates may not make sense. If you have any questions regarding the CMMP or on the actions required to update your copy, let me know. I can be contacted as follows:

Phone: .....(608) 687-3011
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431 North Shore Drive
P.O. Box 397
Fountain City, WI 54629-0397



STEVEN D. TAPP
Channel Maintenance Coordinator

Enclosure	Action Required
GENERAL INFORMATION Pages 1-29 (April 2001).	Replace pages 1-28 of GENERAL INFORMATION (April 1996) with pages 1-29 of GENERAL INFORMATION (April 2001).
TAB 2 – ANNUAL SUMMARIES Page 26 (April 2000) & Pages 27-29 (April 2001).	Replace pages 26 & 27 (April 2000) with page 26 (April 2000) and page 27 (April 2001) and add pages 28 & 29 (April 2001) after page 27 of TAB 2.
TAB 3 – SITE INFORMATION Pages 1-8 of TAB 3-3 (April 2001).	Replace Pages 1-8 of TAB 3-3 (April 2000) with Pages 1-8 of TAB 3-3 (April 2001).
TAB 3 – SITE INFORMATION Page 2 of TAB 3-4 (April 2001).	Replace Page 2 of TAB 3-4 (April 2000) with Page 2 of TAB 3-4 (April 2001).
TAB 3 – SITE INFORMATION Page 1 of TAB 3-6 (April 2001).	Add page 1 of TAB 3-6 (April 2001) after page 6 of TAB 3-5.
TAB 4 – CUT INFORMATION Pages 1-3 of TAB 4-1 (April 2001).	Replace Pages 1-3 of TAB 4-1 (April 2000) with Pages 1-3 of TAB 4-1 (April 2001).
TAB 4 – CUT INFORMATION Pages 1-16 of TAB 4-2 (April 2001).	Replace Pages 1-16 of TAB 4-2 (April 2000) with Pages 1-16 of TAB 4-2 (April 2001).
TAB 4 – CUT INFORMATION Page 1 of TAB 4-5 (April 2001).	Add page 1 of TAB 4-5 (April 2001) after page 1 of TAB 4-4 (April 1996).
TAB 6 – PLACEMENT SITE PLAN Pages 1-3 of TAB 6 (April 2001).	Replace Pages 1-3 of TAB 6 (April 2000) with Pages 1-3 of TAB 6 (April 2001).
TAB 7 – CHANNEL MANAGEMENT PLAN Page 1 of TAB 7-1 (April 2001).	Replace Page 1 of TAB 7-1 (April 2000) with Page 1 of TAB 7-1 (April 2001).
TAB 7 – CHANNEL MANAGEMENT PLAN Page 1 of TAB 7-2 (April 2001).	Replace Page 1 of TAB 7-2 (April 2000) with Page 1 of TAB 7-2 (April 2001).

CHANNEL MAINTENANCE MANAGEMENT PLAN

EXECUTIVE SUMMARY

Upper Mississippi River System
Corps of Engineers, St. Paul District
— October 1995 —

INTRODUCTION

The Channel Maintenance Management Plan (CMMP) is a comprehensive long term plan for channel and harbor maintenance related activities on various navigation projects in the Corps of Engineers St. Paul District. It identifies designated dredged material placement sites, describes a strategy for placement site planning, discusses alternative channel maintenance techniques, and documents policies and procedures. While long term in nature, the plan is designed to accommodate new information and changes.

HISTORICAL PERSPECTIVE

The first navigation improvement and maintenance on the Upper Mississippi River (UMR) was legislated by Congress in 1824 when the Corps was authorized to remove snags and sandbars and confine flows to the main channel. Congressional acts in 1878 and 1907 authorized construction of a 4.5 foot and 6.0 foot channel respectively. These were maintained with the help of wing dams, closing dams, and limited dredging. The Rivers and Harbors Act of 1930 authorized the existing 9-foot channel project which was implemented by constructing a series of locks and dams. However, it was recognized that, even with the navigation dams, supplemental dredging would be necessary, so the construction of two modern dredges including the Dredge WILLIAM A. THOMPSON was authorized. Initially after the lock and dam system was created, dredging volumes were heavy with nearly 5 million cubic yards (CY) dredged in 1938. Average annual dredging has declined steadily to the current average of 690,000 CY.



Prior to the mid-1970's the reach capability of dredging equipment was limited and dredged material was placed conveniently near the dredge cut. This had recognized environmental impacts and natural resource agencies stressed a need for changing channel maintenance practices. In response to the National Environmental Policy Act (NEPA), an Environmental Impact Statement (EIS), was prepared in 1974, for operation and maintenance of the navigation project. The EIS concluded that enhancing dredge equipment capability was needed to improve placement site selection. Also, in 1974, a state and federal agency team was organized to identify and study problems associated with the river and in particular channel maintenance practices. This effort developed into the Great River Environmental Action Team study or GREAT I which was formally authorized by Congress in 1976. The interagency team published a nine volume report in 1980, which included a placement plan for all dredged material anticipated until the year 2025 and various other recommendations. From this study many of the 80 recommendations directed at the Corps were subsequently implemented through incorporation into the operation and maintenance program of the project. A 1992 Implementation Status and Future Program

Report summarized achievements related to the GREAT I recommendations and noted the development of the CMMP as the Action Item 1, Future Program.

DREDGED MATERIAL MANAGEMENT

A basic objective of the District's dredged material placement site planning is to select environmentally acceptable sites where beneficial use of the material is possible. During the CMMP planning process the District reviewed the GREAT recommended sites and compared them with alternative sites to determine whether use was justified from economic, social, and environmental perspectives and to assure consistency with Federal laws and regulations. The planning process begins with the projection of dredging volumes and beneficial use quantities to determine the area required for a 40 year period. The identification of reasonable alternative placement sites is followed by evaluation and selection. Proposed plans are coordinated with other agencies through the River Resources Forum (RRF). Plans are also coordinated with the public through public meetings.

The CMMP is a composite of GREAT I study recommendations, Corps planning since GREAT, and subsequent changes and modifications. As new plans are developed and coordinated, they will be incorporated into the CMMP. Site specific information sheets and operational maps of placement areas are contained in Part III of the CMMP. Part III also includes a five year placement site action plan that will be updated annually.

Through the District's dredged material placement planning and active management practices, the anticipated acres of land needed for this plan has been reduced by over 25 percent and anticipated wetland impacts have been reduced by 55 percent from the GREAT study recommendations.

The Corps prefers to place material at permanent federally owned sites which will be managed to extend their longevity by minimizing dredging quantities and promoting beneficial use. Site preparation and care will vary depending on the need to protect the site for aesthetic or social concerns or to prevent erosion. Non federally owned sites are used through real estate arrangements with the landowners. In some cases it is necessary to place dredged material at a temporary site because it is more efficient to do so or because of emergency channel conditions.

The District has provided dredged material for various beneficial uses to other agencies, local communities, and private individuals at no cost. In the 10 year period from 1985 through 1994, 80 percent of all material dredged has been placed at beneficial use locations. The dredged material is primarily medium grain sand that is used as an aggregate in construction products, for winter road ice control, landfill for development, fill for construction projects, environmental enhancement projects, recreational beach maintenance and many other uses. Because these opportunities are sometimes unpredictable, it is necessary to retain flexibility in the placement site selection and approval process. Recreational beaches on islands have long been popular with boaters and the District encourages using dredged material to enhance appropriate beaches. Interagency groups have developed beach plans and will continue to work together on implementing them.

CHANNEL MANAGEMENT

It is the District's objective to optimize the balance between dredging frequency, quantity, and cost without compromising safety and reliability. To avoid frequent re-dredging and ensure the least overall cost of maintaining the project, advance maintenance dredging to a

specified depth and/or width is practiced. To assure a 9 foot channel is available, dredging is initiated when shoaling results in depths less than 10.5 feet. Dredging is then accomplished to a depth between 11 and 13 feet below low control pool elevation. Authorized depths and widths plus some of the factors and criteria that determine them are explained in Part III of this plan.

The Mississippi River is a complex and dynamic system for sediment movement. As data collection and evaluation capability improve, the magnitude of these changes is becoming more quantifiable. Some major factors which influence shoaling in the navigation channel are hydrologic events and related flow conditions, river geomorphology, and channel control structures.



Part III of this plan contains a summary of all dredging since 1970. The District has been very successful in reducing dredging quantities through active management practices. Since 1975 yearly dredging quantities have averaged about 690,000 CY down from 1.5 million CY for the years 1956-74. The twenty mile reach below the mouth of the Chippewa River accounts for about 45% of the District's dredged material. While bank protection on the Chippewa has been studied, experts have concluded that it would not be economically feasible and would not substantially reduce sediment load.

Channel control structures like wing dams still perform a valuable role. Rehabilitating, restructuring, or supplementing these features can help reduce dredging requirements. The District identifies problem reaches that might be improved through structural measures and evaluates alternatives with other agencies and local organizations.

Adjusting channel dimensions, accurate channel marking, and information sharing are a few nonstructural techniques that can reduce dredging requirements. A technique used to dredge material before it becomes a navigation problem is a sediment trap like the one that has been effective at the mouth of the Chippewa River. Snag removal is also accomplished at some locations when there is a safety concern.

HYDROGRAPHIC SURVEYS

Hydrographic surveys are used to monitor channel conditions, gather and share information, position navigation buoys, determine dredging requirements, calculate quantities, and assess scour. The District has two 36′ launches that can survey a 50′ swath with their retractable booms. A typical survey of 60 acres may take several hours. An on-board computer inputs data onto a disk which is transferred to the project office for processing and plotting onto a map of the river. Channel condition surveys usually begin on those reaches that have historically heavy shoaling, frequent dredging requirements, or other related problems. These surveys are the basic foundation for channel maintenance monitoring and are relied upon throughout the season to track channel conditions. Pre- and post-dredging surveys are performed to determine quantities and assure that dredging has been accomplished as specified.

DREDGING

The timing of dredging depends on the urgency of the situation, other dredging requirements, and location of dredging equipment. A comprehensive dredging schedule/summary is maintained, and is routinely updated as new information becomes available. The dredging

schedule is distributed to other agencies through the On Site Inspection Team. A site specific dredging notice is distributed when plans have been finalized. Placement site requirements are reviewed to assure that evaluations, documentation, permits, and other actions are completed.

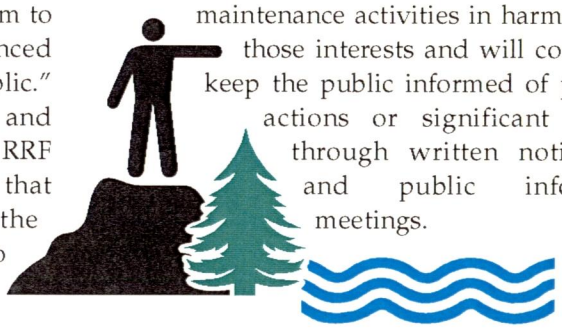
Where there are acceptable placement sites, the hydraulic pipeline cutterhead dredge is the best equipment suited for the UMR because it is the most efficient and cost effective. It does not work as well for small jobs or cuts with distant or small placement sites that cannot be reached with slurry pipes. Mechanical dredging with a backhoe or crane and transport barges is well suited for smaller jobs where placement sites are further than one mile from the dredge cut. Mechanical equipment is easier and faster to set up, but it is usually over twice as costly and not effective for extensive jobs.

The District's primary piece of dredging equipment is the 20″ cutterhead dredge William A. Thompson, which is used regularly on 1000 miles of the Mississippi and other navigable waters in the St. Paul, Rock Island, and St. Louis Districts. With booster pumps the maximum effective reach is 6500′ of floating pontoon pipeline and 3700′ of shoreline pipe. It operates 24 hours a day and production rates usually vary from 10,000 to 13,000 CY per day. The District also has a two crane barges that are used for some dredging jobs or emergencies, but most mechanical dredging is done by contract.

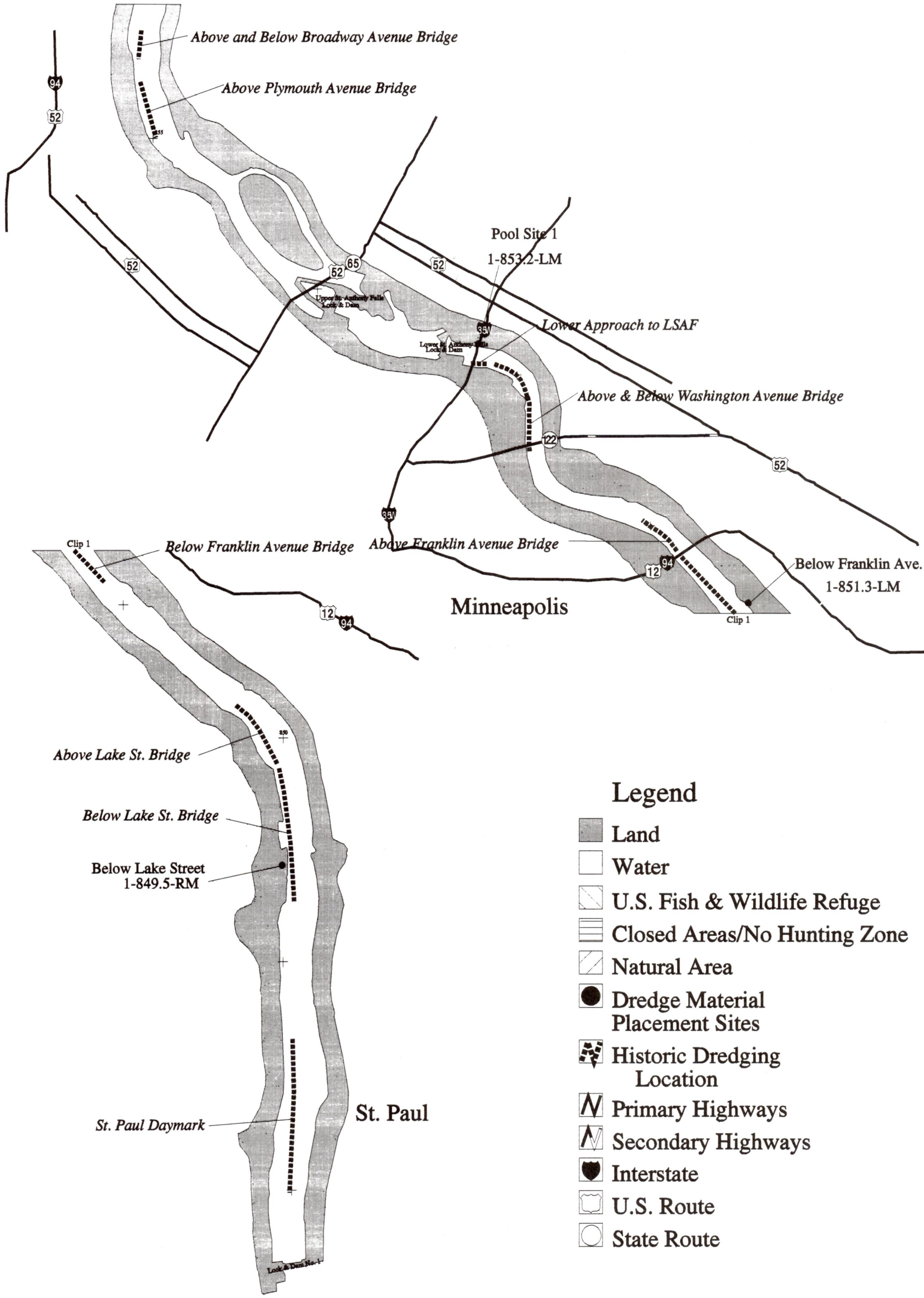
PROGRAM COORDINATION

To assure other interests are informed of channel maintenance activities and have an opportunity to provide input, the District coordinates the program primarily through two interagency groups, the On Site Inspection Team (OSIT) and the River Resources Forum (RRF). Appendix A of the plan provides details of interagency notification and coordination procedures. The OSIT was organized during GREAT I for coordination of dredging events and channel maintenance activities. The GREAT study also led to the formation of the RRF which is made up of six federal and seven state agencies. In 1991 the participating agencies entered into a partnership agreement with a commitment "... to work together as a trusting, cooperative team to manage the river from a resource-balanced approach in the best interest of the public." Through communication, cooperation and compromise the district has been attaining RRF consensus and will continue to pursue that support. Close communication with the navigation industry also is necessary to assure that channel maintenance is consistent with their needs. Procedures are established so towing operators can immediately report groundings or problems to the District.

The UMR projects have been authorized by Congress to provide economical transportation for the region and the country and to provide harbors for safety and recreational opportunities. It is the Corp's responsibility to maintain the benefits in the public's best interest. The public relies on the river for more than navigation including recreational boating, fishing, hunting, camping, residential development, commercial activities, sightseeing, and the enjoyment of nature. The District strives to conduct channel maintenance activities in harmony with those interests and will continue to keep the public informed of proposed actions or significant changes through written notifications and public information meetings.



Pool 1


Above and Below Broadway Avenue Bridge
Above Plymouth Avenue Bridge
Pool Site 1
1-853.2-LM
Lower Approach to LSAF
Above & Below Washington Avenue Bridge
Below Franklin Avenue Bridge
Above Franklin Avenue Bridge
Below Franklin Ave.
1-851.3-LM
Minneapolis
Above Lake St. Bridge
Below Lake St. Bridge
Below Lake Street
1-849.5-RM
St. Paul Daymark
St. Paul
Legend
Land
Water
U.S. Fish & Wildlife Refuge
Closed Areas/No Hunting Zone
Natural Area
Dredge Material Placement Sites
Historic Dredging Location
Primary Highways
Secondary Highways
Interstate
U.S. Route
State Route
Scale 1:27,000
KILOMETERS
1 0 1 2 3
N
W E
S

Pool 2

St. Paul Small Boat Harbor

St. Paul

St. Paul Barge Terminal
2-837.5-RM

St. Paul Barge Terminal

High Bridge
2-840.4-RM

Smith Avenue High Bridge

Holman Field
2-836.8-RM

South Port
2-836.3-RM

St. Paul

Lock & Dam No. 1

Mouth of the Minnesota River

St. Paul

South St. Paul

Clip 1

Clip 1

St. Paul Park

Grey Cloud Slough

Cottage Grove

Shiely Pit
2-822.5-LM

Lower Boulanger
2-821.1-LM

Boulanger Bend Lower Light

Pine Bend

Pine Bend
2-823.8-LM

C.F. Industries
2-823.8-RM

Spring Lake
2-822.8-RM

Upper Boulanger
2-821.5-LM

Boulanger Bend

Lock & Dam No. 2

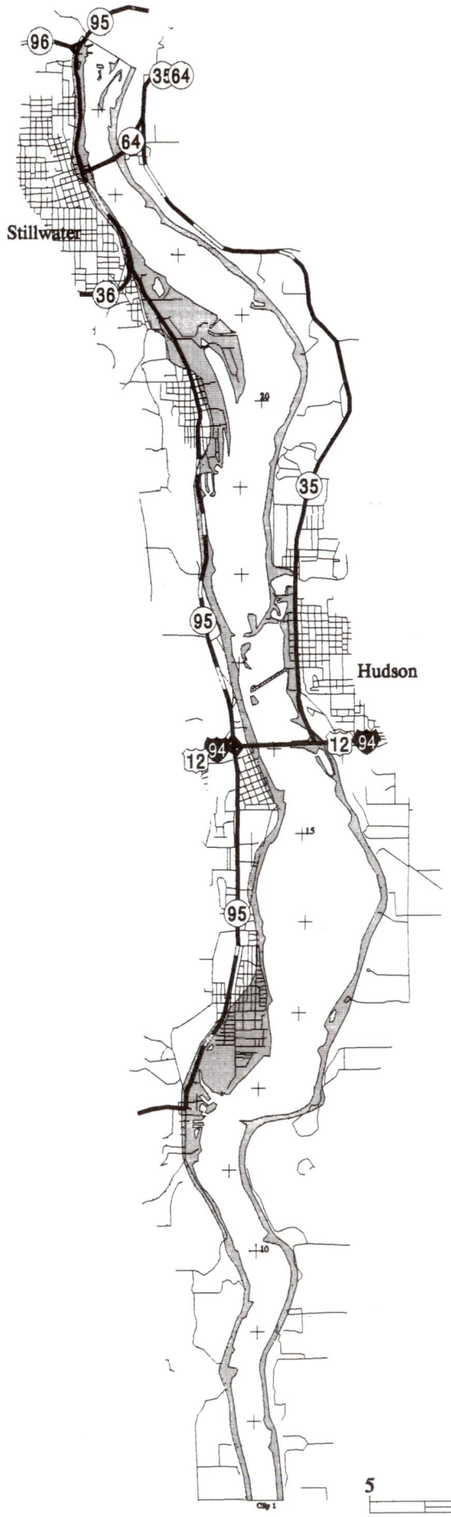
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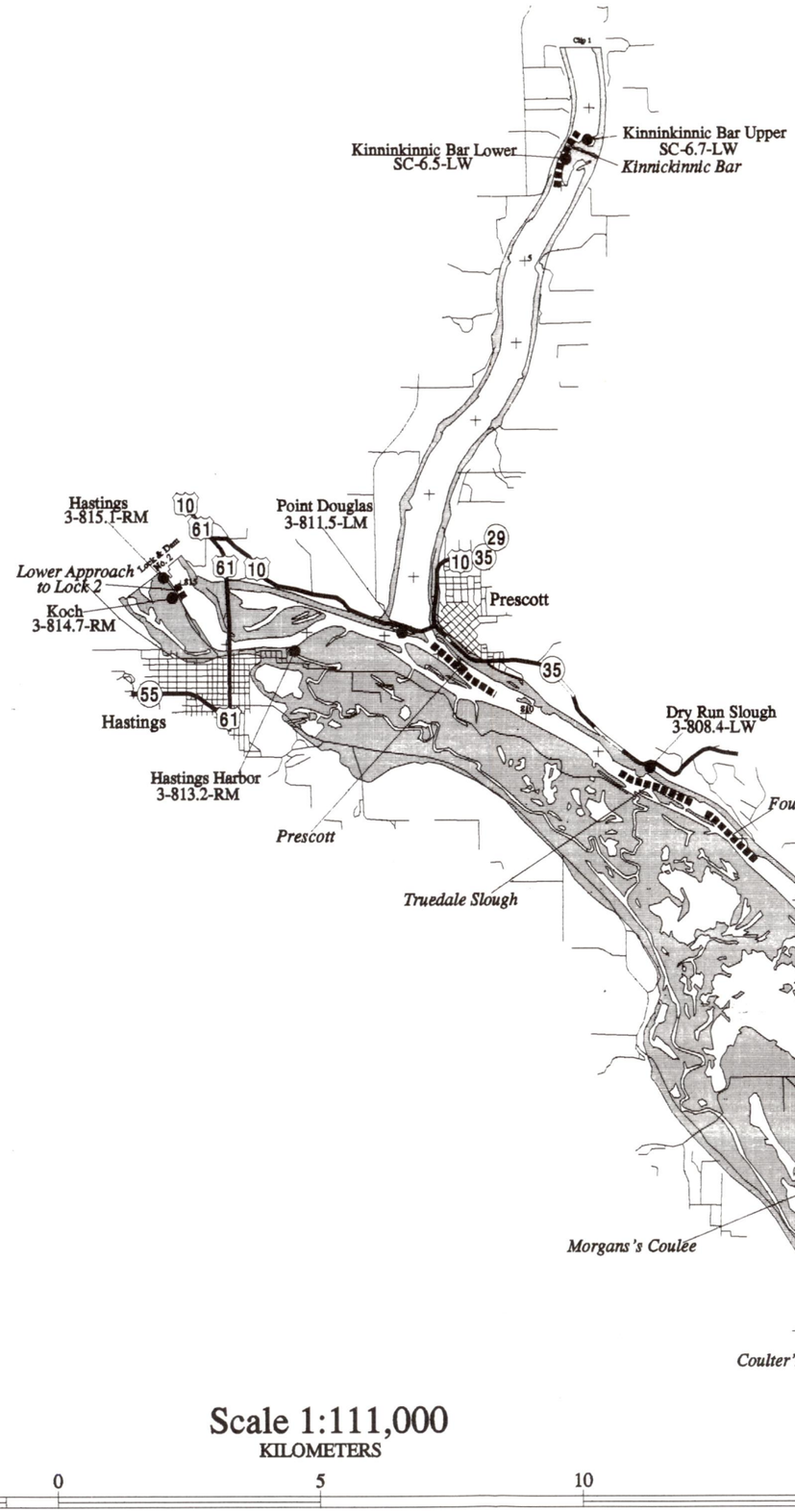
- Land
- Water
- U.S. Fish & Wildlife Refuge
- Closed Areas/No Hunting Zone
- Natural Area
- Dredge Material Placement Sites
- Historic Dredging Location
- Primary Highways
- Secondary Highways
- Interstate
- U.S. Route
- State Route

Scale 1:74000
KILOMETERS

2 0 2 4 6 8

Pool 3





Legend

- Land
- Water
- U.S. Fish & Wildlife Refuge
- Closed Areas/No Hunting Zone
- Natural Area
- Dredge Material Placement Sites
- Historic Dredging Location
- Primary Highways
- Secondary Highways
- Interstate
- U.S. Route
- State Route

Scale 1:111,000

KILOMETERS

5 0 5 10 15

N

W E

S

Regional Dredging Team Meeting

Pool 2 Tour
St. Paul to Hasting

September 16, 1998



TABLE OF CONTENTS

Summary of Dredging Locations - pool 2 1

High Bridge Placement Site 2

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Holman Field Airport 6

Southport 6

St. Paul Barge Terminal Dredge Location 7

Pine Bend 8

Shiely Pit 8

C.F. Industries 8

Grey Cloud Slough Dredge Location 9

Robinson Rocks Dredge Location 9

Pine Bend Dredge Location 9

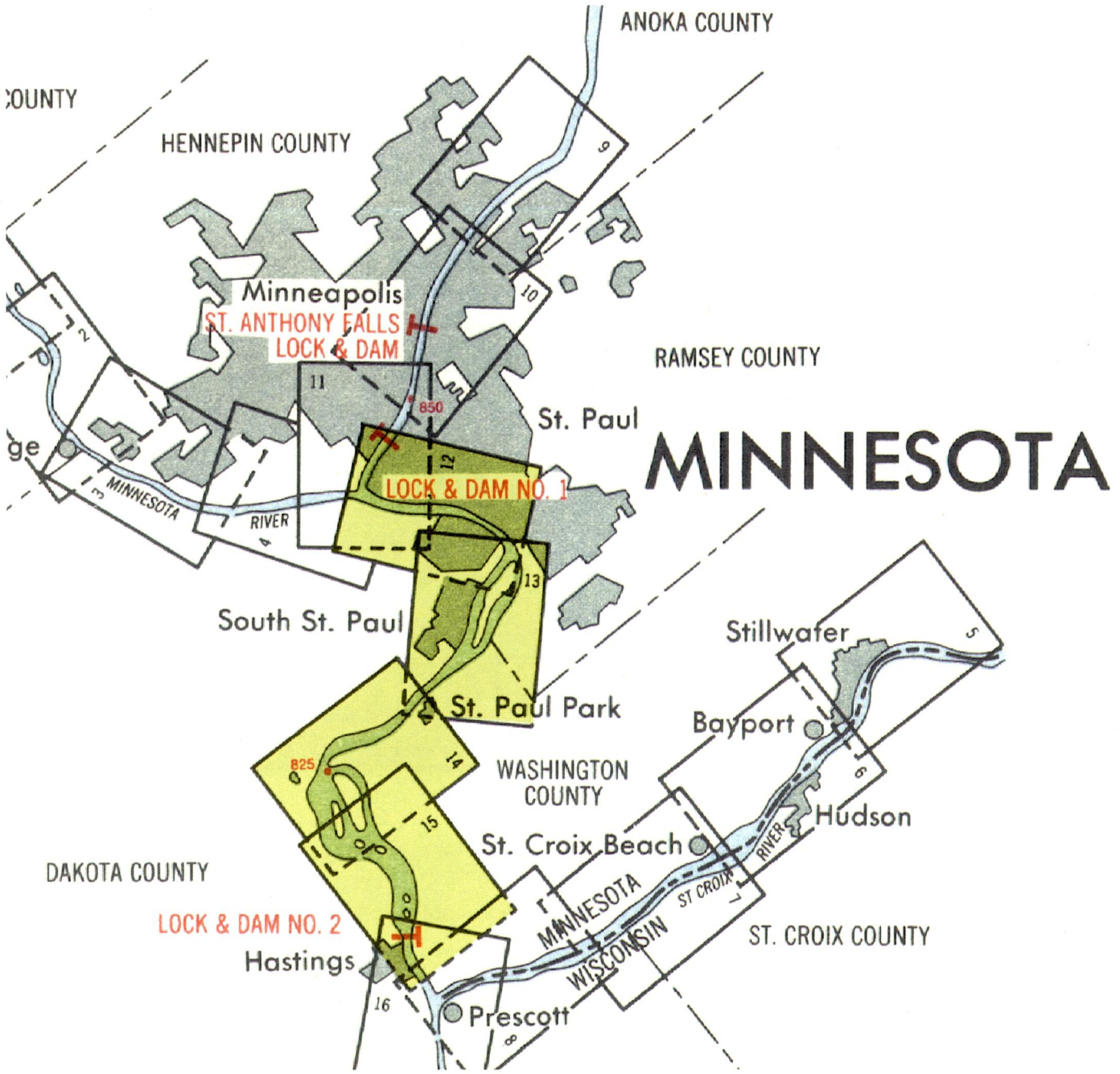
Upper Boulanger 10

Lower Boulanger 10

Boulanger Bend Dredge Location 11

Boulanger Bend Lower Light Dredge Location 11

Notes 12

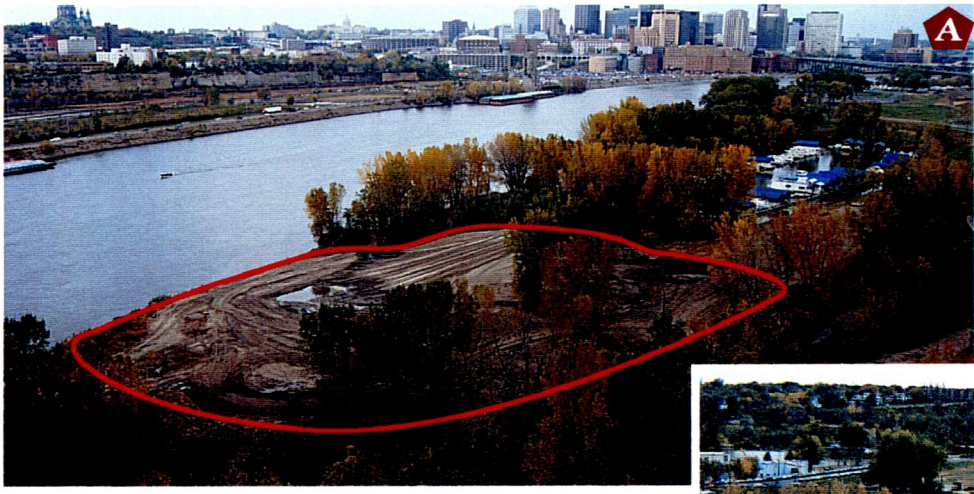


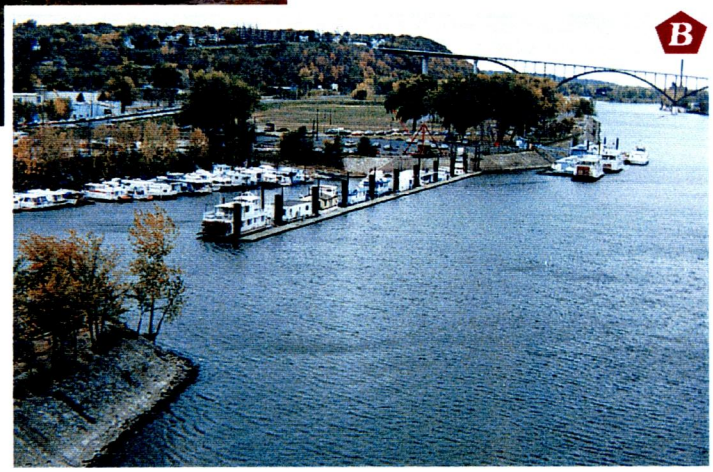
SUMMARY OF DREDGING LOCATIONS - ST PAUL DISTRICT
POOL 2, 1970 TO 1997

April 1998

Historic Dredge Cuts			Frequency Of	Avg. Volume	Avg. Volume	Last Year
Page	Cut Name	Location	Dredging (%)	Per Job (1,000 c.y.)	Per Year (1,000 c.y.)	Dredged
5	Above & Below Smith Ave.	840.0-841.3	42.9	11.3	4.8	1994
7	St. Paul Barge Terminal	836.4-837.8	42.9	151.5	64.9	1996
9	Grey Cloud Slough	827.5-828.3	28.6	22.2	6.3	1995
9	Robinson Rocks	826.1	3.6	7.9	0.3	1977
9	Pine Bend	822.7-823.7	39.3	58.1	22.8	1997
11	Boulanger Bend	820.8-821.4	21.4	69.8	15.0	1997
11	Boulanger Bend Lower Light	819.0-819.8	17.9	68.4	12.2	1995

High Bridge Placement Site - Beneficial use stockpile site provided by the city of St. Paul. The city provides the site for placement of material dredged from the St. Paul Small Boat Harbor.



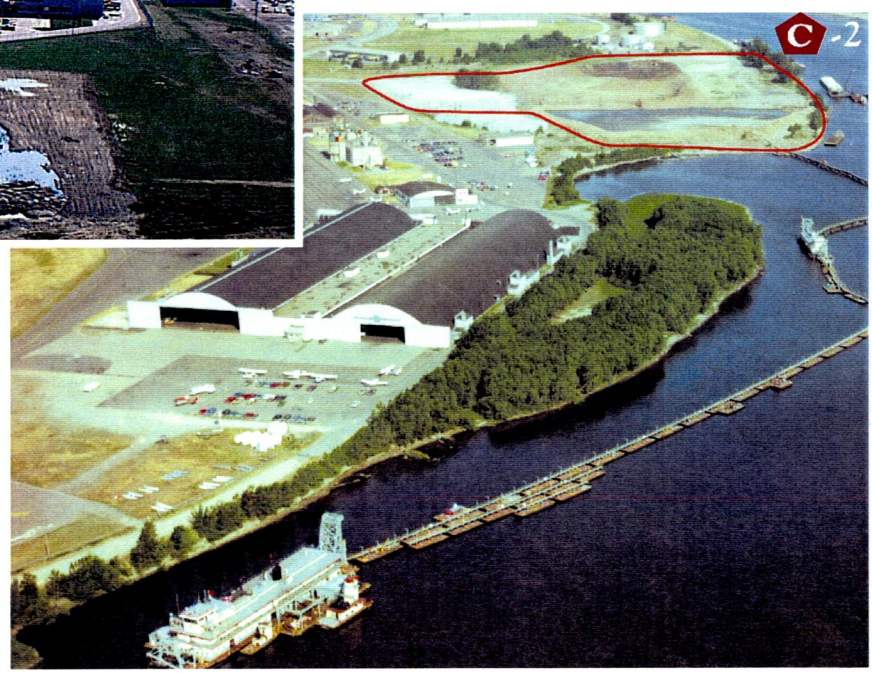


St. Paul Small Boat Harbor - One of the 11 small boat harbors authorized for maintenance by the St. Paul District. This project, located at the lower end of Harriet Island, was completed in 1949.

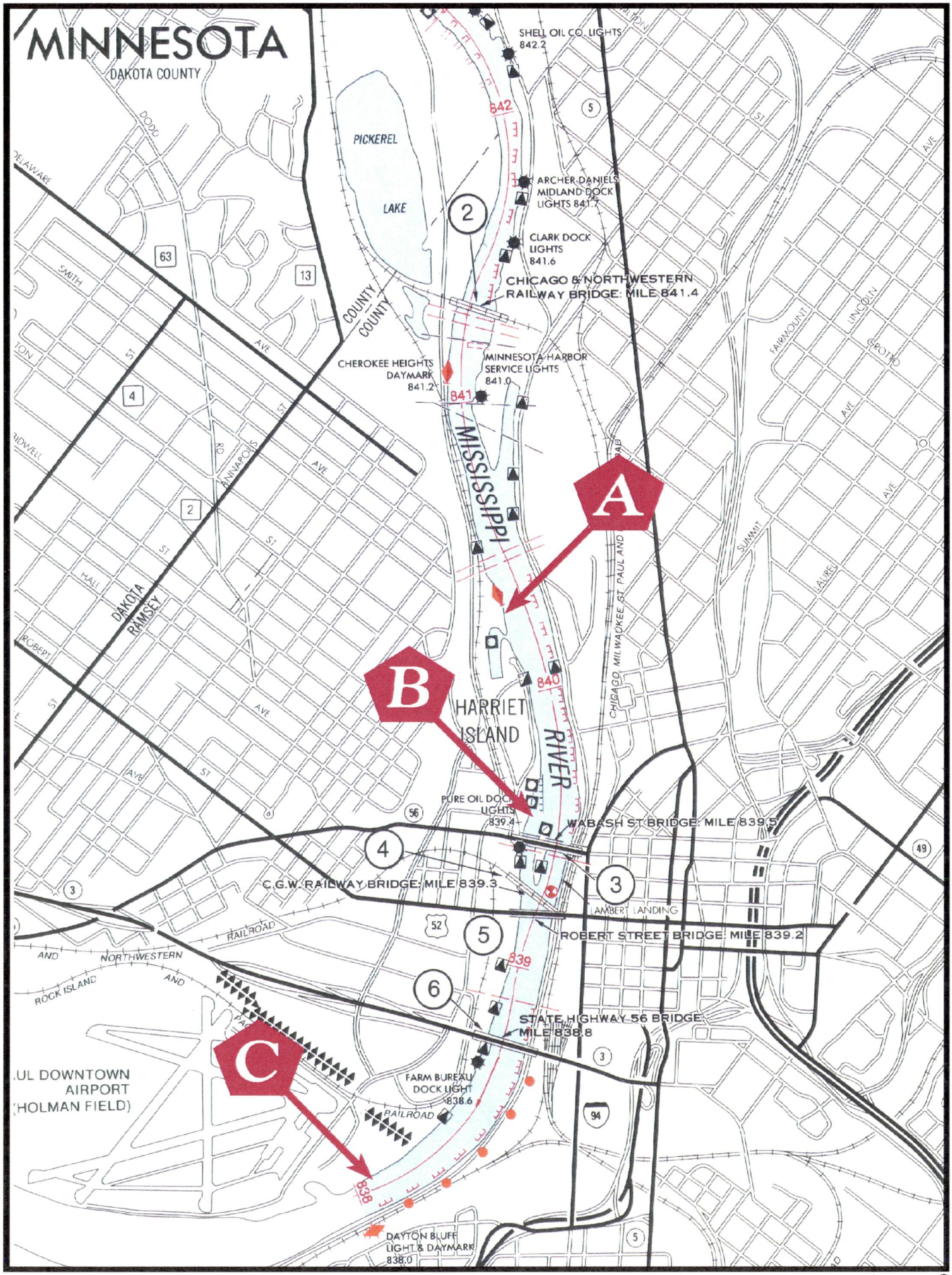
C-1



Northport / Pioneer Press - Material from the St. Paul Barge Terminal dredge cut was used as landfill at the Northport site.



Northport / Pioneer Press - This site was then used for construction of the St. Paul Pioneer Press building.


MINNESOTA
DAKOTA COUNTY
SHELL OIL CO. LIGHTS 842.2
842
PICKEREL LAKE
ARCHER-DANIELS-MIDLAND DOCK LIGHTS 841.7
CLARK DOCK LIGHTS 841.6
CHICAGO & NORTHWESTERN RAILWAY BRIDGE: MILE 841.4
CHEROKEE HEIGHTS DAYMARK 841.2
MINNESOTA HARBOR SERVICE LIGHTS 841.0
841
MISSISSIPPI RIVER
A
B
C
HARRIET ISLAND
840
PURE OIL DOCK LIGHTS 839.4
WABASH ST BRIDGE: MILE 839.5
C.G.W. RAILWAY BRIDGE: MILE 839.3
LAMBERT LANDING
ROBERT STREET BRIDGE: MILE 839.2
839
STATE HIGHWAY 56 BRIDGE: MILE 838.8
FARM BUREAU DOCK LIGHT 838.6
838
DAYTON BLUFF LIGHT & DAYMARK 838.0
DAKOTA
RAMSEY
CHICAGO, MILWAUKEE, ST. PAUL AND
RAILROAD
AND NORTHWESTERN
ROCK ISLAND AND
UL DOWNTOWN AIRPORT (HOLMAN FIELD)
DODD
SMITH
ST
AVE
63
13
4
2
5
56
52
94
49
3

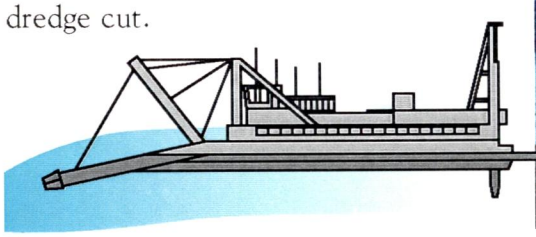


Pre-project

Warner Road - Prior to development, the site was used as a railroad yard and highway into St. Paul.

Dredging and Material Placement

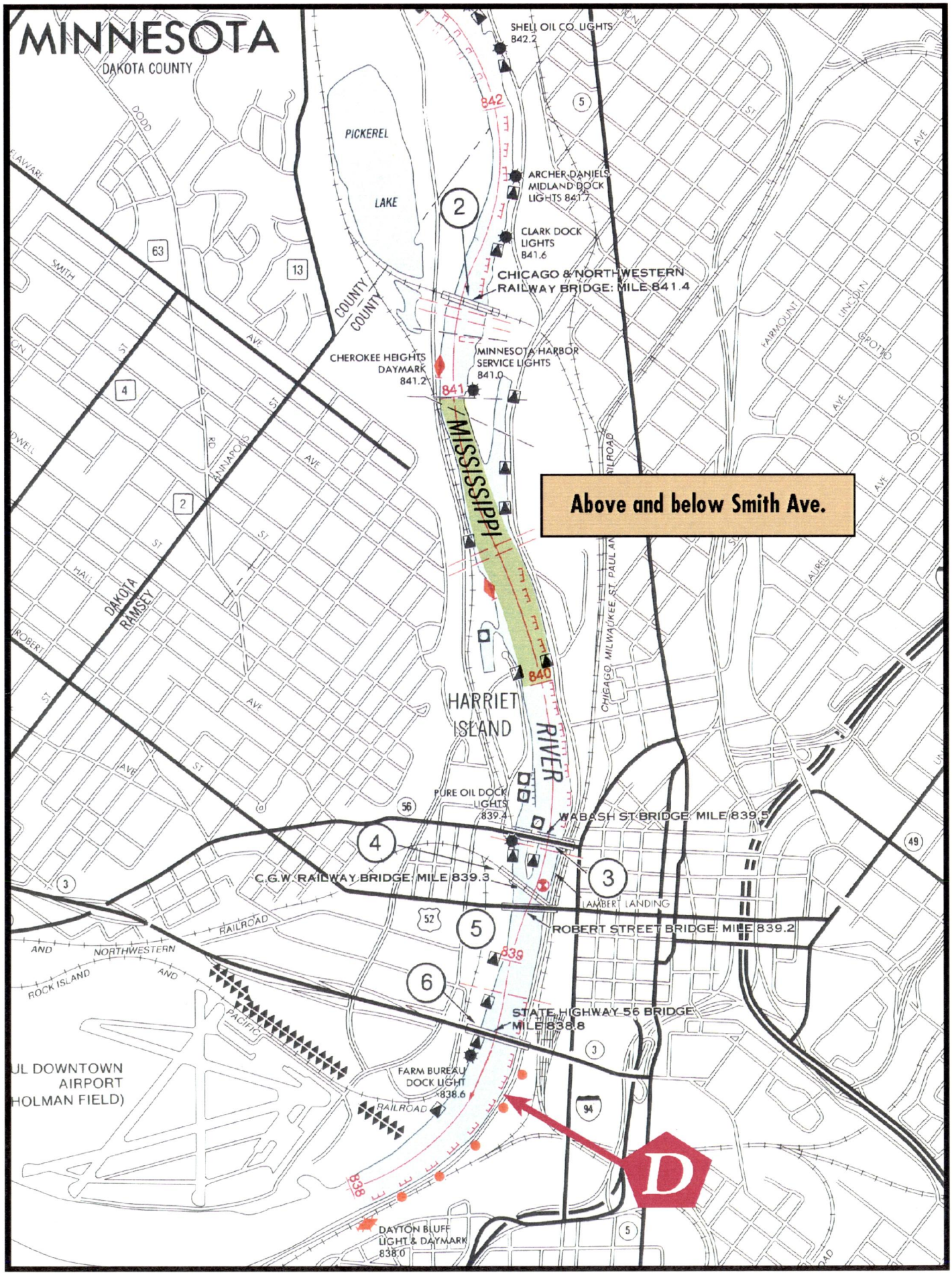
Warner Road- In 1993, the Corps provided nearly 250,000 cubic yards of material to the city of St. Paul as landfill for the construction of the Warner Road realignment project. Material for the project was dredged from the St. Paul Barge Terminal dredge cut.







Warner Road - Completed project following placement of dredged material and new road construction.


MINNESOTA
DAKOTA COUNTY
SHELL OIL CO. LIGHTS
842.2
842
PICKEREL
LAKE
ARCHER-DANIELS
MIDLAND DOCK
LIGHTS 841.7
CLARK DOCK
LIGHTS
841.6
CHICAGO & NORTHWESTERN
RAILWAY BRIDGE: MILE 841.4
CHEROKEE HEIGHTS
DAYMARK
841.2
MINNESOTA HARBOR
SERVICE LIGHTS
841.0
841
MISSISSIPPI
RIVER
Above and below Smith Ave.
HARRIET
ISLAND
840
PURE OIL DOCK
LIGHTS
839.4
WABASH ST. BRIDGE: MILE 839.5
C.G.W. RAILWAY BRIDGE: MILE 839.3
LAMBERT LANDING
ROBERT STREET BRIDGE: MILE 839.2
839
STATE HIGHWAY 56 BRIDGE:
MILE 838.8
FARM BUREAU
DOCK LIGHT
838.6
838
DAYTON BLUFF
LIGHT & DAYMARK
838.0
D
UL DOWNTOWN
AIRPORT
(HOLMAN FIELD)
RAILROAD
AND NORTHWESTERN
AND
ROCK ISLAND
PACIFIC
DAKOTA
RAMSEY
SMITH
AVE
ST
RD
63
13
4
2
56
52
94
49
3
5
6

St. Paul Barge Terminal - Implementation of this project would have involved construction of a sheet-pile wall adjacent to the shoreline (shown on photo) and filling behind it with dredge material. Following negotiations with other river resource partners, this site is no longer being considered because of floodplain and environmental impacts.

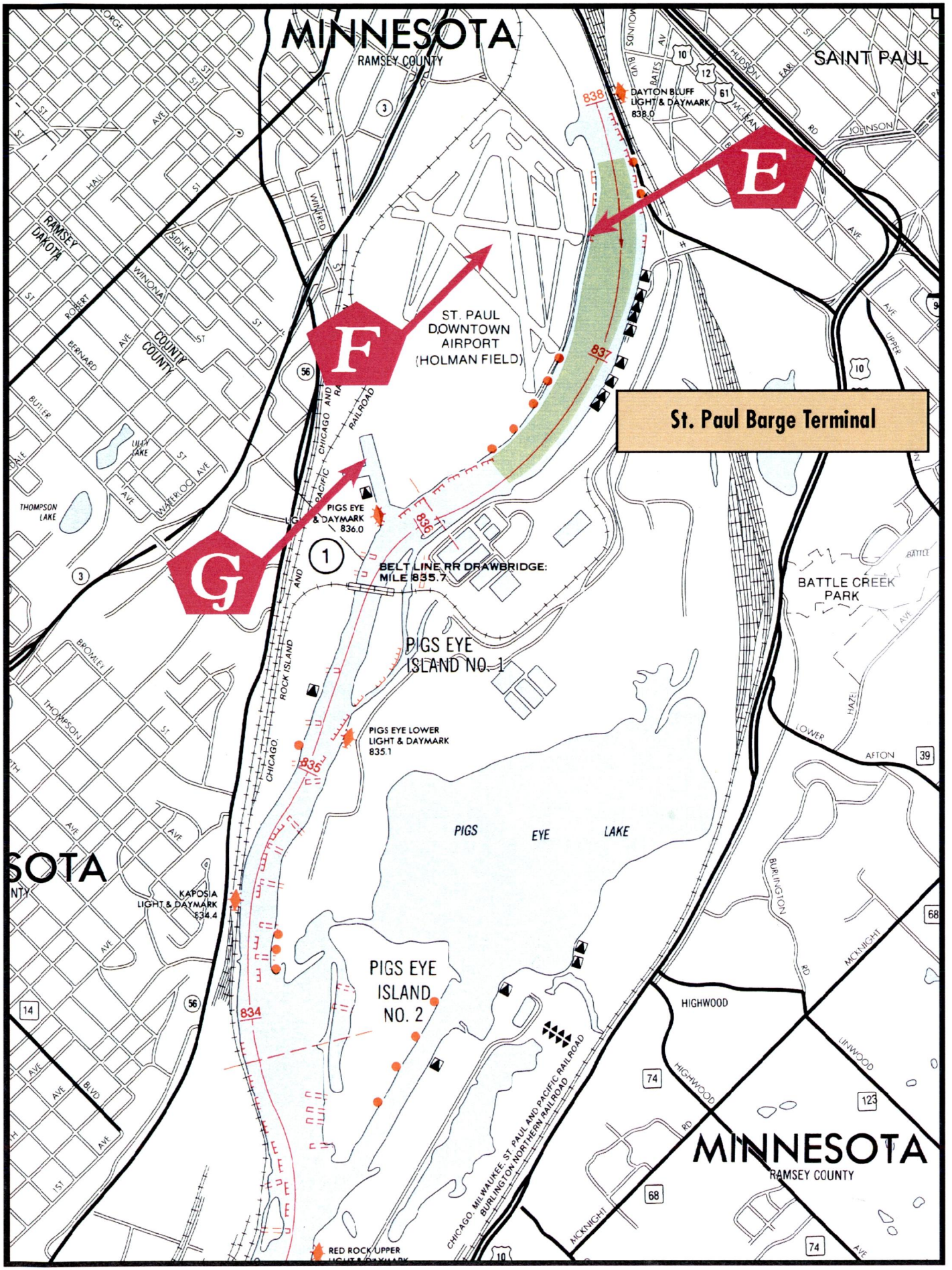


Holman Field Airport - The Holman Field site has been used several times in the past to provide fill for various stages of airport runway and building construction. At this time, the airport's fill requirements have been satisfied.

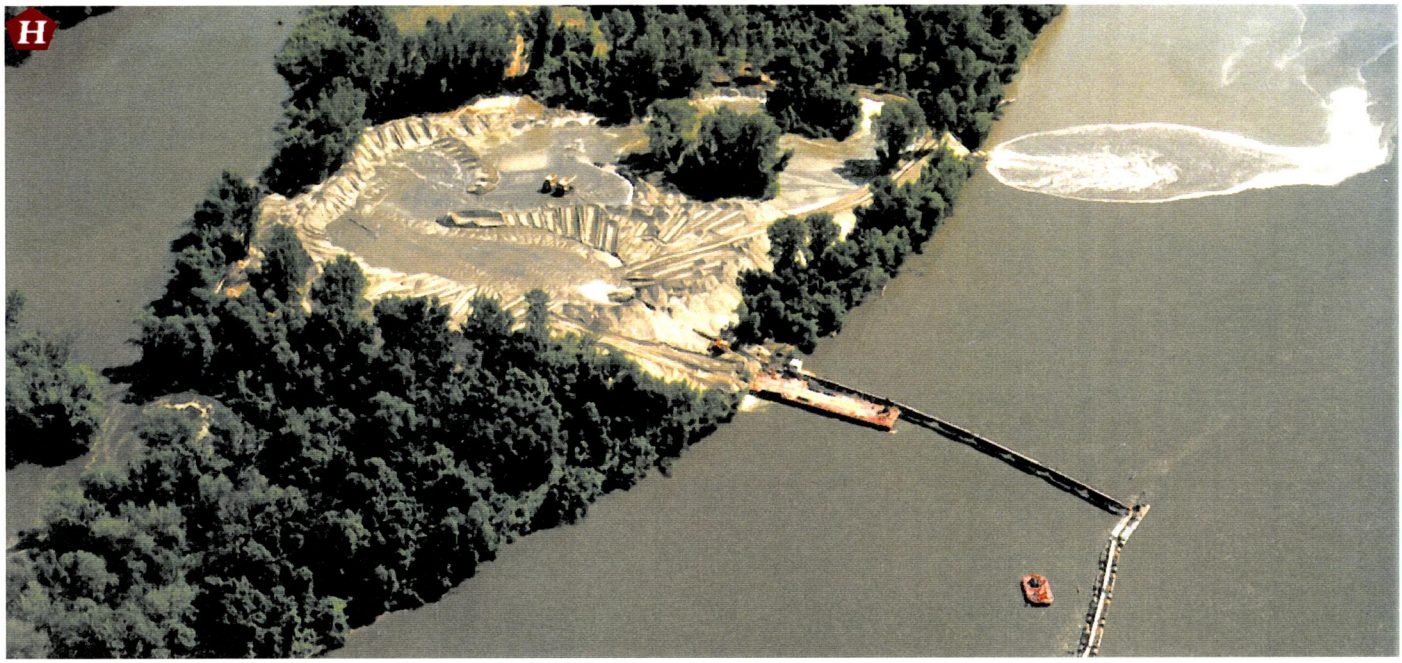




Southport - A long-term real estate agreement with the St. Paul Port Authority has recently been acquired. This 18-acre site will be diked and prepared for receiving material from hydraulic dredging operations.

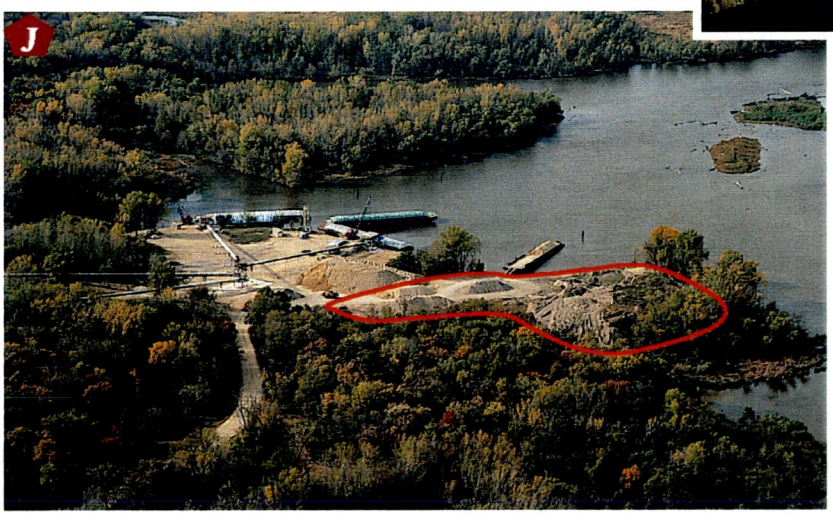

MINNESOTA
RAMSEY COUNTY
SAINT PAUL
DAYTON BLUFF LIGHT & DAYMARK 838.0
838
E
F
G
ST. PAUL DOWNTOWN AIRPORT (HOLMAN FIELD)
837
St. Paul Barge Terminal
PIGS EYE & DAYMARK 836.0
836
BELT LINE RR DRAWBRIDGE: MILE 835.7
BATTLE CREEK PARK
PIGS EYE ISLAND NO. 1
PIGS EYE LOWER LIGHT & DAYMARK 835.1
835
PIGS EYE LAKE
KAPOSIA LIGHT & DAYMARK 834.4
PIGS EYE ISLAND NO. 2
834
HIGHWOOD
CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD
BURLINGTON NORTHERN RAILROAD
MINNESOTA
RAMSEY COUNTY
RED ROCK UPPER

Pine Bend - This 8-acre, government-owned site, is used for temporary storage of material from routine dredging operations. In 1999, the site will be excavated and material transferred to a permanent location on Grey Cloud Island (Shiely Pit - see photo I).

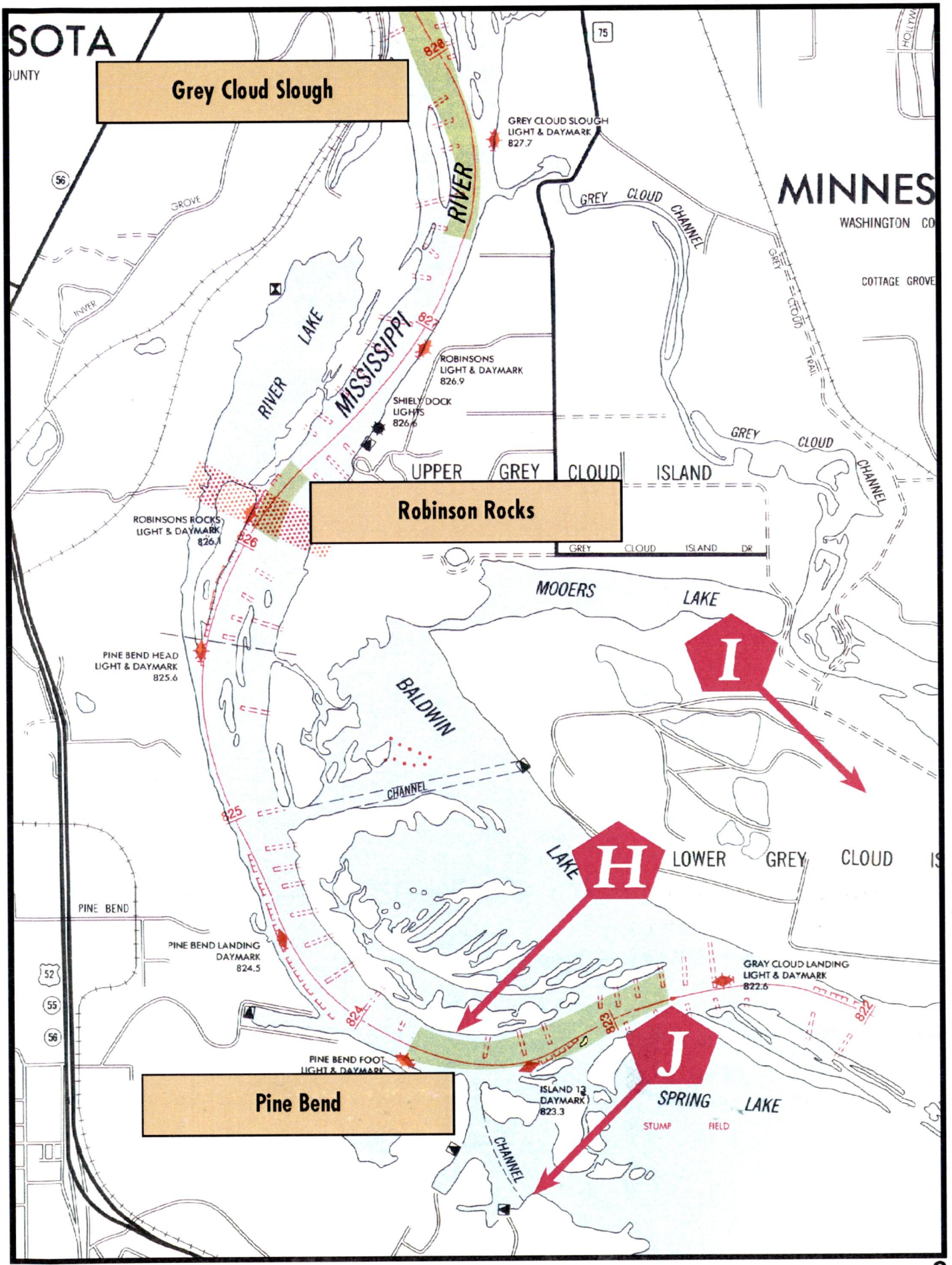


Shiely Pit - Material from three island sites historically used for dredged material placement will be transferred to this privately-owned site. The material will be used to reclaim an area previously excavated for sand and gravel mining operations.





C.F. Industries - Two areas for stockpiling dredged material are provided at this privately-owned site. One is at the dock pictured in this photo and the other is approximately 1200 feet from the dock site. Material is removed for beneficial use off-site.


Grey Cloud Slough
Robinson Rocks
Pine Bend
I
H
J
SOTA
DUNTY
MINNES
WASHINGTON CO
COTTAGE GROVE
828
827
826
825
824
823
822
RIVER
MISSISSIPPI
LAKE
GREY CLOUD SLOUGH LIGHT & DAYMARK 827.7
GREY CLOUD CHANNEL
GREY CLOUD TRAIL
ROBINSONS LIGHT & DAYMARK 826.9
SHIELY DOCK LIGHTS 826.6
UPPER GREY CLOUD ISLAND
GREY CLOUD CHANNEL
ROBINSONS ROCKS LIGHT & DAYMARK 826.1
GREY CLOUD ISLAND DR
MOOERS LAKE
PINE BEND HEAD LIGHT & DAYMARK 825.6
BALDWIN
CHANNEL
LOWER GREY CLOUD
PINE BEND
PINE BEND LANDING DAYMARK 824.5
GRAY CLOUD LANDING LIGHT & DAYMARK 822.6
PINE BEND FOOT LIGHT & DAYMARK
ISLAND 13 DAYMARK 823.3
SPRING LAKE
STUMP FIELD
CHANNEL
56
52
55
75

Upper Boulanger - This 4-acre, privately-owned site, is used for temporary storage of material from routine dredging operations. In 1999, the site will be excavated and material transferred to a permanent location on Grey Cloud Island (Shiely Pit - see photo I).

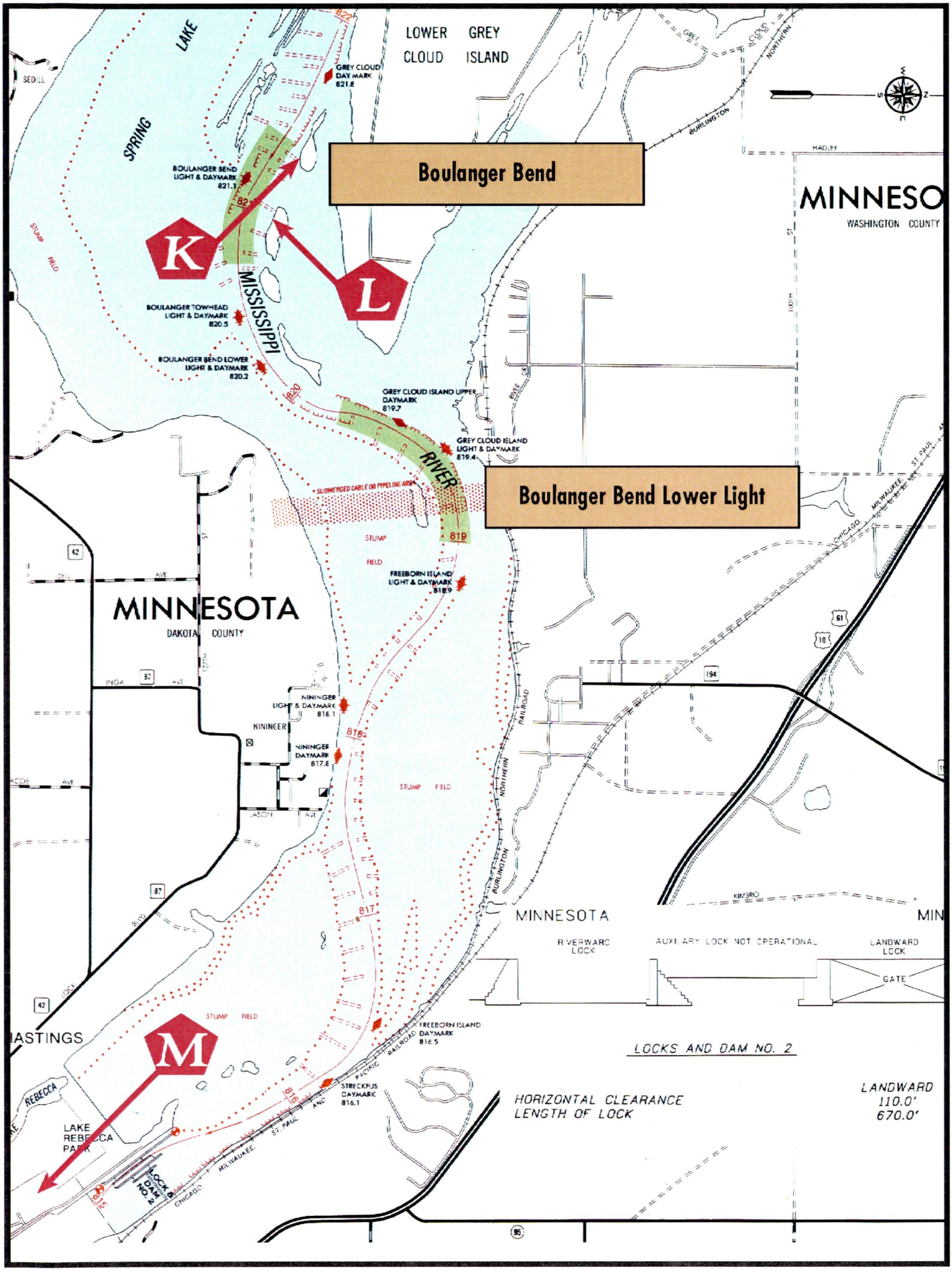


Lower Boulanger - This 8-acre, privately-owned site, is used for temporary storage of material from routine dredging operations. In 1999, the site will be excavated and material transferred to a permanent location on Grey Cloud Island (Shiely Pit - see photo I).



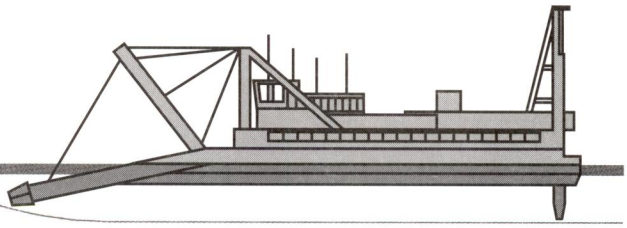


Koch - The Corps is currently working on a real estate agreement for use of 7 acres at this site. Road access to the site is excellent and beneficial use removal of all material stockpiled is expected.

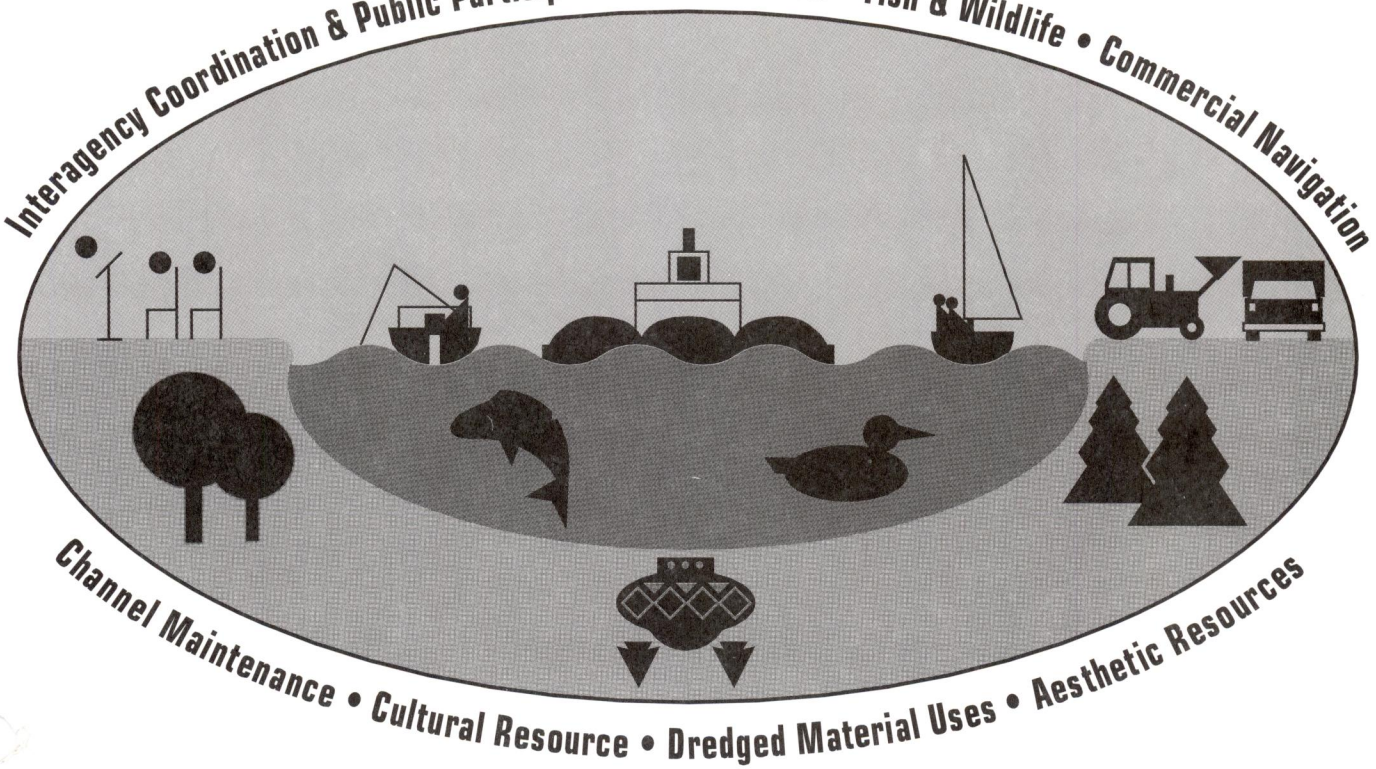

Boulanger Bend
Boulanger Bend Lower Light
LOWER GREY CLOUD ISLAND
LAKE SPRING
MISSISSIPPI RIVER
K
L
M
BOULANGER BEND LIGHT & DAYMARK 821.1
BOULANGER TOWHEAD LIGHT & DAYMARK 820.5
BOULANGER BEND LOWER LIGHT & DAYMARK 820.2
GREY CLOUD DAY MARK 821.8
GREY CLOUD ISLAND UPPER DAYMARK 819.7
GREY CLOUD ISLAND LIGHT & DAYMARK 819.4
FREEBORN ISLAND LIGHT & DAYMARK 818.9
NININGER LIGHT & DAYMARK 818.1
NININGER DAYMARK 817.8
FREEBORN ISLAND DAYMARK 816.5
STRECKFUS DAYMARK 816.1
SUBMERGED CABLE OR PIPELINE AREA
STUMP FIELD
MINNESOTA
DAKOTA COUNTY
WASHINGTON COUNTY
HASTINGS
LAKE REBECCA PARK
LOCK & DAM NO. 2
RIVERWARD LOCK
AUXILARY LOCK NOT OPERATIONAL
LANDWARD LOCK
GATE
LOCKS AND DAM NO. 2
HORIZONTAL CLEARANCE
LENGTH OF LOCK
LANDWARD
110.0'
670.0'

22410

Army Corps
of Engineers®
St. Paul District



CHANNEL MAINTENANCE MANAGEMENT PLAN



Channel Maintenance Management Plan
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GENERAL INFORMATION

Channel Maintenance Management Plan

Upper Mississippi River Navigation System
St. Paul District

1.0 Project Location And Description.

The St. Paul District is responsible for maintaining various navigation projects on the Upper Mississippi River (UMR) and several of its tributaries between Minneapolis, Minnesota and Guttenberg, Iowa. A table and project map located at TAB 1 - Project Information, describes the location of these projects, the boundaries and the authorized dimensions. These projects include navigation channels of varying dimensions, and harbors for both commercial and recreational craft. Maintenance involves dredging, snag removal and various structural and non-structural techniques as described further in this document. The maintenance work requirements are primarily associated with the 9-foot channel projects on the Mississippi and Minnesota Rivers.

2.0 Authorization.

The existing 9-foot navigation channel was authorized by the River and Harbor Act of 1930, which approved construction of a series of locks and dams, supplemented with channel maintenance dredging. Subsequent legislation extended the boundaries of the 9-foot navigation channel and added numerous small boat and commercial harbors to the UMR system. The ongoing program is funded through the Corps of Engineers' annual operation and maintenance appropriation.

3.0 Channel Maintenance Management Plan Objectives.

3.1 Purpose. The Channel Maintenance Management Plan (CMMP) merges previous planning efforts into a comprehensive long-term management plan for channel and harbor maintenance related activities that are associated with the described projects. It consolidates dredged material management plans (DMMP), describes the District's long term management strategy (LTMS) for placement site planning, discusses alternative channel maintenance techniques, and documents policies, procedures and past practices. It will be used as a comprehensive guide for the District's channel maintenance program and to inform other agencies and the public of practices and actions. This plan, while long term in nature, is designed to accommodate new information or changes as developments occur. Revisions will be

prepared, coordinated and distributed as necessary.

3.2 Long Term Management Strategy (LTMS). It is the policy of the Corps of Engineers to develop and implement dredged material management plans (DMMP) that satisfy the long-term placement needs for Corps navigation projects. The DMMP should be for the anticipated project life or other reasonably long period of time, include all foreseeable work, address methods of reducing dredging requirements and costs, and give consideration to all management alternatives. It must be timely, technically feasible, cost-effective, and environmentally acceptable as dictated by established Federal standards, criteria and regulations.

The Corps has developed a consistent, logical procedure by which DMMP alternatives can be identified, evaluated, screened, and recommended so that the dredged material placement operations are conducted in a timely, cost-effective manner that is consistent with sound engineering practices and meets established environmental standards. The framework for DMMP development is a five-phase approach as summarized below. It serves as a guideline to the District for planning future channel maintenance actions.

Phase I - Evaluate Existing Management Options: Study boundaries are set for the geographic area and time period to be analyzed. Dredging needs are estimated in terms of volumes, frequency and dredged material characteristics. Demand for beneficial use of the dredged material is estimated. These projections result in an estimated site(s) capacity required for the time period studied.

Phase II - Formulate Alternatives: Alternatives are systematically developed for feasible management options that include structural and nonstructural techniques for reducing dredging requirements, and placement site alternatives. Data needs are identified and collected as necessary.

Phase III - Detailed Analysis of Alternatives: A detailed evaluation, screening, and selection of a preferred long-term dredged material placement site is conducted. It is a comparative assessment analysis that weighs and balances engineering, economic, and environmental factors and benefits. The purpose is to select the most practicable plan that consists of one or more alternatives, and to document that selection process. The process is explained further in section 6.1 and Appendix D - Placement Site Evaluation Procedures.

Phase IV - DMMP Implementation: Implementation of the selected plan is initiated with consideration of the administrative, procedural, management, and monitoring requirements. Environmental documentation is completed for the life of the plan; certifications, permits, easements and agreements are obtained; site preparation is accomplished as needed; and placement is initiated.

Phase V - Periodic Review and Update: The plan is periodically reevaluated based on factors such as changing regulations, economics or environmental conditions. Technological advances may also result in changes to the plan. The review process also verifies

the validity of any assumptions made in the planning process. Changes in dredged material management needs can be anticipated and accommodated through this phase.

4.0 Applicable Laws And Regulations.

Various laws and regulations apply to the District's channel maintenance operations and dredged material placement practices. The more significant are summarized below.

4.1 River and Harbor Acts of 1930, 1932 and 1958. These acts are the enabling legislation for many of the navigation projects specified in TAB 1-1. They authorize the continued operation and maintenance of the projects.

4.2 National Environmental Policy Act (NEPA). NEPA requires that federal agencies evaluate the effect their actions will have on the environment, and to give appropriate consideration to environmental values in the decision making process. An Environmental Impact Statement (EIS) for operation and maintenance of the Mississippi River navigation project was placed on file in 1974. A programmatic EIS was prepared in response to the GREAT I study in 1980. Environmental assessments have been routinely prepared for specific activities not fully addressed in those documents. An EIS has been prepared to evaluate the activities described in this Channel Maintenance Management Plan.

4.3 Clean Water Act (CWA). Section 404(b) of this act requires an evaluation of the impact of depositing dredged material or effluent water in navigable waters or adjacent wetlands. Criteria for evaluating these impacts are contained in EPA regulation 40 CFR 230. Section 404(t) of the Act requires that the Corps comply with state regulatory requirements when depositing dredged material below the ordinary high water mark or discharging an effluent. State permits are not required for the actual act of dredging, or when placement is above the ordinary high water mark or when there is no effluent discharge. The District has agreements and/or understandings with the States of Minnesota, Wisconsin and Iowa concerning regulatory requirements and procedures for dredged material placement. Key components of those agreements are described in Appendix A - Interagency Coordination Procedures.

Placement of rock to protect or restore existing structures or to repair previously placed shoreline protection is not subject to state regulatory requirements. It is also the Corps' position that state permits are not required for increases in dimensions of existing structures or for new construction, however the District will apply for state permits out of comity and with the understanding that the state will grant permits in a timely fashion.

4.4 Water Resource Development Acts (WRDA). These Acts periodically passed by Congress authorize various activities and programs that may directly or indirectly apply to the channel maintenance program. Examples include using dredged material to create or enhance wetlands, adoption of the GREAT study recommendations, establishment of mitigation policy, and prescribing wetland preservation goals.

4.5 Fish and Wildlife Coordination Act. This Act requires consultation with the U.S. Fish and Wildlife Service (FWS) and state agencies on proposed actions. The Upper Mississippi River is unique in that it is the only major river system in this country that is federally designated for both commercial navigation and fish and wildlife. The navigation channel passes directly through the Upper Mississippi River National Wildlife and Fish Refuge, which is located between Wabasha, Minnesota and Rock Island, Illinois. On the Minnesota River the navigation channel is immediately adjacent to the Minnesota Valley National Wildlife Refuge. Dredged material placement and other channel maintenance activities take place within these refuge boundaries. These activities and the associated effects on the refuges are evaluated in the accompanying EIS.

4.6 National Historic Preservation Act and EO 11593. Proposed channel maintenance activities must be reviewed and, when necessary, cultural resource surveys conducted to assure that properties of historic, archaeological, or architectural significance are not adversely affected by the proposed action. If appropriate, surveyed areas are nominated to the National Register of Historic Places.

4.7 Endangered Species Act. Proposed activities will be investigated to assure that endangered or threatened species and their habitat will not be adversely affected. Review by the FWS is required and close consultation is necessary when potential impacts exist.

4.8 Executive Order 11988. In accordance with this executive order, a floodplain impact analysis must be conducted to determine whether a proposed action would increase flood elevations.

4.9 Executive Order 11990. Dredged material placement sites are to be evaluated on the potential short and long-term impacts associated with the destruction or modification of wetlands. Construction in wetlands is to be avoided wherever there is a practicable alternative.

4.10 33 CFR 335-338 Discharge of Dredged Material Into Waters of the U.S. These rules govern the discharge of dredged material from project operation and maintenance into waters of the U.S. They provide procedures to promote consistent implementation of the environmental protection requirements of Corps operation and maintenance activities. These regulations provide procedures for compliance with state water quality certification requirements and for preparation of public notices. The procedures prescribed in these rules are reflected in the appropriate sections of the CMMP.

4.11 Engineering Regulation 1130-2-520. This Corps of Engineers regulation prescribes policies and practices relating to performance of navigation and dredging operations.

5.0 Channel Maintenance Background.

5.1 Historic Perspective. The first navigation improvements and maintenance on the UMR was legislated by Congress in 1824, when the Corps of Engineers was authorized to remove snags, shoals, and sandbars; and to close sloughs and backwaters so that flows were confined to the main channel, thus maintaining depths for navigation. The River and Harbor Act of 1878 authorized a 4.5-foot channel, to be maintained by constructing headwater reservoirs, bank revetments, and emergent wing dams, closing dams and dikes. A 6-foot channel was authorized by the River and Harbor Act of 1907 and was primarily achieved by construction of additional wing dams and closing dams along with limited dredging. In the late 1930's, most of the 13 lock and dams in the St. Paul District were constructed and became the primary infrastructure for maintaining the 9-foot channel depth. The Upper and Lower St Anthony Falls locks were added to the system in 1963.

Even with the series of navigation dams, the wing dams, closing dams and other rock channel control structures, remain an essential component for maintaining the navigation channel. At the time the 9-foot project was legislated, it was also recognized that the navigation dams would have to be supplemented with dredging to assure that the project depth was maintained. Therefore, construction of two modern dredges was also authorized. One of these, the 20-inch pipeline cutterhead dredge WILLIAM A. THOMPSON was built and assigned to the St. Paul District.

5.2 Early Channel Maintenance Practices. Heavy dredging was initially required to establish the 9-foot channel and provide suitable channel widths on river bends. In 1937 over 4.2 million cubic yards (CY) was dredged and in 1938 nearly 5.0 million CY was dredged in the District. During the period 1938-1955 the average annual dredging requirements were 2.3 million cubic yards. This declined to 1.5 million per year during the period 1956-1972. Since 1937, the Dredge THOMPSON has been the primary piece of dredging equipment used in the District. In 1958 the THOMPSON coverage area was expanded to include the Rock Island District and in 1986 it was further expanded to include the upper portion of the St. Louis District. It has also been used for a number of temporary assignments in other Districts. In the St. Paul District, the THOMPSON has been supplemented with other government and contract hydraulic dredges and mechanical equipment. Mechanical equipment has been used where rock or other physical restrictions prevent use of hydraulic equipment; on small projects where it is more efficient; and at locations where reasonable placement conditions require barge transport.

Until 1975, the THOMPSON reach capability was limited to 1750 feet on water and under 1000 feet on land. Dredged material was placed in open water, along the shoreline, or on adjacent islands. Sites were primarily owned by the government, although some material was provided to private or public landowners within the operating limitations of the equipment. Since 1975, the Dredge THOMPSON fleet was significantly improved and expanded to meet changing placement site requirements as discussed in the following sections. Additional emphasis has also been placed on the use of mechanical equipment. Existing dredging equipment capability and its use is discussed in Section 9.0.

5.3 Environmental Concerns and Initiatives. In the late 1960's, environmental interests expressed concern that placement of dredged material was severely affecting the environment of the Upper Mississippi River. In 1969, the Upper Mississippi River Conservation Committee (UMRCC) developed a survey identifying critical areas to avoid and areas of least impact. The District agreed to follow these recommendations, if the placement was within equipment capability. In 1971, the District initiated an annual meeting to discuss dredged material placement for the upcoming navigation season. Site specific disposal review supplemented the UMRCC recommendations. In the early 1970's, the District began publishing an annual notice of proposed channel maintenance activities and identifying potential placement sites. Notices of individual jobs were issued and on-site meetings were scheduled upon request to solicit information on proposed disposal sites of concern. In 1974, the District released an environmental impact statement for operation and maintenance of the Mississippi River 9-foot navigation project. The principal findings of the EIS were that additional equipment capability was needed to reach more selective dredged material placement sites, and further evaluation of the resource was needed to enhance system management. In response, the District effectively tripled the THOMPSON reach capability by adding a booster pump, additional pipeline and other equipment to the operation. Supplemental barges and equipment were also added to the mechanical dredging fleet to expand the range of placement sites.

In 1973, the State of Wisconsin filed a lawsuit against the Corps, on issues related to the authorized depth, the need for state permits and later on the adequacy of the EIS. The adequacy issue was not pursued after the release of the project EIS in 1974. In 1975, the State of Minnesota filed a lawsuit against the Corps, also contending that a state permit was needed for dredging operations. The District Court ruled in favor of the State of Minnesota but that ruling was overturned by the Circuit Court of Appeals and denied further review by the Supreme Court. Minnesota legislators then successfully led the way for adding the 404(t) amendment to the Clean Water Act of 1977. This amendment requires that the Corps obtain state permits. Wisconsin's lawsuit related to the need for a state permit became a moot issue at that time. In 1981 the final component of the lawsuit was settled when the court ruled that the Corps does have the authority to dredge deeper than 9 feet.

5.4 Great River Environmental Action Team Study. In 1974, under the leadership of the Corps of Engineers and Fish and Wildlife Service, an interagency team was organized to identify and assess the problems associated with multipurpose use of the river and develop recommendations for improved management of the river. This effort developed into the Great River Environmental Action Team (GREAT) study, which was formally authorized by Section 117 of the Water Resources Act of 1976. The study was subdivided into the three reaches of the St. Paul, Rock Island and St. Louis Districts. The St. Paul segment referred to as GREAT I, involved participation by the Corps, Fish and Wildlife Service, Coast Guard, Environmental Protection Agency, Soil Conservation Service, States of Minnesota, Wisconsin and Iowa, Minnesota-Wisconsin Boundary Area Commission, Upper Mississippi River Conservation Committee and Upper Mississippi River Basin Commission.

From 1974 through 1980, the GREAT team carried out an extensive program of research and pilot action projects, addressing total river resource requirements. The nine-volume report

summarizing the study results included 112 specific recommendations directed at river resource agencies and organizations. Among the recommendations, was a site specific dredged material placement plan for all material expected to be dredged during the 40 year period 1986 through 2025.

Of the GREAT study recommendations, 80 were directed at the Corps of Engineers. In response to the study, the District prepared an implementation report in 1981 that analyzed the recommendations and proposed a plan of action for implementation. The North Central Division issued a public notice supporting the proposed action. The Corps concluded that the proposed action was within existing authority and the GREAT I Report and the District's Implementation Report were forwarded through higher headquarters to Congress for information. Many of the 80 recommendations were subsequently implemented through incorporation into the operation and maintenance program for the Mississippi River project. In 1992, the District completed a GREAT I Implementation Status Report and Future Program that summarizes the District's achievements related to GREAT I recommendations and describes future actions.

6.0 Dredged Material Management.

6.1 Placement Site Planning. To start the implementation process for the GREAT I recommended dredged material placement plan, the District reviewed the GREAT sites and compared them with alternative sites to determine whether use was justified from economic, social, and environmental perspectives and to assure consistency with Federal laws and regulations. In the mid-1980's, seventeen reconnaissance reports were initially prepared for individual dredge cuts or for a group of cuts. For a number of dredging locations on the Mississippi River, and at the tributary projects and boat harbors, reports were not prepared because it was determined that no further evaluation was required at this time to initiate implementation of an acceptable long term placement plan. At some locations where plans were prepared, it has not been possible to implement the selected alternative due to various reasons. Therefore, additional planning was accomplished and three new reconnaissance reports were completed in 1995.

Placement sites selected through previous planning are listed by dredging location on the table of designated placement sites at TAB 1-3. TAB 3 also contains considerable information relating to the selected placement sites and TABs 9 through 20 have individual site information sheets and maps. The following paragraphs in this section outline the placement site planning process.

As discussed in section 3.0, the long-term management strategy serves as the general framework for dredged material placement site planning. Appendix D describes in more detail the District's evaluation process for long term site planning. In the planning process it is the Corps' policy to regulate the discharge of dredged material from its projects to assure that dredged material placement occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project. The least costly alternative, consistent with sound engineering practices and selected through the 404(b)(1) guidelines will be designated the Federal standard for the proposed project. The process that has been developed is

consistent with the 404(b)(1) guidelines.

The process starts with a projection of dredging volumes and beneficial use quantities to determine the area required for future placement needs. A 40 year planning period is normally used for these projections, to be consistent with the GREAT I study and to address a sufficient time period for measuring the long term impacts associated with channel maintenance at a given location. The reliability of projecting future dredging and beneficial use removal quantities is relatively low because of the many variables that influence these factors. For that reason the actual longevity of a particular placement site might vary significantly from the planning time period. This will either extend or diminish the available life of the site and determine when further long term planning is necessary.

The next step in the site selection planning is identification of reasonable alternative placement sites. The alternatives are then evaluated for economic, environmental, social and cultural resource impacts. Evaluation criteria and weighted values have been developed for each parameter and are applied to the alternatives. An evaluation matrix is used to quantify impacts and to compare the alternatives. The alternative identification, evaluation and site selection process is coordinated with the interagency River Resources Forum (RRF) and endorsement of the proposed plan is sought from that group. Section 10.0 and appendix A explains details of the coordination procedures.

The evaluation process and criteria are adjusted when it becomes evident that assumptions are no longer valid, there are changes in regulations, policy, etc., or special circumstances exist that warrant a change. Changes in the evaluation process will be coordinated with the River Resources Forum. The basic site selection process will continue to be used in the future whenever it becomes necessary due to a lack of site capacity, problems with implementation, or other factors that affect site availability.

The Channel Maintenance Management Plan (CMMP) consolidates dredged material placement site planning into a comprehensive District-wide long-term plan. The CMMP is a composite of the GREAT I study recommendations, the Corps' post-GREAT planning, and any subsequent changes or modifications that have resulted during implementation. As new dredged material management plans are developed, the selected sites will be incorporated into the CMMP.

The dredged material management plans contained in this document represent the District's best effort using information available at the time of the planning. The plans are based on a number of assumptions and variables, and therefore should not be construed to be all-inclusive. Dredging locations shift and patterns or characteristics such as quantity and frequency can change dramatically. Beneficial use demand for the dredged material is unpredictable and opportunities can develop with very short advance time. Although the District intends to closely follow the specifics contained in the CMMP, it should be recognized that there will be times when deviations are necessary or preferred to take advantage of an opportunity. In those situations, the applicable regulatory requirements will still be satisfied and the procedures described in this document will be followed.

Through an independent evaluation process as explained in section 6.5, the District is also conducting long term planning for the use of dredged material to enhance and/or maintain recreational beaches. As that process is completed, sites requiring dredged material for beach

enhancement will also be added to the CMMP.

6.2 Mitigation Policy. The District understands that the site planning process may result in the selection of an alternative that includes an unavoidable impact on wetland habitat. At a national level, the Corps of Engineers does not have an established policy for mitigation of unavoidable wetland impacts resulting from operation and maintenance of existing projects. It is the District's position that authority for mitigation exists and therefore a District wide policy has been developed and is incorporated into the CMMP as Appendix B - District Mitigation Policy. The District's position is that the CMMP represents a baseline condition that has evolved from previously approved plans that were prepared prior to mitigation requirements or authority existed. The CMMP was developed without the benefit of considering mitigation requirements in the evaluation process and therefore those requirements should not be applied at this time. Implementation was agreed to and has been initiated at nearly all of the sites in the plan. Avoid and minimize measures applied in the planning process have successfully reduced the projected wetland impacts of the CMMP to 45 percent (approximately 200 acres) of the approved dredged material placement plan contained in the GREAT I study. The total projected placement site needs of the CMMP are approximately 865 acres or 77 percent of the 1119 acres projected in the GREAT study. It is anticipated that even further reductions in projected wetland impacts will result through good management efforts during implementation. The District's policy is that compensatory mitigation is not required for impacts associated with implementation of the 1996 version of the CMMP. Proposed wetland impacts that exceed the 1996 CMMP projections will be compensated for in accordance with the established policy in Appendix B.

6.3 Site Management. Once the site selection planning has been completed, implementation and management are initiated. Site management is an important component of the CMMP and involves a number of elements, which are discussed below. Site-specific information sheets and operational maps are contained in TABs 9 through 20. The information sheets provide background information on selection of the site and various details relating to its use. The operating maps show the site boundaries and details related to material placement, removal and other management factors. As implementation progresses and more information becomes available, the site sheets and maps will be updated and upgraded to reflect the current situation and any new information or changed conditions. A five year placement site action plan (TAB 6) has been prepared to identify implementation and management measures required for individual sites. This plan will be updated annually to provide details for the upcoming year and to schedule, prioritize and budget for future required actions.

6.3.1 Real Estate. The Minnesota River, Upper St. Anthony Falls pool and the commercial and recreational boat harbors have local project sponsors that are responsible for furnishing real estate required for the ongoing maintenance of those projects. It is the District's responsibility for obtaining a real estate interest for placement sites throughout the remainder of the Mississippi River project. The District's goal is to secure a long-term interest that allows continued use of the site for the duration of the planning period. Acquisition in fee title of privately owned sites is the preferred option. Permits, easements and land use agreements are

also used to acquire the right to place material on non-Federally owned sites. Unless stipulated otherwise in an agreement, dredged material placed on sites that are not Federally owned becomes the property of the landowner and is not subject to further control by the Corps.

6.3.2 Temporary Sites. A number of sites in the dredged material management plan are temporary in nature because the material is ultimately removed and transferred to a permanent site. As implementation of the existing plan progresses and long term planning continues, the need for other temporary placement sites may become evident and will be coordinated through the RRF. Temporary sites are divided into three categories as described below:

6.3.2.1 Transfer Site - A transfer site is used as an interim holding location until the area is filled and the material can be economically removed and transferred to a designated permanent site. The capacity of the transfer site is determined by safe operating practices and the existing boundaries of the site. Site boundaries will only be expanded after coordination with the RRF.

A transfer site provides an efficient location to place the dredged material when channel maintenance dredging is conducted because placement directly at the permanent site would be too time consuming and/or costly. An example of a transfer site is the Reads Landing containment area, site 4-762.7-LWT. It is anticipated that most transfer sites will be used indefinitely, provided dredging requirements exist and a permanent site is available to periodically transfer the material to. However, changes in equipment and technology, dredging requirements, permanent sites, or other reasons may render a transfer site obsolete in the future and appropriate measures will then be taken to close the site out.

Should it be determined that a transfer site is no longer needed, the Corps will investigate and evaluate options for final disposition of the transfer site. One of the preferred options will include removal of the excess material remaining at the transfer site and restoring the area to an appropriate habitat. Investigations will include seeking a permanent location for the excess material. Other options will include reshaping of the site, capping with fine sediments and revegetating the area. Any option will include consultation with federal and state regulatory agencies to complete restoration work.

6.3.2.2 Emergency Site - An emergency site is used when an emergency or imminent closure condition exists in the channel and the necessary equipment or time is not available to place the material at a permanent or transfer site. Emergency response procedures are discussed in section 9.3 and Appendix A.

Material placed at an emergency site will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies.

A number of sites have been designated for emergency/imminent closure purposes and are contained in the CMMP. An example of an emergency site is 7-708.7-LWE at Winters

Landing. Other emergency sites that are presently not designated may be required during an emergency response. Those sites would be determined in accordance with the provisions of agreements with the state regulatory agencies as discussed in Appendix A.

At emergency sites where there is a high probability for use, advance preparation may be desirable so that adverse environmental impacts are minimized when an actual emergency channel condition develops. Advance preparation measures will be coordinated through the on-site inspection team process (OSIT).

6.3.2.3 In-water Rehandling Site - An in-water rehandling site is a temporary in-water location that is used to reach another site because of equipment reach limitations. In-water rehandling sites that are needed on a recurring basis will be designated as part of the permanent site-operating plan.

Material is temporarily stockpiled at the in-water rehandling site and then removed as soon as possible during the final stage of the dredging event. In-water rehandling sites are selected to coincide with a portion of the dredge cut if possible. If that is not possible, rehandling areas are selected to minimize habitat disturbance and because of there reduced potential for secondary movement of the material before it can be rehandled.

6.3.3 Permanent Sites. Unless designated otherwise all actively used placement sites are considered to be permanent and the District has no plans for further removal of the material once it is placed at these locations. The District's goal is to conduct the channel maintenance program to maximize the longevity of the permanent sites. This will primarily be accomplished by efforts to minimize dredging quantities and to promote beneficial use as discussed below. Sites will be managed to achieve maximum capacity by placing material to the horizontal and vertical limits of the site as determined by the operating plan, surrounding land use, and through actual placement operations. Filling of a site will progress in a logical manner as influenced by the location of the dredge cut and site characteristics such as topography and configuration. When possible, only that portion of larger sites needed for conducting an efficient placement operation will be prepared (i.e. diked, cleared) and used at a given time. The remaining area will be left undisturbed until use of it becomes necessary. Site capacity will be monitored to determine when additional planning is necessary for selecting a future replacement site.

6.3.4 Site Preparation and Management. Most selected sites require site preparation prior to use and periodically again as placement progresses. Measures vary by individual site and method of dredging. Site preparation may include construction of containment berms, clearing of vegetation, utility relocation, installation of culverts for access, installation of effluent control structures, construction of access and material excavation.

Transfer sites requiring periodic excavation are monitored to determine when unloading will be required so that work may be scheduled and budgeted. Excavation is normally accomplished by hydraulic dredge. The dredge excavates an opening approximately 100 feet wide into the interior of the site. Material is removed from the center of the site and transported to the permanent site. Dredging depths within the sites vary from 10 feet to 30 feet or more

depending on equipment capabilities and individual site constraints. A perimeter berm is left intact for future placement. Final configuration of the excavated sites will be determined on a site-specific basis. Access openings at some locations will be closed when the excavation has been completed. Access openings at other locations will be left open initially to allow for temporary use of the interior area by recreational boaters. At some stage in the filling process, it then becomes necessary to close the opening and install an effluent control structure. Disposition of a transfer site that is no longer needed is discussed in section 6.3.2.1.

Protection measures are needed at many locations to minimize erosion from wind, waves and water flow. Measures include vegetative plantings, fencing, walls and rock protection as determined by individual site requirements. Measures vary by the stage of filling at the site and the anticipated future use of the area. The District's objective is to assure that material does not erode from federally owned sites. On non-federally owned sites the landowners are responsible for protection of material placed on their property. Permanent sites that are filled to capacity will be considered for final shaping, placement of topsoil, and planting to protect the site and improve the aesthetics.

6.3.5 Aesthetics and Social Concerns. The District is sensitive to the impacts of dredged material placement on local communities and adjacent landowners. The potential for these impacts must be carefully addressed in the planning and decision making process. Operation of a dredged material stockpile site in or near a residential area creates a number of concerns. There is noise associated with the placement of material at the site and also with the beneficial use removal operation. At some locations local zoning ordinances may affect scheduling of the operations. Trucking operations to and from the site can impact on local road maintenance and at some locations is controlled by the local municipality. Visual impacts are also a major concern for any site whether it is near a community or exposed to boaters on the river. In general, dredged material placement operations and beneficial use removal are often not compatible with surrounding land use. Measures will be taken where appropriate to ameliorate these concerns. These efforts may include fencing, plantings, and limiting hours of operation. Sites or portions of sites that are no longer used will be considered for shaping and planting to improve aesthetics.

6.3.6 Beneficial Use. A major objective of the District is to place material at locations where it can be used productively, either directly at the location where it is placed or for removal and beneficial use elsewhere. The District has provided dredged material for a variety of uses to other federal agencies, state agencies, counties, municipalities, contractors, private organizations and private landowners. Material placed at federally owned stockpile sites is made available at no cost to anyone interested in removal of it on a first come basis. However, if there are competing demands for the material and cost considerations are comparable, the District's policy is to provide the material to the governmental entity that represents the largest public constituency.

The District has had significant success in achieving beneficial use of dredged material. Records of past beneficial use are contained in TAB 2 and summarized in TAB 3-4. Dredged material has been used as landfill for residential and commercial development including airport

expansion, retail stores, sanitary landfill cover, wastewater treatment plants and manufacturing facilities. It has been used to implement environmental enhancement projects such as Weaver Bottoms and Environmental Management Program (EMP) habitat rehabilitation projects like the Pool 8 islands. Recreational use of dredged material has included beach enhancement and park development such as the District's Blackhawk Park and other county and municipal parks. Sand and gravel pits have been filled with dredged material making them suitable for future development. Active uses of dredged material have been construction fill, ice control on roads, summer road maintenance, as an ingredient in molded products and as an aggregate in concrete.

The District actively promotes beneficial use at federally owned sites in a number of ways and encourages it at non-federal sites whenever possible. Notices and questionnaires are periodically distributed to potential users to make them aware of material availability and to gather information on demand and site suitability. At federally owned sites the District has established material removal guidelines (TAB 3-5) to promote fair, safe and efficient use of this resource. As placement site implementation progresses the District will explore other measures to aggressively promote active beneficial use.

The District also works closely with municipalities, developers and contractors to take advantage of new beneficial use opportunities as they surface. Because these opportunities are unpredictable, it is necessary to retain flexibility in the placement site selection and approval process. The on site inspection team process along with flexible state regulatory agreements are key elements in assuring that new beneficial use opportunities can be incorporated into the program on a timely basis. The District encourages other agencies to assist in locating new beneficial use opportunities and being responsive to taking advantage of them.

6.3.7 Floodplain Effects. Detailed hydraulic analysis of the floodplain effects of placement site development with the HEC-2 computer program has found insignificant effects on the water surface profiles. Therefore, detailed evaluation with HEC-2 of most placement sites for floodplain effects is not necessary. The following criteria have been established from review of previous studies to determine when detailed evaluation of floodplain effects using HEC-2 is not necessary. No evaluation is necessary if the placement site: a) reduces the area of the floodplain by less than 15 percent when fully developed, or b) is located immediately downstream of a major structure such as a dam or bridge, or c) is located in the outer fringe of the floodway. Each placement site will be reviewed for potential floodplain effects. HEC-2 analyses will be used for sites that do not match the criteria above and sites that may be questionable. The site information sheets in TABs 9 through 20 indicate the status of any site-specific floodplain impact analyses.

6.4 Thalweg Placement. The objective of thalweg placement is to place the material in the deeper water area of the main channel where it can be assimilated into the river's natural sediment transport system. In concept, the river downstream of the shoaled area can effectively absorb the material that is reintroduced without increasing dredging requirements at other locations and without having an adverse impact on the environment. The District has not actively pursued thalweg placement as a serious option in the long term dredged material planning process because of unknowns and concerns related to the fate of the material and the

ability of the system to effectively assimilate it. As our data gathering, evaluation and monitoring capability improves, dredging equipment technology changes, and our understanding of the sediment transport processes increases, the District may investigate thalweg placement at site-specific locations. This option has the potential for increasing the longevity of placement sites or avoiding the need for developing new sites. It should not be categorically dismissed without basis.

6.5 Recreational Beach Planning. Another beneficial use of dredged material is the creation and maintenance of recreational beaches along the main channel shoreline. The sandy material placed along the shoreline provides an excellent resource for recreational boaters. The District supports its use for that purpose. The objective is to place the material at locations where it will provide recreational opportunities without creating other significant adverse impacts. To determine suitable locations, pool studies have been conducted to evaluate alternatives and select appropriate sites. Evaluation criteria include recreational demand, physical characteristics of the site and accessibility, impacts to other resources, and operational feasibility of implementation. The District has prepared recreational beach plans for a number of pools. These plans have been reviewed by the River Resources Forum and sites have been endorsed for beach maintenance activities. TAB 3-2 lists recreational beach sites that have been endorsed. Implementation has been accomplished at a number of these locations.

Successful implementation of the recreational beach plans depends on preparing evaluations and obtaining approvals in advance. When channel maintenance dredging is required, the Corps will determine whether implementation of a RRF endorsed recreation beach maintenance site is feasible based on projected dredging quantities, available equipment, and beach requirements and physical constraints. The On-Site Inspection Team (OSIT) will be notified of the proposal and a meeting will be held if necessary. OSIT representatives will coordinate involvement of their agency's recreational planners to assure that final details are in compliance with the intended objectives. Site-specific conditions will be reviewed to determine whether conditions have changed to a degree that may render the site unacceptable.

Placement and shaping of the material will be accomplished in accordance with the endorsed site development plan. Departures from the approved site maintenance plan may be necessary in emergency dredging situations or due to actual field conditions and will be coordinated with the OSIT.

Following development of a selected beach area, the Corps and other agencies will informally monitor the beach for future action and evaluate the effectiveness of the development that has been accomplished.

6.6 Fish and Wildlife Habitat Restoration. Restoration or enhancement of fish and wildlife habitat can be accomplished under existing channel maintenance authorities if it is determined to be the base alternative to maintaining the navigation project (i.e., the most cost effective way, consistent with economic, engineering, and environmental criteria). In addition, there are special authorities under which this can occur. These authorities are Section 204 of the Water Resources Development Act (WRDA) of 1992 and Section 1135 of WRDA 1986, as amended. Section 204 authority provides for the use of dredged material for the improvement of

aquatic and ecologically related habitats. Section 204 projects are cost shared on a 75 percent Federal to 25 percent non-Federal basis. Section 204 costs are limited to the incremental costs in excess of those costs necessary to implement the base alternative. For example, if it would cost $100,000 to place dredged material in an acceptable placement site and $150,000 to place the dredged material in a manner that would improve aquatic habitat, the non-Federal sponsor would be required to cost-share only the $50,000 incremental cost needed to obtain the habitat benefits. The non-Federal sponsor is responsible for providing all lands, easements, and rights-of-way, and for operation and maintenance of the habitat project.

Section 1135 authority allows for modification of Corps of Engineers water resource projects for the purpose of improving the quality of the environment. Section 1135 projects are cost shared on a 75 percent Federal to 25 percent non-Federal basis. Normally, from a non-Federal sponsor perspective, Section 204 would be the preferred authority. Section 1135 authority would only be considered when Section 204 authority could not be used (i.e., the habitat restoration activity did not involve the use of dredged material or Section 204 program funding was not available).

7.0 Channel Management.

The District approaches channel and harbor maintenance with a primary objective of minimizing or controlling dredging requirements while maintaining safe and reliable conditions within the project authorities. In addition to dredging, which is detailed in section 9.0, channel maintenance techniques include both structural and non-structural measures as discussed below. The study process and schedule for evaluating and determining significant channel modifications and actions is described in TAB 7 - Channel Management Plan. The schedule and table in this tab is updated annually. Current work-year activities can be found on the District's web page.

7.1 Channel Dimensions. Channel dimensions or dredging limits are based on a number of factors. The authorized dimensions form the baseline and are listed by project in TAB 1-1. The level and type of project use, and user feedback are important considerations in determining dredging dimensions or deciding whether to dredge. Determining dimensions for channel maintenance can be complicated, as there are a number of hydraulic and operational considerations, which must be taken into account. These are explained in TAB 4-4. The objective is to optimize a balance between dredging frequency, quantity and cost without compromising safety and reliability for the project user. Evaluation of dredging dimensions by location from both a hydraulic engineering and operational perspective is required on an ongoing basis with a view towards the long term. Dredging depth and width are discussed in greater detail below. The two are interrelated as the adjustment of one can have an effect on the other as demonstrated in a 1985 study of river tow needs for maneuvering room on the Upper Mississippi River. To avoid frequent re-dredging and ensure the least overall cost of maintaining the project, advance maintenance dredging to a specified depth and/or width is allowed.

7.1.1 Depth. Channel depths are referenced to low control pool elevation (LCP), which is the lowest water surface elevation that can be expected at a given location (within a tolerance of several tenths of a foot). All surveys and dredging depths correlate to LCP. The Mississippi River main stem and navigable tributaries are authorized to a depth of 9.0 feet. To assure that the 9.0 foot depth is available, the dredging process is generally initiated when depths less than 10.5 feet are observed encroaching into the navigable channel. This allows for the possibility of additional shoaling to occur and a reasonable lead-time to schedule and execute the dredging. Dredging is normally conducted to a depth of 11.0, 12.0 or 13.0 feet as determined by past experience and the criteria explained in TAB 4-4.

7.1.2 Width. The authorized width varies for different projects and reaches as listed in TAB 1-1. These specified widths are for straight stretches, but there is a provision in the authorizing documents for increased width on bends. Past experience, user feedback, channel alignment and flow patterns are some of the important factors in determining the appropriate dredging width. Towboat pilot recommendations for bend widths were developed during the GREAT I study and are also used as a guide. Those recommended guidelines are listed in TAB 4-3. The District will continue to work with the navigation industry on establishing and refining site-specific guidelines for channel width.

7.1.3 Pool Operation. This document is not intended to address the procedures or effects of dam or pool operations. An explanation of operations as it relates to the channel maintenance program is important to provide an understanding of how available water depths can be affected.

The dams are designed for navigation purposes only and have no flood control benefits. When runoff and high water stages occur the dam gates are opened. All gates at each dam are fully open long before flood stages are reached, so natural open river conditions exist when flows are high. When the dams are in operation there is a slope in the water surface between two dams. As flows vary, this water surface profile will tend to pivot at the primary control point, which is located at the intersection of the project pool elevation and the ordinary high water mark. As flows increase more water is discharged causing the pool elevations immediately above the dam to decrease and the tailwater elevations downstream of the dam to increase. The decrease in water elevation on the upstream side of the dam is called the drawdown and is legally limited so that navigation and natural resources are not adversely impacted. This drawdown limit is called the secondary control elevation. Project pool elevation is maintained at the primary control point until the drawdown reaches the secondary control elevation. Control is then maintained at the dam and the water surface profile throughout the entire pool is allowed to rise until the difference between the pool and tailwater elevations is less than approximately one foot. At that time all gates are opened and open river conditions exists.

In practical terms, from a channel maintenance perspective, higher discharges and tailwater stages at a dam will result in a decrease in pool elevation or less water depth in the pool area. This condition exists, at least in some portion of the pool area, until increased flows raise water surface elevations above the project pool elevation. Contrary to the belief of some project users, higher flows do not necessarily provide an opportunity to load barges deeper.

7.2 Shoaling Patterns and Trends. The Mississippi River is a complex and dynamic system for sediment movement. Experience has shown that significant shoaling and scouring can occur rapidly in the navigation channel. As data collection and evaluation capability improve, the magnitude of these changes is becoming more quantifiable. This information is being used to develop a better understanding of sediment transport and how it relates to the channel maintenance program. This knowledge will be helpful in designing channel modification projects and evaluating, planning and scheduling dredging activities. It will also provide agencies a better understanding of the dynamics of the river system and potential effects of proposed actions, so that regulatory decisions have a more solid technical basis.

Some major factors influencing shoaling in the navigation channel are hydrologic events and related flow conditions, river geomorphology, and channel control structures. In simple terms, shoaling on the river can be separated into two basic categories, point bars and crossings.

The point bar shoal builds from the inside of the bend towards the outside. During periods of high flows the point bar and adjacent deep-water pool tends to scour and during low flow periods deposition occurs. Deposition will generally continue until a cross sectional balance has been reached and conditions stabilize. The threat of a channel closure is low, but the point bar will narrow and can make navigation difficult and increase the potential for groundings to occur. A point bar dredge cut is characterized by a heavy face on the inside of the dredge cut tapering to a very shallow face on the outside of the cut. Dredging production and effectiveness on a point bar is generally high with both mechanical and hydraulic equipment.

The crossing situation exists between the deeper pools where the thalweg is shifting from one side of the river to the other. The crossing will aggrade during high discharge periods and scour when flows are low. Crossings are characterized by relatively long reaches with depths being fairly uniform throughout. A critical time period is when higher flows are dropping off before the river crossing has sufficient opportunity to adjust. Shoaling above the 10.5 dredging initiation depth is generally spotty over the reach. There is greater potential for channel closures to occur because of the shoaling characteristics and the minimal clearance for passing vessels. When groundings occur, efforts to free the grounded vessel will often result in significant humps being generated that will cause a channel blockage until dredging can be accomplished. The hydraulic dredge is more effective for use on crossings because the dredge face is relatively shallow over a large area.

7.3 Dredging Quantities. There are over 100 locations that have required channel maintenance dredging since 1970. The frequency and volume of dredging varies considerably by location. TAB 4-1 is a summary of dredging locations, volumes, frequency and date of last dredging. A list of all dredging events, quantities and dredging depths by location since 1970 is provided in TAB 4-2. This historic information is used as an indicator of where shoaling problems exist so that surveys and studies can be focused in areas of concern. This information also serves as a starting point in projecting future dredging quantities for placement site studies. As stated previously, a key objective of the program is to reduce dredging quantities for cost savings and to minimize placement site requirements. During the period 1975 through 1995, dredging quantities averaged approximately 700,000 cubic yards per year. This was more than a

50 percent reduction from the average annual dredging quantity of 1.5 million cubic yards during the period 1956-1974. However, dredging quantities have increased in recent years. During the period from 1991-2000, annual dredging quantities averaged 1.0 million cubic yards and during the period from 1995-2000, annual dredging quantities averaged 1.3 million cubic yards. This can be attributed in part to severe flooding on the Mississippi River in 1993 and 1997.

The heaviest dredging requirements in the District are experienced in the 20 mile reach below the mouth of the Chippewa River. This reach accounts for 45 percent of the average annual quantity in approximately 7 percent of the District's geographic area of responsibility for channel maintenance. Studies have been conducted on the feasibility of reducing Mississippi River dredging needs by performing bank protection on the Chippewa River. It has been concluded that protection of the banks would have a fairly small impact on the sediment that reached the Mississippi River. With protection of the banks, the bed erosion would increase to satisfy the transport capacity of the river. Over time, armoring of the bed by larger sediment would gradually reduce the erosion rate and limit the total degradation. After about 50 years, the sediment discharge from the Chippewa River would be reduced about 15 percent and the dredging requirement would be reduced about 84,000 cubic yards per year. An economic analysis found that bank protection was not justified by itself because of its high initial cost and the delay in time until benefits would be provided. International experts on erosion and sediment transport have reviewed this problem and the study results, and have concluded that bank protection would probably not substantially lessen the Chippewa River's material load. The District has no plans at this time to implement a bank protection program on the Chippewa River or other tributaries as a means of reducing channel maintenance dredging requirements on the Mississippi River. The District will remain open to consider new techniques for protecting shorelines from erosion and will apply them where needed if it is determined that they are economically feasible.

7.4 Channel Monitoring. The District is strongly committed to close monitoring of channel conditions to assure that dredging is performed when needed and unnecessary dredging is avoided. Because of the river's dynamic nature and propensity for relatively rapid shoaling and scouring, monitoring through the use of timely and accurate hydrographic surveys is a key element of the channel maintenance program. Substantial savings through dredging avoidance can be realized by having the technology and capability to conduct surveys at critical times during the hydrograph period. The District has observed significant improvements in shoaled areas as flows have decreased and the channel control structures have assisted the sediment transport process. Likewise, critical or restrictive conditions can be avoided or minimized by having timely channel condition information available, so that dredging can be programmed before water levels drop and an emergency results. Providing high quality channel information to the project user has also proven to be an effective method of avoiding groundings and potentially a more significant dredging event. Information sharing with the users will become a more valuable tool in the channel maintenance program as technological advances are made. The District supports improvements that will enhance the channel maintenance mission and will continue to pursue them.

7.5 Aids to Navigation. The United States Coast Guard (USCG) is responsible for maintaining the aids to navigation (buoys, lights, daymarkers) relied upon by both commercial and recreational vessel operators. The District supports the USCG mission in any way appropriate. Hydrographic survey results are routinely furnished to the Coast Guard to provide their buoy tender current channel information. Off station buoys are reported or frequently corrected by Corps resources when Coast Guard resources are not readily available. The Corps or its dredging contractors will routinely reposition buoys after completing dredging to define the new channel alignment. In recent years the District has dedicated equipment and personnel resources to early spring buoy setting. This is a critical time when buoys are severely off station, the Coast Guard cannot mobilize its resources because of ice conditions and commercial navigation is resuming for the season. The practice of supporting the USCG with spring buoy setting has been very effective in establishing a well-marked channel early in the season and potentially avoiding economically and environmentally damaging vessel groundings. The District intends to continue this practice and also that of providing general support because of the potential benefits it provides to the channel maintenance program through grounding and dredging avoidance. The District also supports the Coast Guard in relocating permanent aids to navigation as the natural channel shifts course and these markers no longer adequately identify the navigation channel. It is not cost effective to dredge the channel to align with "obsolete" markers.

7.6 Channel Control Structures. Channel control structures are the wing dams, closing dams, trailer dams, shoreline protection and any other features constructed to maintain the channel alignment or constrict flows to improve the sediment transport efficiency through a reach of the river. Construction of these structures was the primary technique used to establish a 4.5 foot and 6.0 foot channel in the late 1800's and early 1900's. Originally built of rock and brush mats as emergent structures, they became submerged when the 9.0-foot channel was created in the late 1930's. They remain largely intact and still perform a vital role in assuring the availability of a 9.0-foot channel.

Rehabilitating, restructuring or supplementing these features is a key component of efforts to reduce dredging requirements or control where and when dredging takes place. The District approach is to identify problem reaches that may potentially be improved through structural measures. These areas are initially evaluated to determine the scope of the problem and the objective, define the study area and develop study alternatives. Field data is collected that will be used in the study process and to evaluate the potential environmental impacts. Alternatives are evaluated to determine effectiveness in satisfying the objective and to assess the potential impacts. A plan is then selected and implemented. The District values participation from other agencies and local organizations in this process to assure that a comprehensive, well balanced approach is taken. TAB 7 explains the study and coordination process in detail.

7.7 Non-Structural Techniques. Adjusting dredging dimensions, monitoring channel conditions, information sharing with users, and accurate marking of the channel are all non-structural channel maintenance techniques that have been discussed and are used to reduce dredging quantities. Another technique that is being used is sediment trap dredging. This

involves advance maintenance dredging of the material somewhere between the sediment source and the navigation channel to "catch" the material before it becomes a navigational obstruction. Although the sediment trap does not necessarily reduce dredging quantities it allows more control over when and where dredging occurs. This can decrease overall dredging costs, minimize environmental impacts and reduce potentially hazardous channel situations. Sediment trap dredging has been effective at the delta of the Chippewa River in pool 4. It may be considered at other locations in the future.

7.8 Snag Removal. Snags in the river are recognized as providing valuable aquatic habitat and are only removed when there is a safety concern. Removal of trees snagged in the navigation channel is a frequent requirement on the Minnesota River and less common on the other navigation projects. Snags are removed when they become a navigation concern or if it is imminent that they will move into the navigation channel. They are normally placed on an upland site and disposed of in a manner that complies with local ordinances. Maintenance of the 3.0 and 4.0 foot channel projects is generally limited to removal of snags. Snag removal on the St. Croix River is normally limited to requests by the National Park Service because of its wild and scenic river status.

7.9 Harbor Maintenance. Maintenance of the commercial and recreational harbors is straightforward. The depth and horizontal boundaries have been established by the authorizing legislation. The dredging process is initiated when shoaling occurs within those limits, provided funding is available. Dredging depth in harbors is generally 1.0 foot deeper than the authorized depth to avoid frequent re-dredging and ensure the least overall cost for maintaining the project. All of the harbor projects have local sponsors that are responsible for furnishing an acceptable placement site. Periodically, harbors are reviewed to determine if the economic benefits of the project exceed the cost of maintaining it. If the economics are not favorable, federal maintenance may be discontinued.

8.0 Hydrographic Surveys.

Hydrographic surveys are a very basic and integral part of the channel maintenance program. They are used to closely monitor channel conditions, gather and share channel information with project users, position navigation aids, determine dredging requirements, calculate dredging quantities, and assess scour at the dams. Field survey units are the vital onsite link in a well-managed program. Survey capability must be very flexible to respond to highly unpredictable situations such as groundings, channel closures, and pre and post dredging needs. When critical conditions exist, survey personnel must make onsite decisions on the navigability of the channel and provide guidance to project users on how to best navigate a restricted reach. The two basic categories for channel maintenance surveys, channel condition surveys and dredge cut surveys, are discussed below.

8.1 Survey Resources. The District is committed to providing the equipment and personnel resources needed for meeting the channel maintenance objectives discussed in this document. Having sufficient capability, current technology and experienced personnel are the key elements for achieving this. Equipment upgrades and improvements are continually investigated as technological advancements are made. A ten-person survey unit provides the personnel requirements for meeting the hydrographic survey and dredge inspection needs of the District. Survey operations are based at the Channels and Harbors Project Office, located at Fountain City, Wisconsin.

The District has two 26-foot, trailerable survey launches that are capable of mobilizing rapidly to remote locations. Both are equipped with channel-sweep survey systems. The channel-sweep system has retractable booms that when extended from both sides allow the vessel to survey a 25-foot wide swath. Each boom has 2 transducers and the vessel has one center-mounted transducer for a total of 5. As the vessel passes over the survey area, the transducers are collecting sonar soundings at a rate of once per second while the vessel is moving at a rate of approximately 10 feet per second. The horizontal position of the vessel is continually located through the use of a satellite based differential global positioning system (DGPS). Surveys are conducted as the vessel travels upstream and downstream completely blanketing the desired coverage area. A typical survey area may cover 60 acres and take several hours to conduct. The soundings and horizontal coordinates are recorded together in an X-Y-Z format on a computer disk using a hydrographic survey software program. Following collection of the data, the computer disk is transferred to the survey office for final processing and plotting of the soundings. The plotted information is then evaluated and programmed for its intended purpose.

The District also operates an 18-foot trailerable small boat survey system that provides capability to mobilize rapidly to remote locations and to operate in shallower areas. It is equipped with a single transducer survey system and DGPS. Surveys are normally conducted in a cross sectional pattern perpendicular to the flow. Like the larger survey launches, data is collected on a computer disk and information plotted at the survey office.

8.2 Channel Condition Surveys. Hydrographic surveys are routinely conducted to monitor shoaling in the navigation channel or harbor. Vessels are dispatched from the Fountain City Service Base in the spring of the year, normally in mid to late March, which coincides with the opening of the navigation season in the St. Paul District. Initial surveys are conducted before the spring high water period is experienced to obtain an early indication of conditions. When high water periods exist in the spring or at other times of the year, survey operations are normally suspended because of the rapidly changing channel conditions. Reaches that have historically demonstrated heavy shoaling in the navigation channel, frequent dredging requirements or other navigation related problems will normally receive a high scheduling priority. Cursory surveys called channel runs are sometimes used to make an initial determination on whether a shoaling problem exists. The channel runs are conducted by making several broad passes through a reach. If this indicates there are no problems, the vessel can move quickly on to the next location. If there is indication of shoaling in the navigation channel a detailed channel condition survey is conducted as described above. These type of surveys form the foundation for monitoring the channel and are relied upon heavily to determine conditions throughout the navigation season.

The periods immediately following high water events are the most critical time and require a concentrated survey effort to ascertain conditions quickly at many different locations.

8.3 Pre and Post Dredge Surveys. The channel condition survey is used to determine the need for dredging and is generally conducted several weeks or more before the actual dredging can be performed. To provide the most up to date information on the shoaled area, a pre-dredge survey is conducted within 7 days of the commencement of dredging. This time period may be extended if there is good reason to believe that conditions are stable and no change can be expected. The pre-dredge survey is used to make any adjustments in dredge cut alignment and to accurately calculate the quantity of material to be removed. The quantity calculations are performed using the survey software package. Within 24 hours of completion of the dredging event a post-dredge survey is conducted to assure that the desired depth and area has been satisfied and to document the dredging event. This time period may be extended if there is good reason to believe that the dredging has been performed to the specified dimensions and a quick post-dredge survey is not critical. A government dredge inspector routinely monitors the dredging process to assure that work is being performed to specifications.

9.0 Dredging.

9.1 Dredging Process. The majority of dredging takes place between 1 June and 1 November of each year. Once a dredging requirement is established as determined by a channel condition survey, a dredge cut is laid out on the survey drawing using the criteria discussed in section 7.1. The work is then scheduled to be accomplished by the appropriate dredging equipment based on the size of the dredging job, placement site location and characteristics, and equipment availability. The timing of the dredging event relates to the urgency of the situation, dredging requirements at other locations, and the work schedule of the dredging equipment. A comprehensive dredging schedule and summary is maintained for all of the pending and completed dredge events for the navigation season. It is routinely updated as new information becomes available. The priority, sequence and scheduled equipment may frequently change based on the latest overall channel condition information.

If channel conditions are not critical, the dredging work may not be accomplished for a month or more after the requirement is first identified. When the time period from the initial survey to the scheduled time of dredging is lengthy, another channel condition survey is routinely conducted to determine if there is any change. If conditions have improved, dredging may be postponed or cancelled, and monitoring will continue. Conversely, if conditions have deteriorated, dredging may be given a higher priority. As discussed in section 8.3 a pre-dredge survey is conducted immediately before the dredging event is scheduled to begin.

The general dredging schedule is updated periodically and is provided on the District's web page for viewing at any time. This keeps agencies informed of the overall dredging workload. A site-specific dredging notice is provided on the District's web page when dredging plans and details have been finalized. The OSIT is notified by electronic mail each time new dredging notices are added to the District's web page. Coordination and notification procedures

are discussed in greater detail in section 10.0 and Appendix A.

Once a dredging event is scheduled, final preparations and details are initiated. Placement site requirements are reviewed to assure that arrangements are completed for real estate actions, environmental evaluations and documentation, and regulatory permits. As the dredging event approaches, a final internal review and approval process is completed, and instructions are provided to the assigned dredging unit. Global Positioning Systems (GPS) are used for dredge positioning, making it possible to immediately move into cut locations. A government dredge inspector is assigned to the dredging unit to assist and monitor operations, assure instructions are followed, and document details of the event. The inspector will also make minor field adjustments to the cut layout as necessitated by onsite conditions.

9.2 Equipment. The District uses a combination of hydraulic and mechanical equipment for channel maintenance dredging operations. Equipment is either government owned and operated or work is contracted with a private dredging company.

The hydraulic equipment best suited for the Upper Mississippi River (UMR) is the pipeline, cutterhead dredge. The material is loosened by the revolving cutterhead as the dredge sweeps over the cut area. A centrifugal pump forces the sand-water slurry through a series of floating and land based pipeline to the placement site. Using hauling winches connected to the swing anchors set out on either side, the dredge can pull back and forth across the width of the cut. The dredge pivots on one of two large cylindrical spud anchors, which are located on the stern and are used in a stepping fashion to proceed lengthwise through the cut. The sand is deposited in the placement area and the water is returned to the river either through a controlled single point discharge or in a free flowing fashion. Placement site operations are dictated by the type of site and desired outcome. For hydraulic dredging, most sites are containment areas that have been bermed with material from the interior of the site. Bulldozers are used in the operation to concentrate the material vertically in limited areas and to maximize the sites capacity. Hydraulic equipment is specialized for dredging and normally is more cost effective and has a higher production rate than mechanical equipment. Limitations for channel maintenance dredging with hydraulic equipment are small jobs (i.e. less than 15,000 CY) with significant equipment setup time, cuts with distant placement sites (i.e. over 1.5 miles) and small placement sites that cannot tolerate the water slurry.

Mechanical dredging on the UMR consists of a barge mounted crane (dragline or clamshell bucket) or backhoe. The barge is positioned in the dredge cut with spud anchors. The excavated material is loaded on barges, which are transported to the placement site with dredge tenders (small towboats or workboats). The barges are generally deck cargo barges with side boards or coaming to contain the material. Ramps on the bow of the barges are used at the placement site to unload material with endloaders. Another crane or backhoe may also be used to unload the barge. Material is normally transported to placement sites within 4.0 miles of the dredge cut. Material has been transported up to 10 miles but efficiency declines beyond 4.0 miles. Production rates of 125-250 cubic yards per effective dredging hour are typical depending upon equipment capability. Operations are conducted on a 10 to 24 hour day basis depending on the urgency, the overall workload and other operational characteristics. Specialized barges called dumpscows are sometimes used if in-water placement or rehandling of the material is

required. The dumpscow drops the material out the bottom of the barge where it can be left in place in the water or rehandled with another crane or a hydraulic dredge. Mechanical dredging is well suited for small jobs (i.e. less than 15,000 CY), cuts with distant placement sites or small, restricted placement sites. An advantage of mechanical equipment is that there is little setup time and once on site, dredging can commence immediately. It is less desirable than hydraulic dredging because of higher costs (approximately 2 to 2.5 times more expensive) and it is less productive when channel maintenance needs are urgent or extensive.

9.2.1 Government Hydraulic. The District's primary piece of dredging equipment is the cutterhead dredge WILLIAM A. THOMPSON. The THOMPSON is used regularly to service approximately 1000 miles of 9-foot channel on the Upper Mississippi and Illinois Rivers in the Corps of Engineers' St. Paul, Rock Island and St. Louis Districts. It has also been used on occasion for dredging in other Corps Districts' on the Missouri, Ohio and Lower Mississippi Rivers. A typical season has the THOMPSON operating in the St. Paul District from mid May until early August, then in Rock Island District until mid October and in St. Louis District until mid December. Normal shutdown due to winter conditions and for repair and maintenance is from mid December until early March. From early March until mid May it is generally available for dredging as needed and frequently used to respond to critical early season shoaling problems.

The THOMPSON has a 20-inch discharge pipe with a 22-inch intake pipe. The main pump is powered by an 1800 HP diesel engine. Two 850 HP generators provide onboard electrical power. It is self-propelled with two 500 HP electric motors for propulsion. Travel time between locations varies by river conditions, but generally is 2-4 miles per hour (mph) upstream and 4-5 mph downstream. The major ancillary equipment includes a 1350 HP booster pump, a 1200 HP towboat, 3 dredge tenders (small work boats), 3 large bulldozers and a small bulldozer, a truck crane and miscellaneous support barges.

The normal traveling complement includes 4,300 feet of floating pipeline, 2,200 feet of shore pipe, and 2,300 feet of plastic pipe that can be used as either floating or shore pipe. The floating pipeline is mounted on pontoons with flange connections and full lighting. The pipeline system is designed for rapid set-up and breakdown for response to the frequent mobilization and demobilization requirements associated with river channel maintenance dredging. It is also efficient for separating the floating pipeline as necessary to pass towboats. The high speed hauling winch, cutterhead and pump design make the THOMPSON well suited to the typical shallow face, sand substrate dredging requirements typically experienced. Additional pipeline and a second booster pump are available for special projects requiring longer transport distances. Use of this equipment requires advance planning and additional cost because the equipment is mobilized from the Fountain City Service Base and must be transported independently to the dredging location. The additional equipment provides an extra 1,860 feet of steel pipe mounted on pontoons and 1,750 feet of plastic pipe. However, due to horsepower limitations, the maximum effective reach utilizing the additional equipment is 9,700 feet with a lift of 50 feet or less.

The THOMPSON operates 24 hours per day either 5 or 7 days per week depending upon workload. Subsistence and quarters are provided onboard for the dredge personnel. A crew of 49 staffs the Dredge on a 5 day/week operation and 57 employees are needed on a 7 day

operation.

Effective production rates for the THOMPSON, as with any hydraulic dredge, are influenced by a number of job specific variables including pipeline length, dredging face, cut location and orientation, flow rates, sediment particle size and in place material density. Production rates between 800 and 1000 cubic yards per effective dredging hour are typical. Overall dredging time is also significantly impacted by non-effective time due to shut down for placement site work, passing vessels, set-up and breakdown, maintenance and operating repairs, and miscellaneous other reasons. An effective dredging time of 55% is considered average, which based on the above production rates equates to a daily production rate of 10,500 to 13,200 cubic yards.

The District also has a smaller cutterhead dredge, the DUBUQUE, with a 12-inch pipeline. This unit is not regularly staffed. It is used on a limited basis for dredging projects where it is well suited, or when other equipment is not available. Staff from other work units are assigned to operate it when necessary.

9.2.2 Contract Hydraulic. The District's hydraulic dredging equipment is occasionally supplemented with contract hydraulic equipment as needed. This need may result from heavy workload, unavailability of government plant, physical restrictions or specialized equipment requirements. Contract pipeline dredges used in the District range in size from 8 to 24 inch pipelines and are primarily cutterheads, although small portable auger style dredges have been used to dredge recreational boat harbors and special projects.

9.2.3 Government Mechanical. Mechanical dredging is primarily accomplished by contract as discussed in the following section. The District has mechanical dredging equipment available for back-up response during time periods when a contract is not in effect or the overall workload and dredging time available require supplemental capability. This equipment is normally used for other channel maintenance activities and lock and dam maintenance and repair. Equipment available for dredging operations consists of two clamshell cranes (3.0 and 4.0 cubic yard buckets), dredge material barges with coaming and ramps, two dumpscows, endloaders, bulldozers and three tenders. Operations are conducted as described above in Section 9.2.

9.2.4 Contract Mechanical. The majority of the District's mechanical dredging is performed by contract. A contract is awarded for up to a three year period with each year after the first, being optional for renewal. The contract work area includes all of the channel and harbors on the District's portion of the UMR. Individual dredging locations are assigned as the requirement is established through surveys. An estimated total annual quantity is specified, with flexibility for variation due to actual dredging requirements. Payment for dredging is based on cubic yards and includes transporting the material up to 4.0 miles by barge and up to 900 feet on land. Contract provisions also allows for transport further than 4.0 miles by barge and further than 900 feet on land at additional established bid prices. An optional bid item is included in the contract for excavation of existing dredged material from island storage sites (Transfer Sites). Transportation of floating plant between dredging locations and mobilization/demobilization are

also separate bid items.

9.3 Emergency Response. As a matter of national policy, the Corps of Engineers defines a navigation emergency as a situation that would result in an unacceptable hazard to life or navigation, a significant loss of property, or an immediate and unforeseen significant economic hardship if corrective action is not taken within a time period less than the normal time needed under standard procedures. Because of the ambiguity and restrictiveness of this definition, the Corps Districts are encouraged to develop local agreements with state regulatory agencies that will allow for relaxation of permit requirements and provide for a timely response when groundings and channel closures occur. The St. Paul District has reached agreements with the Minnesota, Wisconsin and Iowa regulatory agencies that include provisions for responding to these situations. Details are discussed in Appendix A. These provisions are intended to avoid or correct hazardous channel conditions with minimal impact on natural resources. When critical situations are encountered it is the District's policy to make every attempt to conduct operations in accordance with standard procedures, including placing material at the permanent selected sites. If this is not possible, designated transfer or emergency placement sites are preferred. As a last resort, non-designated sites are selected that will result in the least adverse impact under the situation that exists.

10.0 Program Coordination.

The channel maintenance program is a major activity on the Upper Mississippi River system. How it is conducted can have a significant effect on the resources of the river and many other river related activities. These resources and activities are managed by other elements of the Corps of Engineers and by other local, state and federal agencies or organizations. There are also private individuals and groups interested or affected by the program. Close coordination of the channel maintenance program is a high priority of the District to assure that other interests are informed and have an opportunity to provide input as to how the program is executed. This document serves an important role in achieving this goal. The District employs a supervisor and two individuals in "Channel Maintenance Coordinator" positions, to plan, coordinate and manage the overall program. Management functions are centralized at the Channels and Harbors Project Office located at Fountain City, Wisconsin. There are a number of methods discussed below that the District uses to facilitate the coordination process. Appendix A provides a more detailed explanation of interagency notification and coordination procedures.

10.1 On-Site Inspection Team. The On-Site Inspection Team (OSIT) was organized during the GREAT study to provide a mechanism for timely coordination of dredging events and channel maintenance activities with field level state and federal resource managers. It also allows local communities and other organizations involvement in the program. It is valuable for providing information on proposed actions to agencies at a review level where it can be immediately evaluated for potential impacts. It allows the District the opportunity to obtain advice and recommendations from " local technical experts" as the activity is being planned.

The District uses this input in formulating a final decision on a proposed action. The OSIT also facilitates the regulatory process by providing regulating agencies an early review of the action and allows the District an opportunity to obtain information related to regulatory procedures. The OSIT is used for a variety of purposes: notification for routine dredging events with designated placement sites; operational planning for placement site implementation; alternative site identification for long range dredged material placement planning; coordination and site selection for emergency and imminent closure dredging; and planning and design of channel modification work. OSIT procedures are described in Appendix A.

10.2 River Resources Forum. The River Resources Forum (RRF) is an outgrowth of the GREAT study for continuing interagency cooperation. When that study was completed in 1980, participating agencies realized that the cooperation and coordination process that was established during the GREAT study should continue. Agencies with river resource management responsibilities needed a mechanism for ongoing coordination of channel maintenance and related activities, and so they joined together to form a partnership that started out as the Channel Maintenance Forum and later became the River Resources Forum in recognition of an increased emphasis on coordination of environmental and recreational resources.

Participating federal agencies are: Corps of Engineers, Fish and Wildlife Service, Coast Guard, Environmental Protection Agency, Natural Resources Conservation Service and National Park Service. State agencies include the Department of Natural Resources' and Department of Transportations' from Minnesota, Wisconsin and Iowa and the Minnesota Pollution Control Agency. Representation is at the middle manager/policy-maker level, which has been successful in achieving results, because participants can effectively represent the interests and positions of their respective agencies.

In 1991, participating agencies entered into a formal partnership agreement that states "We, the partners involved in management of the Mississippi River, recognize the multiple uses and benefits provided by this diverse ecosystem and are committed to work together as a trusting, cooperative team to manage the River from a resource-balanced approach in the best interest of the public." The group has a number of established goals and procedures for working together cooperatively that are described in the partnership agreement and accompanying operating procedures, which are included in Appendix A. The RRF is used to build consensus for proposed actions and to streamline administrative procedures. For the channel maintenance program it provides a mechanism by which the District can obtain the collective endorsement and support of other agencies when selecting new placement sites or implementing channel modification activities. Through effective communication and compromise, the District has been successful in obtaining RRF consensus on channel maintenance related proposals and will continue to pursue RRF support in the future.

The RRF is an advisory group that has no statutory or regulatory authority. Recommendations of the RRF are not binding upon any of the participating agencies nor does coordination of activities through the RRF eliminate the need for formal coordination and approval with the appropriate regulatory agencies. However, endorsement of a proposed action by the RRF is highly desirable and is often an important consideration element, in the agency's review and approval process. Failure to obtain RRF consensus or endorsement would result in

proposed actions following normal regulatory procedures. This would require that the proponent agency would have to seek permits or agreements with the individual regulating agency.

The RRF meets three times per year, normally in April, August and December. Field trips are sometimes arranged in conjunction with the meetings so that managers have an opportunity to observe activities first hand. The RRF also has sub-groups for providing technical advice on matters related to fish and wildlife resources, navigation, recreation and public information and education. These groups are used when issues are technically complex or more involved and the RRF cannot take the time necessary to fully investigate details.

10.3 U.S. Coast Guard. In addition to the Corps' responsibility for operating and maintaining the authorized channel on the Upper Mississippi River, the U.S. Coast Guard has major responsibilities related to navigation on the project. The Coast Guard maintains the aids to navigation, licenses vessels and personnel, permits bridges, oversees spill responses and has various authorities for regulating safe transportation. Close coordination of the channel maintenance program with the Coast Guard is imperative. When critical conditions or channel closure situations exist the two agencies work cooperatively in sharing information and making decisions collaboratively so that impacts on navigation interests and the environment are minimized.

10.4 Navigation Industry. One of the principal beneficiaries and users of the Upper Mississippi River navigation projects are the commercial towing interests. Maintaining good communication with the navigation industry is a primary objective of the program. The District strongly encourages ongoing feedback from the commercial users. Information on problem reaches is particularly valuable when scheduling survey and dredging activities, to make the District aware of the situation so the appropriate response can be activated. Procedures are established for towing operators to immediately report problems and groundings to the District. Initiatives are also taken to solicit input from towing interests. These initiatives include questionnaires, rides on vessels and various meetings with users. The River Industry Action Committee (RIAC) is an association of towboat operators, that the District frequently relies upon to coordinate activities and to seek input to decision making actions. RIAC is included in the OSIT process. This group is an especially valuable resource when critical conditions exist and decisions must be made on channel restrictions, navigability, dredging parameters and organizing the resumption of navigation following a closure event. The District participates in an annual information exchange meeting with the navigation industry. This meeting, held in March of each year, provides a forum for both the Corps of Engineers and the towing interests to exchange information and communicate concerns. The District regularly attends meetings of the Upper Mississippi River Waterways Association to stay abreast of issues and activities related to that organization. To coordinate navigation activities unique to the Minneapolis-St. Paul area, the District has been sponsoring an annual meeting with representatives of the industry in that area. Another coordination mechanism that allows for information sharing with the industry is the Navigation Work Group of the RRF. This group assembles the technical expertise of the major agencies and organizations involved in river navigation for the purpose of tackling issues that may extend beyond the capabilities or authority of an individual group.

10.5 General Public. The Upper Mississippi River projects have been authorized by Congress to provide economical transportation for the region and the country, and to provide harbors for safety and recreational opportunities. The public in general benefits by these projects and the Corps must operate and maintain them in consideration of the public's best interest. The District recognizes that navigation is only one of many uses of the river. The public relies upon the river for many other interests including recreational boating, hunting, fishing, camping, sightseeing, residential development, commercial activities and enjoyment of nature. The District strives to conduct channel maintenance activities in harmony with these other interests. Educational literature has been developed to provide information to interested groups and individuals. Presentations are frequently given to groups expressing interest in various aspects of the program.

Coordination with local interests and the general public for proposed actions or significant changes in the program is accomplished through written notifications and public information meetings. Input from individuals and organizations knowledgeable of local resources can be a valuable contribution to the planning and design of a channel maintenance action.

APPENDIX A

INTERAGENCY COORDINATION PROCEDURES

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Interagency Coordination Procedures for Channel Maintenance Activities

1.0 Introduction.

1.1 Purpose. This appendix to the Channel Maintenance Management Plan (CMMP) outlines the notification procedures used by the Corps of Engineers to coordinate channel maintenance activities with the proper state and federal agencies. Channel maintenance consists of dredging events, preparation of placement sites for dredged material, channel control structure modifications, or other related activities. The procedures listed in this document have been developed in consideration of previously approved regulations, agreements, memorandums of understanding, reconnaissance reports and the GREAT report. In the following sections, the U.S. Army Corps of Engineers, St. Paul District will be referred to as the "District".

The District will take all reasonable and practical measures to avoid environmental harm when dredging, including using environmentally sound on-land or confined on-land placement as well as berming. All contract dredgers or others performing work will comply with the terms and conditions agreed to by the District.

1.2 Information and Data Available. To maintain current data and information in the CMMP and to comply with agreements that the District has with state regulatory agencies, a preseason update of information contained in the CMMP will be distributed prior to May 1st of each year. It is anticipated that the following tables will be updated annually: TAB 2, TAB 3-3, TAB 3-4, TAB 4-1, TAB 4-2, TAB 6 and TAB 7. In addition, the following information will be reviewed and updated as necessary: TAB 1-3, TAB 3-1, TAB 3-2, TAB 4-3, TAB 5, and the placement site information sheets and maps contained in TAB's 9 through 20.

2.0 General Information.

2.1 River Resources Forum. The River Resources Forum (RRF) was established for continuing the interagency coordination process that originated during the GREAT study. The RRF serves as an advisory body to the District for implementing the GREAT recommendations and to coordinate river related issues. A RRF partnering agreement was signed on 19 September 1991. That agreement together with the RRF operating procedures dated September 1991 outline the goals, objectives, participants, authority, funding, operation, and functions of the RRF. A resolution for establishment of RRF technical work groups was endorsed by the RRF in December 1991. The resolution provides guidelines for establishing and operating technical work groups. The partnering agreement, operating procedures, and resolution for establishment of RRF technical work groups, have been added to this document as Exhibits A, B, and C respectively.

Finding adequate placement sites for dredged material and the coordination for selecting

sites is an ongoing process. Most existing sites for dredge material placement have been recommended through the GREAT study or through District generated reconnaissance reports that have been endorsed by the RRF. These sites are identified in the CMMP which includes maps and information sheets that provide detailed information on background and planned use. Significant changes or additions will be coordinated with the RRF.

When a major new planning effort is required at a particular location the procedures described in section 6.1 and appendix D of the CMMP will be followed. The planning process will be coordinated with the RRF through the various stages of problem identification, alternative development, evaluation and site selection. Proposals will be submitted to RRF members at least 30 days prior to any requested action. The RRF members will be asked for their endorsement of the proposal. If the proposal is endorsed, the District will pursue site implementation. If the proposal is not endorsed, the District will consider appropriate changes to gain endorsement. If RRF endorsement is not possible, the District will decide to pursue the proposed action following normal regulatory procedures or will abandon it.

2.2 On Site Inspection Team (OSIT). Most detailed coordination with agencies will be through the OSIT. The OSIT function is to provide input to the District for making decisions concerning dredged material placement and other channel maintenance activities, and to coordinate these activities within their respective agencies and states. It is composed of field personnel from various agencies that are most familiar with the resources in the area of the proposed operations. The OSIT provides recommendations on how to best implement the dredged material placement plan for any given dredge cut.

When a dredging condition becomes definite and a project is proposed, a Dredging Notice (Exhibit D) will be sent to the OSIT for the particular pool of the proposed project. Whenever possible, notification to OSIT members should be at least 14 days prior to the start of any proposed project and if a meeting is scheduled, notification should be at least 7 days prior to the meeting date. The OSIT may or may not meet, depending on the site or activity and the proposed work that is planned. If placement is proposed at a designated site, the Dredging Notice should contain information adequate enough to allow an agency to accept the use of the site. If placement is proposed at a non-designated site or a site where procedures have changed, the Dredging Notice will include a request for a meeting giving the date, the time, the place, and whether or not a boat will be required. If an OSIT meeting is held, the District will provide a Memorandum For Record (MFR) following the meeting documenting the outcome (Section 5.1). The District's Channel Maintenance Coordinator will present the OSIT recommendation to the District for a final decision.

The OSIT will also serve as a means for the members to appeal the Corps intended action to the District Engineer. The appeal process will begin when a majority of the members vote to appeal. The Fish and Wildlife Service (FWS) OSIT representative will notify the District Engineer of the appeal immediately by telephone and set a date (approximately one week later) for a hearing by the District Engineer. The Corps will postpone any dredging action under appeal until the conclusion of the hearing, unless the proposed action involves emergency dredging. The FWS representative will coordinate the development of the appeal case and materials to present to the District Engineer. One OSIT member will be selected to make the presentation to the District

Engineer. After an open discussion period, the District Engineer will make a final decision which will conclude the appeal process. The OSIT will be informed of that decision prior to initiation of dredging. If a conflict still exists, agencies may pursue their concerns through normal regulatory procedures. The OSIT appeal process is described in more detail in Exhibit 7 of the GREAT I Main Report (1980).

2.3 Channel Maintenance Program Mailing List. The channel maintenance program mailing list is a document maintained by the Disstrict. It is used for the purpose of informing individuals and agencies of channel maintenance events taking place in the District.

The mailing is broken down into five different groups. These groups are the River Resources Forum (RRF), the Fish and Wildlife Work Group (FWWG), the Recreation Work Group (RWG), the Navigation Work Group (NWG), and the On Site Inspection Team (OSIT). Individuals on the mailing list will be identified as participants or as official agency representatives for a particular group. Those designated as official agency representatives will be the main contact for events which take place on short notice. It will be that individual's responsibility to inform the remaining participants within their agency.

The list will be maintained by the District, but is dependent upon the coordinating agencies furnishing current information regarding addresses, telephone numbers, telefax numbers, and changes in personnel. The list is available at the District's Mississippi River Project Office and is periodically updated and distributed through the RRF.

3.0 State Permits and Agreements.

3.1 General. Iowa, Minnesota, and Wisconsin are the three states within the District which have authority under the federal Clean Water Act of 1977, to control the discharge of dredged or fill material in any portion of the navigable waters within the jurisdiction of that state. Each time dredged material is placed below the ordinary high water mark, or if an effluent is discharged, the District must have a permit, certification, agreement, or waiver from one or more of these states. The Corps' legal position is that state permits are not required when placement is above the ordinary high water mark and there is no effluent discharge. It is also the Corps position that the states do not regulate the act of dredging.

Permits and agreements for each of the three states are on file at the District's Mississippi River Project Office in Fountain City, WI and will be available upon request. They should be referred to for more complete explanations.

3.2 Minnesota. There are two state agencies in Minnesota that have regulatory authority for the placement of dredged material. These agencies are the Minnesota Department of Natural Resources (MDNR) and the Minnesota Pollution Control Agency (MPCA). Permit requirements and agreements for these agencies will be discussed in the following sections.

3.2.1 Department of Natural Resources. The District has a long term permit with the MDNR to discharge dredged material in the maintenance of the Mississippi River, from the

head of navigation to the Iowa border, and on the navigable portions of the Minnesota and St. Croix Rivers. The District also has a Memorandum of Understanding (MOU) with the MDNR to provide orderly procedures and processes for assuring coordination actions between agencies. The requirements are briefly explained as follows.

If routine dredging is scheduled and placement of dredged material will be below the permit elevations as defined in Appendix A of the Minnesota Memorandum Of Understanding (MOU), or at any site which changes the course, current, or cross-section of any state protected waters and/or wetlands, the District will need a permit from the Minnesota DNR. Approved sites as defined by the State of Minnesota are listed in Appendix B of the Minnesota Permit, or are listed in amendments to the appendix. They are sites recommended by the GREAT I study or others coordinated through the RRF and agreed to by the District and the State. A permit does exist which covers all previously endorsed permanent and temporary placement sites. However, the placement of fill at any given site shall be subject to a separate approval based on considerations of OSIT findings and conformity with mutually acceptable past placement practices and procedures at the site. The information in the Dredging Notice will be adequate enough to approve the sites which have been used in the past if the procedures have remained unchanged and there is adequate capacity. Dredge material placement or procedure changes may require the need for an OSIT meeting.

Placement of dredged material at a site which is not a GREAT recommended temporary or permanent site or which has not been designated through the RRF shall require a separate permit approval from the Minnesota DNR. This is also true for those sites which have been designated but have been modified. For most situations, especially when in-water rehandling is involved, the approvals will generally consist of special amendments to the existing permit. If the MDNR determines that placement at a site may result in significant adverse impacts, a separate permit may be required.

3.2.2 Pollution Control Agency. The District has a long-term permit with the MPCA allowing the construction and operation of disposal facilities on the Mississippi River from the head of navigation to the Iowa border and on the Minnesota and St. Croix Rivers. This permit establishes procedures for approval of projects and outlines the coordination which must take place between agencies. The procedures are briefly explained as follows:

The District will need a Water Quality Certification from the Minnesota Pollution Control Agency for any placement operations in the State of Minnesota where either material or effluent must be discharged below the ordinary high water mark. The use of any site shall be subject to approval by the Director of the MPCA following the submission of the proposed plans and specifications. The information on the Dredging Notice will be adequate enough to approve the sites which have been used in the past if the procedures have remained unchanged and there is adequate capacity. If a new site is proposed, the decision for approval will be based on the recommendations of the OSIT and any additional information provided by the District. Information, such as critical and typical cross sections of the placement site showing capacity, erosion protection measures, and plans for removal of material, may be provided by the District to expedite the approval process.

No construction or dredged material placement shall commence until the District has

received written approval from the Director of the MPCA.

3.3 Wisconsin. The District has a Memorandum of Understanding (MOU) with the Wisconsin Department of Natural Resources (WDNR) for the purpose of facilitating long term channel maintenance, recreational beach development and environmental management programs related to the placement of dredged material on the Upper Mississippi River. This MOU exempts the District from state permits, licenses, authorizations, and fees for placing dredged material at designated sites. This says that the District may deposit dredged material at designated sites and conduct other approved specific activities related to channel maintenance. Designated sites as defined by the State of Wisconsin are listed in Exhibits A, B and C of the Wisconsin MOU, or are listed in amendments to those exhibits. They are sites recommended by the GREAT I study or ones coordinated through the RRF and agreed to by the District and the State.

If a proposed dredging operation involves the placement of material in Wisconsin at a non-designated site that requires a state permit, an amendment to the MOU would be sought . An amendment can be made by mutual written agreement of the WDNR and the District. The River Resources Forum will be used in an advisory capacity in connection with any such amendment. If the site is not amended to the Wisconsin MOU, an acceptable alternative site must be chosen for dredge material placement or dredging must be deferred.

3.4 Iowa. The Iowa Department of Natural Resources (IDNR) submits a document to the District each year detailing Iowa's Section 404(t) permit requirements and on site inspection team procedures for the upcoming navigation season. Regulatory agency representatives and OSIT members are also listed in this document. The requirements and procedures have not changed much from year to year and are briefly explained as follows:

If routine dredging is scheduled and discharge of dredged material or effluent will be below the ordinary high water mark in the State of Iowa, the District will need a unified 404(t) permit from the IDNR. This will be obtained whether or not the site has been previously designated.

Information on the District's Dredging Notice will be adequate enough to initiate the permit process. Additional information such as available sediment data, specific methods of containment, erosion control, periodic removal, and impact of dredging and placement on fish and wildlife may be included to expedite the permitting process.

If dredged material will be placed on floodplain lands not owned by the state or the federal government, the IDNR may require the affected landowner to secure a separate floodplain permit prior to issuance of the unified 404(t). If this will take place, the District will notify the landowner at the earliest possible date.

The unified 404(t) permit will consist of a letter signed by the Director of the IDNR. The letter will specify the approved activity and may contain special conditions necessary to meet state requirements. If the District can not meet a permit condition, the IDNR will be notified and the condition will be amended or an alternative placement site will be used.

4.0 Notification Procedures.

4.1 General Procedures and Notices. The District will use telephone calls, telefax, mailed memos, and meetings to coordinate channel maintenance activities. The method used for a specific situation will depend upon the time available, the nature of the activity, the availability of agency personnel, and other related factors. Agencies are encouraged to designate alternate points of contact and after hour contacts to facilitate the notification process. Agency points of contact are listed in the channel maintenance program mailing list, described in section 2.3.

The District will periodically send memorandums or fact sheets with details of current and future plans for the existing navigation season to all OSIT members. This information may include but is not limited to listings of potential problem areas, proposed dredging schedules, and other scheduled channel maintenance work. This notice of the District's plans will help agencies stay up to date with the current channel maintenance projects and those proposed.

4.2 Routine Dredging. Routine channel maintenance dredging is dredging normally scheduled to alleviate shoaling at locations in the navigation channel. These locations, if not dredged could potentially become navigation hazards. For each routine dredging job there are steps or procedures to follow before dredging should take place. The procedures will vary according to the state in which the dredged material will be placed and also according to whether or not the site is contained in the Channel Maintenance Manangement Plan (CMMP).

4.2.1 Placement at Designated Sites. A designated site is one which is included in the Channel Maintenance Management Plan as either a permanent or temporary site. Temporary sites are categorized as either transfer, emergency or in-water rehandling sites as described in section 6.3.2 of the CMMP. To use these sites there must be an adequate capacity to hold the quantity proposed and the placement procedures must be essentially the same as those accepted in the past. If the placement site is a designated site, its use may be proposed and a Dredging Notice will be sent to the OSIT members. OSIT meetings are not anticipated if the site has been designated and placement procedures have been previously accepted. However, if an agency would like to discuss an alternative other than the proposed site or has special concerns, they may request a meeting.

Once a placement site has been chosen and procedures have been outlined, it will be up to the District to assure that all federal, state, and local regulations are followed. These regulations are outlined in section 4.0 of the CMMP.

4.2.2 Placement at Non-Designated Sites. A non-designated site would include any site which is not currently included in the CMMP. This includes newly proposed sites, sites which have been used but not formally endorsed, and sites which have been designated but with substantially different placement procedures.

If a non-designated site is proposed, the District will provide the OSIT with detailed information that will include as appropriate, critical and typical cross sections and specifications of the area and capacity of the site, diagrams of outfall structures if used, erosion protection, location, maps, and plot plans. This information will be submitted at least 30 days prior to scheduled construction or use of the site. If a 30 day review period is not possible due to the urgency of the proposed action, the OSIT members will be notified and asked to expedite the

review process. Proposed use of a non-designated site will include an OSIT meeting unless waived. Use of a non-designated site will be in accordance with state permits and agreements. If a non-designated site has potential for ongoing use, a proposal will be submitted to the RRF for endorsement and the site will be added to the CMMP as a designated site.

4.3 Imminent Closure. The imminent closure provision is intended to avoid the need for emergency dredging by preventing foreseeable closures of the navigation channel. The actual imminent closure dredging definition used with a particular state agency may vary slightly depending upon mutual agreements, but the intent is similar to the following description from the GREAT I report:

> Imminent closure dredging is required when the actual water depth is projected by the District Engineer to be 10 feet or less within 14 days or less, or the channel width is less than 85 percent of the normally maintained width.

If possible, approved permanent or temporary dredged material placement sites shall be used for imminent closure dredging. The priority order for site selection under imminent closure dredging is as follows:

(A) CMMP permanent or transfer placement sites.
(B) CMMP emergency placement sites.
(C) Other appropriate regulatory agency approved emergency sites with removal to CMMP approved sites.

When channel conditions are such that imminent closure dredging is required, the District will comply with the following procedures: The appropriate federal and state designated agency representative for the On Site Inspection Team (OSIT) will be contacted by phone and the imminent closure condition and dredging proposal will be explained. If contact is not made with the official agency representative, an attempt will be made to contact the alternate agency representative on the OSIT for the particular pool. If the District has made a reasonable effort but has been unable to contact the agency representatives, operations may proceed in accordance with the applicable state agreement. When an agency representative is contacted, an OSIT meeting will be arranged unless the method of operation is in compliance with all state and federal agreements and regulations and the OSIT determines that a meeting is not necessary. A Dredging Notice will be sent to the OSIT after a determination has been made whether or not to hold a meeting. A written projection of water surface will be submitted based on normal precipitation and actual water surface elevation conditions for the 14 day period prior to dredging. This projection will be prepared by the District's Chief of Water Control.

The District shall take additional depth measurements at the site prior to dredging. If these later measurements indicate that the channel has stabilized at a depth of ten feet or greater, no dredging shall be accomplished under imminent closure. If the channel has not stabilized, imminent closure dredging will be accomplished.

If a non-designated placement site is used, an after action report will be provided to the OSIT within 30 days of completing dredging, (Section 5.2). Each state has slightly different requirements for imminent closure dredging. The following sections will briefly explain these requirements.

4.3.1 Placement in Minnesota. In compliance with the Memorandum Of Understanding (MOU) between the District and the Minnesota DNR, if dredged material is to be placed below the elevations established in Appendix A, the District will notify the Department as soon as the imminent closure condition becomes known. If proposed placement is not at an approved site, the District will seek verbal approval from the Commissioner of the Minnesota DNR or his designated representative. After verbal approval has been received it will be followed by written approval from the Commissioner's designated representative. If material is placed at a priority C location as listed in Section 4.3, it will be removed to a permanent or transfer site as soon as practical, unless the District and Department agree on another course of action. A verbal approval will also be needed from the Minnesota Pollution Control Agency (MPCA) Director or a designated representative. If the District has made a reasonable effort but has been unable to contact the Director, operations may proceed without the MPCA's verbal approval.

4.3.2 Placement in Wisconsin. In compliance with the Memorandum Of Understanding (MOU) between the District and the Wisconsin DNR, the District will follow the general notification procedures set forth in Section 4.3. The District must also use the priority order for the selection of the placement sites.

4.3.3 Placement in Iowa. The District should attempt to obtain a unified 404(t) permit prior to dredging if at all possible. Permit coordination will be handled by telephone and followed up within seven days by written documentation. The District is authorized to proceed with imminent closure dredging and related placement without the approved 404(t) permit under the following conditions: a) agency representatives can not be reached within the 24 hour period after the District first recognized imminent closure conditions, or b) a unified 404(t) permit has not been verbally approved by agency representatives within 48 hours of being contacted.

4.4 Emergency. The actual emergency dredging terminology agreed to with a particular state agency, may also vary slightly, but the intent is similar to the following description from the GREAT I report:

> Emergency dredging should be defined as dredging required to free a grounded vessel or remove shoals in the channel as a result of a vessel freeing itself. The emergency will continue only until an adequate channel depth and width, as determined by the Corps of Engineers, is restored to allow vessel passage.

If possible, approved permanent or temporary dredged material placement sites shall be used for emergency dredging. The priority order for site selection under emergency dredging is as follows:

(A) CMMP permanent or transfer placement sites.
(B) CMMP emergency placement sites.
(C) Other sites as determined by the Corps, and if possible in consultation with federal and state regulatory agencies, with removal to CMMP approved sites.

When the District determines that emergency dredging is required, immediate notice will

be given to the U.S. Coast Guard to consider establishing a safety zone for dredging operations. Every attempt will then be made to notify the appropriate federal and state regulatory agencies and representatives of the OSIT for that pool. Notification may be verbal and does not require approval from the regulatory agencies. If contact is not made with the official agency representative, an attempt will be made to contact the alternate agency representative on the OSIT for the particular pool. If the District has made a reasonable effort but has been unable to contact the agency representatives, operations may proceed with contact as soon as possible.

If it is at all practical and feasible, an OSIT meeting will be held prior to dredging for recommendations and advice. A Dredging Notice will be sent to the OSIT members as soon as possible.

If a non-designated placement site is used, an after action report will be provided to the OSIT within 30 days of completing dredging, (Section 5.2). After action reports will include consideration of actions necessary to remove material and/or rectify and restore the impacted area. The actual follow up action will be determined in consultation with other federal and state agencies through the OSIT process.

5.0 Reports.

5.1 On Site Inspection Team Memorandum For Record. If an On Site Inspection Team (OSIT) meeting is held, the District will provide a Memorandum For Record (MFR) as soon as possible after the meeting. This MFR will contain an attendance list, alternatives and issues discussed, concerns noted, and the final proposed plan. It will be sent out to the OSIT members for the particular pool in which the meeting took place.

5.2 Imminent Closure or Emergency Dredging Report. Within 30 days of completing imminent closure or emergency dredging, an after action report will be provided to the OSIT if a non-designated placement site has been used. This report will include the following items:

(1) nature of occurrence that necessitated the imminent closure/emergency dredging,
(2) sounding data,
(3) dredging depth,
(4) volume of material dredged,
(5) equipment used,
(6) placement methods,
(7) sediment data available,
(8) actual duration of dredging, including beginning and end dates,
(9) project alternatives considered, both dredging methods and placement sites,
(10) discussion of measures taken to minimize effects,
(11) discussion of any biological effects, and
(12) written projections of water surface and depth.

5.3 Annual Channel Maintenance Summary. At the end of the navigation season, the District will prepare an annual summary report. This report will contain the following items:

(1) location and identification of dredging projects including,
   a. river mile
   b. dates dredged
   c. quantity dredged
   d. disposal site & river mile
   e. equipment used
   f. dredging depth
(2) itemization of dredging costs,
(3) any irregularities associated with a particular job,
(4) estimate of beneficial uses during the season,
(5) results of any monitoring conducted,
(6) discussion of placement sites used,
(7) problems which may come up next season due to late season shoaling or remaining placement site capacities,
(8) summary of other channel maintenance activities.

A Draft of the report will be sent to all OSIT members as well as all members of the RRF, no later than 1 January of the next year. The final report will be finished and sent to the same members no later than 28 February of the next year.

RIVER RESOURCES FORUM

UPPER MISSISSIPPI RIVER MILE 614.0 - 857.6
AND NAVIGABLE TRIBUTARIES

PARTNERING AGREEMENT

We, the partners involved in management of the Mississippi River, recognize the multiple uses and benefits provided by this diverse ecosystem and are committed to work together as a trusting, cooperative team to manage the River from a resource-balanced approach in the best interest of the public.

GOALS

I. We will actively work to foster confidence and mutual trust by discussing issues openly and respecting differences if they should arise.

II. We will work jointly towards our objective of achieving consensus support for agencies' programs, projects, activities, and studies.

III. We will promote effective and timely interagency and public communication so that realistic expectations are established and activities are conducted with full awareness.

IV. We will facilitate internal coordination so that activities are expedited through the administrative process.

V. We will be guided by mutually agreed-upon operating procedures.

MEMBERS

Army Corps of Engineers

Coast Guard

Environmental Protection Agency

Fish and Wildlife Service

National Park Service

Soil Conservation Service

STATE OF IOWA

Department of Natural Resources

Department of Transportation

STATE OF MINNESOTA

Department of Natural Resources

Department of Transportation

Pollution Control Agency

STATE OF WISCONSIN

Department of Natural Resources

Department of Transportation

SEPTEMBER 19, 1991

Date

Exhibit A

River Resources Forum

Operating Procedures
September, 1991

OBJECTIVES

The objectives of the River Resources Forum (RRF) are to:

(1) provide a mechanism for all Federal and State agencies with management or regulatory responsibilities along the Mississippi River and tributaries in the St. Paul District area to facilitate the coordination of their programs and activities; and to

(2) provide an opportunity for other interested parties to express their concerns and views to the agencies.

PARTICIPANTS

Representatives of the following Federal and State agencies are invited to participate in the forum, as well as any others that may have an interest in doing so.

Federal

- Coast Guard
- Corps of Engineers
- Environmental Protection Agency
- Fish and Wildlife Service
- National Park Service
- Soil Conservation Service

State

- Iowa Department of Natural Resources *
- Iowa Department of Transportation
- Minnesota Department of Natural Resources *
- Minnesota Department of Transportation
- Minnesota Pollution Control Agency
- Wisconsin Department of Natural Resources *
- Wisconsin Department of Transportation

Other agencies, organizations, and interests would be notified of the meetings and the view of any affected or interested party would be welcome at the meetings. The Minnesota-Wisconsin Boundary Area Commission is an active non-voting member of the Forum. A list of agency representatives to the Forum and a list of persons to be notified of the meetings is contained in the Channel Maintenance Program Mailing List which is maintained by the St. Paul District, Corps of Engineers.

* Designated state voting agency.

AUTHORITY

The authority for each agency's participation in the activities of the Forum lies within that individual agency's programs, authorities, and management or regulatory responsibilities. Participation in the Forum does not affect an individual agency's responsibility to issue permits, to manage programs, or to operate projects. The views of agencies expressed at the Forum are not binding on another agency.

FUNDING

Each agency or interest would be responsible for the funding of its representatives. The Forum could recommend priority funding of identified research and/or implementation effort through an appropriate lead governmental unit.

OPERATION

The Forum would meet normally three times annually to discuss issues pertinent to the involved river resource management agencies. Meeting places and times would be determined by the Forum. A chairperson/s for the Forum will be selected by the representatives. All meetings will be open to the public. All participants would be welcomed into subject discussions; however, formal Forum recommendations would be based on a concensus vote of each State and each Federal agency. Each State and each Federal agency and will formally designate one voting member.

FUNCTIONS

The functions of the Forum would include, but not be limited to the following:

- providing guidance on the relative priority of implementation of GREAT I study recommendations.

- providing opportunities to openly discuss and assist agencies in the resolution of interagency conflicts.

- recommending changes or modifications to the GREAT I channel maintenance plan, as necessary to allow implementation.

- providing guidance and recommendations to implementing agencies on technical studies, data collection and similar efforts needed to resolve issues and/or problems.

- providing recommendations on implementation of Environmental Management Program activities.

- providing a mechanism for preparation of a comprehensive recreation management plan.

RESOLUTION FOR ESTABLISHMENT OF RIVER RESOURCE FORUM TECHNICAL WORK GROUPS

Endorsed at RRF Meeting 3-4 December 1991

Be it resolved that the River Resource Forum (RRF) supports and endorses the development of technical work groups to enhance the exchange of technical information and to provide for early coordination by field level personnel in matters relating to river resources. The following guidelines are provided:

1. Coordination groups will be established for Fish and Wildlife, Recreation, Navigation, Public Education and Information, and other areas as needed.

2. Each Federal agency and State should designate a single point of contact to serve as the lead representative for each of the above areas of interest. However, each Federal agency or State may have several individuals participate if they choose to do so. The lead representative will be responsible for internal coordination within the Federal agency or State. This individual will also cast the vote of the Federal agency or State if so required to conduct work group business.

3. The purpose of the technical work groups is for field level resource managers and technical experts to meet as needed for review of various activities. These individuals would provide technical comments and information into such matters as the design and priority of studies and projects, alternatives being considered, methods, data needs and related items. The technical work groups may advise the RRF on policy related issues if requested to do so.

4. The RRF will assign topics for the technical work groups to consider. Following their deliberations, the technical work groups will report their findings back to the RRF. The RRF will consider this input in their planning but are not necessarily bound to follow it.

5. The technical work groups will be responsible for deciding their own method of leadership and procedures for general operation and conflict resolution with approval of the RRF if required. (i.e. additional agency funding or staff support is needed)

6. A technical work group may be terminated at the discretion of the RRF.

Exhibit C

DN 95-

DREDGING NOTICE
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT

NOTICE DATE: DREDGING CATEGORY:
MEETING DATE: MEETING TIME:
BOAT REQUIREMENT: MEETING LOCATION:

DREDGE CUT NAME: RIVER MILE:

HISTORIC DATA
Frequency: Avg. Quantity/Job: yd^3
Year Last Dredged: Avg. Quantity/Year: yd^3

SURVEY DATA
Date Surveyed:
Water Surface Elevation:
Low Control Pool Elevation:
Net Difference:
5 Day River Forecast:

DREDGING DATA
Recommended Channel Width:
Recommended Dredging Depth:
Estimated Quantity: yd^3
Type of Dredge:
Proposed Dredging Date: Estimated Duration: days
Justification for Dredging:

MATERIAL PLACEMENT DATA
Proposed Placement Site:
Location:
Site Characteristics:

ALTERNATIVES:

If you have any questions concerning this project or request an on-site meeting please contact this office at (608)-687-3011.

Sincerely,

Enclosures: Site Map

Steven D. Tapp
Channel Maintenance Coordinator
CO-NV-Waterways Unit
431 North Shore, P.O. Box 397
Fountain City, WI 54629-0397

Exhibit D

APPENDIX B

DISTRICT MITIGATION POLICY

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Policy Guidance for Section 404 Mitigation For Operation and Maintenance Activities

St. Paul District, U.S. Army Corps of Engineers

1. References:

a. Section 906 of the Water Resources Development Act of 1986 (Public Law 99-662), Fish and Wildlife Mitigation.

b. Section 307 of the Water Resources Development Act of 1990 (Public Law 10-640, 28 November 1990).

c. Memorandum, CECW-OR, 7 February 1990, subject: Section 404 Mitigation Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines.

d. ER 1105-2-100, 28 December 1990, Section 7-35: Mitigation Planning and Recommendations.

e. Memorandum, CECW-PA, 7 March 1991, subject: Policy Guidance Letter No. 24, Restoration of Fish and Wildlife Habitat Resources.

f. 33 CFR 335-338, Discharge of Dredged Material Into Waters of the U.S. or Ocean Waters; Operation and Maintenance.

2. Background: Reference 1a. authorized the Secretary of the Army to mitigate damages to fish and wildlife resources resulting from any water resources project under the Secretary's jurisdiction, whether completed, under construction, or to be constructed. Reference 1b. established for the Corps of Engineers water resources development program an "interim goal of no overall net loss of the Nation's remaining wetlands base, as defined by acreage and function, and a long-term goal to increase the quality and quantity of the Nation's wetlands, as defined by acreage and function." Reference 1c. provides specific policy and procedures to be used by the Environmental Protection Agency and the Department of the Army in determining the type and level of mitigation necessary to demonstrate compliance with the Clean Water Act Section 404(b)(1) Guidelines for the Section 404 Regulatory Program. Reference 1d. provides guidance on mitigation planning in conducting civil works planning studies. For these studies, the guidance states that the project-caused adverse impacts to fish and wildlife resources shall be avoided or minimized to the extent practicable, and that remaining, unavoidable impacts shall be compensated

to the extent justified. Reference 1e. provides policy guidance for Corps activities regarding restoration of fish and wildlife habitat resources. This guidance document indicates that the policy under current budgetary constraints does not provide for implementation of the provisions of WRDA 1986 to mitigate for past damages to fish and wildlife resources at existing projects under Section 906(e). Reference 1f. provides guidance in evaluating dredged material disposal for navigation projects.

3. Purpose: To provide guidance and procedures for wetland mitigation for St. Paul District Operation and Maintenance (O&M) activities at existing Civil Works projects consistent with Corps policy and applicable laws and regulations.

4. Applicability: This policy guidance is applicable to all St. Paul District elements having Operation and Maintenance responsibilities for existing Civil Works projects. This guidance is not applicable to new starts, which are covered under reference 1d., or the regulatory program, which is covered under reference 1b. This guidance also does not apply to mitigation for degradation that in at least part was caused by the construction of and/or past operation and maintenance activities for existing projects (reference 1e.).

5. Definitions:

Appropriate: Commensurate with the scope and degree of environmental impacts of a project.

Avoidance: Precluding potential impacts by not taking a certain action or parts of an action or by modifying an action to eliminate impacts.

Balanced Multiple Resource Approach: Equitable emphasis on natural, cultural, social, recreational, and economic resources in developing and evaluating alternative actions (sustainable development).

Compensatory mitigation: Providing replacement for the unavoidable loss of aquatic/wetland resources that occur.

Cost Effective: Best use of money; most value.

Existing Technologies: Equipment and methods that are generally available.

Feasibility: To be workable, practicable, cost effective, and environmentally acceptable (in compliance with applicable environmental guidelines, regulations, and laws).

Federal Standard: Dredged material disposal alternative(s) identified by the Corps which represents the least costly alternatives consistent with sound engineering practices and environmental requirements. Under the federal standards determination process the alternative or alternatives are selected through the 404(b)(1) evaluation process, environmental assessment or environmental impact statement, and public notice coordination process.

Justifiable: To be practicable; appropriate, under existing guidance, regulations, and laws; and the most cost effective.

Least Costly: Least in terms of monetary costs, after considering engineering practices and environmental requirements.

Logistics: Factors (i.e., procurement, personnel, equipment, environmental constraints) influencing how, when, and what work is accomplished.

Offset: Balance.

Minimization: Limiting the degree or magnitude of an action; rectifying the impact by rehabilitating or restoring the affected resource; or reducing the impacts over time by preservation or maintenance over time.

Partnership: A group established to cooperatively work together to reach common goals.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Wetlands: Areas that under normal circumstances have hydrophytic vegetation (plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content), hydric soil (a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part), and wetland hydrology (permanent or periodic inundation or prolonged soil saturation sufficient to create anaerobic conditions in the soil). Wetlands will be delineated by the U.S. Army Corps of Engineer's 1987 Wetlands Delineation Manual (Technical Report Y-87-1, with addenda) or the most current manual being used in the Corps 404 Regulatory Program.

6. Policy: The St. Paul District, in its O&M activities, will strive to avoid and minimize adverse impacts and compensate for unavoidable adverse impacts to existing wetlands and aquatic resources. The St. Paul District's interim goal in conducting the O&M mission will be to achieve

no overall net loss of wetland acres, values and functions, and a long-term goal to increase the quality and quantity of wetland acres and functions.

Mitigation planning will be sequential and follow the Council on Environmental Quality regulations (40 CFR 1508.20) to include avoidance, minimization (minimizing, rectifying, or reducing impacts over time), and compensation. The determination of what level of mitigation constitutes appropriate mitigation will be based on the aceres, values and functions of the wetland/aquatic resources that will be affected. Mitigation planning for O&M activities will occur sequentially as follows:

a. Avoidance - No discharge of dredged or fill material will be done if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. To determine whether practicable alternatives are available and capable of being done, consideration, as specified in the 404(b)(1) Guidelines, needs to be given to cost effectiveness, existing technology, and logistics in light of overall project purposes. It is the Corps' policy (see reference 1f.) to regulate the discharge of dredged material from its navigation projects to assure that dredged material disposal occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project. The least costly alternative, consistent with sound engineering practices and selected through the application of the 404(b)(1) guidelines will be designated the federal Standard for the proposed project.

b. Minimization - Projects will be designed, to the extent practicable, to minimize unavoidable impacts to the aquatic ecosystem. Temporary impacts to wetlands (e.g., construction of a temporary access road or staging area) should be rectified by repairing, rehabilitating, or restoring the affected wetlands. After an activity is completed, further wetland impacts from draining or filling will be reduced or eliminated by maintaining, operating, and managing the project in a manner that preserves and maintains remaining wetland functions and values.

c. Compensatory Mitigation - Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been done. Compensatory mitigation (e.g., restoration of existing degraded wetlands, restoration of former wetlands that have been completely or partially drained or filled, or creation of man-made wetlands) should be provided, to the maximum extent practicable and justifiable, in areas adjacent or contiguous to the discharge site (on-site mitigation). If on-site compensatory mitigation is not practicable or feasible, off-site compensatory mitigation should be undertaken in the same geographic area (i.e., in close physical proximity and, to the extent possible, in the same watershed). In the special case of the District's 1995 modified Channel Maintenance Management Plan, a reduction in impacts at one of the selected disposal sites (included in the baseline exemption described in Section 6c(1)(c)) may be evaluated as a compensatory mitigation alternative at another disposal site.

In determining compensatory mitigation, the functional values lost by the resource to be affected must be considered. Generally, in-kind compensatory mitigation is preferable to out-of-

kind. The likelihood of success of habitat development of this type should be considered in determining appropriate and practicable compensatory mitigation. In general, higher priority would be given to restoration of former wetlands or existing degraded wetlands rather than creation of new wetlands.

Functions and values should be assessed by applying aquatic site assessment techniques generally recognized by experts in the field and/or the best professional judgment of Federal and State agency representatives. The determination of the appropriate assessment techniques to use in a given situation should be based on coordination with representatives of the Federal/State/local agencies involved. To the extent practicable, existing coordinating bodies like the River Resources Forum and the Minnesota River Partnership Group will be used to develop and evaluate mitigation alternatives, including the concept of mitigation banking. The final determination of the required level and kind of mitigation will be made by the District Engineer.

The objective of compensatory mitigation for unavoidable impacts is to offset environmental losses. Mitigation should provide, at a minimum, 1 for 1 functional replacement, with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan. In the absence of more definitive information on the functions and values of specific wetlands sites, a minimum of 1 to 1 acreage replacement may be used as a reasonable surrogate for no net loss of functions and values. However, this ratio may be greater where functional values of the area being affected are demonstrably high and the replacement wetlands are of lower functional value or the likelihood of success of the mitigation project is low.

Incremental analysis may be required to determine the most cost effective and justifiable compensation alternatives or measures. Compensatory mitigation will not be used as a method to reduce environmental impacts in the evaluation of the least environmentally damaging practicable alternatives.

(1) Exemptions - Compensatory mitigation for unavoidable impacts on wetlands will be exempt for the following situations.

(a) Normal or Emergency Maintenance or Repair of Existing Structures - A replacement plan for wetlands is not required for normal maintenance and repair of existing Corps of Engineers public works, provided the activity does not significantly change the dimensions or functions of the initial project and does not result in additional intrusion into wetlands or draining or filling, wholly or partially, of a wetland. 33 CFR 230.9(b)

(b) Emergency and Imminent Closure Dredging - A pre-approved replacement plan for wetlands/aquatic areas is not required prior to completing emergency or imminent closure dredging operations. Subsequent required mitigation will involve rectification, removal and restoration, and/or compensatory mitigation.

(c) Great River Environmental Action Team I (GREAT I) Channel Maintenance Plan - The major product of the GREAT I planning effort was a document describing the manner in which the navigation project should be operated and maintained through the year 2025. This GREAT I Channel Maintenance Plan was approved by all State and Federal

resource agencies, except the federal Department of Transportation, and was endorsed by Congress in the 1986 Water Resources Development Act. This channel maintenance plan attempted to balance environmental, recreational, social, and economic values. A great emphasis was placed on avoiding and minimizing impacts on aquatic and wetland habitats. The GREAT I selected plan would have affected 503 acres of aquatic or wetland habitat, compared to 915 acres with the GREAT I National Economic Development Plan and 215 acres with the Environmental Quality Plan.

The St. Paul District modified the GREAT I Channel Maintenance Plan through a series of long term management plans for dredged material placement. The District's 1996 recommended Channel Maintenance Management Plan (CMMP) further reduce the impacts to wetlands and aquatic areas to approximately 228 acres. The recommended plan does include some locations where the impacts to aquatic areas or wetlands exceed the GREAT I Channnel Maintenance Plan. However, the overall recommended plan represents a significant reduction in the total number of acres to be affected. Therefore, a replacement plan for wetlands will not be required for implementation of the 1996 CMMP. The District will not take mitigation credit for the reduction in acres of affected wetlands from the GREAT I recommended plan for other O&M activities or channel maintenance activities that extend past the modified channel maintenance management plan.

The District's 1996 modified CMMP will form the baseline from which all future O&M actions will be evaluated to determine compensatory mitigation requirements. The boundaries of the 1996 CMMP disposal sites form the baseline of the wetland mitigation exemption. Site maps (ortho-rectified aerial photographs, most at a scale of 1" = 200') and narrative will be included in the 1996 Channel Maintenance Management Plan to clearly show and describe the specific areas acceptable to be used for dredged material placement as part of the baseline exemption.

(d) Regulatory Permits - A replacement plan for wetlands will be considered on a case-by-case basis for Corps O&M activities that meet the conditions of the Corps 404 Regulatory Program's Regional, Nationwide, or Programmatic Permits that do not require compensatory mitigation.

(e) Environmental Enhancement/Restoration - For dredged material placement plans and natural resource management activities that are considered environmental enhancement/restoration projects, replacement of acres directly impacted by material placement is not required as long as the anticipated benefits of the project exceed the direct impacts. The additional benefits gained will not be used to compensate for impacts of other projects.

(f) Recreation Beach Maintenance Plans - On the UMR, recreation beach maintenance sites that have been endorsed by the River Resources Forum or On-site Inspection Team, without the need to do compensatory mitigation, would be exempt from the requirements of compensatory mitigation.

(2) Wetland Mitigation Banking - Wetland banking may be an acceptable form of compensatory mitigation under specific criteria designed to ensure an environmentally successful

bank. The wetland bank should be established as soon as practicable, preferably prior to accumulating any debts. If the concept of a bank is pursued for use on the UMR, the St. Paul District proposes a partnership effort with concerned local, State and Federal agencies to accomplish Section 404 compensatory mitigation of non-exempted O&M wetland/aquatic impacts. Potential mitigation studies and projects would be identified, developed, prioritized and endorsed by the River Resources Forum Partnership.

7. Monitoring - Compensatory mitigation projects will be monitored periodically to determine the long-term success of the mitigation project. Monitoring would be limited to physical and chemical parameters and plants. Qualitative information on fish and wildlife use, including macroinvertebrates, may also be collected during site visits.

APPENDIX C

SEDIMENT ANALYSIS PROCEDURES

March 1996

APPENDIX C

STANDARD OPERATING PROCEDURES FOR SEDIMENT EVALUATION IN CONNECTION WITH MAINTENANCE OF THE 9-FOOT NAVIGATION CHANNEL ON THE UPPER MISSISSIPPI RIVER WITHIN THE ST. PAUL DISTRICT, U.S. ARMY CORPS OF ENGINEERS

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1.0 INTRODUCTION

1.1 Purpose

There are over 100 dredge cuts on the Upper Mississippi within the St. Paul District with annual dredging frequencies ranging from annual to less than once every 10 years. Because of the number of dredge cuts, the variability of the frequency of dredging, and the short time between the determination of the need for and the actual dredging, a standard operating procedure for contaminant determinations is needed to provide a consistent and expedient decision-making process.

1.2 Existing Data Base

The existing bulk chemical and physical data are summarized in tables in Part III of the Channel Maintenance Plan. These tables will be updated annually and new tables provided to the agencies. This data is also available on a floppy disk. As new data is generated, it would also be input into the computer data base being created by the National Biological Survey and the Water Quality Work Group of the Upper Mississippi River Conservation Committee. Historic data, meeting the criteria for inclusion in this data base, will be added to this data base as budget and schedules allow. In addition, many studies documenting the effects of dredging and disposal on water quality and the toxicity and bioaccumulation potential of dredged material have been completed on the Upper Mississippi River. These will be summarized and included in Part III of the Channel Maintenance Plan.

1.3 Applicability

This Standard Operating Procedure (SOP) is applicable to proposed discharges of dredged material to United States waters associated with the maintenance of the 9-foot channel on the Upper Mississippi River, within the St. Paul District. The testing and evaluation procedures described herein provide only a portion of the information necessary for a complete evaluation of a proposed dredged or fill material discharge, as required by Section 404(b)(1). This protocol only deals with evaluating the potential impacts of contaminants on aquatic biota from open water disposal or effluents from a containment area or from re-exposing contaminants at a disposal site or at a dredge cut area. A variety of other factors, including physical impacts, have to be considered when evaluating a project. In addition, there may be other contaminant concerns associated with a particular project. For instance, if there is a concern that a particular project could cause problems with groundwater quality and potable water supplies, this protocol would only provide a crude

estimate of the potential problems that could arise. Established tests, such as a leachate test, would address this issue better and may be determined necessary for a particular project. Other issues such as potential problems with runoff from or potential uptake by terrestrial organisms at an upland disposal site could be addressed by very specific tests. However, in most instances, the protocol in this document would provide some technical basis to evaluate these concerns. In the case of projects like Reads Landing Dredged Material Transfer, where there is a concern with impacts on potable water supplies, a project-specific detailed monitoring plan would be developed and coordinated with the regulatory agencies.

1.4 Background

The information contained in this document was primarily derived from three sources: 1.) "Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework" (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, November, 1992); 2.) "Draft Inland Testing Manual" (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, Draft - June 1994); and 3.) Great Lakes Dredged Material Testing and Evaluation Manual" (U.S. Environmental Protection Agency - Regions II, III, V and Great Lakes National Program Office and U.S. Army Corps of Engineers - North Central Division, scheduled for public review - Fall of 1994). The latter source contains detailed guidance on sediment sampling and handling; quality assurance; methods for chemical and physical analysis; and protocols for biological-effects testing and has been relied on extensively in preparing this document.. This SOP should be used in conjunction with the national and Great Lakes testing and evaluation guidance.

2.0 **TESTING APPROACH**

2.1 Tiered Evaluation

A tiered testing approach consistent with the national manual, with a decision-making process at the end of each tier, is recommended as the standard testing and evaluation protocol. This approach, which uses tests of increasing complexity and sophistication to reach decisions with greater degrees of confidence, provides a defensible and technically sound rationale for decision-making. This approach would allow for economical, early decisions in the planning process, when the conclusions from the early tiers so warrant. More effort, funding, and sophisticated tests would be concentrated on projects of greater concern. The recommended components for the three tiers of evaluation are summarized in figure 1.

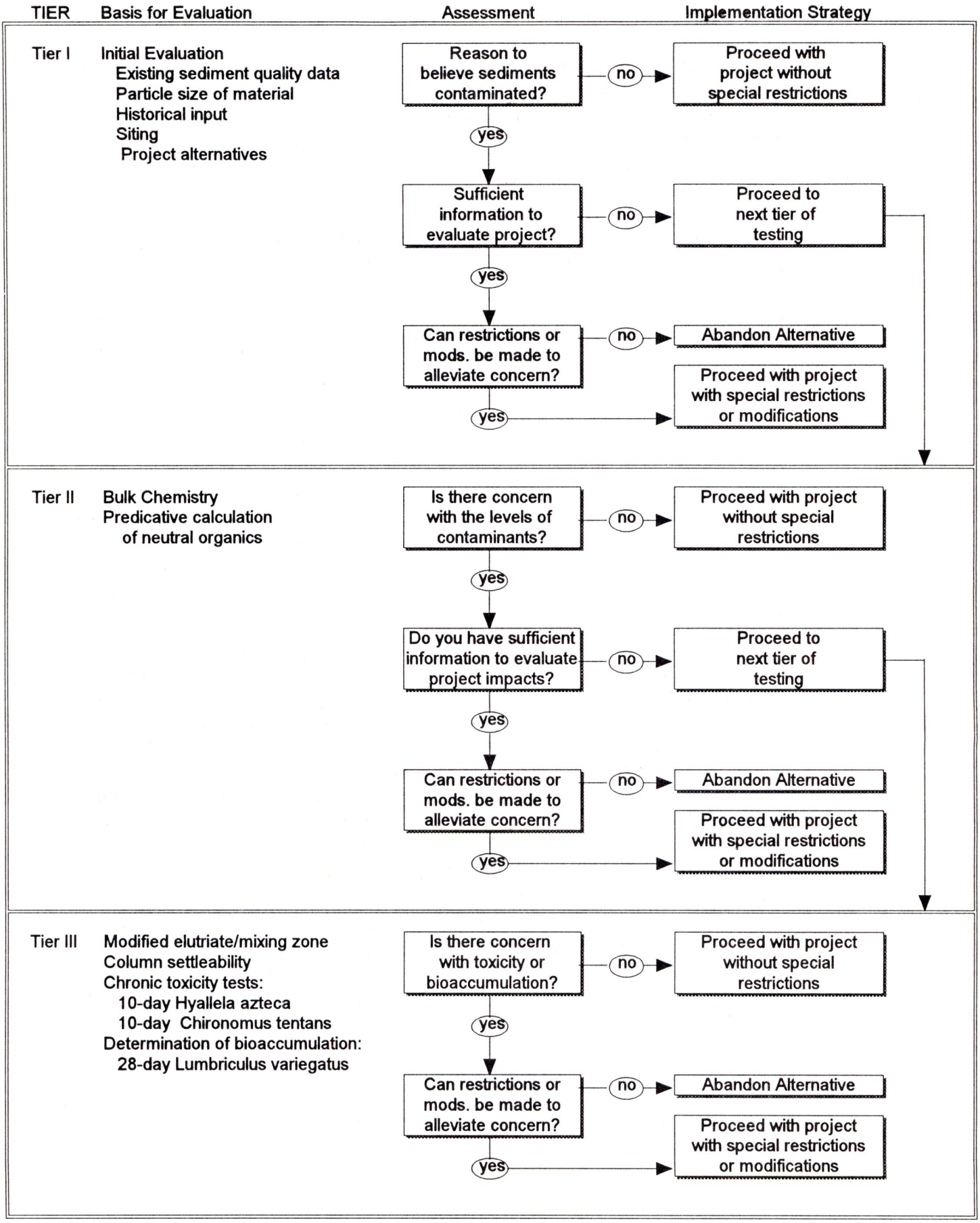
Tier I is an initial evaluation using only existing information, including the following: (1) particle size gradation, which can indicate a potential for contaminant levels; (2) available sediment quality data from within or near the project area; (3) historical input information, including type and proximity to point and non-point discharges, spills, and other sources of pollution; (4) sedimentation history to determine when and how the material to be dredged has accumulated; (5) description of project area, including identification of sensitive areas; and (6) project description, including quantities of dredged or fill material and dredging and disposal methods and sites being considered.

Tier II comprises the standard bulk chemical analysis of sediments and a predictive calculation of neutral organics bioaccumulation potential. Tier III involves more sophisticated tests, including the modified elutriate, column settleability, and biological response tests. The biological response tests concentrate on chronic toxicity and bioaccumulation potential from solid-phase sediments. Acute toxicity testing is not recommended. Based on the contaminant levels that have been found and the results of past acute toxicity testing, it would be extremely rare to find main channel sediments that produce acute toxicity. In addition, some information would be obtained on the potential for acute toxicity from the chronic toxicity tests. Results of acute toxicity testing of sediments would be of limited value for the decision-making. However, ammonia nitrogen levels in some sediments may be an exception, capable of causing acute toxicity. Therefore, the standard ammonia bulk chemistry procedure has been modified to an elutriate procedure, which will allow a direct comparison to water quality criteria and early determination whether ammonia could pose a problem. Appendix F of the National Inland Testing Manual has a detailed discussion of "Specific Considerations for Assessing Ammonia Toxicity in Dredged Material." If it is determined that ammonia concentrations could be toxicologically significant, TIE manipulations as described by Ankley et al. (1992) may be pursued to evaluate the potential toxicity of ammonia in the sediments. There are numerous TIE manipulations and include evaluation of relative species sensitivity (e.g., fish are generally more sensitive than cladocerans), removal of ammonia from the test samples with cation exchange and/or extended air-stripping at elevated pH values prior to toxicity testing, correlation of toxicity with measured ammonia concentrations, and toxicity tests at different pH values with equitoxic concentrations of ammonia. A benthic community analysis of the project area may be desirable for certain projects and could be conducted as part of the tier III evaluation to assist in the interpretation of the chronic toxicity data.

2.2 Coordination/Decision Making Process

From the tier I information, a determination would be made about the potential for contaminants to be present at levels of concern. If there are

Figure 1. Tiered Sediment Testing Protocol for O&M on the Upper Mississippi River



concerns, the specific contaminants and types of problems associated with each of the project alternatives would be identified. In making this determination, the adequacy of the data has to be considered. A lack of adequate information would constitute a reason to be concerned about contaminants. If there is no concern with contaminants, then proceed with the project planning, without special project restrictions. Selection of one of the project alternatives and the project design would be made based on other factors. If there is a concern with contaminants, then the next step is to determine whether there is sufficient information to evaluate the potential effects of the project. If the answer is no, then proceed to the next tier of testing. If the answer is yes, then determine whether economical and engineeringly feasible restrictions can be made to the project to alleviate the contaminants concerns. If the answer is no, then the project or that portion of the project of concern should be abandoned. If the answer is yes, then proceed with the project planning, including the appropriate restrictions. This type of decision-making would be followed after each tier, except that tier III would not have a determination on whether there was adequate information. The reason for this exception is that there has to be some end point in the testing, at which point a final decision on the project has to be reached.

The tiered approach is not intended to be rigid. In all cases, the tier I initial evaluation should be performed. Beyond tier I, decisions to continue with further testing, and the specific tests to be performed, should be done on a project specific basis. In most cases, the tiers should be followed in sequence, with an interagency decision process as outlined in the next paragraph, occurring at the end of each tier. However, the system has to be flexible, and there may be instances when the initial evaluation in tier I may indicate that it is advisable to skip tier II testing and go directly to tier III or perform a combination of tier II and tier III tests. In addition, it is not recommended that all the components within a given tier, especially tier III, be done for all projects in which a decision is made to go to that tier. This has to be decided on a project specific basis based on the results of the earlier tiers and other factors. For example, even if a decision is reached to proceed to tier III testing, if the results from the bulk chemistry and predictive calculations of bioaccumulation potential from tier II do not indicate a concern with bioaccumulation potential, the laboratory determination of bioaccumulation potential in tier III should not be performed. Only those tests in a tier that are necessary to make a technically sound determination should be conducted.

Normal updating of existing sediment data base: Because there are over 100 dredge cuts within the St. Paul District and a very short time between determining the need to dredge and the actual dredging, it is not possible to follow the tiered testing protocol sequentially on a case by case basis. Therefore, a routine updating of the quality of surficial sediments in the historic

dredge cuts is proposed. In addition, contaminant spills and point discharge records supplied by the appropriate agencies will be periodically screened to determine if historically "clean" dredge cuts may have been negatively impacted. This process will provide enough information to provide a tier I and II decision and to determine whether tier III testing might be required for individual dredge cuts. An annual report will be prepared summarizing any data collected that year and the sediment quality data in Part III of the Channel Maintenance Plan would be updated. This information would be provided to the agencies in January of each year. An interagency meeting would subsequently be held to discuss the results of the previous year monitoring and to discuss monitoring requirements for the upcoming year.

Project specific sediment sampling: The ensuing discussion is for larger projects, like the St. Paul Barge Terminal dredge cut in pool 2 or the Reads Landing Dredge Material Transfer project, where a decision is reached that the data provided by the routine updating of sediment quality does not provide adequate information to make a decision. These projects would be handled on a case by case basis, following the tiered testing protocol described above. Interagency coordination will be an integral part of the decision-making process. When the results of a tier are obtained, the Corps of Engineers would evaluate the results and make a preliminary determination. The results and the preliminary determination would then be coordinated with all the agencies having regulatory authority and a mutually agreed upon decision made. The agencies that would be included are the U.S. Environmental Protection Agency and the appropriate State agency having regulatory authority for the particular project. If a decision is reached to proceed to the next tier of testing, the number of samples, the sampling strategy, and the tests to be performed would be discussed with all the agencies and agreed to by the appropriate regulatory agencies for a particular project. Subsequent meetings of the technical experts would be held to discuss the interpretation of the results of the tiers and what, if any, additional testing would be required. A final contaminants determination would be included in the 404(b)(1) Evaluation that is prepared and circulated for public and agency review.

The ensuing discussion and table 1 are only intended to provide some means to put the bulk chemical data collected into perspective and not to establish specific numerical criteria or guidelines. Decisions still have to be made subjectively, considering other factors. Numerical criteria, to determine what bulk chemical levels of contaminants in sediments are of concern, are lacking for the Mississippi River. Attempts have been made for the Great Lakes and are summarized in table 1. Most of these attempts have been made based on an evaluation of background data for the Great Lakes. Table 1 also has summary statistics for the available bulk chemical data for backwater

concerns, the specific contaminants and types of problems associated with each of the project alternatives would be identified. In making this determination, the adequacy of the data has to be considered. A lack of adequate information would constitute a reason to be concerned about contaminants. If there is no concern with contaminants, then proceed with the project planning, without special project restrictions. Selection of one of the project alternatives and the project design would be made based on other factors. If there is a concern with contaminants, then the next step is to determine whether there is sufficient information to evaluate the potential effects of the project. If the answer is no, then proceed to the next tier of testing. If the answer is yes, then determine whether economical and engineeringly feasible restrictions can be made to the project to alleviate the contaminants concerns. If the answer is no, then the project or that portion of the project of concern should be abandoned. If the answer is yes, then proceed with the project planning, including the appropriate restrictions. This type of decision-making would be followed after each tier, except that tier III would not have a determination on whether there was adequate information. The reason for this exception is that there has to be some end point in the testing, at which point a final decision on the project has to be reached.

The tiered approach is not intended to be rigid. In all cases, the tier I initial evaluation should be performed. Beyond tier I, decisions to continue with further testing, and the specific tests to be performed, should be done on a project specific basis. In most cases, the tiers should be followed in sequence, with an interagency decision process as outlined in the next paragraph, occurring at the end of each tier. However, the system has to be flexible, and there may be instances when the initial evaluation in tier I may indicate that it is advisable to skip tier II testing and go directly to tier III or perform a combination of tier II and tier III tests. In addition, it is not recommended that all the components within a given tier, especially tier III, be done for all projects in which a decision is made to go to that tier. This has to be decided on a project specific basis based on the results of the earlier tiers and other factors. For example, even if a decision is reached to proceed to tier III testing, if the results from the bulk chemistry and predictive calculations of bioaccumulation potential from tier II do not indicate a concern with bioaccumulation potential, the laboratory determination of bioaccumulation potential in tier III should not be performed. Only those tests in a tier that are necessary to make a technically sound determination should be conducted.

Normal updating of existing sediment data base: Because there are over 100 dredge cuts within the St. Paul District and a very short time between determining the need to dredge and the actual dredging, it is not possible to follow the tiered testing protocol sequentially on a case by case basis. Therefore, a routine updating of the quality of surficial sediments in the historic

dredge cuts is proposed. In addition, contaminant spills and point discharge records supplied by the appropriate agencies will be periodically screened to determine if historically "clean" dredge cuts may have been negatively impacted. This process will provide enough information to provide a tier I and II decision and to determine whether tier III testing might be required for individual dredge cuts. An annual report will be prepared summarizing any data collected that year and the sediment quality data in Part III of the Channel Maintenance Plan would be updated. This information would be provided to the agencies in January of each year. An interagency meeting would subsequently be held to discuss the results of the previous year monitoring and to discuss monitoring requirements for the upcoming year.

Project specific sediment sampling: The ensuing discussion is for larger projects, like the St. Paul Barge Terminal dredge cut in pool 2 or the Reads Landing Dredge Material Transfer project, where a decision is reached that the data provided by the routine updating of sediment quality does not provide adequate information to make a decision. These projects would be handled on a case by case basis, following the tiered testing protocol described above. Interagency coordination will be an integral part of the decision-making process. When the results of a tier are obtained, the Corps of Engineers would evaluate the results and make a preliminary determination. The results and the preliminary determination would then be coordinated with all the agencies having regulatory authority and a mutually agreed upon decision made. The agencies that would be included are the U.S. Environmental Protection Agency and the appropriate State agency having regulatory authority for the particular project. If a decision is reached to proceed to the next tier of testing, the number of samples, the sampling strategy, and the tests to be performed would be discussed with all the agencies and agreed to by the appropriate regulatory agencies for a particular project. Subsequent meetings of the technical experts would be held to discuss the interpretation of the results of the tiers and what, if any, additional testing would be required. A final contaminants determination would be included in the 404(b)(1) Evaluation that is prepared and circulated for public and agency review.

The ensuing discussion and table 1 are only intended to provide some means to put the bulk chemical data collected into perspective and not to establish specific numerical criteria or guidelines. Decisions still have to be made subjectively, considering other factors. Numerical criteria, to determine what bulk chemical levels of contaminants in sediments are of concern, are lacking for the Mississippi River. Attempts have been made for the Great Lakes and are summarized in table 1. Most of these attempts have been made based on an evaluation of background data for the Great Lakes. Table 1 also has summary statistics for the available bulk chemical data for backwater

sediments on the Upper Mississippi River (above and below Lake Pepin), to put the main channel and boat harbor data into perspective. To establish a background concentration range, the statistical concept that in a normal population 95 percent of the measurements lie within plus or minus 2 standard deviations of the mean may be useful and is summarized in table 1. Background concentrations of such parameters as barium, iron, and manganese far exceed the guidelines developed for the Great Lakes and point out the problems of using guidelines developed for the Great Lakes on the Upper Mississippi River.

3.0 SEDIMENT SAMPLING PROTOCOL

3.1 Sampling Design

Normal updating of existing sediment data base: Updating of the sediment quality data base would occur periodically (minimum of every five years). The selection of dredged cuts to be updated would be done based on a concern that a particular dredge cut that historically has had clean sediments may have changed in quality due to spills, new point dischargers or other factors and for areas (i.e., many sites in pool 2 and boat harbors) where the historical data shows elevated concentrations of contaminants of concern. Normally a minimum of two samples would be analyzed from each dredge cut selected for updating.

Project specific sediment sampling: The ensuing discussion is for larger projects where a decision is reached that the data provided by the routine updating of sediment quality does not provide adequate information to make the decision. In designing the sampling protocol for a particular project, two major factors have to be considered; specifically, the anticipated analytical variability and the spatial heterogeneity. Measures to address analytical variability are included in the quality assurance/control section of this report. To handle horizontal heterogeneity, the most frequently used approach is stratified sampling with random sampling within the strata. This is done to reduce cost, while concentrating sampling efforts on the geographic areas of greatest concern. The reasons for stratifying the sampling can include proximity to a potential source of pollution, different sediment textures within the dredge cut(s), existing data indicating potential hot spots, different sedimentation history within the dredge cut(s), or any other reasons that would cause you to suspect and be able to predict spatial heterogeneity. If there is no basis for stratifying the sampling, then a completely randomized sampling is most appropriate. The number of sampling sites should be representative and would have to be decided on a project specific basis considering the degree of areal heterogeneity anticipated, the degree of contamination expected, and the quantities of dredged material and the disposal methods being proposed.

Table 1. Summarization of Great Lakes Sediment Criteria and Upper Mississippi River Backwater Sediment Concentrations

	Great Lakes Criteria			Mississippi River - Above Lake Pepin Background Data for Backwater Sediments				Mississippi River - Below Lake Pepin Background Data for Backwater Sediments			
Parameter	(MOE) Ministry Ontario Environment	(EPA) Great Lakes Harbors Moderate Class	(EPA) Great Lakes Harbors Heavy Class	Mean	Mean + 1 Standard Deviation	Mean + 2 Standard Deviation	Number Samples	Mean	Mean + 1 Standard Deviation	Mean + 2 Standard Deviation	Number Samples
Aluminum								8630	13202	17775	73
Arsenic	8	3	8	11	24	37	30	2.9	5.7	8.5	79
Barium		20	60					108	161	214	68
Beryllium								0.4	0.7	0.9	65
Boron								5	9	12	65
Cadmium	1		6	1.4	2.1	2.8	30	0.9	2.5	4.2	119
Copper	25	25	50	17	23	30	30	12	19	27	121
Chromium	25	25	75	20	31	43	30	17	27	37	121
Cyanide	0.1	0.1	0.25	<2				<2			
Iron	1000	17000	25000					16800	24900	33000	69
Lead	50	40	60	25	34	43	30	14	21	29	118
Magnesium								4350	6811	9273	65
Manganese		300	500	731	963	1195	26	370	657	943	109
Molybdenum								2.1	2.5	2.9	65
Nickel	25	20	50	18	25	33	30	17	31	45	121
Mercury	0.3		1	0.18	0.31	0.44	30	0.09	0.2	0.32	119
Silver								0.7	1.8	2.9	65
Strontium								20	31	42	65
Zinc	100	90	200	81	110	139	30	51	81	112	121
Vanadium								13	23	33	65
COD	50000	40000	80000	29300	68400	107600	12	34600	65000	95300	7
Ammonia	100	75	200								
TKN	2000	1000	2000	1143	2176	3209	12	1117	1868	2620	7
Phosphorus	1000	420	650								
Oil&Grease	1500	1000	2000								
Org. Carbon %				2.9	4.6	6.3	9	4.2	8.3	12.3	17
Vol. Solids %	6	5	8								
PCBs (ng/g)	50		10000	21	50	78	29	5.7	16	26	45

Units are ug/g dry weight unless otherwise specified

(MOE) is Ontario Ministry of the Environment: Guidelines for Inwater Disposal of Dredged Spoils
(EPA) is the U.S. EPA Great Lakes Harbor Pollution Classification Guidelines

Note: Backwater samples are only for period of 1984-1995. The data base was screened to exclude data that had questionable high values. Detection limits varied substantially and samples with poor sensitivities were not included in the analysis. For the samples with appropriate sensitivities, half the detection limits were used in the calculations.

Location	Data Source	Pools	Years	Contact Person	Numbers
Above L. Pepin	U.S. Army Corps of Engineers	2,3,U4	'84,'87,'88,'94	Dennis Anderson	30
Below L. Pepin	U.S. Army Corps of Engineers	4-10	'84,'85,'87,'88,94	Dennis Anderson	42
	Wisconsin DNR	7,9	'84,'87	John Sullivan	11
	U.S. Fish and Wildlife Service	4 - 10	'83,'84,'85	Stan Smith	68

The other source of spatial variability that needs to be considered in designing the sampling effort is vertical heterogeneity. A major concern expressed by the various agencies has been for the potential to re-expose sediments with higher concentrations of contaminants that are presently sequestered within the proposed dredge cut area. This concern is based on the fact that higher levels of persistent chemicals, such as PCB's, were recorded in fish and surficial sediments in the 1960's and 1970's. Stratifying the sampling with depth quickly multiplies the amount of sampling effort and subsequently the cost. It should be done when there are reasonable expectations that vertical heterogeneity exists and when the dredge cut may re-expose a hot layer or the project can be modified to avoid or handle differently any hot layers should they be found. In evaluating whether there is potential for and concern with vertical heterogeneity, the sedimentation history and sediment stratigraphy for the area have to be evaluated. Most O&M dredge cuts on the Upper Mississippi River are dredged on a frequent enough basis that vertical heterogeneity would not be anticipated in most cases. However, some dredge cuts, especially some of the boat harbors, are dredged only infrequently and there may be a concern with vertical heterogeneity. Where there is a potential for the dredge cut to expose a more contaminated layer, at a minimum two composite samples should be taken, one from around 1 foot above and below the dredging depth and the other from the remaining core. If additional stratification is warranted, additional sub-sampling based on a visual examination may be appropriate.

3.2 Sample Collection Methods

For the normal updating of surficial sediment quality, a 9"x9" ponar will be used to collect the samples from the historic dredge cuts. In instances where there is concern with sediment stratigraphy, sediment samples for analytical work should be collected with wide mouth corers (2 inches or greater). Samples for organic analysis should be collected with a stainless steel corer and samples for metal analysis should be collected with a PVC or similarly inert corer. To charecterize the dredged material, depth integrated samples should be collected to the depth of 1 the proposed dredging. In addition, to characterize the exposed layer, a depth integrated sample should be collected from 1 foot above to 1 foot below the proposed dredging depth.

3.3 Sample Storage

Sediment samples should be collected and stored at 4°C in glass containers with teflon-lined caps for analysis of organics and either linear polyethylene containers or glass containers with teflon-lined caps for analysis

of metals.

Sediment samples collected for elutriate analysis should be stored at 4°C in airtight linear polyethylene containers or glass containers with teflon-lined caps. The elutriate procedure should be initiated within 1 week of collection. Water samples resulting from the elutriate procedure should be stored and preserved as specified for normal water samples in EPA (1983) and Plumb (1981).

Samples for biological response testing should be collected and stored in linear polyethylene containers or stainless steel containers. The containers should be filled to the top, leaving no air space. The samples should be maintained on ice and delivered to the laboratory within 48 hours of collection. At the laboratory, the samples should be homogenized with a commercial mixer equipped with stainless steel bowl and paddles and stored at 4°C. All tests should be initiated as soon as practical after collection, but no later than 8 weeks after collection.

4.0 **ANALYTICAL PROCEDURE**

4.1 Physical and Bulk Chemical Characterization

A standard list of chemical and physical characteristics would be run on all samples collected. Additional parameters would be added to evaluate a specific project, if it is suspected that other contaminants may be present at levels of concern. If an abbreviated list is decided on, at a minimum it should include: elutriate ammonia nitrogen, cadmium, copper, chromium, lead, mercury, particle size, total organic carbon, total volatile solids, zinc, and PCBs (Note for PCBs, congener specific analysis will be proposed for future use. However, because there are over 200 congeners and there is no resolution on which set of congeners should be analyzed on a normal basis, it is not being proposed at this time). The standard parameter list, analytical methods, and approximate limits of detection are listed in Table 2. Appendix F in the Great Lakes Dredged Material Testing and Evaluation Manual is a methods manual for testing and analysis of sediments and water, which will be used in the future when it becomes finalized. When this comes out for public review late this fall, copies will be sent to the agencies for review.

4.2 Modified Elutriate

4.21 Elutriate Preparation

The modified elutriate procedure as described in Environmental Effects of Dredging Technical Notes - EEDP-04-2 (WES 1985) (EM

Table 2. Bulk Chemical Parameter List and Analytical Methods for Sediments.

Parameter	Method	Citation	Practicable Quantification Limit % dry weight
Particle Size	Sieve and hydrometer	Plumb (1981)	0.1
Total Solids	Gravimetric 160.3	EPA (1983)	0.1
Volatile Solids	Ashing Method 160.4	EPA (1983)	0.1
Total Organic Carbon	SW846 - EPA method 9060	EPA (1986)	0.01
Percent Moisture	Method 160.3	EPA (1983)	0.1
			mg/l supernatant
Ammonia Nitrogen	Mod. Elutriate with 350.1	EPA (1983)	0.2
			ug/l dry weight
Cyanide	SW846 - EPA method 9010	EPA (1986)	0.5
Metals			
Arsenic	SW846 - EPA 7060	EPA (1986)	0.2
Cadmium	SW846 - EPA 7131	EPA (1986)	0.2
Chromium	SW846 - EPA 6010	EPA (1986)	5
Copper	SW846 - EPA 6010	EPA (1986)	2
Lead	SW846 - EPA 7421	EPA (1986)	5
Mercury	SW846 - EPA 6010	EPA (1986)	0.01
Nickel	SW846 - EPA 6010	EPA (1986)	5
Zinc	SW846 - EPA 6010	EPA (1986)	1
Manganese	SW846 - EPA 6010	EPA (1986)	10
Chlorinated Hydrocarbons			ug/kg dry weight
alpha BHC	method 8080	EPA (1986)	1
beta BHC	method 8080	EPA (1986)	1
gamma BHC (Lindane)	method 8080	EPA (1986)	1
Chlordane	method 8080	EPA (1986)	1
DDD	method 8080	EPA (1986)	1
DDE	method 8080	EPA (1986)	1
DDT	method 8080	EPA (1986)	1
Dieldrin	method 8080	EPA (1986)	1
Endrin	method 8080	EPA (1986)	1
Heptachlor	method 8080	EPA (1986)	1
PCB's (arochlors 1016 1221, 1232, 1242,1248)	method 8080	EPA (1986)	5
PCB's (arochlors 1254 1260)	method 8080	EPA (1986)	5

NOTES:

1. Samples for ammonia analysis would be extracted following the elutriate procedure. A slurry of water and sediment (concentration of 150 g/l dry weight equivalent) would be prepared and mixed for 5 minutes. This mixture would then be centrifuged at 10,000 times gravity and the supernatant collected and analyzed immediately or within 24 hours, if acidified with H SO to pH <2 and stored at 4 degrees C, following EPA method 350.1 or equivalent.
2. Samples would be extracted by EPA method 3550. Instead of 30 gram samples, 50 grams would be used. The extract would be concentrated to 10 ml and cleaned by GCP using EPA method 3640. The cleaned extract would be further concentrated to 1 ml and solvent exchanged to hexane. The hexane solution would be concentrated to 1 ml before analysis by EPA method 8080. To alleviate problems associated with other contaminants, the extract would be further cleaned by Florosil column using EPA method 3620.

1110-2-5027 would be followed. This procedure involves mixing for 5 minutes with a laboratory mixer in a 1 gallon glass jar a 3-3/4 liter slurry of sediment and dredging site water, with a concentration of 150 g/l (dry-weight basis) sediment. This mixture is then bubble aerated for 1 hour to ensure oxidized conditions in the supernatant during the subsequent settling phase. This is then allowed to settle for 24 hours or the predicted project settling time, and samples of the supernatant are drawn from the cylinder at a point midway between the water surface and the settled sediment interface using syringe and tubing. When trying to similuate the effects of open water disposal of dredged material the standard elutriate procedure should be followed, rather than the modified elutriate procedures.

4.22 Analysis of Supernant

The supernatant samples are then treated and analyzed following the methods for water samples (EPA 1983). The modified elutriate procedure calls for the analysis of the dissolved and total fractions. For analysis of the dissolved constituents, the samples are first filtered (0.45 um filters) and/or centrifuged, depending on the specific parameters to be tested. Samples for analysis of total concentrations would undergo appropriate digestion (EPA 1983) prior to analysis. The volume of receiving water and sediment samples needed depends on the number and types of analyses to be performed.

The parameters tested in the filtered or whole supernatant should be those that were found to be of potential concern from the existing data base or based on the results of the bulk chemistry obtained in the tier II testing. Table 3 summarizes the recommended analytical water sample methods for the appropriate parameters on the standard bulk chemical list. The methods for each of the parameters were selected based on the detection levels needed to compare the results with the water quality criteria developed by EPA (1986, including revisions) and State water quality standards. Detection limits listed in table 3 are methods detection limits. Actual detection limits will vary slightly depending on the nature of the individual samples and the specific equipment of the laboratory and would be reported along with the data.

4.3 Column Settling Test

The column settling test is designed to provide a way to predict the concentration of suspended solids in an effluent and to define the settled behavior of a particular sediment. The protocol is described in EM 1110-2-5027. The tests are conducted in an 8-inch-diameter ported column, usually with a test column depth of 6 feet, although this can be varied to approximate the effective settling depth at the disposal area. A slurry of water and sediment

Table 3. Analytical Methods for Water Samples for the Parameters on the Standard Bulk Chemical Parameter List.

Parameter	EPA (1983) Analytical method	Practical Quantification Limit (ug/l)
Ammonia (N)	Colorimetric Autophenate - EPA 350.1 or Colorimetric , titrimetric, potentiometric distillation - EPA 350.2	50
Cyanide	Colorimetric, Auto UV EPA 335.3	5
Metals		
Arsenic	Sample digestion and spectrophotometric SDDC - EPA 206.4 or Atomic Absorption gaseous hydride - EPA 206.3	19
Cadmium	Atomic Absorption, furnace - EPA 213.2	0.2
Chromium	Atomic Absorption, Chelation extract - EPA 218.	1.1
Copper	Atomic Absorption, direct aspiration - EPA 220.	20
Lead	Atomic Absorption, furnace - EPA 239.2	1
Mercury	Cold vapor, with recorder expans. - EPA 245.1	0.025
Nickel	Atomic Absorption, direct aspiration - EPA 249.	40
Zinc	Atomic Absorption, direct aspiration - EPA 289.	5
Chlorinated Hydrocarbons		
BHC	Gas Chromatography EPA 608	0.003
Lindane	Gas Chromatography EPA 608	0.003
Chlordane	Gas Chromatography EPA 608	0.0043
DDD	Gas Chromatography EPA 608	0.001
DDE	Gas Chromatography EPA 608	0.001
DDT	Gas Chromatography EPA 608	0.001
Dieldrin	Gas Chromatography EPA 608	0.0019
Endrin	Gas Chromatography EPA 608	0.0023
Heptachlor	Gas Chromatography EPA 608	0.004
PCB's	Gas Chromatography EPA 608	0.001

(concentration of 150 g/l dry weight equivalent) is prepared and then allowed to settle. Samples for suspended solids analysis are then taken at prescribed depth intervals above the supernatant/settled solids interface over time. The suspended solids results can then be used to predict, including anticipated resuspension, the effluent quality after various times of settling.

4.4 Theoretical Bioaccumulation of Nonpolar Organic Chemicals

Neutral organics chemicals such as PCB's are distributed within an aquatic ecosystem primarily in the lipids of organisms and in the organic carbon fraction of the sediment. The partition coefficient or preference factor for the neutral organics for organism lipid over sediment organic carbon has been calculated by several investigators. This preference factor has been estimated based on laboratory and field experiments at 4.0 (McFarland, 1987). This relationship then allows for a calculation of the maximum possible concentration that could result in an organism's lipid and subsequently whole-body bioaccumulation potential. This predictive model is relatively simple and is described below.

$$TBP = pf * L * (C_s / FOC)$$

pf = Preference Factor (a constant set to 4.0)
TBP = Maximum whole-body bioaccumulation potential (wet weight - in the same units of concentration as C_s.
L = Decimal fraction of an organism's lipid content (wet weight).
C_s = Concentration of chemical in the sediment (dry weight - any unit of measurement).
FOC = Decimal fraction of organic carbon content of the sediment (wet weight).

This predictive model assumes no metabolic degradation or biotransformation of the chemical and total bioavailability of sediment-associated chemical to the organism. Therefore, estimates of TBP from this model can present a worst-case prediction of bioaccumulation from the sediments. The model does not take into account if a major source of the contaminants is from suspended solids or dissolved in the water or if biomagnification is an important consideration for the particular parameter of interest. The model was developed for sessile organisms living within and obtaining their life prerequisites from the sediments. For mobile species, such as fish, the predictive equation can be complicated by a variety of factors and should be considered a worst-case analysis. This predictive model is still very much state of the art and is based in theory and laboratory experiments, with some field verification (Clarke, McFarland, and

Dorkin, 1988) and (Rubenstein, 1989). As additional research is conducted, slight modifications to this equation, especially for the preference factor constant, may occur.

The TBP for the proposed dredged material should be interpreted by comparison to the TBP of the reference material. If the TBP of the dredged material is not greater than that of the reference sediment, no bioaccumulation testing for non-polar organics may be necessary. For any non-polar organics having a consumption advisory, the TBP for the appropriate species and size/age classes should be evaluated.

The TBP algorithm is not suitable for sediments with FOCs of less than 0.5%. It can be presumed that some level of uptake would occur, if the contaminant concentration is greater and/or the total organic carbon is less in the dredged material versus the reference sediments. When the FOCs are less than 0.5%, the need for going on to Tier 3 bioaccumulation testing will have to be determined on a case-by-case basis. It should be noted that most main channel sediments on the Upper Mississippi River are relatively coarse and contains less than 0.5% FOCs.

In summary, the model will not provide a definitive answer for the bioaccumulation potential of neutral organics, but will provide a rough estimate that can be used to assist in the determination of whether bioaccumualtion of neutral organics is a concern and whether a laboratory determination of bioaccumulation is warranted for a particular project.

5.0 **BIOLOGICAL RESPONSE TESTING**

All the biological response testing described below involves the use of solid-phase sediments. The use of solid-phase sediments is a good approach when evaluating the effects of open water disposal because it simultaneously looks at the water column impacts and the benthic impacts at the disposal site. However, it is a very conservative approach when evaluating the effects of effluents or long-term runoff from containment areas, where the major concern may only be water column effects. Therefore, the results obtained from this testing have to be viewed differently depending on the nature of the project being evaluated. If water column impacts are the only concern, Appendix G of the Great Lakes Dredged Material Testing and Evaluation Manual contains guidance on 21-day *Daphnia magna* and 7-day *Pimephales promelas* water column toxicity tests. The ensuing discussion on chronic toxicity and bioaccumulation is mainly derived from Appendix G of the Great Lakes Dredged Material Testing and Evaluation Manual.

5.1 Chronic Toxicity Testing

10-day *Hyalella azteca* Partial Life Cycle Test: This procedure would determine the chronic toxic effects of chemicals sorbed to sediments using *Hyalella azteca* exposed over a 10-day period. The organisms would be exposed to solid-phase sediments with either an intermittent- or continuous-flow over laying water renewal system, with the endpoint in the toxicity test being survival. The specific details of this work, including animal culture and data analysis, are contained in Appendix G of the Great Lakes Dredged Material Testing and Evaluation Manual. Each treatment would be replicated eight times, using 10 *Hyalella azteca* per replicate, for a total of 80 animals per treatment. *Hyalella azteca* (7-14 days old) would be exposed in 300-ml high-form beakers with 100 ml of control, reference, and test sediments. The exposures would be under intermittent or continuous renewal of overlaying water at 23°C. Food would be added daily and aeration would be accomplished with a glass-tipped air line 4 cm below the surface. At the end of 10 days, survivors would be counted. Dissolved oxygen, pH, and temperature would be monitored daily. In addition, alkalinity, hardness, specific conductance and total ammonia would be monitored at the beginning and at the termination of the exposures.

10-day *Chironomus tentans* Partial Life Cycle Tests: This procedure would determine the chronic toxic effects of chemicals sorbed to sediments using *Chironomus tentans* exposed over a 10-day period. The specific details of this work, including animal culture and data analysis, are contained in Appendix G of the Great Lakes Dredged Material Testing and Evaluation Manual. Each treatment would be replicated eight times, using 10 *C. tentans* per replicate, for a total of 80 animals per treatment. *C. tentans* would be exposed to a control sediment, a reference sediment, and the test sediment over 10 days of their life cycle (second (8-12 days) to fourth instar) in 300-mL glass aquaria with 150-175 mL of water and 100 mL of sediment. Overlaying water would be renewed with a water renewal siphoning cycle. Aeration with a glass-tipped air line 4 cm below the surface would be done. Larvae would be fed daily. At the end of 10 days, the surviving organisms would be counted and weighed (dry weight). Dissolved oxygen, pH, and temperature would be monitored daily. In addition, alkalinity, hardness, specific conductance and total ammonia would be monitored at the beginning and at the termination of the exposures.

5.2 Bioaccumulation Testing

28-day *Lumbriculus variegatus* exposures: This procedure would determine the bioaccumulation of chemicals sorbed to sediments using *Lumbriculus variegatus* exposed over a 28-day period. Laboratory

determination of bioaccumulation potential requires that animals be exposed to a sublethal sediment concentration. Prior to or concurrent with the full 28-day bioaccumulation study, a 10-day toxicity screening test should be performed with each sediment. It is important to screen the sediment for toxicity, evidenced either by mortalities or behavioral effects (i.e., avoidance of sediment by not burrowing), to determine if the full 28-day test should be performed. This screening test would be performed as described for *Hyallela azteca*. Screening tests may not be required if the sediments have been previously screened by performing chronic testing on *Hyallela azteca* and/or *Chironomus tentans*, with no indication of toxicological responses.

Adult *Lumbriculus variegatus* (1-5 grams each depending on the analytes of concern) would be exposed to a control, a reference, and the test sediment for 28-days. The exposures would be run in four replicate tanks, with the number (80 to 1,000) of animals per tank determined by the life requirements of the organisms and by the amount of tissue needed to perform the analytical work. An equal number of animals and replicates would be frozen for background concentration following gut clearance at the time the experiment is started. Exposure to the sediments would be run for 28 days. At the end of 28 days, all remaining organisms would be removed per tank and placed in clean water overnight to allow gut clearance, then frozen. The bioaccumulation exposures would be conducted in a flow-through system (2 volumes per day renewal) consisting of 5.5-liter glass tanks. Prior to the start of the test, approximately 1.6 L of sediment would be added to each test tank. The appropriate amount of water, approximately 6 to 7.5 cm depth, would be added and the mixture would be allowed to settle for 24 hours. Dissolved oxygen, pH, and temperature would be monitored daily. In addition, alkalinity, hardness, specific conductance and total ammonia would be monitored at the beginning and at the termination of the exposures. No food would be provided, because food would alter the organic carbon content of the sediment, which could influence the bioavailability of chemicals in the sediment. The specific tissue analysis method would depend on the contaminants of interest (Appendix F of the Great Lakes Dredged Material Testing and Evaluation Manual contains methods for the analysis). In addition, lipid content of the annelid would be measured and depending on the analyte of concern, total organic carbon and/or acid volatile sulfides would be measured in the sediments.

The above procedure will be sufficient to determine the steady-state bioaccumulation for most analytes. However, for nonionic organic chemicals, the larger the octanol-water partition coefficient the longer it will take to come into equilibrium or steady state in animal tissue. There are two ways to help ensure that steady-state is reached. One is to run tests for longer than 28-days if it is suspected that chemicals of concern will not come to equilibrium tissue concentrations in this time period. The other way is to expand the test to

provide kinetic uptake information. This can only be accomplished by exposing the animals for increasing lengths of time to allow either a direct determination of the steady state concentration. A minimum of 5 time interval exposures should be done (i.e., 1, 3, 7, 14 and 28 days). Calculation of potential maximum bioaccumulation can then be accomplished using a linear regression technique and an iterative process to estimate the steady state value.

This determination method is described in detail in Busacker and Anderson (1989).

6.0 QUALITY ASSURANCE/CONTROL PROCEDURES

6.1 Analytical - General

Potential contractors that would do any of the analytical work would be required to have a comprehensive quality assurance/control program, including documentation following the procedures of U.S. Environmental Protection Agency and U.S. Army Corps of Engineers (in press). A laboratory audit of a potential contractor's laboratory would be performed by a research chemist from the Corps of Engineers prior to any sample analysis. This inspection would cover equipment and facilities, records of maintenance and calibration of equipment, the expertise of the personnel who would be doing the work, the results of any inter-laboratory or intra-laboratory quality control checks, and the laboratory's quality assurance program and documentation. The potential contractor would be required to correct any deficiencies prior to any sample analysis. These audits would be performed every three to five years, unless specific problems were encountered with a particular laboratory, requiring a more frequent audit. A completed laboratory inspection report for a particular contractor would be made available to interested agencies.

6.2 Analytical - Project Specific

In addition to evaluating a potential contractor's quality assurance program, the following quality assurance measures would be run routinely with every batch of samples analyzed by the contractor's laboratory.

Duplicate Samples. Duplicate or split samples would be collected in the field for at least 10 percent of all samples collected, but never less than one duplicate per collection effort. For the first batch of sediment samples collected for bulk chemical analysis by a particular contractor, duplicate samples would be made available to the various Federal and State agencies for their independent analysis. The results of these split samples analyses would be evaluated by the Corps to assess the performance of the contractor's laboratory. Subsequent duplicate samples collected would be analyzed by the contractor's

laboratory as field replicates.

Replicate Analyses. Replicate analyses would be conducted for each parameter on a minimum of 10 percent of the samples collected. The contractor would compute the relative percent differences and/or the coefficient of variation and report it with the data. Samples selected for replicate analysis would be distributed equally among the different types of samples encountered.

Reagent Blanks. The contractor would run a minimum of one reagent blank for every 10 samples and every time samples are analyzed. The reagent blank is to be interspersed with the regular samples; it is not to be analyzed separately. Data for each reagent blank would be reported along with other quality control data for any given analysis.

Spiked Samples. For each parameter possible, at least one sample would be spiked with a known concentration and analyzed during the normal analytical procedure. Surrogate spiking would not be allowed for PCB's and would only be allowed for other parameters if the laboratory can provide sufficient documentation that the surrogate results reflect the normal recovery of the parameters actually being analyzed for. Percent recovery would then be computed and reported with the rest of the data.

Blind Samples. At the discretion of the Corps, blind water samples from the EPA Quality Assurance Laboratory in Cincinnati, Ohio, would be provided to the contractor by the Corps for quality assurance testing of water samples. These samples would be analyzed with a normal run of collected or submitted samples. The results of this testing would be reported with the data from that analytical period.

All contractors would be required to analyze established blind sediment sample as a preliminary screening. At the discretion of the Corps, blind sediment sample would also be provided to the contractor along with a normal run of collected samples for quality assurance testing.

Uninterrupted Parameter Analysis. The Corps requires that a single parameter or set of parameters for a group of samples be analyzed by the contractor during the same analytical session. All analyses for parameters in samples, reagent blanks, spiked samples, and blind samples would be conducted during the same analytical session. To clarify: once the instrument or procedure is set up and running for a given parameter or set of parameters, all samples and their associated controls would be run. The instrument or procedure would not be stopped, except for an emergency, until the analyses for that parameter are completed on all samples. If the analytical sequence is

interrupted or delayed, upon resumption all blanks, spiked samples, and the remaining unknowns would be run.

Performance Criteria. Acceptable accuracy on blind sample and spiked sample analyses is ± 2 standard deviations of the mean value. If more than 5 percent of blind sample or spiked sample analyses exceed ± 2 standard deviations of the mean value, the Corps may request that quality control be checked or may order another laboratory inspection. In addition, if blind sample or spiked sample analyses exceed $\pm$ 3 standard deviations, the data for this set of samples would be rejected by the Corps. The Corps expects the coefficient of variation on replicate analyses to be less than 10 percent for most parameters.

6.3 Biological Response Testing

Detailed quality assurance procedures are described in Appendix G of the Great Lakes Dredged Material Testing and Evaluation Manual, including general laboratory requirements.

As part of the quality assurance for the biological response testing, the following criteria would be used to reject the results of any of the biological response exposures and require repeating the exposures:

1. More than 10 to 30 percent (depending on the particular test) of the organisms in the reference sediment or control sediment die.
2. Temperature deviation exceeds 1°C from prescribed temperature.
3. Dissolved oxygen drops below 40 percent (depending on the particular test) of saturation.
4. pH deviates by more than 1 unit.

Standard reference toxicant bioassays would also be conducted to assess the sensitivity of the laboratory test organisms (Busacker and Anderson 1989).

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APPENDIX D

PLACEMENT SITE EVALUATION PROCEDURES

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MATRIX EVALUATION CRITERIA
APPENDIX D

A. GENERAL

A matrix is used by the St. Paul District, Corps of Engineers (CENCS) to evaluate the various dredged material placement alternatives proposed for the various site plans. The development of the criteria used is an on-going process that began with the preparation of the first channel maintenance plan report for GREAT implementation. The matrix used here was developed from the matrix originally used by CENCS in the Dredged Material Placement Reconnaissance Reports, from the mid-1980's, and modified by the matrix developed by the Rock Island District, Corps of Engineers (CENCR) for their dredged material placement program.

The CENCS matrix uses index values to score the dredged material placement alternatives in six different categories: dredging and material placement cost, impacts to natural resources, beneficial use, impacts to cultural resources, social impacts, and impacts to recreation. Index values used for evaluating placement alternatives range from 0 (least desirable) to 10 (most desirable).

The resulting index values, scored for the various categories, are then adjusted by multiplying them by a weight factor which is assigned to each category. The weight factor determines the relative importance of each category in the dredged material placement alternative evaluation process. The dredging and material placement cost and impacts to the natural resources categories were assigned the highest weight factors. Both are assigned a weight factor of 30. Beneficial use and cultural resources are equally weighted at 10. Social impacts are weighted at 15 because the experience CENCS has had with implementing plans has indicated that there are significant local concerns related to operating placement sites near developed areas. These concerns can have a significant effect on how or whether a plan can be implemented. The remaining category of recreation has been set at 5 because CENCS does not believe that it will have as much of an impact on implementing placement plans as the other categories. Recreational beach planning is being conducted independent of the long term placement site planning.

Finally, the index values, multiplied by their appropriate weight factor, are totaled. The dredged material placement alternative with the highest total points becomes the preferred dredging and material placement alternative.

Following are the criteria used to assign index values in the various evaluation categories.

B. DREDGING AND MATERIAL PLACEMENT COSTS (Weight Factor = 30)

The cost to dredge is partially dependent on the dredged material placement alternative selected. The dredging and Material Placement Cost Matrix ranks the dredged material placement alternatives by the estimated cost to dredge and place the dredged material. This section describes the process which will be used to estimate the cost to dredge, transport, and place the dredged material for the placement site alternatives being evaluated in the site plans. The estimated costs may lack refinement, but they are considered to be reliable for their intended use for alternative comparison.

The estimated costs will be converted to cost per cubic yard units. Index values are then assigned to ranges of cost per cubic yard values. The index values for ranges of cost per cubic yard are shown in TABLE D-1.

TABLE D-1
Dredging and Material Placement
Cost Index Values

Value	Criteria
10	$0.0 - $2.50 per cu. yd.
9	$2.51 - $3.75 per cu. yd.
8	$3.76 - $5.00 per cu. yd.
7	$5.01 - $6.25 per cu. yd.
6	$6.26 - $7.50 per cu. yd.
5	$7.51 - $8.75 per cu. yd.
4	$8.76 - $10.00 per cu. yd.
3	$10.01 - $11.25 per cu. yd.
2	$11.26 - $12.50 per cu. yd.
1	$12.51 + per cu. yd.

The cost per cubic yard of material dredged is calculated by dividing the estimated total cost to perform the dredging and placement operation by the estimated long-term dredging quantities for the site plan.

The dredging and material placement costs do not include mobilization costs to place the dredge and its normal attendant plant on site. Such costs are not usually affected by the placement alternative. Rather, mobilization costs are affected by factors that cannot be predicted, such as distance from the previous job, direction the dredge has to travel, dredge and equipment readiness, and river conditions. Thus, the calculated costs used to determine index values are less than the dredging costs that the St. Paul District uses for other purposes and reports.

Two types of dredging are usually considered for channel maintenance dredging in the St. Paul District: hydraulic dredging and mechanical dredging. Placement site requirements for the dredged material resulting from the different types of dredging are also different. Thus, a different methodology is used to estimate the costs of performing the two different types of dredging and dredged material placement.

Following is an explanation of how the costs are estimated to dredge and implement the various dredged material placement alternatives being evaluated in the site plans.

1. Hydraulic Dredging: It is assumed that all hydraulic dredging will be performed by the Government-owned Dredge THOMPSON. The cost to hydraulically dredge and place the material is calculated from the rental cost of the dredge and its attendant plant, the time required to complete the job, and the cost and time needed to implement other requirements for placing dredged material.

a. Dredge and Plant Rental Cost: A plant rental rate has been given to the Dredge THOMPSON and its attendant plant. The rent pays for the operation and maintenance of the dredge and its attendant plant. For the purpose of the cost estimates, a rate $21,000 per day, or $875 per hour, has been adopted. This rate is an average over the last few years and can reasonably be expected for the Dredge THOMPSON in the near future. To compute the cost, the hourly rental rate is multiplied by the estimated hours required to complete the job.

b. Time Required to Complete a Job: A dredging operation is divided into "effective" pumping and "noneffective" time. The effective pumping time is the time during which the dredge is excavating and pumping the material to the placement site. Examples of noneffective time are the time required to pass a tow, the time to perform minor repairs, the time required to move the "end" of the discharge line, or the time required for other work related to the material placement operation.

A production rate is used to determine the effective pumping time required for the dredge at a specific job. A production rate is the average number of cubic yards per hour dredged when the dredge is effectively pumping. For example, if, from historical data, it is known that the dredge's production rate is 1,000 cubic yards per hour for a given set-up and material type, to determine the effective pumping time required to dredge 10,000 cubic yards, divide the dredge's production rate into the quantity to determine that it will require 10 hours of effective pumping time.

As alluded to in the preceding paragraph, the production rate as affected by the dredge equipment being used(set up) and the type of material being dredged. Technically, the production rate is affected by the discharge pipe diameter, the velocity of the discharge flow, and the concentration of the dredged material in the discharge slurry. The Dredge THOMPSON'S discharge pipe diameter is a constant 20 inches. (This is true whether or not the booster barge MULLEN is being used.)

The velocity of the flow in the discharge pipeline is primarily dependent on discharge pipe length (assuming that all of the available horsepower of the dredge and booster pumps are being used). As more pipeline is added, increasing the length of the discharge pipeline, the flow velocity of the discharge is reduced, thereby reducing the production rate.

The concentration of dredged material in the discharge slurry is affected by the type of material being dredged, Heavy material (coarse sand or gravel) requires higher flow velocity in the pipeline than light material. Higher velocities prevent the material from settling out in the pipeline. However, as the concentration of material in the slurry increases, the velocity decreases. Thus, the heavier the material, the higher the velocity requirements, and the lower the slurry's concentration of material can be to maintain the required velocity. For light river channel sand, concentrations as high as 20 percent may be realized by the dredge THOMPSON. For coarse gravel material, concentrations as low as 5 percent may be realized by the Dredge THOMPSON.

The concentration of dredged material in the discharge slurry also is affected by the height of the face of the dredge cut. If the material is not available to dredge, more water is pumped, A dredge is usually more efficient when dredging a cut with a large face.

In summary, the Dredge THOMPSON can dredge more material per unit of time when a job requires a short pipeline to reach the placement site and the material to be dredged is light sand with a large average face. The production rate is decreased as the distance to the placement site is increased (necessitating a longer discharge pipeline), the material to be dredged becomes coarser, or the average face of the dredge cut becomes smaller.

The production rate for a historical dredge cut on the UMR in CENCS is estimated from historical data. Specifically, the production rate is calculated from the Dredge THOMPSON'S daily logs. For a given recurring dredge cut, it is usually correct to assume that the material type is the same from event to event and that the shoaling patterns are similar, resulting in similar average face, from event to event. (The type of material to be dredged and the shoaling patterns for a given dredge cut are usually characteristic of the dredge cut.) The one variable is the length of the discharge pipeline. This length is determined by the location of the placement site. Enough information is available in the daily logs to develop relationships between production rate and pumping distance for various types of material and various average faces. Thus, the effective pumping time for a given site plan can be estimated from historical data. This is the approach used in the site plans to estimate effective pumping time.

The noneffective time accounts for the time spent on activities to support the dredging and material placement operation. Included in the noneffective time are the time spent to perform routine maintenance and minor repairs to the dredge, the time spent to advance the dredge and make adjustments to the discharge pipeline, the time spent to "break" the pipeline and move the dredge out of the way to pass tows, and the time spent to set up and tear down the job.

The placement site, or alternative, also may have some requirements or conditions that must be met or complied with which increase the time required to complete the job. An example would be a requirement to shape the material during placement which necessitates frequently moving the discharge pipe. The placement alternative may require site preparations such as berming to control the return water and to contain the dredged material or adjustments may be required to a drop structure. These activities normally are performed by the dredge's crew and are also considered noneffective time.

The noneffective time also will be estimated from historical data (daily logs). For placement alternatives where no historical information exists, noneffective time will be estimated using conventional construction estimating methods.

c. Other Costs: Other costs such as land acquisition, site preparation, and site management, or any activity performed to implement the dredged material placement alternative not accomplished with the dredge's plant, will increase the cost per cubic yard and thereby reduce the index value. These other costs will be calculated as cost per cubic yard by spreading the cost over the alternative's estimated capacity.

In summary, for channel maintenance dredging using a hydraulic dredge, the estimated cost of the dredging and dredged material placement will be based on a dredge plant rental rate of $21,000 per day, the time estimated to complete the operation, and the cost to perform other activities in support of the dredged material placement alternative. The plant rental of $21,000 per day is the rate that reasonably can be expected for the Dredge THOMPSON in the near future. The estimated

time to complete the operation will be the sum of the effective pumping and noneffective time. Both the effective and noneffective time will be estimated from historical data. The other activities that need to be performed in support of the placement alternative also will be estimated from historical data. The other activities that need to be performed in support of the placement alternative also will be estimated from historical data, if such data exist. If the data does not exist, conventional estimating methods will be used to estimate the cost. All cost estimates used to determine cost index values for the various dredged material placement alternatives will be fully documented in the individual site plan reports.

2. Mechanical Dredging: Most mechanical dredging in the St. Paul District will be conducted by contract. The cost to mechanically dredge and place material is calculated from the per cubic yard unit cost and the transportation of dredged material by barge to a placement site in the current contract and the cost and time needed to implement other requirements for placing dredged material.

a. Per Cubic Yard Unit Cost: The St. Paul District awards a mechanical dredging contract for each year in which the contractor bids a price for dredging per cubic yard and miscellaneous mobilization and other contract costs. The price has varied over the years and has been going up. For the purpose of estimating costs of the alternatives, a per cubic yard unit cost of $5.32 will be used which is the average 1994-1996 contract price. To compute the cost, the per cubic yard unit cost is added to any additional costs for transportation of material and other costs required for placement of dredged material.

b. Transportation of Dredged Material: There will be no extra costs associated with transportation of dredged material if the placement site is located within four river miles of the dredge cut. The transportation distance is measured from the center of the dredge cut along the midchannel sailing line (as detailed on the Upper Mississippi River Navigation Charts) to the center of the navigation channel at a point perpendicular to the center of the placement site, to the nearest tenth of a mile. If transportation is between four and eight miles, a cost of $0.25 per cubic yard, per mile is added to the cost of dredging. If transportation is over eight miles, a cost of $0.85 per cubic yard, per mile is added to the cost of dredging. These transportation costs are the averages taken from the 1994-1996 mechanical dredging contract.

c. Other Costs: Other costs such as land acquisition, site preparation, and site management, or any activity performed to implement the dredged material placement alternative not accomplished with the mechanical contractor's equipment, will increase the cost per cubic yard and thereby reduce the index value. These other costs will be calculated as cost per cubic yard by spreading the cost over the alternative's estimated capacity.

In summary, for channel maintenance dredging using a mechanical dredge, the estimated cost of the dredging and dredged material placement will be based on a per cubic yard dredging cost of $5.32, plus transportation of dredged material costs if the distance is greater than 4 miles, plus the cost to perform other activities in support of the dredged material placement alternative.

The per cubic yard dredging cost and the transportation costs were taken from the 1994 mechanical dredging contract. These prices can reasonably be expected for mechanical dredging in the near future. The other activities that need to be performed in support of the placement alternative also will

be estimated from historical data, if such data exist. If the data does not exist, conventional estimating methods will be used to estimate the cost. All cost estimates used to determine cost index values for the various dredged material placement alternatives will be fully documented in the individual site plan reports.

C. NATURAL RESOURCES (Weight Factor = 30)

Within the Natural Resources Matrix, there are two broad categories for evaluation: water quality and the aquatic and terrestrial ecosystem. Of the possible 30 points for the natural resources weight factor, 8 are designated for water quality, 22 to the aquatic and terrestrial ecosystem. Following is a description of both.

1. Water Quality: The basic assumption with the following worksheet is that the dredged material being considered is uncontaminated sand typical of the majority of dredge cuts on the Upper Mississippi River within the St. Paul District. When the dredged material is contaminated, the worksheet would not be used, and the impact values will be assigned without the use of pre-established criteria.

In addition to the effects on the water column, the physical effects on the aquatic ecosystem of in-water rehandling or effluent from disposal areas are included in the evaluation provided the integrity of site is not significantly altered or the disruptions would not occur over long periods. If a site would be dramatically altered, or there would be long-term disruptions, the evaluation of impact would be included in the ecosystem worksheet.

Impact Considerations

Discharge Type			
1. Confined disposal with adequate retention		1	_____
2. Confined disposal without adequate retention		0.5	_____
3. Unconfined disposal	0.5		_____
4. Direct open water		0.1	_____
Discharge Area Characteristics			
1. Non-sensitive area with adequate mixing		1	_____
2. Non-sensitive area without adequate mixing		0.5	_____
3. Sensitive area with adequate mixing		0.5	_____
4. Sensitive area without adequate mixing		0.1	_____
Nature of Discharge (check 2)			
1. Short duration (<1 week)		1	_____
2. Long duration (>1 week)		0.5	_____
3. Infrequent		1	_____
4. Frequent		0.5	_____
Other _____		____	_____
	TOTAL		_____

2. Aquatic and Terrestrial: Index values assigned to natural resource impacts from the dredged material placement alternatives will be calculated by the procedure developed by Wege and Palesh (1982, 1983). The 1982 procedure was generally accepted at the Channel Maintenance Forum in 1983 for its use in pool 4 of the Upper Mississippi River. Wege and Palesh (1983) was a later accepted procedure with the St. Paul District. These procedures quantify the relative impacts and benefits of dredged material placement to the natural resources. HEP was initially developed to compensate habitat losses associated with development plans, but has since been useful as a planning tool to evaluate project alternatives during early planning stages.

The proposed HEP methodology involves five steps:

1. Identification of habitat types to be affected by the project.

2. Assigning numerical habitat values to each habitat type.

3. Estimating habitat losses or gains in acres over the project life.

4. Performing a trade-off analysis to compare different habitat types.

5. Quantifying habitat losses in terms of relative habitat units.

a. Identification of Habitats Impacted: The disposal alternatives selected for evaluation could impact the ten different habitat types listed below.

Old Dredged Material - Old disposal site habitats on the river can vary greatly. The typical old disposal site habitat is a mosaic of sand deposits in early stages of revegetation and pockets of trees and shrubs that were able to withstand the dredged material deposition. It is expected through succession this habitat would return to a condition similar to bottomland forest habitat.

Brush and Willow. Areas dominated by dense shrub growth, mostly willows, are included in this habitat type.

Sand. These are areas dominated by bare sand with little or no vegetation. This habitat type would be also be created by dredged material placement.

Bottomland Forest. This habitat type is undisturbed bottomland forest areas with mature trees. The habitat type is assumed to be a climax community.

Marshes - Wetland areas characterized by dense stands persistent emergent vegetation such as sedges, cattails, bur reed, common reed, etc.

Shallow Aquatic - Shallow water areas generally less than four feet deep characterized by abundant floating-leaved or submerged vegetation such as coontail, white water lily, and pondweeds.

Terrestrial Herbaceous - Upland sites generally dominated by herbaceous vegetation. Some scattered shrub and young tree growth may be present.

Terrestrial Woody - Upland sites dominated by woody vegetation. It is expected that most high disposal sites would eventually evolve into this habitat type in 40+ years.

Cropland - Actively farmed areas.

Deep Aquatic - Water areas generally deeper than four feet such submergent aquatic vegetation is not common.

b. Determination of Habitat Unit Values (HUV): Habitat types have been evaluated for terrestrial and aquatic species. Ten evaluation species were selected for each habitat type and combined to evaluate those habitats providing both the terrestrial and aquatic benefits (Table 5-2). The evaluation species were selected by an evaluation team and were a representation of an ecological cross-section of the fish and wildlife community of each habitat type. The habitats were evaluated by identifying the existing characteristics of the habitat at each location and determining by consensus of the team how well those characteristics fulfilled the habitat requirements of the selected evaluation species. Numerical ratings for each evaluation species were based on a scale of 0-10, and since 10 species were used to evaluate each habitat, HUV from 0-100 were possible.

c. Estimation of Habitat Losses over the Project Life: The HEP evaluation quantifies habitat losses or gains over the project life in terms of habitat units (HU) by multiplying habitat quality (or HUV) by the change in habitat quantity (acres). It compares habitat impacts of dredged material disposal to habitat changes occurring over the project life in the absence of any disposal. A prediction of future habitat changes due to natural succession or anticipated developments must be made for the 40-year time period for each habitat type. This results in a gradual change in habitat values over 40 years. Since bottomland forest was considered to be at a climax stage of succession, no change in habitat value was anticipated over the project life. Target years are selected representing important time periods when significant changes in habitat quantity occur. For many projects, losses occur at one point in time (e.g. wetland filling), while others occur gradually from disposal over a 40-year period. Target year zero represents the exiting or baseline conditions for each habitat. Target year 1 is the start of dredged material disposal.

d. Trade-off Analysis: Evaluating dredged material disposal alternatives often involve losses of dissimilar habitats making it difficult to compare losses between habitat types and alternatives. The first step in the trade-off analysis is to develop Relative Value Criteria (RVC) used to determine the intrinsic values of habitats. The following criteria were selected:

Scarcity - The abundance of the habitat.
Diversity - The ability of the habitat to support a diverse fauna.
Manageability - Whether or not the habitat can be managed given its nature and location.
Replaceability - Whether or not the habitat can be replaced either by natural succession or by man.
Productivity - The primary productivity of the habitat.

A pairwise comparison of each of the above criteria was performed to rank their importance to each other. Scarcity, diversity, and productivity were considered equally important and received a relative weight of 0.27. Manageability and replaceability were considered equal and received a relative weight of 0.10.

The next step is to compare habitats selected for the project site to the RVC. These values need to be determined for each project area based on the quality and quantity of habitat types. Habitats are ranked against the criteria on a 0.1 to 1.0 scale as follows:

0.1 ----------**Scarcity**---------- 1.0
common rare

0.1 ----------**Diversity**---------- 1.0
low high

0.1 ----------**Manageability**---------- 1.0
difficult easy

0.1 ----------**Replaceability**---------- 1.0
easy impossible

0.1 ----------**Productivity**---------- 1.0
low high

The value chosen for the RVC is then multiplied by the relative weight. For example, a habitat type with a diversity RVC of 0.4 would be multiplied by 0.27 for a index value of 0.108. The index values are added together within each habitat type, and their totals are divided by the largest summation of the habitat types to determine the Relative Value Indices (RVI). If, for example the shallow aquatic habitat type has the highest sum of index values of 0.6. The RVI for this habitat type would be 1.0 (0.6/0.6=1). If the sum for another habitat type is 0.3, its RVI would be 0.5 (0.3/0.6=0.5). This ranks the relative value of each habitat type on a 0-1 scale.

d. Quantify Habitat Impacts: The final step in the HEP is to quantify habitat impacts in terms of Habitat Units (HU) by multiplying the HUV for the habitat types by the impact area. Since it is a trade-off analysis, relative habitat units (RHU) are calculated by multiplying HU by RVI. To display project benefits and costs, HU displayed are then annualized over the project life. For each alternative, the RHU is calculated to determine the gain or loss for each habitat type. To display project benefits and costs, HU displayed are annualized over the project life.

e. Literature Cited

Wege, G.L., and G.D. Palesh. 1982. Habitat evaluation of dredged material disposal alternatives using the habitat evaluation procedures (HEP). U.S. Fish and Wildlife Service, Twin Cities Field Office. 28pp.

Wege, G.L., and G.D. Palesh. 1983. Standards for use with the habitat evaluation procedures (HEP) to evaluate dredged material disposal alternatives on the Upper Mississippi River (GREAT-I). U.S. Fish and Wildlife Service, Twin Cities Field Office. 11pp.

D. BENEFICIAL USE (Weight Factor = 10)

Generally defined, beneficial use of dredged material is the productive use of the material by the public or private sectors. Examples of common beneficial uses of dredged material in the St. Paul District are upland habitat development, wetland creation, aquatic habitat enhancement, creation of areas for bird nesting, beach nourishment, winter road maintenance, levee repair and improvement, aggregate for concrete, lining flyash pits, bank protection, and general purpose fill. Placing dredged material at locations where it could or would be used beneficially was a planning objective of the GREAT I study and is an objective of the Corps of Engineers.

A market survey was conducted in 1977-1978 to determine the demand for dredged material as part of the GREAT I study. In 1982, the Wisconsin Department of Natural Resources under contract by the St. Paul District Corps of Engineers completed a report titled Demands, Productive Uses And Economic Impacts Of The Beneficial Use Of Dredged Material On The Upper Mississippi River. This report updated the GREAT I information and in addition to this report, there have been and there will continue to be supplemental reports for specific areas depending on how current the data is. These reports will serve as the basis for identifying potential users of dredged material and in developing the site plans. During the development of the site plans, all known potential beneficial users in the area will be contacted, and a plan for beneficial use will be formulated for each site plan where it is operationally feasible.

The dredged material placement alternatives that provide beneficial use potential for the dredged material will be considered in evaluating the alternatives using the matrix. Those alternatives with beneficial use potential will be assigned index values ranging from 0 (no beneficial use potential) to 10 (active beneficial use). The index value will then be adjusted by the weight factor and incorporated into the matrix. The beneficial use index values and the corresponding criteria are shown in TABLE D-2.

TABLE D-2

Beneficial Use Index Values

Value	Criteria
10	The alternative placement site would be actively used as a beneficial use site for dredged material outside the floodplain and provide local economic benefits.
8	The alternative placement site would be actively used as a beneficial use site for dredged material within the floodplain and provide environmental or recreational benefits.
6	The alternative placement site has **high** potential for use of the dredged material. Criteria considered: a) The site is located in an area where identified potential users of the dredged material have indicated high demand. b) Good access to the site is available or a local sponsor or benefactor is willing to develop access to the site.
4	The alternative placement site has **moderate** potential for use of the dredged material. Criteria considered: a) The site is located in an area where identified potential users of the dredged material have indicated moderate demand. b) Existing access is poor and there is a moderate potential for improvement of access.
2	The alternative placement site has **low** potential use of the dredged material. Criteria considered: a) The site is located in an area where identified potential users of the dredged material have indicated low demand. b) Access to the site is not available and no local sponsor or benefactor can be identified to develop access to the site.
0	The alternative placement site has no potential for beneficial use of dredged material.

E. CULTURAL RESOURCES (Weight Factor = 10)

Comprehensive archeological and historic surveys have not been completed for the entire Upper Mississippi River. Some pools within the St. Paul District have detailed information on cultural resources while others have little current survey information. In addition, some pools have an existing body of landform data on which more scientific predictions of site locations can be made. Some dredge disposal sites have been intensively surveyed for cultural resources, others will require survey before being used and yet others will not need any further survey efforts.

The following matrix follows the matrices completed for the Dredge Material Placement Reconnaissance Reports by the St. Paul District in the early 1980's and that done by the Rock Island District in their Long-Term Management Strategy for Dredge Material Placement. While the criteria remain basically the same as those used in the 1980's by St. Paul, like the more recent efforts by Rock Island, we have attempted to use all existing data on known and predicted resource locations, and their association with changing landform information when this information was available.

Coordination with the State Historic Preservation Officers, the State Archeologists and the National Park Service has been completed for a large majority of the disposal sites and will be completed for all new sites added as a result of this study.

Points	Criteria
10	***No potential*** for impact to cultural resources based on recent age of landform or negative survey results.
8	***Negligible potential*** for cultural resources impacts based on knowledge of surveys in similar physiographic settings or avoidance of impacts on known resources.
6	***Low potential*** for impacts to cultural resources based on knowledge of surveys in similar physiographic settings or no knowledge of known properties from historic records in the vicinity of the disposal area.
4	***Moderate potential*** for impacts to cultural resources based on knowledge of surveys in similar physiographic settings or knowledge of known properties in the vicinity of the disposal area.
2	***High potential*** for cultural resources located in the disposal area or cultural resources exist at the placement site which have not been evaluated against the criteria of the National Register of Historic Places.
0	***Extreme potential*** for properties listed on or determined eligible for the National Register of Historic Places to be effected by placement.

F. SOCIAL IMPACTS (Weight Factor = 15)

Socioeconomic criteria will be utilized to evaluate dredged material placement site alternatives in terms of social impacts. These evaluation criteria will account for the positive and negative impacts for the following categories:

(1) business and industrial activity and employment
(2) community cohesion
(3) public services and facilities
(4) property values and tax revenues
(5) life, health, and safety
(6) aesthetic values and noise levels

The evaluation process for social impacts is similar to process used to evaluate the recreational use potential. The social impacts of the dredged material placement alternatives will be evaluated based on a point system. The maximum amount of points any one alternative can attain will be

100. Points will be given by assessing the alternative in the six socioeconomic categories listed previously. The maximum amount of points that can be scored in any category is based on the overall importance of the category relative to the other socioeconomic categories.

Point values and criteria for assessing social impacts are shown in the following tables.

Category 1 - Business and Industrial Activity and Employment

Maximum Points - 30

Criteria	Qualifier	Points
Dredged material demand	High demand	8
	High potential use	6
	Potential use	4
	No known potential use	2
	No potential use	0
Supply of existing material	Inadequate supply	8
	Significant supply	4
	Many local sources of supply	0
Impacts on competing firms	No adverse impacts	7
	Possible adverse impacts	5
	Probable adverse impacts	3
	Competing firms expressing opposition	1
Impacts on area employment	No adverse impacts	7
	No expected impacts	4
	Possible adverse impacts	1

Category 2 - Community Cohesion

Maximum points - 20

Criteria	Qualifier	Points
Residential development	None within one mile of site	5
	None within 1/2 mile of site	4
	Limited development (rural)	3
	Moderate development	2
	High development	1
	Dense development	0
Land availability	Willing seller (no condemnation)	5
	Unknown if willing seller	3
	No willing seller	0
Public opposition	No potential opposition	5
	No opposition expressed	3
	Possible opposition	2
	Opposition from some businesses and residents	1
	Large public opposition	0
Adjacent land use	Compatible	5
	Mixed, some compatible	2
	Incompatible	0

Category 3 - Public Services and Facilities

Maximum points - 20

Criteria	Qualifier	Points
Existing public facilities	Improve facilities	5
	Maintain facilities	4
	No change	3
	Slight adverse impact	2
	Adverse impacts	1
	Detrimental impacts	0
Planned public facilities	Provide additional needed facilities	5
	Provide new but unneeded facilities	3
	Slight adverse impacts	2
	Adverse impacts	1
	Detrimental impacts	0
Public Safety	No resulting safety threat	5
	Slight safety threat	3
	Resulting safety threat	1
	Public attraction with significant safety threat	0
Maintenance costs	No change	5
	Some increase	2
	Significant increase	0

Category 4 - Property Values and Tax Revenues

Maximum points - 10

Criteria	Qualifier	Points
Property values and tax revenues of placement site or adjacent land	Improves and increases	10
	Slight improvement and increase	8
	No impacts	6
	Slight decrease	4
	Decrease	2
	Severe decrease	0

Category 5 - Life, Health, and Safety

Maximum points - 10

Criteria	Qualifier	Points
Life, health, and safety	Improves current conditions	10
	No adverse impacts	8
	No change to current conditions	6
	No improvements to current risky conditions	4
	Adverse impacts	2
	Unacceptable creation of dangerous conditions	0

Category 6 - Aesthetic Values and Noise Levels
part 1

Criteria	Qualifier	Points
Aesthetic Values	Enhanced aesthetics due to use of material to replenish an existing beach; no impacts due to replenishing local existing material stockpile	5
	No significant impact due to material being placed on an existing placement site	4
	Minimal impacts due to the creation of a new beach area in area of sparse vegetation	3
	Moderate impact due to the creation of a new beach in area of heavy vegetation	2
	Adverse impact due to creation of an emerged island in the river	1
	Adverse impact due to creation of new non-beach placement site within viewing distance of residential area	0

Category 6 - Aesthetics and Noise Levels
part 2

Criteria	Qualifier	Points
Noise levels	No permanent impacts; no significant temporary impacts during material placement	5
	No significant permanent impacts; no significant temporary impacts during material placement	4
	No significant permanent impacts; adverse temporary impacts during material placement	3
	Adverse permanent impacts due to recreation beach activities (rural area); adverse temporary impacts during material placement	2
	Adverse permanent impacts due to recreation beach activities (urban area); adverse temporary impacts during material placement	1
	Permanent adverse impacts due to beneficial use activities; adverse temporary impacts due to material placement	0

G. RECREATION (Weight Factor = 5)

Category 1 - Existing Recreation Facilities

Maximum 5 points

Qualifier	Points
Improve Facilities	5
Maintain Facilities	4
No Change	3
Slight adverse impact	2
Adverse impacts	1
Detrimental impacts	0

Category 2 - Recreation Opportunities

Maximum 5 points

Qualifier	Points
Provide additional needed facilities (Demand exceeds supply)	5
Provide new facilities/low demand (Supply exceeds demand)	4
No affect	3
Slight adverse impact	2
Adverse impacts	1
Detrimental impacts	0

TAB 1 - PROJECT INFORMATION

TAB 1

PROJECT INFORMATION

Upper Mississippi River System Navigation Projects
St. Paul District
Location and Authorized Dimensions

Project	Location			Dimensions (FT)		Distance
	Pool(s)	River Miles	Cities	Width	Depth	Miles
Channels						
Upper Mississippi River	USAF	857.6-853.4	Minneapolis, MN	150	9	4.2
	1 - 2	853.4-815.2	Mpls, MN - Hastings, MN	200	9	38.2
	3 - 10	815.2-614.0	Hastings, MN - Guttenberg, IA	300	9	201.2
Minnesota River		25.6-14.7	Shakopee, MN - Savage, MN		4	10.9
	2-844.0RB	14.7-0.0	Savage, MN - Mpls, MN	100	9	14.7
St. Croix River		51.8-24.5	Taylors Falls, MN - Stillwater, MN		3	27.3
	3-811.3LB	24.5-0.0	Stillwater, MN - Prescott, WI	200	9	24.5
Black River	8-698.2LB	1.4-0.0	LaCrosse, WI	300	9	1.4
			Total miles 3 and 4 foot channel:			38.2
			Total miles 9 foot channel:			284.2
Harbors						
St. Paul	2	839.6 RB	St. Paul, MN		5	
Hastings	3	813.1 RB	Hastings, MN		5	
Red Wing Commercial	4	791.3 RB	Red Wing, MN		9	
Red Wing Recreational	4	791.1 RB	Red Wing, MN		5	
Bay City, WI	4	786.8 LB	Bay City, WI		5	
Lake City	4	772.6 RB	Lake City, MN		5	
Pepin	4	767.0 LB	Pepin, WI		5	
Wabasha	4	760.5 RB	Wabasha, MN		5	
Alma	4	754.0 LB	Alma, WI		5	
Winona Recreational	6	726.1 LB	Winona, MN		5	
Winona Commercial	6	726.1 RB	Winona, MN		9	
Lansing	9	663.5 RB	Lansing, IA		5	
Prairie du Chien Rec	10	636.0 LB	Prairie du Chien, WI		5	
Prairie du Chien Comm	10	635.2 LB	Prairie du Chien, WI		9	
			Total Number of Recreational Harbors:			11
			Total Number of Commercial Harbors:			3

April 1996

Project Map


Mile 857.6: Upstream limit of 9 foot channel project
850
St. Paul
St. Paul Small Boat Harbor
L/D 1
Minneapolis
Minnesota River
St. Croix River
L/D 2
Prescott
Hastings
Hastings Small Boat Harbor
800
L/D 3
Red Wing Commercial Harbor
Bay City Small Boat Harbor
Red Wing
Red Wing Small Boat Harbor
Pepin Small Boat Harbor
Pepin
Lake City
Lake City Small Boat Harbor
Wabasha Small Boat Harbor
Alma Small Boat Harbor
Wabasha
Alma
L/D 4
750
L/D 5
Fountain City - Mississippi River Project Office
L/D 5A
Winona Commercial Harbor
Winona
Trempealeau
Winona Small Boat Harbor
L/D 6
Black River
L/D 7
700
La Crosse
L/D 8
WI
MN
IA
Lansing
Lansing Small Boat Harbor
650
L/D 9
Prairie du Chien Small Boat Harbor
Prairie du Chien Commercial Harbor
Prairie du Chien
Guttenberg
L/D 10
Mile 614.0: Lower limit of St. Paul District

DESIGNATED PLACEMENT SITES BY DREDGING LOCATION April 1998			KEY for Placement Methods M = Mechanical H = Hydraulic M,H = Either, or, First listed is preferred M&H = Both are required									
Historic Dredge Cuts			Placement Site Alternatives and Placement Methods									
Pool-Cut #	Cut Name	Location	Transfer Site If Required	Meth.	First Priority Perm. Site	Meth.	Second Priority Perm. Site	Meth.	Third Priority Perm. Site	Meth.	Emergency	Meth.
*** Main Channel Dredging ***												
MN-5	Above Savage R.R. Br.	14.3-14.7			MN-13.5-RMP	H,M						
MN-4	Cargill Slip	12.8-13.6			MN-13.5-RMP	H,M						
MN-3C	Peterson's Bar	11.8-12.4			MN-12.1-RMP	H,M						
MN-3B	Below Peterson's Bar	11.2-11.8			MN-12.1-RMP	H,M						
MN-3A	Above 35W Br.	10.7-11.2			MN-10.1-RMP	M						
MN-2	4Mile Cut-Off	3.8-4.7			MN-7.3-RMP	M						
MN-1	Mouth of MN River	0.0-0.5			2-840.4-RMP	M						
SC-1	Kinnickinnic Bar	6.0-6.5			SC-6.7-LWP	H,M	SC-6.5-LWP	H,M	3-811.5-LMP	M&H		
USAF-3	Mpls. Turning Basin	856.8-857.6			U-856.6-RMP	H,M						
USAF-2	Above Lowry Ave. Br.	856.4-856.8			U-856.6-RMP	H,M						
USAF-1B	Broadway Ave. Br.	855.5-856.1			U-856.6-RMP	M						
USAF-1A	Above Plymoth Ave. Br.	854.8-855.5			U-856.6-RMP	M						
1-7B	Lower Appch. LSAF	853.4			1-853.2-LMP	M						
1-7A	Washington Ave. Br.	852.5-853.0			1-853.2-LMP	M						
1-6	Above Franklin Ave. Br.	851.6-853.4			1-853.2-LMP	M					1-851.3-LME	H
1-5	Below Franklin Ave. Br.	850.7-851.4			1-853.2-LMP	M					1-851.3-LME	H
1-4	Above Lake Street Br.	849.9-850.5			1-853.2-LMP	M					1-849.5-RME	H
1-3	Below Lake Street Br.	848.9-849.9			1-853.2-LMP	M					1-849.5-RME	H
1-2	St. Paul Daymark	848.5-848.9			1-853.2-LMP	M						
1-1	Upper Appch. L/D 1	847.7-848.4			1-853.2-LMP	M						
2-9	Above & Below Smith Ave.	840.0-841.3			2-840.4-RMP	M,H						
2-7	St. Paul Barge Terminal	836.4-837.8			2-836.3-RMP	H						
2-5B	Grey Cloud Slough	827.5-828.3	2-823.8-LMT	M	2-822.5-LMP	H	2-823.8-RMP(1)	M				
2-5A	Robinson Rocks	826.1	2-823.8-LMT	M	2-822.5-LMP	H	2-823.8-RMP(1)	M				
2-4	Pine Bend	822.7-823.7	2-823.8-LMT	H,M	2-822.5-LMP	H	2-823.8-RMP(1)	M				
2-3	Boulanger Bend	820.8-821.4	2-821.5-RMT	H,M	2-822.5-LMP	H	2-823.8-RMP(1)	M				
2-2	Boulanger Bend Lower Light	819.0-819.8	2-821.1-RMT	H,M	2-822.5-LMP	H	2-823.8-RMP(1)	M				
3-9	Lower Appch. L/D 2	814.9-815.1			3-814.7-RMP	M	3-815.1-RMP	M				
3-7	Prescott	810.3-811.7			3-811.5-LMP	H	3-813.2-RMP	M				
3-5B	Truedale Slough	807.9-808.6			3-808.4-LWP	H						
3-5A	Four Mile Island	807.0-807.9			3-808.4-LWP	H						
3-4	Big River	804.1-806.0	3-799.2-RMT	M	3-798.0-LWP	H						
3-3	Morgans Coulee	801.9-803.0	3-799.2-RMT	M	3-798.0-LWP	H					3-802.3-RME	H,M

DESIGNATED PLACEMENT SITES BY DREDGING LOCATION April 1998			KEY for Placement Methods M = Mechanical H = Hydraulic M,H = Either, or, First listed is preferred M&H = Both are required									
Historic Dredge Cuts			Placement Site Alternatives and Placement Methods									
Pool-Cut #	Cut Name	Location	Transfer Site If Required	Meth.	First Priority Perm. Site	Meth.	Second Priority Perm. Site	Meth.	Third Priority Perm. Site	Meth.	Emergency	Meth.
3-2	Coulters Island	800.8-801.8	3-799.2-RMT	M	3-798.0-LWP	H					3-801.7-LWE	H
3-1	Diamond Bluff	798.8-800.4	3-799.2-RMT	H,M	3-798.0-LWP	H						
4-10	Trenton	794.0-794.6			4-794.7-RMP	H,M	4-791.6-RM	M				
4-9	Cannon River	792.1-793.5			4-791.6-RMP	M,H						
4-8	Above Red Wing Hwy. Br.	790.8-791.2			4-791.6-RMP	M,H	4-788.5-RMP(2)	M				
4-7	Below Red Wing Hwy. Br.	789.5-790.3			4-791.6-RMP	M	4-788.5-RMP(2)	M				
4-6	Head of Lake Pepin	785.2-785.4			4-791.6-RMP	M						
4-5B	Chippewa Delta	763.2	4-762.7-LWT	H	4-761.0-RMP	H	4-761.1-RMP(3)	H				
4-5A	Reads Landing	761.8-763.8	4-762.7-LWT	H,M	4-761.0-RMP	H	4-761.1-RMP(3)	H,M				
4-4	Above Crats Island	758.5-759.5	4-759.3-LWT	H,M	4-760.2-RMP	H	4-759.5-RMP	H	4-759.3-RMP	H		
4-3	Above Teepeota Point	757.0-757.9	4-757.5-LW	H,M								
4-2	Grand Encampment	755.8-756.9	4-756.5-LWT	H,M	4-754.0-LWP	M						
4-1	Beef Slough	753.9-754.6			4-754.0-LWP	M,H						
5-8	Lower Appch. L/D 4	752.6-752.8	5-748.0-RMT	M	5-749.8-RMP	M,H						
5-7	Mule Bend	748.6-749.6	5-748.0-RMT	H,M	5-749.8-RMP	M,H						
5-6	West Newton	748.2-747.2	5-748.0-RMT	H,M	5-749.8-RMP	M,H						
5-5	Below West Newton	746.0-746.8	5-748.0-RMT	M	5-749.8-RMP	M,H						
5-4	Fisher Island	744.8-746.0	5-745.8-RMT	H,M	5-744.0-RMP	H						
5-3	Lower Zumbro	744.0-744.6	5-744.7-LWT	H,M	5-744.0-RMP	H						
5-2	Sommerfield Island	742.6-743.9	5-744.7-LWT	M	5-744.0-RMP	H						
5A-5	Island 58	734.0-735.2			5A-738.2-RMP	M	5A-733.5-LWP	M	5A-731.9-LWP	M	5A-734.5-LWE	H
5A-4	Fountain City	733.3-733.8			5A-731.9-LWP	H,M	5A-733.5-LWP	M				
5A-3	Betsy Slough	731.0-732.0			5A-731.9-LWP	H,M	5A-733.5-LWP	M				
5A-2	Wilds Bend	730.2-730.7	5A-730.5-LWT	H,M	5A-731.9-LWP	H,M	5A-733.5-LWP	M				
6-3	Below Winona R.R. Br.	723.4-723.8			6-726.3-RMP	M						
6-2	Gravel Point	721.8-722.9			6-720.5-RMP	M						
6-1	Homer	720.4-721.1			6-720.5-RMP	H,M						
7-7	Lower Appch. L/D 6	714.0-714.3			7-714.1-LWP	H,M						
7-6	Richmond Island	711.4-712.3			7-714.1-LWP	M	7-713.1-RMP	M				
7-4	Winters Landing	707.4-709.3			7-714.1-LWP	M					7-708.7-LWE	H,M
7-3	Dakota	706.1-706.6	7-706.5-RMT	H,M	7-707.3-RMP	H						
7-2B	Head of Dresbach	704.0-705.3	7-706.5-RMT	M	7-707.3-RMP	H						
7-2A	Lower Dresbach Island	703.0-703.7	7-706.5-RMT	M	7-707.3-RMP	H						
7-1	Upper Appch. L/D 7	702.9-702.5	7-706.5-RMT	M	7-707.3-RMP	H						
8-10	LaCrosse R.R. Br.	699.8-700.4			8-695.7-LWP	M						

DESIGNATED PLACEMENT SITES BY DREDGING LOCATION April 1998			KEY for Placement Methods M = Mechanical H = Hydraulic M,H = Either, or, First listed is preferred M&H = Both are required									
Historic Dredge Cuts			Placement Site Alternatives and Placement Methods									
Pool-Cut #	Cut Name	Location	Transfer Site If Required	Meth.	First Priority Perm. Site	Meth.	Second Priority Perm. Site	Meth.	Third Priority Perm. Site	Meth.	Emergency	Meth.
8-9	Sand Slough	694.3-695.0			8-695.7-LWP	M						
8-7	Picayune Island	691.4-692.4			8-695.7-LWP	M						
8-6	Above Brownsville	689.9-690.8	8-690.4-LWT	H,M	8-695.7-LWP	M						
8-5	Brownsville	688.7-689.4			8-688.7-RMP	H,M						
8-4	Head of Raft Channel	687.5-688.7			8-688.7-RMP	H,M						
8-3	Deadman's Slough	686.5-687.5			8-688.7-RMP	H,M						
9-10	Lower Appch. L/D 8	678.7-679.2			9-677.7-LWP	M						
9-9	Island 126	677.5-678.4			8-695.7-LWP	M						
9-8	Twin Island	676.0-676.6			9-677.7-LWP	M	8-695.7-LWP	M				
9-6	Battle Island	671.0-672.0			9-670.5-LWP	M,H						
9-4	Indian Camp Light	665.0-665.8			9-670.5-LWP	M	8-695.7-LWP	M			9-665.8-RIE	H,M
9-3	Lansing Upper Light	663.8-664.9			9-663.5-LWP	H,M					9-664.3-RIT	H,M
10-9	Hay Point	646.0-646.6			10-647.1-LWP	M						
10-8	Jackson Island	643.7-644.7	10-643.5-LWI(4)	H	10-642.4-LWP	H,M					10-644.5-RIE	H,M
10-7	Mississippi Gardens	642.7-643.4			10-642.4-LWP	H,M						
10-6	East Channel	633.2-635.8			10-635.0-LWP	M						
10-3	Wyalusing	627.3-628.0			10-628.0-LWP	H	10-627.8-LWP(5)	H,M				
10-2	McMillan Island	618.4-619.6	10-618.7-RIT	H,M	10-618.0-RIP	H						
*** Authorized Harbor Dredging ***												
2	St. Paul SBH	839.6			2-840.4-RMP	M						
3	Hastings SBH	813.2			3-814.7-RMP	M						
4	Red Wing Comm. Harbor	791.5			4-791.6-RMP	H,M						
4	Red Wing SBH	791.0			4-791.6-RMP	H,M						
4	Bay City SBH	786.8			?	?					?	?
4	Lake City SBH	772.5	4-762.7-LWT	M	4-761.0-RMP	H						
4	Pepin SBH	767.0	4-762.7-LWT	M	4-761.0-RMP	H						
4	Wabasha SBH	760.5	4-762.7-LWT	M	4-761.0-RMP	H						
4	Alma SBH	754.0			4-754.0-LWP	M						
6	Winona Comm. Harbor	726.3			6-726.3-RMP	M						
6	Winona SBH	726.1			6-726.3-RMP	M	6-726.0-LM	M				
9	Lansing SBH	663.5			9-663.5-LWP	M						
10	Prairie Du Chien Comm. H.	635.2			10-635.0-LWP	M						
10	Prairie Du Chien SBH	636.0			10-635.0-LWP	M						

NOTES FOR DESIGNATED PLACEMENT SITES BY DREDGING LOCATION (April 1998)

(1) - This site has potential for use and would supplement the CMMP and provide greater longevity to the recommended sites.
(2) - This site has potential for use and would supplement the CMMP and provide greater longevity to the recommended sites. Material placement at this site or the first priority site will depend on the demand at each site by the City of Red Wing.
(3) - This site will be retained in the plan because of unknowns with predictions of dredging requirements and beneficial use. Actual dredging records show an increase in dredging quantities in the Wabasha area cuts.
(4) - This is an inwater rehandling site for cut 8. The exact rehandling location may vary based on OSIT recommendations but will be between miles 643.2 and 643.8 using the criteria set forth on page B-6 on the 1985 Pool 10 Reconnaissance Report.
(5) - The Pool 10 Reconnaissance Report endorsed on 9/30/85 added this site to the plan. Placement will be considered when a job in the area is required.

TAB 2 - ANNUAL SUMMARIES

TAB 2

ANNUAL CHANNEL MAINTENANCE SUMMARIES (1975 to Present)

Definition of Abbreviations and Terms

Equipment Categories

WAT - Dredge WILLIAM A. THOMPSON
DUBQ - Dredge DUBUQUE
GM - Government Mechanical (Derrickbarge HAUSER, Cranebarge WADE)
CM - Contract Mechanical
CH - Contract Hydraulic
WID - Water Injection Dredging

Placement Site Location Categories

U-856.6-RMP U = Upper Pool MN = Minnesota River
1-10 = Pools 1-10 SC = St. Croix River

U-856.6-RMP 856.6 = Upper Mississippi River Mile

U-856.6-RMP R or L = Right or Left descending side of the channel

U-856.6-RMP M, W, or I = Minnesota, Wisconsin, or Iowa

U-856.6-RMP P, T, E, or I = Permanent, Transfer, Emergency, or In-Water Rehandling Sites

Beneficial Use Categories

S = Stockpile - Material that is stockpiled at locations where it is available for removal and active beneficial use at other locations. Examples of the type of use include ice control, road maintenance, general fill, concrete or bituminous aggregate, etc.

L = Landfill - Material placed directly at a permanent location for a beneficial use. Sub-categories are as follows:

1 = General fill placed for commercial, residential, industrial, or recreational development: or to reclaim excavated areas, such as sand and gravel pits; or to stabilize eroding areas.

2 = Fill placed for recreational beach enhancement, maintenance, or creation.

3 = Fill placed for environmental enhancement.

A = Public - Sites that are in public ownership at any level of government or non-profit organizations where the general public will benefit from the placement of material.

B = Private - Sites that are in private ownership of any type.

Placement Site Classification

U = Upland Placement B = Beach Placement
C = Confined Placement O = Open Water Placement

Type Categories (Dredging)

R = Routine dredging NCM = Non-Channel Maintenance
E = Emergency dredging H = Commercial or Small Boat Harbor
I = Imminent Closure dredging

1975 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
USAF	Blw. SooLine R.R. Br.	857.4	GM	09/30-10/01	12	4,118	U-855.6-RM		S/A	U	R
USAF	Abv. Lowry Ave. Br.	856.6	GM	10/01-10/07	12	16,778	U-855.6-RM		S/A	U	R
USAF	Abv. & Blw. Broadway	855.7	GM	09/18-09/23	12	4,588	U-855.9-RM		S/A	U	R
USAF	Abv. Plymouth Ave.	855.2	GM	09/23-09/29	12	13,572	U-855.9-RM		S/A	U	R
1	Blw. Franklin Ave.	850.9	GM	08/17-08/26	12	20,032	1-852.7-RM	1.01	S/A	U	R
1	Abv. Lake St. Br.	850.1	GM	06/18-07/16	12	55,462	1-852.7-RM	1.01	S/A	U	R
				07/28-07/30		9,677	1-852.7-RM	1.01	S/A	U	
1	Blw. Lake St. Br.	849.3	GM	08/27-09/09	11	22,312	1-852.7-RM	1.01	S/A	U	R
1	Upper Appch. L/D 1	848.1	GM	08/07-08/17	11	28,439	1-852.7-RM	1.01	S/A	U	R
2	Abv. & Blw. Smith Ave.	840.5	GM	06/14-06/17	13	5,128	2-840.4-RM	2.16	S/A	U	R
2	SBH-St. Paul	839.6	GM	06/05-06/13	6	7,689	2-840.4-RM	2.16	S/A	U	H
2	Pine Bend Foot Light	823.4	GM	07/31-08/06	12	7,239	2-821.5-LM		A	U	I
				09/09-09/17		6,574	JL. Shiely		L1/B	U	
4	Trenton	794.3	WAT	07/07-07/10	11	32,645	4-794.7-RM	4.63	L2/B	B	R
4	Reads Landing	762.5	WAT	06/09-06/19	13	11,000	4-762.3			O	R
						94,297	4-762.7-LW	4.29T	A	C	
4	Crats Island	759.0	WAT	05/29-06/09	13	74,316	4-759.3-LW	4.16T	A	U	R
				06/19-06/23		26,055	4-759.3-LW	4.16T	A	U	
						10,000	4-759.0-RM		L2/A	B	
4	Abv. Teepeeota Point	757.7	WAT	08/08-08/13	13	41,922	4-757.5-LW	4.13T	A	U	R
5	Mule Bend	748.2	WAT	08/14-08/18	11	8,324	5-748.2-RM		L2/A	B	R
5	Blw. West Newton	746.6	WAT	08/07-08/08	13	16,226	5-746.5-RM		A	U	R
5	Fisher Island	745.7	WAT	08/07	12	13,933	5-745.4-LW		A	U	R
5	Lower Zumbro	744.6	WAT	08/13-08/14	12	13,666	5-744.7-LW	5.08T	L2/A	B	R
5A	Island 58	734.5	WAT	06/23-06/28	11	20,000	5A-734.1-LW		L2/A	B	R
						16,112	5A-734.6-RM		L2/A	B	
6	SBH-Winona	726.1	GM	05/22-06/04	6	15,345	6-726.0-LM	6.27	S/A	U	H
7	Richmond Island	711.8	WAT	07/30-08/04	12	41,597	7-711.8-RM		A	U	R
7	Dakota	706.2	WAT	06/28-07/01	11	7,428	7-706.5-RM	7.12T	A	U	R
8	Abv. Brownsville	690.5	WAT	08/18-08/20	13	23,411	8-690.4-LW	8.17T	L2/A	B	R
10	Jackson Island	644.5	WAT	08/20-08/23	13	38,322	10-644.5-RI	10.22T	A	U	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	489,254		193,919			683,173
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			23,034			23,034
	NON-CHAN. MAINT.						0
	TOTAL	489,254	0	216,953	0	0	706,207
FISCAL YEAR	MISS. RIVER	489,254		175,082			664,336
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			23,034			23,034
	NON-CHAN. MAINT.						0
	TOTAL	489,254	0	198,116	0	0	687,370

1975 Beneficial Use Update	
Total Beneficial Use	333,872
Total Quantity Dredged	706,207
Beneficial Use Quantity	47%
Total Jobs With Beneficial Use	18
Total Jobs	25
Beneficial Use Jobs	72%

1976 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Abv. & Blw. Petersons Bar	M12.0	CH	10/18-11/02	11	37,800	MN-12.1-RM		S/B	U	R
USAF	Blw. Soo Line R.R. Bridge	857.3	GM	07/12-08/26	12	75,429	U-855.6-RM		S/A	U	R
USAF	Abv. Lowry Ave. Br.	856.6	GM	08/27-09/01	12	9,042	U-854.8-LM	U.03	S/B	U	R
USAF	Abv. NPRR Bridge	855.7	GM	09/01-09/08	12	8,614	U-854.8-LM	U.03	S/B	U	R
USAF	Abv. Broadway Ave. Br.	855.2	GM	09/08-09/21	12	22,627	U-854.8-LM	U.03	S/B	U	R
1	Abv. Lake Street	850.0	GM	06/30-07/08	12	10,627	1-852.7-RM	1.01	S/A	U	R
1	Upper Appch. L/D 1	848.1	GM	06/25-06/29	11	6,483	1-852.7-RM	1.01	S/A	U	R
2	Smith Ave. Bridge	840.4	GM	05/26-06/24	13	32,015	2-840.4-RM	2.16	S/A	U	R
2	St. Paul Barge Terminal	837.2	WAT	05/27-06/18	11	101,837	2-838.2-RM	2.15	L1/A	U	R
2	Grey Cloud Slough	828.0	WAT	07/06-07/08	13	38,414	2-827.8-RM	Shoreline	L2/A	B	R
2	Grey Cloud Landing	823.5	WAT	07/01-07/12	13	19,189	2-823.6-LM	Open Water	L2/A	B	R
4	Aux. Lock - L/D 4	752.8	GM	09/22-09/28	6	5,657	4-754.0-LW	4.02	S/A	U	R
5	Lower Zumbro	744.8	WAT	06/23-06/29	12	45,000	5-744.0-RM	5.30	A	U	R
				07/14-07/16		6,751	5-744.7-LW	5.08T	A	U	
5A	Island 58	734.4	WAT	05/05-05/10	11	17,913	5A-734.5-LW	5A.14T	A	U	R
5A	Head of Betsy Slough	731.2	WAT	05/12-05/13	11	10,526	5A-731.9-LW	5A.25	S/B	U	R
5A	Wilds Bend	730.4	WAT	05/11-05/12	11	14,534	5A-730.5-LW	5A.08T	A	U	R
6	SBH-Winona	726.2	GM	05/19-05/20	6	2,167	6-726.0-LM	6.27	S/A	U	H
6	Lower Winona R.R. Br.	723.7	WAT	05/14-05/24	13	18,000	6-723.4-RM	6.16	L1/B	U	R
						19,591	6-723.3-RM	6.17	L1/A	U	
7	Head of Dresbach	705.0	WAT	07/19-07/20	12	7,600	7-705.0-LW	7.13	A	U	R
8	Abv. LaCrosse R.R. Br.	700.1	GM	10/16-10/29	13	18,248	8-700.0-RM	8.28	L1/B	U	R
8	Blw. Head of Raft Channel	686.8	GM	09/29-10/13	11	14,047	8-695.7-LW	8.06	S/A	U	R
9	Below L/D 8	679.1	GM	10/14-10/15	6	4,167	8-679.1-LW		L1/A	U	R
9	Below Twin Island	676.7	WAT	07/21-07/22	11	6,200	9-676.5-RM	9.20T	A	U	R
10	Mississippi Gardens	643.0	WAT	08/11-08/16	13	25,934	10-643.1-LW	10.30	L1/B	U	R
10	Prairie du Chien, WI	635.0	WAT	07/23-08/10	13	*104,932	10-635.0-LW		L1/A	U	R

* - Approximately 65,160 cubic yards were double pumped in-water to reach the placement site.

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	436,421		206,956			643,377
	MINN. RIVER					63,800	63,800
	ST. CROIX RIVER						0
	HARBORS			2,167			2,167
	NON-CHAN. MAINT.						0
	TOTAL	436,421	0	209,123	0	63,800	709,344
FISCAL YEAR	MISS. RIVER	436,421		191,204			627,625
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			2,167			2,167
	NON-CHAN. MAINT.						0
	TOTAL	436,421	0	193,371	0	0	629,792

1976 Beneficial Use Update	
Total Beneficial Use	611,346
Total Quantity Dredged	709,344
Beneficial Use Quantity	86%
Total Jobs With Beneficial Use	21
Total Jobs	26
Beneficial Use Jobs	81%

1977 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Abv. Savage R.R. Br.	M14.5	CH	03/22-03/31	11	24,000	MN-14.5-LM		S/A	C	R
USAF	Blw. Soo Line R.R. Br.	857.1	GM	08/29-09/13	12	22,934	U-855.6-RM		S/A	U	R
USAF	Blw. Plymouth Ave. Br.	855.1	GM	09/14-09/19	12	9,633	U-855.6-RM		S/A	U	R
1	Abv. Lake St. Bridge	850.3	GM	08/22-08/26	12	10,086	1-852.7-RM	1.01	S/A	U	R
1	Blw. St. Paul Daymark	848.9	GM	08/17-08/22	11	4,477	1-852.7-RM	1.01	S/A	U	R
2	Smith Ave. Bridge	840.4	GM	08/16	13	1,868	2-840.4-RM	2.16	S/A	U	R
2	Robinsons Rocks	826.1	GM	08/02-08/12	11	7,894	2-827.6-LM		L1/B	U	R
2	Boulanger Bend Lwr. Lt.	819.0	GM	07/25-08/02	13	13,265	2-821.5-LM		A	U	R
4	SBH-Pepin	767.0	GM	09/28	6	292	6-726.0-LM	6.27	S/A	U	H
4	Reads Landing	762.7	GM	03/30-04/07	12	11,206	4-762.7-RM	Open Water	A	O	E
4	Crats Island	759.3	GM	06/09-06/22	11	17,749	4-759.5-RM	4.18	L1/B	U	R
4	Grand Encampment	756.5	GM	09/22-09/26	11	3,671	4-754.0-LW	4.02	S/A	U	R
5	Fisher Island	745.2	GM	09/29-10/12	12	19,740	5-745.8-RM	5.12T	A	U	R
7	Bnd. Lwr. Guidewall L/D6	714.3	GM	05/31-06/06	6	6,062	7-714.1-LW	7.06	S/A	U	R
7	Winters Landing	708.0	GM	06/29-07/19	11/12	25,096	7-705.2-RM	7.01	L1/B	U	R
7	Dakota	706.3	GM	06/24-06/29	11	4,357	7-705.2-RM	7.01	L1/B	U	R
8	Brownsville	689.0	WAT	08/17-08/19	13	23,973	8-688.7-RM	8.30	S/B	U	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	23,973		158,038			182,011
	MINN. RIVER					24,000	24,000
	ST. CROIX RIVER						0
	HARBORS			292			292
	NON-CHAN. MAINT.						0
	TOTAL	23,973	0	158,330	0	24,000	206,303
FISCAL YEAR	MISS. RIVER	23,973		175,707			199,680
	MINN. RIVER				63,800	24,000	87,800
	ST. CROIX RIVER						0
	HARBORS			292			292
	NON-CHAN. MAINT.						0
	TOTAL	23,973	0	175,999	63,800	24,000	287,772

1977 Beneficial Use Update

Total Beneficial Use	162,092
Total Quantity Dredged	206,303
Beneficial Use Quantity	79%
Total Jobs With Beneficial Use	14
Total Jobs	17
Beneficial Use Jobs	82%

1978 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
SC	Kinnickinnic Bar	SC6.5	GM	07/27-08/16	13	20,778	SC-0.4-RM	SC.26	L1/A	U	R
USAF	Below Soo Line	857.2	GM	10/19-10/24	12	7,823	U-855.6-RM		S/A	U	R
USAF	Above Lowry	856.5	GM	10/18-10/19	12	3,960	U-855.6-RM		S/A	U	R
USAF	Below NPRR	855.8	GM	10/11-10/17	12	9,727	U-855.6-RM		S/A	U	R
USAF	Above Plymouth	855.3	GM	10/02-10/11	12	9,350	U-855.6-RM		S/A	U	R
1	Above Franklin	851.7	GM	08/21-09/06	12	28,482	1-852.7-RM	1.01	S/A	U	R
1	Below Franklin	851.0	GM	09/07-09/13	12	8,159	1-852.7-RM	1.01	S/A	U	R
1	Above Lake Street	850.1	GM	09/30	12	228	1-852.7-RM	1.01	S/A	U	R
1	Below Lake Street	849.2	GM	09/14-09/23	12	15,287	1-852.7-RM	1.01	S/A	U	R
1	Above L/D 1	848.2	GM	09/25-09/29	12	7,702	1-852.7-RM	1.01	S/A	U	R
4	Red Wing Comm. Harbor	791.5	GM	10/30-11/01	12	3,282	4-791.5-RM		L1/A	U	H
4	Reads Landing	762.6	WAT	05/23-05/30	12/13	90,240	4-762.7-LW	4.29T	A	C	E
						6400	4-762.5-LW		L2/A	B	
4	Reads Landing	762.7	WAT	08/10-08/18	12	43,612	4-762.7-LW	4.29T	A	C	I
4	Crats Island	759.0	WAT	05/31-06/15	12	68,421	4-759.5-RM	4.19	L1/B	C	R
4	Crats Island	759.0	WAT	09/05-09/14	12	21,583	4-759.5-RM	4.19	L1/B	C	I
5	Mule Bend(Berm Const.)	748.3	GM	07/14-07/26	6	21,632	5-748.0-RM	5.18T	A	C	R
5	Above West Newton	748.0	WAT	09/15-09/19	12	12,958	5-748.0-RM	5.18T	A	C	R
5	Fisher Island	745.0	WAT	06/16-06/27	12	45,437	5-745.8-RM	5.12T	A	C	R
5A	Island 58	734.5	GM	06/30-07/06	12	3,998	5A-731.9-LW	5A.25	S/B	U	R
5A	Betsy Slough	731.3	GM	05/17-05/25	12	10,910	5A-732.0-LW		S/A	U	R
5A	Wilds Bend	730.6	GM	05/26-06/01	13	6,956	5A-732.0-LW		S/A	U	R
5A	Wilds Bend	730.5	DUBQ	08/23-09/01	11	11,566	5A-730.5-LW	5A.08T	A	C	I
5A	Wilds Bend	730.5	WAT	09/20-09/25	11	14,622	5A-730.5-LW	5A.08T	A	C	R
7	Winters Landing	708.5	GM	06/05-06/22	12	25,366	7-705.2-RM	7.01	L1/B	U	R
7	Dakota	706.2	GM	06/01-06/02	12	3,054	7-705.2-RM	7.01	L1/B	U	R
				06/23-06/29		6,612	7-706.5-RM	7.12T	A	U	
7	Head of Dresbach	705.2	WAT	11/17-11/20	12	7,614	7-705.0-LW	7.13	A	U	R
8	Above Brownsville	690.4	WAT	11/15-11/16	12	11,667	8-690.4-LW	8.17T	A	C	R
9	Indian Camp Light	665.5	WAT	10/06-10/12	11	6,130	9-665.2-RI		L2/A	B	R
9	Lansing Light	664.0	WAT	09/26-10/06	12	57,294	9-664.3-RI	9.17T	A	C	R
10	Wyalusing Slough	627.9	WAT	11/02-11/14	8	34,824	10-628.0-LW	10.01	S/L1/B	C	NCM

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	420,802	11,566	169,246			601,614
	MINN. RIVER						0
	ST. CROIX RIVER			20,778			20,778
	HARBORS			3,282			3,282
	NON-CHAN. MAINT.						0
	TOTAL	420,802	11,566	193,306	0	0	625,674
FISCAL YEAR	MISS. RIVER	329,316	11,566	155,306			496,188
	MINN. RIVER						0
	ST. CROIX RIVER			20,778			20,778
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	329,316	11,566	176,084	0	0	516,966

1978 Beneficial Use Update	
Total Beneficial Use	302,420
Total Quantity Dredged	625,674
Beneficial Use Quantity	48%
Total Jobs With Beneficial Use	21
Total Jobs	30
Beneficial Use Jobs	70%

1979 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
USAF	Below Soo Line	857.4	GM	08/18-08/30	12	26,600	U-854.8-LM		S/B	U	R
USAF	Above Lowry Ave.	856.7	GM	08/17	12	2,500	U-854.8-LM		S/B	U	R
USAF	Below NPRR Bridge	855.8	GM	08/15-08/16	12	5,500	U-854.8-LM		S/B	U	R
USAF	Above Plymouth Ave.	855.3	GM	07/31-08/14	12	24,400	U-854.8-LM		S/B	U	R
1	LSAF Approach	853.2	GM	07/30	13	600	1-852.7-RM	1.01	S/A	U	R
1	Above Franklin Ave.	851.5	GM	08/31-09/07	12	14,100	1-852.7-RM	1.01	S/A	U	R
1	Below Franklin Ave.	851.3	GM	09/08-09/14	12	16,800	1-852.7-RM	1.01	S/A	U	R
1	Above Lake Street	850.1	GM	09/15-10/01	12	29,700	1-852.7-RM	1.01	S/A	U	R
1	Below Lake Street	849.1	GM	10/02-10/05	12	10,900	1-852.7-RM	1.01	S/A	U	R
1	Below St. Paul Daymark	848.5	GM	10/06-10/15	12	11,100	1-852.7-RM	1.01	S/A	U	R
2	Smith Ave. Bridge	840.5	GM	07/13-07/20	12	5,700	2-840.4-RM	2.16	S/A	U	R
2	SBH-St. Paul	839.5	GM	07/21-07/27	6	8,800	2-840.4-RM	2.16	S/A	U	H
2	St. Paul Barge Terminal	837.0	WAT	07/12-08/06	13	159,000	2-838.2-RM	2.15	L1/B	C	R
4	Reads Landing	762.7	WAT	05/26-06/15	12	130,300	4-762.7-LW	4.29T	A	C	I
4	Crats Island	759.0	GM	05/30-06/14	12	1,200	4-760.5-RM		S/A	U	I
						29,000	4-759.3-LW	4.16T	A	C	
4	Crats Island	759.0	WAT	06/16-06/28	12	105,300	4-759.3-LW	4.16T	A	C	I
4	Above Teepeeota Point	757.5	WAT	08/16-08/25	13	74,700	4-757.5-LW	4.13T	A	C	R
5	Mule Bend	748.8	WAT	08/07-08/15	13	35,200	5-748.0-RM	5.18T	A	C	R
5	Below West Newton	746.6	WAT	08/26-08/31	13	32,900	5-745.8-RM	5.12T	A	C	R
5	Fisher Island	745.5	WAT	06/29-07/11	13	19,900	5-744.7-LW	5.08T	A	C	R
						22,700	5-745.8-RM	5.12T	A	C	
5A	Island 58	734.2	GM	10/30-11/05	13	17,000	5A-732.0-LW		S/A	U	R
6	SBH-Winona	726.0	GM	07/02	6	500	6-726.0-LM	6.27	S/A	U	H

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	580,000		195,100			775,100
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			9,300			9,300
	NON-CHAN. MAINT.						0
	TOTAL	580,000	0	204,400	0	0	784,400
FISCAL YEAR	MISS. RIVER	671,486		185,213			856,699
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			12,582			12,582
	NON-CHAN. MAINT.						0
	TOTAL	671,486	0	197,795	0	0	869,281

1979 Beneficial Use Update	
Total Beneficial Use	334,400
Total Quantity Dredged	784,400
Beneficial Use Quantity	43%
Total Jobs With Beneficial Use	16
Total Jobs	22
Beneficial Use Jobs	73%

1980 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Above Savage Bridge	M14.5	CH	11/18-11/23	12	12,800	MN-14.4-LM		S/A	C	R
MN	Petersons Bar	M12.0	CH	11/12-11/15	11	3,800	MN-12.1-RM		S/B	C	R
SC	Kinnickinnic Bar	SC6.5	GM	04/16-05/15	13	41,000	SC-13.5-RM	SC.21	L1/A	U	E
2	Smith Ave. Bridge	840.4	GM	07/07-07/16	13	20,600	2-840.4-RM	2.16	S/A	U	R
4	SBH-Pepin	767.0	GM	08/26-08/28	6	2,000	4-766.9-LW		L1/B	U	H
4	Reads Landing(Side Ch.)	762.5	CH	08/26-10/03	6	9,000	4-762.7-LW	4.29T	A	C	NCM
4	Grand Encampment	756.8	WAT	11/28-11/30	12	10,300	4-756.5-LW	4.10T	A	C	E
4	L/D 4 Chamber & Aux Lock	752.8	GM	07/17-07/18	Si11	6,000	4-754.0-LW	4.02	S/A	U	R
				09/03-09/05							
5	Island 40 Wing Dams	752.5	GM	08/29-09/03	7	3,800	4-754.0-LW	4.02	S/A	U	NCM
5	Mule Bend (Side Ch.)	748.4	CH	10/06-10/17	6	1,600	5-748.0-RM	5.18T	A	C	NCM
5	Lower Zumbro	744.4	DUBQ	06/16-06/26	11	10,300	5-744.7-LW	5.08T	A	C	R
5A	Betsy Slough	731.3	GM	06/12-06/27	11	11,700	5A-732.0-LW		S/A	U	R
						21,600	5A-731.9-LW	5A.25	S/B	U	
						1,500	5A-731.3-LW		L1/B	U	
5A	Wilds Bend	730.5	GM	06/04-06/11	11	8,300	5A-732.0-LW		S/A	U	R
						7,600	5A-731.9-LW	5A.25	S/B	U	
5A	L/D 5A Chamber	728.5	GM	06/30	Si11	200	5A-732.0-LW		S/A	U	R
6	Blckbird Slough(Side Ch.)	727.8	GM	08/20-08/21	6	4,400	6-726.0-LM	6.27	S/A	U	NCM
6	SBH-Winona	726.0	GM	08/19	6	700	6-726.0-LM	6.27	S/A	U	H
7	Winters Landing	708.4	GM	11/03-11/06	12	8,200	7-714.1-LW	7.06	S/A	U	R
9	Ferry Slough (Side Ch.,)	672.1	GM	08/13-08/14	6	1,000	9-670.5-LW	9.55	S/A	U	NCM
9	Head of Battle Island	671.9	GM	08/14-08/18	13	5,400	9-670.5-LW	9.55	S/A	U	R
9	Lansing Upper Light	664.0	GM	07/24-08/12	12	35,000	9-662.6-RI		S/B	U	R
10	McMillan Island	618.0	GM/DU	10/20-10/31	11		10-618.8-RI	*10.04	S/B	C	R

* - In-water rehandling

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	10,300	10,300	139,800		10,600	171,000
	MINN. RIVER					16,600	16,600
	ST. CROIX RIVER			41,000			41,000
	HARBORS			2,700			2,700
	NON-CHAN. MAINT.						0
	TOTAL	10,300	10,300	183,500	0	27,200	231,300
FISCAL YEAR	MISS. RIVER		10,300	167,847		8,308	186,455
	MINN. RIVER						0
	ST. CROIX RIVER			41,000			41,000
	HARBORS			2,700			2,700
	NON-CHAN. MAINT.						0
	TOTAL	0	10,300	211,547	0	8,308	230,155

1980 Beneficial Use Update	
Total Beneficial Use	200,100
Total Quantity Dredged	231,300
Beneficial Use Quantity	87%
Total Jobs With Beneficial Use	17
Total Jobs	21
Beneficial Use Jobs	81%

1981 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
2	Pine Bend	823.5	GM	05/19-06/03	13	20,000	2-831.0-RM		L1/A	U	R
				06/18-06/25		8,000	2-824.1-LM	2.25	L2/B	B	
4	Reads Landing	763.0	GM	06/04-06/15	12/13	21,000	4-762.7-LW	4.29T	A	C	I
4	Reads Landing	762.8	WAT	07/21-07/29	13	67,500	4-762.7-LW	4.29T	A	C	I
4	Crats Island	759.0	WAT	08/13-08/20	12	52,200	4-759.3-LW	4.16T	A	C	R
5A	Betsy Slough	731.3	GM	08/06-08/12	12	13,200	5A-732.0-LW		S/A	U	R
5A	Wilds Bend	730.5	GM	08/12-08/18	12	11,600	5A-731.9-LW	5A.25	S/B	U	R
5A	L/D 5A Auxiliary Lock	728.5	GM	08/19-08/21		2,460	5A-731.9-LW	5A.25	S/B	U	R
						1,240	6-726.0-LM	6.27	S/A	U	
7	Winters Landing	708.5	GM	10/27-11/05	12	11,300	7-704.6-RM		L1/B	U	R
7	Head of Dresbach	705.0	GM	10/10-10/16	12	2,100	7-705.5-RM		L1/B	U	R
						5,100	7-706.5-RM	7.12T	A	U	
7	Above L/D 7	703.5	GM	10/16-10/27	13	19,100	7-706.5-RM	7.12T	A	U	R
8	Brownsville	688.8	WAT	08/20-08/29	13	59,100	8-688.7-RM	8.30	S/A	C	R
8	Head of Raft Channel	687.8	WAT	08/30-09/02	11	10,500	8-688.7-RM	8.30	S/A	C	R
9	Indian Camp Light	665.5	GM	08/24-09/01	13	10,400	9-670.5-LW	9.55	L1/A	U	R
9	Lansing	664.5	GM	07/20-08/05	12	19,500	9-662.6-RI		L1/B	U	R
10	Jackson Island	664.5	GM	09/3-8&10/7-9	13	7,500	10-647.1-LW	10.17	S/B	U	R
10	McMillan Island	618.0	WAT	10/29-11/06	11	45,400	10-618.8-RI	*10.04	L1/B	C	R

* - In-water rehandling

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	234,700		152,500			387,200
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	234,700	0	152,500	0	0	387,200
FISCAL YEAR	MISS. RIVER	199,600		125,100		2,292	326,992
	MINN. RIVER					16,600	16,600
	ST. CROIX RIVER						0
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	199,600	0	125,100	0	18,892	343,592

1981 Beneficial Use Update	
Total Beneficial Use	222,300
Total Quantity Dredged	387,200
Beneficial Use Quantity	57%
Total Jobs With Beneficial Use	11
Total Jobs	16
Beneficial Use Jobs	69%

1982 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Below Petersons Bar	M11.2	CH	Began 10/18	11	1,248	MN-12.1-RM		L1/B	C	R
MN	Petersons Bar	M12.0	CH		11	18,516	MN-12.1-RM		L1/B	C	R
MN	Above Savage R.R. Bridge	M14.5	CH	Complete11/18	12	43,500	MN-14.8-RM		S/B	C	R
USAF	Mpls. Turning Basin	857.4	CM	09/27-09/30	12	48,176	U-857.0-RM		S/A	U	R
				10/20-11/10							
USAF	Abv. & Blw. Lowry Ave. Br.	856.5	CM	08/11-09/17	11	76,631	U-857.0-RM		S/A	U	R
USAF	Abv. & Blw. NPRR Br.	855.5	CM	09/30-10/19	12	20,565	U-857.0-RM		S/A	U	R
1	Lower Appch. LSAF	853.3	CM	08/03-08/05	13	1,493	1-852.7-RM	1.01	S/A	U	R
1	Abv. Lake St. Br.	850.0	WAT	07/29-08/03	11/12	57,605	1-849.5-RM	1.03T	A	U	E
2	Smith Ave. Br.	840.4	WAT	08/04-08/05	13	14,717	2-840.4-RM	2.16	S/A	C	R
2	SBH-St. Paul	840.0	CM	11/15-11/26	6	8,413	2-840.4-RM	2.16	S/A	U	H
4	SBH-Red Wing	791.0	CH	07/05-11/02	6	28,000	4-791.5-RM	4.54	L1/B	C	H
4	Reads Landing	763.5	WAT	05/25-06/02	13	149,000	4-762.7-LW	4.29T	A	C	I
				06/15-07/01		61,055	4-761.1-RM	*4.25	L1/B	C	
4	Crats Island	759.3	WAT	06/02-06/15	13	139,412	4-759.3-LW	4.16T	A	C	R
5	Mule Bend Side Channel	749.3	CM	11/15-11/19	6	4,573	5-749.3-RM		A	U	R
5	Mule Bend	748.9	WAT	07/09-07/13	11	24,519	5-748.0-RM	5.18T	A	C	R
5	West Newton	748.1	CM	10/04-10/21	13	21,900	5-748.0-RM	5.18T	A	C	R
5	Fisher Island	745.1	WAT	07/02-07/08	11	28,147	5-745.8-RM	5.12T	A	C	R
5A	Island 58	734.2	CM	09/29-09/30	13	5,751	5A-731.9-LW	5A.25	S/B	U	R
				10/22-10/27							
5A	Head of Betsy Slough	731.3	CM	06/03-06/15	11/12	20,194	5A-731.9-LW	5A.25	S/B	U	R
6	SBH-Winona	726.3	CM	06/24-06/25	6	250	7-714.1-LW	7.06	S/A	U	H
6	Winona Ind. Harbor	726.3	CM	08/31-09/02	13	1,909	7-714.1-LW	7.06	S/A	U	H
7	Behind L/D 6 Guidewall	714.1	CM	08/30-08/31	6	1,363	7-714.1-LW	7.06	S/A	U	R
7	Richmond Island	712.0	CM	08/18-08/30	12	5,619	7-714.1-LW	7.06	S/A	U	R
7	Winters Landing	708.4	CM	06/29-08/17	11	52,796	7-714.1-LW	7.06	S/A	U	R
8	Abv. LaCrosse R.R. Br.	700.1	CM	09/07-09/16	13	17,366	8-695.7-LW	8.06	S/A	U	R
8	Brownsville	688.8	WAT	07/15-07/17	12	16,047	8-688.7-RM	8.30	S/A	C	R
8	Head of Raft Channel	688.0	WAT	07/19-07/20	12	12,593	8-688.7-RM	8.30	S/A	C	R
9	Lower Appch. L/D 8	678.9	CM	09/20-09/28	13	5,638	9-677.2-LW	9.15	S/B	U	R
9	Lansing Upper Light	664.0	WAT	08/22-08/24	13	36,833	9-664.0-RM		L2/A	B	R
10	McMillan Island	618.0	WAT	08/11-08/20	12	68,688	10-618.8-RM	10.04	L1/B	C	R

* - In-water rehandling

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	608,616			282,065		890,681
	MINN. RIVER					63,264	63,264
	ST. CROIX RIVER						0
	HARBORS				10,572	28,000	38,572
	NON-CHAN. MAINT.						0
	TOTAL	608,616	0	0	292,637	91,264	992,517
FISCAL YEAR	MISS. RIVER	654,016		40,100	190,978		885,094
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS				2,159	19,600	21,759
	NON-CHAN. MAINT.						0
	TOTAL	654,016	0	40,100	193,137	19,600	906,853

1982 Beneficial Use Update	
Total Beneficial Use	567,361
Total Quantity Dredged	992,517
Beneficial Use Quantity	57%
Total Jobs With Beneficial Use	23
Total Jobs	30
Beneficial Use Jobs	77%

1983 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Above 35W Bridge	M10.1	CM	Began 10/25	12	36,612	MN-11.2-RM		L1/B	U	R
MN	Above Peterson's Bar	M12.0	CM		12	29,516	MN-11.2-RM		L1/B	U	R
MN	Blw. Cargill Slip	M12.7	CM		12	11,808	MN-11.2-RM		L1/B	U	R
MN	Abv. Savage Bridge	M14.5	CM		12	10,767	MN-14.8-RM		S/B	U	R
MN	Continental Grain	M14.6	CM	Complete12/16	12	28,748	MN-14.8-RM		S/B	U	R
1	Lower Appch. LSAF	852.2	GM	11/10	13	500	1-852.7-RM	1.01	S/A	U	R
1	Below Lake Street	849.0	GM	11/01-11/10	12	12,802	1-852.7-RM	1.01	S/A	U	R
2	Smith Ave. Bridge	840.5	GM	11/10-11/17	13	7,808	2-840.4-RM	2.16	S/A	U	R
4	Reads Landing	762.3	WAT	06/21-06/29	12	14,765	4-762.6-RM		L1/B	U	I
						43,434	4-762.7-LW	4.29T	A	C	
4	Crats Island	759.0	WAT	07/01-07/08	13	101,541	4-759.3-LW	4.16T	A	C	R
4	Teepeeota Point	757.4	GM	08/01-09/03	13	56,081	4-754.0-LW	4.02	L1/A	U	E
4	Grand Encampment	756.0	GM	09/06-09/09	12	7,597	4-754.0-LW	4.02	L1/A	U	E
4	Grand Encampment	756.0	GM	10/11-10/28	12	42,130	4-754.0-LW	4.02	L1/A	U	R
4	Access Channel	753.7	GM	07/27-07/29	7	4,662	4-754.0-LW	4.02	L1/A	U	E
5	Blw. West Newton	746.6	WAT	06/07-06/11	12	29,477	5-745.8-RM	5.12T	A	C	E
				06/16-06/17							
5	Fisher Island	745.0	WAT	06/11-06/15	12	47,173	5-744.7-LW	5.08T	A	C	E
5	Lower Zumbro	744.4	WAT	06/17-06/20	11	37,204	5-744.7-LW	5.08T	A	C	E
5A	Betsy Slough	731.2	WAT	07/12-07/19	12	57,458	5A-730.5-LW	5A.08T	A	C	R
5A	Wilds Bend	730.5	WAT	07/20-07/22	12	36,922	5A-730.5-LW	5A.08T	A	C	R
6	Lower Appch. L/D 5A	728.5	GM	07/30	13	500	6-726.0-LM	6.27	S/A	U	R
6	SBH-Winona	726.1	GM	09/01-09/05	6	6,255	6-726.0-LM	6.27	S/A	U	H
8	Brownsville	688.9	WAT	11/09-11/14	12	17,859	8-688.7-RM	8.30	S/A	C	R
8	Head of Raft Channel	688.0	WAT	11/07-11/09	12	22,014	8-688.7-RM	8.30	S/A	C	R
9	Indian Camp Light	665.5	GM	09/11-09/26	13	30,841	9-662.2-RI	*9.28	L1/A	C	E
	Warroad Harbor		CH	06/02-07/15	8	43,000	Open Water		L3/A	O	R

* - In-water rehandling

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	407,847		162,921			570,768
	MINN. RIVER				117,451		117,451
	ST. CROIX RIVER						0
	HARBORS			6,255		43,000	49,255
	NON-CHAN. MAINT.						0
	TOTAL	407,847	0	169,176	117,451	43,000	737,474
FISCAL YEAR	MISS. RIVER	367,974		99,681	91,087		558,742
	MINN. RIVER					63,264	63,264
	ST. CROIX RIVER						0
	HARBORS			6,255	8,413	51,400	66,068
	NON-CHAN. MAINT.						0
	TOTAL	367,974	0	105,936	99,500	114,664	688,074

1983 Beneficial Use Update	
Total Beneficial Use	384,265
Total Quantity Dredged	737,474
Beneficial Use Quantity	52%
Total Jobs With Beneficial Use	19
Total Jobs	25
Beneficial Use Jobs	76%

1984 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
USAF	Turning Basin	857.3	CM	08/16-08/17	12	2,794	U-856.6-RM		S/A	U	R
USAF	Abv. Lowry Ave.	856.9	CM	08/02-08/15	12	36,667	U-856.6-RM		S/A	U	R
USAF	Broadway Ave.	855.5	CM	09/04-09/26	12	23,868	U-856.6-RM		S/A	U	R
2	Smith Ave.	840.3	CM	08/18-08/29	13	15,676	2-840.4-RM	2.16	S/A	U	E
						6,118	2-841.3-LM	2.37	L1/B	U	
2	SBH-St. Paul	839.6	GM	10-11	6	12,300	2-840.4-RM	2.16	S/A	U	H
						13,700	2-841.3-LM	2.37	L1/B	U	
2	St. Paul Barge Terminal	837.3	WAT	07/09-07/20	14	210,938	2-836.8-RM	2.14	L1/B	C	R
				08/13-08/14							
3	SBH-Hastings	813.2	GM	11/26-12/10	6	5,500	3-813.2-RM	3.46	S/B	U	H
4	Chippewa Delta	763.8	CH	10/05-11/20	9	301,000	4-761.0-RM	4.24	L1/S/A	U	R
4	Reads Landings	762.7	CH	05/27	13	69,000	4-761.0-RM	4.24	L1/S/A	U	R
4	Crats Island	759.1	WAT	07/24-08/01	12	90,752	4-759.3-LW	4.16T	A	C	E
4	Teepeeota Point	757.6	WAT	08/05-08/09	12	61,428	4-757.5-LW	4.13T	A	C	I
4	Grand Encampment	756.0	WAT	08/01-08/05	11	37,863	4-756.5-LW	4.10T	A	C	E
5	West Newton	746.5	GM	09/04-09/18	12	11,300	5-745.8-RM	5.12T	A	C	R
5	Fisher Island	745.4	WAT	08/20-08/27	12	13,084	5-745.8-RM	5.12T	A	C	E
						60,405	5-744.7-LW	5.08T	A	C	
5A	Betsy Slough	731.2	WAT	06/18-06/21	12	18,515	5A-730.5-LW	5A.08T	A	C	R
			GM	08/23-08/30	12	3,693	5A-731.9-LW	5A.25	S/B	U	
5A	Wilds Bend	730.5	GM	08/16-08/22	12	3,953	5A-731.9-LW	5A.25	S/B	U	R
7	Winters Landing	708.3	GM	03/24-03/30	10.5	14,935	7-706.5-RM	7.12T	A	U	E
8	Blw. LaCrosse R.R. Br.	699.2	CM	11/08-11/26	13	5,500	8-700.0-RM	8.28	L1/B	U	R
						3,000	8-699.7-RM		L1/B	U	
						17,976	8-699.3-RM		L1/B	U	
8	Brownsville	688.0	WAT	08/17-08/19	11	15,167	8-688.7-RM	8.30	S/L1/B	C	R
8	Upper Auxiliary L/D 9	647.9	GM	05/21-05/25		1,500	10-644.5-RI	10.22T	L3/A	U	R
9	Indian Camp Light	665.7	WAT	08/29-08/30	11	13,939	9-665.2-RI		L2/A	B	R
9	Lansing Upper Light	664.0	CM	10/09	12	12,000	9-670.5-LW	9.55	S/A	U	R
						12,257	9-663.5-LW	9.50T	S/A	U	
						12,042	9-663.0-RI	9.03	S/A	U	
		664.4	WAT	11/05		77,154	9-664.3-RI	9.17T	A	C	

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	599,245		35,381	147,898	370,000	1,152,524
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			31,500			31,500
	NON-CHAN. MAINT.						0
	TOTAL	599,245	0	66,881	147,898	370,000	1,184,024
FISCAL YEAR	MISS. RIVER	561,964		98,621	85,123	69,000	814,708
	MINN. RIVER				117,451		117,451
	ST. CROIX RIVER						0
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	561,964	0	98,621	202,574	69,000	932,159

1984 Beneficial Use Update	
Total Beneficial Use	798,588
Total Quantity Dredged	1,184,024
Beneficial Use Quantity	67%
Total Jobs With Beneficial Use	16
Total Jobs	22
Beneficial Use Jobs	73%

1985 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
SC	Kinnikinnic Bar	SC6.5	WAT	06/03-06/10	13	60,581	SC-6.5-LW	SC.12	L2/A	B	R
USAF	Abv. Lowry Ave. Br.	856.6	CM	11/01-11/21	12	17,772	U-856.6-RM		S/A	U	R
1	Abv. Lake St. Br.	850.0	CM	09/22-11/01	12	29,079	1-852.7-RM	1.01	S/A	U	R
2	St. Paul Barge Terminal	837.3	WAT	05/08-05/31	14/13	225,793	2-836.8-RM	2.14	L1/B	C	R
4	Chippewa Delta	763.8	WAT	07/09-07/29	9	170,544	4-761.0-RM	4.24	L1/S/A	C	R
4	Reads Landing	762.5	WAT	07/01-07/09	13	56,334	4-761.0-Rm	4.24	L1/S/A	C	R
4	Crats Island	759.2	WAT	04/30-05/04	13	38,589	4-759.3-LW	4.16T	A	C	R
4	Crats Island	759.0	CM	07/05-07/18	13	13,631	4-759.7-RM	4.20	L1/B	U	R
4	Crats Island	759.1	WAT	08/02-08/06	12	29,199	4-759.7-RM	4.20	L1/B	C	R
4	Grand Encampment	756.5	WAT	07/30-08/01	11	20,026	4-756.5-LW	4.10T	A	C	R
4	Aux. Gate Bays - L/D 4	752.9	GM	04/07-05/03	Si11	10,000	4-754.0-LW	4.02	L1/A	U	R
5	Aux. Gate Bays - L/D 5	738.1	GM	06/05-06/06	Si11	1,000	5A-735.8-RM	5A.23	L1/B	U	R
						957	5A-734.5-LW	5A.14T	L3/A	U	
5A	Betsy Slough	731.1	WAT	06/17-06/19	12	23,249	5A-730.5-LW	5A.08T	L1/A	C	R
5A	Wilds Bend	730.4	WAT	06/12-06/15	12	43,040	5A-730.5-LW	5A.08T	L1/A	C	R
5A	Lock Chamber - L/D 5A	728.2	GM	05/08	Si11	411	6-726.0-LM	6.27	S/A	U	R
6	SBH-Winona	726.2	GM	05/10	6	250	6-726.0-LM	6.27	S/A	U	H
6	Homer	720.1	GM	06/10-07/18	12	24,837	6-723.6-RM		S/B	U	R
						4,526	6-726.2-RM		L1/B	U	
7	Winter's Landing	708.5	CM	05/16-07/03	12	45,736	7-714.1-LW	7.06	S/A	U	R
						2,250	7-704.6-RM		L1/B	U	
8	Abv. Brownsville	690.3	WAT	06/25-06/27	12	39,730	8-690.4-LW	8.17T	A	C	R
8	Brownsville	688.9	WAT	06/20-06/24	12	25,710	8-688.7-RM	8.30	S/A	C	R
8	Head of Raft Channel	688.0	CM	07/22-08/15	12	25,128	8-688.7-RM	8.30	S/A	C	R
9	Indian Camp Light	665.5	CM	08/15-09/21	12	7,250	9-670.5-LW	9.55	S/L1/A	U	R
						20,259	9-663.5-LW	9.50T	S/A	U	
10	McMillan Island	618.5	WAT	08/09-08/21	12	67,095	10-618.8-RI	*10.04	L1/B	C	R

* - In-water rehandling

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	739,309		41,731	161,105		942,145
	MINN. RIVER						0
	ST. CROIX RIVER	60,581					60,581
	HARBORS			250			250
	NON-CHAN. MAINT.						0
	TOTAL	799,890	0	41,981	161,105	0	1,002,976
FISCAL YEAR	MISS. RIVER	816,463		41,731	183,412	301,000	1,342,606
	MINN. RIVER						0
	ST. CROIX RIVER	60,581					60,581
	HARBORS			31,750			31,750
	NON-CHAN. MAINT.						0
	TOTAL	877,044	0	73,481	183,412	301,000	1,434,937

1985 Beneficial Use Update	
Total Beneficial Use	904,631
Total Quantity Dredged	1,002,976
Beneficial Use Quantity	90%
Total Jobs With Beneficial Use	20
Total Jobs	23
Beneficial Use Jobs	87%

1986 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
USAF	Abv. Lowry Ave. Br.	856.6	CM	07/14-07/26	11	37,500	U-856.6-RM		S/A	U	R
1	LSAF Approach	848.1	CM	10/30	Sill	800	1-852.7-RM	1.01	S/A	U	R
2	Pine Bend	823.0	CM	06/21-07/13	12	19,519	2-822.8-LM		L2/A	B	E
						17,950	2-823.3-LM		L2/A	B	
3	Diamond Bluff	799.0	WAT	11/07-11/10	11	34,771	3-799.9-LW	3.10	L1/B	C	E
3	L/D 3 Aux. Gates	797.0	GM	06/19-06/25	Si11	4,800	3-799.2-RM	3.07T	L3/A	U	R
4	Crats Island	758.8	WAT	06/11-06/16	13	183,322	4-759.3-LW	4.16T	A	C	E
				07/16-07/19							
4	Crats Island	759.2	WAT	11/03-11/05	12	26,195	4-759.3-LW	4.16T	A	C	R
4	Teepeeota Point	757.5	WAT	06/11-06/16	12	54,827	4-757.5-LW	4.13T	A	C	R
				07/20-07/22							
4	Teepeeota Point	759.7	GM	11/09	11	275	4-757.6-LW		A	O	E
4	Grand Encampment	756.5	WAT	08/05-08/06	12	19,000	4-756.5-LW	4.10	A	C	R
5	Below West Newton	746.5	WAT	07/23-07/26	12	31,606	5-745.8-RM	5.12T	A	C	R
5	Fisher Island	745.0	WAT	07/26-08/04	12	50,926	5-745.8-RM	5.12T	A	C	R
						92,002	5-744.7-LW	5.08T	A	C	
5	Lower Zumbro	744.0	WAT	07/19-07/29	11	97,793	5-744.7-LW	5.08T	A	C	R
5A	Betsy Slough	731.0	WAT	08/08-08/10	12	39,426	5A-730.5-LW	5A.08T	L1/A	C	R
6	L/D 5A Gate Bay	728.7	GM	06/09	Si11	150	5A-728.7-RM		L3/A	U	R
6	SBH - Winona	726.3	GM	06/04-06/06	6	4,050	6-726.0-LM	6.27	S/A	U	H
6	Homer	720.2	WAT	11/13-11/14	11	18,845	6-720.5-RM	6.11	B	C	E
7	Winter's Landing	808.4	CM	07/29-08/23	12	59,881	7-714.1-LW	7.06	S/A	U	R
7	Dakota	707.0	WAT	07/04-07/05	12	18,056	7-706.5-RM	7.12T	A	C	R
7	Dresbach	705.0	WAT	06/06-06/09	12	29,551	7-706.5-RM	7.12T	A	C	I
				07/01-07/03							
8	Blw. LaCrosse R.R. Br.	699.0	CM	08/23-09/16	13	10,000	8-700.1-RM		L1/B	U	R
						20,000	8-700.1-RM		L1/A	U	
						11,000	8-697.7-LW		L1/B	U	
						10,915	8-695.7-LW	8.06	S/A	U	
8	Abv. Brownsville	690.3	WAT	07/06-07/09	11	26,727	8-690.4-LW	8.17T	A	C	R
8	Abv. Brownsville	690.2	DUBQ	09/20-09/23	11	8,145	8-690.4-LW	8.17T	A	C	R
8	Brownsville	689.0	WAT	07/10-07/14	11	44,744	8-688.7-RM	8.30	S/A	C	R
8	McMillan Island	619.0	DUBQ	09/09-09/23	11	6,895	10-619.3-RI		L2/A	B	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	767,791	15,040	5,225	187,565		975,621
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			4,050			4,050
	NON-CHAN. MAINT.						
	TOTAL	767,791	15,040	9,275	187,565	0	979,671
FISCAL YEAR	MISS. RIVER	687,980	15,040	4,950	227,233		935,621
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			4,050			4,050
	NON-CHAN. MAINT.						0
	TOTAL	687,980	15,040	9,000	227,233	0	939,253

1986 Beneficial Use Update	
Total Beneficial Use	322,401
Total Quantity Dredged	979,671
Beneficial Use Quantity	33%
Total Jobs With Beneficial Use	12
Total Jobs	25
Beneficial Use Jobs	48%

1987 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Abv. Peterson Bar	M-12.1	CM	03/02-03/11	11	9,564	MN-12.1-RM		S/B	U	E
MN	Abv. Peterson Bar	M-12.1	DUBQ	05/26-06/01	12	8,637	MN-12.1-RM		S/B	C	R
MN	4 Mile Cut-Off	M-4.0	GM	08/18-09/04	12	4,389	2-840.4-RM	2.16	S/A	U	R
USAF	Mpls. Turning Basin	857.3	CM	07/21-07/30	12	21,601	U-856.6-RM		S/A	U	R
USAF	Abv. Lowry Ave. Br.	856.5	DUBQ	04/01-04/29	12	85,560	U-856.6-RM		S/A	C	E
USAF	Broadway Ave. Br.	855.6	CM	07/10-07/20	12	27,589	U-856.6-RM		S/A	U	R
1	Blw. Franklin Ave.	852.8	CM	07/01-07/08	11	10,894	1-853.2-LM	1.01A	S/A	U	R
1	Abv. Lake St.	850.5	GM	03/25-04/02	12	11,550	1-853.2-LM	1.01A	S/A	U	R
1	Abv. Lake St.	850.5	CM	06/22-06/29	11	12,213	1-853.2-LM	1.01A	S/A	U	E
1	Blw. Lake St.	849.9	CM	05/21-06/01	12	41,342	1-853.2-LM	1.01A	S/A	U	R
1	St. Paul Daymark	848.5	CM	04/30-05/21	12	38,884	1-853.2-LM	1.01A	S/A	U	R
1	St. Paul Daymark	848.0	CM	06/29-06/30	12	4,527	1-853.2-LM	1.01A	S/A	U	R
2	SBH - St. Paul	839.6	GM	08/04-08/17	6	4,409	2-840.4-RM	2.16	S/A	U	H
2	St. Paul Barge Terminal	837.5	WAT	07/07-07/19	13	32,199	2-836.8-RM	2.14	L1/B	C	R
2	Grey Cloud Slough	827.3	CM	06/16-06/19	11	10,698	2-827.1-RM		L2/A	B	E
3	Coulters Island	801.6	CM	08/04-08/06	11	3,174	3-799.9-LW	3.10	L1/B	U	R
4	Teepeeota Point	757.5	DUBQ	06/05-06/16	12	20,741	4-757.5-LW	4.13T	A	C	R
4	Grand Encampment	756.5	CM	08/07-08/23	12	22,804	4-754.0-LW	4.02	S/A	U	R
5	Lower Zumbro	744.5	WAT	06/26-06/30	12	24,622	5-744.7-LW	5.08T	L3/A	C	R
6	SBH - Winona	726.3	CM	03/23-03/24	6	760	6-726.0-LM	6.27	S/A	U	H
7	Dresbach Island	703.0	DUBQ	03/20-03/21	11	2,409	7-703.0-LW		L2/A	B	I
8	Brownsville	689.0	WAT	06/23-06/25	12	18,153	8-688.7-RM	8.30	S/A	C	R
9	Indian Camp Light	665.7	WAT	05/02-05/03	12	21,101	9-665.7-RI		L2/A	B	E

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	96,075	108,710	11,550	193,726		410,061
	MINN. RIVER		8,637	4,389	9,564		22,590
	ST. CROIX RIVER						0
	HARBORS			4,409	760		5,169
	NON-CHAN. MAINT.						0
	TOTAL	96,075	117,347	20,348	204,050	0	437,820
FISCAL YEAR	MISS. RIVER	175,886	108,710	11,825	194,526		490,947
	MINN. RIVER		8,637	4,389	9,564		22,590
	ST. CROIX RIVER						0
	HARBORS			4,409	760		5,169
	NON-CHAN. MAINT.						0
	TOTAL	175,886	117,347	20,623	204,850	0	518,706

1987 Beneficial Use Update	
Total Beneficial Use	417,079
Total Quantity Dredged	437,820
Beneficial Use Quantity	95%
Total Jobs With Beneficial Use	22
Total Jobs	23
Beneficial Use Jobs	96%

1988 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Peterson's Bar	M-11.9-M-12.2	CM	10/13-10/19	12	3,870	MN-12.1-RM		S/B	U	R
USAF	Turning Basin	857.3-857.6	CM	09/27-10-12	12	33,655	U-856.6-RM		S/A	U	R
USAF	Abv. Lowry Ave. Br.	855.4-857.1	CM	08/24-08/30	12	2,164	U-856.6-RM		S/A	U	R
USAF	Abv. & Blw. Broadway Br.	855.4-855.6	CM	09/23-09/27	12	4,377	U-856.6-RM		S/A	U	R
USAF	Abv. & Blw. Plymouth Br.	854.8-853.5	CM	08/31-09/22	12	31,860	U-856.6-RM		S/A	U	R
1	Lwr. Approach LSAF Lock	853.4-853.5	CM	08/23-08/23	12	400	1-853.2-RM	1.01A	S/A	U	R
1	Abv. Franklin Ave. Br.	851.5-851.8	CM	08/04-08/23	12	12,415	1-853.2-RM	1.01A	S/A	U	R
1	Abv. Lake St. Bridge	849.9-851.0	CM	07/28-08/04	12	3,992	1-853.2-RM	1.01A	S/A	U	R
1	St. Paul Daymark	848.7-848.8	CM	07/14-07/25	12	5,037	1-853.2-RM	1.01A	S/A	U	R
2	St. Paul Barge Terminal	837.2-837.4	WAT	07/01-07/16	13	138,655	2-836.8-RM	2.14	L1/B	C	R
2	Pine Bend Foot Light	834.3-824.6	GM	04/01-04/12	12	22,000	2-823.8-RM		S/B	U	E
4	Cannon River	792.7-793.2	CM	06/22-07/12	11	12,791	4-788.5-RM	4.47	L1/A	U	I
4	Chippewa River Delta	763.3-763.5	WAT	05/27-06/28	9	382,816	4-762.7-LW	4.29T	L1/S/A	C	R
5	Aux. Lock Chamber L/D 4	752.6-752.7	GM	11/07-11/10	8	2,160	4-754.0-LW	4.02	S/A	U	R
5	Below West Newton	746.4-746.6	WAT	05/23-05/24	12	15,055	5-745.8-RM	5.12T	L3/A	C	R
5	Fisher Island	745.1-745.4	WAT	05/25-05/26	12	22,755	5-745.8-RM	5.12T	L3/A	C	R
5A	Betsy Slough	731.1-731.4	CM	06/02-06/16	11	7,853	5A-731.9-LW	5A.25	S/A	U	R
7	Lower Approach L/D 6	714.1-714.2	CM	11/21-11/22	13	500	7-714.1-LW	7.06	S/A	U	R
8	Above Brownsville	690.1-690.4	CM	10/21-11/04	13	23,313	8-695.7-LW	8.06	S/A	U	R
9	Lower Approach L/D 8	678.8-679.1	CM	11/07-11/16	13	5,322	9-670.5-LW	9.55	L1/A	U	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	559,281		24,160	143,679		727,120
	MINN. RIVER				3,870		3,870
	ST. CROIX RIVER						0
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	559,281	0	24,160	147,549	0	730,990
FISCAL YEAR	MISS. RIVER	559,281		22,000	89,303		670,584
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	559,281	0	22,000	89,303	0	670,584

1988 Beneficial Use Update	
Total Beneficial Use	730,990
Total Quantity Dredged	730,990
Beneficial Use Quantity	100%
Total Jobs With Beneficial Use	20
Total Jobs	20
Beneficial Use Jobs	100%

1989 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Peterson's Bar	M12.0-M12.4	DUBQ	08/07-08/10	12	12,478	MN-12.1-RM		S/L1/B	C	R
SC	Kinnikinnic Bar	SC6.4-SC6.6	GM	04/26-04/30	11	10,541	SC-6.5-LW	SC.12	L1/A	U	E
USAF	Abv. Lowry Ave. Br.	856.4-867.2	DUBQ	08/14-08/22	12	16,167	U-856.6-RM		S/A	C	I
2	Pine Bend Foot Light	822.7-823.7	CM	08/02-08/17	12	15,253	2-823.8-RM		S/B	U	R
2	Boulanger Bend	820.8-821.4	WAT	09/19-09/30	12	88,294	2-821.5-LM		A	C	R
3	Lower Approach L/D 2	814.8-815.1	CM	09/22-10/02	13	10,503	2-815.1-RM		S/A	U	I
3	Smith Bar Upper Light	805.4-805.6	CM	10/02-10/05	11	3,268	2-815.1-RM		S/A	U	R
3	Coulter's Island	801.6-801.9	CM	07/23-08/02	12	11,120	3-799.9-LW	3.10	L1/B	U	R
3	Diamond Bluff	799.6-799.9	CM	07/13-07/23	12	12,966	3-799.9-LW	3.10	L1/B	U	R
5	Mule Bend	747.5-748.2	WAT	07/23-07/27	13	40,306	5-748.0-RM	5.18T	A	C	R
5A	Betsy Slough	731.2-731.4	CM	06/14-06/23	13	21,993	5A-731.9-LW	5A.25	S/A	U	R
5A	Wilds Bend	730.3-730.6	WAT	07/20-07/28	12	26,889	5A-730.5-LW	5A.08T	L1/A	C	R
						51,034	5A-729.4-RM		L1/A	B	
6	Blw. Winona R.R. Br.	723.4-723.6	CM	06/30-07/12	13	14,542	6-726.3-RM		S/A	U	R
7	Winters Ldg. New Channel	708.0-709.0	CM	Early Summer	11/12	10,000	7-706.5-RM	7.12T	A	U	R
				Early Summer		21,460	7-714.1-LW	7.06	S/A	U	
				Early Fall		15,708	7-713.1-RM	7.05	S/B	U	R
7	Head of Dresbach Island	705.0-705.5	WAT	07/17-07/20	12	19,233	7-705.0-LW	7.13T	L2/A	B	R
7	Upper Approach L/D 7	703.5-703.7	CM	08/18-09/08	13	7,193	7-714.1-LW	7.06	S/A	U	R
8	LaCrosse, WI	698.6-698.7	CM	06/26-06/29	13	8,113	8-695.7-LW	8.06	S/A	U	R
8	Head of Raft Channel	687.7-688.1	WAT	06/28-07/11	14	64,864	8-687.0-RM		L3/A	O	R
8	Blw. Hd. of Raft Channel	687.2-687.6	WAT	07/11-07/14	13	34,725	8-687.0-RM		L3/A	O	R
9	Island 126	677.4-677.9	CM	09/11-09/20	12	8,044	9-670.5-LW	9.55	L1/A	U	R
9	Indian Camp Light	665.6-665.7	CM	06/06-06/07	12	4,974	9-663.5-LW	9.50T	S/A	U	R
9	Lansing Upper Light	664.4-664.7	CM	05/22-06/07	12	18,921	9-663.5-LW	9.50T	S/A	U	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	325,345	16,167		184,058		525,570
	MINN. RIVER		12,478				12,478
	ST. CROIX RIVER			10,541			10,541
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	325,345	28,645	10,541	184,058	0	548,589
FISCAL YEAR	MISS. RIVER	325,345	16,167	2,160	233,256		576,928
	MINN. RIVER		12,478		3,870		16,348
	ST. CROIX RIVER			10,541			10,541
	HARBORS						0
	NON-CHAN. MAINT.						0
	TOTAL	325,345	28,645	12,701	237,126	0	603,817

1989 Beneficial Use Update	
Total Beneficial Use	409,989
Total Quantity Dredged	548,589
Beneficial Use Quantity	75%
Total Jobs With Beneficial Use	21
Total Jobs	23
Beneficial Use Jobs	91%

1990 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
1	L/D #1 Chamber	847.6	**CM	09/22	Sill	40	2-836.2-RM		S/B	U	E
2	SBH - St. Paul	839.6	CM	07/23-07/25	6	2,678	2-840.4-RM	2.16	S/A	U	R
2	Grey Cloud Slough	827.6-828.0	CM	07/09-07/20	12	20,120	2-821.5-LM		A	U	R
4	Head of Lake Pepin	785.2-785.4	CM	06/11-06/21	12	11,532	4-788.5-RM	4.47	L1/A	U	R
4	Chippewa River Delta	736.6	WAT	07/17-08/10	9	308,801	4-762.7-LW	4.29T	L1/S/A	C	R
4	Beef Slough	753.9-754.3	CM	05/30-06/08	12	16,970	4-754.0-LW	4.02	S/A	U	R
5	Blw. West Newton	746.4-746.6	CM	10/03-10/10	12	7,200	5-744.7-LW	5.08T	L3/A	C	R
5	Fisher Island	745.6-745.8	WAT	08/14-08/15	12	7,934	5-744.7-LW	5.08T	L3/A	C	R
5	Sommerfield Island	742.8-743.0	CM	10/11-10/15	12	3,208	5-744.7-LW	5.08T	L3/A	C	R
5A	Head of Betsy Slough	731.1-731.2	CM	09/21-10/02	12	13,835	5A-731.9-LW	5A.25	S/A	U	R
7	Lower Appch. L/D 6	713.6-714.0	CM	08/25-09/05	13	15,305	7-713.1-RM	7.05	S/B	U	R
7	Dakota	705.7-707.3	CM	07/27-08/13	11	27,986	7-713.1-RM	7.05	S/B	U	R
7	Lower Dresbach Island	703.4-703.6	CM	08/14-08/24	12	19,816	7-713.1-RM	7.05	S/B	U	R
8	Above Brownsville	690.2-690.5	WAT	08/21-08/23	13	24,888	8-690.4-LW	8.17T	A	C	R
8	Brownsville	688.8-689.1	CM	09/06-09/20	12	28,937	8-688.2-RM		L1/A	U	R
9	Lansing Upper Light	663.8-664.7	WAT	08/24-09/01	12	32,719	9-664.3-RI	9.17T	L1/A	C	R

** - This dredging was completed under separate contract and the contractor was responsible for disposal of the material.

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	374,342			164,949		539,291
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS						0
	NON-CHAN. MAINT.				2,678		2,678
	TOTAL	374,342	0	0	167,627	0	541,969
FISCAL YEAR	MISS. RIVER	374,342			156,252		530,594
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS						0
	NON-CHAN. MAINT.				2,678		2,678
	TOTAL	374,342	0	0	158,930	0	533,272

1990 Beneficial Use Update	
Total Beneficial Use	496,961
Total Quantity Dredged	541,969
Beneficial Use Quantity	92%
Total Jobs With Beneficial Use	14
Total Jobs	16
Beneficial Use Jobs	88%

1991 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Peterson's Bar	11.7-12.2	CM	09/12-09/13	12	3,515	MN-12.1-RM		S/B	U	R
USAF	Abv. Lowry Ave. Br.	857.1-857.3	DUBQ	09/25-10/03	12	7,287	U-856.6-RM		S/A	C	R
USAF	Abv. Lowry Ave. Br.	856.5-857.1	DUBQ	08/26-09/25	12	42,898	U-856.6-RM		S/A	C	R
1	Abv. Franklin Ave. Br.	851.8-851.9	CM	09/05-09/11	13	8,295	1-853.2-LM	1.01A	S/A	U	R
1	Abv. Lake Street Br.	850.1-850.4	CM	08/28-09/05	12	7,909	1-853.2-LM	1.01A	S/A	U	R
2	SBH - St. Paul	839.6	GM	10/23-10/29	6	1,250	2-840.4-RM	2.16	S/A	U	H
4	Chippewa River Delta	763.3-763.6	WAT	07/26-08/16	9	269,326	4-762.7-LW	4.29T	L1/S/A	C	R
4	Crats Island	758.9-759.3	WAT	07/11-07/16	12	41,000	4-759.3-LW	4.16T	L1/B	C	I
4	Teepeeota Point	757.2-757.9	WAT	07/06-07/11	12	48,000	4-757.5-LW	4.13T	A	C	I
4	Grand Encampment	755.8-756.8	WAT	07/17-07/26	12	66,000	4-756.5-LW	4.10T	A	C	I
4	Beef Slough	753.8-754.1	CM	08/23-08/26	12	3,501	4-754.0-LW	4.02	S/A	U	R
5	Murphy's Cut	747.4	*CM	05/02-05/24	4	2,000	5-747.4-RM		L1/A	U	NCM
5	Blw. West Newton	746.5-746.6	CM	07/12-07/16	12	7,719	5-745.8-RM	5.12T	L3/A	C	R
5	Minneiska (Cut 1)	742.8-743.0	GM	06/27-07/11	13	9,742	5-744.7-LW	5.08T	L3/A	C	I
5	Minneiska (Cut 2)	742.6-742.9	CM	07/05-07/10	12	14,173	5-745.8-RM	5.12T	L3/A	C	I
5	Minneiska (Cut 3)	742.5-742.6	CM	07/16-07/19	12	10,175	5-745.8-RM	5.12T	L3/A	C	R
5A	Head of Betsy Slough	731.0-731.2	CM	08/16-08/22	12	11,469	5A-731.9-LW	5A.25	S/A	U	R
6	Homer	720.2-720.4	CM	08/09-08/15	12	6,449	6-723.5-RM		S/B	U	R
						2,614	6-726.3-RM		S/A	U	
7	Winters Landing	708.0-708.6	CM	07/22-08/02	12	19,365	7-714.1-LW	7.06	S/A	U	I
7	Head of Dresbach Island	705.1-705.3	CM	08/02-08/08	12	11,204	7-714.1-LW	7.06	S/A	U	R
8	Brownsville	689.1-689.2	GM	10/31-11/01	12	1,750	8-689.2-LW		L2/A	B	E
						2,000	8-688.7-RM	8.20	S/A	U	
8	Head of Raft Channel	688.0-688.1	GM	11/16-11/16	11	910	8-688.0-LW	Open Water	A	O	E
9	Lansing Upper Light	664.4-664.7	WAT	08/19-08/22	12	17,636	9-664.3-RI	9.17T	L1/A	C	R
	Zippel Bay Harbor		CH	09/04-09/21	4	1950	Confined		A	C	H

NOTE - The Lansing Placement Site (9-644.3-RI) was excavated by mechanical contracted dredging equipment from 18 June to 2 July to a depth of 10 feet. Approximately 34,654 cubic yards (not reflected in quantity totals below) were removed and stockpiled at Blackhawk Park (9-670.5-LW) to be used for park development.

* - This dredging was completed under separate contract.

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	441,962	50,185	14,402	102,873		609,422
	MINN. RIVER				3,515		3,515
	ST. CROIX RIVER						0
	HARBORS			1,250		1,950	3,200
	NON-CHAN. MAINT.				2,000		2,000
	TOTAL	441,962	50,185	15,652	108,388	1,950	618,137
FISCAL YEAR	MISS. RIVER	441,962	47,756	9,742	116,740		616,200
	MINN. RIVER				3,515		3,515
	ST. CROIX RIVER						0
	HARBORS					1,950	1,950
	NON-CHAN. MAINT.				2,000		2,000
	TOTAL	441,962	47,756	9,742	122,255	1,950	623,665

1991 Beneficial Use Update	
Total Beneficial Use	501,277
Total Quantity Dredged	618,137
Beneficial Use Quantity	81%
Total Jobs With Beneficial Use	20
Total Jobs	24
Beneficial Use Jobs	83%

1992 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
MN	Abv. Savage R.R. Bridge	14.5-14.7	CM	10/12-10/13	12	5,087	MN-12.1-RM		S/B	U	R
MN	Peterson's Bar	11.7-12.0	CM	10/05-10/08	12	5,920	MN-12.1-RM		S/B	U	R
USAF	Turning Basin	857.0-857.6	CM	08/11-08/20	12	21,568	U-856.6-RM		S/A	C	R
USAF	Abv. Lowry Ave. Br.	856.7-857.0	CM	08/21-09/01	12	15,505	U-856.6-RM		S/A	C	R
USAF	Blw. Lowry Ave. Br.	856.0-856.4	CM	09/02-09/09	12	8,871	U-856.6-RM		S/A	C	R
USAF	Abv. Broadway Ave. Br.	855.3-855.6	CM	09/10-09/17	12	10,753	U-856.6-RM		S/A	C	R
1	Blw. Franklin Ave. Br.	850.8-851.1	CM	09/21-10/01	13	16,583	1-853.2-LM	1.01A	S/A	U	R
2	SBH - St. Paul	839.6	GM	04/27-05/13	6	11,817	2-840.4-RM	2.16	S/A	U	H
2	Freeborn Light	818.7-818.9	CM	07/31-08/07	11	6,437	2-821.5-LM		A	C	R
3	Lower Approach L/D 2	814.8-815.1	CM	10/15-10/29	13	19,061	3-815.1-RM		S/A	U	R
3	Coulters Island	801.5-801.8	CM	06/30-07/13	12	25,344	3-799.2-RM	3.07T	A	U	R
3	Upper Coulters Island	802.5-802.9	GM	08/18-08/25	11	6,394	3-799.2-RM	3.07T	A	U	E
3	Diamond Bluff	799.8-799.9	CM	07/13-07/17	12	7,211	3-799.2-RM	3.07T	A	U	R
3	Diamond Bluff	800.1-800.2	CM	07/28-07/30	12	4,814	3-799.2-RM	3.07T	A	U	E
4	Cannon River	792.4-793.0	CM	07/20-07/27	12	19,282	4-794.7-RM		L2/B	B	R
4	Chippewa River Delta	763.3-763.6	WAT	06/29-07/21	9	158,955	4-762.7-LW	4.29T	L1/S/A	C	R
4	Reads Landing	762.4-762.8	WAT	06/16-06/19	12	31,601	4-762.7-LW	4.29T	L1/S/A	C	I
4	Indian Slough	760.0	DUBQ	09/19-09/28	8	8,000	4-759.3-LW	4.16T	L1/B	C	NCM
4	Crats Island	758.4-759.2	WAT	05/08-05/14	12	97,821	4-759.3-LW	4.16T	L1/B	C	I
4	Teepeeota Point	757.4-757.7	WAT	05/15-05/17	12	8,814	4-757.5-LW	4.13T	A	C	R
				06/11-06/15	12	19,334	4-757.5-LW	4.13T	A	C	
4	Teepeeota Point	757.4-757.7	CM	05/19-05/26	12	9,987	4-754.0-LW	4.02	S/A	U	E
4	Grand Encampment	756.0-756.8	CM	05/27-06/03	12	20,678	4-754.0-LW	4.02	S/A	U	R
5	Below West Newton	746.4-746.6	WAT	06/02-06/03	12	16,665	5-745.8-RM	5.12T	L3/A	C	R
5	Fisher Island	745.5-745.7	WAT	06/04-06/05	12	12,764	5-745.8-RM	5.12T	L3/A	C	R
5	Lower Zumbro	744.2-744.6	WAT	06/05-06/10	12	23,925	5-744.7-LW	5.08T	L3/A	C	R
5	Lower Zumbro	744.0-744.3	WID	07/27-07/30	11	2,941	N/A		A	O	R
5	Minneiska	742.6-742.7	CM	05/11-05/18	12	20,759	5-744.7-LW	5.08T	L3/A	C	R
5A	Betsy Slough	731.0-731.2	WAT	07/22-07/29	13	43,055	5A-730.5-LW	5A.08T	L1/A	C	R
5A	Wilds Bend	730.3-730.4	GM	04/14-04/16	13	2,843	5A-731.9-LW	5A.25	S/A	U	R
7	L/D 6 Aux. Lock	714.1-714.2	GM	08/13-08/14	8	300	5A-731.9-LW	5A.25	S/A	U	R
7	Lower Dresbach Island	703.5-703.6	CM	06/22-06/26	12	8,883	7-713.1-RM	7.05	S/B	U	R
8	Belower LaCrosse R.R. Br.	698.7-699.4	CM	08/25-09/04	12	3,716	BR-1.1-RW		S/B	U	I
8	Above Brownsville	690.0-690.3	WAT	05/27-05/30	12	24,590	8-690.4-LW	8.17T	A	C	R
8	Brownsville	688.8-689.2	CM	06/11-06/12	12	4,474	8-686.7-RM		L3/A	O	R
				06/18-06/19	12	4,818	8-686.7-FM		L3/A	O	
8	Head of Raft Channel	688.0-688.1	CM	06/15-06/17	13	9,296	8-686.7-RM		L3/A	O	R
9	L/D 8 Lower Guidewall	679.0	GM	03/25-03/25	8	370	9-670.5-LW	9.55	L1/A	U	R
				07/28-08/11	8	2,275	9-670.5-LW	9.55	L1/A	U	
9	Indian Camp Light	665.3-665.7	CM	06/04-06/10	12	10,577	9-663.5-LW	9.50T	S/A	U	R
9	Lansing Upper Light	664.0-664.7	WAT	05/18-05/23	12	38,561	9-664.3-RI	9.17T	L1/A	C	E
10	McMillian Island	618.0-619.0	WAT	08/04-08/21	12	70,829	10-618.8-RI	10.04	L1/B	C	R

		WAT	DUBQ	GM	CM	WID	TOTAL
CALENDAR YEAR	MISS. RIVER	546,914		12,182	248,617	2,941	810,654
	MINN. RIVER	0			11,007		11,007
	ST. CROIX RIVER						0
	HARBORS			11,817			11,817
	NON-CHAN. MAINT.		8,000				8,000
	TOTAL	546,914	8,000	23,999	259,624	2,941	841,478
FISCAL YEAR	MISS. RIVER	546,914	2,429	16,842	228,048	2,941	797,174
	MINN. RIVER						0
	ST. CROIX RIVER						0
	HARBORS			13,067			13,067
	NON-CHAN. MAINT.		8,000				8,000
	TOTAL	546,914	10,429	29,909	228,048	2,941	818,241

1992 Beneficial Use Update	
Total Beneficial Use	735,599
Total Quantity Dredged	841,478
Beneficial Use Quantity	87%
Total Jobs With Beneficial Use	31
Total Jobs	39
Beneficial Use Jobs	79%

1993 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
USAF	Turning Basin	857.0-857.3	CM	10/05-10/14	12	20,454	U-856.6-RM	-	S/A	C	I
MN	Peterson's Bar	11.7-12.2	CM	11/06-11/11	11	11,218	MN-12.1-RM	-	S/B	U	I
MN	Above Peterson's Bar	12.3-12.4	CM	11/12-11/12	11	1,324	MN-12.1-RM	-	S/B	U	I
MN	Mouth of the MN River	0.7-0.9	CM	11/15-11/17	11	3,402	2-840.4-RM	2.16	S/A	U	I
2	SBH-St. Paul	839.6	CM	10/19-10/26	6	10,000	2-840.4-RM	2.16	S/A	U	R
2	St. Paul Barge Terminal	836.5-837.5	CH2	09/08-11/13	12	242,526	2-838.6-LM	-	L1/A	C	R
2	Grey Cloud Slough	827.7-828.0	WAT	09/25-09/27	11	9,389	2-827.3-RM	-	L2/B	B	I
2	Grey Cloud Slough	827.3	CM	10/16-10/18	5	4,533	2-827.3-RM	-	L2/B	B	NCM
2	Pine Bend Landing	824.3-824.6	WAT	09/14-09/16	11	13,863	2-824.3-LM	-	A	O	E
2	Boulanger Bend	820.7-821.3	WAT	09/17-09/24	11	36,919	2-821.1-LM	2.31	B	C	I
3	Smith Bar Upper Light	805.3-805.6	CM	10/03-10/04	11	1,295	3-799.2-RM	3.07T	A	U	I
3	Coulters Island	801.6-801.9	CM	09/30-10/03	11	5,675	3-799.2-RM	3.07T	A	U	I
3	Diamond Bluff	800.2-800.3	CM	11/04-11/04	11	1,143	3-799.2-RM	3.07T	A	U	R
4	Below Trenton	793.3-793.6	CM	10/27-11/03	11	8,603	4-795.7-LW	-	L1/A	O	I
4	Reads Landing	762.4-762.8	WAT	09/28-10/02	12	48,383	4-762.7-LW	4.29T	L1/S/A	C	I
4	Crats Island	758.9-759.4	WAT	08/18-08/22	12	72,830	4-759.3-LW	4.16T	L1/B	C	I
4	Teepeeota Point	757.4-757.7	WAT	08/30-09/03	12	38,292	4-757.5-LW	4.13T	A	C	I
4	Grand Encampment	755.8-756.8	CM	08/21-09/08	12	39,723	4-754.0-LW	4.02	S/A	U	I
4	Beef Slough	754.0-754.3	CM	08/18-08/21	12	10,931	4-754.0-LW	4.02	S/A	U	E
5	Below West Newton	746.4-746.7	CM	08/13-08/17	12	12,283	5-744.7-LW	5.07T	L3/A	C	I
5	Fisher Island	745.6-745.9	DUBQ	08/05-08/11	12	16,300	5-745.8-RM	5.12T	L3/A	C	E
5	Lower Zumbro	743.9-744.5	WAT	08/23-08/28	12	56,724	5-744.7-LW	5.08T	L3/A	C	E
5	Minneiska	742.7-742.9	CM	08/06-08/12	12	15,926	5-744.7-LW	5.08T	L3/A	C	E
5A	Betsy Slough	731.1-731.3	WAT	09/05-09/11	12	33,465	5A-731.9-LW	5A.25	S/A	C	I
6	SBH-Winona	726.3	CM	08/03-08/05	6	2,613	6-726.3-RM	-	S/A	U	R
7	Lower Appch. L/D 6	713.7-714.0	WAT	10/06-10/09	13	35,157	7-714.1-LW	7.06	S/A	C	I
7	Winters Landing	707.9-708.3	CM	09/09-09/11	12	6,171	7-713.1-RM	7.05	S/B	U	I
				09/12-09/16	12	8,227	7-706.5-RM	7.12T	A	U	
7	Dakota - Job 1	706.1-707.1	GM	08/30-09/09	12	8,880	7-706.5-RM	7.12T	A	U	I
				09/24-09/29	11	6,012	7-706.5-RM	7.12T	A	U	
7	Head of Dresbach Island	705.0-705.3	GM	09/09-09/23	12	17,989	7-706.5-RM	7.12T	A	U	I
7	Dresbach Island	703.4-703.7	GM	09/29-10/01	11	2,884	7-706.5-RM	7.12T	A	U	R
8	Above Brownsville	690.0-690.7	CH1	08/23-09/23	12	49,867	8-690.4-LW	8.17T	A	C	I
8	Brownsville	688.9-689.1	GM	08/13-08/28	12	14,196	8-688.7-RM	8.30	S/A	C	E
						3,000	8-689.0-RM	-	L1/B	U	
						1,750	8-691.6-LW	-	L2/A	B	
9	Indian Camp Light	665.5-666.2	CM	09/20-09/28	12	13,000	9-670.5-LW	9.55	L1/A	U	I
10	McMillan Island	618.8-619.0	CM	09/17-09/19	11	3,047	10-618.6-RI	10.18T	L2/S/A	B	E

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	345,022	16,300	54,711	146,478	292,393	854,904
	MINN. RIVER	0	0	0	15,944	0	15,944
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	12,613	0	12,613
	NON-CHAN. MAINT.	0	0	0	4,533	0	4,533
	TOTAL	345,022	16,300	54,711	179,568	292,393	887,994
FISCAL YEAR	MISS. RIVER	290,512	16,300	53,750	126,763	133,122	620,447
	MINN. RIVER	0	0	0	11,007	0	11,007
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	2,613	0	2,613
	NON-CHAN. MAINT.	0	0	0	0	0	0
	TOTAL	290,512	16,300	53,750	140,383	133,122	634,067

1993 Beneficial Use Update	
Total Beneficial Use	696,948
Total Quantity Dredged	887,994
Beneficial Use Quantity	78%
Total Jobs With Beneficial Use	24
Total Jobs	34
Beneficial Use Jobs	71%

1994 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YDS.	PLCMT. SITE LOC.	SITE NUMBER	CATEGORY	CLASS	TYPE
USAF	Turning Basin	857.1-857.5	CM	09/13-10/01	12	33,993	U-856.6-RM	-	S/A	C	R
USAF	Abv. Lowry Ave. Br.	856.4-857.1	CM	08/08-09/13	12	48,598	U-856.6-RM	-	S/A	C	R
USAF	Broadway Ave. Br.	855.3-855.7	CM	10/02-10/12	12	15,052	U-856.6-RM	-	S/A	C	R
USAF	Abv. Plymouth Ave. Br.	855.1-855.3	CM	10/13-10/26	12	12,000	U-856.6-RM	-	S/A	C	R
1	Blw. Franklin Ave. Br.	850.8-851.1	CM	09/14-10/03	12	25,509	1-853.2-LM	1.01A	S/A	U	R
1	Abv. Lake St. Br.	850.0-850.4	CM	10/04-10/18	12	25,250	1-853.2-LM	1.01A	S/A	U	R
1	Blw. Lake Street Br.	849.2-849.4	CM	10/19-10/27	12	11,450	1-853.2-LM	1.01A	S/A	U	R
2	Lower Appch. L/D 1	847.4-847.5	CM	09/13-09/14	13	1,880	2-840.4-RM	2.16	S/A	U	R
2	SBH - St. Paul	839.6	CM	09/07-09/12	6	5,966	2-840.4-RM	2.16	S/A	U	R
2	Above Wabasha Ave. Br.	839.5-839.6	CM	09/26-09/26	13	660	2-836.2-RM	-	S/B	U	E
2	Grey Cloud Slough	827.6-827.9	CM	11/01-11/17	12	13,168	2-823.8-RM	-	S/B	U	R
3	Below Diamond Bluff	799.2-799.4	CM	08/08-08/11	11	5,933	3-799.2-RM	3.07T	A	U	R
3	Coulters Island	801.5-801.9	CM	06/10-06/23	11	13,052	3-799.2-RM	3.07T	A	U	I
3	Diamond Bluff	800.3-800.6	CM	07/29-08/04	11	9,048	3-799.2-RM	3.07T	A	U	R
4	Cannon River	792.8-793.2	CM	08/15-09/01	12	27,676	4-788.5-RM	4.47	S/A	U	R
4	Crats Island	758.8-759.4	WAT	06/22-06/27	12	76,945	4-759.3-LW	4.16T	L1/B	C	I
4	Grand Encampment	756.6-756.8	CM	11/01-11/04	11	5,201	4-754.0-LW	4.02	S/A	U	R
4	Beef Slough	754.0-754.4	CM	07/19-07/26	11	9,427	4-754.0-LW	4.02	S/A	U	R
5	Mule Bend	747.8-748.2	WAT	06/17-06/19	12	26,962	5-748.0-RM	5.18T	A	C	E
5	West Newton	747.5-747.7	WAT	06/20-06/21	12	13,728	5-748.0-RM	5.18T	A	C	E
5	Below West Newton	746.5-746.6	WAT	08/04-08/06	12	10,993	5-745.8-RM	5.12T	L3/A	C	R
5	Minneiska	742.4-742.8	CM	06/27-07/02	12	13,694	5-744.7-LW	5.08T	L3/A	C	R
5A	Betsy Slough	731.1-731.2	WAT	11/16-11/17	12	10,150	5A-730.5-LW	5A.08T	L1/A	C	R
		731.0-731.2	WAT	07/07-07/11	12	17,715	5A-731.9-LW	5A.25	S/A	C	R
5A	Wilds Bend	730.3-730.5	WAT	07/13-07/19	12	19,391	5A-731.9-LW	5A.25	S/A	C	R
			WAT	07/19-07/21	12	6,756	5A-730.5-LW	5A.08T	L1/A	C	
6	Lower Winona RR Br.	723.4-723.7	CM	07/07-07/15	12	8,601	6-726.3-RM	-	S/A	U	R
8	Brownsville	689.1-689.3	GM	06/05-06/10	12	5,869	8-688.7-RM	8.30	S/A	C	E
		688.4-688.8	WAT	06/12-06/15	12	10,319	8-688.7-RM	8.30	S/A	C	R
		688.8-689.3	WAT	06/28-07/05	12	29,152	8-688.7-RM	8.30	S/A	C	
8	Head of Raft Channel	688.0-688.2	WAT	07/25-07/26	12	9,159	8-688.7-RM	8.30	S/A	C	R
9	Indian Camp Light	665.4-665.7	GM	08/09-10/05	13	39,400	9-669.2-RI	-	L1/A	U	R
			GM	10/06-10/18	13	6,400	9-670.5-LW	9.55	L1/A	U	
9	Lansing Upper Light	664.4-664.8	WAT	07/27-08/02	12	24,064	9-664.3-RI	9.17T	L1/A	C	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	255,334	0	51,669	280,192	0	587,195
	MINN. RIVER	0	0	0	0	0	0
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	5,966	0	5,966
	NON-CHAN. MAINT.	0	0	0	0	0	0
	TOTAL	255,334	0	51,669	286,158	0	593,161
FISCAL YEAR	MISS. RIVER	299,694	0	42,833	228,207	159,271	730,005
	MINN. RIVER	0	0	0	15,944	0	15,944
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	15,966	0	15,966
	NON-CHAN. MAINT.	0	0	0	4,533	0	4,533
	TOTAL	299,694	0	42,833	264,650	159,271	766,448

1994 Beneficial Use Update	
Total Beneficial Use	524,438
Total Quantity Dredged	593,161
Beneficial Use Quantity	88%
Total Jobs With Beneficial Use	26
Total Jobs	31
Beneficial Use Jobs	84%

1995 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YARDS	PLCMT. SITE LOC.&TYPE	CATE-GORY	CLASS	JOB TYPE
MN	Petersons Bar	11.5-12.4	CM	10/06-10/21	12	30,133	MN-12.1-RMP	S/B	U	R
2	SBH - St. Paul	839.6	CM	10/23-10/26	6	8,000	2-840.4-RMP	S/A	U	R
2	St. Paul Barge Term.	837.2-837.6	CM	09/19-10/04	12	21,055	2-840.4-RMP	S/A	U	I*
2	Grey Cloud Slough	827.7-828.0	CM	06/21-07/12	12	15,066	2-823.8-RMP	S/B	U	R
2	Pine Bend Head Light	824.2-824.6	WAT	08/10-08/19	12	41,157	2-823.8-LMT	A	C	I
2	Access/Pine Bend Site	823.8	CM	07/14-07/20	6	6,000	2-821.1-LMT	B	C	NCM
2	Pine Bend Foot Light	822.7-823.2	WAT	08/04-08/10	12	34,407	2-823.8-LMT	A	C	I
2	Boulanger Bend	819.6-821.4	WAT	08/21-08/27	12	38,185	2-821.1-LMT	B	C	I
2	Boulanger Bend Lwr. Lt.	819.9-820.2	CM	10/27-11/22	12	29,035	2-821.1-LMT	B	C	R
2	Freeborn Light	818.4-819.0	CM	07/22-09/06	12	58,516	2-821.5-LMT	B	C	I
3	Smith Bar Upper Light	805.1-805.4	CM	09/22-09/29	12	16,291	3-799.2-RMT	A	C	I
3	Coulters Island	801.5-802.5	GM	06/26-07/06	11	20,160	3-799.2-RMT	A	C	I
			CM	09/12-09/22	12	32,704	3-799.2-RMT	A	C	
			CM	09/29-10/24	12	7,526	3-799.2-RMT	A	C	
3	Diamond Bluff	799.6-800.0	WAT	07/25-08/01	12	56,570	3-799.2-RMT	A	C	I
3	Below Diamond Bluff	799.0-799.5	WAT	07/24-07/25	12	10,111	3-799.2-RMT	A	C	I
4	Chippewa Delta	763.2	CH	09/15-09/27	9	200,105	4-761.0-RMP	L1/S/A	C	R
4	Crats Island	758.5-759.5	WAT	05/02-05/08	12	51,755	4-759.3-LWT	L1/B	C	R
		759.0-759.3	WAT	10/26-10/28	12	13,652	4-759.3-LWT	L1/B	C	I*
4	Teepeeota Point	757.3-757.7	WAT	04/25-05/01	12	45,345	4-757.5-LWP	A	C	R
		757.2-757.7	WAT	10/29-11/01	12	16,071	4-757.5-LWP	A	C	I*
4	Grand Encampment	755.7-756.7	WAT	04/16-04/24	12	56,465	4-756.5-LWT	A	C	E*
		756.4-756.8	CM	10/26-11/14	12	29,302	4-756.5-LWT	A	C	I*
4	Beef Slough	754.0-754.4	CM	05/04-05/16	12	18,536	4-754.0-LWP	S/A	U	R
5	West Newton	747.5-747.7	WAT	06/12-06/14	13	18,891	5-748.0-RMT	A	C	R
5	Below West Newton	746.5-746.7	WAT	05/18-05/23	12	15,794	5-745.8-RMT	L3/A	C	R
5	Fisher Island	744.8-745.6	WAT	05/11-05/18	12	27,707	5-745.8-RMT	L3/A	C	R
						37,849	5-744.7-LWT	L3/A	C	
5	Lower Zumbro	744.2-744.5	WAT	05/09-05/11	12	18,098	5-744.7-LWT	L3/A	C	R
		743.5-744.2	WAT	11/02-11/03	12	16,666	5-744.7-LWT	L3/A	C	R
5	Minnelska	742.4-742.6	CM	04/26-05/02	12	12,420	5-744.7-LWT	L3/A	C	R
		742.8-743.0	GM	10/19-11/02	12	12,540	5-744.7-LWT	L3/A	C	I*
5A	Betsy Slough	731.1-731.3	WAT	06/15-06/21	13	59,230	5A-731.9-LWP	S/A	C	R
5A	Wilds Bend	729.9-730.2	WAT	06/22-06/23	12	7,741	5A-730.5-LWT	L1/A	C	R
		729.9-730.2	CM	09/05-09/11	12	17,869	5A-730.5-LWT	L1/A	C	
6	Below Winona RR Br.	723.4-723.6	CM	08/10-08/20	12	16,054	6-726.3-RMP	S/A	U	R
7	Winters Landing	707.8-708.1	GM	05/22-05/25	12	6,560	7-713.1-RMP	S/B	U	R
		707.9-708.2	CM	08/21-08/29	12	14,216	7-714.1-LMP	S/A	C	
7	Dakota	705.7-708.0	CM	07/30-08/09	12	10,405	7-713.1-RMP	S/B	U	R
7	Head of Dresbach Island	705.0-705.4	CM	06/12-06/14	12	1,500	7-705.1-RMP	L2/B	B	I*
						3,500	7-706.5-RMT	A	U	
			CM	07/03-07/06	12	9,927	7-706.5-RMT	A	U	E*
7	Lower Dresbach Island	703.2-703.6	CM	05/17-06/09	12	36,550	7-706.5-RMT	A	U	I*
8	Above Brownsville	690.0-690.6	WAT	07/18-07/21	12	28,030	8-690.4-LWT	A	C	R
8	Brownsville	688.9-689.2	WAT	11/05-11/06	12	11,683	8-688.7-RMP	S/A	C	R
9	Indian Camp Light	665.5-665.7	CM	06/26-06/30	12	8,000	9-670.5-LWP	L1/A	U	I*
			CM	07/20-07/29	12	12,541	9-670.5-LWP	L1/A	U	
9	Lansing Upper Light	664.3-664.8	WAT	06/25-06/29	12	57,556	9-664.3-RIT	L1/A	C	E
			WAT	07/14-07/16	12	17,463	9-664.3-RIT	L1/A	C	
		663.7-664.3	CM	07/08-07/19	12	19,484	9-663.5-LWP	S/A	U	
10	McMillan Island	618.8-618.9	CM	06/15-06/16	12	4,642	10-618.7-RIT	A	C	I
		617.8-618.3	GM	08/18-10/16	12	36,160	10-618.2-LIP	L1/A	O	R
		618.3-619.1	WAT	10/21-10/23	12	22,184	10-618.7-RIT	A	C	I

* OSIT coordination was completed prior to dredging, dredging practices were routine, placement site used was previously approved, and placement methods did not change from past practice at the site. No after action report will be completed, as all information necessary is contained in this dredging summary.

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	702,610	0	75,420	395,139	200,105	1,373,274
	MINN. RIVER	0	0	0	30,133	0	30,133
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	8,000	0	8,000
	NON-CHAN. MAINT.	0	0	0	6,000	0	6,000
	TOTAL	702,610	0	75,420	439,272	200,105	1,417,407
FISCAL YEAR	MISS. RIVER	632,504	0	63,034	412,327	200,105	1,307,970
	MINN. RIVER	0	0	0	0	0	0
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	0	0	0
	NON-CHAN. MAINT.	0	0	0	6,000	0	6,000
	TOTAL	632,504	0	63,034	418,327	200,105	1,313,970

1995 Beneficial Use Update	
Total Beneficial Use	795,838
Total Quantity Dredged	1,417,407
Beneficial Use Quantity	56%
Total Jobs With Beneficial Use	24
Total Jobs	43
Beneficial Use Jobs	56%

1996 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YARDS	PLCMT. SITE LOC.&TYPE	CATE-GORY	CLASS	JOB TYPE
MN	Above Savage RR. Br.	14.5-14.7	CM	08/20-08/22	12	5,190	MN-12.1-RMP	S/B	U	R
MN	Peterson's Bar	11.6-12.2	CM	08/06-08/19	12	12,842	MN-12.1-RMP	S/B	U	R
U	Mpls. Turning Basin	857.0-857.5	DUBQ	07/25-08/28	12	41,194	U-856.6-RMP	S/A	C	*E
			DUBQ	09/23-10/04	12	15,286	U-856.6-RMP	S/A	C	
U	Above Lowry Ave. Br.	856.4-857.0	CM	07/02-07/09	12	15,019	U-856.6-RMP	S/A	C	*E
			DUBQ	07/10-07/24	12	21,033	U-856.6-RMP	S/A	C	
			DUBQ	08/29-09/19	12	21,736	U-856.6-RMP	S/A	C	
U	Abv. Broadway Ave. Br.	855.4-855.6	CM	07/10-07/25	12	15,642	U-856.6-RMP	S/A	C	*I
U	Abv. Plymouth Ave. Br.	855.0-855.2	CM	07/26-07/26	12	1,800	U-856.6-RMP	S/A	C	*I
1	Abv. Lake Street Br.	850.0-850.4	CM	08/29-09/20	12	27,915	1-853.2-LMP	S/A	U	*I
1	Blw. Lake Street Br.	849.1-849.4	CM	09/23-09/27	12	7,805	1-853.2-LMP	S/A	U	*I
2	SBH - St. Paul	839.6	CM	08/19-08/21	6	1,071	2-840.4-RMP	S/A	U	R
2	St. Paul Barge Terminal	837.4-837.6	CM	07/28-08/03	12	9,950	2-840.4-RMP	S/A	U	E
		837.0-837.6	WAT	10/14-10/27	13	121,000	2-836.8-RMP	L1/B	C	R
4	Cannon River	792.8-793.6	CM	10/09-11/04	12	39,214	4-791.5-RMP	L1/B	U	R
4	Red Wing Comm. H.	791.5	CM	08/16-08/17	10	668	4-791.5-RMP	L1/B	U	E
4	Crats Island	758.8-759.3	WAT	06/18-06/23	12	82,256	4-759.3-LWT	L1/B	U	*I
4	Teepeeota Point	757.3-757.8	WAT	06/11-06/17	12	79,350	4-757.5-LW	A	C	*I
4	Grand Encampment	756.3-756.8	WAT	06/24-06/29	12	46,781	4-757.5-LW	A	C	*I
		755.9-756.0	CM	07/09-07/12	12	12,210	4-754.0-LWP	S/A	U	
4	L/D 4 Aux. Lock	752.8	GM	05/22-06/04	8	6,300	4-754.0-LWP	S/A	U	R
5	Mule Bend	747.8-748.9	WAT	07/11-07/16	12	47,646	5-748.0-RMT	A	C	R
5	Below West Newton	746.5-746.7	WAT	07/02-07/05	12	23,651	5-745.8-RMT	L3/A	C	R
5	Fisher Island	745.5-745.7	WAT	06/30-07-02	12	22,991	5-745.8-RMT	L3/A	C	R
5	Lower Zumbro	744.1-744.4	WAT	07/06-07/09	12	42,198	5-744.7-LWT	L3/A	C	R
5	Minneiska	742.3-743.2	CM	06/27-07/01	12	19,651	5-744.7-LWT	L3/A	C	*E
			CM	09/09-09/23	12	23,719	5-744.7-LWT	L3/A	C	
5	Abv. Mt. Vernon Light	741.2-741.5	CM	09/24-10/04	12	17,259	5-744.7-LWT	L3/A	C	R
5A	Betsy Slough	731.1-731.3	WAT	07/17-07/22	13	44,041	5A-731.9-LWP	S/A	C	R
5A	Wilds Bend	729.8-730.1	WAT	07/24-07/27	12	33,657	5A-730.5-LWT	L1/A	C	R
6	Winona Comm. Harbor	726.3	GM	10/02-10/05	10	2,000	6-726.0-LMP	S/A	U	R
6	SBH Winona	726.0	GM	05/09-05/17	6	1,613	6-726.0-LMP	S/A	U	R
7	Winters Landing	707.8-708.1	CM	08/21-09/05	12	22,597	7-714.1-LWP	S/A	C	R
7	Dakota	706.1-706.3	CM	05/29-05/30	12	2,750	7-706.5-RMT	A	U	R
			CM	06/03-06/07	12	11,395	7-706.5-RMT	A	U	
7	Head of Dresbach Is.	704.4-705.3	CM	05/31-06/02	12	10,232	7-706.5-RMT	A	U	*E
			CM	06/11-06/18	12	11,044	7-706.5-RMT	A	U	
7	Lower Dresbach Is.	703.1-703.7	CM	06/19-06/26	12	16,031	7-706.5-RMT	A	U	R
			CM	07/16-07/17	12	5,808	7-706.5-RMT	A	U	
8	Above Brownsville	690.0-690.6	WAT	05/23-05/29	12	21,525	8-690.4-LWT	A	C	R
8	Brownsville	688.9-689.2	WAT	05/30-06/07	12	74,640	8-688.7-RMP	S/A	C	R
8	Head of Raft Channel	687.6-688.7	WAT	07/30-08/04	12	34,929	8-688.7-RMP	S/A	C	R
9	Indian Camp Light	665.5-665.8	CM	07/19-08/02	12	35,043	9-663.5-LWP	S/A	U	*I
9	Lansing Upper Light	664.5-664.8	CM	08/06-08/20	12	28,691	9-663.5-LWP	S/A	U	*I
		663.9-664.3	WAT	10/05-10/07	12	12,818	9-663.5-LWP	S/A	C	
10	McMillan Island	618.3-619.1	WAT	09/28-10/03	12	40,157	10-618.7-RIT	A	C	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	727,640	99,249	0	333,775	0	1,160,664
	MINN. RIVER	0	0	0	18,032	0	18,032
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	3,613	1,739	0	5,352
	NON-CHAN. MAINT.	0	0	6,300	0	0	6,300
	TOTAL	727,640	99,249	9,913	353,546	0	1,190,348
FISCAL YEAR	MISS. RIVER	653,999	94,154	22,183	358,833	0	1,129,169
	MINN. RIVER	0	0	0	48,165	0	48,165
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	1,613	9,739	0	11,352
	NON-CHAN. MAINT.	0	0	6,300	0	0	6,300
	TOTAL	653,999	94,154	30,096	416,737	0	1,194,986

1996 Beneficial Use Update

Total Beneficial Use	897,629
Total Quantity Dredged	1,190,348
Beneficial Use Quantity	75%
Total Jobs With Beneficial Use	30
Total Jobs	37
Beneficial Use Jobs	81%

* OSIT coordination was completed prior to dredging, dredging practices were routine, placement site used was previously approved, and placement methods did not change from past practice at the site. No after action report will be completed, as all information necessary is contained in this dredging summary.

1997 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YARDS	PLCMT. SITE LOC.&TYPE	CATE-GORY	CLASS	JOB TYPE
MN	Peterson's Bar	11.5-12.7	CM	09/25-10/07	12	18,799	MN-12.1-RMP	S/B	U	*I
U	Above Lowry Ave. Br.	856.5-857.1	CM	10/20-11/06	12	43,829	U-856.6-RMP	S/A	C	R
1	Above Lake St. Br.	850.0-850.4	CM	07/09-07/30	12	32,934	1-853.2-LMP	S/A	U	R
2	SBH St. Paul	839.6	CM	06/02-06/23	6	14,000	2-840.4-RMP	S/A	U	R
2	Access to Pine Bend	823.8	CM	05/22-05/23	6	4,000	2-823.8-RMP	S/B	U	R
2	Pine Bend	824.4-824.7	CM	05/27-06/02	12	17,150	2-823.8-RMP	S/B	U	*I
		824.4-824.7	WAT	09/14-09/17	12	23,509	2-823.8-LMT	A	C	
2	Grey Cloud Landing	822.7-823.3	WAT	09/09-09/13	12	24,578	2-823.8-LMT	A	C	*I
2	Boulanger Bend	821.0-821.3	CM	10/10-10/15	12	13,663	2-821.5-LMT	B	C	E
3	SBH Hastings	813.2	CM	11/10-11/13	6	4,375	3-813.2-RMP	B	U	R
3	Coulters Island	801.5-801.9	CM	08/18-08/25	11	10,299	3-799.2-RMT	A	C	*I
3	Diamond Bluff	799.7-800.5	CM	08/25-08/28	11	6,731	3-799.2-RMT	A	C	*I
4	Cannon River	793.2-793.6	CM	06/25-07/01	12	7,958	4-788.5-RMP	S/A	U	*I
		793.2-793.6	CM	10/29-11/09	12	27,750	4-788.5-RMP	S/A	U	
4	Reads Landing	762.4-762.8	WAT	09/03-09/06	12	27,826	4-762.7-LWT	L1/S/A	C	*I
4	Crats Island	758.8-759.4	WAT	05/13-05/22	12	62,988	4-759.3-LWT	L1/B	C	*I
4	Teepeeota Point	757.4-757.9	WAT	07/29-08/06	12	77,216	4-757.5-LW	A	C	*I
4	Grand Encampment	755.8-756.8	CM	05/19-05/28	12	17,186	4-754.0-LWP	S/A	U	*I
		755.8-756.8	WAT	08/09-08/16	12	22,021	4-757.5-LW	S/A	U	
4	Beef Slough	754.0-754.3	CM	05/05-05/18	12	31,647	4-754.0-LWP	S/A	U	*E
5	Mule Bend	747.9-748.9	WAT	07/19-07/27	12	44,119	5-748.0-RMT	A	C	R
5	Below West Newton	746.4-746.7	CM	06/04-06/13	12	18,536	5-748.0-RMT	A	C	*I
		746.5-746.6	CM	06/26-06/26	11	900	6-726.3-RMP	S/A	U	
		746.4-746.7	WAT	07/09-07/12	12	17,037	5-745.8-RMT	L3/A	C	
5	Fisher Island	745.4-745.8	WAT	07/02-07/09	12	66,267	5-745.8-RMT	L3/A	C	*I
5	Lower Zumbro	744.9-745.4	WAT	07/13-07/17	12	28,134	5-744.7-LWT	L3/A	C	R
5A	Betsy Slough	731.1-731.3	CM	06/14-06/23	12	20,757	5A-731.9-LWP	S/A	C	*I
6	SBH Winona	726.1	GM	05/14-05/28	6	5,282	6-726.0-LMP	S/A	U	R
6	Below Winona RR. Br.	722.9-723.7	CM	06/09-06/30	12	40,658	6-726.3-RMP	S/A	U	*E
6	Homer	720.1-720.7	CM	10/22-10/27	13	15,665	6-720.5-RMP	S/B	C	R
7	Lower Appch. L/D 6	713.8-714.0	GM	07/01-07/18	13	7,639	7-714.1-LWP	S/A	C	R
		713.8-714.0	CM	10/13-10/21	13	9,559	7-714.1-LWP	S/A	C	
7	Winters Landing	707.5-708.3	CM	07/29-08/06	12	14,924	7-713.1-RMP	S/B	U	*I
7	Dakota	706.1-706.3	CM	08/07-08/18	12	23,842	7-713.1-RMP	S/B	U	R
7	Head of Dresbach Is.	704.3-705.3	CM	05/30-06/02	12	7,679	7-706.5-RMT	A	U	*I
		704.3-705.3	CM	07/08-07/21	12	19,347	7-713.1-RMP	S/B	U	
						1,440	7-704.9-RMP	L2/B	U	
7	Lower Dresbach Is.	703.4-703.7	CM	07/22-07/28	12	11,133	7-713.1-RMP	S/B	U	R
8	Above Brownsville	690.3-690.5	WAT	08/29-08/31	12	17,876	8-690.4-LWT	A	C	R
8	Brownsville	688.9-689.1	CM	06/03-06/06	12	7,620	8-688.7-RMP	S/A	C	*I
		688.8-689.2	WAT	08/20-08/25	12	51,420	8-688.7-RMP	S/A	C	
8	Head of Raft Channel	688.0-688.1	WAT	08/26-08/28	12	12,666	8-688.7-RMP	S/A	C	R
9	Indian Camp Light	665.5-665.8	CM	08/19-09/04	12	24,888	9-663.5-LWP	S/A	C	*I
						9,422	9-670.5-LWP	L1/A	U	
9	Lansing Upper Light	664.0-664.8	CM	09/05-09/24	12	30,111	9-663.5-LWP	S/A	C	R
						5,676	9-670.5-LWP	L1/A	U	
10	McMillan Island	617.9-619.1	CM	09/26-10/08	11	32,852	10-618.7-RIT	A	C	*I

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	475,657	0	7,639	504,156	0	987,452
	MINN. RIVER	0	0	0	18,799	0	18,799
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	5,282	18,375	0	23,657
	NON-CHAN. MAINT.	0	0	0	4,000	0	4,000
	TOTAL	475,657	0	12,921	545,330	0	1,033,908
FISCAL YEAR	MISS. RIVER	629,554	5,095	7,639	418,963	0	1,061,251
	MINN. RIVER	0	0	0	8,676	0	8,676
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	7,282	14,000	0	21,282
	NON-CHAN. MAINT.	0	0	0	4,000	0	4,000
	TOTAL	629,554	5,095	14,921	445,639	0	1,095,209

1997 Beneficial Use Update

Total Beneficial Use	752,475
Total Quantity Dredged	1,033,908
Beneficial Use Quantity	73%
Total Jobs With Beneficial Use	25
Total Jobs	36
Beneficial Use Jobs	69%

* OSIT coordination was completed prior to dredging, dredging practices were routine, placement site used was previously approved, and placement methods did not change from past practice at the site. No after action report will be completed, as all information necessary is contained in this dredging summary.

1998 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YARDS	PLCMT. SITE LOC.&TYPE	CATE-GORY	CLASS	JOB TYPE
MN	Above Savage RR. Br.	14.5-14.7	CM	08/24-08/26	12	2,634	MN-12.1-RMP	S/B	U	*I
MN	Cargill Slip	12.6-12.8	CM	08/26-08/31	12	3,498	MN-12.1-RMP	S/B	U	I
MN	Petersons Bar	11.6-12.4	CM	08/05-08/23	12	29,593	MN-12.1-RMP	S/B	U	*I
U	Turning Basin	857.2-857.5	CM	07/09-07/17	12	14,247	U-856.6-RMP	S/A	U	*I
U	Above Lowry Ave. Br.	856.7-856.8	CM	06/09-06/11	12	3,965	U-856.6-RMP	S/A	U	R
U	Above Broadway Ave. Br.	855.5-855.8	CM	06/15-06/25	12	18,833	U-856.6-RMP	S/A	U	*I
U	Above Plymouth Ave. Br.	855.1-855.4	CM	06/29-07/08	12	15,603	U-856.6-RMP	S/A	U	*I
1	Below Franklin Ave. Br.	850.7-851.1	CM	07/21-08/01	12	12,104	1-853.2-LMP	S/A	U	*I
1	Above Lake Street	849.9-850.1	CM	09/01-09/04	12	5,207	1-853.2-LMP	S/A	U	*I
1	Below Lake Street	849.1-849.3	CM	09/08-09/15	12	14,731	1-853.2-LMP	S/A	U	*I
2	SBH St. Paul	839.6	CM	03/30-04/06	6	9,294	2-840.4-RMP	S/A	U	R
2	St. Paul Barge Terminal	837.3-837.6	CM	09/17-10/03	12	25,898	2-836.3-RMP	S/L1/A	U	R
2	Grey Cloud Slough	827.6-828.0	CM	04/13-04/22	12	25,571	2-823.8-RMP	S/B	U	R
2	Grey Cloud Landing	822.7-823.1	WAT	06/27-07/01	12	14,268	2-823.8-LMT	A	C	R
		822.7-823.1	DUBQ	09/21-11/11	12	36,661	2-823.8-LMT	A	C	
2	Boulanger Bend	820.3-821.3	CM	04/23-05/04	12	14,993	2-823.8-RMP	S/B	U	*I
		820.3-821.3	CM	05/05-05/27	12	45,019	2-821.1-LMT	B	C	
2	Freeborn Light	818.4-819.5	CM	05/28-06/05	12	9,150	2-821.1-LMT	B	C	R
2	L/D 2 Behind Up Guidewall	815.3	GM	09/14-09/17	7	900	2-821.5-LMT	B	C	R
2	L/D 2 Aux. Lock	815.2	GM	09/10-09/15	15	900	2-821.5-LMT	B	C	R
3	Lwr. Appch. L/D 2	814.7-815.0	CM	10/06-10/23	13	29,085	3-814.7-RMP	S/B	U	R
3	Morgans Coulee	802.2-802.9	CH	06/18-06/24	13	47,135	3-800.0-LWP	S/B	C	R
3	Coulters Island	801.4-802.0	CH	06/05-06/17	12	50,140	3-800.0-LWP	S/B	C	*I
3	Diamond Bluff	799.6-800.7	CH	05/28-06/04	12	52,952	3-800.0-LWP	S/B	C	*I
		799.6-800.7	CH	06/25-07/02	12	21,221	3-800.0-LWP	S/B	C	
3	Below Diamond Bluff	799.0-799.5	CH	07/03-07/07	12	25,999	3-800.0-LWP	S/B	C	R
4	Cannon River	793.5-793.6	CM	12/14-12/15	12	600	4-796.8-LWP	L1/A	C	R
4	Chippewa Delta	763.2	WAT	07/12-07/30	9	270,717	4-762.7-LWT	L1/S/A	C	R
4	Reads Landing	762.5-762.8	WAT	07/10-07/12	12	23,521	4-762.7-LWT	L1/S/A	C	*I
4	Crats Island	758.8-759.4	DUBQ	05/12-06/04	12	30,546	4-759.3-LWT	L1/B	C	*I
4	Teepeeota Point	757.4-758.0	WAT	07/03-07/10	12	54,040	4-757.5-LW	A	C	*I
4	Beef Slough	754.0-754.4	CM	05/17-05/20	12	9,792	4-754.0-LWP	S/A	U	R
5	Mule Bend	747.9-748.9	WAT	07/31-08/05	12	35,433	5-748.0-RMT	A	C	*I
5	West Newton	747.4-747.6	WAT	08/05-08/07	12	8,579	5-748.0-RMT	A	C	R
5	Below West Newton	746.4-746.7	WAT	08/08-08/10	12	18,298	5-745.8-RMT	L3/A	C	*I
5	Fisher Island	745.6-745.8	WAT	08/11-08/13	12	9,650	5-745.8-RMT	L3/A	C	R
5A	Betsy Slough	731.1-731.3	GM	05/08-05/10	12	2,811	5A-731.9-LWP	S/A	C	*I
		731.1-731.4	CM	06/03-06/11	12	30,894	5A-731.9-LWP	S/A	C	
6	SBH Winona	726.1	GM	04/21-04/29	6	3,500	6-726.0-LMP	S/A	U	R
6	Lower Winona	723.0-723.6	CM	05/27-06/02	12	10,998	6-726.3-RMP	S/A	U	R
7	Lower Appch. L/D 6	713.6-714.0	WAT	10/13-10/17	13	42,328	7-714.1-LWP	S/A	C	*I
7	Winters Landing	707.6-708.2	CM	07/13-07/21	12	15,320	7-713.1-RMP	S/B	U	*I
7	Head of Dresbach Is.	704.5-705.3	CM	06/15-06/24	12	18,065	7-706.5-RMT	A	U	*I
7	Lower Dresbach Is.	703.4-703.7	CM	06/25-07/08	12	15,598	7-706.5-RMT	A	U	*I
8	L/D 7 Dock Access	702.3	GM	05/27-06/05	7	1,980	7-706.5-RMT	A	U	R
8	LaCrosse R.R. Bridge	698.5-699.2	CM	07/22-07/31	12	18,690	8-696.1-LWP	S/A	U	*I
8	Above Brownsville	690.1-690.5	CM	08/03-08/14	12	30,456	8-696.1-LWP	S/A	U	R
8	Brownsville	688.7-689.1	WAT	08/14-08/17	12	18,310	8-688.7-RMP	S/A	C	R
9	Island 126	677.6-678.0	CM	10/15-10/23	12	23,489	9-677.7-LWP	L1/B	U	I
9	Indian Camp Light	665.5-665.8	CM	08/19-08/27	12	8,734	9-670.5-LWP	L1/A	U	*I
		665.5-665.8	CM	08/30-09/01	12	6,956	9-663.5-LWP	S/A	C	
9	Lansing Upper Light	664.4-664.8	CM	09/08-09/14	12	13,554	9-663.5-LWP	S/A	C	*I
10	McMillan Island	618.2-619.2	CM	10/05-10/07	12	6,423	10-618.7-RIT	A	C	*I

* OSIT coordination was completed prior to dredging, dredging practices were routine, placement site used was previously approved, and placement methods did not change from past practice at the site. No after action report will be completed, as all information necessary is contained in this dredging summary.

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	495,144	67,207	2,811	443,975	197,447	1,206,584
	MINN. RIVER	0	0	0	35,725	0	35,725
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	3,500	9,294	0	12,794
	NON-CHAN. MAINT.	0	0	3,780	0	0	3,780
	TOTAL	495,144	67,207	10,091	488,994	197,447	1,258,883
FISCAL YEAR	MISS. RIVER	452,816	37,596	2,811	511,091	197,447	1,201,761
	MINN. RIVER	0	0	0	45,848	0	45,848
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	3,500	13,669	0	17,169
	NON-CHAN. MAINT.	0	0	3,780	0	0	3,780
	TOTAL	452,816	37,596	10,091	570,608	197,447	1,268,558

1998 Beneficial Use Update	
Total Beneficial Use	1,011,867
Total Quantity Dredged	1,258,883
Beneficial Use Quantity	80%
Total Jobs With Beneficial Use	37
Total Jobs	48
Beneficial Use Jobs	77%

1999 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YARDS	PLCMT. SITE LOC.&TYPE	CATE-GORY	CLASS	JOB TYPE
MN	Peterson's Bar	11.7-12.4	CM	10/07-10/13	12	8,000	MN-12.1-RMP	S/B	U	*I
U	Turning Basin	857.1-857.4	DUBQ	10/06-10/19	12	7,174	U-856.6-RMP	S/A	U	*I
U	Above Lowry Ave. Br.	856.4-857.1	DUBQ	09/17-10/05	12	12,729	U-856.6-RMP	S/A	U	*I
		856.4-857.1	DUBQ	10/20-11/01	12	8,040	U-856.6-RMP	S/A	U	
1	Above Lake Street	850.0-850.3	CM	09/09-09/17	12	6,150	1-853.2-LMP	S/A	U	*I
2	St. Paul Barge Terminal	837.1-837.6	CM	06/14-06/28	13	24,931	2-836.3-RMP	S/L1/A	U	R
2	Pine Bend	823.6-824.4	CH	10/12-10/20	12	34,114	2-822.5-LMP	L1/B	C	R
2	Boulanger Bend	820.5-821.3	CH	09/22-10/10	12	128,285	2-822.5-LMP	L1/B	C	R
2	Boulanger Bend Lower Lt.	819.9-820.5	CH	09/12-09/22	12	55,232	2-822.5-LMP	L1/B	C	R
2	Freeborn Island	818.3-819.4	CH	08/19-09/11	12	100,487	2-822.5-LMP	L1/B	C	R
		819.1-819.2	CM	10/05-10/05	12	1,829	2-823.8-RMP	S/B	U	
4	Crats Island	758.9-759.3	WAT	07/08-07/14	12	25,768	4-759.3-LWT	L1/B	C	*I
4	Grand Encampment	755.8-756.0	CM	06/30-07/08	12	10,672	4-754.0-LWP	S/A	U	R
		756.2-756.7	WAT	07/01-07/07	12	33,512	4-756.5-LWT	L1/A	C	
4	Beef Slough	754.0-754.4	CM	07/08-07/19	12	20,631	4-754.0-LWP	S/A	U	*I
5	Minneiska	742.3-742.6	CM	11/11-11/13	12	10,977	5-744.7-LWT	L3/A	C	R
5A	Betsy Slough	731.1-731.4	WAT	06/21-06/30	13	51,308	5A-731.9-LWP	S/A	C	R
		731.8-731.9	GM	07/07-07/13	12	2,265	5A-731.9-LWP	S/A	C	
7	Head of Dresbach Is.	704.5-705.2	CM	08/09-08/20	12	36,409	7-713.1-RMP	S/B	U	*I
7	Lower Dresbach Is.	703.5-703.7	CM	07/21-08/06	12	16,303	7-713.1-RMP	S/B	U	*I
8	Brownsville	688.7-689.2	WAT	10/21-10/29	13	29,656	8-688.7-RMP	S/A	C	*I
8	Head of Raft Channel	687.6-688.2	WAT	10/14-10/21	13	26,355	8-688.7-RMP	S/A	C	R
9	Indian Camp Light	665.6-665.8	CM	10/06-10/19	12	15,014	9-670.5-LWP	L1/A	U	*I
9	Lansing Upper Light	664.3-664.7	CM	09/26-10/06	12	20,464	9-663.5-LWP	S/A	C	*I
10	McMillan Island	618.0-619.1	CM	09/13-09/25	12	28,951	10-618.7-RIT	A	C	*I

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	166,599	27,943	2,265	192,331	318,118	707,256
	MINN. RIVER	0	0	0	8,000	0	8,000
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	0	0	0
	TOTAL	166,599	27,943	2,265	200,331	318,118	715,256
FISCAL YEAR	MISS. RIVER	152,916	38,990	2,265	216,916	216,486	627,573
	MINN. RIVER	0	0	0	0	0	0
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	0	0	0	0
	TOTAL	152,916	38,990	2,265	216,916	216,486	627,573

1999 Beneficial Use Update	
Total Beneficial Use	686,305
Total Quantity Dredged	715,256
Beneficial Use Quantity	96%
Total Jobs w/Beneficial Use	20
Total Jobs	21
Beneficial Use Jobs	95%

* OSIT coordination was completed prior to dredging, dredging practices were routine, placement site used was previously approved, and placement methods did not change from past practice at the site. No after action report will be completed, as all information necessary is contained in this dredging summary.

1999 Non-Channel Dredging / Rock Work Summary - St. Paul District							
Pool		River Mile(s)	Work Dates	Equip	Cubic Yards Dredged	Rock (Tons)	Placement Site
2	Upper Boulanger Bend Excavation	2-821.5-LMT	12/2/99 - 12/15/99	CH	80000	0	2-822.5-LMP
2	Lower Boulanger Bend Excavation	2-821.1-LMT	10/21/99 - 12/1/99	CH	230300	0	2-822.5-LMP
3	L/D 3 Storage Yard Bank Stabilization	796.9L	5/4/99 - 5/5/99	GM	0	300	N/A
4	L/D 4 Storage Yard Bank Stabilization	752.8L	5/7/99 - 5/10/99	GM	0	200	N/A
4	L/D 4 Auxillary Lock Dredging	752.8	7/26/99 - 8/10/99	GM	3800	0	4-754.0-LWP
4	Peterson Lake Erosion Protection	754.6R	5/6/99	GM	0	100	N/A
5	Pool 5 Channel Management Study Totals - 1999	738.1 - 752.8	9/23/99 - 11/12/99	GM	3740	22215	N/A
5	Wing Dam Notching (11 of 14)	739.8 - 751.8	9/23/99 - 9/30/99	GM	3740	0	N/A
5	Head of West Newton Chute, Is. 42 Stabilization	750R	11/1/9 - 11/12/99	GM	0	2462	N/A
5	Wing Dam #84 Rehabilitation & Extension	746.6R	9/27/99 - 11/12/99	GM	0	985	N/A
5	Roebuck's Run Bank Protection	746.6L	9/27/99 - 11/12/99	GM	0	7695	N/A
5	Roebuck's Run Day Mark Wing Dam & Liner Fortification	746.6L	9/27/99 - 11/12/99	GM	0	6669	N/A
5	Wing Dam #85 Rehabilitation & Extension	746.4R	9/27/99 - 11/12/99	GM	0	554	N/A
5	CP Railroad Embankment Stabilization (Below MN-14)	742.4R	Jul-99	GM	0	3,850	N/A
5A	Island 58 Mitigation	5A-734.5-LWE	10/7/99 - 10/15/99	GM	500	0	5A-734.5-LWE
8	Above Brownsville Excavation	8-690.4-LWT	11/2/99 - 11/15/99	WAT	60000	0	8-688.7-RMP
8	Pool 8 Channel Management Study Totals - 1999	683.5 - 694.0	5/26/99 - 5/27/99	GM	150	0	N/A
8	Wing Dam #15 (Root River) Notching	694.0R	5/26/99 - 5/27/99	GM	150	0	N/A
8	Brownsville Reshaping	8-688.7-RMP	10/99 - 11/99	GM	0	0	8-688.7-RMP
8	I-94 Boat Landing Stabilization & Protection (FWS/EMP)	701.6R	6/1/99 - 6/4/99	GM	0	600	N/A
9	Lansing Harbor Breakwater Repair	663.5R	5/18/99 - 5/25/99	GM	0	800	N/A
10	Frenchtown Lake Access Notching	620.5R	3/9/99	CM	25	0	N/A

Total quantities by equipment:

Government Hydraulic - THOMPSON (WAT) =	60,000	0
Government Hydraulic - DUBUQUE (DUBQ) =	0	0
Government Mechanical - HAUSER/WADE (GM) =	8,190	23,661
Contract Hydraulic - (CH) =	310,300	0
Contract Mechanical - (CM) =	25	0
Total Quantities =	**378,515**	**23,661**

2000 DREDGING SUMMARY - ST. PAUL DISTRICT

POOL	LOCATION	RIVER MILE	EQUIP.	DATE	DEPTH	CUBIC YARDS	PLCMT. SITE LOC.&TYPE	CATE-GORY	CLASS	JOB TYPE
MN	Petersons Bar	11.7-12.4	CM	04/24-05/01	12	14,516	MN-12.1-RMP	S/B	U	*I
MN	Cargill Slip	12.6-13.6	CM	05/01-05/02	12	3,902	MN-12.1-RMP	S/B	U	R
MN	Above Savage RR Br.	14.5-14.7	CM	05/02-05/08	12	7,594	MN-12.1-RMP	S/B	U	*I
1	Lower Appch. LSAF	853.2-853.3	CM	10/20-10/23	13	1,000	1-853.2-LMP	S/A	U	R
1	Below Franklin Ave. Br.	850.7-851.1	CM	08/28-09/12	12	17,049	1-853.4-LMP	L1/B	U	R
1	Upper Appch. L/D 1	847.9-848.3	CM	05/09-05/11	12	7,330	1-853.2-LMP	S/A	U	*I
		847.9-848.3	CM	09/18-10/19	12	27,847	1-853.4-LMP	L1/B	U	
2	SBH - St. Paul	839.6	CM	04/17-04/20	6	5,840	2-840.4-RMP	S/A	U	R
2	Above Wabasha St. Br.	839.5-839.6	CM	08/02-08/02	12	485	2-836.3-RMP	S/L1/A	C	*E
2	St. Paul Barge Terminal	837.1-837.6	CM	04/04-04/13	13	27,333	2-836.3-RMP	S/L1/A	C	R
		837.1-837.6	WAT	06/15-07/14	13	136,250	2-836.3-RMP	S/L1/A	C	
3	Smith Bar	805.1-805.4	CM	05/18-05/20	12	4,159	3-799.2-RMT	S/B	C	R
3	Coulters Island	801.5-801.9	CM	03/25-03/28	12	8,869	3-799.2-RMT	S/B	C	*I
		801.5-801.9	CM	05/15-05/17	12	10,495	3-799.2-RMT	S/B	C	
4	Cannon River	792.7-793.0	CM	05/21-06/06	12	24,047	4-791.6-RMP	S/A	U	R
4	Head of Lake Pepin	784.6-785.4	CM	06/07-06/23	12	33,946	4-791.6-RMP	S/A	U	R
4	Chippewa Delta	763.2	WAT	05/18-06/12	9	270,432	4-762.7-LWT	L1/S/A	C	R
4	Crats Island	758.9-759.3	WAT	07/28-08/01	12	22,067	4-759.3-LWT	L1/B	C	*I
4	Teepeeota Point	757.3-757.9	WAT	08/02-08/10	12	65,505	4-757.5-LW	A	C	*I
4	Grand Encampment	756.0-756.8	CM	06/26-06/29	12	5,731	4-754.0-LWP	S/A	U	R
5	Below West Newton	746.4-746.7	WAT	05/09-05/10	12	10,126	5-745.8-RMT	L3/A	C	R
5	Fisher Island	744.8-745.4	WAT	05/10-05/17	12	42,487	5-745.8-RMT	L3/A	C	R
5	Lower Zumbro	744.1-744.4	CM	07/05-07/11	12	10,559	5-744.7-LWT	L3/A	C	R
5	Minneiska	742.2-742.6	CM	07/12-07/25	12	27,707	5-744.7-LWT	L3/A	C	R
5A	Betsy Slough	731.2-731.3	WAT	07/24-07/26	13	22,749	5A-731.9-LWP	S/A	C	*I
6	SBH - Winona	726.1	GM	05/03-05/04	6	700	6-726.0-LMP	S/A	U	R
6	Upper Appch. L/D 6	714.5-714.6	CM	08/03-08/04	11	1,466	7-713.1-RMP	S/B	U	R
7	Lower Dresbach Is.	703.5-703.7	CM	07/31-08/03	12	5,054	7-713.1-RMP	S/B	U	*I
8	Root River	693.5-693.7	GM	06/24-06/25	12	2,400	8-690.3-RMP	L1/A	O	*I
		693.5-693.7	CM	08/07-08/14	12	13,093	8-696.1-LWP	S/A	U	
8	Above Brownsville	689.8-690.5	WAT	08/14-08/16	13	43,048	8-690.4-LWT	S/A	C	R
9	Lansing Upper Light	663.8-664.3	CM	08/15-09/12	12	38,108	9-663.5-LWP	S/A	C	R

		WAT	DUBQ	GM	CM	CH	TOTAL
CALENDAR YEAR	MISS. RIVER	612,664	0	2,400	264,278	0	879,342
	MINN. RIVER	0	0	0	26,012	0	26,012
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	700	5,840	0	6,540
	TOTAL	612,664	0	3,100	296,130	0	911,894
FISCAL YEAR	MISS. RIVER	668,675	18,564	2,400	285,726	101,632	1,076,997
	MINN. RIVER	0	0	0	34,012	0	34,012
	ST. CROIX RIVER	0	0	0	0	0	0
	HARBORS	0	0	700	5,840	0	6,540
	TOTAL	668,675	18,564	3,100	325,578	101,632	1,117,549

2000 Beneficial Use Update	
Total Beneficial Use	846,389
Total Quantity Dredged	911,894
Beneficial Use Quantity	93%
Total Jobs w/Beneficial Use	27
Total Jobs	28
Beneficial Use Jobs	96%

* OSIT coordination was completed prior to dredging, dredging practices were routine, placement site used was previously approved, and placement methods did not change from past practice at the site. No After Action Report will be completed as all information necessary is contained in this dredging summary.

2000 Channel Management & Placement Site Activities Summary - St. Paul District								
Pool	Job Name / Description	Work Type (see Key)	River Mile(s)	Work Dates	Equip	Cubic Yards Dredged	Rock (Tons)	Placement Site
2	Pine Bend	EX	823.8-LMT	5/1 - 6/20/00	CH	407,000	N/A	822.5-LMP
2	Upper Boulanger Bend	EX	821.5-LMT	4/5 - 4/26/00	CH	149,500	N/A	822.5-LMP
4	Alma Marina	LS	754.0-LWP	10/11 - 11/1/00	CT/MR	0	0	N/A
5	Pool 5 Channel Management Study Totals - 2000		738.1 - 752.8	4/25 - 8/09/00	MR	0	3,075	N/A
5	Head of West Newton Chute, Is. 42	BS	750.0-R	4/25 - 4/27/00	MR	0	340	N/A
5	Wing Dam #9 at Belvidere Slough	WD	748.1-L	4/25 - 4/27/00	MR	0	510	N/A
5	Belvidere Slough/Probst Lake	BS	748.0-L	7/28 - 8/9/00	MR	0	2,225	N/A
5	Weaver Modifications - MN-4&5	IS/RE	745.4-R	8/17 - 8/21/00	MR	0	0	N/A
5	Lost Island (NRM)	BS	744.7-LWT	7/31 - 8/10/00	MR	200	1,140	744.7-LWT
5A	Wilds Bend	EX	730.5-LWT	6/8 - 11/7/00	CH	500,000	0	Polander EMP Is, Mathy Pit #2
7	Trempealeau	LS	714.1-LWP	10/5 - 11/1/00	MR	0	0	N/A
7	Dakota Island	EX	706.5-RMT	9/13 - 11/1/00	CM	97,400	0	713.1-RMP
8	Above Brownsville	EX	690.4-LWT	10/20 - 11/13/00	WAT	110,100	0	688.7-RMP
8	Pool 8 Channel Management Study Totals - 2000		683.5 - 694.0	5/16 - 7/24/00	MR	16,800	14,996	N/A
8	Island 116	IS/BS	690.2R	5/16 - 7/21/00	MR	16,500	14,996	N/A
8	Revetment Notching	WD	683.5R	7/24/00	MR	300	0	N/A

Key

BS	Bank Stabilization	CH	Contract Hydraulic
CL	Closure	CM	Contract Mechanical
EX	Excavation	CT	Contract or Purchase Order
IS	Island	DUBQ	COE Dredge Dubuque
LS	Landscaping	MR	COE Maintenance & Repair Unit
RE	Reshaping	WAT	COE Dredge William A Thompson
WD	Wing Dam		

TAB 3

DREDGED MATERIAL PLACEMENT SITE INFORMATION

DREDGED MATERIAL PLACEMENT SITES - April 1998

Location	GREAT Site #	Site Name	Endorsement (Notes)	Total GREAT Acres				Total CMMP Acres				Wet. Diff.
				Wetland	Disturbed Floodplain	Upland	Total	Wetland	Disturbed Floodplain	Upland	Total	
MN-13.5-RMP	MN.03	Cargill	GREAT	7.0	0.0	0.0	7.0	7	0	0	7	0.0
MN-12.1-RMP	-	Kraemer Site		0.0	0.0	0.0	0.0	0	0	5	5	0.0
MN-12.0-RMP	MN.06		GREAT (a)	0.0	0.0	24.0	24.0	0	0	0	0	0.0
MN-11.4-RMP	MN.30		GREAT	32.5	0.0	32.5	65.0	0	0	0	0	-32.5
MN-10.1-RMP	-	NSP Site		0.0	0.0	0.0	0.0	0	0	7	7	0.0
MN-7.3-RMP	-	Hwy. 77 Bridge		0.0	0.0	0.0	0.0	0	0	4	4	0.0
MN-4.5-RMP	MN.28		GREAT	0.0	0.0	18.0	18.0	0	0	0	0	0.0
			TOTALS	39.5	0.0	50.5	90.0	7	0	16	23	-32.5
SC-22.0-RMP	SC.24		GREAT	16.0	0.0	0.0	16.0	0	0	0	0	-16.0
SC-18.2-RMP	SC.18		GREAT	4.0	2.0	0.0	6.0	0	0	0	0	-4.0
SC-17.5-LWP	SC.28	Above Hudson RR Bridge	GREAT	0.0	4.0	0.0	4.0	0	0	0	0	0.0
SC-17.0-LWP	SC.22	Hudson	GREAT	1.5	0.0	1.5	3.0	0	0	0	0	-1.5
SC-16.6-LWP	SC.01	Beer Can Island	GREAT	7.0	0.0	0.0	7.0	0	0	0	0	-7.0
SC-16.-17LWP	SC.3-6	Beer Can Island	GREAT	0.0	7.0	0.0	7.0	0	0	0	0	0.0
SC-13.5-RMP	SC.21		GREAT	0.0	5.0	0.0	5.0	0	0	0	0	0.0
SC-8.5-RMP	SC.27		GREAT	2.0	0.0	0.0	2.0	0	0	0	0	-2.0
SC-6.7-LWP	SC.13	Kinnickinnic Bar Upper	GREAT	0.0	9.0	0.0	9.0	0	4	0	4	0.0
SC-6.5-LWP	SC.12	Kinnickinnic Bar Lower	GREAT	0.0	17.0	0.0	17.0	0	7	0	7	0.0
SC-0.5-RMP	SC.16	Pt. Douglas Nearshore	GREAT	2.5	0.0	0.0	2.5	0	0	0	0	-2.5
SC-0.4-RMP	SC.26	Pt. Douglas Beach	GREAT	2.5	2.5	0.0	5.0	0	0	0	0	-2.5
			TOTALS	35.5	46.5	1.5	83.5	0	11	0	11	-35.5
U-857.1-RMP	U.02		GREAT	0.0	0.0	3.0	3.0	0	0	0	0	0.0
U-856.6-RMP	-	USAF Site		0.0	0.0	0.0	0.0	0	0	7	7	0.0
U-854.7-LMP	U-03		GREAT	0.0	0.0	7.0	7.0	0	0	0	0	0.0
			TOTALS	0.0	0.0	10.0	10.0	0	0	7	7	0.0
1-853.2-LMP	1.01A	Pool 1 Site	RRF - 3/84	0.0	0.0	0.0	0.0	0	0	2	2	0.0
1-853.1-RMP	1.01		GREAT	0.0	0.0	3.5	3.5	0	0	0	0	0.0
1-851.3-LME	1.07T	Below Franklin Avenue	GREAT, RRF - 3/84	0.0	11.5	0.0	11.5	0	5	0	5	0.0
1-849.5-RME	1.03T	Below Lake Street	GREAT, RRF - 3/84	0.0	6.0	0.0	6.0	0	4	0	4	0.0
1-848.5-LME	1.02T		GREAT	0.0	4.5	0.0	4.5	0	0	0	0	0.0
			TOTALS	0.0	22.0	3.5	25.5	0	9	2	11	0.0
2-843.3-RMP	2.18		GREAT (2-1)	0.0	0.0	0.0	0.0	0	0	0	0	0.0
2-841.3-LMP	2.37		GREAT	0.0	0.0	7.0	7.0	0	0	0	0	0.0
2-840.4-RMP	2.16	Highbridge	GREAT	0.0	0.0	3.4	3.4	0	0	4	4	0.0
2-838.2-RMP	2.15	Northport	GREAT (2-2)	0.0	0.0	5.5	5.5	0	0	6	6	0.0
2-837.5-RMP	2.40	St. Paul Barge Terminal	GREAT	28.0	0.0	0.0	28.0	0	0	0	0	-28.0
2-837.2-LMP	2.02		GREAT (a)	0.0	0.0	69.0	69.0	0	0	0	0	0.0
2-836.8-RMP	2.14	Holman field	GREAT, Not Endorsed (2-3)	0.0	0.0	0.0	0.0	0	0	0	0	0.0
2-836.3-RMP	2.13	Southport	GREAT	18.0	0.0	0.0	18.0	18	0	0	18	0.0
2-832.5-RMP	2.10		GREAT	0.0	0.0	25.0	25.0	0	0	0	0	0.0
2-823.8-LMT	2.25T	Pine Bend		0.0	0.0	0.0	0.0	0	8	0	8	0.0
2-823.8-RMP	-	C.F. Industries	OSIT - 9/94 (b)	0.0	0.0	0.0	0.0	0	1	6	7	0.0
2-822.8-RMP	2.24	Spring Lake	RRF - 11/85 (conceptual)(b)	0.0	0.0	0.0	0.0	0	0	0	0	0.0
2-822.5-LMP	-	Shiely Pit	(2-4)	0.0	0.0	0.0	0.0	0	0	15	15	0.0
2-821.5-LMT	-	Upper Boulanger		0.0	0.0	0.0	0.0	0	4	0	4	0.0

DREDGED MATERIAL PLACEMENT SITES - April 1998

Location	GREAT Site #	Site Name	Endorsement (Notes)	Total GREAT Acres				Total CMMP Acres				Wet. Diff.
				Wetland	Disturbed Floodplain	Upland	Total	Wetland	Disturbed Floodplain	Upland	Total	
2-821.1-LMT	2.31T	Lower Boulanger		0.0	0.0	0.0	0.0	3	5	0	8	3.0
2-820.0-LMP	2.35		GREAT	0.0	0.0	25.0	25.0	0	0	0	0	0.0
2-815.4-RMP	2.30		GREAT	3.5	0.0	0.0	3.5	0	0	0	0	-3.5
			TOTALS	49.5	0.0	65.9	115.4	21	18	31	70	-28.5
3-815.1-RMP	-	Hastings	RRF - 4/90	0.0	0.0	0.0	0.0	0	0	1	1	0.0
3-814.7-RMP	-	Koch		0.0	0.0	0.0	0.0	0	0	7	7	0.0
3-814.5-LMP	3.42		GREAT	8.5	0.0	0.0	8.5	0	0	0	0	-8.5
3-814.3-RMP	3.47-8		GREAT	0.0	1.5	1.5	3.0	0	0	0	0	0.0
3-813.2-RMP	3.46	Hastings Harbor	GREAT	0.0	0.0	11.0	11.0	0	0	11	11	0.0
3-811.5-LMP	3.34	Point Douglas	GREAT	4.0	0.0	6.0	10.0	4	0	6	10	0.0
3-808.4-LWP	3.27	Dry Run Slough	GREAT	31.0	0.0	0.0	31.0	13	0	0	13	-18.0
3-802.3-RME	3.14T	Morgans	GREAT	7.0	3.5	0.0	10.5	3	0	0	3	-4.0
3-801.7-LWE	3.12T	Coulters	GREAT	6.0	6.0	0.0	12.0	2	1	0	3	-4.0
3-799.8-LWP	3.09		GREAT (3-1)	35.0	0.0	0.0	35.0	0	0	0	0	-35.0
3-798.0-LWP	-	County/Private Pits	RRF - 01/97	0.0	0.0	0.0	0.0	0	0	31	31	0.0
3-799.2-RMT	3.07	Corps Island	RRF - 12/95	0.0	0.0	0.0	0.0	2	5	0	7	2.0
			TOTALS	91.5	11.0	18.5	121.0	24	6	56	86	-67.5
4-794.7-RMP	4.63	Red Wing Yacht Club	GREAT, RRF - 11/85 (4-1)	4.0	7.0	0.0	11.0	2	4	0	6	-2.0
4-791.6-RMP	4.57	Red Wing Commercial Harbo	GREAT, RRF - 11/85	0.0	0.0	16.0	16.0	2	0	11	13	2.0
4-791.5-RMP	4.54	Red Wing Harbor Site	GREAT (a)	3.0	0.0	5.0	8.0	0	0	0	0	-3.0
4-789.6-RMP	4.49		GREAT	8.0	0.0	0.0	8.0	0	0	0	0	-8.0
4-789.3-RMT	4.48		GREAT (4-2)	1.0	0.0	0.0	1.0	0	0	0	0	-1.0
4-788.5-RMP	4.47	Colvill Park	GREAT (b)	6.0	0.0	5.0	11.0	0	0	5	5	-6.0
4-785.0-RMP	4.37-8		GREAT	0.0	0.0	13.0	13.0	0	0	0	0	0.0
4-762.7-LWT	4.29T	Reads Landing	GREAT, RRF - 4/82	0.0	9.5	0.0	9.5	0	22	0	22	0.0
4-761.1-RMP	4.25	Carrels Pit	GREAT (b)	0.0	0.0	18.0	18.0	0	0	18	18	0.0
4-761.0-RMP	4.24	Wabasha Gravel Pit	GREAT, RRF - 4/82 (4-3)	10.0	0.0	50.0	60.0	10	0	76	86	0.0
4-760.2-RMP	MDNR.2	MDNR.2	RRF - 10/83 (4-4)	0.0	0.0	0.0	0.0	0	0	30	30	0.0
4-759.7-RMP	4.20		GREAT	0.0	0.0	6.4	6.4	0	0	0	0	0.0
4-759.5-RMP	4.19		GREAT (4-4)	0.0	0.0	5.7	5.7	0	0	6	6	0.0
4-759.4-RMT	4.18		GREAT	0.0	3.0	0.0	3.0	0	0	0	0	0.0
4-759.3-RMP	4.17		RRF - 10/83 (4-4)	0.0	0.0	0.0	0.0	0	3	0	3	0.0
4-759.3-LWT	4.16T	Crats Island	RRF - 3/83, 11/85	0.0	0.0	0.0	0.0	0	22	0	22	0.0
4-757.5-LW	4.13T	Teepeeota Point	GREAT, RRF - 6/83	0.0	7.5	0.0	7.5	0	46	0	46	0.0
4-756.5-LWT	4.10T	Grand Encampment	GREAT, RRF - 6/83	0.0	4.0	0.0	4.0	0	8	0	8	0.0
4-754.0-LWP	4.02	Alma Marina	GREAT, RRF - 6/83	10.3	0.0	0.0	10.3	3	4	0	7	-7.3
			TOTALS	39.3	31.0	114.1	184.4	17	109	146	272	-22.3
5-751.5-LWP	5.26	Alma Power Plant	GREAT (5-1)	15.0	0.0	0.0	15.0	0	0	0	0	-15.0
5-751.2-LWP	5.26A		GREAT (5-1)	15.0	0.0	0.0	15.0	0	0	0	0	-15.0
5-749.8-RMP	5.24	West Newton Chute	GREAT, RRF - 10/83 (5-1)	0.0	0.0	36.0	36.0	0	0	39	39	0.0
5-748.0-RMT	5.18T	Above West Newton	GREAT	0.0	27.5	0.0	27.5	0	14	0	14	0.0
5-747.5-LWP	5.28	Buffalo City	GREAT (5-1)	0.0	0.0	15.0	15.0	0	0	0	0	0.0
5-745.8-RMT	5.12T	Above Fisher Island	GREAT, RRF - 9/85	0.0	5.5	0.0	5.5	0	14	0	14	0.0
5-744.7-LWT	5.08T	Lost Island	RRF - 3/83, 9/85	0.0	0.0	0.0	0.0	0	18	0	18	0.0
5-744.0-RMP	5.30	Weaver Bottoms	GREAT, RRF - 9/85 (5-2)	76.0	0.0	0.0	76.0	108	0	0	108	32.0
			TOTALS	0.0	33.0	36.0	69.0	0	46	39	85	0.0

DREDGED MATERIAL PLACEMENT SITES - April 1998

Location	GREAT Site #	Site Name	Endorsement (Notes)	Total GREAT Acres				Total CMMP Acres				Wet. Diff.
				Wetland	Disturbed Floodplain	Upland	Total	Wetland	Disturbed Floodplain	Upland	Total	
5A-738.2-RMP	5A.36	L/D 5 Site	GREAT, RRF - 6/83	1.0	1.0	0.0	2.0	1	1	0	2	0.0
5A-737.5-RMP	5A.23	Bass Camp	GREAT, RRF - 10/83, 12/86	7.0	0.0	0.0	7.0	0	0	0	0	-7.0
5A-734.5-LWE	5A.14T	Island 58	GREAT, RRF - 12/86	0.0	7.0	0.0	7.0	0	3	0	3	0.0
5A-733.5-LWP	5A.34	Ft. City Service Base	RRF - 12/86	0.0	0.0	0.0	0.0	2	0	0	2	2.0
5A-731.9-LWP	5A.25	Fountain City 1	GREAT, RRF - 10/83	0.0	6.0	0.0	6.0	0	6	0	6	0.0
5A-731.8-LWP	5A.32	Fountain City 2	GREAT, RRF - 10/83	34.0	0.0	0.0	34.0	0	0	0	0	-34.0
5A-730.5-LWT	5A.08T	Wilds Bend	GREAT, RRF - 3/84	5.0	4.0	0.0	9.0	0	8	0	8	-5.0
			TOTALS	47.0	18.0	0.0	65.0	3	18	0	21	-44.0
6-726.3-RMP	-	Winona Commercial Harbor		0.0	0.0	0.0	0.0	0	0	6	6	0.0
6-726.0-LMP	6.27	Winona Harbor	GREAT	0.0	0.5	0.0	0.5	0	1	0	1	0.0
6-724.6-RMP	6.20		GREAT	0.0	2.5	0.0	2.5	0	0	0	0	0.0
6-724.5-RMP	6.19		GREAT	0.0	2.5	0.0	2.5	0	0	0	0	0.0
6-723.3-RMP	6.17	Winona Industrial Park	GREAT (b)	0.0	0.0	0.0	0.0	0	0	0	0	0.0
6-720.5-RMP	6.11	Homer	GREAT	9.0	2.0	0.0	11.0	8	2	0	10	-1.0
			TOTALS	9.0	7.5	0.0	16.5	8	3	6	17	-1.0
7-714.1-LWP	7.06	Trempealeau	GREAT, RRF - 3/84	21.0	0.0	0.0	21.0	5	0	0	5	-16.0
7-713.1-RMP	7.05	Hot Fish Shop	GREAT, RRF - 3/84	12.0	0.0	0.0	12.0	0	3	0	3	-12.0
7-708.7-LWE	7.11T	Winters Landing	GREAT	0.0	1.5	0.0	1.5	1	1	0	2	1.0
7-707.3-RMP	7.25A	Dakota Boat Ramp	RRF - 3/84, 6/86	0.0	0.0	0.0	0.0	5	0	0	5	5.0
7-706.5-RMT	7.12T	Dakota Island	GREAT, RRF - 6/86	0.0	6.4	0.0	6.4	0	8	0	8	0.0
7-705.2-RMP	7.01		GREAT	0.0	1.2	0.0	1.2	0	0	0	0	0.0
7-702.5-RMP	7.20	L/D 7 Site	GREAT, RRF - 3/84 (7-1)	0.0	0.0	1.7	1.7	0	0	0	0	0.0
			TOTALS	33.0	9.1	1.7	43.8	11	12	0	23	-22.0
8-700.0-RMP	8.28		GREAT	4.0	0.0	0.0	4.0	0	0	0	0	-4.0
8-695.7-LWP	8.06	Isle La Plume	GREAT, RRF - 10/83 (8-1)	0.0	44.0	0.0	44.0	0	0	9	9	0.0
8-690.4-LWT	8.17T	Above Brownsville	GREAT	0.0	8.5	0.0	8.5	0	14	0	14	0.0
8-688.7-RMP	8.30	Brownsville Containment	GREAT, RRF - 3/84	33.0	22.0	0.0	55.0	17	17	2	36	-16.0
8-684.7-LWP	8.22	Stoddard	GREAT	0.0	0.0	4.0	4.0	0	0	0	0	0.0
			TOTALS	37.0	74.5	4.0	115.5	17	31	11	59	-20.0
9-678.0-RME	9.21T	Island 126	GREAT	0.0	10.0	0.0	10.0	0	0	0	0	0.0
9-677.7-LWP	9.15	Genoa Power Plant	GREAT, RRF - 6/86	0.0	0.0	1.0	1.0	0	0	2	2	0.0
9-676.5-RME	9.20T	Twin Island	GREAT	16.0	14.0	0.0	30.0	0	0	0	0	-16.0
9-671.8-LWP	9.11	Gantenbein	GREAT	4.5	0.0	0.5	5.0	0	0	0	0	-4.5
9-671.3-LWP	9.33		GREAT	13.0	0.0	0.0	13.0	0	0	0	0	-13.0
9-670.5-LWP	9.55	Blackhawk Park	RRF - 6/86	0.0	0.0	0.0	0.0	41	7	21	69	41.0
9-667.5-LWP	9.07	Desoto	GREAT, RRF - 6/86 (9-1)	13.0	0.0	0.0	13.0	0	0	0	0	-13.0
9-665.8-RIE	9.18T	Indian Camp Light	GREAT	2.7	0.0	0.0	2.7	0	3	0	3	-2.7
9-664.3-RIT	9.17T	Lansing	GREAT (9-2)	0.0	4.0	0.0	4.0	0	9	0	9	0.0
9-663.5-RIP	9.26		GREAT	22.0	0.0	0.0	22.0	0	0	0	0	-22.0
9-663.5-LWP	9.50T	Lansing Hwy Bridge	RRF - 12/92	0.0	0.0	0.0	0.0	5	0	0	5	5.0
9-663.0-RIP	9.03		GREAT	0.0	0.0	4.1	4.1	0	0	0	0	0.0
9-662.2-RIP	9.28		GREAT, Not Endorsed (9-3)	33.0	0.0	0.0	33.0	0	0	0	0	-33.0
9-660.0-RIP	9.47		GREAT	0.0	0.0	1.0	1.0	0	0	0	0	0.0
9-652.3-LWP	9.41	Lynxville	GREAT	4.0	0.0	4.5	8.5	0	0	0	0	-4.0
			TOTALS	75.2	28.0	11.1	114.3	46	19	23	88	-29.2

DREDGED MATERIAL PLACEMENT SITES - April 1998

Location	GREAT Site #	Site Name	Endorsement (Notes)	Total GREAT Acres				Total CMMP Acres				Wet. Diff.
				Wetland	Disturbed Floodplain	Upland	Total	Wetland	Disturbed Floodplain	Upland	Total	
10-647.1-LWP	10.17	Varo Property	GREAT, RRF - 9/85	2.0	0.0	1.5	3.5	2	0	2	4	0.0
10-646.5-LWP	10.16	Gordon Bay Landing	GREAT	6.0	0.0	0.0	6.0	0	0	0	0	-6.0
10-644.5-RIE	10.22T	Jackson Island	GREAT (10-1)	0.0	0.0	3.0	3.0	0	0	3	3	0.0
10-643.5-LWI	-	Jackson Rehandle	RRF - 9/85	0.0	0.0	0.0	0.0	3	0	0	3	3.0
10-642.4-LWP	10.40	Mississippi Gardens	GREAT, RRF - 9/85	0.0	0.0	25.8	25.8	0	0	4	4	0.0
10-635.5-LWP	10.42	Proposed Boat Harbor	RRF - 4/82 (10-2)	0.0	0.0	0.0	0.0	0	0	0	0	0.0
10-635.0-LWP	10.43	Prairie Municipal Dock	RRF - 4/82 (10-3)	0.0	0.0	0.0	0.0	0	5	0	5	0.0
10-634.6-RIP	10.41		GREAT	4.5	0.0	0.0	4.5	0	0	0	0	-4.5
10-628.0-LWP	10.01	Wyalusing Pit	GREAT, RRF - 9/85 (10-4)	0.0	0.0	8.2	8.2	0	0	6	6	0.0
10-627.8-LWP	10.24	Wyalusing Beach	RRF - 9/85 (10-5)	0.0	0.0	0.0	0.0	0	2	0	2	0.0
10-618.8-RIP	10.04	Esmann Island	GREAT, RRF - 9/85	8.2	0.0	0.0	8.2	0	0	0	0	-8.2
10-618.7-RIT	10.18	McMillan Island	RRF - 9/95	0.0	0.0	0.0	0.0	2	3	0	5	2.0
10-618.0-RIP	-	Buck Creek	RRF - 9/95	0.0	0.0	0.0	0.0	2	0	8	10	2.0
10-616.0-RIP	10.03		GREAT (a)	0.0	0.0	10.0	10.0	0	0	0	0	0.0
10-615.5-RIP	10.02		GREAT	0.0	0.0	5.5	5.5	0	0	0	0	0.0
			TOTALS	20.7	0.0	44.0	64.7	9	10	23	42	-11.7

NOTES:

General - Some dredge cuts in several Pools are no longer being considered. Therefore, sites recommended for placement of that material will not be considered.

(a) This site is in the original GREAT I plan but is no longer available, not needed, or could be a conditional substitute depending on future development. Acreages affected are listed in the table but not included in totals.

(b) This site has potential for use and would supplement the CMMP and provide greater longevity to the recommended sites. No wetland impacts are shown on this site because it is either upland or it has wetlands that the landowner is responsible for providing any permits or mitigation required prior to filling.

(2-1) Landowner has offered to unload barges with his own equipment and stockpile it on site with his own conveyor equipment at a cost to the government. This cost has prohibited use of the site.

(2-2) This site was filled to capacity and developed before the GREAT I plan was finished.

(2-3) Placement of material at this site is conditional upon landowner meeting all Federal, State, and local regulatory agreements (this does not indicate GREAT I approval of the airport expansion). The area was described as 80 acres of type 1 & 2 wetlands and 30 acres of type 3 & 4 wetlands. Actual acreages affected are not listed in the table nor included in acreage totals. After placement in 1996, the Metropolitan Airports Commission stated that no more material would be accepted. Use of the second priority site will be pursued.

(2-4) This pit site has much more capacity than the entire 40 year dredging projection in Lower Pool 2. For planning, capacity will be listed as the 40 year projected dredging quantity.

(3-1) This site has been developed.

(4-1) The Upper Pool 4 Recon. Report recommended 7 acres. Based on a 1995 OSIT meeting, the landowner will only allow use of 6 acres or less.

(4-2) Endorsed as an unloading site only. Volume 8 of the GREAT I report identifies an 8 acre area described as Type 1&2 wetland but we believe only a one acre area would be required.

(4-3) GREAT I identified the area as 60 acres. This has been revised to 80 acres based on real estate purchased by the Corps.

(4-4) Filled to capacity during Crats Island Excavation in 1987.

(5-1) Only one of these sites was selected in order of preference: 5.26A, 5.24, 5.26, and 5.28. The Corps selected site 5.24 after further study. Acreages affected for sites 5.26, 5.26A, and 5.28 are listed in the table but not included in totals.

(5-2) GREAT I identified 76 acres of type 4 & 5 wetlands and 32 acres of upland. The effects of the Weaver Bottoms project have been assessed under a separate environmental document, acres affected are shown for the site but are not included in totals.

(7-1) GREAT I incorrectly identified 1.7 acres as bottomland forest which would have been wetlands. This was changed to 1.7 acres of disturbed terestrial. Access to this site for unloading dredged material made this site unacceptable. A storage building has been constructed on site and the area is unavailable.

(8-1) Reconaissance Report identified 4 acres. This has been revised to 9 acres based on real estate agreement with LaCrosse, WI.

(9-1) Reconnaissance Report identified use of 4 acres. Development at this site has occured without placement from dredging operations. Placement that would have gone to this site will be placed at site 9-670.5-LW.

(9-2) GREAT I acres = 4 which did not include dikes. We have identified the area to its full boundary. GREAT I also identified 1 acre of wetland which has been changed to upland.

(9-3) This site was selected by GREAT I but not endorsed. Material would be placed at the site if the marina is developed. Acerages affected are shown for the site but are not included in totals.

(10-1) GREAT I incorrectly identified 3 acres as wetlands. The area is upland and has been changed to disturbed terestrial.

(10-2) This site has been filled by the landowner.

(10-3) Dredging in the East Channel has been deferred and development of this site may not be required.

(10-4) The size of the area was scaled off maps based on descriptions in the minutes of the 4/82 RRF meeting. Due to low volume and frequency, limited traffic, and presence of endangered species, dredging in cut 6 and development of this site is not anticipated. If future dredging requires use of this site, boundaries and details for use will be established through OSIT process.

(10-5) Reconnaissance Report recommended 6 acres. Because of the low frequency of dredging at cut 3, development of this site is not anticipated. If future dredging requires use of this site, boundaries and details for use will be established through OSIT process. Other than location on GREAT I map, no information could be found documenting the size of the area. The 2 acres were scaled off a map of the beach.

COMPARISON OF ACRES
CMMP vs GREAT

April 1998

	CMMP				GREAT				WETLAND
Pool	Wetland	Dist. Floodplain	Upland	Total	Wetland	Dist. Floodplain	Upland	Total	DIFFERENCE
MN	7.0	0.0	16.0	23.0	39.5	0.0	50.5	90.0	-32.5
SC	0.0	11.0	0.0	11.0	35.5	46.5	1.5	83.5	-35.5
U	0.0	0.0	7.0	7.0	0.0	0.0	10.0	10.0	0.0
1	0.0	9.0	2.0	11.0	0.0	22.0	3.5	25.5	0.0
2	21.0	18.0	31.0	70.0	49.5	0.0	65.9	115.4	-28.5
3	24.0	6.0	56.0	86.0	91.5	11.0	18.5	121.0	-67.5
4	17.0	109.0	146.0	272.0	39.3	31.0	114.1	184.4	-22.3
5	0.0	46.0	39.0	85.0	0.0	33.0	36.0	69.0	0.0
5A	3.0	18.0	0.0	21.0	47.0	18.0	0.0	65.0	-44.0
6	8.0	3.0	6.0	17.0	9.0	7.5	0.0	16.5	-1.0
7	11.0	12.0	0.0	23.0	33.0	9.1	1.7	43.8	-22.0
8	17.0	31.0	11.0	59.0	37.0	74.5	4.0	115.5	-20.0
9	46.0	19.0	23.0	88.0	75.2	28.0	11.1	114.3	-29.2
10	9.0	10.0	23.0	42.0	20.7	0.0	44.0	64.7	-11.7
TOTALS	**163.0**	**292.0**	**360.0**	**815.0**	**477.2**	**280.6**	**360.8**	**1118.6**	**-314.2**

Total CMMP Wetland Acres = **163**

Total GREAT Wetland Acres = **477** (Rounded)

Wetland Difference = **-314** (Reduction in wetland acres from the GREAT CMP)

RECREATION BEACH SITES

April 1996

REC. BEACH LOCATION	SITE PRIORITY	ESTIMATED CAPACITY (CY)	DEPTH OF FILL (FT)	AREA OF FILL (AC)	DREDGE CUT	DISTANCE TO CUT (FT)	PLACEMENT METHOD	ENDORSEMENT
2-824.1-LM	N/A	Maintain, TBD by OSIT	TBD	TBD	2/5	Adjacent	H,M	GREAT
2-827.8-RM	N/A	Maintain, TBD by OSIT	TBD	TBD	2/5	Adjacent	H,M	GREAT
2-828.1-LM	N/A	Maintain, TBD by OSIT	TBD	TBD	2/4	Adjacent	H,M	GREAT
3-907.5-RM	N/A	Maintain, TBD by OSIT	TBD	TBD	3/5	Adjacent	H,M	GREAT
3-805.5-RM	N/A	Maintain, TBD by OSIT	TBD	TBD	3/4	Adjacent	H,M	GREAT
3-802.3-RM	N/A	Maintain, TBD by OSIT	TBD	TBD	3/3	Adjacent	H,M	GREAT
3-799.4-RM	N/A	Maintain, TBD by OSIT	TBD	TBD	3/1	Adjacent	H,M	GREAT
4-789.6-RM	N/A	Redevelop, TBD by OSIT	TBD	TBD	4/7	Adjacent	H,M	GREAT
4-784.7-RM	N/A	Redevelop, TBD by OSIT	TBD	TBD	4/6	Adjacent	H,M	GREAT
4-762.4-RM	N/A	Redevelop, TBD by OSIT	TBD	TBD	4/5	Adjacent	H,M	GREAT
4-759.5-LW	N/A	Maintain w/o fill	N/A	N/A	N/A	N/A	N/A	GREAT
4-756.2-RM	N/A	Redevelop, TBD by OSIT	TBD	TBD	4/2	Adjacent	H,M	GREAT
4-753.3-RM	N/A	Redevelop, TBD by OSIT	TBD	TBD	4/1	Adjacent	H,M	GREAT
5-749.7-LW	N/A	Maintain w/o fill	N/A	N/A	N/A	N/A	N/A	GREAT
5-743.6-RM	N/A	Maintain, TBD by OSIT	TBD	TBD	5/2	Adjacent	H,M	GREAT
5-741.6-RM	N/A	Maintain, TBD by OSIT	TBD	TBD	5/1	Adjacent	H,M	GREAT
7-712.8-LW	Low	5000 or OSIT	2-3	0.9	7/6	2100'	M,Emerg. H	RRF - 8/88
7-712.1-LW	Medium	8000	2-5	2.4	7/6	Adjacent	H,M	RRF - 8/88
7-711.7-RM	Medium	Reshape/Emerg. or OSIT	2-3	2.1	7/6	Adjacent	H,M	RRF - 8/88
7-709.0-LW	Medium	15000	2-3	2.9	7/4	Adjacent	H,M	RRF - 8/88
7-706.5-LW	Medium	10000	2-3	2	7/3	Adjacent	H	RRF - 8/88
7-706.5-RM	C	Maintain, TBD by OSIT	TBD	TBD	7/3	Adjacent	H	RRF - 8/88
7-705.0-LW	Medium	15000	2-3	4.7	7/2	Adjacent	H,M	RRF - 8/88
8-694.6-RM	Medium	7000-9000	1-3	2.7	8/9	Adjacent	H,M	RRF - 8/88
8-692.5-LW	Medium	1000-2000	2-3	0.4	8/8	Adjacent	M	RRF - 8/88
8-691.6-LW	Medium	4000-8000	2-3	3.2	8/7	Adjacent	H,M	RRF - 8/88
8-690.8-RM	Low	3000-5000	2-3	1	8/6	Adjacent	Emerg. M	RRF - 8/88
8-690.5-RM	Medium	8000-12000	2-4	2.8	8/6	Adjacent	H,M	RRF - 8/88
8-690.2-LW	Low	N/A, reshape only	N/A	N/A	N/A	N/A	N/A	RRF - 8/88
8-689.2-LW	Medium	5000-9500	1-2	2	8/5	Adjacent	H,M	RRF - 8/88
8-688.5-RM	Medium	TBD	2-3	TBD	8/4	Adjacent	H,M	RRF - 8/88
8-688.2-LW	Low	N/A, reshape only	N/A	N/A	N/A	N/A	N/A	RRF - 8/88
9-678.2-RM	N/A	Emerg. or OSIT	TBD	TBD	9/9	Adjacent	H,M	RRF - 12/87
9-677.8-LW	N/A	Emerg. or OSIT	TBD	TBD	9/9	Adjacent	H,M	RRF - 12/87
9-676.7-LW	N/A	Emerg. or OSIT	TBD	TBD	9/8	Adjacent	H,M	RRF - 12/87
9-676.0-RM	N/A	Emerg. or OSIT	TBD	TBD	9/7	Adjacent	H,M	RRF - 12/87
9-671.4-RI	N/A	TBD by OSIT	TBD	TBD	9/6	Adjacent	H,M	RRF - 12/87
9-665.8-RI	N/A	TBD by OSIT	TBD	TBD	9/4	Adjacent	H,M	RRF - 12/87
9-665.3-RI	N/A	TBD by OSIT	TBD	TBD	9/4	Adjacent	H,M	RRF - 12/87
9-664.8-RI	N/A	TBD by OSIT	TBD	TBD	9/3	Adjacent	H,M	RRF - 12/87
9-664.3-RI	N/A	TBD by OSIT	TBD	TBD	9/3	Adjacent	H,M	RRF - 12/87
9-663.8-LW	N/A	TBD	TBD	TBD	9/3	Adjacent	H,M	RRF - 12/87
10-646.6-LW	High	20000	3	4.3	10/9	Adjacent	H,M	RRF - 6/86
10-645.0-RI	Medium	8000-12000	3	2.1	10/8	Adjacent	H,M	RRF - 6/86
10-644.2-LW	High	14000	3-4	2.1	10/8	Adjacent	H,M	RRF - 6/86
10-643.0-RI	Medium	10000	3-5	1.5	10/7	Adjacent	H,M	RRF - 6/86
10-637.2-LW	Low	4000	2-3	1.5	10/7	5.5 Miles	M	RRF - 6/86
10-637.2-RI	Medium	4000	2-3	1	10/7	5.5 Miles	M	RRF - 6/86
10-627.9-RI	N/A	N/A - Maintain as is	N/A	N/A	N/A	N/A	N/A	RRF - 6/86
10-627.7-RI	High	7000	3-4	1.1	10/3	Adjacent	H,M	RRF - 6/86
10-627.3-LW	Medium	6000	3-4	0.9	10/3	Adjacent	H,M	RRF - 6/86
10-626.0-RI	High	4000	3-5	0.6	10/3	8000'	M	RRF - 6/86
10-623.0-LW	High	20000	3-5	4.2	10/2	3.5 Miles	M	RRF - 6/86
10-619.5-RI	Medium	5000-9000	3-5	1.7	10/2	2000'	H,M	RRF - 6/86
10-619.0-LW	Low	4000	3-5	0.4	10/2	Adjacent	H,M	RRF - 6/86
10-618.6-LW	Medium	4000-6000	3-5	0.8	10/2	Adjacent	H,M	RRF - 6/86
10-618.6-RI	High	4000	3	0.75	10/2	Adjacent	H,M	RRF - 6/86

Key To Abbreviations:

OSIT - On-Site Inspection Team
RRF - River Resources Forum
TBD - To Be Determined

H - Hydraulic
M - Mechanical
C - Completed

NOTES:

Sites endorsed by GREAT were not given priorities and specific areas were not identified. Action Item 19 in the GREAT I Report identifies a list of recommended beach sites.

Recreation Beach Maintenance Plans for Pools 7&8 were endorsed at RRF meeting #22 on 16-17 August 1988 with the condition that "any references to minimum quantities on site plates be deleted and during implementation, OSIT notices should indicate that a beach plan site is going to be used."

Recreation Beach Maintenance Plan for Pool 9 was endorsed at RRF meeting #19 on 2 December 1987 "with a change to the recommendation for site 9-663.8-LW, which leaves it open for further consideration."

Recreation Beach Maintenance Plan for Pool 10 was endorsed at RRF meeting #13 on 23 June 1986.

RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
MN-14.8-RMP								43,500	39,515					
MN-14.5-LMP		26,000	24,000			12,800								
MN-12.1-RMP		37,800				3,800		19,764					18,201	3,870
MN-11.2-RMP									77,936					
SC-13.5-RMP						41,000								
SC-6.5-LWP											60,581			
SC-0.4-RMP				20,778										
U-857.0-RMP								145,372						
U-856.6-RMP										63,329	17,772	37,500	134,750	72,056
U-855.9-RMP	34,938													
U-855.6-RMP	4,118	75,429	32,567	30,860										
U-854.8-LMP		40,283			59,000									
1-853.4-LMP														
1-853.2-LMP												35,500	119,410	21,844
1-852.7-RMP	135,922	17,110	14,563	59,858	83,200			1,493	13,302		29,079	800		
1-851.3-LME*												(17,800)		
1-849.5-RME*								57,605				(17,700)		
2-841.3-LMP										19,818				
2-840.4-RMP	12,817	32,015	1,868		14,500	20,600		23,130	7,808	27,976			8,798	
2-838.6-LMP														
2-838.2-RMP		101,837			159,000									
2-836.8-RMP										210,938	225,793		32,199	138,655
2-836.3-RMP														
2-836.2-RMP														
2-831.0-RMP							20,000							
2-827.8-RMP		38,414												
2-827.6-LMP			7,894											
2-827.3-RMP														
2-827.1-RMP													10,698	
2-824.3-LMP														
2-823.8-LMT							8,000							
2-823.8-RMP														22,000
2-823.6-LMP		19,189												
2-823.3-LMP												17,950		
2-822.8-LMP												19,519		
2-822.5-LMP														
2-821.5-LMT*	7,239		13,265											
2-821.1-LMT*														
2-815.1-RMP														
JL SHIELY	6,574													
2-814.7-RMP														
3-813.2-RMP										5,500				
3-799.9-LWP												34,771	3,174	

* = Site has been excavated.

NA = Site not selected in the CMMP.
No capacity computation will be made for these sites.

RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
3-799.2-RMT*												4,800		
3-800.0-LWP														
4-796.8-LWP														
4-795.7-LWP														
4-794.7-RMP	32,645													
4-791.6-RMP														
4-791.5-RMP				3,282				28,000						
4-789.3-RMT												13,150		
4-788.5-RMP														12,791
4-766.9-LWP						2,000								
4-762.7-LWT*	94,297		11,206	133,852	130,300	9,000	88,500	149,000	43,434		(1,279,000)			382,816
4-762.6-RMP									14,765					
4-762.5-LWP				6,400										
4-762.3-LWP	11,000													
4-761.1-RMP								61,055						
4-761.0-RMP										370,000	1,505,878			
4-760.5-RMP					1,200								1,427,000	
4-759.7-RMP											42,830			
4-759.5-RMP			17,749	90,004										
4-759.3-LWT*	100,371				134,300		52,200	139,412	101,541	90,752	38,589	209,517	(1,427,000)	
4-759.0-RMP	10,000													
4-757.6-LWP												275		
4-757.5-LW	41,922				74,700					61,428		54,827	20,741	
4-756.5-LWT*						10,300				37,863	20,026	5,850		
4-754.0-LWP		5,657	3,671			9,800			110,470		10,000		22,804	2,160
5-752.2-RMP														
5-749.3-RMP								4,573						
5-748.2-RMP	8,324													
5-748.0-RMT				34,590	35,200	1,600		46,419						
5-747.4-RMP														
5-746.5-RMP	16,226													
5-745.8-RMT*			19,740	45,437	55,600			28,147	29,477	24,384		82,532	(782,000)	37,810
5-745.4-LWP	13,933													
5-744.7-LWT*	13,666	6,751			19,900	10,300			84,377	60,405		(395,205)	24,622	
5-744.0-RMP		45,000										585,000	782,000	
5-743.9-LWP														
5A-735.8-RMP											1,000			
5A-734.6-RMP	16,112													
5A-734.5-LWE		17,913									957			
5A-734.1-LWP	20,000													
5A-732.0-LWP				17,866	17,000	20,200	13,200							
5A-731.9-LWP		10,526		3,998		29,200	14,060	25,945		7,646				7,853
5A-731.5-RMP														

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RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
5A-731.3-LWP						1,500								
5A-730.5-LWT*		14,534		26,188					94,380	(281,485)	66,289	39,426		
5A-729.4-RMP														
5A-729.0-RMP														
5A-728.7-RMP												150		
6-726.3-RMP														
6-726.2-RMP											4,526			
6-726.0-LMP	15,345	2,167	292		500	5,100	1,240		6,755		661	4,050	760	
6-723.6-RMP											24,837			
6-723.5-RMP														
6-723.4-RMP		18,000												
6-723.3-RMP		19,591								300,000				
6-720.5-RMP												18,845		
7-714.1-LWP			6,062			8,200		61,937			45,736	59,881		500
7-713.1-RMP														
7-711.8-RMP	41,597													
7-706.5-RMT	7,428			6,612			24,200			14,935		47,607		
7-705.5-RMP							2,100							
7-705.2-RMP			29,453	28,420										
7-705.1-RMP														
7-705.0-LMP		7,600		7,614										
7-704.9-RMP														
7-704.6-RMP							11,300				2,250			
7-703.0-LWP													2,409	
8-700.1-RMP												30,000		
8-700.0-RMP		18,248								5,500				
8-699.7-RMP										3,000				
8-699.3-RMP										17,976				
BR-1.1-RWP														
8-697.7-LWP												11,000		
8-696.1-LWP		14,047						17,366				10,915		23,313
8-691.6-LWP														
8-690.4-LWT*	23,411			11,667							39,730	34,872		
8-690.3-RMP														
8-689.2-LWP														
8-689.0-RMP														
8-688.7-RMP			23,973				69,600	28,640	39,873	15,167	50,838	44,744	18,153	
8-688.2-RMP														
8-688.0-LWP														
8-687.0-RMP														
8-686.7-RMP														
8-679.1-LWP		4,167												
9-677.7-LWP														

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RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
9-677.2-LWP								5,638						
9-676.5-RME		6,200												
9-670.5-LWP						6,400	10,400			12,000	7,250			122,322
9-669.2-RIP														
9-665.7-RIP													21,101	
9-665.2-RIP				6,130						13,939				
9-664.3-RIT*				57,294						77,154			(91,000)	(117,000)
9-664.0-RIP								36,833						
9-663.5-LWP										12,257	20,259			
9-663.0-RIP										12,042			91,000	
9-662.6-RIP						35,000	19,500							
9-662.2-RIP									30,841					
10-647.1-LWP							7,500							
10-644.5-RIE	38,322									1,500				
10-643.1-LWP		25,934												
10-635.0-LWP		104,932												
10-628.0-LWP				34,824										
10-619.3-RIP												6,895		
10-618.8-RIP						4,500	45,400	68,688			67,095			
10-618.7-RIT														
10-618.2-LIP														
WARROAD									43,000					
ZIPPLE BAY														
TOTALS	706,207	709,344	206,303	625,674	784,400	231,300	387,200	992,517	737,474	1,184,024	1,002,976	979,671	437,820	730,990

* = Site has been excavated.
NA = Site not selected in the CMMP.
No capacity computation will be made for these sites.

RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Net Placed	Est. Remaining Capacity
MN-14.8-RMP													83,000	NA
MN-14.5-LMP													63,000	NA
MN-12.1-RMP	12,478		3,515	11,007	12,542		30,133	18,032	18,799	35,725	8,000	26,012	260,000	20,000
MN-11.2-RMP													78,000	NA
SC-13.5-RMP													41,000	NA
SC-6.5-LWP	10,541												71,000	31,500
SC-0.4-RMP													21,000	NA
U-857.0-RMP													145,000	NA
U-856.6-RMP	16,167		50,185	56,697	20,454	109,643		131,710	43,829	52,648	27,943		835,000	100,000
U-855.9-RMP													35,000	NA
U-855.6-RMP													143,000	NA
U-854.8-LMP													99,000	NA
1-853.4-LMP												44,896	45,000	0
1-853.2-LMP			16,204	16,583		62,209		35,720	32,934	32,042	6,150	8,330	387,000	35,000
1-852.7-RMP													355,000	NA
1-851.3-LME*													(18,000)	85,000
1-849.5-RME*													40,000	60,000
2-841.3-LMP													20,000	NA
2-840.4-RMP		2,678	1,250	11,817	13,402	7,846	29,055	11,021	14,000	9,294		5,840	256,000	8,000
2-838.6-LMP					242,526								243,000	NA
2-838.2-RMP													261,000	0
2-836.8-RMP								121,000					729,000	0
2-836.3-RMP										25,898	24,931	164,068	215,000	200,000
2-836.2-RMP		40				660							1,000	NA
2-831.0-RMP													20,000	NA
2-827.8-RMP													38,000	NA
2-827.6-LMP													8,000	NA
2-827.3-RMP					13,922								14,000	NA
2-827.1-RMP													11,000	NA
2-824.3-LMP					13,863								14,000	NA
2-823.8-LMT							75,564		48,087	50,929		(407,000)	(224,000)	450,000
2-823.8-RMP	15,253					13,168	15,066		21,150	40,564	1,829		129,000	60,000
2-823.6-LMP													19,000	NA
2-823.3-LMP													18,000	NA
2-822.8-LMP													20,000	NA
2-822.5-LMP											628,418	556,500	1,185,000	NA
2-821.5-LMT*	88,294	20,120		6,437			58,516		13,663	1,800	(80,000)	(149,500)	(20,000)	230,000
2-821.1-LMT*					36,919		73,220			54,169	(230,300)		(66,000)	375,000
2-815.1-RMP	13,771			19,061									33,000	5,000
JL SHIELY													7,000	NA
2-814.7-RMP										29,085			29,000	70,000
3-813.2-RMP									4,375				10,000	165,000
3-799.9-LWP	24,086												62,000	NA

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No capacity computation will be made for these sites.

RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Net Placed	Est. Remaining Capacity
3-799.2-RMT*				43,763	8,113	28,033	143,362		17,030	(489,928)		23,523	(221,000)	466,000
3-800.0-LWP										687,375			687,000	NA
4-796.8-LWP										600			1,000	NA
4-795.7-LWP					8,603								9,000	NA
4-794.7-RMP				19,282									52,000	NA
4-791.6-RMP												57,993	58,000	340,000
4-791.5-RMP								39,882					71,000	NA
4-789.3-RMT													13,000	NA
4-788.5-RMP		11,532				27,676			35,708				88,000	0
4-766.9-LWP													2,000	NA
4-762.7-LWT*		308,801	269,326	190,556	48,383		(1,094,200)		27,826	294,238		270,432	79,000	707,000
4-762.6-RMP													15,000	NA
4-762.5-LWP													6,000	NA
4-762.3-LWP													11,000	NA
4-761.1-RMP													61,000	645,000
4-761.0-RMP							1,294,305						3,170,000	2,750,000
4-760.5-RMP													1,428,000	NA
4-759.7-RMP													43,000	NA
4-759.5-RMP													108,000	NA
4-759.3-LWT*			41,000	105,821	72,830	76,945	65,407	82,256	62,988	30,546	25,768	22,067	25,000	794,000
4-759.0-RMP													10,000	NA
4-757.6-LWP													0	NA
4-757.5-LW			48,000	28,148	38,292		61,416	126,131	99,237	54,040		65,505	774,000	1,425,000
4-756.5-LWT*			66,000				85,767			(474,000)	33,512		(215,000)	440,500
4-754.0-LWP		16,970	3,501	30,665	50,654	14,628	18,536	18,510	48,833	9,792	31,303	5,731	414,000	40,000
5-752.2-RMP										474,000			474,000	NA
5-749.3-RMP													5,000	NA
5-748.2-RMP													8,000	NA
5-748.0-RMT	40,306					40,690	18,891	47,646	62,655	44,012			372,000	206,000
5-747.4-RMP			2,000										2,000	NA
5-746.5-RMP													16,000	NA
5-745.8-RMT*			32,067	29,429	16,300	10,993	43,501	46,642	83,304	27,948		52,613	(116,000)	401,000
5-745.4-LWP													14,000	NA
5-744.7-LWT*		18,342	9,742	44,684	84,933	13,694	97,573	102,827	28,134		10,977	38,266	274,000	525,000
5-744.0-RMP													1,412,000	0
5-743.9-LWP				2,941									3,000	NA
5A-735.8-RMP													1,000	NA
5A-734.6-RMP													16,000	NA
5A-734.5-LWE													19,000	40,000
5A-734.1-LWP													20,000	NA
5A-732.0-LWP													68,000	NA
5A-731.9-LWP	21,993	13,835	11,469	3,143	33,465	37,106	59,230	44,041	20,757	33,705	53,573	22,749	454,000	60,000
5A-731.5-RMP												103,070	103,000	200,000

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No capacity computation will be made for these sites.

RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Net Placed	Est. Remaining Capacity
5A-731.3-LWP													2,000	NA
5A-730.5-LWT*	26,889			43,055		16,906	25,610	33,657				(318,220)	(213,000)	450,000
5A-729.4-RMP	51,034												51,000	NA
5A-729.0-RMP												215,150	215,000	0
5A-728.7-RMP													0	NA
6-726.3-RMP	14,542		2,614		2,613	8,601	16,054		41,558	10,998			97,000	150,000
6-726.2-RMP													5,000	NA
6-726.0-LMP								3,613	5,282	3,500		700	50,000	9,000
6-723.6-RMP													25,000	NA
6-723.5-RMP			6,449										6,000	NA
6-723.4-RMP													18,000	NA
6-723.3-RMP													320,000	NA
6-720.5-RMP									15,665				35,000	80,000
7-714.1-LWP	28,653		30,569		35,157		14,216	22,597	17,198	42,328			373,000	99,000
7-713.1-RMP	15,708	63,107		8,883	6,171		16,965		69,246	15,320	52,712	101,820	350,000	10,000
7-711.8-RMP													42,000	NA
7-706.5-RMT	10,000				43,992		49,977	57,260	7,679	35,643		(95,300)	210,000	140,000
7-705.5-RMP													2,000	NA
7-705.2-RMP													58,000	NA
7-705.1-RMP							1,500						2,000	NA
7-705.0-LMP	19,233												34,000	NA
7-704.9-RMP									1,440				1,000	NA
7-704.6-RMP													14,000	NA
7-703.0-LWP													2,000	NA
8-700.1-RMP													30,000	NA
8-700.0-RMP													24,000	NA
8-699.7-RMP													3,000	NA
8-699.3-RMP													18,000	NA
BR-1.1-RWP				3,716									4,000	NA
8-697.7-LWP													11,000	NA
8-696.1-LWP	8,113									49,146		13,093	136,000	200,000
8-691.6-LWP					1,750								2,000	NA
8-690.4-LWT*		24,888		24,590	49,867		28,030	21,525	17,876		(65,000)	(67,052)	144,000	506,000
8-690.3-RMP												2,400	2,000	0
8-689.2-LWP			1,750										2,000	NA
8-689.0-RMP					3,000								3,000	NA
8-688.7-RMP			2,000		14,196	54,499	11,683	109,569	71,706	18,310	121,011	110,100	804,000	1,100,000
8-688.2-RMP		28,937											29,000	NA
8-688.0-LWP			910										1,000	NA
8-687.0-RMP	99,589												100,000	NA
8-686.7-RMP				18,588									19,000	NA
8-679.1-LWP													4,000	NA
9-677.7-LWP										23,489			23,000	22,000

* = Site has been excavated.
NA = Site not selected in the CMMP.
No capacity computation will be made for these sites.

RECORD OF DREDGED MATERIAL PLACEMENT (April 2001)

Site Location	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Net Placed	Est. Remaining Capacity
9-677.2-LWP													6,000	NA
9-676.5-RME													6,000	NA
9-670.5-LWP	8,044		32,150	2,645	13,000	6,400	20,541		15,098	8,734	15,014		280,000	120,000
9-669.2-RIP						39,400							39,000	NA
9-665.7-RIP													21,000	NA
9-665.2-RIP													20,000	NA
9-664.3-RIT*		32,719	(14,514)	38,561		24,064	75,019						82,000	168,000
9-664.0-RIP													37,000	NA
9-663.5-LWP	23,895			10,577			19,484	76,552	54,999	20,510	20,464	38,108	297,000	120,000
9-663.0-RIP													103,000	NA
9-662.6-RIP													55,000	NA
9-662.2-RIP													31,000	NA
10-647.1-LWP													8,000	48,000
10-644.5-RIE													40,000	40,000
10-643.1-LWP													26,000	NA
10-635.0-LWP													105,000	30,000
10-628.0-LWP													35,000	123,000
10-619.3-RIP													7,000	NA
10-618.8-RIP				70,829									257,000	NA
10-618.7-RIT					3,047		26,826	40,157	32,852	6,423	28,951		138,000	5,000
10-618.2-LIP							36,160						36,000	NA
WARROAD													43,000	NA
ZIPPLE BAY			1,950										2,000	NA
TOTALS	548,589	541,969	618,137	841,478	887,994	593,161	1,417,407	1,190,348	1,033,908	1,258,883	715,256	911,894	20,274,924	

* = Site has been excavated.
NA = Site not selected in the CMMP.
No capacity computation will be made for these sites.

RECORD OF BENEFICIAL USE - 1975 TO 1995												April 1996
YEAR	*	STOCKPILES	GENERAL LANDFILL L1	REC. LANDFILL L2	ENVIRON. LANDFILL L3	TOTALS FOR A & B	TOTAL BEN. USE	TOTAL DREDGED	% BEN. USE	BEN. USE JOBS	# OF JOBS	% OF JOBS BEN.
1975	A	203,140	0	91,513	0	294,653						
	B	0	6,574	32,645	0	39,219	333,872	706,207	47%	18	25	72%
1976	A	146,425	230,527	57,603	0	434,555						
	B	114,609	62,182	0	0	176,791	611,346	709,344	86%	21	26	81%
1977	A	83,023	0	0	0	83,023						
	B	23,973	55,096	0	0	79,069	162,092	206,303	79%	14	17	82%
1978	A	108,584	24,060	12,530	0	145,174						
	B	38,822	118,424	0	0	157,246	302,420	625,674	48%	21	30	70%
1979	A	116,400	0	0	0	116,400						
	B	59,000	159,000	0	0	218,000	334,400	784,400	43%	16	22	73%
1980	A	83,100	41,000	0	0	124,100						
	B	72,500	3,500	0	0	76,000	200,100	231,300	87%	17	21	81%
1981	A	84,040	30,400	0	0	114,440						
	B	21,560	78,300	8,000	0	107,860	222,300	387,200	57%	11	16	69%
1982	A	277,938	0	36,833	0	314,771						
	B	75,083	177,507	0	0	252,590	567,361	992,517	57%	23	30	77%
1983	A	67,738	141,311	0	43,000	252,049						
	B	39,515	92,701	0	0	132,216	384,265	737,474	52%	19	25	76%
1984	A	127,604	370,000	13,939	1,500	513,043						
	B	28,313	257,232	0	0	285,545	798,588	1,184,024	67%	16	22	73%
1985	A	171,595	303,167	60,581	957	536,300						
	B	24,837	343,494	0	0	368,331	904,631	1,002,976	90%	20	23	87%
1986	A	157,890	59,426	44,364	4,950	266,630						
	B	0	55,771	0	0	55,771	322,401	979,671	33%	12	25	48%
1987	A	304,675	0	34,208	24,622	363,505						
	B	18,201	35,373	0	0	53,574	417,079	437,820	95%	22	23	96%
1988	A	127,726	400,929	0	37,810	566,465						
	B	25,870	138,655	0	0	164,525	730,990	730,990	100%	20	20	100%
1989	A	127,134	96,508	19,233	99,589	342,464						
	B	43,439	24,086	0	0	67,525	409,989	548,589	75%	21	23	91%

RECORD OF BENEFICIAL USE												April 2001
YEAR	*	STOCKPILES	GENERAL LANDFILL L1	REC. LANDFILL L2	ENVIRON. LANDFILL L3	TOTALS FOR A & B	TOTAL BEN. USE	TOTAL DREDGED	% BEN. USE	BEN. USE JOBS	# OF JOBS	% OF JOBS BEN.
1990	A	62,420	353,052	0	18,342	433,814						
	B	63,147	0	0	0	63,147	496,961	541,969	92%	14	16	88%
1991	A	117,792	288,962	1,750	41,809	450,313						
	B	9,964	41,000	0	0	50,964	501,277	618,137	81%	20	24	83%
1992	A	148,543	274,817	0	92,701	516,061						
	B	23,606	176,650	19,282	0	219,538	735,599	841,478	87%	31	39	79%
1993	A	169,941	312,512	4,797	101,233	588,483						
	B	18,713	75,830	13,922	0	108,465	696,948	887,994	78%	24	34	71%
1994	A	322,208	86,770	0	24,687	433,665						
	B	13,828	76,945	0	0	90,773	524,438	593,161	88%	26	31	84%
1995	A	168,258	357,435	0	141,074	666,767						
	B	62,164	65,407	1,500	0	129,071	795,838	1,417,407	56%	24	43	56%
1996	A	453,333	33,657	0	149,469	636,459						
	B	18,032	243,138	0	0	261,170	897,629	1,190,348	75%	30	37	81%
1997	A	408,825	42,924	0	111,438	563,187						
	B	124,860	62,988	1,440	0	189,288	752,475	1,033,908	73%	25	36	69%
1998	A	308,171	303,572	0	27,948	639,691						
	B	318,141	54,035	0	0	372,176	1,011,867	1,258,883	80%	37	48	77%
1999	A	220,375	48,526	0	10,977	279,878						
	B	62,541	343,886	0	0	406,427	686,305	715,256	96%	20	21	95%
2000	A	359,660	272,832	0	90,879	723,371						
	B	56,055	66,963	0	0	123,018	846,389	911,894	93%	27	28	96%
TOTALS		6,283,311	6,887,124	454,140	1,022,985	14,647,560	14,647,560	20,274,924	72%	549	705	78%

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ARMY CORPS OF ENGINEERS CENTRE
190 FIFTH STREET EAST
ST. PAUL, MN 55101-1638

REPLY TO
ATTENTION OF

U.S. Army Corps of Engineers
Waterways Section
P.O. Box 397
Fountain City, WI 54629-0397

NOTICE TO: Potential Users of Dredged Material

SUBJECT: Beneficial Use of Dredged Material

In connection with channel maintenance dredging on the Mississippi River, the Corps of Engineers has stockpiled sand at various sites along the river for use by the public. Material stockpiled at federally owned sites is available free of charge and is being used for a variety of purposes. The majority of the material is a medium grade, clean sand that works well for construction fill, winter ice control, bituminous mix, and concrete production. Information concerning the physical and chemical composition of this material can be obtained by contacting the Corps' Waterways Section office in Fountain City, WI.

Our goal is to find a productive use for all of the material the Corps dredges. To accomplish this goal, the Corps will continue to develop and improve its beneficial use stockpile sites. Signs will be developed and placed at the sites to identify areas where material is reserved for local government offices and areas where material will be available to the public. By placing dredged material into stockpile sites it provides the public with an opportunity to benefit in a number of ways. They receive the material free of charge, it can be reserved allowing local government offices to beneficially use the material, and beneficial use of the material can protect environmentally sensitive locations.

Information on where the stockpile sites are located is attached, along with guidelines for removal and beneficial use of the dredged material. If there are any questions, please direct them to the Corps' Waterways Section office (608)-687-3011.

Chief, Waterways Section

GENERAL INFORMATION

Dredged material removed by the Corps of Engineers during channel maintenance operations on the Mississippi River has been placed at the following federally owned sites.

Site	State	County	City/Township	Pool	River Mile
Hastings (L/D 2)	MN	Dakota	Hastings	3	815.1
Wabasha Gravel Pit	MN	Wabasha	Wabasha	4	761.0
Alma Marina	WI	Buffalo	Alma	4	754.0
Fountain City 1	WI	Buffalo	Fountain City	5A	731.9
Trempealeau	WI	Trempealeau	Trempealeau	7	714.1
Brownsville	MN	Houston	Brownsville	8	688.7
Lansing Hwy Br.	WI	Crawford	*	9	663.5

* This stockpile is located across the main channel of the Mississippi River from Lansing, Iowa.

The locations of these sites are illustrated on the attached plates. Dredged material stockpiled at these locations is available, free of charge, for removal and use by any interested parties, unless reserved for use by government offices only.

In addition to these sites, the Corps has plans to develop sites at Diamond Bluff, WI (Ag. Land South), Red Wing, MN (Red Wing Commercial Harbor), Kellogg, MN (West Newton Chute), Whitman, MN (Lock & Dam 5), Victory, WI (Blackhawk Park), and Guttenberg, IA (Buck Creek).

Guidelines for Removal and Beneficial Use of Dredged Material

The following guidelines govern removal and beneficial use of dredged material from Federal property.

1. The user is responsible for all costs associated with the loading handling, and transport of material from the site.

2. The Government accepts no liability for a user's actions, damage to equipment, or injury to personnel when operating on Federal property.

3. The user accepts full responsibility for the material once it is removed from the site. It is the responsibility of the user to assure that the ultimate disposition of the material is in accordance with all local, State, and Federal regulations.

4. When access to a stockpile site involves crossing non-federal property, it is the user's responsibility to obtain the necessary permission.

5. The Government accepts no responsibility for the condition of the stockpile on the site. Users are asked to implement good sound practices in removing material.

6. Users are expected to conduct their operations in a courteous manner with full consideration of adjacent landowners.

7. Simultaneous removal by two or more different users should be well coordinated between the parties involved and accomplished in a mutually helpful manner. Sharing of equipment in limited size work areas is encouraged.

8. If the demand for material at a particular location exceeds the available supply, the policy is to allow public entities first opportunity to obtain material. The priority will generally be in the following order: Federal and State agencies, County, Municipality, non-profit organization, private organization and private individuals. Conflicts that cannot be worked out by the parties involved will be resolved by the Corps of Engineers.

9. Please follow any signs identifying where material may be removed or any other instructions relating to removal of material.

10. Removal is permitted year round with the exception of nationally observed holidays, local celebrations, and when road bans are in effect. Removal is permitted Monday through Friday between the hours of 7:00 AM. and 5:00 PM.

11. Steep vertical faces on excavated piles present safety hazards. If a pile is unattended, make sure it has a more gradual, safe slope.

12. The Government reserves the right to deny any user from further removal of material if this privilege is abused. Improper use of a stockpile may result in development of tighter restrictions on dredged material removal.

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ARMY CORPS OF ENGINEERS CENTRE
190 FIFTH STREET EAST
ST. PAUL, MN 55101-1638

REPLY TO
ATTENTION OF

U.S. Army Corps of Engineers
Waterways Section
P.O. Box 397
Fountain City, WI 54629-0397

SUBJECT: Beneficial Use Survey for Potential Users of Dredged Material

The program of channel maintenance, as mandated by federal law and carried out by the U.S. Army Corps of Engineers, has historically produced a large amount of sand dredged from the Mississippi River. Sand from the Mississippi River serves as excellent fill material, is used for ice control on winter roadways and can be used in asphalt as a filler and cover. Other potential uses include things such as mortar sand, soil conditioning, landscape purposes, use in ready mix, and so on.

There is no need for this resource to remain untapped, lying idle in piles, to be eroded back into the river system causing environmental damage, or to be dredged a second time. The demand for this sand is growing, and removing sand from stockpiles for beneficial uses eliminates it from the river environment. This removal is a boon both for the receiving party and the river ecology.

A market survey was conducted in 1977-78 to determine the demand for dredged sand. To those who participated, we extend our thanks for your cooperation. Your input served to aid in the selection process of dredge material placement sites for the channel maintenance activities of the U.S. Army Corps of Engineers. Because the data from the previous survey is now old, and development of new placement sites will be based on beneficial use estimates, it is very important at this time to update the results of the previous survey.

Please fill out the enclosed survey so we will know who to contact as material becomes available. Even if your needs seem too small to mention, all responses will be important for accurate survey results. Those not returning the survey will be removed from the mailing list and will not receive future notifications for placement sites and material availability. Feel free to make any comments on this form. Return postage has been provided on the back of the survey form for your convenience along with instructions for returning the survey. Please respond within 30 days of receiving the survey. If you have additional questions or comments please contact the Waterways Section office at the address above.

Sincerely,

Chief, Waterways Section

BENEFICIAL USE SURVEY FORM

1. This survey filled out by:

Name:_____
Title:_____
Agency/Dept.:_____
Address:_____
City/State/Zip:_____
Phone:_____ Office Hours:_____

2. Dredged sand is acceptable to you for use as:

( ) no use	( ) ready mix	( ) asphalt mix
( ) fill	( ) soil conditioning	( ) asphalt cover
( ) ice control	( ) landscaping	( ) mortar sand

( ) other (please specify):_____

3. How much sand do you use in an average year?_____

4. If channel maintenance dredged material were placed at the proposed sites, how much could you use for the following time periods: (Estimate, if necessary. Answers do not constitute an obligation to accept material.)

1993-1997 (next 5 years)_____
1993-2032 (next 40 years)_____

5. The attached maps show the locations of the proposed beneficial use stockpile sites. Considering present fuel costs and other costs involved in transport, can your demand for sand be served by these sites?

( ) Yes - If yes, circle usable site(s).
(Site 1) (Site 2) (Site 3)

( ) No

6. Where do you get sand from now?

( ) no supplier ( ) own pit ( ) own dredge
( ) private companies (please specify):_____
_____
( ) other government bodies (please specify):_____
_____

7. Are you aware of any other department, agency, individual, government unit, or company that may be interested in using dredged sand?_____
_____
_____
_____

8. Are you interested in remaining on the mailing list to receive information regarding placement sites and material availability?

( ) Yes ( ) No

If you have any problems or questions about this survey please call the Waterways Section office, at (608)687-3011.

COMMENTS:

Checklist of further actions required prior to implementation of CMMP placement sites, not including recreation beaches.								
Location	GREAT Site #	Site Name	Further Federal Endangered Species Coordination*	Further Cultural Resources Work	Additional Groundwater Investigation	Floodplain Impact Assessment	Real Estate Acquistion or Agreement	Change in Land Use Allocation
SC-6.7-LWP	SC.13	Kinnickinnic Bar Upper		Coordination		Yes	Permit	
SC-6.5-LWP	SC.12	Kinnickinnic Bar Lower		Coordination		Yes	Permit	
U-856.6-RMP	-	USAF Site		Coordination			Permit	
2-840.4-RMP	2.16	Highbridge		Coordination			Local Sponsor	
2-836.3-RMP	2.13	Southport					Permit	
2-823.8-RMP	-	C.F. Industries		Survey			Permit	
2-822.5-LMP	-	Shiely Pit					Permit	
3-815.1-RME	-	Hastings		Coordination				
3-814.7-RMP	-	Koch				Yes	Permit	
3-813.2-RMP	3.46	Hastings Harbor					Acquisition	
3-811.5-LMP	3.34	Point Douglas		Coordination			Acquisition	
3-808.4-LWP	3.27	Dry Run Slough		Survey		Yes	Acquisition	
3-802.3-RME	3.14T	Morgans	Eagle	Coordination				Yes
3-801.7-LWE	3.12T	Coulters					Acquisition	
3-799.2-RMT	3.07	Corps Island		Coordination				Yes
3-798.0-LWP		County/Private Gravel Pit			Yes		Acquisition	
4-794.7-RMP	4.63	Red Wing Yacht Club	Eagle				Permit/Acquisition	
4-791.6-RMP	4.57	Red Wing Commercial Harbor		Coordination			Permit	
4-788.5-RMP	4.47	Colvill Park	Eagle				Permit	
4-761.1-RMP	4.25	Carrels Pit			Yes		Acquisition	
4-761.0-RMP	4.24	Wabasha Gravel Pit			Yes			
4-757.5-LWP	4.13T	Teepeeota Point	Eagle					
4-754.0-LWP	4.02	Alma Marina						Yes
5-749.8-RMP	5.24	West Newton Chute		Nat Reg Assess				
5A-738.2-RMP	5A.36	L/D 5 Site		Coordination				
5A-734.5-LWT	5A.14T	Island 58					Permit	Yes
5A-733.5-LWP	5A.34	Ft. City Service Base						Yes
6-726.3-RMP	-	Winona Commercial Harbor		Coordination			Permit	
6-726.0-LMP	6.27	Winona Harbor					Permit	
6-720.5-RMP	6.11	Homer		Coordination	Yes		Permit/Acquisition	
7-714.1-LWP	7.06	Trempealeau		Coordination				
7-713.1-RMP	7.05	Hot Fish Shop		Coordination			Permit/Acquisition	
7-708.7-LWE	7.11T	Winters Landing						Yes
7-707.3-RMP	7.25A	Dakota Boat Ramp		Further Testing	Yes		Permit/Acquisition	
7-706.5-RMT	7.12T	Dakota Island						Yes
8-695.7-LWP	8.06	Isle La Plume					Permit	
9-677.7-LWP	9.15	Genoa Power Plant					Permit	
9-665.8-RIE	9.18T	Indian Camp Light						Yes
9-663.5-LWP	9.50T	Lansing Hwy Bridge						Yes
10-647.1-LWP	10.17	Varo Property		Survey	Yes		Acquisition	
10-644.5-RIE	10.22T	Jackson Island		Survey				Yes
10-643.5-RIT		Jackson Rehandling Site	Mussels	Survey				
10-642.4-LWP	10.40	Mississippi Gardens	Eagle	Survey			Permit/Acquisition	
10-628.0-LWP	10.01	Wyalusing Pit			Yes		Permit/Acquisition	
10-627.8-LWP	10.24	Wyalusing Beach	Mussels	Coordination		Yes	Permit	
10-635.0-LWP	10.43	Prairie Municipal Dock				Yes	Permit	
10-618.7-RIT	10.18	McMillan Island				Yes		Yes

* Changed conditions could cause additional endangered species coordination to be required at any of the proposed placement sites.

TAB 4

DREDGING LOCATION (CUT) INFORMATION

TAB 4 - CUT INFORMATION

SUMMARY OF DREDGING LOCATIONS - ST PAUL DISTRICT
1970 TO 2000

April 2001

Pool	Historic Dredge Cuts Cut Name	Location	Avg. Vol. Per Year	Avg. Vol. Per Job	Frequency Of Dredging	Last Year Dredged
*** Main Channel Dredging ***						
MN	Abv. Savage R.R. Br.	14.3-14.7	5,789	17,947	32%	2000
MN	Cargill Slip	12.5-13.6	620	6,403	10%	2000
MN	Peterson's Bar	11.8-12.4	9,718	16,737	58%	2000
MN	Blw. Peterson's Bar	11.3-11.7	466	7,227	6%	1983
MN	Abv. 35W Br.	10.7-11.2	1,181	36,612	3%	1983
MN	4 Mile Cut-off	3.4-4.7	142	4,389	3%	1987
MN	Mouth of the MN River	0.0-1.1	1,040	16,117	6%	1993
SC	Hudson	16.1-17.6	5,902	182,964	3%	1974
SC	Kinnickinnic Bar	6.0-6.5	5,454	33,812	16%	1989
USAF	Mpls. Turning Basin	856.8-857.6	16,176	29,498	55%	1999
USAF	Abv. Lowry Ave. Br.	856.4-856.8	21,775	35,527	61%	1999
USAF	Blw. Lowry Ave. Br.	856.0-856.4	286	8,871	3%	1992
USAF	Broadway Ave. Br.	855.3-856.1	5,326	13,759	39%	1998
USAF	Abv. Plymoth Ave. Br.	854.8-855.5	8,106	20,942	39%	1998
1	Lower Appch. LSAF	853.4	155	799	19%	2000
1	Washington Ave. Br.	852.5-853.0	1,641	16,952	10%	1987
1	Abv. Franklin Ave. Br.	851.6-852.4	3,824	16,933	23%	1991
1	Blw. Franklin Ave. Br.	850.7-851.4	8,453	23,822	35%	2000
1	Abv. Lake St. Br.	849.9-850.5	12,958	23,629	55%	1999
1	Blw. Lake St. Br.	848.9-849.9	7,034	19,822	35%	1998
1	St. Paul Daymark	848.5-848.9	2,782	14,372	19%	1988
1	Upper Appch. L/D 1	847.7-848.4	4,639	20,543	23%	2000
1	Lower Appch. L/D 1	847.4-847.5	61	1,880	3%	1994
2	Abv. & Blw. Smith Ave.	840.0-841.3	4,144	12,846	32%	1994
2	Abv. Wabasha Ave. Br.	839.5-839.6	37	573	6%	2000
2	Blw. Lafayette St. Br.	838.0-839.0	298	9,224	3%	1970
2	St. Paul Barge Terminal	836.4-837.8	65,035	134,405	48%	2000
2	Grey Cloud Slough	827.5-828.3	6,690	23,042	29%	1998
2	Robinson Rocks	826.1	255	7,894	3%	1977
2	Pine Bend Landing	824.3-824.6	6,066	62,686	10%	1995
2	Pine Bend	822.7-823.7	17,289	48,722	35%	1999
2	Boulanger Bend	820.7-821.4	19,574	80,905	24%	1999
2	Boulanger Bend Lwr. Lt.	819.0-819.8	10,337	64,087	16%	1999
2	Freeborn Light	818.0-818.9	5,691	44,105	13%	1999
2	Upper Appch. L/D 2	815.2-816.5	482	14,936	3%	1974
3	Lower Appch. L/D 2	814.9-815.1	2,935	22,744	13%	1998
3	Prescott	810.3-811.7	1,463	45,352	3%	1972
3	Truedale Slough	807.9-808.6	859	26,644	3%	1972
3	Four Mile Island	807.0-807.9	2,206	68,388	3%	1972
3	Big River	804.1-806.0	3,133	19,423	16%	2000
3	Morgans Coulee	802.2-802.9	2,664	27,526	10%	1998
3	Coulters Island	800.8-801.9	8,672	26,882	32%	2000
3	Diamond Bluff	798.8-800.4	12,819	44,155	29%	1998
4	Trenton	794.0-794.6	3,722	57,690	6%	1975
4	Cannon River	792.1-793.5	9,829	33,856	29%	2000
4	Red Wing Hwy. Br.	789.5-791.2	4,706	72,940	6%	1972
4	Head of Lake Pepin	785.2-785.4	1,467	22,739	6%	2000
4	Chippewa Delta	763.2	75,248	259,188	29%	2000
4	Reads Landing	761.8-763.8	37,148	67,740	55%	1998
4	Crats Island	759.0	62,980	81,349	77%	2000
4	Teepeeota Point	757.0-757.9	34,124	58,770	58%	2000
4	Grand Encampment	755.8-756.9	22,461	38,682	58%	2000
4	Beef Slough	753.8-754.1	5,526	17,132	32%	1999
5	Lower Appch. L/D 4	753	509	5,264	10%	1976
5	Mule Bend	748.6-749.6	11,914	33,576	35%	1998
5	West Newton	747.2-748.2	6,096	20,999	29%	1998

SUMMARY OF DREDGING LOCATIONS - ST PAUL DISTRICT
1970 TO 2000

April 2001

Pool	Historic Dredge Cuts Cut Name	Location	Avg. Vol. Per Year	Avg. Vol. Per Job	Frequency Of Dredging	Last Year Dredged
5	Blw. West Newton	746.0-746.8	16,162	27,834	58%	2000
5	Fisher Island	744.8-746.0	31,522	44,417	71%	2000
5	Lower Zumbro	744.0-744.6	18,865	36,551	52%	2000
5	Minneiska	742.7-743.0	8,154	22,980	35%	2000
5	Abv. Mt. Vernon Light	741.2-741.5	2,584	40,054	6%	1996
5A	Island 58	734.0-735.2	7,704	29,854	26%	1982
5A	Fountain City	733.3-733.8	1,304	40,411	3%	1972
5A	Betsy Slough	731.0-732.0	22,718	28,171	81%	2000
5A	Wilds Bend	730.2-730.7	14,233	25,953	55%	1996
6	Lower Appch. L/D 5A	728.5	317	4,910	6%	1983
6	Blw. Winona R.R. Br.	723.4-723.8	9,695	33,394	29%	1998
6	Gravel Point	721.8-722.9	535	16,578	3%	1972
6	Homer	720.4-721.1	5,357	33,214	16%	1997
6	Upper Appch. L/D 6	714.5-714.6	47	1,466	3%	2000
7	Lower Appch. L/D 6	714.0-714.3	3,822	19,745	19%	1998
7	Richmond Island	711.4-712.3	4,136	32,053	13%	1982
7	Winters Landing	707.4-709.3	23,150	39,870	58%	1998
7	Dakota	706.1-706.6	7,318	20,623	35%	1997
7	Dresbach	704.0-705.3	10,340	22,895	45%	1999
7	Lower Dresbach Island	703.0-703.7	4,531	14,047	32%	2000
7	Upper Appch. L/D 7	702.5	848	13,147	6%	1989
8	Lower Appch. L/D 7	702	390	12,089	3%	1973
8	LaCrosse R.R. Br.	699.8-700.4	7,106	36,717	19%	1992
8	Blw. LaCrosse R.R. Br.	698.7-699.4	723	11,203	6%	1998
8	LaCrosse	698.6-698.7	262	8,113	3%	1989
8	Sand Slough	694.3-695.0	2,542	78,790	3%	1970
8	Root River	693.5-693.7	500	15,493	3%	2000
8	Picyune Island	691.4-692.4	2,476	38,383	6%	1973
8	Abv. Brownsville	689.9-690.8	22,434	38,636	58%	2000
8	Brownsville	688.7-689.4	21,875	30,824	71%	1999
8	Head of Raft Channel	687.5-688.7	15,633	34,615	45%	1999
8	Deadman's Slough	686.5-687.5	1,573	24,386	6%	1989
9	Lower Appch. L/D 8	678.7-679.2	488	5,042	10%	1988
9	Island 126	677.5-678.4	4,596	47,496	10%	1998
9	Twin Island	676.0-676.6	200	6,200	3%	1976
9	Battle Island	671.0-672.0	2,452	25,334	10%	1980
9	Indian Camp Light	665.0-665.8	16,875	27,533	61%	1999
9	Lansing Upper Light	663.8-664.9	29,617	45,907	65%	2000
9	Above Atchafalaya Bluff	660.0-661.0	2,837	87,934	3%	1970
10	Hay Point	646.0-646.6	2,559	39,667	6%	1972
10	Jackson Island	643.7-644.7	7,177	74,159	10%	1981
10	Mississippi Gardens	642.7-643.4	5,695	88,278	6%	1976
10	Prairie Du Chien	635.0	3,385	104,932	3%	1976
10	Wyalusing	627.0-629.0	1,104	34,217	3%	1970
10	McMillan Island	618.4-619.6	15,746	34,867	45%	1999
10	Upper Appch. L/D 10	615.1-616.5	1,736	53,817	3%	1973
*** Authorized Harbor Dredging ***						
2	St. Paul SBH	839.6	4,454	8,629	52%	2000
3	Hastings SBH	813.2	550	5,686	10%	1997
4	Red Wing Comm. Harbor	791.5	232	2,397	10%	1996
4	Red Wing SBH	791.0	903	28,000	3%	1982
4	Bay City	787	0	0	0%	
4	Lake City	773	0	0	0%	1965
4	Pepin SBH	767.0	74	1,146	6%	1980
4	Wabasha SBH	761	0	0	0%	
4	Alma SBH	754	100	3,104	3%	1970
6	Winona Comm. Harbor	726.3	143	1,480	10%	1996

SUMMARY OF DREDGING LOCATIONS - ST PAUL DISTRICT
1970 TO 2000

April 2001

Pool	Historic Dredge Cuts Cut Name	Location	Avg. Vol. Per Year	Avg. Vol. Per Job	Frequency Of Dredging	Last Year Dredged
6	Winona SBH	726.1	2,032	3,499	58%	2000
9	Lansing SBH	664	0	0	0%	
10	Prarie Du Chien SBH	636	0	0	0%	
10	Prarie Du Chien CH	635	0	0	0%	
*** Lock & Dam Dredging ***						
1	L/D 1 Lock Chamber	847.6	1	40	3%	1990
2	L/D 2 Behind Up Guidewall	815	29	900	3%	1998
2	L/D 2 Aux. Lock	815	29	900	3%	1998
3	L/D 3 Aux. Gates	797.0	155	4,800	3%	1986
4	L/D 4 Aux. Lock	752.8	1,094	5,653	19%	1999
5	L/D 5 Aux. Lock	738.1	63	1,957	3%	1985
5A	L/D 5A Gate Bay	728.7	5	150	3%	1986
5A	L/D 5A Chamber	728.5	20	306	6%	1985
5A	L/D 5A Aux. Lock	728.5	119	3,700	3%	1981
7	Lower Guidewall L/D 6	714.3	240	3,713	6%	1982
7	L/D 6 Aux. Lock	714	10	300	3%	1992
8	L/D 7 Dock Access	702	64	1,980	3%	1998
9	L/D 8 Lower Guidewall	679.0	85	2,645	3%	1992
9	Upper Aux. L/D 9	647.9	48	1,500	3%	1984
*** Miscellaneous Dredging ***						
2	Access/Pine Bend Site	823.8	323	5,000	6%	1997
4	Old Miss. Channel	796.0-796.9	233	7,219	3%	1974
4	Indian Slough	760.0	258	8,000	3%	1992
4	Access Channel	753.7	150	4,662	3%	1983
5	Island 40 Wing Dams	752.5	123	3,800	3%	1980
5	Mule Bend Side Channel	748.4	606	9,389	6%	1982
5	Murphy's Cut	747.4	65	2,000	3%	1991
6	Blackbird Slough Sd.Ch.	727.8	142	4,400	3%	1980
9	Ferry Slough Sd. Ch.	672.1	32	1,000	3%	1980
10	Wyalusing Slough Sd.Ch.	627.9	1,123	34,824	3%	1978

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1970		1971		1972		1973		1974		1975		1976		1977		1978		1979	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
*** Main Channel Dredging ***																						
MN	Abv. Savage R.R. Br.	14.3-14.7							12	13,154					11	26,000	11	24,000				
MN	Cargill Slip	12.5-13.6																				
MN	Peterson's Bar	11.8-12.4			12	4,689			12	36,532					11	37,800						
MN	Blw. Peterson's Bar	11.3-11.7							12	13,206												
MN	Abv. 35W Br.	10.7-11.2																				
MN	4 Mile Cut-off	3.4-4.7																				
MN	Mouth of the MN River	0.0-1.1			12	28,832																
SC	Hudson	16.1-17.6									13	182,964										
SC	Kinnickinnic Bar	6.0-6.5					13	36,159											13	20,778		
USAF	Mpls. Turning Basin	856.8-857.6	13	84,831			13	19,591					12	4,118	12	75,429	12	22,934	12	7,823	12	26,600
USAF	Abv. Lowry Ave. Br.	856.4-856.8									13	129,633	12	16,778	12	9,042			12	3,960	12	2,500
USAF	Blw. Lowry Ave. Br.	856.0-856.4																				
USAF	Broadway Ave. Br.	855.3-856.1											12	4,588	12	8,614			12	9,727	12	5,500
USAF	Abv. Plymoth Ave. Br.	854.8-855.5	13	50,207					11	28,246	13	32,001	12	13,572	12	22,627	12	9,633	12	9,350	12	24,400
1	Lower Appch. LSAF	853.4																			13	600
1	Washington Ave. Br.	852.5-853.0	13	14,180	12	16,553	12	20,124														
1	Abv. Franklin Ave. Br.	851.6-852.4	13	14,481	12	17,006	12	23,754											12	28,482	12	14,100
1	Blw. Franklin Ave. Br.	850.7-851.4			12	26,440	13	80,885	13	27,588			12	20,032					12	8,159	12	16,800
1	Abv. Lake St. Br.	849.9-850.5					13	38,226	13	27,887			12	65,139	12	10,627	12	10,086	12	228	12	29,700
1	Blw. Lake St. Br.	848.9-849.9	14	25,458			13	21,899	13	34,057			11	22,312					12	15,287	12	10,900
1	St. Paul Daymark	848.5-848.9	13	11,886					12	10,320							11	4,477			12	11,100
1	Upper Appch. L/D 1	847.7-848.4	13	6,978	13	24,909	14	34,111					11	28,439	11	6,483			12	7,702		
1	Lower Appch. L/D 1	847.4-847.5																				
2	Abv. & Blw. Smith Ave.	840.0-841.3	13	4,890					13	13,940			13	5,128	13	32,015	13	1,868			12	5,700
2	Abv. Wabasha Ave. Br.	839.5-839.6																				
2	Blw. Lafayette St. Br.	838.0-839.0	13	9,224																		
2	St. Paul Barge Terminal	836.4-837.8	13	14,750			13	230,273	13	293,690					11	101,837					13	159,000
2	Grey Cloud Slough	827.5-828.3			13	43,834	13	26,584							13	38,414						
2	Robinson Rocks	826.1															11	7,894				
2	Pine Bend Landing	824.3-824.6									13	133,039										
2	Pine Bend	822.7-823.7			13	215,536							12	13,813	13	19,189						
2	Boulanger Bend	820.7-821.4								4,576	13	236,857										
2	Boulanger Bend Lwr. Lt.	819.0-819.8					14	85,435			13	137,468					13	13,265				
2	Freeborn Light	818.0-818.9																				
2	Upper Appch. L/D 2	815.2-816.5									13	14,936										
3	Lower Appch. L/D 2	814.9-815.1									13	32,325										
3	Prescott	810.3-811.7					13	45,352														
3	Truedale Slough	807.9-808.6					13	26,644														
3	Four Mile Island	807.0-807.9					13	68,388														
3	Big River	804.1-806.0					13	72,100														

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1970		1971		1972		1973		1974		1975		1976		1977		1978		1979	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
3	Morgans Coulee	802.2-802.9									11	29,050										
3	Coulters Island	800.8-801.9			13	70,266																
3	Diamond Bluff	798.8-800.4			13	147,926																
4	Trenton	794.0-794.6			13	82,734							11	32,645								
4	Cannon River	792.1-793.5							13	136,783												
4	Red Wing Hwy. Br.	789.5-791.2			13	87,341	13	58,538														
4	Head of Lake Pepin	785.2-785.4																				
4	Chippewa Delta	763.2																				
4	Reads Landing	761.8-763.8			13	29,200	13	52,444			12	60,455	13	105,297			12	11,206	12	140,252	12	130,300
4	Crats Island	759.0			13	122,647	13	78,704	13	115,886	12	29,044	13	110,371			11	17,749	12	90,004	12	135,500
4	Teepeeota Point	757.0-757.9	13	142,735	13	53,511			13	65,189	11	24,490	13	41,922							13	74,700
4	Grand Encampment	755.8-756.9	13	67,351					13	100,059							11	3,671				
4	Beef Slough	753.8-754.1			13	37,600					11	12,282										
5	Lower Appch. L/D 4	752.6							11	7,719	11	7,943			11	130						
5	Mule Bend	748.6-749.6			13	46,070					13	45,845							6	21,632	13	35,200
5	West Newton	747.2-748.2			13	60,408							11	8,324					12	12,958	13	32,900
5	Blw. West Newton	746.0-746.8	13	135,256	13	62,534			13	22,778	13	28,878	13	16,226								
5	Fisher Island	744.8-746.0			13	114,120	13	65,741	13	72,477	11	7,343	12	13,933	12	37,336	12	19,740	12	45,437	13	42,600
5	Lower Zumbro	744.0-744.6	13	49,592	13	77,827	13	46,000	13	14,155			12	13,666	12	14,415						
5	Minneiska	742.7-743.0	13	55,609	13	2,484																
5	Abv. Mt. Vernon Light	741.2-741.5									13	62,849										
5A	Island 58	734.0-735.2	13	35,643	13	12,468	13	109,945					11	36,112	11	17,913			12	3,998	13	17,000
5A	Fountain City	733.3-733.8					13	40,411														
5A	Betsy Slough	731.0-732.0	13	10,740	13	1,135	13	66,833							11	10,526			12	10,910		
5A	Wilds Bend	730.2-730.7	13	63,121	13	2,961	13	19,067	13	13,659	11	17,127			11	14,534			11	33,144		
6	Lower Appch. L/D 5A	728.5			13	9,320																
6	Blw. Winona R.R. Br.	723.4-723.8	13	26,403	13	79,851					13	65,850			13	37,591						
6	Gravel Point	721.8-722.9					13	16,578														
6	Homer	720.4-721.1					13	93,132														
6	Upper Appch. L/D 6	714.5-714.6																				
7	Lower Appch. L/D 6	714.0-714.3							13	7,983												
7	Richmond Island	711.4-712.3			13	19,088	13	61,906					12	41,597								
7	Winters Landing	707.4-709.3	13	213,410			13	23,566			13	80,569					11	25,096	12	25,366		
7	Dakota	706.1-706.6	13	64,411			13	31,666					11	7,428			11	4,357	12	9,666		
7	Dresbach	704.0-705.3	13	81,089			13	19,905							12	7,600			12	7,614		
7	Lower Dresbach Island	703.0-703.7																				
7	Upper Appch. L/D 7	702.5																				
8	Lower Appch. L/D 7	702.4							13	12,089												
8	LaCrosse R.R. Br.	699.8-700.4	13	39,100					13	67,195					13	18,248						
8	Blw. LaCrosse R.R. Br.	698.7-699.4																				
8	LaCrosse	698.6-698.7																				

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1970		1971		1972		1973		1974		1975		1976		1977		1978		1979	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
8	Sand Slough	694.3-695.0	13	78,790																		
8	Root River	693.5-693.7																				
8	Picyune Island	691.4-692.4					13	48,133	13	28,633												
8	Abv. Brownsville	689.9-690.8	13	86,621	13	54,519	13	46,923	13	122,961	11	11,144	13	23,411					12	11,667		
8	Brownsville	688.7-689.4	13	35,971	13	36,966	13	27,133	13	57,709							13	23,973				
8	Head of Raft Channel	687.5-688.7	13	177,818			13	34,633	13	43,745												
8	Deadman's Slough	686.5-687.5													11	14,047						
9	Lower Appch. L/D 8	678.7-679.2													6	4,167						
9	Island 126	677.5-678.4	13	110,956																		
9	Twin Island	676.0-676.6													11	6,200						
9	Battle Island	671.0-672.0					13	43,825	13	26,778												
9	Indian Camp Light	665.0-665.8			13	40,667	13	26,789	13	122,616	13	28,178							11	6,130		
9	Lansing Upper Light	663.8-664.9			13	94,568	13	68,961	13	85,119	13	31,577							12	57,294		
9	Above Atchafalaya Bluff	660.0-661.0	13	87,934																		
10	Hay Point	646.0-646.6	13	42,933			13	36,400														
10	Jackson Island	643.7-644.7	13	176,655									13	38,322								
10	Mississippi Gardens	642.7-643.4	13	150,621											13	25,934						
10	Prairie Du Chien	635.0													13	104,932						
10	Wyalusing	627.0-629.0	13	34,217																		
10	McMillan Island	618.4-619.6	13	34,633					13	15,680												
10	Upper Appch. L/D 10	615.1-616.5							13	53,817												
*** Authorized Harbor Dredging ***																						
2	St. Paul SBH	839.6			6	12,841							6	7,689							6	8,800
3	Hastings SBH	813.2	6	7,184																		
4	Red Wing Comm. Harbor	791.5									12	3,240							12	3,282		
4	Red Wing SBH	791.0																				
4	Bay City	786.8																				
4	Lake City	772.5																				
4	Pepin SBH	767.0															6	292				
4	Wabasha SBH	760.5																				
4	Alma SBH	754.0	6	3,104																		
6	Winona Comm. Harbor	726.3	13	531																		
6	Winona SBH	726.1	6	13,286	6	1,098	6	3,348	6	1,264			6	15,345	6	2,167					6	500
9	Lansing SBH	663.5																				
10	Prarie Du Chien SBH	636.0																				
10	Prarie Du Chien CH	635.2																				
*** Lock & Dam Dredging ***																						
1	L/D 1 Lock Chamber	847.6																				
2	L/D 2 Behind Up Guidewall	815.3																				
2	L/D 2 Aux. Lock	815.2																				
3	L/D 3 Aux. Gates	797.0																				

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1970		1971		1972		1973		1974		1975		1976		1977		1978		1979	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
4	L/D 4 Aux. Lock	752.8													6	5,657						
5	L/D 5 Aux. Lock	738.1																				
5A	L/D 5A Gate Bay	728.7																				
5A	L/D 5A Chamber	728.5																				
5A	L/D 5A Aux. Lock	728.5																				
7	Lower Guidewall L/D 6	714.3															6	6,062				
7	L/D 6 Aux. Lock	714.1																				
8	L/D 7 Dock Access	702.3																				
9	L/D 8 Lower Guidewall	679.0																				
9	Upper Aux. L/D 9	647.9																				
*** Miscellaneous Dredging ***																						
2	Access/Pine Bend Site	823.8																				
4	Old Miss. Channel	796.0-796.9									13	7,219										
4	Indian Slough	760.0																				
4	Access Channel	753.7																				
5	Island 40 Wing Dams	752.5																				
5	Mule Bend Side Channel	748.4									13	14,204										
5	Murphy's Cut	747.4																				
6	Blackbird Slough Sd.Ch.	727.8																				
9	Ferry Slough Sd. Ch.	672.1																				
10	Wyalusing Slough Sd.Ch.	627.9																	8	34,824		
TOTALS:				2,262,599		1,737,949		1,950,106		1,697,490		1,466,510		706,207		709,474		206,303		625,674		784,400

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1980		1981		1982		1983		1984		1985		1986		1987		1988		1989	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
*** Main Channel Dredging ***																						
MN	Abv. Savage R.R. Br.	14.3-14.7	12	12,800			12	43,500	12	39,515												
MN	Cargill Slip	12.5-13.6							12	11,808												
MN	Peterson's Bar	11.8-12.4	11	3,800			11	18,516	12	29,516							11	18,201	12	3,870	12	12,478
MN	Blw. Peterson's Bar	11.3-11.7					11	1,248														
MN	Abv. 35W Br.	10.7-11.2							12	36,612												
MN	4 Mile Cut-off	3.4-4.7															12	4,389				
MN	Mouth of the MN River	0.0-1.1																				
SC	Hudson	16.1-17.6																				
SC	Kinnickinnic Bar	6.0-6.5	13	41,000									13	60,581							11	10,541
USAF	Mpls. Turning Basin	856.8-857.6					12	48,176			12	2,794					12	21,601	12	33,655		
USAF	Abv. Lowry Ave. Br.	856.4-856.8					11	76,631			12	36,667	12	17,772	11	37,500	12	85,560	12	2,164	12	16,167
USAF	Blw. Lowry Ave. Br.	856.0-856.4																				
USAF	Broadway Ave. Br.	855.3-856.1					12	20,565			12	23,868					12	27,589	12	4,377		
USAF	Abv. Plymoth Ave. Br.	854.8-855.5																	12	31,860		
1	Lower Appch. LSAF	853.4					13	1,493	13	500					13	800			12	400		
1	Washington Ave. Br.	852.5-853.0																				
1	Abv. Franklin Ave. Br.	851.6-852.4																	12	12,415		
1	Blw. Franklin Ave. Br.	850.7-851.4															11	10,894				
1	Abv. Lake St. Br.	849.9-850.5					11	57,605					12	29,079			11	23,763	12	3,992		
1	Blw. Lake St. Br.	848.9-849.9							12	12,802							12	41,342				
1	St. Paul Daymark	848.5-848.9															12	43,411	12	5,037		
1	Upper Appch. L/D 1	847.7-848.4																				
1	Lower Appch. L/D 1	847.4-847.5																				
2	Abv. & Blw. Smith Ave.	840.0-841.3	13	20,600			13	14,717	13	7,808	13	21,794										
2	Abv. Wabasha Ave. Br.	839.5-839.6																				
2	Blw. Lafayette St. Br.	838.0-839.0																				
2	St. Paul Barge Terminal	836.4-837.8									14	210,938	13	225,793			13	32,199	13	138,655		
2	Grey Cloud Slough	827.5-828.3															11	10,698				
2	Robinson Rocks	826.1																				
2	Pine Bend Landing	824.3-824.6																				
2	Pine Bend	822.7-823.7			13	28,000									12	37,469			12	22,000	12	15,253
2	Boulanger Bend	820.7-821.4																			11	88,294
2	Boulanger Bend Lwr. Lt.	819.0-819.8																				
2	Freeborn Light	818.0-818.9																				
2	Upper Appch. L/D 2	815.2-816.5																				
3	Lower Appch. L/D 2	814.9-815.1																			13	10,503
3	Prescott	810.3-811.7																				
3	Truedale Slough	807.9-808.6																				
3	Four Mile Island	807.0-807.9																				
3	Big River	804.1-806.0																			11	3,268

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1980		1981		1982		1983		1984		1985		1986		1987		1988		1989	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
3	Morgans Coulee	802.2-802.9																				
3	Coulters Island	800.8-801.9															11	3,174			12	11,120
3	Diamond Bluff	798.8-800.4													11	34,771					12	12,966
4	Trenton	794.0-794.6																				
4	Cannon River	792.1-793.5																	11	12,791		
4	Red Wing Hwy. Br.	789.5-791.2																				
4	Head of Lake Pepin	785.2-785.4																				
4	Chippewa Delta	763.2									9	301,000	9	170,544					9	382,816		
4	Reads Landing	761.8-763.8	6	9,000	12	88,500	13	210,055	12	58,199	13	69,000	13	56,334								
4	Crats Island	759.0			12	52,200	13	139,412	13	101,541	12	90,752	12	81,419	12	209,517						
4	Teepeeota Point	757.0-757.9							13	56,081	12	61,428			11	55,102	12	20,741				
4	Grand Encampment	755.8-756.9	12	10,300					12	49,727	11	37,863	11	20,026	12	19,000	12	22,804				
4	Beef Slough	753.8-754.1																				
5	Lower Appch. L/D 4	752.6																				
5	Mule Bend	748.6-749.6	6	1,600			11	24,519													13	40,306
5	West Newton	747.2-748.2					13	21,900			12	11,300										
5	Blw. West Newton	746.0-746.8							12	29,477					12	31,606			12	15,055		
5	Fisher Island	744.8-746.0					11	28,147	12	47,173	12	73,489			12	142,928			12	22,755		
5	Lower Zumbro	744.0-744.6	11	10,300					11	37,204					11	97,793	12	24,622				
5	Minneiska	742.7-743.0																				
5	Abv. Mt. Vernon Light	741.2-741.5																				
5A	Island 58	734.0-735.2					13	5,751														
5A	Fountain City	733.3-733.8																				
5A	Betsy Slough	731.0-732.0	11	34,800	12	13,200	11	20,194	12	57,458	12	22,208	12	23,249	12	39,426			11	7,853	13	21,993
5A	Wilds Bend	730.2-730.7	11	15,900	12	11,600			12	36,922	12	3,953	12	43,040							12	77,923
6	Lower Appch. L/D 5A	728.5							13	500												
6	Blw. Winona R.R. Br.	723.4-723.8																			13	14,542
6	Gravel Point	721.8-722.9																				
6	Homer	720.4-721.1											12	29,363	11	18,845						
6	Upper Appch. L/D 6	714.5-714.6																				
7	Lower Appch. L/D 6	714.0-714.3																	13	500		
7	Richmond Island	711.4-712.3					12	5,619														
7	Winters Landing	707.4-709.3	12	8,200	12	11,300	11	52,796			10	14,935	12	47,986	12	59,881					12	47,168
7	Dakota	706.1-706.6													12	18,056						
7	Dresbach	704.0-705.3			12	7,200									12	29,551					12	19,233
7	Lower Dresbach Island	703.0-703.7															11	2,409				
7	Upper Appch. L/D 7	702.5			13	19,100															13	7,193
8	Lower Appch. L/D 7	702.4																				
8	LaCrosse R.R. Br.	699.8-700.4					13	17,366			13	26,476			13	51,915						
8	Blw. LaCrosse R.R. Br.	698.7-699.4																				
8	LaCrosse	698.6-698.7																			13	8,113

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1980		1981		1982		1983		1984		1985		1986		1987		1988		1989	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
8	Sand Slough	694.3-695.0																				
8	Root River	693.5-693.7																				
8	Picyune Island	691.4-692.4																				
8	Abv. Brownsville	689.9-690.8											12	39,730	11	34,872			13	23,313		
8	Brownsville	688.7-689.4			13	59,100	12	16,047	12	17,859	11	15,167	12	25,710	11	44,744	12	18,153				
8	Head of Raft Channel	687.5-688.7			11	10,500	12	12,593	12	22,014			12	25,128							14	64,864
8	Deadman's Slough	686.5-687.5																			13	34,725
9	Lower Appch. L/D 8	678.7-679.2					13	5,638											13	5,322		
9	Island 126	677.5-678.4																			12	8,044
9	Twin Island	676.0-676.6																				
9	Battle Island	671.0-672.0	13	5,400																		
9	Indian Camp Light	665.0-665.8			13	10,400			13	30,841	11	13,939	12	27,509			12	21,101			12	4,974
9	Lansing Upper Light	663.8-664.9	12	35,000	12	19,500	13	36,833			12	113,453									12	18,921
9	Above Atchafalaya Bluff	660.0-661.0																				
10	Hay Point	646.0-646.6																				
10	Jackson Island	643.7-644.7			13	7,500																
10	Mississippi Gardens	642.7-643.4																				
10	Prairie Du Chien	635.0																				
10	Wyalusing	627.0-629.0																				
10	McMillan Island	618.4-619.6	11	4,500	11	45,400	12	68,688					12	67,095	11	6,895						
10	Upper Appch. L/D 10	615.1-616.5																				
*** Authorized Harbor Dredging ***																						
2	St. Paul SBH	839.6					6	8,413			6	26,000					6	4,409				
3	Hastings SBH	813.2									6	5,500										
4	Red Wing Comm. Harbor	791.5																				
4	Red Wing SBH	791.0					6	28,000														
4	Bay City	786.8																				
4	Lake City	772.5																				
4	Pepin SBH	767.0	6	2,000																		
4	Wabasha SBH	760.5																				
4	Alma SBH	754.0																				
6	Winona Comm. Harbor	726.3					13	1,909														
6	Winona SBH	726.1	6	700			6	250	6	6,255			6	250	6	4,050	6	760				
9	Lansing SBH	663.5																				
10	Prarie Du Chien SBH	636.0																				
10	Prarie Du Chien CH	635.2																				
*** Lock & Dam Dredging ***																						
1	L/D 1 Lock Chamber	847.6																				
2	L/D 2 Behind Up Guidewall	815.3																				
2	L/D 2 Aux. Lock	815.2																				
3	L/D 3 Aux. Gates	797.0													7	4,800						

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1980		1981		1982		1983		1984		1985		1986		1987		1988		1989	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
4	L/D 4 Aux. Lock	752.8	8	6,000									8	10,000					8	2,160		
5	L/D 5 Aux. Lock	738.1											8	1,957								
5A	L/D 5A Gate Bay	728.7													8	150						
5A	L/D 5A Chamber	728.5	8	200									8	411								
5A	L/D 5A Aux. Lock	728.5			8	3,700																
7	Lower Guidewall L/D 6	714.3					6	1,363														
7	L/D 6 Aux. Lock	714.1																				
8	L/D 7 Dock Access	702.3																				
9	L/D 8 Lower Guidewall	679.0																				
9	Upper Aux. L/D 9	647.9									8	1,500										
*** Miscellaneous Dredging ***																						
2	Access/Pine Bend Site	823.8																				
4	Old Miss. Channel	796.0-796.9																				
4	Indian Slough	760.0																				
4	Access Channel	753.7							7	4,662												
5	Island 40 Wing Dams	752.5	7	3,800																		
5	Mule Bend Side Channel	748.4					6	4,573														
5	Murphy's Cut	747.4																				
6	Blackbird Slough Sd.Ch.	727.8	6	4,400																		
9	Ferry Slough Sd. Ch.	672.1	6	1,000																		
10	Wyalusing Slough Sd.Ch.	627.9																				
TOTALS:				231,300		387,200		992,517		694,474		1,184,024		1,002,976		979,671		437,820		730,990		548,589

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1990		1991		1992		1993		1994		1995		1996		1997		1998		1999	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
*** Main Channel Dredging ***																						
MN	Abv. Savage R.R. Br.	14.3-14.7					12	5,087							12	5,190			12	2,634		
MN	Cargill Slip	12.5-13.6																	12	3,498		
MN	Peterson's Bar	11.8-12.4			12	3,515	12	5,920	11	12,542			12	30,133	12	12,842	12	18,799	12	29,593	12	8,000
MN	Blw. Peterson's Bar	11.3-11.7																				
MN	Abv. 35W Br.	10.7-11.2																				
MN	4 Mile Cut-off	3.4-4.7																				
MN	Mouth of the MN River	0.0-1.1							11	3,402												
SC	Hudson	16.1-17.6																				
SC	Kinnickinnic Bar	6.0-6.5																				
USAF	Mpls. Turning Basin	856.8-857.6					12	21,568	12	20,454	12	33,993			12	56,480			12	14,247	12	7,174
USAF	Abv. Lowry Ave. Br.	856.4-856.8			12	50,185	12	15,505			12	48,598			12	57,788	12	43,829	12	3,965	12	20,769
USAF	Blw. Lowry Ave. Br.	856.0-856.4					12	8,871														
USAF	Broadway Ave. Br.	855.3-856.1					12	10,753			12	15,052			12	15,642			12	18,833		
USAF	Abv. Plymoth Ave. Br.	854.8-855.5									12	12,000			12	1,800			12	15,603		
1	Lower Appch. LSAF	853.4																				
1	Washington Ave. Br.	852.5-853.0																				
1	Abv. Franklin Ave. Br.	851.6-852.4			13	8,295																
1	Blw. Franklin Ave. Br.	850.7-851.4					13	16,583			12	25,509							12	12,104		
1	Abv. Lake St. Br.	849.9-850.5			12	7,909					12	25,250			12	27,915	12	32,934	12	5,207	12	6,150
1	Blw. Lake St. Br.	848.9-849.9									12	11,450			12	7,805			12	14,731		
1	St. Paul Daymark	848.5-848.9																				
1	Upper Appch. L/D 1	847.7-848.4																				
1	Lower Appch. L/D 1	847.4-847.5									13	1,880										
2	Abv. & Blw. Smith Ave.	840.0-841.3																				
2	Abv. Wabasha Ave. Br.	839.5-839.6									13	660										
2	Blw. Lafayette St. Br.	838.0-839.0																				
2	St. Paul Barge Terminal	836.4-837.8							12	242,526			12	21,055	13	130,950			12	25,898	13	24,931
2	Grey Cloud Slough	827.5-828.3	12	20,120					11	13,922	12	13,168	12	15,066					12	25,571		
2	Robinson Rocks	826.1																				
2	Pine Bend Landing	824.3-824.6							11	13,863			12	41,157								
2	Pine Bend	822.7-823.7											12	34,407			12	65,237	12	50,929	12	34,114
2	Boulanger Bend	820.7-821.4							11	36,919			12	38,185			12	13,663	12	60,012	12	128,285
2	Boulanger Bend Lwr. Lt.	819.0-819.8											12	29,035							12	55,232
2	Freeborn Light	818.0-818.9					11	6,437					12	58,516					12	9,150	12	102,316
2	Upper Appch. L/D 2	815.2-816.5																				
3	Lower Appch. L/D 2	814.9-815.1					13	19,061											13	29,085		
3	Prescott	810.3-811.7																				
3	Truedale Slough	807.9-808.6																				
3	Four Mile Island	807.0-807.9																				
3	Big River	804.1-806.0							11	1,295			12	16,291								

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1990		1991		1992		1993		1994		1995		1996		1997		1998		1999	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
3	Morgans Coulee	802.2-802.9					12	6,394											13	47,135		
3	Coulters Island	800.8-801.9					12	25,344	11	5,675	11	13,052	12	60,390			11	10,299	12	50,140		
3	Diamond Bluff	798.8-800.4					12	12,025	11	1,143	11	14,981	12	66,681			11	6,731	12	100,172		
4	Trenton	794.0-794.6																				
4	Cannon River	792.1-793.5					12	19,282	11	8,603	12	27,676			12	39,214	12	35,708	12	600		
4	Red Wing Hwy. Br.	789.5-791.2																				
4	Head of Lake Pepin	785.2-785.4	12	11,532																		
4	Chippewa Delta	763.2	9	308,801	9	269,326	9	158,955					9	200,105					9	270,717		
4	Reads Landing	761.8-763.8					12	31,601	12	48,383							12	27,826	12	23,521		
4	Crats Island	759.0			12	41,000	12	97,821	12	72,830	12	76,945	12	65,407	12	82,256	12	62,988	12	30,546	12	25,768
4	Teepeeota Point	757.0-757.9			12	48,000	12	38,135	12	38,292			12	61,416	12	79,350	12	77,216	12	54,040		
4	Grand Encampment	755.8-756.9			12	66,000	12	20,678	12	39,723	11	5,201	12	85,767	12	58,991	12	39,207			12	44,184
4	Beef Slough	753.8-754.1	12	16,970	12	3,501			12	10,931	11	9,427	12	18,536			12	31,647	12	9,792	12	20,631
5	Lower Appch. L/D 4	752.6																				
5	Mule Bend	748.6-749.6									12	26,962			12	47,646	12	44,119	12	35,433		
5	West Newton	747.2-748.2									12	13,728	13	18,891					12	8,579		
5	Blw. West Newton	746.0-746.8	12	7,200	12	7,719	12	16,665	12	12,283	12	10,993	12	15,794	12	23,651	12	36,473	12	18,298		
5	Fisher Island	744.8-746.0	12	7,934			12	12,764	12	16,300			12	65,556	12	22,991	12	66,267	12	9,650		
5	Lower Zumbro	744.0-744.6					12	26,866	12	56,724			12	34,764	12	42,198	12	28,134				
5	Minneiska	742.7-743.0	12	3,208	13	34,090	12	20,759	12	15,926	12	13,694	12	24,960	12	43,370					12	10,977
5	Abv. Mt. Vernon Light	741.2-741.5													12	17,259						
5A	Island 58	734.0-735.2																				
5A	Fountain City	733.3-733.8																				
5A	Betsy Slough	731.0-732.0	12	13,835	12	11,469	13	43,055	12	33,465	12	27,865	13	59,230	13	44,041	12	20,757	12	33,705	13	53,573
5A	Wilds Bend	730.2-730.7					13	2,843			12	26,147	12	25,610	12	33,657						
6	Lower Appch. L/D 5A	728.5																				
6	Blw. Winona R.R. Br.	723.4-723.8									12	8,601	12	16,054			12	40,658	12	10,998		
6	Gravel Point	721.8-722.9																				
6	Homer	720.4-721.1			12	9,063											13	15,665				
6	Upper Appch. L/D 6	714.5-714.6																				
7	Lower Appch. L/D 6	714.0-714.3	13	15,305					13	35,157							13	17,198	13	42,328		
7	Richmond Island	711.4-712.3																				
7	Winters Landing	707.4-709.3			12	19,365			12	14,398			12	20,776	12	22,597	12	14,924	12	15,320		
7	Dakota	706.1-706.6	11	27,986					12	14,892			12	10,405	12	14,145	12	23,842				
7	Dresbach	704.0-705.3			12	11,204			12	17,989			12	14,927	12	21,276	12	28,466	12	18,065	12	36,409
7	Lower Dresbach Island	703.0-703.7	12	19,816			12	8,883	11	2,884			12	36,550	12	21,839	12	11,133	12	15,598	12	16,303
7	Upper Appch. L/D 7	702.5																				
8	Lower Appch. L/D 7	702.4																				
8	LaCrosse R.R. Br.	699.8-700.4																				
8	Blw. LaCrosse R.R. Br.	698.7-699.4					12	3,716											12	18,690		
8	LaCrosse	698.6-698.7																				

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1990		1991		1992		1993		1994		1995		1996		1997		1998		1999	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
8	Sand Slough	694.3-695.0																				
8	Root River	693.5-693.7																				
8	Picyune Island	691.4-692.4																				
8	Abv. Brownsville	689.9-690.8	13	24,888			12	24,590	12	49,867			12	28,030	12	21,525	12	17,876	12	30,456		
8	Brownsville	688.7-689.4	12	28,937	12	3,750	12	9,292	12	18,946	12	45,340	12	11,683	12	74,640	12	59,040	12	18,310	13	29,656
8	Head of Raft Channel	687.5-688.7			11	910	13	9,296			12	9,159			12	34,929	12	12,666			13	26,355
8	Deadman's Slough	686.5-687.5																				
9	Lower Appch. L/D 8	678.7-679.2																				
9	Island 126	677.5-678.4																	12	23,489		
9	Twin Island	676.0-676.6																				
9	Battle Island	671.0-672.0																				
9	Indian Camp Light	665.0-665.8					12	10,577	12	13,000	13	45,800	12	20,541	12	35,043	12	34,310	12	15,690	12	15,014
9	Lansing Upper Light	663.8-664.9	12	32,719	12	17,636	12	38,561			12	24,064	12	94,503	12	41,509	12	35,787	12	13,554	12	20,464
9	Above Atchafalaya Bluff	660.0-661.0																				
10	Hay Point	646.0-646.6																				
10	Jackson Island	643.7-644.7																				
10	Mississippi Gardens	642.7-643.4																				
10	Prairie Du Chien	635.0																				
10	Wyalusing	627.0-629.0																				
10	McMillan Island	618.4-619.6					12	70,829	11	3,047			12	62,986	12	40,157	11	32,852	12	6,423	12	28,951
10	Upper Appch. L/D 10	615.1-616.5																				
*** Authorized Harbor Dredging ***																						
2	St. Paul SBH	839.6	6	2,678	6	1,250	6	11,817	6	10,000	6	5,966	6	8,000	6	1,071	6	14,000	6	9,294		
3	Hastings SBH	813.2															6	4,375				
4	Red Wing Comm. Harbor	791.5													10	668						
4	Red Wing SBH	791.0																				
4	Bay City	786.8																				
4	Lake City	772.5																				
4	Pepin SBH	767.0																				
4	Wabasha SBH	760.5																				
4	Alma SBH	754.0																				
6	Winona Comm. Harbor	726.3													10	2,000						
6	Winona SBH	726.1							6	2,613					6	1,613	6	5,282	6	3,500		
9	Lansing SBH	663.5																				
10	Prarie Du Chien SBH	636.0																				
10	Prarie Du Chien CH	635.2																				
*** Lock & Dam Dredging ***																						
1	L/D 1 Lock Chamber	847.6	8	40																		
2	L/D 2 Behind Up Guidewall	815.3																	7	900		
2	L/D 2 Aux. Lock	815.2																	15	900		
3	L/D 3 Aux. Gates	797.0																				

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			1990		1991		1992		1993		1994		1995		1996		1997		1998		1999	
POOL	NAME	LOCATION	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.	*	QTY.
4	L/D 4 Aux. Lock	752.8													8	6,300					8	3,800
5	L/D 5 Aux. Lock	738.1																				
5A	L/D 5A Gate Bay	728.7																				
5A	L/D 5A Chamber	728.5																				
5A	L/D 5A Aux. Lock	728.5																				
7	Lower Guidewall L/D 6	714.3																				
7	L/D 6 Aux. Lock	714.1					8	300														
8	L/D 7 Dock Access	702.3																	7	1,980		
9	L/D 8 Lower Guidewall	679.0					8	2,645														
9	Upper Aux. L/D 9	647.9																				
*** Miscellaneous Dredging ***																						
2	Access/Pine Bend Site	823.8											6	6,000			6	4,000				
4	Old Miss. Channel	796.0-796.9																				
4	Indian Slough	760.0					8	8,000														
4	Access Channel	753.7																				
5	Island 40 Wing Dams	752.5																				
5	Mule Bend Side Channel	748.4																				
5	Murphy's Cut	747.4			4	2,000																
6	Blackbird Slough Sd.Ch.	727.8																				
9	Ferry Slough Sd. Ch.	672.1																				
10	Wyalusing Slough Sd.Ch.	627.9																				
TOTALS:				541,969		616,187		841,478		887,994		593,161		1,417,407		1,190,348		1,033,908		1,258,883		719,056

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			2000		TOTALS	AVG./YR.	AVG./JOB	FREQ.
POOL	NAME	LOCATION	*	QTY.	70-00	70-00	70-00	(%)
*** Main Channel Dredging ***								
MN	Abv. Savage R.R. Br.	14.3-14.7	12	7,594	179,474	5,789	17,947	32%
MN	Cargill Slip	12.5-13.6	12	3,902	19,208	620	6,403	10%
MN	Peterson's Bar	11.8-12.4	12	14,516	301,262	9,718	16,737	58%
MN	Blw. Peterson's Bar	11.3-11.7			14,454	466	7,227	6%
MN	Abv. 35W Br.	10.7-11.2			36,612	1,181	36,612	3%
MN	4 Mile Cut-off	3.4-4.7			4,389	142	4,389	3%
MN	Mouth of the MN River	0.0-1.1			32,234	1,040	16,117	6%
SC	Hudson	16.1-17.6			182,964	5,902	182,964	3%
SC	Kinnickinnic Bar	6.0-6.5			169,059	5,454	33,812	16%
USAF	Mpls. Turning Basin	856.8-857.6			501,468	16,176	29,498	55%
USAF	Abv. Lowry Ave. Br.	856.4-856.8			675,013	21,775	35,527	61%
USAF	Blw. Lowry Ave. Br.	856.0-856.4			8,871	286	8,871	3%
USAF	Broadway Ave. Br.	855.3-856.1			165,108	5,326	13,759	39%
USAF	Abv. Plymoth Ave. Br.	854.8-855.5			251,299	8,106	20,942	39%
1	Lower Appch. LSAF	853.4	13	1,000	4,793	155	799	19%
1	Washington Ave. Br.	852.5-853.0			50,857	1,641	16,952	10%
1	Abv. Franklin Ave. Br.	851.6-852.4			118,533	3,824	16,933	23%
1	Blw. Franklin Ave. Br.	850.7-851.4	12	17,049	262,043	8,453	23,822	35%
1	Abv. Lake St. Br.	849.9-850.5			401,697	12,958	23,629	55%
1	Blw. Lake St. Br.	848.9-849.9			218,043	7,034	19,822	35%
1	St. Paul Daymark	848.5-848.9			86,231	2,782	14,372	19%
1	Upper Appch. L/D 1	847.7-848.4	12	35,177	143,799	4,639	20,543	23%
1	Lower Appch. L/D 1	847.4-847.5			1,880	61	1,880	3%
2	Abv. & Blw. Smith Ave.	840.0-841.3			128,460	4,144	12,846	32%
2	Abv. Wabasha Ave. Br.	839.5-839.6	12	485	1,145	37	573	6%
2	Blw. Lafayette St. Br.	838.0-839.0			9,224	298	9,224	3%
2	St. Paul Barge Terminal	836.4-837.8	13	163,583	2,016,078	65,035	134,405	48%
2	Grey Cloud Slough	827.5-828.3			207,377	6,690	23,042	29%
2	Robinson Rocks	826.1			7,894	255	7,894	3%
2	Pine Bend Landing	824.3-824.6			188,059	6,066	62,686	10%
2	Pine Bend	822.7-823.7			535,947	17,289	48,722	35%
2	Boulanger Bend	820.7-821.4			606,791	19,574	80,905	24%
2	Boulanger Bend Lwr. Lt.	819.0-819.8			320,435	10,337	64,087	16%
2	Freeborn Light	818.0-818.9			176,419	5,691	44,105	13%
2	Upper Appch. L/D 2	815.2-816.5			14,936	482	14,936	3%
3	Lower Appch. L/D 2	814.9-815.1			90,974	2,935	22,744	13%
3	Prescott	810.3-811.7			45,352	1,463	45,352	3%
3	Truedale Slough	807.9-808.6			26,644	859	26,644	3%
3	Four Mile Island	807.0-807.9			68,388	2,206	68,388	3%
3	Big River	804.1-806.0	12	4,159	97,113	3,133	19,423	16%

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			2000		TOTALS	AVG./YR.	AVG./JOB	FREQ.
POOL	NAME	LOCATION	*	QTY.	70-00	70-00	70-00	(%)
3	Morgans Coulee	802.2-802.9			82,579	2,664	27,526	10%
3	Coulters Island	800.8-801.9	12	19,364	268,824	8,672	26,882	32%
3	Diamond Bluff	798.8-800.4			397,396	12,819	44,155	29%
4	Trenton	794.0-794.6			115,379	3,722	57,690	6%
4	Cannon River	792.1-793.5	12	24,047	304,704	9,829	33,856	29%
4	Red Wing Hwy. Br.	789.5-791.2			145,879	4,706	72,940	6%
4	Head of Lake Pepin	785.2-785.4	12	33,946	45,478	1,467	22,739	6%
4	Chippewa Delta	763.2	9	270,432	2,332,696	75,248	259,188	29%
4	Reads Landing	761.8-763.8			1,151,573	37,148	67,740	55%
4	Crats Island	759.0	12	22,067	1,952,374	62,980	81,349	77%
4	Teepeeota Point	757.0-757.9	12	65,505	1,057,853	34,124	58,770	58%
4	Grand Encampment	755.8-756.9	12	5,731	696,283	22,461	38,682	58%
4	Beef Slough	753.8-754.1			171,317	5,526	17,132	32%
5	Lower Appch. L/D 4	752.6			15,792	509	5,264	10%
5	Mule Bend	748.6-749.6			369,332	11,914	33,576	35%
5	West Newton	747.2-748.2			188,988	6,096	20,999	29%
5	Blw. West Newton	746.0-746.8	12	10,126	501,012	16,162	27,834	58%
5	Fisher Island	744.8-746.0	12	42,487	977,168	31,522	44,417	71%
5	Lower Zumbro	744.0-744.6	12	10,559	584,819	18,865	36,551	52%
5	Minneiska	742.7-743.0	12	27,707	252,784	8,154	22,980	35%
5	Abv. Mt. Vernon Light	741.2-741.5			80,108	2,584	40,054	6%
5A	Island 58	734.0-735.2			238,830	7,704	29,854	26%
5A	Fountain City	733.3-733.8			40,411	1,304	40,411	3%
5A	Betsy Slough	731.0-732.0	13	22,749	704,269	22,718	28,171	81%
5A	Wilds Bend	730.2-730.7			441,208	14,233	25,953	55%
6	Lower Appch. L/D 5A	728.5			9,820	317	4,910	6%
6	Blw. Winona R.R. Br.	723.4-723.8			300,548	9,695	33,394	29%
6	Gravel Point	721.8-722.9			16,578	535	16,578	3%
6	Homer	720.4-721.1			166,068	5,357	33,214	16%
6	Upper Appch. L/D 6	714.5-714.6	11	1,466	1,466	47	1,466	3%
7	Lower Appch. L/D 6	714.0-714.3			118,471	3,822	19,745	19%
7	Richmond Island	711.4-712.3			128,210	4,136	32,053	13%
7	Winters Landing	707.4-709.3			717,653	23,150	39,870	58%
7	Dakota	706.1-706.6			226,854	7,318	20,623	35%
7	Dresbach	704.0-705.3			320,528	10,340	22,895	45%
7	Lower Dresbach Island	703.0-703.7	12	5,054	140,469	4,531	14,047	32%
7	Upper Appch. L/D 7	702.5			26,293	848	13,147	6%
8	Lower Appch. L/D 7	702.4			12,089	390	12,089	3%
8	LaCrosse R.R. Br.	699.8-700.4			220,300	7,106	36,717	19%
8	Blw. LaCrosse R.R. Br.	698.7-699.4			22,406	723	11,203	6%
8	LaCrosse	698.6-698.7			8,113	262	8,113	3%

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			2000		TOTALS	AVG./YR.	AVG./JOB	FREQ.
POOL	NAME	LOCATION	*	QTY.	70-00	70-00	70-00	(%)
8	Sand Slough	694.3-695.0			78,790	2,542	78,790	3%
8	Root River	693.5-693.7	12	15,493	15,493	500	15,493	3%
8	Picyune Island	691.4-692.4			76,766	2,476	38,383	6%
8	Abv. Brownsville	689.9-690.8	13	43,048	695,441	22,434	38,636	58%
8	Brownsville	688.7-689.4			678,126	21,875	30,824	71%
8	Head of Raft Channel	687.5-688.7			484,610	15,633	34,615	45%
8	Deadman's Slough	686.5-687.5			48,772	1,573	24,386	6%
9	Lower Appch. L/D 8	678.7-679.2			15,127	488	5,042	10%
9	Island 126	677.5-678.4			142,489	4,596	47,496	10%
9	Twin Island	676.0-676.6			6,200	200	6,200	3%
9	Battle Island	671.0-672.0			76,003	2,452	25,334	10%
9	Indian Camp Light	665.0-665.8			523,119	16,875	27,533	61%
9	Lansing Upper Light	663.8-664.9	12	38,108	918,131	29,617	45,907	65%
9	Above Atchafalaya Bluff	660.0-661.0			87,934	2,837	87,934	3%
10	Hay Point	646.0-646.6			79,333	2,559	39,667	6%
10	Jackson Island	643.7-644.7			222,477	7,177	74,159	10%
10	Mississippi Gardens	642.7-643.4			176,555	5,695	88,278	6%
10	Prairie Du Chien	635.0			104,932	3,385	104,932	3%
10	Wyalusing	627.0-629.0			34,217	1,104	34,217	3%
10	McMillan Island	618.4-619.6			488,136	15,746	34,867	45%
10	Upper Appch. L/D 10	615.1-616.5			53,817	1,736	53,817	3%
*** Authorized Harbor Dredging ***								
2	St. Paul SBH	839.6	6	5,840	138,068	4,454	8,629	52%
3	Hastings SBH	813.2			17,059	550	5,686	10%
4	Red Wing Comm. Harbor	791.5			7,190	232	2,397	10%
4	Red Wing SBH	791.0			28,000	903	28,000	3%
4	Bay City	786.8						
4	Lake City	772.5						
4	Pepin SBH	767.0			2,292	74	1,146	6%
4	Wabasha SBH	760.5						
4	Alma SBH	754.0			3,104	100	3,104	3%
6	Winona Comm. Harbor	726.3			4,440	143	1,480	10%
6	Winona SBH	726.1	6	700	62,981	2,032	3,499	58%
9	Lansing SBH	663.5						
10	Prarie Du Chien SBH	636.0						
10	Prarie Du Chien CH	635.2						
*** Lock & Dam Dredging ***								
1	L/D 1 Lock Chamber	847.6			40	1	40	3%
2	L/D 2 Behind Up Guidewall	815.3			900	29	900	3%
2	L/D 2 Aux. Lock	815.2			900	29	900	3%
3	L/D 3 Aux. Gates	797.0			4,800	155	4,800	3%

* Dredging Depth (ft)

RECORD OF DREDGING EVENTS (April 2001)

DREDGE CUTS			2000		TOTALS	AVG./YR.	AVG./JOB	FREQ.
POOL	NAME	LOCATION	*	QTY.	70-00	70-00	70-00	(%)
4	L/D 4 Aux. Lock	752.8			33,917	1,094	5,653	19%
5	L/D 5 Aux. Lock	738.1			1,957	63	1,957	3%
5A	L/D 5A Gate Bay	728.7			150	5	150	3%
5A	L/D 5A Chamber	728.5			611	20	306	6%
5A	L/D 5A Aux. Lock	728.5			3,700	119	3,700	3%
7	Lower Guidewall L/D 6	714.3			7,425	240	3,713	6%
7	L/D 6 Aux. Lock	714.1			300	10	300	3%
8	L/D 7 Dock Access	702.3			1,980	64	1,980	3%
9	L/D 8 Lower Guidewall	679.0			2,645	85	2,645	3%
9	Upper Aux. L/D 9	647.9			1,500	48	1,500	3%
*** Miscellaneous Dredging ***								
2	Access/Pine Bend Site	823.8			10,000	323	5,000	6%
4	Old Miss. Channel	796.0-796.9			7,219	233	7,219	3%
4	Indian Slough	760.0			8,000	258	8,000	3%
4	Access Channel	753.7			4,662	150	4,662	3%
5	Island 40 Wing Dams	752.5			3,800	123	3,800	3%
5	Mule Bend Side Channel	748.4			18,777	606	9,389	6%
5	Murphy's Cut	747.4			2,000	65	2,000	3%
6	Blackbird Slough Sd.Ch.	727.8			4,400	142	4,400	3%
9	Ferry Slough Sd. Ch.	672.1			1,000	32	1,000	3%
10	Wyalusing Slough Sd.Ch.	627.9			34,824	1,123	34,824	3%
TOTALS:				911,894	29,348,558	946,728		

* Dredging Depth (ft)

ST. PAUL DISTRICT RECOMMENDED BEND WIDTHS

April 1996

Reproduced From Attachment 3 of the GREAT I Technical Apendix E, Volume 3, September 1980

Bend Location	River Mile	Normal Width Before Dredging	Normal Width After Dredging	Width at Last Sounding	Maximum Potential Width	Suggested Width
Below Lock and Dam 1	846.3-846.7			150	200	150
Fort Snelling	845.7-846.3			200	250	200
Lower Mouth - Minnesota River	843.3-844.3			250	300	300
Lilydale, Minnesota	841.7-842.4			300	350	300
Below Omaha Railroad Bridge	840.7-841.4			250	250	250
Above Beltline Railroad Bridge	835.7-836.3			400	500	400
Armour	832.9-833.6			400	400	400
Grey Cloud Slough	827.3-828.0	250	400	500	500	450
Pine Bend Head Light	825.0-826.2	200	400	350	400	400
Pine Bend Foot Light	823.3-824.3	250	375	350	375	375
Grey Cloud Landing	822.3-823.3	250	400	400	400	400
Boulanger Bend	820.3-821.5	250	450	500	500	500
Boulanger Bend Lower Light	818.4-820.3	250	450	450	500	400
Nininger, Minnesota	817.8-818.4	250	400	400	500	400
Upper Approach - Lock and Dam 2	815.6-816.9			500	600	500
Hastings Highway Bridge	813.8-814.2			450	450	450
Point Douglas, Wisconsin	812.4-813.0	250	400	400	500	400
Prescott, Wisconsin	810.0-810.7	300	450	500	600	450
Truedale Slough	808.2-808.8	200	350	350	400	400
Four Mile Island	807.2-807.8	350	450	500	500	500
Below Wind Creek	800.8-800.7	300	500	500	500	450
Below Diamond Bluff	798.7-799.5	250	400	400	500	400
Upper Approach - Lock and Dam 3	797.0-798.4	300	600	600	700	600
Trenton, Wisconsin	794.0-794.5	200	600	600	650	600
Above Red Wing Highway Bridge	790.5-792.0	300	500	350-450	400-600	500
Below Red Wing Highway Bridge	789.4-790.3	200	500	500	600	500
Goose Bay	787.5-788.6	200	350	350	400	350
Head of Lake Pepin	785.2-785.6	300	450	450	550	500
Reads Landing	762.4-763.3	100	450	500	600	500
Below Reads Landing	761.5-762.5	300	450	550	600	500
Crats Island	758.0-759.5	100	500	450	600	450
Above Teepeeota Point	757.2-757.8	350	500	500	550	500
Beef Slough	753.7-754.6	200	400	400	450	400
Alma Lower Light	751.0-752.1			450	450	450
Upper Mouth - Zumbro River	749.4-751.0			500	550	500
Mule Bend	747.8-748.8	200	450	500	600	500
West Newton	747.0-747.8	250	450	400	600	450
Below West Newton	746.4-746.9	300	500	450	650	450
Lower Zumbro	744.9-745.4	350	500	500	650	500
Summerfield Island	742.8-743.6	150	400	400	500	400
Minneiska, Minnesota	742.0-743.0			500	600	500
Mount Vernon Light	740.3-741.3	200	500	500	500	500
Richtman Light	739.3-740.3			550	600	550
Upper Approach - Lock and Dam 5	738.1-739.0			500	500	500
Island 58	734.0-735.0	200	500	500	600	500
Fountain City	732.7-733.5	250	400	400	500	400
Head of Betsy Slough	731.7-732.3	250	500	500	600	500
Betsy Slough Bend	731.0-731.7	250	450	450	500	500
Wilds Bend	729.5-731.0	250	450	500	500	450
Island 71	726.0-726.7	300	450	450	500	450
Gravel Point	721.6-722.4	300	500	600	600	500
Blacksmith Slough	718.0-719.0			550	700	550
Lamoille, Minnesota	715.6-716.6			500	600	500
Head of Richmond Island	712.6-713.4	250	450	400	600	450

ST. PAUL DISTRICT RECOMMENDED BEND WIDTHS						April 1996
Reproduced From Attachment 3 of the GREAT I Technical Apendix E, Volume 3, September 1980						
Bend Location	River Mile	Normal Width Before Dredging	Normal Width After Dredging	Width at Last Sounding	Maximum Potential Width	Suggested Width
Queens Bluff	711.0-712.0	200	500	500	600	500
Winters Landing	708.0-709.0	200	500	300	600	400
Dakota, Minnesota	706.0-707.4	150	400	400	500	400
Black River	698.0-698.7			600	600	600
Broken Arrow	695.8-696.8	300	500	450	600	450
Sand Slough	694.4-695.2	300	600	500	700	500
Two Mile Island	691.8-692.2			500	800	500
Above Brownsville	690.2-691.0	100	400	500	650	400
Brownsville	689.7-690.2	100	500	450	600	400
Head of Raft Channel	687.5-688.4	200	400	450	500	400
Below Head of Raft Channel	686.5-687.5	250	400	350	500	400
Deadmans Slough	685.5-686.5			400	500	400
Warners Landing	683.0-683.6			400	450	400
Island 126	677.2-678.2	250	500	450	600	450
Twin Island	676.0-677.3	150	400	500	600	400
Bad Axe Bend	674.0-675.0	300	600	450	600	450
Head of Battle Island	670.7-671.5	300	450	500	500	450
Battle Island	669.8-670.7			500	600	500
Lansing Upper Light	663.8-664.4	200	600	500	800	500
Above Lansing Bridge	663.4-663.8			450	550	450
Below Lansing	660.3-661.0	300	600	450	700	450
Heytmans Crossing	654.5-655.5			500	500	500
Crooked Slough Foot Light	651.6-652.4			500	500	500
Gordons Bay	645.4-646.1	350	600	400	700	450
Mississippi Gardens	642.5-643.5	250	550	500	800	500
Johnsonport	640.6-641.8			500	600	500
Wyalusing Bend	628.6-629.3	300	600	600	700	500
Wyalusing	627.2-628.0	300	600	600	1000	500
Catfish Slough	625.7-626.6			700	800	500
Clayton, Iowa	624.7-625.7			750	900	500
French Island	619.8-620.6			500	800	500
McMillian Island	617.0-619.0	200	500	500	500	500
Ferry Slough	615.6-616.3	300	600	600	600	450
Upper Approach to Lock and Dam 10	615.1-615.6			600	600	600

Factors Influencing Dredging Dimensions
Upper Mississippi River - St. Paul District

The District is committed to minimizing overall dredging quantities and costs, while maintaining the necessary project dimensions. The objective is to optimize a balance between dredging frequency, quantity and cost without compromising safety and reliability for the project user. There are numerous factors that influence a determination of dredging dimensions for a given location and dredging event. Some of the factors are related to the hydraulics of the river system and others are operational in nature. They may affect the determination of dredging depth, width or timing of the event. Not all factors are considered for each dredging event. Some are evaluated over a period of time and may consider a history of dredging events. The factors are discussed below.

1. Location to Tributaries - Deeper dredging depths are favored for cuts located just downstream of a heavily sediment laden tributary.

2. Type of Reach - A straight, divided river reach favors deeper dredging while an undivided bend in a stable meandering reach is better suited for shallower dredging depths.

3. Location of Cut with Respect to the Thalweg - A cut in alignment with and on the thalweg is considered a positive factor for shallower dredging. A cut on or near a point bar favors deeper dredging depths.

4. Cut Stability - If experience indicates that a cut does not fill or scours under low flow conditions shallower dredging may be justified. Cuts filling under low flows support deeper dredging.

5. Dredging Frequency/Volume - Actual experience dredging to different depths is valuable. If overall volume and frequency is lower because of shallower depth dredging, it would favor continuation of the practice.

6. Surrounding Depths - Dredging depth consistency with surrounding depths outside of the cut area is a consideration to avoid creating significant variation in contours.

7. Equipment Efficiency - Dredging equipment is generally more efficient with deeper depths because the average dredging face (layer being removed) is closer to the equipment's design for optimum performance.

8. Placement Site Factors - A site with limited capacity favors reduced dimensions to minimize dredging quantities and maximize site longevity. A related factor for hydraulic dredging is the placement site's tolerance for a high water ratio in the slurry. If the site cannot tolerate large volumes of water, a deeper depth is favored to increase the sand portion of the slurry. A related factor for mechanical dredging is the placement sites distance from the dredge cut. Sites requiring a long transport would favor minimizing quantities.

9. Dredging Requirements - Emergency conditions or an overall heavy dredging workload favor reduced dimensions to expedite the process.

10. User Feedback & Maintenance Experience - Input from vessel operators and general experience and past practices both from a navigation and channel maintenance perspective is an indispensable factor for determining appropriate dimensions.

Checklist of further actions that will be required prior to implementation of dredging, snagging and recreational beach development.			
Pool	Site/Cut Name	Location (river mile)	Further Federal Endangered Species Coordination*
*** Main Channel Dredging ***			
SC	Kinnickinnic Bar	6.0 - 6.5	Mussels
3	Prescott	810.3 - 811.7	Mussels
3	Truedale Slough	807.9 - 808.6	Mussels
3	Four Mile Island	807.0 - 807.9	Mussels
4	Above Red Wing High Bridge	790.8 - 791.2	Mussels
4	Below Red Wing High Bridge	789.5 - 790.3	Mussels
5	Lower Approach L/D 4	752.6 - 752.8	Mussels
5A	Island 58	734.0 - 735.2	Mussels
5A	Fountain City	733.3 - 733.8	Mussels
6	Gravel Point	721.8 - 722.9	Mussels
7	Richmond Island	711.4 - 712.3	Mussels
7	Upper Approach to L/D 7	702.5 - 702.9	Mussels
8	Sand Slough	694.3 - 695.0	Mussels
8	Picayune Island	691.4 - 692.4	Mussels
8	Deadman's Slough	686.5 - 687.5	Mussels
10	Hay Point	646.0 - 646.6	Mussels
10	Jackson Island	643.7 - 644.7	Mussels
10	Mississippi Gardens	642.7 - 643.4	Mussels
10	Wyalusing	627.3 - 628.0	Mussels
Various	New Cuts or New Sediment Traps	Undetermined	Mussels
*** Recreational Beach Development ***			
3	3-805.5-RM	805.5 (Minnesota)	Eagle
3	3-802.3-RM	802.3 (Minnesota)	Eagle
4	4-762.4-RM	762.4 (Minnesota)	Eagle
4	4-756.2-RM	756.2 (Minnesota)	Eagle
8	8-694.6-RM	694.6 (Minnesota)	Eagle
10	10-644.2-LW	644.2 (Wisconsin)	Mussels
10	10-637.2-LW	637.2 (Wisconsin)	Mussels
10	10-637.2-RI	637.2 (Iowa)	Mussels
10	10-623.0-LW	623.0 (Wisconsin)	Mussels
*** Snagging ***			
All	Upper Mississippi, St. Croix and Minnesota Rivers	where needed	Eagle and Mussels

* Changed conditions could cause additional endangered species coordination to be required at any of the proposed dredging locations or recreational beach sites.

TAB 5

SEDIMENT QUALITY AND CHARACTERISTIC DATA

TAB 5 - SEDIMENT QUALITY DATA

Sediment Contaminants Data Base for 9-Foot Navigation Project - St. Paul District

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Key for Tables

System
- 1 Mississippi River
- 2 Minnesota River
- 3 St. Croix River
- 4 Black River
- 5 Root River

Habitat Type
- 1 Main Channel
- 2 Boat Harbors
- 3 Backwaters

Sampling Gear
- 1 9"x9" Ponar
- 2 Petite Ponar
- 3 Eckman Dredge
- 4 Coring Device - 2 inch inner diameter

Data Citation
- COE U.S. Army Corps of Engineers, St. Paul District
- WDNR Wisconsin Department of Natural Resources
- FWS U.S. Fish and Wildlife Service
- MWCC Metropolitan Waste Control Commission

Table 1. Contaminant Data for Upstream of 9 ft. Navigation Project

			Record #	1024	1037	1050	1063	1010	1006	1002	1019	1023	1015	1032	1036	1028
			River Mile	872.0	872.0	872.0	872.0	872.0	872.0	872.0	872.0	872.0	872.0	872.0	872.0	872.0
			Location	Anoka x-sec - mean	Anoka x-sec - mean	Anoka x-sec - mean	Anoka x-sec - mean	Anoka x-sec - south	Anoka x-sec - mid	Anoka x-sec - north	Anoka x-sec - mid	Anoka x-sec - south	Anoka x-sec - north	Anoka x-sec - mid	Anoka x-sec - south	Anoka x-sec - north
			Year	1982	1983	1984	1985	1981	1981	1981	1982	1982	1982	1983	1983	1983
			System	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
			Sam. Gear	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clf.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC	< 5	< 0.53	< 0.32	< 0.26									
	ug/kg		b-BHC	< 10	< 1.1	5	< 0.53									
	ug/kg		BHC													
	ug/kg		g-BHC (lindane)	15	< 0.53	< 0.32	< 0.26									
	ug/kg		Heptachlor	5	< 0.53	< 0.32	< 0.26									
	ug/kg		Aldrin													
	ug/kg		Heptachlorepoxide													
	ug/kg		Endosulfan I													
	ug/kg		Dieldrin	< 20	< 1.6	< 0.96	< 0.79									
	ug/kg		4,4'-DDE	< 7	< 1.6	< 0.96	< 0.79									
	ug/kg		Endrin	< 10	< 2.1	< 1.3	< 1.1									
	ug/kg		Endosulfan II													
	ug/kg		4,4'-DDD	< 14	< 3.2	< 1.9	< 1.6									
	ug/kg		Endrinaldehyde													
	ug/kg		Sulfan sulfate													
	ug/kg		4,4'-DDT	< 20	< 4.2	< 2.5	< 2.1									
	ug/kg		Methoxychlor													
	ug/kg		Endrinketone													
	ug/kg		Chlorodane	< 2	< 11	< 6.4	< 5.3									
	ug/kg		Toxaphene													
METALS	mg/kg		Ag (silver)					0.06	0.07	0.06	0.051	0.055	0.052	0.035	0.029	0.038
	mg/kg		Al (aluminum)													
	mg/kg		As (arsenic)					1.1	0.82	1.08	1.83	1.32	1.58	1.67	4.13	3.66
	mg/kg		B (boron)													
	mg/kg		Ba (barium)													
	mg/kg		Be (beryllium)					0.12	0.13	0.13	0.112	0.101	0.117	0.093	0.21	0.123
	mg/kg		Cd (cadmium)					0.05	0.05	0.05	0.032	0.022	0.02	0.01	0.109	0.018
	mg/kg		Cr (chromium)					25.7	12.4	20.5	10.3	8.5	9.1	9.4	34.6	18.2
	mg/kg		Cu (copper)					4.9	3.2	4.5	3.1	2.6	2.8	2.3	7.4	10.1
	mg/kg		Fe (iron)													
	mg/kg		Hg (mercury)					0.005	0.005	0.005	0.05	0.05	0.05	0.05	0.05	0.05
	mg/kg		Mg (magnesium)													
	mg/kg		Mn (manganese)								551	321	319			
	mg/kg		Mo (molybdenum)													
	mg/kg		Ni (nickel)					11.2	6	9.3	7.1	5.7	6.1	7.4	25.5	18.7
	mg/kg		Pb (lead)					4.9	3.2	12.2	1.8	2.2	1.8	0.6	2.6	1.1
	mg/kg		Sb (antimony)													
	mg/kg		Se (selenium)					0.12	0.12	0.11	0.05	0.6	0.05	0.05	0.05	0.05
	mg/kg		Sn (tin)													
	mg/kg		Sr (strontium)													
	mg/kg		Ti (titanium)								0.6	0.6	0.6	0.6	0.6	0.6
	mg/kg		Zn (zinc)					20.5	16.7	19.2	14.3	12.6	14.1	10.6	21.4	20.1
	mg/kg		V (vanadium)													
PCB'S	ug/kg		Aroclor-1006	50	6.20	44	< 5.3									
	ug/kg		Aroclor-1221													
	ug/kg		Aroclor-1232													
	ug/kg		Aroclor-1242													
	ug/kg		Aroclor-1248													
	ug/kg		Aroclor-1254	80	10	38	< 5.3									
	ug/kg		Aroclor-1260	< 20	< 5.3	< 3.2	< 5.3									
	ug/kg		Total PCB's													
PARTICLE SIZE %FINER		SAND coarse	3 in													
			1 1/2													
			3/4													
			3/8													
			4													
			8													
			10													
		SAND medium	16													
			20													
			30													
			40													
			50													
		SAND fine	70													
			80													
			100													
			140													
		SILT CLAY	200													
			270													
			0.20 mm													
			0.05 mm													
MISC	%		Total Organic Carb													
	mg/kg		Chem Oxy Demand													
	mg/kg		Kjedahl Nitrogen													
	mg/kg		Total Phosph													
	mg/kg		Oil and Grease													
	mg/kg		Cyanide, Total													
	mg/kg		Ammonia													
	mg/l		Ammonia Elutriate													
	%		Moisture													
	%		Total Solids													
	%		Volatile Solids													

Table 1. Contaminant Data for Upstream of 9 ft. Navigation Project

			Record #	1041	1049	1045	1062	1054	1058
			River Mile	872.0	872.0	872.0	872.0	872.0	872.0
			Location	Anoka x-sec - north	Anoka x-sec - south	Anoka x-sec - mid	Anoka x-sec - south	Anoka x-sec - north	Anoka x-sec - mid
			Year	1984	1984	1984	1985	1985	1985
			System	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1
			Pool	-1	-1	-1	-1	-1	-1
			Sam. Gear	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10
			Data Clt.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC						
	ug/kg		b-BHC						
	ug/kg		BHC						
	ug/kg		g-BHC (lindane)						
	ug/kg		Heptachlor						
	ug/kg		Aldrin						
	ug/kg		Heptachlorepoxide						
	ug/kg		Endosulfan I						
	ug/kg		Dieldrin						
	ug/kg		4,4'-DDE						
	ug/kg		Endrin						
	ug/kg		Endosulfan II						
	ug/kg		4,4'-DDD						
	ug/kg		Endrinaldehyde						
	ug/kg		Sulfan sulfate						
	ug/kg		4,4'-DDT						
	ug/kg		Methoxychlor						
	ug/kg		Endrinketone						
	ug/kg		Chlorodane						
	ug/kg		Toxaphene						
METALS	mg/kg		Ag (silver)	0.005	0.016	0.019	0.031	0.031	0.039
	mg/kg		Al (aluminum)						
	mg/kg		As (arsenic)	1.14	1.4	1.31	3.17	4.04	3.75
	mg/kg		B (boron)						
	mg/kg		Ba (barium)						
	mg/kg		Be (beryllium)	0.116	0.163	0.096	0.097	0.111	0.142
	mg/kg		Cd (cadmium)	0.021	0.027	0.021	0.02	0.074	0.012
	mg/kg		Cr (chromium)	8.8	11.3	7.8	9.1	9.8	10.9
	mg/kg		Cu (copper)	2.7	5.5	3.2	5	6.1	8.3
	mg/kg		Fe (iron)						
	mg/kg		Hg (mercury)	0.05	0.05	0.05	0.05	0.05	0.05
	mg/kg		Mg (magnesium)						
	mg/kg		Mn (manganese)	332	450.6	356.4	434.5	895.9	417
	mg/kg		Mo (molybdenum)						
	mg/kg		Ni (nickel)	5.9	8	6.3	5.3	11.7	7.2
	mg/kg		Pb (lead)	1.8	2.2	2.4	2.6	6.8	2.5
	mg/kg		Sb (antimony)				10.2	13.6	8.3
	mg/kg		Se (selenium)	0.12	0.12	0.12	0.12	0.12	0.12
	mg/kg		Sn (tin)						
	mg/kg		Sr (strontium)						
	mg/kg		Ti (titanium)	0.6	0.6	0.6	4.2	4.5	3.3
	mg/kg		Zn (zinc)	12.7	16	13	11.6	21.9	14.4
	mg/kg		V (vanadium)						
PCB'S	ug/kg		Aroclor-1006						
	ug/kg		Aroclor-1221						
	ug/kg		Aroclor-1232						
	ug/kg		Aroclor-1242						
	ug/kg		Aroclor-1248						
	ug/kg		Aroclor-1254						
	ug/kg		Aroclor-1260						
	ug/kg		Total PCB's						
PARTICLE SIZE %FINER	SAND	coarse	3 in						
			1 1/2						
			3/4						
			3/8						
			4						
			8						
			10						
		medium	16						
			20						
			30						
			40						
			50						
		fine	70						
			80						
			100						
			140						
	SILT CLAY		200						
			270						
			0.20 mm						
			0.05 mm						
MISC	%		Total Organic Carb						
	mg/kg		Chem Oxy Demand						
	mg/kg		Kjedahl Nitrogen						
	mg/kg		Total Phosph						
	mg/kg		Oil and Grease						
	mg/kg		Cyanide, Total						
	mg/kg		Ammonia						
	mg/l		Ammonia Elutriate						
	%		Moisture						
	%		Total Solids						
	%		Volatile Solids						

Table 2. Contaminant Data for Upper and Lower St. Anthony Pools

			Record #	1	419	2	3	420	4	421	422	5	6	423	424	7	425
			River Mile	857.6	857.5	857.5	857.5	856.9	856.8	856.7	856.5	856.2	856.2	855.9	855.8	855.6	855.5
			Location	BW S.STE.MRR	BW S.STE.MRR	BW S.STE.MRR	BW S.STE.MRR	BW S.STE.MRR	BW S.STE.MRR	AB LOWERY BRIDGE	AB LOWERY BRIDGE	AB LOWERY BRIDGE	AB LOWERY BRIDGE	AB & BLW NPRR BRIDGE	AB & BLW NPRR BRIDGE	AB & BLW NPRR BRIDGE	AB PLYMOUTH AVE BR.
			Year	1980	1989	1974	1974	1989	1980	1989	1989	1978	1978	1989	1989	1975	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC's	ug/kg		a-BHC		< 0.08			< 0.07		< 0.75	< 0.76			< 0.07	< 0.74		< 0.08
	ug/kg		b-BHC		< 0.16			< 0.15		< 1.5	< 1.52			< 0.14	< 1.49		< 0.15
	ug/kg		BHC		< 0.24			< 0.22		< 2.25	< 2.29			< 0.22	< 2.23		< 0.23
	ug/kg		g-BHC (lindane)		< 0.11			< 0.1		< 1	< 1.02			< 0.1	< 0.99		< 0.1
	ug/kg		Heptachlor		< 0.08			< 0.07		< 0.75	< 0.76			< 0.07	< 0.74		< 0.08
	ug/kg		Aldrin		< 0.11			< 0.1		< 1	< 1.02			< 0.1	< 0.99		< 0.1
	ug/kg		Heptachlorepoxide		< 0.13			< 0.12		< 1.25	< 1.27			< 0.12	< 1.24		< 0.13
	ug/kg		Endosulfan I		< 0.13			< 0.12		< 1.25	< 1.27			< 0.12	< 1.24		< 0.13
	ug/kg		Dieldrin	0	< 0.13	< 10	< 10	< 0.12	0	< 1.25	< 1.27	0	0	< 0.12	< 1.24		< 0.13
	ug/kg		4,4'-DDE	0	< 0.11	< 10	< 10	< 0.1	0	< 1	< 1.02	0	0.2	< 0.1	< 0.99		< 0.1
	ug/kg		Endrin	0	< 0.24	< 10	< 10	< 0.22	0	< 2.25	< 2.29	0	0	< 0.22	< 2.23		< 0.23
	ug/kg		Endosulfan II		< 0.26			< 0.25		< 2.5	< 2.54			< 0.24	< 2.48		< 0.25
	ug/kg		4,4'-DDD	0	< 0.29	< 10	< 10	< 0.27	0	< 2.75	< 2.79	0	0	< 0.26	< 2.73		< 0.28
	ug/kg		Endrinaldehyde		< 0.29			< 0.27		< 2.75	< 2.79			< 0.26	< 2.73		< 0.28
	ug/kg		Sulfan sulfate		< 0.29			< 0.27		< 2.75	< 2.79			< 0.26	< 2.73		< 0.28
	ug/kg		4,4'-DDT	0	< 0.34	< 10	< 10	< 0.32	0	< 3.25	< 3.3	0	0	< 0.31	< 3.22		< 0.33
	ug/kg		Methoxychlor		< 0.58			< 0.55		< 5.5	< 5.59			< 0.53	< 5.46		< 0.55
	ug/kg		Endrinketone		< 0.29			< 0.27		< 2.75	< 2.79			< 0.26	< 2.73		< 0.28
	ug/kg		Chlorodane	0	< 1.58	< 10	< 10	< 1.49	0	< 15	< 15.24	0	0	< 1.44	< 14.08		< 1.51
	ug/kg		Toxaphene		< 1.58			< 1.49		< 15	< 15.24			< 1.44	< 14.08		< 1.51
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	2.3	< 0.8	< 0.9	2.4	0	2.3	2	0	0	1.8	2.2	0.55	1.9
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	10					10			10	10				
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 1.2	1	1	< 1.1	< 10	< 1.1	< 1.1	< 10	< 10	< 1.1	< 1.2	< 0.1	< 1.2
	mg/kg		Cr (chromium)	20	4.8	8	10	5.6	20	5.3	6	< 10	< 10	5	5.8	7.4	5.3
	mg/kg		Cu (copper)	< 10	3.1	6	5	2.1	< 10	1.8	7.2	< 10	< 10	1.9	1.8	6.3	1.8
	mg/kg		Fe (iron)	1800					2300			2400	2100				
	mg/kg		Hg (mercury)	0	< 0.01	0.7	0.7	< 0.01	0	< 0.01	< 0.01	0	0	< 0.01	< 0.01	0.12	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	210	305			312	210	252	284	180	170	267	220		284
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	10	< 6.2	6	8	< 5.2	10	< 5.3	6	< 10	10	< 5.7	6.9		< 5.9
	mg/kg		Pb (lead)	10	3	< 10	< 10	3.2	40	2.5	3.7	< 10	< 10	2.2	2.1	< 0.1	2.5
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)		< 0.88			< 0.82		< 0.78	< 0.81			< 0.81	< 0.83		< 0.85
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	8.9	13.6	15	33	23.2	25	16.1	14.9	10	10	13.6	13.7	19.9	15.5
	mg/kg		V (vanadium)														
PCB's	ug/kg		Aroclor-1006		< 1.58			< 1.49		< 15	< 15.24			< 1.44	< 14.08		< 1.51
	ug/kg		Aroclor-1221		< 1.58			< 1.49		< 15	< 15.24			< 1.44	< 14.08		< 1.51
	ug/kg		Aroclor-1232		< 1.58			< 1.49		< 15	< 15.24			< 1.44	< 14.08		< 1.51
	ug/kg		Aroclor-1242		< 1.58			< 1.49		< 15	< 15.24			< 1.44	< 14.08		< 1.51
	ug/kg		Aroclor-1248		< 1.58			< 1.49		< 15	< 15.24			< 1.44	< 14.08		< 1.51
	ug/kg		Aroclor-1254		< 3.3			< 3.1		< 31.25	< 31.75			< 3	< 31		< 3.15
	ug/kg		Aroclor-1260		< 3.3			< 3.1		< 31.25	< 31.75			< 3	< 31		< 3.15
	ug/kg		Total PCB's	0		0	0		3			0	0			0	
PARTICLE SIZE %FINER	SAND	coarse	3 in	100					100			100	100				
			1 1/2	100					100			100	95				
			3/4	100					97			100	78				
			3/8	100	99.9			98.6	96	97.6	100	99	68	96.8	98.8		99.9
			4	100					94								
			8		99.6			92.6		92.5	98.4	98	59	93.4	95.3		98.1
			10	98	97.0			71.0	91	78.5	91.2			87.4	88.8		90.1
		medium	16									89.0	48.0				
			20		72.6			26.6		32.9	40.7			40.2	37.1		46.7
			30	31.0					37.0			35.0	19.0				
			40		72.6			26.6		32.9	40.7			40.2	37.1		46.7
			50														
		fine	70		10.5			7.3		6.0	6.7	5.0	6.0	8.6	4.6		9.2
			80	1.0	1.6			0.8	2.0	0.4	1.4			0.6	0.5		0.6
			100		1.6			0.7		0.3	1.3			0.5	0.3		0.5
			140		1.2			0.7	0.0		1.0	3.0	4.0	0.5			0.4
	SILT CLAY		200		0.9			0.6			0.8			0.4			0.3
			270	0.0	0.9			0.5	0.0		0.7	0.5	0.0				
			0.20 mm	0.0	0.6			0.5	0.0		0.7	0.0	0.0				
			0.05 mm	100.0					100.0			100.0	100.0				
MISC	%		Total Organic Carb		0.61			0.074		0.32	0.24			0.32	0.61		0.4
	mg/kg		Chem Oxy Demand	2100		1705	2247		5700			2200	22000			6860	
	mg/kg		Kjedahl Nitrogen	660		241	150		560			240	400				
	mg/kg		Total Phosph			139	173					50	100				
	mg/kg		Oil and Grease	0		238	190		0			100	0			399	
	mg/kg		Cyanide, Total		< 0.67			< 0.62		< 0.59	< 0.61			< 0.62	< 0.63		< 0.64
	mg/kg		Ammonia		12.00			2.50		1.10	3.10			2.40	1.60		3.10
	mg/l		Ammonia Elutriate														
	%		Moisture		25.4			19.6		16.1	18.1			19.2	20.4		22.2
	%		Total Solids		74.6			80.4		83.9	81.9			80.8	79.6		77.8
	%		Volatile Solids		0.9			0.7		0.4	0.6			0.6	0.5		0.7

Table 2. Contaminant Data for Upper and Lower St. Anthony Pools

			Record #	8	426	9
			River Mile	855.4	854.9	854.2
			Location	AB PLYMOUTH AVE BR.	AB PLYMOUTH AVE BR.	AB PLYMOUTH AVE BR.
			Year	1980	1989	1980
			System	1	1	1
			Habitat Type	1	1	1
			Pool	0	0	0
			Sam. Gear	1	1	1
			Sam. Depth	10	10	10
			Data Cit.	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 0.08	
	ug/kg		b-BHC		< 0.17	
	ug/kg		BHC		< 0.25	
	ug/kg		g-BHC (lindane)		< 0.11	
	ug/kg		Heptachlor		< 0.08	
	ug/kg		Aldrin		< 0.11	
	ug/kg		Heptachlorepoxide		< 0.14	
	ug/kg		Endosulfan I		< 0.14	
	ug/kg		Dieldrin	0	< 0.14	0
	ug/kg		4,4'-DDE	0	< 0.11	2.2
	ug/kg		Endrin	0	< 0.25	0
	ug/kg		Endosulfan II		< 0.28	
	ug/kg		4,4'-DDD	0	< 0.31	1.3
	ug/kg		Endrinaldehyde		< 0.31	
	ug/kg		Sulfan sulfate		< 0.31	
	ug/kg		4,4'-DDT	0	< 0.36	0
	ug/kg		Methoxychlor		< 0.61	
	ug/kg		Endrinketone		< 0.31	
	ug/kg		Chlorodane	0	< 1.67	0
	ug/kg		Toxaphene		< 1.67	
METALS	mg/kg		Ag (silver)			
	mg/kg		Al (aluminum)			
	mg/kg		As (arsenic)	0	1.8	0
	mg/kg		B (boron)			
	mg/kg		Ba (barium)	10		30
	mg/kg		Be (beryllium)			
	mg/kg		Cd (cadmium)	< 10	< 1.2	< 10
	mg/kg		Cr (chromium)	20	7.6	< 10
	mg/kg		Cu (copper)	< 10	5.7	< 10
	mg/kg		Fe (iron)	2500		4100
	mg/kg		Hg (mercury)	0	< 0.01	0
	mg/kg		Mg (magnesium)			
	mg/kg		Mn (manganese)	320	433	380
	mg/kg		Mo (molybdenum)			
	mg/kg		Ni (nickel)	10	< 6.1	10
	mg/kg		Pb (lead)	10	9	20
	mg/kg		Sb (antimony)			
	mg/kg		Se (selenium)		< 0.9	
	mg/kg		Sn (tin)			
	mg/kg		Sr (strontium)			
	mg/kg		Ti (titanium)			
	mg/kg		Zn (zinc)	9.8	42.4	14
	mg/kg		V (vanadium)			
PCB'S	ug/kg		Aroclor-1006		< 1.67	
	ug/kg		Aroclor-1221		< 1.67	
	ug/kg		Aroclor-1232		< 1.67	
	ug/kg		Aroclor-1242		< 1.67	
	ug/kg		Aroclor-1248		< 1.67	
	ug/kg		Aroclor-1254		< 3.48	
	ug/kg		Aroclor-1260		< 3.48	
	ug/kg		Total PCB's	0		40
PARTICLE SIZE %FINER	SAND	coarse	3 in	100		100
			1 1/2	100		95
			3/4	100		77
			3/8	99	94.8	52.0
			4	96		32.0
			8		89.4	
			10	89	82.3	17.0
		medium	16			
			20		54.1	
			30	37.0		4.0
			40		54.1	
			50			
		fine	70		19.2	
			80	1.0	2.4	1.0
			100		2.0	
			140	0.0	1.5	0.0
	SILT CLAY		200		1.0	
			270	0.0	0.8	0.0
			0.20 mm	0.0	0.5	0.0
			0.05 mm	100.0		100.0
MISC	%		Total Organic Carb		0.74	
	mg/kg		Chem Oxy Demand	2200		9000
	mg/kg		Kjedahl Nitrogen	400		800
	mg/kg		Total Phosph			
	mg/kg		Oil and Grease	0		0
	mg/kg		Cyanide, Total		< 0.68	
	mg/kg		Ammonia		7.60	
	mg/l		Ammonia Elutriate			
	%		Moisture		26.3	
	%		Total Solids		73.7	
	%		Volatile Solids		1.2	

Table 3. Contaminant Data for Pool 1 of the Upper Mississippi River

			Record #	10	427	11	428	12	429	13	14	15	430			16	
			River Mile	853.0	852.9	852.5	852.5	852.2	852.0	851.7	851.6	851.6	851.6	851.6	851.6	851.5	851.4
			Location	AB&BW WASH AVE BR.	AB&BW WASH AVE BR.	AB&BW WASH AVE BR.	AB&BW WASH AVE BR.	AB FRANK. AVE BRIDGE	AB FRANK. AVE BRIDGE	AB FRANK. AVE BRIDGE	AB FRANK. AVE BRIDGE	AB FRANK. AVE BRIDGE	AB FRANK. AVE BRIDGE	BELOW FRANKLIN BRIDGE	BELOW FRANKLIN BRIDGE dup	BLW FRANK. AVE BRIDGE	ABOVE FRANKLIN BRIDGE
			Year	1980	1989	1980	1989	1980	1989	1980	1974	1975	1989	1994	1994	1980	1994
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 0.08		< 0.08		< 0.08				< 0.07	< 0.25	< 0.25		< 0.25
	ug/kg		b-BHC		< 0.15		< 0.15		< 0.15				< 0.15	0.57	< 0.25		1.1
	ug/kg		BHC		< 0.23		< 0.23		< 0.23				< 0.22	< 0.25	< 0.25		< 0.25
	ug/kg		g-BHC (lindane)		< 0.1		< 0.1		< 0.1				< 0.1	< 0.25	< 0.25		< 0.25
	ug/kg		Heptachlor		< 0.08		< 0.08		< 0.08				< 0.07	< 0.25	< 0.25		< 0.25
	ug/kg		Aldrin		< 0.1		< 0.1		< 0.1				0.12				
	ug/kg		Heptachlorepoxide		< 0.13		< 0.13		< 0.13				< 0.12				
	ug/kg		Endosulfan I		< 0.13		< 0.13		< 0.13				< 0.12				
	ug/kg		Dieldrin	0	< 0.13	0	< 0.13	0	< 0.13	0	< 10		< 0.12	< 0.5	< 0.49	0	0.58
	ug/kg		4,4'-DDE	0	< 0.1	4.2	< 0.1	0	< 0.1	0	< 10		< 0.1	< 0.5	< 0.49	0	< 0.5
	ug/kg		Endrin	0	< 0.23	0	< 0.23	0	< 0.23	0	< 10		< 0.22	< 0.5	< 0.49	0	< 0.5
	ug/kg		Endosulfan II		< 0.26		< 0.25		< 0.25				< 0.24				
	ug/kg		4,4'-DDD	1.7	< 0.38	1.2	< 0.28	0.4	< 0.28	0.9	< 10		< 0.27	< 0.5	< 0.49	1.7	< 0.5
	ug/kg		Endrinaldehyde		< 0.28		< 0.28		< 0.28				< 0.27				
	ug/kg		Sulfan sulfate		< 0.28		< 0.28		< 0.28				< 0.27				
	ug/kg		4,4'-DDT	2.2	< 0.33	0	< 0.33	0.3	< 0.33	0.2	< 10		< 0.32	< 0.5	< 0.49	1	< 0.5
	ug/kg		Methoxychlor		< 0.56		< 0.55		< 0.56				< 0.54				
	ug/kg		Endrinketone		< 0.28		< 0.28		< 0.28				< 0.27				
	ug/kg		Chlorodane	3	< 1.54	1	< 1.51	0	< 1.52	1	< 10		< 1.46	< 0.25	< 0.25	5	< 0.25
	ug/kg		Toxaphene		< 1.54		< 1.51		< 1.52				< 1.46				
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	1.4	0	1.4	0	1.4	0	< 0.8	0.46	1.8	0.89		0	0.86
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	10		10		30		10						10	
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 1.2	< 10	< 1.2	< 10	< 1.2	< 10	< 1	< 0.1	< 1.1	< 0.12		< 10	0.47
	mg/kg		Cr (chromium)	20	6.6	30	6.2	< 10	6.5	< 10	8	8	7	5.9		10	6.5
	mg/kg		Cu (copper)	< 10	8.1	< 10	6.2	< 10	4.3	< 10	5	4.3	5.2	1.7		< 10	2.4
	mg/kg		Fe (iron)	2000		1900		4400		3300						2900	
	mg/kg		Hg (mercury)	0	< 0.01	0	< 0.01	0	< 0.01	0	0.3	0.14	< 0.01	< 0.05		0	< 0.05
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	160	148	190	221	240	195	190			267	171		150	257
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	10	< 5.8	10	< 5.8	< 10	< 6	10	5		7.7	4.4		< 10	5.2
	mg/kg		Pb (lead)	40	8.3	30	10.3	30	6.7	20	< 10	< 0.1	14.9	11.5		< 10	13.6
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)		< 0.83		< 0.84		< 0.86				< 0.82				
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	19	21.2	1.8	20.7	19	19.8	16	16	24	19.7	15.9		15	17.7
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006		< 1.54		< 1.51		< 1.52				< 1.46	< 5	< 4.9		< 5
	ug/kg		Aroclor-1221		< 1.54		< 1.51		< 1.52				< 1.46	< 5	< 4.9		< 5
	ug/kg		Aroclor-1232		< 1.54		< 1.51		< 1.52				< 1.46	< 5	< 4.9		< 5
	ug/kg		Aroclor-1242		< 1.54		< 1.51		< 1.52				< 1.46	< 5	< 4.9		< 5
	ug/kg		Aroclor-1248		< 1.54		< 1.51		< 1.52				< 1.46	< 5	< 4.9		< 5
	ug/kg		Aroclor-1254		< 3.2		< 3.15		< 3.18				< 3.05	< 5	< 4.9		< 5
	ug/kg		Aroclor-1260		< 3.2		< 3.15		< 3.18				< 3.05	< 5	< 4.9		< 5
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER	SAND	coarse	3 in	100		100		100		100	100	100				100	
			1 1/2	100		100		100		100	100	100				100	
			3/4	100		100		100		100	100	100				100	
			3/8	100		100		100		100	100	100				100	
			4	99	99.7	100	99.3	99	100	100	100	99	98.5	99.7		100	100
			8	98		99		95		100	98	99				97	
			10		98.6		96.4		100				86.8	99.0			99.1
		medium	16	83.0	91.1	94.0	92.7	88.0	99.9	99.0	94.0	99.0	64.6			88.0	
			20											96.0			92.2
			30		47.8		73.8		91.2				25.6				
			40	39.0		42.0		33.0		91.0	61.0	78.0		55.7		20.0	33.2
			50		47.8		73.8		91.2				25.6				
		fine	70														
			80		1.9		24.1		17.9				7.3				
			100	2.0	0.4	3.0	1.3	1.0	1.2	3.0	1.0	4.0	2.5	2.0		1.0	1.2
			140		0.3		1.1		0.9				2.2	1.7			0.8
	SILT CLAY		200	0.0	0.3	1.0	0.9	0.0	0.8	1.0	0.0	2.0	1.6	1.7		0.0	0.6
			270		0.1		0.7						1.0				
			0.20 mm	0.0		0.0	0.5	0.0		0.0	0.0		0.8			0.0	
			0.05 mm	0.0		0.0	0.3	0.0		0.0	0.0		0.5			0.0	
MISC	%		Total Organic Carb		0.15		0.15		0.21				0.77	0.064	0.063		0.035
	mg/kg		Chem Oxy Demand	5700		7500		17000		3800	4300	3700				6700	
	mg/kg		Kjedahl Nitrogen	48600		750		210		300	269					490	
	mg/kg		Total Phosph								135						
	mg/kg		Oil and Grease	1000		0		0		0	247	245				100	
	mg/kg		Cyanide, Total		< 0.63		< 0.63		< 0.65				< 0.62	< 0.06			0.06
	mg/kg		Ammonia		0.63		3		4.7				5.5				
	mg/l		Ammonia Elutriate											< 0.06	< 0.06		< 0.06
	%		Moisture		20.3		21.1		23.3				19.4	20.3	21.5		22.1
	%		Total Solids		79.7		78.9		76.7				80.6	79.7	78.5		77.9
	%		Volatile Solids		0.5		0.5		0.5				1	1.17	1.45		1.21

Table 3. Contaminant Data for Pool 1 of the Upper Mississippi River

			Record #	431	432	17	433		18	19	20	21	434	22	435	436	
			River Mile	851.3	850.9	850.7	850.3	850.3	850.2	850.2	850.11	850.0	850.0	849.9	849.7	849.3	849.2
			Location	BLW FRANK. AVE BRIDGE	BLW FRANK. AVE BRIDGE	BLW FRANK. AVE BRIDGE	AB LAKE ST. BRIDGE	ABOVE LAKE ST BRIDGE	AB LAKE ST. BRIDGE	AB LAKE ST. BRIDGE	AB LAKE ST. BRIDGE	AB LAKE ST. BRIDGE	AB LAKE ST. BRIDGE	AB LAKE ST. BRIDGE	BLW LAKE ST. BRIDGE	BLW LAKE ST. BRIDGE	BELOW LAKE ST BRIDGE
			Year	1989	1989	1980	1989	1994	1978	1978	1974	1982	1989	1980	1989	1989	1994
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.07	< 0.07		< 0.07	< 0.25					< 0.07		< 0.07	< 0.08	< 0.25
	ug/kg		b-BHC	< 0.14	< 0.14		< 0.15	3.1					< 0.14		< 0.15	< 0.16	1.2
	ug/kg		BHC	< 0.21	< 0.21		< 0.22	< 0.25					< 0.22		< 0.22	< 0.24	< 0.25
	ug/kg		g-BHC (lindane)	< 0.1	< 0.09		< 0.1	< 0.25					< 0.1		< 0.1	< 0.11	< 0.25
	ug/kg		Heptachlor	< 0.07	< 0.07		< 0.07	< 0.25					< 0.07		< 0.07	< 0.08	< 0.25
	ug/kg		Aldrin	< 0.1	< 0.09		< 0.1						< 0.1		< 0.1	< 0.11	
	ug/kg		Heptachlorepoxide	< 0.12	< 0.12		< 0.12						< 0.12		< 0.12	< 0.14	
	ug/kg		Endosulfan I	< 0.12	< 0.12		< 0.12						< 0.12		< 0.12	< 0.14	
	ug/kg		Dieldrin	< 0.12	< 0.12	0	< 0.12	1.2	0	0	< 10	< 0.1	< 0.12	0	< 0.12	< 0.14	< 0.5
	ug/kg		4,4'-DDE	< 0.1	< 0.09	0	< 0.1	0.52	49	3.6	< 10	< 0.1	< 0.1	0	< 0.1	< 0.11	< 0.5
	ug/kg		Endrin	< 0.21	< 0.21	0	< 0.22	< 0.49	0	0	< 10		< 0.22	0	< 0.22	< 0.24	< 0.5
	ug/kg		Endosulfan II	< 0.24	< 0.23		< 0.24						< 0.24		< 0.24	< 0.27	
	ug/kg		4,4'-DDD	< 0.26	< 0.26	0.3	< 0.27	< 0.49	0	1.2	< 10	< 0.1	< 0.26	1.9	< 0.27	< 0.3	< 0.5
	ug/kg		Endrinaldehyde	< 0.26	< 0.26		< 0.27						< 0.26		< 0.27	< 0.3	
	ug/kg		Sulfan sulfate	< 0.26	< 0.26		< 0.27						< 0.26		< 0.27	< 0.3	
	ug/kg		4,4'-DDT	< 0.31	< 0.3	0.3	< 0.31	< 0.49	0	0	< 10	< 0.1	< 0.31	0.7	< 0.32	< 0.35	< 0.5
	ug/kg		Methoxychlor	< 0.52	< 0.51		< 0.53						< 0.53		< 0.54	< 0.59	
	ug/kg		Endrinketone	< 0.26	< 0.26		< 0.27						< 0.26		< 0.27	< 0.3	
	ug/kg		Chlorodane	< 1.43	< 1.46	1	< 1.45	< 0.25	0	0	< 10	< 1	< 1.44	6	< 1.46	< 1.62	< 0.25
	ug/kg		Toxaphene	< 1.43	< 1.46		< 1.45						< 1.44		< 1.46	< 1.62	
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1.6	2.4	0	1.5	1	3	0	< 1	2	1.5	0	1.8	1.9	1
	mg/kg		B (boron)														
	mg/kg		Ba (barium)			20			210	20				20			
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 1.2	< 1.1	< 10	< 1.2	0.47	< 10	< 10	2	0.56	< 1.2	< 10	< 1.2	< 1.3	0.38
	mg/kg		Cr (chromium)	6.4	7.4	< 10	6.3	7.1	30	< 10	10	6.9	6.2	< 10	6.2	6.3	6.8
	mg/kg		Cu (copper)	2.6	< 1.5	< 10	2.6	3.5	100	< 10	10	3.1	2	< 10	2.9	4	2.4
	mg/kg		Fe (iron)			3500			8000	3100				3900			
	mg/kg		Hg (mercury)	< 0.01	< 0.01	0	< 0.01	< 0.05	1.4	0	1.1	1.69	< 0.01	0	< 0.01	0.034	< 0.04
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	190	183	160	219	198	690	150			124	280	196	250	196
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 5.8	< 5.7	< 10	< 5.9	5	40	20	7	8	< 5.9	< 10	< 6.3	< 6.6	6
	mg/kg		Pb (lead)	6.4	7.6	< 10	7.8	9.3	320	20	19	11	5.4	50	32.4	12.5	6.7
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	< 0.83	< 0.82		< 0.85						< 0.84		< 0.9	< 0.94	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	15.5	15	14	16.2	21.9	400	20	29	37	24.1	33	24.2	23.7	14.9
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 1.43	< 1.46		< 1.45	< 4.9					< 1.44		< 1.46	< 1.62	< 5
	ug/kg		Aroclor-1221	< 1.43	< 1.46		< 1.45	< 4.9					< 1.44		< 1.46	< 1.62	< 5
	ug/kg		Aroclor-1232	< 1.43	< 1.46		< 1.45	< 4.9					< 1.44		< 1.46	< 1.62	< 5
	ug/kg		Aroclor-1242	< 1.43	< 1.46		< 1.45	< 4.9					< 1.44		< 1.46	< 1.62	< 5
	ug/kg		Aroclor-1248	< 1.43	< 1.46		< 1.45	< 4.9					< 1.44		< 1.46	< 1.62	< 5
	ug/kg		Aroclor-1254	< 2.98	< 2.93		< 3.03	< 4.9					< 3		< 3.05	< 3.38	< 5
	ug/kg		Aroclor-1260	< 2.98	< 2.93		< 3.03	< 4.9					< 3		< 3.05	< 3.38	< 5
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER		SAND coarse	3 in			100			100	100	100			100			
			1 1/2			100			100	100	100			100			
			3/4			100			100	100	100			100			
			3/8			100			100	100	100			100			
			4	99.2	95.1	100	99.8	99.4	99	100	99		99.2	100	99.7	99.7	97.8
			8			100					99			98			
			10	94.7	89.4		99.4	96.5	97	98			98.7		98.2	99.1	93.4
		SAND medium	16	87.1	80.3	99.0	96.9				96.0		97.9	94.0	92.3	96.5	
			20					89.1	94.0	86.0							81.8
			30	54.6	47.1		69.0						92.7		63.7	81.2	
			40			84.0		43.7	90.0	33.0	66.0			56.0			37.4
			50	54.6	47.1		69.0						92.7		63.7	81.2	
		SAND fine	70														
			80	3.8	8.0		10.0		79.0	3.0			16.2		14.6	25.5	
			100	0.8	0.4	1.0	1.0	1.3			2.0		0.7	4.0	2.7	16.2	0.7
			140	0.6	0.3		0.6	0.7							2.0	13.1	0.6
		SILT CLAY	200	0.5	0.2	0.0	0.5	0.5	68.0	2.0	0.0			2.0	1.6	10.7	0.5
			270	0.4			0.3									8.5	
			0.20 mm	0.4		0.0			35.0	0.5	0.0			0.0			
			0.05 mm	0.2		0.0			13.0	0.0	0.0			0.0			
MISC	%		Total Organic Carb	0.11	0.034		0.22	0.112					0.23		0.75	1.99	0.104
	mg/kg		Chem Oxy Demand			2900			26000	4900	5032	3130		9400			
	mg/kg		Kjedahl Nitrogen			290			9200	410	548	< 20.00		1900			
	mg/kg		Total Phosph						990	87	201						
	mg/kg		Oil and Grease			0			1000	0	354	230		0			
	mg/kg		Cyanide, Total	< 0.63	< 0.62		< 0.65	< 0.06					< 0.64		< 0.68	< 0.72	0.08
	mg/kg		Ammonia	3.10	1.2		3.8						1.8		14	11.0	
	mg/l		Ammonia Elutriate					< 0.06									< 0.06
	%		Moisture	20.1	19.7		22.6	18.4					21.9		26.6	30.1	21.4
	%		Total Solids	79.9	80.3		77.4	81.6					78.1		73.4	69.9	78.6
	%		Volatile Solids	0.7	0.5		0.7	1.64					0.5		1.3	2.6	1.33

Table 3. Contaminant Data for Pool 1 of the Upper Mississippi River

			Record #	23	24	437		25	26	27	438	28	29	30		31	439
			River Mile	848.9	848.8	848.8	848.8	848.8	848.7	848.7	848.6	848.2	848.23	848.2	848.2	848.1	848.1
			Location	BLW LAKE ST. BRIDGE	BW DAYMARK 849.1	BW DAYMARK 849.1	ST PAUL DAYMARK 2	BW DAYMARK 849.1	BW DAYMARK 849.1	BW DAYMARK 849.1	BW DAYMARK 849.1	UPPER APPROACH L/D 1	UPPER APPROACH L/D 1	UPPER APPROACH L/D 1	ST PAUL DAYMARK 1	UPPER APPROACH L/D 1	UPPER APPROACH L/D 1
			Year	1980	1982	1989	1994	1982	1978	1978	1989	1974	1974	1975	1994	1975	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC			< 0.07	< 0.25				< 0.07				< 0.24		< 0.08
	ug/kg		b-BHC			< 0.15	0.48				< 0.15				0.38		< 0.15
	ug/kg		BHC			< 0.22	< 0.25				< 0.22				< 0.24		< 0.23
	ug/kg		g-BHC (lindane)			< 0.1	< 0.25				< 0.1				< 0.24		< 0.1
	ug/kg		Heptachlor			< 0.07	< 0.25				< 0.07				< 0.24		< 0.08
	ug/kg		Aldrin			< 0.1					< 0.1						< 0.1
	ug/kg		Heptachlorepoxide			< 0.12					< 0.12						< 0.13
	ug/kg		Endosulfan I			< 0.12					< 0.12						< 0.13
	ug/kg		Dieldrin	0	< 0.1	< 0.12	< 0.51	< 0.1	0	0	< 0.12	< 10	< 10		< 0.49		< 0.13
	ug/kg		4,4'-DDE	0	< 0.1	< 0.1	< 0.51	< 0.1	0	0	< 0.1	< 10	< 10		< 0.49		< 0.1
	ug/kg		Endrin	0	< 0.1	< 0.22	< 0.51	< 0.1	0	0	< 0.22	< 10	< 10		< 0.49		< 0.23
	ug/kg		Endosulfan II			< 0.25					< 0.25						< 0.25
	ug/kg		4,4'-DDD	0	< 0.1	< 0.27	< 0.51	< 0.1	0.2	2.2	< 0.27	< 10	< 10		< 0.49		< 0.28
	ug/kg		Endrinaldehyde			< 0.27					< 0.27						< 0.28
	ug/kg		Sulfan sulfate			< 0.27					< 0.27						< 0.28
	ug/kg		4,4'-DDT	0	< 0.1	< 0.32	< 0.51	1	0	0.5	< 0.32	< 10	< 10		< 0.49		< 0.33
	ug/kg		Methoxychlor			< 0.54					< 0.54						< 0.55
	ug/kg		Endrinketone			< 0.27					< 0.27						< 0.28
	ug/kg		Chlorodane	0	< 1	< 1.48	< 0.25	< 1	0	2	< 1.48	< 10	< 10		< 0.24		< 1.5
	ug/kg		Toxaphene			< 1.48					< 1.48						< 1.5
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	1.3	1.5	0.95	0.68	0	0	2.2	< 0.8	< 0.9	1.6	0.91	2.2	1.6
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	10					10	20							
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 0.2	< 1.2	0.45	< 0.2	< 10	< 10	< 1.3	1	< 1	< 0.1	0.42	4.3	< 1.3
	mg/kg		Cr (chromium)	< 10	2.9	4.8	8.6	3.9	< 10	< 10	6.8	8	9	9.6	8.2	37.5	5.5
	mg/kg		Cu (copper)	< 10	1.9	15.8	2.4	2	< 10	< 10	7.9	11	12	24	1.8	39.7	4.2
	mg/kg		Fe (iron)	2800	3600			3900	1700	2300							
	mg/kg		Hg (mercury)	0	0.035	< 0.01	< 0.04	0.035	0	0	0.02	1.1	0.6	0.09	< 0.05	0.4	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	150		136	212		100	130	222				150		196
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	4	< 5.9	5.3	5	< 10	< 10	< 6.3	6	3		4.1		< 6.4
	mg/kg		Pb (lead)	< 10	8	10.9	6.6	10	10	20	11.2	< 11	< 12	< 0.1	10.8	118	5.3
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)			< 0.85					< 0.91						< 0.92
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	13	12	15.6	17.3	13	10	20	23.2	24	23	40.9	16.9	158	17.5
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006			< 1.48	< 5.1				< 1.48				< 4.9		< 1.5
	ug/kg		Aroclor-1221			< 1.48	< 5.1				< 1.48				< 4.9		< 1.5
	ug/kg		Aroclor-1232			< 1.48	< 5.1				< 1.48				< 4.9		< 1.5
	ug/kg		Aroclor-1242			< 1.48	< 5.1				< 1.48				< 4.9		< 1.5
	ug/kg		Aroclor-1248			< 1.48	< 5.1				< 1.48				< 4.9		< 1.5
	ug/kg		Aroclor-1254			< 3.08	< 5.1				< 3.08				< 4.9		< 3.13
	ug/kg		Aroclor-1260			< 3.08	< 5.1				< 3.08				< 4.9		< 3.13
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER		SAND coarse	3 in	100					100	100		100	100				
			1 1/2	100	100			100	100	100		100	100				
			3/4	100	100			100	100	100		100	100				
			3/8	100	100			100	100	100		96	96				
			4	99	100	100	100	100	100	100	100	86	86		100		100
			8	98	100			100				78	78				
			10			99.9	99.6		100	99	99.8				99.9		99.7
		SAND medium	16	93.0	100.0	99.3		99.0			99.2	74.0	74.0				99.6
			20				98.7		100.0	91.0					99.3		
			30		93.0	92.7		96.0			91.0						98.0
			40	58.0	80.0		90.5	84.0	94.0	63.0		63.0	63.0		84.4		
			50		51.0	92.7		47.0			91.0						98.0
		SAND fine	70		17.0			18.0									
			80			25.7			11.0	7.0	22.2						36.8
			100	0.0	4.0	0.8	4.4	5.0			3.8	4.0	4.0		3.3		3.7
			140			0.7	0.9				3.6				0.9		3.8
		SILT CLAY	200	0.0	3.0	0.7	0.4	3.0	1.0	3.0	2.6	1.0	1.0		0.7		2.6
			270		3.0	0.5		3.0			1.9						1.9
			0.20 mm	0.0	1.0	0.4		1.0	0.0	0.0	1.4	0.0	0.0				1.8
			0.05 mm	0.0	0.0	0.3		0.0	0.0	0.0	1.1	0.0	0.0				1.3
MISC	%		Total Organic Carb			0.28	0.071				0.74				0.045		0.15
	mg/kg		Chem Oxy Demand	2000	2360			2960	2300	3600		5243	8243	26334		91600	
	mg/kg		Kjedahl Nitrogen	600	170			150	250	380		156	145				
	mg/kg		Total Phosph		95			110	630	82		170	406				
	mg/kg		Oil and Grease	0	< 50			< 50	0	0		396	374	1147		3160	
	mg/kg		Cyanide, Total			< 0.64	< 0.07				< 0.69				< 0.06		< 0.69
	mg/kg		Ammonia			3					10.5						8.1
	mg/l		Ammonia Elutriate				< 0.06								< 0.06		
	%		Moisture			22.3	23.2				27.1				20.2		28
	%		Total Solids			77.7	76.8				73				79.8		72
	%		Volatile Solids			0.5	0.99				1.2				1.1		1.4

Table 3. Contaminant Data for Pool 1 of the Upper Mississippi River

		Record #		32	33	34	35	1071	1075	1076	1088	1080	1084	440
		River Mile	848.1	848.03	848.02	848.01	848	848	848	848	848	848	848	847.9
		Location	UPPER APPROACH L/D 1,1	UPPER APPROACH L/D 1	UPPER APPROACH L/D 1	UPPER APPROACH L/D 1	UPPER APPROACH L/D 1	Ab. L/D 1 - mid	Ab. L/D 1 - west	Ab. L/D 1 - mean	Ab. L/D 1 - west	Ab. L/D 1 - east	Ab. L/D 1 - mid	UPPER APPROACH L/D 1
		Year	1994	1982	1982	1978	1978	1983	1983	1983	1985	1985	1985	1989
		System	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	1	1	1	1	1	1	1	1	1	1	1	1
		Sam. Gear	1	1	1	1	1	3	3	3	3	3	3	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	COE	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE
CHC'S	ug/kg	a-BHC	< 0.25							< 0.53				< 0.08
	ug/kg	b-BHC	2.6							< 1.1				< 0.15
	ug/kg	BHC	< 0.25											< 0.23
	ug/kg	g-BHC (lindane)	< 0.25							< 0.53				< 0.1
	ug/kg	Heptachlor	< 0.25							< 0.53				< 0.08
	ug/kg	Aldrin												< 0.1
	ug/kg	Heptachlorepoxide												< 0.13
	ug/kg	Endosulfan I												< 0.13
	ug/kg	Dieldrin	< 0.49	< 0.1	< 0.1	0	0			< 1.6				< 0.13
	ug/kg	4,4'-DDE	< 0.49	< 0.1	< 0.1	1.2	1			< 1.6				< 0.1
	ug/kg	Endrin	< 0.49	< 0.1	< 0.1	0	0			< 2.1				< 0.23
	ug/kg	Endosulfan II												< 0.25
	ug/kg	4,4'-DDD	< 0.49	< 0.1	< 0.1	0.9	3.6			< 3.2				< 0.28
	ug/kg	Endrinaldehyde												< 0.28
	ug/kg	Sulfan sulfate												< 0.28
	ug/kg	4,4'-DDT	< 0.49	< 0.1	< 0.1	0	0.5			< 4.2				< 0.33
	ug/kg	Methoxychlor												< 0.56
	ug/kg	Endrinketone												< 0.28
	ug/kg	Chlorodane	< 0.25	< 1	< 1	0	0			< 11				< 1.52
	ug/kg	Toxaphene												< 1.52
METALS	mg/kg	Ag (silver)						0.056	0.09	0.083	0.013	0.027	0.078	
	mg/kg	Al (aluminum)												
	mg/kg	As (arsenic)	0.69	0.57	0.66	0	0	1.01	0.7	1	1.41	2.36	1.47	2.1
	mg/kg	B (boron)												
	mg/kg	Ba (barium)				10	10							
	mg/kg	Be (beryllium)						0.069	0.068	0.091	0.081	0.074	0.073	
	mg/kg	Cd (cadmium)	0.36	< 0.19	< 0.19	< 10	< 10	0.103	0.109	0.165	0.042	0.166	0.052	< 1.2
	mg/kg	Cr (chromium)	11.2	2.9	3.8	< 10	< 10	13.3	13	9	6.5	6.1	7.5	7
	mg/kg	Cu (copper)	11.9	2.9	1.9	< 10	< 10	2.9	3.3	5.4	2	2.7	2	5.3
	mg/kg	Fe (iron)		3100	3800	2200	2200							
	mg/kg	Hg (mercury)	0.08	0.026	0.032	0	0	0.05	0.05	0.05	0.05	0.05	0.05	0.019
	mg/kg	Mg (magnesium)												
	mg/kg	Mn (manganese)	171			140	140				118	192.6	120.8	242
	mg/kg	Mo (molybdenum)												
	mg/kg	Ni (nickel)	4.9	4	5	< 10	10	6.5	6.3	5.4	3.7	4	3.7	< 6.2
	mg/kg	Pb (lead)	14.6	10	9	10	10	6.5	6.7	8.3	4.6	15.6	7.8	13.9
	mg/kg	Sb (antimony)									4.4	4.5	5	
	mg/kg	Se (selenium)						0.05	0.05	0.05	0.12	0.12	0.12	< 0.89
	mg/kg	Sn (tin)												
	mg/kg	Sr (strontium)												
	mg/kg	Ti (titanium)						0.6	0.6	0.6	1.7	1.4	1.9	
	mg/kg	Zn (zinc)	13.9	11	17	20	20	14	11.7	14.6	12.5	24.4	12.7	24.3
	mg/kg	V (vanadium)												
PCB'S	ug/kg	Aroclor-1006	< 4.9							16				< 1.52
	ug/kg	Aroclor-1221	< 4.9											< 1.52
	ug/kg	Aroclor-1232	< 4.9											< 1.52
	ug/kg	Aroclor-1242	< 4.9											< 1.52
	ug/kg	Aroclor-1248	< 4.9											< 1.52
	ug/kg	Aroclor-1254	< 4.9							22				< 3.18
	ug/kg	Aroclor-1260	< 4.9							< 5.3				< 3.18
	ug/kg	Total PCB's												
PARTICLE SIZE %FINER	SAND coarse	3 in				100	100							
		1 1/2		100	100	100	100							
		3/4		100	100	100	100							
		3/8		100	100	100	100							
		4	100	97	100	100	100							99.8504
		8		94	100									
		10	99.8			100	99							99.7
	SAND medium	16		92.0	100.0									99.3
		20	98.8			100.0	98.0							
		30		89.0	100.0									98.3
		40	91.5	83.0	99.0	100.0	93.0							
		50		61.0	83.0									98.3
	SAND fine	70		24.0	34.0									
		80				20.0	25.0							60.6
		100	3.0	9.0	5.0									2.8
		140	1.2											2.3
	SILT CLAY	200	0.8	4.0	3.0	3.0	5.0							1.8
		270		3.0	2.0									1.3
		0.20 mm		1.0	1.0	0.0	1.0							1.3
		0.05 mm		0.0	0.0	0.0	0.0							0.8
MISC	%	Total Organic Carb	0.049											0.64
	mg/kg	Chem Oxy Demand		4120	3710	4900	5200							
	mg/kg	Kjedahl Nitrogen		190	140	490	630							
	mg/kg	Total Phosph		100	190	150	88							
	mg/kg	Oil and Grease		65	75	0	0							
	mg/kg	Cyanide, Total	< 0.06											< 0.68
	mg/kg	Ammonia												13
	mg/l	Ammonia Elutriate	< 0.06											
	%	Moisture	22											26.2
	%	Total Solids	78											73.8
	%	Volatile Solids	1.04											1.6

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	36	37	38	407			39	40	417	408	41	418	42	410
			River Mile	843.36	840.71	840.7	840.5	840.5	840.5	840.4	840.32	840.2	840	839.7	839.6	839.5	839.2
			Location	LOW. MOUTH MN. RIVER	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	SMITH AVE BRIDGE 2	SMITH AVE BRIDGE 1	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	ST. PAUL SM BOAT	ST. PAUL SM BOAT HRBR	HARRIET IS.	HARRIET IS.
			Year	1974	1978	1978	1989	1994	1994	1975	1974	1989	1989	1981	1989	1980	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	2	2	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.1	< 0.24	< 0.22			< 0.08	< 0.08		< 0.09		< 0.15
	ug/kg		b-BHC				< 0.2	1.7	< 0.22			< 0.16	< 0.15		< 0.19		< 0.3
	ug/kg		BHC				< 0.29	< 0.24	< 0.22			< 0.24	< 0.23		< 0.28		< 0.45
	ug/kg		g-BHC (lindane)				< 0.13	< 0.24	< 0.22			< 0.11	< 0.1		< 0.13		< 0.2
	ug/kg		Heptachlor				< 0.1	< 0.24	< 0.22			< 0.08	< 0.08		< 0.09		< 0.15
	ug/kg		Aldrin				< 0.13					< 0.11	< 0.1		< 0.13		< 0.2
	ug/kg		Heptachlorepoxide				< 0.16					< 0.14	< 0.13		< 0.16		< 0.25
	ug/kg		Endosulfan I				< 0.16					< 0.14	< 0.13		< 0.16		< 0.25
	ug/kg		Dieldrin	< 10	0	0	< 0.16	< 0.48	< 0.44		< 10	< 0.14	< 0.13	1.5	< 0.16	0	< 0.25
	ug/kg		4,4'-DDE	< 10	0	0	< 0.13	< 0.48	< 0.44		< 10	< 0.11	< 0.1	< 0.1	< 0.13	0.8	< 0.2
	ug/kg		Endrin	< 10	0	1	< 0.29	< 0.48	< 0.44		< 10	< 0.24	< 0.23	< 0.1	< 0.28	0	< 0.45
	ug/kg		Endosulfan II				< 0.33					< 0.27	< 0.26		< 0.31		< 0.5
	ug/kg		4,4'-DDD	< 10	0.4	0	< 0.36	< 0.48	< 0.44		< 10	< 0.3	< 0.28	1.5	< 0.35	0	< 0.55
	ug/kg		Endrinaldehyde				< 0.36					< 0.3	< 0.28		< 0.35		< 0.55
	ug/kg		Sulfan sulfate				< 0.36					< 0.3	< 0.28		< 0.35		< 0.55
	ug/kg		4,4'-DDT	< 10	0	0	< 0.42	< 0.48	< 0.44		< 10	< 0.35	< 0.33	0.9	< 0.41	0	< 0.65
	ug/kg		Methoxychlor				< 0.72					< 0.59	< 0.56		< 0.69		< 1.1
	ug/kg		Endrinketone				< 0.36					< 0.3	< 0.28		< 0.35		< 0.55
	ug/kg		Chlorodane	< 10	0	0	< 1.96	< 0.24	< 0.22		< 10	< 1.62	< 1.54	7	< 1.88	0	< 3
	ug/kg		Toxaphene				< 1.54					< 1.88	< 1.38		< 1.46		< 2.68
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	< 0.8	0	0	2.7	0.72	0.68	0.36	< 0.8	2.7	< 1	29	2.5	0	5.8
	mg/kg		B (boron)														
	mg/kg		Ba (barium)		20	20								100		30	
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 1	< 10	< 10	< 1.7	< 0.11	< 0.11	< 0.1	< 1	< 1.7	< 1.1	3	< 1.5	< 10	< 2.4
	mg/kg		Cr (chromium)	15	< 10	< 10	11.75	6.7	5.9	8.6	12	7.4	6.4	10	7.7	10	26.2
	mg/kg		Cu (copper)	10	< 10	< 10	19.8	2.6	5.3	3.5	3	10.9	8	18	10.4	30	24
	mg/kg		Fe (iron)		3500	3400								1200		2700	
	mg/kg		Hg (mercury)	4.6	0	0	0.64	< 0.04	< 0.04	0.079	0.6	0.034	< 0.01	< 0.01	0.037	0	0.093
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)		210	210	777.5	197	632			427	81.1	1100	558	240	1400
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	12	< 10	< 10	11.15	6.2	8.4		12	< 8.4	< 5.7	20	8.6	10	19
	mg/kg		Pb (lead)	< 10	< 10	< 10	23.75	1.9	2.3	< 0.1	12	26.9	3.8	40	8.1	10	32
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				1.7					< 1.2	< 0.81		< 1.1		2.8
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	19	10	10	55.55	11.5	14.9	16.1	18	38	24.7	67	40.8	1.9	97.1
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1221				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1232				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1242				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1248				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1254				< 4.08	< 4.8	< 4.4			< 3.38	< 3.2		< 3.93		< 6.25
	ug/kg		Aroclor-1260				< 4.08	< 4.8	< 4.4			< 3.38	< 3.2		< 3.93		< 6.25
	ug/kg		Total PCB's	0	5	0					0	0		8		6	
PARTICLE SIZE %FINER		SAND coarse	3 in		100	100				100	100					100	
			1 1/2	96	100	100				100	100			100		100	
			3/4	90	100	100				100	100			100		100	
			3/8	83	100	79				89	100			100		94	
			4	72	99	60	100	99.3	58.3	79	98	100	96.9	100	100	82	100
			8	56						57	90			100		82	
			10		95	34	99.7	96.3	42.6			96.6	86.1		100		99.2
		SAND medium	16	40.0			96.1			43.0	23.0	91.5	68.7	100	99.7	80.0	99.2
			20		75.0	15.0		75.4	30.7								
			30				84.1					87.6	35.0	100	98.8		96.8
			40	12.0	38.0	7.0		23.9	12.9	7.0	12.0			100		58.0	
			50				84.1					87.6	35.0	100	98.8		96.8
		SAND fine	70											99.0			
			80		7.0	4.0	69.3					83.3	16.4		97.5		94.4
			100	0.0			29.7	5.5	1.0	1.0	0.0	25.9	1.3	98.0	48.4	26.0	75.4
			140				24.8	4.6	0.7			19.0	1.1		40.0		69.1
	SILT CLAY		200	0.0	3.0	3.0	18.2	3.0	0.4	0.0	0.0	16.0	0.9	92.0	27.0	20.0	48.4
			270				13.6					9.7	0.7	85.0	17.5		33.6
			0.20 mm	0.0	0.5	0.0	10.5			0.0	0.0	6.7	0.5	51.0	12.9	12.0	25.2
			0.05 mm	0.0	0.0	0.0	7.0			0.0	0.0	6.0	0.4	22.0	10.4	4.0	16.1
MISC	%		Total Organic Carb				2.43	0.061	0.069			4.37	2.61		3.39		5.58
	mg/kg		Chem Oxy Demand	1401	4400	2900				1850	< 487			62000		9100	
	mg/kg		Kjedahl Nitrogen	186	330	330				--	447			6030		900	
	mg/kg		Total Phosph	192	160	470				--	216			--		--	
	mg/kg		Oil and Grease	256	0	0				47	773			0		0	
	mg/kg		Cyanide, Total				< 0.91	< 0.06	< 0.06			< 0.91	< 0.62		< 0.83		< 1.3
	mg/kg		Ammonia				87					94	5.3		90		176
	mg/l		Ammonia Elutriate					< 0.06	< 0.06								
	%		Moisture				44.6	16.3	15.7			45.1	18.9		39.5		62.2
	%		Total Solids				55.4	83.7	84.3			54.9	81.1		60.5		37.8
	%		Volatile Solids				4.5	1.19	1.23			4.8	0.8		4.2		7.8

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	43	44	45	1094	1100	1097	1113	1109	1105	1114	1127	1122	1126	1118
		River Mile	839.02	839.01	839	839	839	839	839	839	839	839	839	839	839	839
		Location	HARRIET IS.	HARRIET IS.	HARRIET IS.	St. Paul -North	St. Paul - south	St. Paul - mid	St. Paul - south	St. Paul - mid	St. Paul -North	St. Paul - mean	St. Paul - mean	St. Paul - mid	St. Paul - south	St. Paul - north
		Year	1978	1978	1978	1981	1981	1981	1982	1982	1982	1982	1983	1983	1983	1983
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	1	1	1	3	3	3	3	3	3	3	3	3	3	3
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg	a-BHC										< 5	5	< 0.53	< 0.53	5.7
	ug/kg	b-BHC										< 10	< 1.1	< 1.1	< 1.1	< 1.1
	ug/kg	BHC														
	ug/kg	g-BHC (lindane)										20	< 0.53	< 0.53	< 0.53	< 0.53
	ug/kg	Heptachlor										4	< 0.53	< 0.53	< 0.53	< 0.53
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin	0	0	0							< 20	< 1.6	< 1.6	< 1.6	< 1.6
	ug/kg	4,4'-DDE	0	0.5	0							< 7	< 1.6	< 1.6	< 1.6	< 1.6
	ug/kg	Endrin	0	0	0							< 10	< 2.1	< 2.1	< 2.1	< 2.1
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD	0	2.1	0.2							< 14	< 3.2	< 3.2	< 3.2	< 3.2
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT	0	0	0							< 20	< 4.2	< 4.2	< 4.2	< 4.2
	ug/kg	Methoxychlor														
	ug/kg	Endrinketone														
	ug/kg	Chlorodane	0	4	0							< 2	< 11	< 11	< 11	< 11
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)				0.13	0.071	0.199	0.228	0.129	0.121			0.136	0.329	0.076
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	0	2	0	4.51	0.98	1.09	5.09	2.31	1.11			2.95	2.91	1.38
	mg/kg	B (boron)														
	mg/kg	Ba (barium)	30	140	10											
	mg/kg	Be (beryllium)				0.38	0.137	0.266	0.553	0.28	0.117			0.119	0.168	0.129
	mg/kg	Cd (cadmium)	< 10	< 10	< 10	0.1	0.219	0.096	0.316	0.087	0.079			0.138	0.156	0.093
	mg/kg	Cr (chromium)	< 10	10	< 10	24.5	17.3	26.3	24.4	22.2	7.9			24	36.7	17.2
	mg/kg	Cu (copper)	10	20	< 10	5.6	5.6	7.7	14.3	6.4	4.2			6.9	11.2	3.9
	mg/kg	Fe (iron)	3700	14000	4000											
	mg/kg	Hg (mercury)	0	0	0	0.05	0.05	0.17	0.05	0.06	0.06			0.05	0.05	0.05
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	140	1900	290				908.7	525	266.2					
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	30	20	10	15.3	14.2	14.1	15.6	11	6			10.9	16.8	9.8
	mg/kg	Pb (lead)	30	60	40	31.1	8.4	20.4	14.4	7.8	6			13.1	18.2	16.5
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)				0.16	0.37	0.52	0.07	0.06	0.06			0.08	0.05	0.05
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)							0.9	0.7	0.7			0.4	0.6	0.6
	mg/kg	Zn (zinc)	68	80	20	54.7	22.3	37.7	60.1	29	18.7			26.9	35	15.3
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006										50	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg	Aroclor-1221														
	ug/kg	Aroclor-1232														
	ug/kg	Aroclor-1242														
	ug/kg	Aroclor-1248														
	ug/kg	Aroclor-1254										1100	54	11	16	34
	ug/kg	Aroclor-1260										< 20	47	6.3	29	16
	ug/kg	Total PCB's	0	66	10											
PARTICLE SIZE %FINER	SAND coarse	3 in	100	100	100											
		1 1/2	100	100	100											
		3/4	100	100	98											
		3/8	100	100	83											
		4	100	100	63											
		8														
		10	98	98	27											
	SAND medium	16														
		20	92.0	87.0	9.0											
		30														
		40	33.0	77.0	5.0											
		50														
	SAND fine	70														
		80	15.0	72.0	4.0											
		100														
		140														
	SILT CLAY	200	5.0	68.0	3.0											
		270														
		0.20 mm	1.0	48.0	0.0											
		0.05 mm	0.0	25.0	0.0											
MISC	%	Total Organic Carb														
	mg/kg	Chem Oxy Demand	3300	66000	3500											
	mg/kg	Kjedahl Nitrogen	300	9800	250											
	mg/kg	Total Phosph	140	1100	370											
	mg/kg	Oil and Grease	0	0	0											
	mg/kg	Cyanide, Total														
	mg/kg	Ammonia														
	mg/l	Ammonia Elutriate														
	%	Moisture														
	%	Total Solids														
	%	Volatile Solids														

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	1139	1135	1131	1139	1138	1152	1147	1151	1143	409	46	411	47	48
			River Mile	839	839	839	839	839	839	839	839	839	839	838.5	837.8	837.52	837.51
			Location	St. Paul - mean -dup	St. Paul - mid	St. Paul - north	St. Paul - mean	St. Paul - south	St. Paul - mean	St. Paul - mid	St. Paul - south	St. Paul - north	HARRIET IS.	HARRIET IS.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.
			Year	1984	1984	1984	1984	1984	1985	1985	1985	1985	1989	1980	1989	1975	1975
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	3	3	3	3	3	3	3	3	3	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	6.8	< 0.32	7.9	6.2	1.2	0.98				< 0.07		< 0.13		
	ug/kg		b-BHC	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.53				< 0.14		< 0.27		
	ug/kg		BHC										< 0.21		< 0.4		
	ug/kg		g-BHC (lindane)	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.26				< 0.09		< 0.18		
	ug/kg		Heptachlor	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.26				< 0.07		< 0.13		
	ug/kg		Aldrin										< 0.09		1.1		
	ug/kg		Heptachlorepoxide										< 0.12		< 0.22		
	ug/kg		Endosulfan I										< 0.12		< 0.22		
	ug/kg		Dieldrin	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.79				< 0.12	0	< 0.22		
	ug/kg		4,4'-DDE	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.79				< 0.09	7.3	< 0.18		
	ug/kg		Endrin	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.1				< 0.21	0	< 0.4		
	ug/kg		Endosulfan II										< 0.23		< 0.45		
	ug/kg		4,4'-DDD	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.6				< 0.25	5.9	< 0.49		
	ug/kg		Endrinaldehyde										< 0.25		< 0.49		
	ug/kg		Sulfan sulfate										< 0.25		< 0.49		
	ug/kg		4,4'-DDT	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.1				< 0.3	0	< 0.58		
	ug/kg		Methoxychlor										< 0.51		< 0.98		
	ug/kg		Endrinketone										< 0.25		< 0.49		
	ug/kg		Chlorodane	< 6.4	< 6.4	< 6.4	< 6.4	< 6.4	267				< 1.38	5	< 2.68		
	ug/kg		Toxaphene										< 3		< 2.09		
METALS	mg/kg		Ag (silver)		0.105	0.039		0.196		0.144	0.025	0.013					
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)		1.95	5.49		3.88		3.78	2.88	2.12	< 0.98	0	4.5	1.56	1.5
	mg/kg		B (boron)														
	mg/kg		Ba (barium)											120			
	mg/kg		Be (beryllium)		0.219	0.187		0.68		0.231	0.216	0.111					
	mg/kg		Cd (cadmium)		0.181	0.083		0.675		0.28	0.037	0.022	< 1.1	< 10	< 2.2	0.9	1
	mg/kg		Cr (chromium)		12.8	9.1		22.5		22	16.9	7.8	8	20	13.6	10.9	13.3
	mg/kg		Cu (copper)		7.7	4		13.9		9.6	6.7	2.5	15.1	< 10	11	9.7	10.4
	mg/kg		Fe (iron)											8800			
	mg/kg		Hg (mercury)		0.15	0.05		0.05		0.06	0.05	0.05	< 0.01	0	0.066	0.058	0.051
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)		359	553.5		991.9		561.4	246.7	223.3	230	1400	713		
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)		7.5	6.8		17.8		11.5	9.2	5.4	6.1	20	< 11		
	mg/kg		Pb (lead)		10.8	4.1		15.5		22.2	4.7	5	9.5	50	36.7	28.4	36.5
	mg/kg		Sb (antimony)							12.2	7.7	5.8					
	mg/kg		Se (selenium)		0.12	0.12		0.12		0.12	0.12	0.13	< 0.77		< 1.6		
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)		0.6	0.6		0.6		4.5	3.2	2.4					
	mg/kg		Zn (zinc)		26.3	17.5		59.6		28.7	17.2	12.7	16	77	50.9	41.3	42.7
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 3.2	< 3.2	< 3.2	< 3.2	< 3.2	145				< 1.38		< 2.68		
	ug/kg		Aroclor-1221										< 1.38		< 2.68		
	ug/kg		Aroclor-1232										< 1.38		< 2.68		
	ug/kg		Aroclor-1242										< 1.38		< 2.68		
	ug/kg		Aroclor-1248										< 1.38		< 2.68		
	ug/kg		Aroclor-1254	63	14	37	51	19	< 5.3				< 2.88		< 5.58		
	ug/kg		Aroclor-1260	34	8.8	17	30	33	12.2				< 2.88		< 5.58		
	ug/kg		Total PCB's											29		0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in											100		100	100
			1 1/2											100		100	100
			3/4											100		100	100
			3/8											100		100	100
			4										90.4	100	99.2	99	99
			8											100		99	99
			10										76.9		94.6		
		medium	16										53.7	99.0	93.7	96.0	96.0
			20														
			30										31.2		76.0		
			40											85.0		53.0	53.0
			50										31.2		76.0		
		fine	70														
			80										14.4		60.9		
			100										0.1	58.0	41.1	19.0	19.0
			140												35.7		
	SILT CLAY		200											36.0	24.0	9.0	9.0
			270												16.5		
			0.20 mm											19.0	14.9		
			0.05 mm											9.0	8.5		
MISC	%		Total Organic Carb										0.034		6.24		
	mg/kg		Chem Oxy Demand											690		15755	16600
	mg/kg		Kjedahl Nitrogen											7400		--	--
	mg/kg		Total Phosph											--		--	--
	mg/kg		Oil and Grease											0		1625	1712
	mg/kg		Cyanide, Total										< 0.58		< 1.2		
	mg/kg		Ammonia										0.81		110		
	mg/l		Ammonia Elutriate														
	%		Moisture										14.1		59		
	%		Total Solids										85.9		41		
	%		Volatile Solids										0.9		6.5		

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	1C	1T		2C	3C	2T	2B	3B	3T	49	50	4B	5B	5C
		River Mile	837.5	837.5	837.5	837.4	837.4	837.4	837.4	837.4	837.4	837.21	837.2	837.2	837.2	837.2
		Location	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	STPBH 1	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.
		Year	1992	1992	1994	1992	1992	1992	1992	1992	1992	1978	1974	1992	1992	1992
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	2	1	1	1	1	1	1	1	1	1	1	1
		Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	4	4	1	4	4	4	4	4	4	1	1	4	4	4
		Sam. Depth	10-244	10	10	10-128	10-259	10	128	259	10	10	10	207	229	10-229
		Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg	a-BHC	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg	b-BHC	< 1.1	< 1	0.92	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg	BHC	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg	g-BHC (lindane)	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg	Heptachlor	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	1.9	< 10	< 0.79	< 0.79	< 0.9
	ug/kg	4,4'-DDE	1.5	2.6	< 0.62	< 1	< 1	< 0.7	3.6	1.4	< 0.8	0	< 10	< 0.79	< 0.79	< 0.9
	ug/kg	Endrin	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	0	< 10	< 0.79	< 0.79	< 0.9
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	3.8	< 10	< 0.79	< 0.79	< 0.9
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	0	< 10	< 0.79	< 0.79	< 0.9
	ug/kg	Methoxychlor														
	ug/kg	Endrinketone														
	ug/kg	Chlorodane	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	9	< 10	< 0.79	< 0.79	< 0.9
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)														
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	5.9	3.2	3.5	4.5	5.1	2.2	6.9	3.6	1.9	2	< 0.8	1.3	2.3	5.4
	mg/kg	B (boron)														
	mg/kg	Ba (barium)										100				
	mg/kg	Be (beryllium)														
	mg/kg	Cd (cadmium)	0.41	0.36	0.43	0.35	0.29	0.12	1	0.26	0.09	< 10	0.9	0.06	0.17	0.29
	mg/kg	Cr (chromium)	11	6.5	14	8.5	10	3.4	15	8.7	4.9	10	9	2.5	5.6	8.6
	mg/kg	Cu (copper)	19	6.5	9	16	16	4	42	13	4.3	20	2	1.4	5.8	10
	mg/kg	Fe (iron)										12000				
	mg/kg	Hg (mercury)	< 0.1	< 0.1	< 0.05	< 0.1	< 0.1	< 0.1	0.13	< 0.1	< 0.1	0	1.1	< 0.1	< 0.1	< 0.1
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	1100	390	563	926	940	260	1400	690	280	1300		140	300	620
	mg/kg	Mo (molybdenum)	<													
	mg/kg	Ni (nickel)	12	8.2	11	11	14	4.7	13	11	6.2	30	5	2.9	7	11
	mg/kg	Pb (lead)	21	< 2.5	10	9.2	8.9	< 2.5	35	< 9.7	< 2.5	60	< 9	< 2.5	6.5	7
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)														
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)														
	mg/kg	Zn (zinc)	66	26	40.7	48	49	15	100	45	21	70	12	9.4	27	40
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg	Aroclor-1221	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg	Aroclor-1232	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg	Aroclor-1242	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg	Aroclor-1248	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg	Aroclor-1254	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg	Aroclor-1260	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg	Total PCB's										200	0			
PARTICLE SIZE %FINER	SAND coarse	3 in										100	100			
		1 1/2										100	100			
		3/4										100	100			
		3/8										100	100			
		4										100	100			
		8											96			
		10			100							100				
	SAND medium	16											90.0			
		20			99.8							100				
		30														
		40			99.5							100	20.0			
		50														
	SAND fine	70														
		80										94.0				
		100			95.6								0.0			
		140			86.3											
	SILT CLAY	200			76.0							83.0	0.0			
		270														
		0.20 mm										45.0	0.0			
		0.05 mm										22.0	0.0			
MISC	%	Total Organic Carb			0.744											
	mg/kg	Chem Oxy Demand										73000	1874			
	mg/kg	Kjedahl Nitrogen										7300	134			
	mg/kg	Total Phosph										960	210			
	mg/kg	Oil and Grease										0	318			
	mg/kg	Cyanide, Total	0.5	0.5	0.63	0.5	0.5	0.5	0.5	0.5	0.5			0.5	0.5	0.5
	mg/kg	Ammonia	28	2.1		19	15	0.49	30	14	1.7			3.7	4.7	8.3
	mg/l	Ammonia Elutriate			1.5											
	%	Moisture			36.2											
	%	Total Solids	57.5	72.1	63.8	60.1	63	78.3	47.8	57.6	68.1			76.3	72.8	67.2
	%	Volatile Solids	6.5	2.7	4.66	5.8	4.8	1.2	9.4	4.9	1.7			1.2	2.7	4.5

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	5T	4C		51	52	W3	W1	W2	412	53	54	55	413	56
			River Mile	837.2	837.2	837.2	837.19	837	836.8	836.8	836.8	836.6	835.07	833.03	832.4	832.1	831.5
			Location	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	STPBH 2	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	Wetland/Holme n Field	Wetland/Holme n Field	Wetland/Holme n Field	ST. PAUL BARGE TERM.			BELOW CUDAHY	BELOW CUDAHY	BELOW CUDAHY
			Year	1992	1992	1994	1978	1980	1992	1992	1992	1989	1974	1974	1981	1989	1980
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	2	1	1				1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	4	4	1	1	1				1	1	1	1	1	1
			Sam. Depth	10	10-207	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC's	ug/kg		a-BHC	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.1				< 0.1	
	ug/kg		b-BHC	< 0.9	< 0.86	0.45			< 1.2	< 1.4	< 1.2	< 0.21				< 0.21	
	ug/kg		BHC	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.31				< 0.31	
	ug/kg		g-BHC (lindane)	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.14				< 0.14	
	ug/kg		Heptachlor	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.1				< 0.1	
	ug/kg		Aldrin									< 0.14				1	
	ug/kg		Heptachlorepoxide									< 0.17				< 0.17	
	ug/kg		Endosulfan I									< 0.17				< 0.17	
	ug/kg		Dieldrin	< 0.9	< 0.86	< 0.45	0	0.66	< 1.2	< 1.4	< 1.2	< 0.17	< 10	< 10	0.8	< 0.17	< 0.2
	ug/kg		4,4'-DDE	< 0.9	< 0.86	< 0.45	0	< 0.2	2.6	2.2	2.6	< 0.14	< 10	< 10	< 0.1	< 2.1	< 0.2
	ug/kg		Endrin	< 0.9	< 0.86	< 0.45	0	0.2	< 1.2	< 1.4	< 1.2	< 0.31	< 10	< 10	< 0.1	< 0.31	< 0.2
	ug/kg		Endosulfan II									< 0.35				< 0.34	
	ug/kg		4,4'-DDD	< 0.9	< 0.86	< 0.45	0.3	1.43	1.8	< 1.4	2.4	< 0.38	< 10	< 10	1.9	< 0.38	0.6
	ug/kg		Endrinaldehyde									< 0.38				< 0.38	
	ug/kg		Sulfan sulfate									< 0.38				< 0.38	
	ug/kg		4,4'-DDT	< 0.9	< 0.86	< 0.45	0	1.68	< 1.2	< 1.4	< 1.2	< 0.45	< 10	< 10	0.4	< 0.44	< 0.4
	ug/kg		Methoxychlor									< 0.77				< 0.75	
	ug/kg		Endrinketone									< 0.38				< 0.38	
	ug/kg		Chlorodane	< 0.9	< 0.86	< 0.23	1	3.05	< 1.2	< 1.4	< 1.2	< 2.09	< 10	< 10	4	< 2.05	0.83
	ug/kg		Toxaphene									< 2.05				< 2.42	
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	3.9	3	1.9	0		4.8	5.7	7	3.1	1.8	1.2	9	2.5	
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				10								50		
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	0.23	0.16	0.41	< 10	0.75	1.1	1	0.89	< 1.6	6	15	2	< 0.81	1.91
	mg/kg		Cr (chromium)	8.3	6.7	11.3	< 10	38.5	20	18	18	11.1	43	115	10	8.7	56.1
	mg/kg		Cu (copper)	10	7	3.4	< 10	8.8	37	34	32	10.8	33	36	11	7.3	9.58
	mg/kg		Fe (iron)				2600	14500							5000		12400
	mg/kg		Hg (mercury)	< 0.1	< 0.1	< 0.04	0	< 0.01	0.14	< 0.1	0.12	0.048	0.8	0.8	0.02	0.03	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	600	400	345	130		1200	1200	1300	609			490	283	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	10	7.5	11.1	< 10	22.4	21	20	19	9.2	33	42	< 10	5.8	22.9
	mg/kg		Pb (lead)	4.2	3.7	2.3	10	19.5	37	36	40	21.8	95	73	20	27.7	7.44
	mg/kg		Sb (antimony)		<												
	mg/kg		Se (selenium)									< 1.2				< 1.1	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	38	27	17.6	10	202	110	100	98	55.6	143	170	40	32.2	157
	mg/kg		V (vanadium)														
PCB's	ug/kg		Aroclor-1006	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1221	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1232	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1242	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1248	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1254	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 4.35				< 4.28	
	ug/kg		Aroclor-1260	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 4.35				< 4.28	
	ug/kg		Total PCB's				11	15.9					0	0	20		4.81
PARTICLE SIZE %FINER	SAND	coarse	3 in				100	100									100
			1 1/2				100	100							100		100
			3/4				100	100							100		100
			3/8				100	100							100		100
			4			71.6	100	100				100			100	100	100
			8					100							96		100
			10			52.7	100					100				99.4	
		medium	16					100				99.5			88.0	98.2	88.0
			20			35.0	90.0										
			30									97.8			73.0	92.5	
			40			16.0	34.0	100							81.0		35.0
			50									97.8			50.0	92.5	
		fine	70												46.0		
			80				9.0					85.6				76.3	
			100			3.8		76.0				33.0			43.0	38.9	11.0
			140			3.6						29.0				34.9	
	SILT CLAY		200			3.0	4.0	42.0				19.5			34.0	24.9	11.0
			270									13.3			29.0	16.9	
			0.20 mm				0.0					9.3			15.0	12.3	
			0.05 mm				0.0	19.0				8.8			7.0	8.3	6.0
MISC	%		Total Organic Carb			0.075						6.69				2.19	
	mg/kg		Chem Oxy Demand				3500	18400					101355	75148	23000		6600
	mg/kg		Kjedahl Nitrogen				230	--					422	2797	4090		--
	mg/kg		Total Phosph				100	1770					1130	1687	--		1770
	mg/kg		Oil and Grease				0	560					1269	884	0		12400
	mg/kg		Cyanide, Total	0.5	0.5	< 0.06			0.5	0.5	0.5	< 0.89				< 0.87	
	mg/kg		Ammonia	4.1	5.1				0.82	3.8	0.18	77				164	
	mg/l		Ammonia Elutriate			< 0.06											
	%		Moisture			15.7						43.7				42.5	
	%		Total Solids	63.6	70.3	84.3			43.4	44.2	50	56.3				57.5	
	%		Volatile Solids	5.1	3.5	1.21			11.5	10.7	10.3	4				4.8	

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	414	57	1164	1160	1156	416	58	59	60	1364	61	62	1365	63
			River Mile	831.2	831.1	831	831	831	828.2	828	827.91	827.9	827.9	827.85	827.84	827.8	827.7
			Location	BELOW CUDAHY	BELOW CUDAHY	Newport - west	Newport - mid	Newport - east	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	Grey Cloud Slough 2	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	Grey Cloud Slough 1	GREY CLOUD SLOUGH
			Year	1989	1981	1985	1985	1985	1989	1980	1978	1978	1994	1974	1974	1994	1975
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1	3	3	3	1	1	1	1	3	1	1	3	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	MWCC	MWCC	MWCC	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.12					< 0.77				< 0.25			< 0.24	
	ug/kg		b-BHC	< 0.24					< 1.54				< 0.25			< 0.24	
	ug/kg		BHC	< 0.36					< 2.3				< 0.25			< 0.24	
	ug/kg		g-BHC (lindane)	< 0.16					< 1.02				< 0.25			< 0.24	
	ug/kg		Heptachlor	< 0.12					< 0.77				< 0.25			< 0.24	
	ug/kg		Aldrin	0.4					< 1.02								
	ug/kg		Heptachlorepoxide	< 0.2					< 1.28								
	ug/kg		Endosulfan I	< 0.2					< 1.28								
	ug/kg		Dieldrin	< 0.2	2.7				< 1.28	< 0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		4,4'-DDE	< 0.16	< 0.1				< 1.02	< 0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Endrin	< 0.36	< 0.1				< 2.3	< 0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Endosulfan II	< 0.4					< 2.56								
	ug/kg		4,4'-DDD	< 0.44	5.6				< 2.82	0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Endrinaldehyde	< 0.44					< 2.82								
	ug/kg		Sulfan sulfate	< 0.44					< 2.82								
	ug/kg		4,4'-DDT	< 0.53	1.2				< 3.33	< 0.4	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Methoxychlor	< 0.89					< 5.63								
	ug/kg		Endrinketone	< 0.44					< 2.82								
	ug/kg		Chlorodane	< 2.42	8				< 15.36	< 0.4	0	0	< 0.25	< 10	< 10	< 0.24	
	ug/kg		Toxaphene	< 1.44					< 1.62								
METALS	mg/kg		Ag (silver)			0.055	0.064	0.068									
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	2.4	14	2.16	2.06	4.59	1.6		0	0	0.77	< 0.8	< 0.9	1.4	0.45
	mg/kg		B (boron)														
	mg/kg		Ba (barium)		60						10	10					
	mg/kg		Be (beryllium)			0.14	0.136	0.349									
	mg/kg		Cd (cadmium)	< 1.6	3	0.064	0.06	0.15	< 1.2	0.96	< 10	< 10	0.38	< 1	< 1	0.39	< 0.1
	mg/kg		Cr (chromium)	15.1	10	7.8	7.5	17.3	5.9	33.2	< 10	< 10	7.8	12	10	8.7	16.5
	mg/kg		Cu (copper)	10.9	16	3.5	2.4	6.1	< 1.5	6.64	< 10	< 10	2.4	5	2	2	7.9
	mg/kg		Fe (iron)		6100					11100	3000	1700					
	mg/kg		Hg (mercury)	0.038	< 0.01	0.05	0.05	0.05	< 0.01	< 0.01	0.06	0	< 0.04	0.7	0.4	< 0.04	0.097
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	606	680	265.5	266.1	812.6	257		170	100	256			487	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	10.9	10	5.9	5.6	9.4	< 5.8	28.7	< 10	< 10	6.8	10	7	8.2	
	mg/kg		Pb (lead)	15.3	30	3.9	3.1	4.6	2.8	4.9	< 10	< 10	2.6	< 10	< 10	6.7	< 0.1
	mg/kg		Sb (antimony)			5.2	4.9	14.1									
	mg/kg		Se (selenium)	< 1.1		0.12	0.12	0.12	< 0.83								
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)			2.3	1.8	5.4									
	mg/kg		Zn (zinc)	52.6	54	13.5	11.6	25.7	13.4	66.4	20	8	14	19	20	15.3	29.7
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1221	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1232	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1242	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1248	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1254	< 5.05					< 32				< 4.9			< 4.8	
	ug/kg		Aroclor-1260	< 5.05					< 32				< 4.9			< 4.8	
	ug/kg		Total PCB's		38					1.2	0	0		0	0		0
PARTICLE SIZE %FINER	SAND	coarse	3 in							100		100		100	100		100
			1 1/2		100					100		100		100	100		100
			3/4		100					100		100		100	100		100
			3/8		100					100		100		100	100		100
			4	100	100				98.4	100		100	99.9	100	100	96.2	99
			8		100					100				98	98		98
			10	98.4					95.9			96	96.4			82	
		medium	16	93.4	100				88.2	90.0				92.0	92.0		88.0
			20									84.0	70.4			59.2	
			30	60.2	99.0				35.1								
			40		95.0					35.0		34.0	7.9	18.0	18.0	29.1	26.0
			50	60.2	89.0				35.1								
		fine	70		87.0												
			80	31.0					2.4			3.0					
			100	22.7	85.0				0.4	3.0			0.4	0.0	0.0	4.1	3.0
			140	20.8					0.3				0.0			1.6	
	SILT CLAY		200	15.7	76.0					2.0		2.0	0.0	0.0	0.0	1.1	3.0
			270	10.7	70.0												
			0.20 mm	8.1	42.0							0.0		0.0	0.0		
			0.05 mm	5.7	16.0					2.0		0.0		0.0	0.0		
MISC	%		Total Organic Carb	1.39					0.068				0.066			0.043	
	mg/kg		Chem Oxy Demand		44000					2760	1900	2800	11500	950	511	10600	4850
	mg/kg		Kjedahl Nitrogen		4150					--	350	302		236	138		--
	mg/kg		Total Phosph		--					853	85	97		177	250		--
	mg/kg		Oil and Grease		0					7870	0	0	< 0.06	76	64	< 0.06	133
	mg/kg		Cyanide, Total	< 0.85					< 0.63				<0.06			0.09	
	mg/kg		Ammonia	58					1.2								
	mg/l		Ammonia Elutriate										<0.06			<0.06	
	%		Moisture	41.2					20.8				20.2			15.8	
	%		Total Solids	58.8					79.2				79.8			84.2	
	%		Volatile Solids	3					0.5				1.15			1.06	

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	415	1168	1174	1171	1188	1187	1183	1179	1192	1201	1196	1200	1212	1213
			River Mile	827.6	827	827	827	827	827	827	827	827	827	827	827	827	827
			Location	GREY CLOUD SLOUGH	Grey Cloud - east	Grey Cloud - west	Grey Cloud - mid	Grey Cloud - mean	Grey Cloud - west	Grey Cloud - mid	Grey Cloud - east	Grey Cloud - east	Grey Cloud - mean	Grey Cloud - mid	Grey Cloud - west	Grey Cloud - west	Grey Cloud - mean-du
			Year	1989	1981	1981	1981	1982	1982	1982	1982	1983	1983	1983	1983	1984	1984
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC	< 0.07				< 5				< 5	< 0.53	< 5	< 5	< 0.32	3.5
	ug/kg		b-BHC	< 0.14				< 10				< 10	< 1.1	< 10	< 10	< 0.64	< 0.64
	ug/kg		BHC	< 0.22													
	ug/kg		g-BHC (lindane)	< 0.1				8				< 7	< 0.53	< 7	< 7	< 0.32	< 0.32
	ug/kg		Heptachlor	< 0.07				9				< 5	< 0.53	< 5	< 5	< 0.32	< 0.32
	ug/kg		Aldrin	< 0.1													
	ug/kg		Heptachlorepoxide	< 0.12													
	ug/kg		Endosulfan I	< 0.12													
	ug/kg		Dieldrin	< 0.12				< 20				< 20	< 1.6	< 20	< 20	< 0.96	< 0.96
	ug/kg		4,4'-DDE	< 0.1				< 7				< 7	< 1.6	< 7	< 7	< 0.96	< 0.96
	ug/kg		Endrin	< 0.22				< 10				< 10	< 2.1	< 10	< 10	< 1.3	< 1.3
	ug/kg		Endosulfan II	< 0.24													
	ug/kg		4,4'-DDD	< 0.26				< 14				< 14	< 3.2	< 14	< 14	< 1.9	< 1.9
	ug/kg		Endrinaldehyde	< 0.26													
	ug/kg		Sulfan sulfate	< 0.26													
	ug/kg		4,4'-DDT	< 0.84				< 20				< 20	< 4.2	< 20	< 20	< 2.5	< 2.5
	ug/kg		Methoxychlor	< 0.53													
	ug/kg		Endrinketone	< 0.26													
	ug/kg		Chlorodane	< 1.44				< 2				< 2	< 11	< 2	< 2	< 6.4	< 6.4
	ug/kg		Toxaphene	< 15.36													
METALS	mg/kg		Ag (silver)		0.094	0.588	0.175		0.28	0.06	0.124	0.144		0.041	0.042	0.136	
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1	1.83	8.82	1.44		3.3	1.71	2.13	2.09		1.15	2.16	1.65	
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														
	mg/kg		Be (beryllium)		0.174	0.588	0.218		0.36	0.119	0.233	0.137		0.107	0.149	0.158	
	mg/kg		Cd (cadmium)	< 1.1	0.085	1.024	0.346		0.341	0.123	0.38	0.202		0.309	0.47	0.355	
	mg/kg		Cr (chromium)	6.7	22.6	50.2	31.8		19	14.8	18.8	33.5		17.3	38.7	10.8	
	mg/kg		Cu (copper)	7.7	5.3	24.8	8.4		10.4	4.3	7.4	6.2		6.2	12.3	5.4	
	mg/kg		Fe (iron)														
	mg/kg		Hg (mercury)	< 0.01	0.02	0.1	0.22		0.08	0.05	0.06	0.05		0.05	0.05	0.06	
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	537					539	415.8	923.8					257.9	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	5.6	15.4	25.5	18.9		11.5	9.8	13.2	15.8		11.7	16	6.6	
	mg/kg		Pb (lead)	1.5	5.5	25.8	13.7		10.6	2.2	4.2	4.2		3	11.9	4.8	
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	< 0.79	0.19	0.2	0.64		0.08	0.05	0.07	0.05		0.05	0.16	0.12	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)						0.7	0.6	0.6	0.6		0.6	0.7	0.6	
	mg/kg		Zn (zinc)	15.6	30	102	40.3		44.4	19	28.9	27.1		19.3	44.7	23.6	
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 1.44				80				< 20	32	9.8	13	< 3.2	< 3.2
	ug/kg		Aroclor-1221	< 1.44													
	ug/kg		Aroclor-1232	< 1.44													
	ug/kg		Aroclor-1242	< 1.44													
	ug/kg		Aroclor-1248	< 1.44													
	ug/kg		Aroclor-1254	< 3				1000				42	60	17	14	34	62
	ug/kg		Aroclor-1260	< 3				< 20				9.8	8.5	< 20	< 20	12	19
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER	SAND	coarse	3 in														
			1 1/2														
			3/4														
			3/8														
			4	100													
			8														
			10	96.4													
		medium	16	84.4													
			20														
			30	30.6													
			40														
			50	30.6													
		fine	70														
			80	2.1													
			100	0.6													
			140	0.5													
	SILT CLAY		200	0.5													
			270	0.4													
			0.20 mm	0.3													
			0.05 mm	0.2													
MISC	%		Total Organic Carb	0.049													
	mg/kg		Chem Oxy Demand														
	mg/kg		Kjedahl Nitrogen														
	mg/kg		Total Phosph														
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total	< 0.6													
	mg/kg		Ammonia	< 0.24													
	mg/l		Ammonia Elutriate														
	%		Moisture	16.6													
	%		Total Solids	83.4													
	%		Volatile Solids	0.7													

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	1213	1205	1209	1221	1226	1225	1217	64	65	66	493	1361	1362	67
			River Mile	827	827	827	827	827	827	827	826.8	826.4	824.4	823.7	823.7	823.4	823.39
			Location	Grey Cloud - mean	Grey Cloud - east	Grey Cloud - mid	Grey Cloud - mid	Grey Cloud - mean	Grey Cloud - west	Grey Cloud - east	ROBINSONS ROCKS	ROBINSONS ROCKS	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	Pine Bend Foot Light 1	Pine Bend Foot Light 2	PINE BEND FOOT LIGHT
			Year	1984	1984	1984	1985	1985	1985	1985	1982	1982	1982	1989	1994	1994	1974
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	3	3	3	3	3	3	3	1	1	1	1	3	3	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	3	4.9	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26				< 0.07	< 0.24	< 0.26	
	ug/kg		b-BHC	< 0.64	< 0.64	< 0.64	< 0.53	< 0.53	< 0.53	< 0.53				< 0.15	< 0.24	0.52	
	ug/kg		BHC											< 0.22	< 0.24	< 0.26	
	ug/kg		g-BHC (lindane)	< 0.32	1.2	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26				< 0.1	< 0.24	< 0.26	
	ug/kg		Heptachlor	< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	0.33	< 0.26				< 0.07	< 0.24	< 0.26	
	ug/kg		Aldrin											< 0.1			
	ug/kg		Heptachlorepoxide											< 0.12			
	ug/kg		Endosulfan I											< 0.12			
	ug/kg		Dieldrin	< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.1	< 0.1	< 0.1	< 0.12	< 0.49	< 0.51	< 10
	ug/kg		4,4'-DDE	< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.1	< 0.1	< 0.1	< 0.1	< 0.49	< 0.51	< 10
	ug/kg		Endrin	< 1.3	< 1.3	< 1.3	< 1.1	< 1.1	< 1.1	< 1.1	< 0.1	< 0.1	< 0.1	< 0.22	< 0.49	< 0.51	< 10
	ug/kg		Endosulfan II											< 0.24			
	ug/kg		4,4'-DDD	< 1.9	< 1.9	< 1.9	< 1.6	< 1.6	< 1.6	< 1.6	< 0.1	< 0.1	< 0.1	< 0.27	< 0.49	< 0.51	< 10
	ug/kg		Endrinaldehyde											< 0.27			
	ug/kg		Sulfan sulfate											< 0.27			
	ug/kg		4,4'-DDT	< 2.5	< 2.5	< 2.5	< 2.1	< 2.1	< 2.1	< 2.1	< 0.1	< 0.1	< 0.1	< 0.32	< 0.49	< 0.51	< 10
	ug/kg		Methoxychlor											< 0.54			
	ug/kg		Endrinketone											< 0.27			
	ug/kg		Chlorodane	< 6.4	< 6.4	< 6.4	< 5.3	< 5.3	< 5.3	< 5.3	< 1	< 1	< 1	< 1.46	< 0.24	< 0.26	< 10
	ug/kg		Toxaphene											< 2.38			
METALS	mg/kg		Ag (silver)		0.024	0.026	0.011		1.139	0.02							
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)		2.9	1.48	1.66		6.34	3.25	1.5	1.3	1.1	< 1.11	0.97	1.2	< 1
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														
	mg/kg		Be (beryllium)		0.159	0.102	0.091		0.235	0.167							
	mg/kg		Cd (cadmium)		0.141	0.126	0.052		4.5	0.112	< 0.2	< 0.2	< 0.15	< 1.21	< 0.12	< 0.12	1
	mg/kg		Cr (chromium)		13.1	7.4	7.5		41.8	14.5	6	6	5.3	8.7	5.6	8.1	29
	mg/kg		Cu (copper)		4.3	2.8	1.9		23.4	4.9	3	3	2.3	4.5	1.9	3.4	5
	mg/kg		Fe (iron)								5600	4700	5400				
	mg/kg		Hg (mercury)		0.05	0.07	0.05		0.12	0.05	0.028	0.05	0.018	< 0.01	< 0.05	< 0.05	0.8
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)		2090.7	275.8	196.8		478.2	2227.8				264	180	289	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)		9.7	6.7	5.7		13.7	9.5	8	7	6	8.78	4.7	6.4	19
	mg/kg		Pb (lead)		2.7	2.5	2.2		25.2	3.2	4	4	5	5.4	3.4	4.2	< 11
	mg/kg		Sb (antimony)				4.7		7.9	14.1							
	mg/kg		Se (selenium)		0.12	0.12	0.12		0.12	0.13				< 0.92			
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)		0.6	0.6	1.9		3.3	5.4							
	mg/kg		Zn (zinc)		18.5	16.1	11.6		61.6	18.5	15	16	13	23.6	12.8	20	14
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 3.2	< 3.2	18	30.6	27.9	387	23.1				< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1221											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1232											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1242											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1248											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1254	61	45	37	< 5.3	< 5.3	< 5.3	< 5.3				< 3.05	< 4.9	< 5.1	
	ug/kg		Aroclor-1260	18	12	11	< 5.3	< 5.3	9.3	< 5.3				< 3.05	< 4.9	< 5.1	
	ug/kg		Total PCB's								0	0	0				0
PARTICLE SIZE %FINER		SAND coarse	3 in														100
			1 1/2								100	100	100				100
			3/4								100	100	100				100
			3/8								99	100	100				100
			4								95	100	99	100	100	100	100
			8								88	99	95				100
			10											100	99.6	99.3	
		SAND medium	16								76.0	96.0	81.0	98.6			100.0
			20												92.2	96.7	
			30								44.0	78.0	47.0	82.9			
			40								17.0	49.0	24.0		31.4	68.1	94.0
			50								6.0	14.0	9.0	82.9			
		SAND fine	70								5.0	8.0	6.0				
			80											33.4			
			100								5.0	6.0	5.0	6.8	2.8	12.2	4.0
			140											5.5	1.8	10.5	
		SILT CLAY	200								4.0	5.0	4.0	4.1	1.3	10.2	0.0
			270								4.0	5.0	3.0	3.2			
			0.20 mm								1.0	1.0	1.0	2.1			0.0
			0.05 mm								0.0	0.0	0.0	1.5			0.0
MISC	%		Total Organic Carb											0.58	0.062	0.101	
	mg/kg		Chem Oxy Demand								2590	4400	1630		11800	18800	4079
	mg/kg		Kjedahl Nitrogen								130	190	64				99
	mg/kg		Total Phosph								190	170	250				143
	mg/kg		Oil and Grease								< 50	60	< 50		0.2	0.48	285
	mg/kg		Cyanide, Total											< 0.65	0.09	0.11	
	mg/kg		Ammonia											14			
	mg/l		Ammonia Elutriate												0.2	0.48	
	%		Moisture											22.6	20.7	23.5	
	%		Total Solids											77.4	79.3	76.5	
	%		Volatile Solids											1.2	1.18	1.88	

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	68	69	318	70	71	72	73	74	494	1363	319	383	379	377
			River Mile	823.21	823.2	823	822.94	822.93	822.92	822.91	822.9	822.9	822.9	822.5	821.8	821.8	821.8
			Location	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	R-Spring Lake 1	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	Pine Bend Foot Light 3	R-Spring Lake 2	Spring Lake-Pool 2/Ser-2	Spring Lake-Pool 2/Pac-1	Spring Lake-Pool 2/Key-2
			Year	1978	1978	1984	1982	1975	1975	1975	1975	1989	1994	1984	1988	1988	1988
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	3	1	1	1	1	1	1	1	3	3	3	3
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1	2	1	1	1	1	1	1	3	2	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC									< 0.12	< 0.24		< 0.06	< 0.17	< 0.002
	ug/kg		b-BHC									< 0.24	< 0.24		< 0.12	< 0.42	< 0.006
	ug/kg		BHC									< 0.36	< 0.24				
	ug/kg		g-BHC (lindane)									< 0.16	< 0.24		< 0.08	< 0.22	< 0.006
	ug/kg		Heptachlor			< 0.5						< 0.12	< 0.24	< 0.5	< 0.06	< 0.22	< 0.006
	ug/kg		Aldrin									< 0.16					
	ug/kg		Heptachlorepoxide									< 0.2					
	ug/kg		Endosulfan I									< 0.2					
	ug/kg		Dieldrin	0	0	< 0.5	< 0.1					< 0.2	< 0.48	< 0.5	< 0.04	< 0.4	< 0.01
	ug/kg		4,4'-DDE	0	0	< 0.5	< 0.1					< 0.16	< 0.48	< 0.5	< 0.04	< 0.58	< 0.01
	ug/kg		Endrin	0	0	< 0.5	< 0.1					< 0.36	< 0.48	< 0.5	< 0.12	< 4.4	< 0.02
	ug/kg		Endosulfan II									< 0.4					
	ug/kg		4,4'-DDD	0	0	< 0.5	< 0.1					< 0.44	< 0.48	< 0.5	< 0.22	< 1.3	< 0.01
	ug/kg		Endrinaldehyde									< 0.44					
	ug/kg		Sulfan sulfate									< 0.44					
	ug/kg		4,4'-DDT	0	0	< 0.5	< 0.1					< 0.51	< 0.48	< 0.5	< 0.24	< 0.87	< 0.01
	ug/kg		Methoxychlor									< 0.87					
	ug/kg		Endriniketone									< 0.44					
	ug/kg		Chlorodane	0	0	< 0.5	< 1					< 2.38	< 0.24	< 0.5	< 0.28	< 1.2	< 0.04
	ug/kg		Toxaphene									< 1.63					
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	0	13	1	0	0	0.67	0.94	2.6	0.91	12	31	1.8	4.94
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	10	10												
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 10	2	< 0.19	< 0.1	< 0.1	1.6	2.7	< 1.77	0.41	1.5	1.8	1.2	1.14
	mg/kg		Cr (chromium)	< 10	< 10	23	3.8	9.2	9.2	16.5	31.7	20	6.6	29	33	19	19
	mg/kg		Cu (copper)	< 10	< 10	15	1.9	4.9	5	9	13.9	18.3	1.8	18	22	11	20.6
	mg/kg		Fe (iron)	3400	2600		4400										
	mg/kg		Hg (mercury)	0	0	< 0.099	0.031	0.093	0.069	0.048	0.07	< 0.02	< 0.04	< 0.091	0.14	0.02	0.17
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	130	120							1080	167		750	380	622
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	< 10	18	6					15.8	5.7	29	22	10	15
	mg/kg		Pb (lead)	< 10	< 10	30	4	< 0.1	< 0.1	9.7	10	10.9	9.1	15	31	14	25.9
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)									< 1.34			44	< 0.75	< 0.35
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	20	20	71	13	20.5	21.3	30.7	55.3	74	12.9	50	96	44	75.9
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006									< 2.38	< 4.8		< 1.2	< 3	< 0.15
	ug/kg		Aroclor-1221									< 2.38	< 4.8				
	ug/kg		Aroclor-1232									< 2.38	< 4.8				
	ug/kg		Aroclor-1242									< 2.38	< 4.8				
	ug/kg		Aroclor-1248									< 2.38	< 4.8				
	ug/kg		Aroclor-1254									< 4.95	< 4.8		< 2.4	< 3	< 98
	ug/kg		Aroclor-1260									< 4.95	< 4.8		< 2.4	< 3	< 0.25
	ug/kg		Total PCB's	0	8	40	0	0	0	0	0			4			
PARTICLE SIZE %FINER	SAND	coarse	3 in	100	100			100	100	100	100						
			1 1/2	100	100		100	100	100	100	100						
			3/4	100	100	100	100	100	100	100	100			100			
			3/8	100	100		100	100	100	100	100						
			4	100	100	100	100	99	99	98	98	99.9	100	100			
			8				99	96	96	94	94						
			10	100	100	100						99.8	98.6	99			
		medium	16				94.0	87.0	87.0	89.0	91.0	99.2					
			20	99.0	100.0								91.1				
			30				77.0					97.5					
			40	85.0	91.0	100.0	66.0	41.0	41.0	54.0	76.0		56.6	98.0			
			50				41.0					97.5					
		fine	70				18.0										
			80	13.0	11.0							83.4					
			100			99.0	8.0	5.0	5.0	9.0	34.0	65.3	3.2	87.0			
			140									48.4	1.3				
	SILT CLAY		200	6.0	3.0	93.0	4.0	2.0	2.0	8.0	31.0	28.4	1.0	79.0			
			270			86.0	4.0					19.0		76.0			
			0.20 mm	0.0	0.0	27.0	1.0					14.1		53.0			
			0.05 mm	0.0	0.0	12.0	0.0					9.1		19.0			
MISC	%		Total Organic Carb									5.73	0.375				1.21
	mg/kg		Chem Oxy Demand	5600	4300		1630	1848	2386	7050	15600		10200	119000			
	mg/kg		Kjedahl Nitrogen	520	450	1500	94	--	--	--	--			3600			
	mg/kg		Total Phosph	88	190	88000	940	--	--	--	--			75000			
	mg/kg		Oil and Grease	0	0		< 50	204	284	374	483		< 0.06				
	mg/kg		Cyanide, Total									< 1.06	0.11				
	mg/kg		Ammonia									175					
	mg/l		Ammonia Elutriate										<0.06				
	%		Moisture									52.7	16				
	%		Total Solids									47.3	84				
	%		Volatile Solids									4.4	1.02				

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	384	381	375	380	382	378	376	320	75	76	1358	1360	321	77
			River Mile	821.8	821.8	821.8	821.8	821.8	821.8	821.8	821.6	821.1	821	820.9	820.6	820.5	819.7
			Location	Spring Lake-Pool 2/Ser-3	Spring Lake-Pool 2/Pac-3	Spring Lake-Pool 2/Key-1	Spring Lake-Pool 2/Pac-2	Spring Lake-Pool 2/Ser-1	Spring Lake-Pool 2/Key-3	Spring Lake-Pool 2/Key-1	R-Spring Lake 3	BOULANGER BEND	BOULANGER BEND	Boulander Bend 1	Boulander Bend 2	R-Spring Lake 4	BOUL. BEND LOW LIGHT
			Year	1988	1988	1988	1988	1988	1988	1988	1984	1978	1974	1994	1994	1984	1981
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	3	3	3	3	3	3	3	3	1	1	1	1	3	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1	1	1	1	1	1	2	1	1	3	3	2	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.06	< 0.17	< 0.002	< 0.17	< 0.06	< 0.002					< 0.24	< 0.25		
	ug/kg		b-BHC	< 0.12	< 0.42	< 0.006	< 0.42	< 0.12	< 0.006					< 0.24	1.3		
	ug/kg		BHC											< 0.24	< 0.25		
	ug/kg		g-BHC (lindane)	< 0.08	< 0.22	< 0.006	< 0.22	< 0.08	< 0.006					< 0.24	< 0.25		
	ug/kg		Heptachlor	< 2.4	< 0.22	< 0.006	< 0.22	< 0.06	< 0.006		< 0.5			< 0.24	< 0.25	< 0.5	
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin	< 0.04	< 0.4	< 0.01	< 0.4	< 0.04	< 0.01		< 0.5	< 1	< 10	< 0.48	1.10	< 0.5	1.6
	ug/kg		4,4'-DDE	< 0.08	< 0.58	< 0.01	< 1.4	< 0.08	< 0.01		< 0.5		< 10	0.74	< 0.48	< 0.5	< 0.1
	ug/kg		Endrin	< 0.12	< 4.4	< 0.02	< 4.4	< 0.12	< 0.02		< 0.5	< 1	< 10	< 0.48	< 0.48	< 0.5	< 0.1
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD	< 0.22	< 1.3	< 0.01	< 1.3	< 0.22	< 0.01		< 0.5		< 10	< 0.48	< 0.48	< 0.5	7
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT	< 0.24	< 0.87	< 0.01	< 0.87	< 0.24	< 0.01		< 0.5	< 4	< 10	< 0.48	< 0.48	< 0.5	0.8
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane	< 0.28	< 1.2	< 0.04	< 1.2	< 0.28	< 0.04		< 0.5		< 10	< 0.24	< 0.25	< 0.5	11
	ug/kg		Toxaphene	< 1.96													
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	23	1.8	5.67	1.9	36	3.95	4.71	12	2.3	< 0.8	0.9	1.2	12	29
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														100
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	1	0.82	1.67	1.1	2.6	0.54	1.61	2.7	4.5	1	0.42	0.45	4	8
	mg/kg		Cr (chromium)	24	16	23.8	20	47	16.1	21.6	30	54.7	8	8	6.9	30	
	mg/kg		Cu (copper)	16	8.2	32.4	11	31	14.3	24.6	20	25.3	2	3	2.4	20	38
	mg/kg		Fe (iron)									16000					13000
	mg/kg		Hg (mercury)	0.11	0.02	0.18	0.02	0.23	0.12	0.18	< 0.125	0.118	1.8	< 0.05	< 0.05	< 0.16	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	720	370	712	360	1000	629	653		652		245	222		1400
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	17	10	16.8	12	28	13.5	14.4	23	24	5	6.5	5.3	34	30
	mg/kg		Pb (lead)	28	12	31.5	13	41	22.6	28.5	34	104	< 10	5.7	3.8	30	30
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	35	< 0.75	< 0.34	< 0.75	< 26	< 0.32	0.34							
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	73	38	84.8	47	130	64.1	75.7	80	93.4	19	18	17.2	83	130
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 1.2	< 3	< 0.15	< 3	< 1.2	< 0.15					< 4.8	< 5.1		
	ug/kg		Aroclor-1221											< 4.8	< 5.1		
	ug/kg		Aroclor-1232											< 4.8	< 5.1		
	ug/kg		Aroclor-1242											< 4.8	< 5.1		
	ug/kg		Aroclor-1248											< 4.8	< 5.1		
	ug/kg		Aroclor-1254	< 2.4	< 3	96	< 3	< 2.4	< 53					< 4.8	< 5.1		
	ug/kg		Aroclor-1260	< 2.4	< 3	< 0.25	< 3	< 2.4	< 0.25					< 4.8	< 5.1		
	ug/kg		Total PCB's								41	90	0			55	68
PARTICLE SIZE %FINER		SAND coarse	3 in									100	100				
			1 1/2									100	100				100
			3/4								100	100	100			99	100
			3/8									100	100				100
			4								100	100	99	100		99	100
			8										99				100
			10								100			99.5	100	99	
		SAND medium	16										95.0				99.0
			20											90.1	99.2		
			30														97.0
			40								99.0		48.0	58.9	95.3	94.0	95.0
			50														92.0
		SAND fine	70														90.0
			80														
			100								98.0		0.0	11.8	21.3	87.0	88.0
			140											10.0	11.1		
		SILT CLAY	200								97.0	45.0	0.0	9.7	10.4	74.0	82.0
			270								95.0					70.0	78.0
			0.20 mm								44.0		0.0			41.0	49.0
			0.05 mm								14.0	30.0	0.0			18.0	23.0
MISC	%		Total Organic Carb			1.11			3.11					0.132	0.125		
	mg/kg		Chem Oxy Demand								51900	27000	2872	15800	19400	58900	110000
	mg/kg		Kjedahl Nitrogen								1900	1870	73			2200	7680
	mg/kg		Total Phosph								32000	867	217			41000	--
	mg/kg		Oil and Grease									230	204	< 0.06	0.57		0
	mg/kg		Cyanide, Total											<0.06	<0.07		
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate											<0.06	0.6		
	%		Moisture											21.1	24.9		
	%		Total Solids											78.9	75.1		
	%		Volatile Solids											1.58	1.9		

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	78				1359		1229	1233	1236	1272	1298	1291	1254	1310
			River Mile	819.1	818.8	818.7	818.7	818.6	818.5	816.0	816.0	816.0	816.0	816.0	816.0	816.0	816
			Location	BOUL. BEND LOW LIGHT	NIN 818.8	818.4 - 818.9 NIN CDF 8/21	818.4 - 818.9 NIN CDF 8/29	Boul Bend Low Light 1	NIN 818.5	Ab. L/D 2 - east	Ab. L/D 2 - mid	Ab. L/D 2 - west	Ab. L/D 2 - mid	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - east	Ab. L/D 2 - east
			Year	1981	1995	1995	1995	1994	1995	1981	1981	1981	1982	1982	1982	1982	1983
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	1	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1			3	1	3	3	3	3	3	3	3	3
			Sam. Depth	10	10			10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC's	ug/kg		a-BHC		< 0.7	< 0.4	< 0.5	< 0.43	< .06					< 5			2.4
	ug/kg		b-BHC		< 0.7	< 0.4	< 0.5	1.6	< .06					< 10			< 1.1
	ug/kg		BHC		< 0.7	< 0.4	< 0.5	< 0.43	< .06								
	ug/kg		g-BHC (lindane)		< 0.7	< 0.4	< 0.5	< 0.43	< .06					11			< 0.53
	ug/kg		Heptachlor		< 0.7	< 0.4	< 0.5	< 0.43	< .06					5			< 0.53
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin	2.9	< 0.7	< 0.4	< 0.5	< 0.94	< .06					< 20			< 1.6
	ug/kg		4,4'-DDE	2.4	< 0.7	< 0.4	< 0.5	< 0.48	< .06					< 7			< 1.6
	ug/kg		Endrin	< 0.1	< 0.7	< 0.4	< 0.5	< 0.48	< .06					< 10			< 2.1
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD	6.30	< 0.7	1.20	1.90	< 0.48	< .06					< 14			< 3.2
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT	9.70	< 0.7	1.70	2.70	< 0.48	< .06					< 20			< 4.2
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane	7.00	< 1.1	< 0.6	< 0.8	< 0.43	< 0.9					< 2			< 11
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)							1.1	1.08	0.69	0.67		0.54	1.07	0.592
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	21	4.1	2.8	3.3	4.7	3.1	6.3	6.14	5.68	5.2		7	15	6.2
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	80													
	mg/kg		Be (beryllium)							0.641	0.54	0.529	0.43		0.5	0.77	0.281
	mg/kg		Cd (cadmium)	4	0.3	0.43	0.5	0.93	0.3	3.159	2.93	2.61	1.4		1	2.23	1.075
	mg/kg		Cr (chromium)	30	27	15	17	26.2	17	63.6	62.6	58.2	33.8		36.4	58.5	62.4
	mg/kg		Cu (copper)	18	17	13	18	21.5	14	33.8	31.5	28.3	17.2		18.8	31.3	17.7
	mg/kg		Fe (iron)	7100													
	mg/kg		Hg (mercury)	< 0.01	0.046	0.02	0.033	0.14	0.035	0.25	0.19	0.2	0.15		0.14	0.22	0.05
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	700	1300	970	1300	1210	830				698		906	1305	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	30	20	14	15	21.3	15	29.2	25.6	28.3	18.3		19.2	28.9	21.4
	mg/kg		Pb (lead)	30	10	12	15	16.5	11	40	37.7	33.5	19.4		18	32.7	18.2
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)							0.22	0.21	0.2	0.06		0.07	0.1	0.05
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)										0.8		0.8	0.9	0.3
	mg/kg		Zn (zinc)	62	71	64	67	82.8	56	152.7	128	113.4	70.6		75.9	153.4	84
	mg/kg		V (vanadium)														
PCB's	ug/kg		Aroclor-1006		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9					60			24
	ug/kg		Aroclor-1221		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1232		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1242		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1248		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1254		< 8.4	< 4.9	< 5.9	16	< 6.9					1100			5.7
	ug/kg		Aroclor-1260		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9					< 20			< 5.3
	ug/kg		Total PCB's	170													
PARTICLE SIZE %FINER		SAND coarse	3 in														
			1 1/2	100													
			3/4	100													
			3/8	100													
			4	100													
			8	100													
			10														
		SAND medium	16	99.0	100	100	100		100								
			20		99.5	99.6	99.5	100.0	99.4								
			30	97.0	99.3	99.0	99.5		99.1								
			40	95.0	98.3	97.6	98.8	99.7	98.8								
			50	92.0	83.2	60.6	83.5		70.2								
		SAND fine	70	90.0	82.9	60.1	83.1		70.0								
			80		82.9	60.1	83.1		70.0								
			100	88.0	82.9	60.1	83.1	98.9	70.0								
			140		82.9	60.1	83.1	96.7	70.0								
		SILT CLAY	200	87.0	82.9	60.1	83.1	96.2	70.0								
			270	85.0													
			0.20 mm	63.0													
			0.05 mm	29.0													
MISC	%		Total Organic Carb		2.3	3.4	2.1	> 1.6	1.4								
	mg/kg		Chem Oxy Demand	51000				86900									
	mg/kg		Kjedahl Nitrogen	4860													
	mg/kg		Total Phosph	--													
	mg/kg		Oil and Grease	0				1.7									
	mg/kg		Cyanide, Total		< 0.5	< 0.5	< 0.5	<0.11	< 0.5								
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate		1.7	< 0.1	11	1.7	0.7								
	%		Moisture		59	39	46	54.9	52.0								
	%		Total Solids		41	61	54	45.1	48.0								
	%		Volatile Solids		6.1	5	5.3	8.7	4.4								

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	1316	1326	1324	1338	1330	1334	1337	1130	1357	1357	1356	1352	1342	496
		River Mile	816.0	816.0	816.0	816.0	816	816.0	816.0	816.0	816.0	816.0	816.0	816.0	816.0	815.7
		Location	Ab. L/D 2 - mid	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - mean	Ab. L/D 2 - east	Ab. L/D 2 - mid	Ab. L/D 2 - west	Ab. L/D 2 - east	Ab. L/D 2 - mean-dup	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - mid	Ab. L/D 2 - east	ABOVE L/D 2
		Year	1983	1983	1983	1984	1984	1984	1984	1984	1985	1985	1985	1985	1985	1989
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	3	3	3	3	3	3	3	3	3	3	3	3	3	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE
CHC'S	ug/kg	a-BHC	2.000	9.70	12.000	13		1.600	1.2	12.000	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.08
	ug/kg	b-BHC	< 1.1	< 1.1	< 1.1	< 0.64		< 0.64	< 0.64	< 0.64	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.17
	ug/kg	BHC														< 0.25
	ug/kg	g-BHC (lindane)	< 0.53	< 0.53	< 0.53	4.1		< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.11
	ug/kg	Heptachlor	< 0.53	< 0.53	< 0.53	< 0.32		< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.08
	ug/kg	Aldrin														< 0.11
	ug/kg	Heptachlorepoxide														< 0.14
	ug/kg	Endosulfan I														< 0.14
	ug/kg	Dieldrin	< 1.6	< 1.6	< 1.6	< 0.96		< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79	< 0.14
	ug/kg	4,4'-DDE	< 1.6	< 1.6	< 1.6	< 0.96		< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79	< 0.11
	ug/kg	Endrin	< 2.1	< 2.1	< 2.1	< 1.3		< 1.3	< 1.3	< 1.3	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 0.25
	ug/kg	Endosulfan II														< 0.28
	ug/kg	4,4'-DDD	< 3.2	< 3.2	< 3.2	< 1.9		< 1.9	< 1.9	< 1.9	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 0.31
	ug/kg	Endrinaldehyde														< 0.31
	ug/kg	Sulfan sulfate														< 0.31
	ug/kg	4,4'-DDT	< 4.2	< 4.2	< 4.2	< 2.5		< 2.5	< 2.5	< 2.5	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 0.36
	ug/kg	Methoxychlor														< 0.62
	ug/kg	Endrinketone														< 0.31
	ug/kg	Chlorodane	< 11	< 11	< 11	< 6.4		< 6.4	< 6.4	< 6.4	< 5.3	< 5.3	< 5.3	115.00	< 5.3	< 1.68
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)	0.4885		0.1515		1.374	0.395	0.085				0.297	0.374	1.1	
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	7.6		7.4		5.06	2.99	5				6.79	9.92	8.53	< 1.18
	mg/kg	B (boron)														
	mg/kg	Ba (barium)														
	mg/kg	Be (beryllium)	0.2755		0.298		0.642	0.36	0.538				0.48	0.444	0.432	
	mg/kg	Cd (cadmium)	0.683		0.4895		3.101	0.875	0.252				1.244	1.242	1.618	< 1.3
	mg/kg	Cr (chromium)	80.7		92.6		49.2	22.6	31.4				27.3	27.2	27.2	12.1
	mg/kg	Cu (copper)	16.5		13.15		26.1	13.4	11.6				15	15.6	18.5	5.64
	mg/kg	Fe (iron)														
	mg/kg	Hg (mercury)	0.1		0.05		0.05	0.1	0.05				0.1	0.09	0.24	< 0.01
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)					932.6	649.9	1052.2				711.7	721.4	693.7	1860
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	24.55		25.4		24.3	15.5	22.2				15.5	14.7	14	15
	mg/kg	Pb (lead)	16.85		10.2		32.3	14.2	8.7				14.8	14.9	23.6	4.73
	mg/kg	Sb (antimony)											14	14.2	13.5	
	mg/kg	Se (selenium)	0.06		0.07		0.12	0.12	0.12				0.13	0.12	0.13	< 0.99
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)	0.7		0.6		0.6	0.6	0.6				5.4	5.4	5.2	
	mg/kg	Zn (zinc)	70.95		53.55		123.5	57.6	48.9				60.4	62.1	77.3	37
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	40.00	146	195.00	214		25	41	176.00	424	387	171	95	485	< 1.68
	ug/kg	Aroclor-1221														< 1.68
	ug/kg	Aroclor-1232														< 1.68
	ug/kg	Aroclor-1242														< 1.68
	ug/kg	Aroclor-1248														< 1.68
	ug/kg	Aroclor-1254	16	24	44	52		7.8	20	26	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3	< 3.5
	ug/kg	Aroclor-1260	6.1	10	21	27		< 3.2	10	13	7.7	7.2	27.2	31	29.4	< 3.5
	ug/kg	Total PCB's														
PARTICLE SIZE %FINER	SAND coarse	3 in														
		1 1/2														
		3/4														
		3/8														
		4														100
		8														
		10														97.0
	SAND medium	16														88.0
		20														
		30														69.5
		40														
		50														69.5
	SAND fine	70														
		80														53.9
		100														45.8
		140														35.7
	SILT CLAY	200														25.8
		270														17.8
		0.20 mm														12.6
		0.05 mm														9.4
MISC	%	Total Organic Carb														1.32
	mg/kg	Chem Oxy Demand														
	mg/kg	Kjedahl Nitrogen														
	mg/kg	Total Phosph														
	mg/kg	Oil and Grease														
	mg/kg	Cyanide, Total														< 0.68
	mg/kg	Ammonia														12
	mg/l	Ammonia Elutriate														
	%	Moisture														27
	%	Total Solids														73
	%	Volatile Solids														2.8

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	79	80	81	495
			River Mile	815.5	815.5	815.4	815.4
			Location	ABOVE L/D 2	ABOVE L/D 2	ABOVE L/D 2	ABOVE L/D 2
			Year	1982	1982	1974	1989
			System	1	1	1	1
			Habitat Type	1	1	1	1
			Pool	2	2	2	2
			Sam. Gear	1	1	1	1
			Sam. Depth	10	10	10	10
			Data Clt.	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.08
	ug/kg		b-BHC				< 0.16
	ug/kg		BHC				< 0.24
	ug/kg		g-BHC (lindane)				< 0.11
	ug/kg		Heptachlor				< 0.08
	ug/kg		Aldrin				< 0.11
	ug/kg		Heptachlorepoxide				< 0.14
	ug/kg		Endosulfan I				< 0.14
	ug/kg		Dieldrin	< 0.1	< 0.1	< 10	< 0.14
	ug/kg		4,4'-DDE	< 0.1	< 0.1	< 10	< 0.11
	ug/kg		Endrin	< 0.1	< 0.1	< 10	< 0.24
	ug/kg		Endosulfan II				< 0.27
	ug/kg		4,4'-DDD	< 0.1	< 0.1	< 10	< 0.3
	ug/kg		Endrinaldehyde				< 0.3
	ug/kg		Sulfan sulfate				< 0.3
	ug/kg		4,4'-DDT	< 0.1	< 0.1	< 10	< 0.35
	ug/kg		Methoxychlor				< 0.6
	ug/kg		Endrinketone				< 0.3
	ug/kg		Chlorodane	< 1	< 1	< 10	< 1.63
	ug/kg		Toxaphene				< 1.68
METALS	mg/kg		Ag (silver)				
	mg/kg		Al (aluminum)				
	mg/kg		As (arsenic)	2.8	2.7	1	2.9
	mg/kg		B (boron)				
	mg/kg		Ba (barium)				
	mg/kg		Be (beryllium)				
	mg/kg		Cd (cadmium)	0.77	1.2	3	< 1.33
	mg/kg		Cr (chromium)	10	12	39	14.6
	mg/kg		Cu (copper)	10	13	10	5.4
	mg/kg		Fe (iron)	6800	6300		
	mg/kg		Hg (mercury)	0.038	0.02	0.7	< 0.01
	mg/kg		Mg (magnesium)				
	mg/kg		Mn (manganese)				674
	mg/kg		Mo (molybdenum)				
	mg/kg		Ni (nickel)	10	9	29	19.2
	mg/kg		Pb (lead)	13	18	< 13	5.3
	mg/kg		Sb (antimony)				
	mg/kg		Se (selenium)				< 1.01
	mg/kg		Sn (tin)				
	mg/kg		Sr (strontium)				
	mg/kg		Ti (titanium)				
	mg/kg		Zn (zinc)	46	54	44	43.5
	mg/kg		V (vanadium)				
PCB'S	ug/kg		Aroclor-1006				< 1.63
	ug/kg		Aroclor-1221				< 1.63
	ug/kg		Aroclor-1232				< 1.63
	ug/kg		Aroclor-1242				< 1.63
	ug/kg		Aroclor-1248				< 1.63
	ug/kg		Aroclor-1254				< 3.4
	ug/kg		Aroclor-1260				< 3.4
	ug/kg		Total PCB's	0	1460	0	
PARTICLE SIZE %FINER	SAND	coarse	3 in				
			1 1/2	100	100		
			3/4	100	100		
			3/8	100	100		
			4	100	100		100
			8	99	100		
			10				95.4
		medium	16	99.0	99.0		84.6
			20				
			30	97.0	95.0		65.8
			40	96.0	89.0		
			50	95.0	77.0		65.8
		fine	70	94.0	65.0		
			80				50.8
			100	93.0	58.0		41.2
			140				34.6
	SILT CLAY		200	91.0	56.0		24.2
			270	90.0	55.0		17.7
			0.20 mm	69.0	39.0		12.4
			0.05 mm	33.0	17.0		8.5
MISC	%		Total Organic Carb				1.23
	mg/kg		Chem Oxy Demand	19200	35600	14184	
	mg/kg		Kjedahl Nitrogen	1100	1200	288	
	mg/kg		Total Phosph	1100	1400	980	
	mg/kg		Oil and Grease	175	370	163	
	mg/kg		Cyanide, Total				< 0.71
	mg/kg		Ammonia				9.8
	mg/l		Ammonia Elutriate				
	%		Moisture				29.9
	%		Total Solids				70.1
	%		Volatile Solids				3.9

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	541	82	83	539	540		84	529	85	86	87	88	530	89
			River Mile	815.1	815.0	815.0	813.1	813.1	813.1	813.0	811.5	811.0	811.0	811.0	811.0	810.9	809.6
			Location	Below L/D 2	LOWER APPRO. L/D 2	LOWER APPRO. L/D 2	HASTINGS SM BOAT	HASTINGS SM BOAT	HASTINGS SM BOAT	HASTINGS SM BOAT	PRESCOTT	PRESCOTT	PRESCOTT	PRESCOTT	PRESCOTT	PRESCOTT	PINE COULEE
			Year	1989	1982	1982	1989	1989	1994	1979	1989	1982	1982	1978	1978	1989	1982
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	2	2	1	2	1	1	1	1	1	1	1
			Pool	2	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.07	< 0.11	< 0.38		< 0.07					< 0.07	
	ug/kg		b-BHC				< 0.14	< 0.22	2.4		< 0.14					< 0.14	
	ug/kg		BHC				< 0.21	< 0.33	< 0.38		< 0.22					< 0.21	
	ug/kg		g-BHC (lindane)				< 0.09	< 0.15	< 0.38		< 0.1					< 0.1	
	ug/kg		Heptachlor				< 0.07	< 0.11	0.58		< 0.07					< 0.07	
	ug/kg		Aldrin				< 0.09	< 0.15			< 0.1					< 0.1	
	ug/kg		Heptachlorepoxide				< 0.12	< 0.18			< 0.12					< 0.12	
	ug/kg		Endosulfan I				< 0.12	< 0.18			< 0.12					< 0.12	
	ug/kg		Dieldrin		< 0.1	< 0.1	< 0.12	< 0.18	< 0.76	0	< 0.12	< 0.1	< 0.1	0	0	< 0.12	< 0.1
	ug/kg		4,4'-DDE		< 0.1	< 0.1	< 0.09	< 0.15	< 2.3	4.6	< 0.1	< 0.1	< 0.1	0	0	< 0.1	< 0.1
	ug/kg		Endrin		< 0.1	< 0.1	< 0.21	< 0.33	< 0.76	0	< 0.22	< 0.1	< 0.1	0	0	< 0.21	< 0.1
	ug/kg		Endosulfan II				< 0.24	< 0.36			< 0.24					< 0.24	
	ug/kg		4,4'-DDD		< 0.1	< 0.1	< 0.26	< 0.4	< 1.4	4.9	< 0.26	< 0.1	< 0.1	0	0	< 0.26	< 0.1
	ug/kg		Endrinaldehyde				< 0.26	< 0.4			< 0.26					< 0.26	
	ug/kg		Sulfan sulfate				< 0.26	< 0.4			< 0.26					< 0.26	
	ug/kg		4,4'-DDT		< 0.1	< 0.1	< 0.31	< 0.4	< 0.76	0.4	< 0.31	< 0.1	< 0.1	0	0	< 0.31	< 0.1
	ug/kg		Methoxychlor				< 0.52	< 0.8			< 0.53					< 0.52	
	ug/kg		Endriniketone				< 0.26	< 0.4			< 0.26					< 0.26	
	ug/kg		Chlorodane		< 1	< 1	< 1.42	< 2.18	< 0.38	8	< 1.44	< 1	< 1	0	0	< 1.43	< 1
	ug/kg		Toxaphene				< 1.42	< 2.18			< 0.144					< 1.43	
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)		1.8	2.5	< 0.98	< 1.6	4.5	2	1.9	2	2.5	0	0	1.6	2.9
	mg/kg		B (boron)														
	mg/kg		Ba (barium)							110				20	10		
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)		< 0.19	< 0.18	< 1.1	< 1.7	1.4	< 10	< 1	< 0.17	< 0.18	< 10	< 10	< 1.1	< 0.19
	mg/kg		Cr (chromium)		5.6	8	6.4	22.8	31.3	40	5.2	6.8	5.5	< 10	< 10	7.3	5.8
	mg/kg		Cu (copper)		2.8	7.1	2.9	18.3	24.1	30	14.4	2.5	2.8	< 10	< 10	11.1	2.9
	mg/kg		Fe (iron)		6200	10000				11000		6000	5700	3200	3000		8500
	mg/kg		Hg (mercury)		0.01	0.015	< 0.01	0.32	0.11	0	< 0.01	0.072	0.045	0	0	< 0.12	0.034
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)				358	741	1020	910	404			180	340	349	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)		8	12	8.5	14.3	19.7	20	5.5	8	7	< 10	< 10	6.7	9
	mg/kg		Pb (lead)		1.9	7	1.5	< 18.9	19.6	40	2	3	4	< 10	< 10	2.3	6
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				< 0.82	< 1.3			< 0.79					< 0.83	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)		16	28	17.3	< 81.9	87.6	90	16.2	13	14	10	10	18.2	16
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1221				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1232				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1242				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1248				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1254				< 2.95	< 4.55	54		< 3					< 2.98	
	ug/kg		Aroclor-1260				< 2.95	< 4.55	< 4.9		< 3					< 2.98	
	ug/kg		Total PCB's		0	0				74		0	0	0	0		0
PARTICLE SIZE %FINER		SAND coarse	3 in									100			100		100
			1 1/2			100				100		100	100	100	100		100
			3/4			100				100		100	100	100	100		100
			3/8			100				100		100	100	100	100		100
			4	99.7		100	98.4	100		100	95.3	99	97	100	100	99.1	90
			8			98				100			90	99			
			10	99.0			95.4	99.8			83.9	97			99	92.5	49
		SAND medium	16	95.4		89.0	82.4	98.4		99.0	57.8		76.0	91.0		69.6	
			20						100			87.0			92.0		22.0
			30	71.2		67.0	37.3	96.9		97.0	17.0		39.0	53.0		19.8	
			40			35.0			99.7	94.0		53.0	16.0	26.0	34.0		11.0
			50	71.2		14.0	37.3	96.9		90.0	17.0		6.0	9.0		19.8	
		SAND fine	70			9.0				87.0			4.0	5.0			
			80	16.5			9.7	96.0			0.9	40.0			1.0	3.1	5.0
			100	0.5		8.0	1.3	84.5	99.0	85.0	0.0		4.0	4.0		2.5	
			140	0.4			1.1	59.9	98.5							2.4	
		SILT CLAY	200	0.3		7.0	0.9	34.0	96.9	83.0		37.0	3.0	3.0	0.0	2.2	3.0
			270	0.3		7.0	0.5	19.6		82.0			3.0	3.0		1.6	
			0.20 mm	0.2		1.0	0.3	14.2		60.0		22.0	1.0	1.0	0.0	1.2	1.0
			0.05 mm	0.2		0.0	0.3	10.8		32.0		10.0	0.0	0.0	0.0	0.8	0.0
MISC	%		Total Organic Carb	0.011			0.17	1.53			0.017					0.15	
	mg/kg		Chem Oxy Demand			2245				7910		57000	1050	1990	1900		2800
	mg/kg		Kjedahl Nitrogen			94				760		9700	55	92	240		220
	mg/kg		Total Phosph			175				400		1100	210	160	46		270
	mg/kg		Oil and Grease			50				60		0	< 50	< 50	0		0
	mg/kg		Cyanide, Total				< 0.61	< 0.6	< 0.11		< 0.59					< 0.63	
	mg/kg		Ammonia				3.2	20.00			< 0.24					16	
	mg/l		Ammonia Elutriate						0.9								
	%		Moisture				19.1	17.3	54.1		15.3					20.4	
	%		Total Solids				80.9	82.7	45.9		84.7					79.6	
	%		Volatile Solids				0.7	1.1	7.35		0.1					1.3	

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	90	91	531	92	93	94	95	532	96	97	533		98	99
			River Mile	809.6	808.5	808.3	808.0	808.0	807.8	807.8	807.3	805.6	804.6	802.8	802.7	802.7	802.5
			Location	PINE COULEE	TRUEDALE SLOUGH	TRUEDALE SLOUGH	TRUEDALE SLOUGH	TRUEDALE SLOUGH	FOUR MILE ISLAND	FOUR MILE ISLAND	FOUR MILE ISLAND	BIG RIVER	BIG RIVER	MORGANS COULEE	COULTERS IS MORGANS 1	COULTERS IS MORGANS	COULTERS IS MORGANS
			Year	1982	1980	1989	1979	1979	1978	1978	1989	1981	1981	1989	1994	1974	1981
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC			< 0.07					< 0.07			< 0.07	< 0.24		
	ug/kg		b-BHC			< 0.15					< 0.15			< 0.14	< 0.24		
	ug/kg		BHC			< 0.22					< 0.22			< 0.22	< 0.24		
	ug/kg		g-BHC (lindane)			< 0.1					< 0.1			< 0.1	< 0.24		
	ug/kg		Heptachlor			< 0.07					< 0.07			< 0.07	< 0.24		
	ug/kg		Aldrin			< 0.1					< 0.1			< 0.1			
	ug/kg		Heptachlorepoxide			< 0.12					< 0.12			< 0.12			
	ug/kg		Endosulfan I			< 0.12					< 0.12			< 0.12			
	ug/kg		Dieldrin	< 0.1	< 0.2	< 0.12	0	0	0	0	< 0.12	1	< 0.1	< 0.12	< 0.48	< 10	< 0.1
	ug/kg		4,4'-DDE	< 0.1	< 0.2	< 0.1	0	0	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.48	< 10	< 0.1
	ug/kg		Endrin	< 0.1	< 0.2	< 0.22	0	0	0	0	< 0.22	< 0.1	< 0.1	< 0.22	< 0.48	< 10	< 0.1
	ug/kg		Endosulfan II			< 0.24					< 0.24			< 0.24			
	ug/kg		4,4'-DDD	< 0.1	< 0.2	< 0.27	0	0	0	0	< 0.27	1.4	< 0.1	< 0.26	< 0.48	< 10	< 0.1
	ug/kg		Endrinaldehyde			< 0.27					< 0.27			< 0.26			
	ug/kg		Sulfan sulfate			< 0.27					< 0.27			< 0.26			
	ug/kg		4,4'-DDT	1	< 0.4	< 0.32	0	0	0	0	< 0.32	0.7	< 0.1	< 0.31	< 0.48	< 10	< 0.1
	ug/kg		Methoxychlor			< 0.54					< 0.54			< 0.53			
	ug/kg		Endrinketone			< 0.27					< 0.27			< 0.26			
	ug/kg		Chlorodane	< 1	0.4	< 1.46	0	0	0	0	< 1.46	3	< 1	< 1.44	< 0.24	< 10	< 1
	ug/kg		Toxaphene			< 1.46					< 1.46			< 1.44			
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1.7		< 1	0	0	0	0	1.4	3	10	< 1	1	< 0.9	10
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				30	30	10	30		20	20				30
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 0.18	1.01	< 1.1	< 10	< 10	< 10	< 10	< 1.1	< 1	< 1	< 1.1	< 0.11	< 1	< 1
	mg/kg		Cr (chromium)	5.6	26.8	3.2	< 10	< 10	< 10	< 10	7.9	< 10	30	5.5	6.3	5	< 10
	mg/kg		Cu (copper)	2.8	2.16	8.7	20	< 10	< 10	< 10	4	2	2	1.8	1.3	3	3
	mg/kg		Fe (iron)	5900	7859		4300	5600	2400	5000		3000	2000				2800
	mg/kg		Hg (mercury)	0.028	< 0.01	< 0.01	0	0	0	0	< 0.02	< 0.01	< 0.01	< 0.01	0.13	0.5	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)			222	260	580	200	450	2600	310	150	3170	181		190
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	8	14.3	< 5.5	10	< 10	< 10	< 10	9.5	< 10	< 10	< 5.5	5	3	< 10
	mg/kg		Pb (lead)	4	3.4	2.4	< 10	< 10	< 10	< 10	2.3	< 10	< 10	2	4.7	< 9	< 10
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)			< 0.84					< 0.82			< 0.85			
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	14	14.4	12.7	20	10	10	20	16.9	14	11	18.1	11.8	76	15
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1221			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1232			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1242			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1248			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1254			< 3.05					< 3.05			< 3	< 4.8		
	ug/kg		Aroclor-1260			< 3.05					< 3.05			< 3	< 4.8		
	ug/kg		Total PCB's	0	0		0	3	0	0		2	0			0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in				100	100	100	100		100					100
			1 1/2	100	100		100	100	100	100		100	100			100	100
			3/4	100	100		100	100	100	100		100	100			100	100
			3/8	99	100		100	100	100	100		100	100			100	100
			4	92	100		100	100	94	100	93.0722	96	100	96.878	99.1	100	99
			8	75	97		98						98			98	95
			10					98	78	99	82.9801	90		94.471	93.8		
		medium	16	54.0	91.0		87.0				67.0		92.0	91.0		81.0	82.0
			20					65.0	35.0	95.0		74.0			88.8		
			30	32.0	65.0						26.4		65.0	71.7		53.0	
			40	21.0	34.0		50.0	13.0	10.0	59.0		31.0	37.0		66.5	14.0	8.0
			50	10.0	6.0						26.4		6.0	71.7		1.0	
		fine	70	6.0	3.0								0.0			0.0	
			80					2.0	4.0	2.0	0.6	3.0		8.6			
			100	5.0	3.0		1.0				0.0		0.0	0.6	1.2	0.0	0.0
			140											0.6	0.8		
	SILT CLAY		200	4.0	3.0		1.0	2.0	3.0	0.0		2.0	0.0	0.5	0.5	0.0	0.0
			270	3.0	2.0								0.0	0.4		0.0	
			0.20 mm	1.0	2.0			0.0	1.0	0.0		0.0	0.0	0.3		0.0	0.0
			0.05 mm	0.0	0.0		1.0	0.0	0.0	0.0		0.0	0.0	0.3		0.0	0.0
MISC	%		Total Organic Carb			0.091					0.17			0.28	0.022		
	mg/kg		Chem Oxy Demand	2100	1040		624	10000	3000	1800		1600	5200			1500	431
	mg/kg		Kjedahl Nitrogen	90	18		--	1100	5200	280		190	294			244	235
	mg/kg		Total Phosph	160	140		511	260	290	170		440	--				247
	mg/kg		Oil and Grease	55	< 50		670	0	0	0		100	0			0	< 6
	mg/kg		Cyanide, Total			< 0.59					< 0.61			< 0.62	< 0.06		
	mg/kg		Ammonia			< 0.24					< 0.24			0.50			
	mg/l		Ammonia Elutriate												< 0.06		
	%		Moisture			15.9					17.6			19.8	17.8		
	%		Total Solids			84.1					82.4			80.2	82.2		
	%		Volatile Solids			0.6					0.7			0.8	1.0		

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #			534	100	101	535	102	536		1360	1366	1363	103	538
			River Mile	802.5	802.5	802.1	801.9	801.9	801.8	801.4	801.1	800.5	800.0	800.0	800.0	800.0	800.0
			Location	COULTERS IS MORGANS 2	COULTERS IS MORGANS 2dup	MORGANS COULEE	COULTERS IS MORGANS	COULTERS IS MORGANS	COULTERS IS M.SLOUGH	COULTERS IS MORGANS	COULTERS IS M.SLOUGH	LARSON LAKE	Ab. L/D 3 - east	Ab. L/D 3 - west	Ab. L/D 3 - mid	BLW DIAMOND BLUFF	BLW DIAMOND BLUFF
			Year	1994	1994	1989	1978	1978	1989	1981	1989	1994	1981	1981	1981	1981	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	3	1	1	1	1	1
			Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	1	1	1	1	1	1	1	3	3	3	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	MWCC	MWCC	MWCC	COE	COE
CHC'S	ug/kg		a-BHC	< 0.24	< 0.25	< 0.07			< 0.07		< 0.07	0.12					< 0.08
	ug/kg		b-BHC	< 0.24	< 0.25	< 0.14			< 0.15		< 0.15	0.24					< 0.16
	ug/kg		BHC	< 0.24	< 0.25	< 0.22			< 0.22		< 0.22	0.36					< 0.25
	ug/kg		g-BHC (lindane)	< 0.24	< 0.25	< 0.1			< 0.1		< 0.1	0.16					< 0.11
	ug/kg		Heptachlor	< 0.24	< 0.25	< 0.07			< 0.07		< 0.07	0.12					< 0.08
	ug/kg		Aldrin			< 0.1			< 0.1		< 0.1	0.16					< 0.11
	ug/kg		Heptachlorepoxide			< 0.12			< 0.12		< 0.12	0.2					< 0.14
	ug/kg		Endosulfan I			< 0.12			< 0.12		< 0.12	0.2					< 0.14
	ug/kg		Dieldrin	< 0.47	< 0.49	< 0.12	0	0	< 0.12	< 0.1	< 0.12	0.2				< 0.1	< 0.14
	ug/kg		4,4'-DDE	< 0.47	< 0.49	< 0.1	0	0	< 0.1	< 0.1	< 0.1	0.16				< 0.1	< 0.11
	ug/kg		Endrin	< 0.47	< 0.49	< 0.22	0	0	< 0.22	< 0.1	< 0.22	0.36				< 0.1	< 0.25
	ug/kg		Endosulfan II			< 0.24			< 0.24		< 0.24	0.4					< 0.27
	ug/kg		4,4'-DDD	< 0.47	< 0.49	< 0.26	0	0	< 0.27	< 0.1	< 0.27	0.44				< 0.1	< 0.3
	ug/kg		Endrinaldehyde			< 0.26			< 0.27		< 0.27	0.44					< 0.3
	ug/kg		Sulfan sulfate			< 0.26			< 0.27		< 0.27	0.44					< 0.3
	ug/kg		4,4'-DDT	< 0.47	< 0.49	< 0.31	0	0	< 0.32	< 0.1	< 0.32	0.52				< 0.1	< 0.36
	ug/kg		Methoxychlor			< 0.53			< 0.54		< 0.54	0.88					< 0.6
	ug/kg		Endrinketone			< 0.26			< 0.27		< 0.27	0.44					< 0.3
	ug/kg		Chlorodane	< 0.24	< 0.25	< 1.44	0	0	< 1.46	< 1	< 1.46	2.41				< 1	< 1.64
	ug/kg		Toxaphene			< 1.44			< 1.46		< 1.46	2.41					< 1.64
METALS	mg/kg		Ag (silver)										0.167	0.069	1.07		
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1.5		< 1	0	0	< 1	6	< 1	5	2.53	0.53	1.07	10	< 1.2
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				10	20		20						30	
	mg/kg		Be (beryllium)										0.175	0.127	0.14		
	mg/kg		Cd (cadmium)	0.25		< 1.1	< 10	< 10	< 1.1	< 1	< 1.1	< 2	0.361	0.066	0.11	< 1	< 1.3
	mg/kg		Cr (chromium)	6.9		19.4	< 10	< 10	6.6	< 10	5	33.1	18.3	7.7	9.4	< 10	7.9
	mg/kg		Cu (copper)	2.3		4.4	< 10	< 10	3.7	2	1.9	18.6	6.8	2.2	2.6	3	4.4
	mg/kg		Fe (iron)				3700	2300		2900						3000	
	mg/kg		Hg (mercury)	< 0.04		< 0.01	0	0.04	< 0.01	< 0.01	< 0.01	< 0.2	0.03	0.02	0.01	< 0.01	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	325		356	160	160	270	190	169	817				170	562
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	6.3		10	< 10	< 10	< 5.5	< 10	< 5.6	22.1	10.2	5.5	4.2	< 10	7.1
	mg/kg		Pb (lead)	2.7		1.9	< 10	< 10	3.8	< 10	6.9	16.1	9.1	4.2	3.3	< 10	4.1
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)			< 0.85			< 0.84		< 0.85	< 1.6	0.13	0.13	0.11		< 1
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	15.5		22.7	20	10	20.1	15	14.4	63.7	33.1	15.8	13.9	18	26.4
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1221	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1232	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1242	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1248	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1254	< 4.7	< 4.9	< 3			< 3.05		< 3.05	5.03					< 3.43
	ug/kg		Aroclor-1260	< 4.7	< 4.9	< 3			< 3.05		< 3.05	5.03					< 3.43
	ug/kg		Total PCB's				0	0		0						0	
PARTICLE SIZE %FINER	SAND	coarse	3 in					100		100							
			1 1/2				100	100		100						100	
			3/4				100	100		100						100	
			3/8				100	100		100						100	
			4	98		99.84	100	100	98.4027	100	99.4601					99	99.5146
			8				98									95	
			10	95.8		99.243		99	96.4716	97	98.1938						96.8648
		medium	16			93.0	94.0		89.1		94.9					89.0	91.7
			20	86.2				91.0		84.0							
			30			48.6	76.0		62.4		75.7					69.0	67.9
			40	31.0			53.0	59.0		49.0						52.0	
			50			48.6	17.0		62.4		75.7					21.0	67.9
		fine	70				2.0									3.0	
			80			3.8		1.0	9.2	2.0	7.6						21.7
			100	1.0		0.5	0.0		0.3		0.7					0.0	7.8
			140	0.9		0.5			0.3		0.7						7.0
	SILT CLAY		200	0.3		0.4	0.0	0.0	0.2	1.0	0.5					0.0	5.2
			270			0.3	0.0				0.4					0.0	3.7
			0.20 mm				0.0	0.0		0.0	0.3					0.0	3.0
			0.05 mm				0.0	0.0		0.0	0.2					0.0	2.0
MISC	%		Total Organic Carb	0.026	0.026	0.25			0.086		0.13						0.69
	mg/kg		Chem Oxy Demand				2200	2200		2200						2700	
	mg/kg		Kjedahl Nitrogen				422	300		260						242	
	mg/kg		Total Phosph				--	110		260						--	
	mg/kg		Oil and Grease				100	0		0						100	
	mg/kg		Cyanide, Total			< 0.62			< 0.62		< 0.63	< 0.98					< 0.82
	mg/kg		Ammonia			0.25			0.56		< 0.25						43.00
	mg/l		Ammonia Elutriate	< 0.06	< 0.06							113.00					
	%		Moisture	14.2	16.0	19.8			19.6		20.9						38.7
	%		Total Solids	85.8	84.0	80.2			80.4		79.1						61.3
	%		Volatile Solids	0.9	1.0	0.6			0.7		0.6	6.2					3.4

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

		Record #	537			104				344	341	342	340	347	346	345
		River Mile	800.0	800.0	799.5	799.2	799.2	799.0	798.5	797.3	797.3	797.3	797.3	797.3	797.3	797.3
		Location	BLW DIAMOND BLUFF	BLW DIAMOND BLUFF 1	UPPER GOOSE LAKE	BLW DIAMOND BLUFF	BLW DIAMOND BLUFF 2	MID GOOSE LAKE	LOWER GOOSE LAKE	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3
		Year	1989	1994	1994	1981	1994	1994	1994	1986	1986	1986	1986	1986	1986	1986
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	3	1	1	3	3	1	1	1	1	1	1	1
		Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg	a-BHC	< 0.08	< 0.24	0.13		< 0.24	0.13	0.14							
	ug/kg	b-BHC	< 0.15	< 0.24	0.27		< 0.24	0.26	0.27							
	ug/kg	BHC	< 0.23	< 0.24	0.4		< 0.24	0.39	0.41							
	ug/kg	g-BHC (lindane)	< 0.1	< 0.24	0.18		< 0.24	0.17	0.18							
	ug/kg	Heptachlor	< 0.08	< 0.24	0.13		< 0.24	0.13	0.14							
	ug/kg	Aldrin	< 0.1		0.18			0.17	0.18							
	ug/kg	Heptachlorepoxide	< 0.13		0.22			0.21	0.23							
	ug/kg	Endosulfan I	< 0.13		0.22			0.21	0.23							
	ug/kg	Dieldrin	< 0.13	< 0.49	0.22	< 0.1	< 0.49	0.21	0.23							
	ug/kg	4,4'-DDE	< 0.1	< 0.49	0.18	< 0.1	< 0.49	0.17	0.18							
	ug/kg	Endrin	< 0.23	< 0.49	0.4	< 0.1	< 0.49	0.39	0.41							
	ug/kg	Endosulfan II	< 0.25		0.44			0.43	0.45							
	ug/kg	4,4'-DDD	< 0.28	< 0.49	0.49	< 0.1	< 0.49	0.47	0.5							
	ug/kg	Endrinaldehyde	< 0.28		0.49			0.47	0.5							
	ug/kg	Sulfan sulfate	< 0.28		0.49			0.47	0.5							
	ug/kg	4,4'-DDT	< 0.33	< 0.49	0.57	< 0.1	< 0.49	0.56	0.59							
	ug/kg	Methoxychlor	< 0.56		0.97			0.94	0.99							
	ug/kg	Endrinketone	< 0.28		0.49			0.47	0.5							
	ug/kg	Chlorodane	< 1.52	< 0.24	2.65	< 1	< 0.24	2.57	2.71							
	ug/kg	Toxaphene	< 1.52		2.65			2.57	2.71							
METALS	mg/kg	Ag (silver)														
	mg/kg	Al (aluminum)								2600	2700	1800	2600	1700	2100	3250
	mg/kg	As (arsenic)	< 1.1	0.81	2.5	17	1.1	5.1	3.8	0.48	0.2	1.13	0.31	0.78	0.37	1.38
	mg/kg	B (boron)														
	mg/kg	Ba (barium)				20				17	18	13	10	13	13	24
	mg/kg	Be (beryllium)														
	mg/kg	Cd (cadmium)	< 1.2	< 0.12	< 2.2	< 2	0.37	< 2.2	< 2.3	0.21	0.23	0.24	0.19	0.17	0.21	0.33
	mg/kg	Cr (chromium)	5.4	5.8	25.3	< 10	6.5	26.2	24.6	6.4	9	5	5	4.5	5.3	9.4
	mg/kg	Cu (copper)	3.2	1.4	14.2	3	2	20.7	19.2	1.9	2.1	1.4	1.3	1.3	1.9	4.3
	mg/kg	Fe (iron)				2200										
	mg/kg	Hg (mercury)	< 0.01	< 0.04	< 0.22	< 0.01	0.12	< 0.22	< 0.23	0.028	0.005	0.007	0.007	0.007	0.009	0.046
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	370	192	1010	130	221	1150	1100	190	250	180	120	120	140	210
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	< 5.8	4.5	21.3	< 10	4.7	24.2	17.9	6	5.8	4.4	4.8	3.7	4.9	5.6
	mg/kg	Pb (lead)	14.9	3.2	8.8	< 20	3.2	18.2	17.3	7.6	7.1	6.6	5.6	5.7	6.3	11.6
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)	< 0.89		< 1.8			< 1.7	< 1.8	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)														
	mg/kg	Zn (zinc)	19.9	12.4	74.8	16	13.9	107	75	13	13	11.5	10	9.4	11	19.5
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg	Aroclor-1221	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg	Aroclor-1232	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg	Aroclor-1242	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg	Aroclor-1248	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg	Aroclor-1254	< 3.18	< 4.9	5.53		< 4.9	5.35	5.65							
	ug/kg	Aroclor-1260	< 3.18	< 4.9	5.53		< 4.9	5.35	5.65							
	ug/kg	Total PCB's				0				0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND coarse	3 in														
		1 1/2				100										
		3/4				100										
		3/8				100										
		4	98.926	100		100	99.4									
		8				96										
		10	82.5677	99.7			91.9									
	SAND medium	16	79.5			83.0										
		20		96.3			88.0									
		30	66.6			49.0										
		40		65.8		28.0	62.1									
		50	66.6			9.0										
	SAND fine	70				1.0										
		80	19.6													
		100	5.0	1.5		0.0	4.3									
		140	4.7	1.0			3.1									
	SILT CLAY	200	3.9	0.6		0.0	2.7									
		270	3.1			0.0										
		0.20 mm	2.5			0.0										
		0.05 mm	1.6			0.0										
MISC	%	Total Organic Carb	0.42	0.03			0.054									
	mg/kg	Chem Oxy Demand				2400										
	mg/kg	Kjedahl Nitrogen				249										
	mg/kg	Total Phosph				--										
	mg/kg	Oil and Grease				0										
	mg/kg	Cyanide, Total	< 0.73	< 0.06	< 1.1		< 0.06	< 1.1	< 1.1							
	mg/kg	Ammonia	24.00													
	mg/l	Ammonia Elutriate		< 0.06	204.00		< 0.06	388.00	249.00							
	%	Moisture	31.2	21.4			21.7									
	%	Total Solids	68.8	78.6			78.3									
	%	Volatile Solids	2.1	0.9	6.7		1.1	8.4	11.8							

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	339	343	1371	1397	1375	1379	1380	1393	1392	1384	1388	1401	1405	1406
			River Mile	797.3	797.3	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0
			Location	Above lock and dam 3	Above lock and dam 3	Ab. L/D 3 - east	Ab. L/D 3 - west	Ab. L/D 3 - mid	Ab. L/D 3 - west	Ab. L/D 3 - mean	Ab. L/D 3 - mean	Ab. L/D 3 - west	Ab. L/D 3 - east	Ab. L/D 3 - mid	Ab. L/D 3 - mid	Ab. L/D 3 - west	Ab. L/D 3 - mean
			Year	1986	1986	1982	1982	1982	1982	1982	1983	1983	1983	1983	1984	1984	1984
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC							< 0.53	6.1						< 0.32
	ug/kg		b-BHC							< 10	< 1.1						< 0.64
	ug/kg		BHC														
	ug/kg		g-BHC (lindane)							8	2.1						< 0.32
	ug/kg		Heptachlor							7	< 0.53						< 0.32
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin							< 20	< 1.6						< 0.96
	ug/kg		4,4'-DDE							< 7	< 1.6						< 0.96
	ug/kg		Endrin							< 10	< 2.1						< 1.3
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD							< 14	< 3.2						< 1.9
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT							< 20	< 4.2						< 2.5
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane							< 2	< 11						< 6.4
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)			0.099	0.108	0.099	0.157			0.064	0.031	0.06	0.081	0.083	
	mg/kg		Al (aluminum)	1950	3000												
	mg/kg		As (arsenic)	0.25	0.72	1.96	1.34	1.62	5.03			1.9	1.01	1.54	1.79	2.04	
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	9.9	25												
	mg/kg		Be (beryllium)			0.171	0.126	0.096	0.515			0.117	0.084	0.117	0.119	0.224	
	mg/kg		Cd (cadmium)	0.19	0.465	0.124	0.209	0.082	0.214			0.064	0.114	0.082	0.124	0.24	
	mg/kg		Cr (chromium)	5	9.4	11.4	11	14.5	28.5			26.2	25	30.3	9.9	12.1	
	mg/kg		Cu (copper)	1.7	3.6	3.2	4.5	2.5	13			3.4	2.2	2.9	3.7	6.1	
	mg/kg		Fe (iron)														
	mg/kg		Hg (mercury)	0.007	0.022	0.05	0.05	0.05	0.05			0.05	0.05	0.05	0.05	0.05	
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	130	250	580.8	334.6	400.6	1408.8						441.9	469	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	4.3	8.6	7.4	7.5	9.3	18.7			9.5	7.7	11.9	6.9	8.6	
	mg/kg		Pb (lead)	5.2	10.8	3.5	5.1	2.6	6			3.8	3.8	2.9	30.2	4.7	
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	< 0.2	< 0.2	0.05	0.12	0.05	0.06			0.06	0.05	0.05	0.12	0.12	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)			0.6	0.6	0.7	0.8			0.6	0.6	0.6	0.6	0.6	
	mg/kg		Zn (zinc)	10.5	20.5	19.2	22.8	17.2	52.2			16.1	15.5	15	17.4	28.4	
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006							70.00	16.00						16.00
	ug/kg		Aroclor-1221														
	ug/kg		Aroclor-1232														
	ug/kg		Aroclor-1242														
	ug/kg		Aroclor-1248														
	ug/kg		Aroclor-1254							90	9.8						10
	ug/kg		Aroclor-1260							< 20	< 5.3						< 3.2
	ug/kg		Total PCB's	0	0												
PARTICLE SIZE %FINER	SAND	coarse	3 in														
			1 1/2	100													
			3/4	100													
			3/8	100													
			4	100													
			8	100													
			10														
		medium	16	99.0													
			20														
			30	87.0													
			40	71.0													
			50	40.0													
		fine	70	10.0													
			80														
			100	1.0													
			140														
	SILT CLAY		200	1.0													
			270	0.0													
			0.20 mm	0.0													
			0.05 mm	0.0													
MISC	%		Total Organic Carb														
	mg/kg		Chem Oxy Demand	1800													
	mg/kg		Kjedahl Nitrogen	295													
	mg/kg		Total Phosph	--													
	mg/kg		Oil and Grease	0													
	mg/kg		Cyanide, Total														
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate														
	%		Moisture														
	%		Total Solids														
	%		Volatile Solids														

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	1419	1419	1410	1418	1414
			River Mile	797.0	797.0	797.0	797.0	797.0
			Location	Ab. L/D 3 - mean	Ab. L/D 3 - mean-dup	Ab. L/D 3 - east	Ab. L/D 3 - west	Ab. L/D 3 - mid
			Year	1985	1985	1985	1985	1985
			System	1	1	1	1	1
			Habitat Type	1	1	1	1	1
			Pool	3	3	3	3	3
			Sam. Gear	3	3	3	3	3
			Sam. Depth	10	10	10	10	10
			Data Clt.	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
	ug/kg		b-BHC	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
	ug/kg		BHC					
	ug/kg		g-BHC (lindane)	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
	ug/kg		Heptachlor	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
	ug/kg		Aldrin					
	ug/kg		Heptachlorepoxide					
	ug/kg		Endosulfan I					
	ug/kg		Dieldrin	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79
	ug/kg		4,4'-DDE	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79
	ug/kg		Endrin	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
	ug/kg		Endosulfan II					
	ug/kg		4,4'-DDD	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
	ug/kg		Endrinaldehyde					
	ug/kg		Sulfan sulfate					
	ug/kg		4,4'-DDT	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
	ug/kg		Methoxychlor					
	ug/kg		Endrinketone					
	ug/kg		Chlorodane	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg		Toxaphene					
METALS	mg/kg		Ag (silver)			0.01	0.012	0.011
	mg/kg		Al (aluminum)					
	mg/kg		As (arsenic)			1.79	1.44	1.62
	mg/kg		B (boron)					
	mg/kg		Ba (barium)					
	mg/kg		Be (beryllium)			0.113	0.082	0.091
	mg/kg		Cd (cadmium)			0.083	0.063	0.061
	mg/kg		Cr (chromium)			9.2	7.5	6.7
	mg/kg		Cu (copper)			6.3	1.4	1.6
	mg/kg		Fe (iron)					
	mg/kg		Hg (mercury)			0.05	0.05	0.05
	mg/kg		Mg (magnesium)					
	mg/kg		Mn (manganese)			206.4	135	221.5
	mg/kg		Mo (molybdenum)					
	mg/kg		Ni (nickel)			6.7	4.6	4.9
	mg/kg		Pb (lead)			3.9	2.5	3
	mg/kg		Sb (antimony)			4	3.4	3.3
	mg/kg		Se (selenium)			0.11	0.13	0.12
	mg/kg		Sn (tin)					
	mg/kg		Sr (strontium)					
	mg/kg		Ti (titanium)			1.9	1.4	1.4
	mg/kg		Zn (zinc)			18.3	11.6	13.1
	mg/kg		V (vanadium)					
PCB'S	ug/kg		Aroclor-1006	22.10	17.10	< 5.3	35.00	27.70
	ug/kg		Aroclor-1221					
	ug/kg		Aroclor-1232					
	ug/kg		Aroclor-1242					
	ug/kg		Aroclor-1248					
	ug/kg		Aroclor-1254	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg		Aroclor-1260	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg		Total PCB's					
PARTICLE SIZE %FINER		SAND coarse	3 in					
			1 1/2					
			3/4					
			3/8					
			4					
			8					
			10					
		SAND medium	16					
			20					
			30					
			40					
			50					
		SAND fine	70					
			80					
			100					
			140					
		SILT CLAY	200					
			270					
			0.20 mm					
			0.05 mm					
MISC	%		Total Organic Carb					
	mg/kg		Chem Oxy Demand					
	mg/kg		Kjedahl Nitrogen					
	mg/kg		Total Phosph					
	mg/kg		Oil and Grease					
	mg/kg		Cyanide, Total					
	mg/kg		Ammonia					
	mg/l		Ammonia Elutriate					
	%		Moisture					
	%		Total Solids					
	%		Volatile Solids					

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	105	106	107	485	108	109		110	486		111	491	492	
			River Mile	794.5	794.1	793.1	793.1	792.8	792.8	792.8	792.5	792.5	792.5	792.2	791.5	791.5	791.5
			Location	TRENTON	TRENTON	CANNON RIVER	CANNON RIVER	CANNON RIVER	CANNON RIVER	CANNON RIVER 1	CANNON RIVER	CANNON RIVER	CANNON RIVER 2	CANNON RIVER	REDWING COMM	REDWING COMM	REDWING COMM 1
			Year	1981	1981	1982	1989	1978	1978	1994	1974	1989	1994	1982	1989	1989	1994
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	2	2	1
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.07			< 0.24		< 0.07	< 0.24		< 0.1	< 0.16	< 0.32
	ug/kg		b-BHC				< 0.15			< 0.24		< 0.15	< 0.24		< 0.2	< 0.32	1
	ug/kg		BHC				< 0.22			< 0.24		< 0.22	< 0.24		< 0.3	< 0.48	< 0.32
	ug/kg		g-BHC (lindane)				< 0.1			< 0.24		< 0.1	< 0.24		< 0.14	< 0.21	< 0.32
	ug/kg		Heptachlor				< 0.07			< 0.24		< 0.07	< 0.24		< 0.1	< 0.16	< 0.32
	ug/kg		Aldrin				< 0.1					< 0.1			< 0.14	< 0.21	
	ug/kg		Heptachlorepoxide				< 0.12					< 0.12			< 0.17	< 0.26	
	ug/kg		Endosulfan I				< 0.12					< 0.12			< 0.17	< 0.26	
	ug/kg		Dieldrin	< 0.1	< 0.1	< 0.1	< 0.12	0	0	< 0.48	< 10	< 0.12	< 0.48	< 0.1	< 0.17	< 0.26	< 0.65
	ug/kg		4,4'-DDE	< 0.1	< 0.1	< 0.1	< 0.1	0	0	< 0.48	< 10	< 0.1	< 0.48	< 0.1	< 0.14	< 0.21	< 0.65
	ug/kg		Endrin	< 0.1	< 0.1	< 0.1	< 0.22	0	0	< 0.48	< 10	< 0.22	< 0.48	< 0.1	< 0.3	< 0.48	< 0.65
	ug/kg		Endosulfan II				< 0.24					< 0.25			< 0.34	< 0.53	
	ug/kg		4,4'-DDD	< 0.1	< 0.1	< 0.1	< 0.27	0	0	< 0.48	< 10	< 0.27	< 0.48	< 0.1	< 0.37	< 0.58	< 0.65
	ug/kg		Endrinaldehyde				< 0.27					< 0.27			< 0.37	< 0.58	
	ug/kg		Sulfan sulfate				< 0.27					< 0.27			< 0.37	< 0.58	
	ug/kg		4,4'-DDT	< 0.1	< 0.1	1	< 0.31	0	0	< 0.48	< 10	< 0.32	< 0.48	< 0.1	< 0.44	< 0.69	< 0.65
	ug/kg		Methoxychlor				< 0.53					< 0.55			< 0.74	< 1.16	
	ug/kg		Endrinketone				< 0.27					< 0.27			< 0.37	< 0.58	
	ug/kg		Chlorodane	< 1	< 1	< 1	< 1.45	0	0	< 0.24	< 10	< 1.49	< 0.24	< 1	< 2.03	< 3.17	< 0.32
	ug/kg		Toxaphene				< 1.45					< 1.49			< 2.03	< 3.17	
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	< 1	0	1.2	< 1.05	0	0	1.5	< 0.7	< 1	1.4	1.3	2.5	2.9	2.8
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	10	10			10	10								
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 1	< 1	< 0.18	< 1.5	< 10	< 10	< 0.13	< 1	< 1.1	< 0.11	0.18	< 1.64	2.5	0.74
	mg/kg		Cr (chromium)	< 10	< 10	3.5	3.7	< 10	< 10	8.7	17	4.3	5.1	4.6	23.3	51	25.2
	mg/kg		Cu (copper)	< 10	< 10	1.8	2.2	< 10	< 10	3.1	10	< 1.45	1.2	2.3	8.3	25	11.6
	mg/kg		Fe (iron)	2300	2600	4100		1700	2400					4500			
	mg/kg		Hg (mercury)	< 0.01	< 0.01	0.042	< 0.01	0.47	0.66	0.11	0.4	< 0.01	< 0.04	0.066	< 0.02	0.13	0.08
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	140	140		201	970	180	308		165	234		734	986	781
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	< 10	5	6.8	< 10	< 10	6.4	77	< 5.46	4.9	5	8.7	26	13.2
	mg/kg		Pb (lead)	< 10	< 10	2	< 0.85	< 10	< 10	7.1	< 6	1.2	4	3.4	11.2	24.9	10.5
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				< 0.88					< 0.83			< 1.25	< 1.84	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	7	10	10	12.8	< 10	10	18.6	15	12	11	14	49.2	114	50.3
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1221				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1232				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1242				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1248				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1254				< 3.03			< 4.8		< 3.1	< 4.8		< 4.23	< 6.6	< 6.5
	ug/kg		Aroclor-1260				< 3.03			< 4.8		< 3.1	< 4.8		< 4.23	< 6.6	< 6.5
	ug/kg		Total PCB's	0	0	0		0	0		0			0			
PARTICLE SIZE %FINER	SAND	coarse	3 in					100	100		100						
			1 1/2	100	100	100		100	100		100			100			
			3/4	100	100	100		100	100		100			100			
			3/8	100	100	100		100	100		100			100			
			4	100	100	100	100	100	100	99.5	100	100	100	100	100	100	100
			8	98	98	99					100			100			
			10				100	100	98	97.7		99.8	98.6		99.9	99.9	99.7
		medium	16	93.0	90.0	95.0	99.2				99.0	98.0		99.0	99.5	99.4	
			20					97.0	88.0	90.1			89.2				99.2
			30	74.0	70.0	72.0	71.8					81.7		91.0	97.9	98.4	
			40	60.0	50.0	46.0		69.0	58.0	65.7	90.0		49.7	78.0			97.8
			50	40.0	18.0	16.0	71.8					81.7		60.0	97.9	98.4	
		fine	70	23.0	5.0	5.0								38.0			
			80				10.3	8.0	5.0			14.7			89.9	97.1	
			100	11.0	2.0	2.0	0.6			24.4	2.0	0.4	0.9	18.0	55.4	88.5	77.9
			140				0.5			22.9		0.6	0.6		39.6	76.7	69.0
	SILT CLAY		200	5.0	1.0	2.0	0.5	2.0	1.0	22.4	0.0	0.4	0.5	11.0	24.9	49.3	64.8
			270	1.0	0.0	2.0	0.4							10.0	17.9	30.2	
			0.20 mm	0.0	0.0	1.0		1.0	1.0		0.0			3.0	14.5	22.5	
			0.05 mm	0.0	0.0	0.0		0.0	0.0		0.0			1.0	9.6	12.1	
MISC	%		Total Organic Carb				0.47			0.134		0.5	0.038		4	11.9	1.02
	mg/kg		Chem Oxy Demand	430	15000	984		1800	2400		2553			5595			
	mg/kg		Kjedahl Nitrogen	215	695	27		200	390		61			157			
	mg/kg		Total Phosph	--	--	140		37	80		164			295			
	mg/kg		Oil and Grease	0	0	< 50		0	100		58			55			
	mg/kg		Cyanide, Total				< 0.6			< 0.07		< 0.61	< 0.06		< 0.9	< 1.4	< 0.09
	mg/kg		Ammonia				< 0.24					0.9			47.00	86	
	mg/l		Ammonia Elutriate							5.40			< 0.06				1.10
	%		Moisture				16.9			24.1		17.8	15.6		44.4	63	42.7
	%		Total Solids				83.1			75.9		82.2	84.4		55.6	37	57.3
	%		Volatile Solids				0.7			1.5		0.5	0.95		5.4	6.7	5.2

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #		112	113	489	490	114	115	488	487	116	333	335	334	374
			River Mile	791.5	791.4	791.4	791.2	791.2	791.0	791.0	791.0	790.1	789.8	786.5	786.0	786.0	786.0
			Location	REDWING SM BOAT 1	REDWING COMM	AB&BW REDWING HWY BR	REDWING SM BOAT	REDWING SM BOAT	REDWING SM BOAT	REDWING SM BOAT	AB&BW REDWING HWY BR	AB&BW REDWING HWY BR	AB&BW REDWING HWY BR	L-Lk Pepin-Bay City 1-1	L-Lk Pepin-Bay City 2-2	L-Lk Pepin-Bay City 2-1	Lk Pepin-Bay City/Ser-5
			Year	1994	1980	1980	1989	1989	1979	1979	1989	1989	1980	1987	1987	1987	1988
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	2	2	1	2	2	2	2	1	1	1	3	3	3	3
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	4	4	4	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	76	77-152	76	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.39			< 0.09	< 0.11			< 0.07	< 0.07		< 5	< 5	< 5	< 0.06
	ug/kg		b-BHC	2.6			< 0.19	< 0.21			< 0.15	< 0.15		< 5	< 5	< 5	< 0.12
	ug/kg		BHC	< 0.39			< 0.28	< 0.32			< 0.22	< 0.22					
	ug/kg		g-BHC (lindane)	< 0.39			< 0.12	< 0.14			< 0.1	< 0.1		< 5	< 5	< 5	< 0.08
	ug/kg		Heptachlor	< 0.39			< 0.09	< 0.11			< 0.07	< 0.07		< 5	< 5	< 5	< 0.06
	ug/kg		Aldrin				< 0.12	< 0.14			< 0.1	< 0.1					
	ug/kg		Heptachlorepoxide				< 0.16	< 0.18			< 0.12	< 0.12					
	ug/kg		Endosulfan I				< 0.16	< 0.18			< 0.12	< 0.12					
	ug/kg		Dieldrin	< 0.79	0.92	0	< 0.16	< 0.18	1.2	0	< 0.12	< 0.12	0.2	< 5	< 5	< 5	< 0.04
	ug/kg		4,4'-DDE	1.5	0.28	0	< 0.12	< 0.14	5.3	1.1	< 0.1	< 0.1	0	< 5	< 5	< 5	< 0.08
	ug/kg		Endrin	< 0.79	0.24	0	< 0.28	< 0.32	0	0	< 0.22	< 0.22	0	< 5	< 5	< 5	< 0.12
	ug/kg		Endosulfan II				< 0.31	< 0.36			< 0.25	< 0.25					
	ug/kg		4,4'-DDD	0.93	5.28	0	< 0.34	< 0.39	4.2	1.6	< 0.27	< 0.27	1.5	< 5	< 5	< 5	< 0.22
	ug/kg		Endrinaldehyde				< 0.34	< 0.39			< 0.27	< 0.27					
	ug/kg		Sulfan sulfate				< 0.34	< 0.39			< 0.27	< 0.27					
	ug/kg		4,4'-DDT	< 0.79	0.56	0	< 0.41	< 0.46	1.2	0	< 0.32	< 0.32	0.3	< 5	< 5	< 5	< 0.24
	ug/kg		Methoxychlor				< 0.69	< 0.78			< 0.55	< 0.55					
	ug/kg		Endrinketone				< 0.34	< 0.39			< 0.27	< 0.27					
	ug/kg		Chlorodane	< 0.39	7.1	0	< 1.87	< 2.14	9	0	< 1.49	< 1.49	0	< 5	< 5	< 5	< 0.29
	ug/kg		Toxaphene				< 1.87	< 2.14			< 1.49	< 1.49					
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	4		0	< 1.36	< 1.52	3	6	< 0.98	< 1.11	0	58.2	< 1.2	< 1.2	24
	mg/kg		B (boron)														
	mg/kg		Ba (barium)			40			150	170			40				
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	1.3	4.23	< 10	< 1.49	< 1.67	< 10	< 10	< 1.07	< 1.22	< 10	< 1.5	< 1.5	< 1.5	2.3
	mg/kg		Cr (chromium)	27.5	84.7	10	18.1	21.2	40	60	6.9	6.9	10	< 3.7	< 3.7	8.9	38
	mg/kg		Cu (copper)	17.8	17.8	< 10	6.8	9.9	30	30	< 1.4	2.57	< 10	15.8	8.9	8.9	21
	mg/kg		Fe (iron)		22900	6100			17000	21000			6900				
	mg/kg		Hg (mercury)	0.14	0.035	0	< 0.02	< 0.02	0	0	< 0.01	< 0.01	0	< 0.8	< 0.8	< 0.8	0.26
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	936		550	62.2	7.8	1200	1200	213	237	500	1077.5	721.8	721.8	850
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	16.2	57.4	< 10	8.8	11.6	20	20	< 5.17	6.9	< 10	< 12.9	27.8	< 12.9	23
	mg/kg		Pb (lead)	19.8	8.08	< 10	11.4	13.4	60	50	2.3	35.2	< 10	37.2	34.7	33.2	34
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				< 1.14	< 1.27			< 0.81	< 0.93					< 38
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	78.3	216	30	50.2	59.3	100	110	11.1	21.5	40	124.8	111.7	103	110
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					< 1.2
	ug/kg		Aroclor-1221	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1232	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1242	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1248	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1254	41			< 3.9	< 4.45			< 3.1	< 3.1					< 2.4
	ug/kg		Aroclor-1260	< 7.9			< 3.9	< 4.45			< 3.1	< 3.1					< 2.4
	ug/kg		Total PCB's		59.8	0			51	82			18	0	0	0	
PARTICLE SIZE %FINER	SAND	coarse	3 in		100	100			100	100			100				
			1 1/2		100	100			100	100			100				
			3/4		100	100			100	100			100				
			3/8		100	100			100	100			100				
			4		100	100	99.9	100	100	100	100	100	100				
			8		100	84							100				
			10				99.9	100	100	98	100	99.9					
		medium	16		100.0	70.0	99.4	99.5			99.3	99.1	99.0				
			20	100.0					99.0	98.0							
			30				98.4	98.5			71.7	95.2					
			40	99.7		51.0			99.0	98.0			68.0				
			50				98.4	98.5			71.7	95.2					
		fine	70														
			80				95.0	95.9	99.0	96.0	19.8	49.9					
			100	99.2	98.0	27.0	46.0	54.9			1.8	9.3	30.0				
			140	97.9			30.6	34.2			1.6	7.6			94.3	97.8	
	SILT CLAY		200	96.4	96.0	13.0	19.6	23.4	98.0	93.0	1.0	7.0	27.0				
			270				17.2	15.1				5.2			75.5	70.4	
			0.20 mm			3.0	11.7	13.0	60.0	65.0		4.5	15.0		44.4	36.8	
			0.05 mm		50.0	1.0	8.3	9.0	20.0	29.0		3.0	7.0		44.4	36.8	
MISC	%		Total Organic Carb	> 1.6			1.42	2.84			0.2	0.9			4.06	4.88	
	mg/kg		Chem Oxy Demand		35200	7600			180000	99000			17000				
	mg/kg		Kjedahl Nitrogen		--	1100			8400	6800			1600				
	mg/kg		Total Phosph		3140	--			1200	1200			--				
	mg/kg		Oil and Grease		530	0			0	0			0				
	mg/kg		Cyanide, Total	< 0.11			< 0.84	< 0.95			< 0.64	< 0.66					
	mg/kg		Ammonia				20	33.0			1.4	10.8					
	mg/l		Ammonia Elutriate	0.7													
	%		Moisture	53.5			40.8	47.4			21.5	24.7					
	%		Total Solids	46.5			59.2	52.6			78.5	75.3					
	%		Volatile Solids	7.03			4.3	5.0			0.6	1.3					

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

		Record #	370	373	369	371	372	117	336	337	118	119	120	121	122	338
		River Mile	786.0	786.0	786.0	786	786	785.9	785.6	785.4	785.32	785.31	785.3	785.01	785	785.0
		Location	Lk Pepin-Bay City/Key-5	Lk Pepin-Bay City/Ser-4	Lk Pepin-Bay City/Key-4	Lk Pepin-Bay City/Pac-4	Lk Pepin-Bay City/Pac-5	BAY CITY SM BOAT	L-Lk Pepin-Bay City 3-1	L-Lk Pepin-Bay City 4-1	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	L-Lk Pepin-Bay City 5-1
		Year	1988	1988	1988	1988	1988	1982	1987	1987	1978	1978	1978	1974	1974	1987
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	3	3	3	3	3	2	3	3	1	1	1	1	1	3
		Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Sam. Gear	1	1	1	1	1	1	4	4	1	1	1	1	1	4
		Sam. Depth	10	10	10	10	10	10	90	76	10	10	10	10	10	45
		Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg	a-BHC	< 0.002	< 0.06	< 0.002	< 0.17	< 0.17		< 5	< 5						< 5
	ug/kg	b-BHC	< 0.006	< 0.12	< 0.006	< 0.42	< 0.42		< 5	< 5						< 5
	ug/kg	BHC														
	ug/kg	g-BHC (lindane)	< 0.006	< 0.08	< 0.006	< 0.22	< 0.22		< 5	< 5						< 5
	ug/kg	Heptachlor	< 0.006	< 0.06	< 0.006	< 0.22	< 0.22		< 5	< 5						< 5
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin	< 0.01	< 0.04	< 0.01	< 0.4	< 0.4	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg	4,4'-DDE	< 0.01	< 0.08	< 0.01	< 0.58	< 0.58	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg	Endrin	< 0.02	< 0.12	< 0.02	< 4.4	< 4.4	< 0.1	< 5	< 5	0	0	0	< 10	< 10	5.9
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD	< 0.01	< 0.22	< 0.01	< 1.3	< 1.3	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT	< 0.01	< 0.24	< 0.01	< 0.87	< 0.87	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg	Methoxychlor														
	ug/kg	Endrinketone														
	ug/kg	Chlordane	< 0.04	< 0.28	< 0.04	< 1.2	< 1.2	< 1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)														
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	4.43	11	3.96	1.8	1.9	3.2	< 1.2	19.3	0	0	0	< 1	< 1	24.5
	mg/kg	B (boron)														
	mg/kg	Ba (barium)									0	0	0			
	mg/kg	Be (beryllium)														
	mg/kg	Cd (cadmium)	1.66	1.1	0.8	1	1.4	0.66	< 1.5	< 1.5	< 10	< 10	< 10	< 1	< 1	< 1.5
	mg/kg	Cr (chromium)	23.8	18	12.8	16	22	11	< 3.7	< 3.7	< 10	< 10	< 10	29	30	< 3.7
	mg/kg	Cu (copper)	16.3	11	9.17	7.5	10	8.8	22.6	22.6	< 10	< 10	< 10	2	5	8.9
	mg/kg	Fe (iron)						7400			2600	2400	2100			
	mg/kg	Hg (mercury)	0.29	0.18	0.15	0.08	0.22	0.027	< 0.8	< 0.8	0	0	0	< 0.1	< 0.1	< 0.8
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	730	640	548	400	400		757	1035.2	120	130	130			862.7
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	15.8	13	9.66	9.2	10	8	27.8	27.8	< 10	< 10	< 10	17	18	< 12.9
	mg/kg	Pb (lead)	31.2	22	17.5	12	13	6.6	37.1	31.5	20	20	20	< 9	< 9	30
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)	< 0.35	< 18	< 0.3	< 0.75	< 0.75									
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)														
	mg/kg	Zn (zinc)	85.1	58	45.7	38	46	35	129.1	137.8	10	20	< 10	13	12	116.1
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	< 0.15	< 1.2	< 0.15	< 3	< 3									
	ug/kg	Aroclor-1221														
	ug/kg	Aroclor-1232														
	ug/kg	Aroclor-1242														
	ug/kg	Aroclor-1248														
	ug/kg	Aroclor-1254	100	< 2.4	72	< 3	< 3									
	ug/kg	Aroclor-1260	< 0.25	< 2.4	< 0.25	< 3	< 3									
	ug/kg	Total PCB's						0	0	0	2	1	1	0	0	0
PARTICLE SIZE %FINER	SAND coarse	3 in									100	100	100	100	100	
		1 1/2						100			100	100	100	100	100	
		3/4						100			100	100	100	100	100	
		3/8						100			100	100	100	100	100	
		4						100			100	99	99	100	100	
		8						100						100	100	
		10									90	75	80			
	SAND medium	16						100						98.0	98.0	
		20									78.0	67.0	65.0			
		30						98.0								
		40						93.0			18.0	16.0	15.0	76.0	76.0	
		50						85.0								
	SAND fine	70						76.0								
		80									12.0	10.0	10.0			
		100						71.0						5.0	5.0	
		140							99.3	93.8						
	SILT CLAY	200						67.0			10.0	8.0	8.0	0.0	0.0	
		270						66.0	76.3	72.2						
		0.20 mm						48.0	33.9	35.0	8.0	6.0	7.0	0.0	0.0	
		0.05 mm						23.0	33.8	35.0	5.0	5.0	5.0	0.0	0.0	
MISC	%	Total Organic Carb	0.71		1.7				5.98	3.03						
	mg/kg	Chem Oxy Demand						47500			2300	1100	6600	1712	2303	
	mg/kg	Kjedahl Nitrogen						1400			380	280	320	88	148	
	mg/kg	Total Phosph						590			170	84	110	205	225	
	mg/kg	Oil and Grease						430			0	0	0	149	147	
	mg/kg	Cyanide, Total														
	mg/kg	Ammonia														
	mg/l	Ammonia Elutriate														
	%	Moisture														
	%	Total Solids														
	%	Volatile Solids														

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	123	124	125	617	126	481	482	127	128	483	484	129	130	131
			River Mile	784.61	784.6	784.2	780	773	772.8	772.8	772.79	767.1	766.9	766.9	763.51	763.5	763.0
			Location	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	L-Lake Pepin Maiden	LAKE CITY SM BOAT	LAKE CITY SM BOAT	LAKE CITY SM BOAT		PEPIN SM BOAT	PEPIN SM BOAT	PEPIN SM BOAT	MOUTH OF CHIP. RIVER	MOUTH OF CHIP. RIVER	READS LANDING
			Year	1978	1978	1978	1987	1981	1989	1989	1974	1982	1989	1989	1982	1982	1974
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	3	2	2	2	1	2	2	2	1	1	1
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	3	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	45	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	WDNR	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC						< 0.2	< 0.07			< 0.07	< 0.09			
	ug/kg		b-BHC						< 0.39	< 0.15			< 0.15	< 0.18			
	ug/kg		BHC						< 0.59	< 0.22			< 0.22	< 0.26			
	ug/kg		g-BHC (lindane)						< 0.26	< 0.1			< 0.1	< 0.12			
	ug/kg		Heptachlor						< 0.2	< 0.07			< 0.07	< 0.09			
	ug/kg		Aldrin						< 0.26	< 0.01			< 0.1	< 0.12			
	ug/kg		Heptachlorepoxide						< 0.33	< 0.12			< 0.12	< 0.15			
	ug/kg		Endosulfan I						< 0.33	< 0.12			< 0.12	< 0.15			
	ug/kg		Dieldrin	0		< 1			< 0.33	< 0.12	< 10	< 0.1	< 0.12	< 0.15	< 0.1	< 0.1	< 10
	ug/kg		4,4'-DDE	0					< 0.26	< 0.1	50	< 0.1	< 0.1	< 0.12	< 0.1	< 0.1	< 10
	ug/kg		Endrin	0		< 1			< 0.59	< 0.22	< 10	< 0.1	< 0.22	< 0.26	< 0.1	< 0.1	< 10
	ug/kg		Endosulfan II						< 0.65	< 0.24			< 0.25	< 0.29			
	ug/kg		4,4'-DDD	0					< 0.72	< 0.27	< 10	< 0.1	< 0.27	< 0.32	2.2	< 0.1	< 10
	ug/kg		Endrinaldehyde						< 0.72	< 0.27			< 0.27	< 0.32			
	ug/kg		Sulfan sulfate						< 0.72	< 0.27			< 0.27	< 0.32			
	ug/kg		4,4'-DDT	0		< 4			< 0.85	< 0.31	< 10	700	< 0.32	< 0.38	16.7	< 0.1	< 10
	ug/kg		Methoxychlor						< 1.44	< 0.53			< 0.55	< 0.65			
	ug/kg		Endriniketone						< 0.72	< 0.27			< 0.27	< 0.32			
	ug/kg		Chlorodane	0					< 3.92	< 1.45	< 10	< 1	< 1.49	< 1.76	< 1	< 1	< 10
	ug/kg		Toxaphene						< 3.92	< 1.45			< 1.49	< 1.76			
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	0	3.15		1	3.4	1.7	4	1.8	< 1.14	< 1.11	1.3	1.1	< 0.9
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	30	10			90									
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 10	4	< 1	2	< 2.98	< 1.24	9	0.35	< 1.24	< 1.22	< 0.19	< 0.19	< 1
	mg/kg		Cr (chromium)	< 10	10	63.6		10	31.3	15.7	115	7.1	9.9	7.8	4.8	3.8	8
	mg/kg		Cu (copper)	< 10	< 10	23.5		20	79.8	20.9	58	7.1	8.4	7.9	3.9	2.8	10
	mg/kg		Fe (iron)	3600	2200	22800		14000				4900			5100	3800	
	mg/kg		Hg (mercury)	2.2	1.4	0.077		< 0.01	0.2	< 0.01	5.4	0.031	< 0.01	< 0.01	< 0.01	< 0.01	0.3
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	290	130	879		900	1290	264			311	268			
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	< 10	30		20	25.5	14.7	35	6	10.3	9.9	5	5	8
	mg/kg		Pb (lead)	20	< 10	42	< 10	460	29.7	84	47	11	7.3	7.7	2	2	< 7
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)						< 2.3	< 0.95			< 0.95	< 0.93			
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	18	< 10	88.8		78	117	< 0.65	185	28	22.7	27.8	14	13	19
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1221						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1232						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1242						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1248						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1254						< 8.18	< 3.03			< 3.1	< 3.68			
	ug/kg		Aroclor-1260						< 8.18	< 3.03			< 3.1	< 3.68			
	ug/kg		Total PCB's	1	0	65	0	0			0	0			0	0	0
PARTICLE SIZE %FINER		SAND coarse	3 in	100	100	100											
			1 1/2	100	100	100		100				100			100	100	
			3/4	100	100	100		100				100			100	100	
			3/8	100	100	100		100				98			100	100	
			4	100	100	100		100	100	85.0		97	100		98	100	
			8					100				95			96	99	
			10	100	99				100	79.0			97.9				
		SAND medium	16					100	98.9	68.0		92.0	91.1		93.0	97.0	
			20	100.0	90.0												
			30					98.0	95.9	25.2		81.0	67.1		79.0	69.0	
			40	99.0	41.0			90.0				65.0			45.0	49.0	
			50					72.0	95.9	25.2		42.0	67.1		11.0	30.0	
		SAND fine	70					52.0				27.0			4.0	10.0	
			80	67.0	3.0				91.6	4.7			23.7				
			100					35.0	82.7	0.7		21.0	3.2		3.0	4.0	
			140						78.8	0.7			2.5				
	SILT CLAY		200	22.0	1.0	67.0		22.0	70.0	0.4		18.0	1.8		2.0	3.0	
			270					21.0	55.6			17.0	1.5		2.0	3.0	
			0.20 mm	8.0	0.0			13.0	46.3			9.0	1.4		1.0	1.0	
			0.05 mm	2.0	0.0	44.0		4.0	31.2			4.0	1.1		0.0	0.0	
MISC	%		Total Organic Carb						25.4	0.6			0.7	1.7			
	mg/kg		Chem Oxy Demand	15000	2800	89800		110000			113005	12800			585	1686	772
	mg/kg		Kjedahl Nitrogen	1200	410	1690		11300			4121	600			26	35	48
	mg/kg		Total Phosph	430	93	951		--			1769	230			94	111	232
	mg/kg		Oil and Grease	0	0	710		--			2825	205			< 50	< 50	85
	mg/kg		Cyanide, Total						< 2.2	< 0.63			< 0.63	< 0.68			
	mg/kg		Ammonia						232	2.3			3.3	10			
	mg/l		Ammonia Elutriate														
	%		Moisture						76.9	21.1			20.8	26.6			
	%		Total Solids						23.1	78.9			79.2	73.4			
	%		Volatile Solids						12.3	1.6			1.3	1.3			

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	132	480	133	134	479	135	136	137	138	139	140	141	142	705
			River Mile	763	763	762.5	762.3	762.1	761.9	760	759.08	759.07	759.03	759.02	759.01	759	758.6
			Location	READS LANDING	READS LANDING	READS LANDING	READS LANDING	READS LANDING	READS LANDING	WABASHA SM BOAT	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	R-Bay Lower End of Island
			Year	1974	1989	1980	1980	1989	1980	1981	1974	1974	1982	1982	1978	1978	1985
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	2	1	1	1	1	1	1	3
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	2
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	FWS
CHC'S	ug/kg		a-BHC		< 0.08			< 0.74									< 10
	ug/kg		b-BHC		< 0.15			< 1.48									< 10
	ug/kg		BHC		< 0.23			< 2.21									
	ug/kg		g-BHC (lindane)		< 0.1			< 0.98									< 10
	ug/kg		Heptachlor		< 0.08			< 0.74									< 10
	ug/kg		Aldrin		< 0.1			< 0.98									
	ug/kg		Heptachlorepoxide		< 0.13			< 1.23									
	ug/kg		Endosulfan I		< 0.13			< 1.23									
	ug/kg		Dieldrin	< 10	< 0.13	< 0.2	0	< 1.23	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg		4,4'-DDE	< 10	< 0.1	< 0.2	0	< 0.98	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg		Endrin	< 10	< 0.23	< 0.2	0	< 2.21	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg		Endosulfan II		< 0.26			< 2.46									
	ug/kg		4,4'-DDD	< 10	< 0.28	< 0.2	0	< 2.71	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg		Endrinaldehyde		< 0.28			< 2.71									
	ug/kg		Sulfan sulfate		< 0.28			< 2.71									
	ug/kg		4,4'-DDT	< 10	< 0.33	< 0.4	0	< 3.2	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg		Methoxychlor		< 0.56			< 5.41									
	ug/kg		Endrinketone		< 0.28			< 2.71									
	ug/kg		Chlorodane	< 10	< 1.54	< 0.4	0	< 14.76	0		< 10	< 10	< 1	< 1	0	0	< 10
	ug/kg		Toxaphene		< 1.54			< 14.76									
METALS	mg/kg		Ag (silver)														< 0.4
	mg/kg		Al (aluminum)														6520
	mg/kg		As (arsenic)	< 1	1		0	1.4	0	< 1	< 0.9	1	3	1.7	0	0	< 7
	mg/kg		B (boron)														7
	mg/kg		Ba (barium)				20		10	80					30	30	203
	mg/kg		Be (beryllium)														0.44
	mg/kg		Cd (cadmium)	< 1	< 1.2	0.755	< 10	< 1.1	< 10	1	1	1	< 0.19	0.2	< 10	< 10	1.3
	mg/kg		Cr (chromium)	5	5.9	14.5	< 10	8.4	< 10	< 10	7	7	15	4	< 10	20	25
	mg/kg		Cu (copper)	7	< 1.6	1.62	< 10	2.1	< 10	10	7	7	5.7	4	< 10	< 10	19
	mg/kg		Fe (iron)			10320	4200		4000	11000			10000	5200	2700	2400	20400
	mg/kg		Hg (mercury)	0.4	< 0.14	< 0.01	0	< 0.12	0	< 0.01	1.4	0.6	0.017	0.015	0	0	0.06
	mg/kg		Mg (magnesium)														3570
	mg/kg		Mn (manganese)		292		240	269	180	920					260	310	< 2340
	mg/kg		Mo (molybdenum)														2
	mg/kg		Ni (nickel)	5	< 6.2	12.8	< 10	8.44	< 10	< 10	7	7	10	6	< 10	< 10	20
	mg/kg		Pb (lead)	< 7	3.1	2.56	< 10	0.79	< 10	80	< 7	< 7	4	2	< 10	< 10	25
	mg/kg		Sb (antimony)														< 4
	mg/kg		Se (selenium)		< 0.95			< 0.84									< 10
	mg/kg		Sn (tin)														< 2
	mg/kg		Sr (strontium)														61.1
	mg/kg		Tl (titanium)														20
	mg/kg		Zn (zinc)	13	15.1	48	20	17	40	72	17	17	26	15	10	10	74.9
	mg/kg		V (vanadium)														< 17
PCB'S	ug/kg		Aroclor-1006		< 1.54			< 14.76									
	ug/kg		Aroclor-1221		< 1.54			< 14.76									
	ug/kg		Aroclor-1232		< 1.54			< 14.76									
	ug/kg		Aroclor-1242		< 1.54			< 14.76									
	ug/kg		Aroclor-1248		< 1.54			< 14.76									
	ug/kg		Aroclor-1254		< 3.2			< 30.75									
	ug/kg		Aroclor-1260		< 3.2			< 30.75									
	ug/kg		Total PCB's	0		0	0		0	0	0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in	100		100	100		100		100	100			100	100	
			1 1/2	100		100	100		100	100	100	100	100	100	100	100	
			3/4	96		100	100		100	100	100	100	98	100	100	100	
			3/8	89		100	100		100	100	100	100	96	100	100	100	
			4	84	100	100	100	94.0	98	100	99	99	88	100	100	95	
			8	74		98	98		95	100	93	93	83	98			
			10		100			90.7							96	87	
		medium	16	58.0	99.8	90.0	91.0	79.5	87.0	97.0	80.0	80.0	74.0	91.0			
			20												76.0	66.0	
			30		98.8			15.8		85.0			49.0	65.0			
			40	4.0		30.0	17.0		33.0	71.0	12.0	12.0	26.0	33.0	30.0	27.0	
			50		98.8			15.8		54.0			6.0	6.0			
		fine	70							40.0			2.0	3.0			
			80		81.8			0.4							2.0	2.0	
			100	0.0	3.2	2.0	1.0	0.1	1.0	28.0	0.0	0.0	1.0	2.0			
			140		2.0												
	SILT CLAY		200	0.0	1.4	1.0	0.0		0.0	21.0	0.0	0.0	1.0	2.0	1.0	1.0	
			270		0.7					20.0			1.0	2.0			
			0.20 mm	0.0	0.5	1.0	0.0		0.0	11.0	0.0	0.0	1.0	1.0	0.0	0.0	
			0.05 mm	0.0		1.0	0.0		0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	
MISC	%		Total Organic Carb		0.18			0.009									
	mg/kg		Chem Oxy Demand	960		527	1600		1300	16000	< 481	< 453	952	956	1600	1700	
	mg/kg		Kjedahl Nitrogen	44		--	600		460	1280	117	42	68	44	130	250	
	mg/kg		Total Phosph	227		672	--		--	--	235	188	270	233	67	240	
	mg/kg		Oil and Grease	60		185	0		0	--	101	126	< 50	< 50	0	0	
	mg/kg		Cyanide, Total		< 0.68			< 0.6									
	mg/kg		Ammonia		5.6			0.36									
	mg/l		Ammonia Elutriate														
	%		Moisture		26			16.7									
	%		Total Solids		74			83.3									
	%		Volatile Solids		0.8			0.5									

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	143	144	145	146	147	706	148	149	150	151	455	152	153	154
			River Mile	757.53	757.52	757.51	757.5	757.49	757.3	756.8	756.32	755.8	754.6	754.5	754.4	754.21	754.2
			Location	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	L-Bay Down. of Disposal	GRAND ENCAMPMENT	GRAND ENCAMPMENT	GRAND ENCAMPMENT	BEEF SLOUGH	ALMA SM BOAT	BEEF SLOUGH	BEEF SLOUGH	BEEF SLOUGH
			Year	1982	1982	1978	1978	1974	1985	1980	1974	1980	1982	1989	1982	1978	1978
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	3	1	1	1	1	2	1	1	1
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	2	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE	COE	COE
CHC's	ug/kg		a-BHC						< 10					< 0.08			
	ug/kg		b-BHC						< 10					< 0.14			
	ug/kg		BHC											< 0.22			
	ug/kg		g-BHC (lindane)						< 10					< 0.1			
	ug/kg		Heptachlor						< 10					< 0.07			
	ug/kg		Aldrin											< 0.1			
	ug/kg		Heptachlorepoxide											< 0.12			
	ug/kg		Endosulfan I											< 0.12			
	ug/kg		Dieldrin	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.12	< 0.1	0	0
	ug/kg		4,4'-DDE	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.1	< 0.1	0	0
	ug/kg		Endrin	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.22	< 0.1	0	0
	ug/kg		Endosulfan II											< 0.24			
	ug/kg		4,4'-DDD	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.26	< 0.1	0	0
	ug/kg		Endrinaldehyde											< 0.26			
	ug/kg		Sulfan sulfate											< 0.26			
	ug/kg		4,4'-DDT	< 0.1	< 0.1	0	0	< 10	10	0	< 10	0	< 0.1	< 0.31	27	0	0
	ug/kg		Methoxychlor											< 0.53			
	ug/kg		Endrinketone											< 0.26			
	ug/kg		Chlorodane	< 1	< 1	0	0	< 10	< 10	0	< 10	0	< 1	< 1.44	< 1	0	0
	ug/kg		Toxaphene											< 1.44			
METALS	mg/kg		Ag (silver)						< 0.4								
	mg/kg		Al (aluminum)						11500								
	mg/kg		As (arsenic)	1.4	1.8	0	0	0.9	< 7	0	< 0.8	0	2	1.5	1.5	0	0
	mg/kg		B (boron)						5								
	mg/kg		Ba (barium)			30	30		141	20		20				10	10
	mg/kg		Be (beryllium)						0.65								
	mg/kg		Cd (cadmium)	< 0.2	0.19	< 10	< 10	1	0.8	< 10	< 1	< 10	< 0.2	< 1.2	< 0.2	< 10	< 10
	mg/kg		Cr (chromium)	4	3.9	< 10	< 10	6	34	< 10	7	< 10	5.9	7	4	< 10	< 10
	mg/kg		Cu (copper)	3	3.5	< 10	< 10	6	26	< 10	10	< 10	3.9	3.2	3	< 10	< 10
	mg/kg		Fe (iron)	4000	4550	1900	2300		24500	3400		3400	6200		4400	2000	2200
	mg/kg		Hg (mercury)	0.027	0.01	0	0	0.4	0.06	0	0.4	0	< 0.01	< 0.12	0.01	0	0
	mg/kg		Mg (magnesium)						5110								
	mg/kg		Mn (manganese)			250	250		< 866	220		160		376		180	130
	mg/kg		Mo (molybdenum)						3								
	mg/kg		Ni (nickel)	10	5	< 10	< 10	6	22	< 10	5	< 10	7	6.1	6	< 10	< 10
	mg/kg		Pb (lead)	2	2	< 10	< 10	< 11	26	< 10	< 7	< 10	2	< 0.52	2	< 10	< 10
	mg/kg		Sb (antimony)						< 4								
	mg/kg		Se (selenium)						< 10					< 0.88			
	mg/kg		Sn (tin)						< 2								
	mg/kg		Sr (strontium)						25.4								
	mg/kg		Ti (titanium)						20								
	mg/kg		Zn (zinc)	26	14	10	10	16	98.8	14	15	12	16	17	14	12	10
	mg/kg		V (vanadium)						< 25								
PCB'S	ug/kg		Aroclor-1006											< 1.44			
	ug/kg		Aroclor-1221											< 1.44			
	ug/kg		Aroclor-1232											< 1.44			
	ug/kg		Aroclor-1242											< 1.44			
	ug/kg		Aroclor-1248											< 1.44			
	ug/kg		Aroclor-1254											< 3			
	ug/kg		Aroclor-1260											< 3			
	ug/kg		Total PCB's	0	0	0	0	0	0	0	0	4	0		0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in			100	100	100		100	100	100				100	100
			1 1/2	100	100	100	100	100		100	100	100	100		100	100	100
			3/4	100	100	100	100	100		100	100	100	100		100	100	100
			3/8	100	100	100	100	100		100	100	100	100		100	100	100
			4	99	100	98	99	96		100	100	100	100	99.1	99	100	100
			8	98	99			92		100	98	100	99		99		
			10			96	90							98.0		99	100
		medium	16	97.0	95.0			82.0		98.0	95.0	95.0	96.0	93.7	97.0		
			20			83.0	73.0									93.0	95.0
			30	75.0	66.0								59.0	61.9	86.0		
			40	46.0	31.0	44.0	36.0	28.0		48.0	21.0	37.0	31.0		69.0	59.0	46.0
			50	17.0	8.0								14.0	61.9	31.0		
		fine	70	5.0	2.0								6.0		10.0		
			80			2.0	3.0							5.7		3.0	2.0
			100	4.0	2.0			0.0		1.0	0.0	3.0	4.0	0.4	4.0		
			140											0.3			
	SILT CLAY		200	4.0	1.0	1.0	0.0	0.0		0.0	0.0	1.0	3.0		3.0	0.0	1.0
			270	3.0	1.0								2.0		3.0		
			0.20 mm	1.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	1.0		1.0	0.0	0.0
			0.05 mm	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
MISC	%		Total Organic Carb											0.042			
	mg/kg		Chem Oxy Demand	803	730	2200	2800	< 515		550	< 400	1700	959		1713	1800	2000
	mg/kg		Kjedahl Nitrogen	177	44	260	200	66		160	13	220	29		82	220	170
	mg/kg		Total Phosph	270	186	140	35	117		--	229	--	147		184	180	35
	mg/kg		Oil and Grease	< 50	< 50	0	0	801		0	756	0	< 50		< 50	0	0
	mg/kg		Cyanide, Total											< 0.63			
	mg/kg		Ammonia											0.31			
	mg/l		Ammonia Elutriate														
	%		Moisture											20.3			
	%		Total Solids											79.7			
	%		Volatile Solids											0.4			

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	155	457	458			156	456
			River Mile	754	754	754	754	754	753.99	753.9
			Location	BEEF SLOUGH	BEEF SLOUGH	BEEF SLOUGH	BEEF SLOUGH 1	BEEF SLOUGH 1	ALMA SM BOAT	ALMA SM BOAT
			Year	1974	1989	1989	1994	1994	1979	1989
			System	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	2	2
			Pool	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 0.18	< 0.17	< 0.24	< 0.25		< 0.08
	ug/kg		b-BHC		< 0.35	< 0.33	< 0.24	< 0.25		< 0.15
	ug/kg		BHC		< 0.53	< 0.5	< 0.24	< 0.25		< 0.23
	ug/kg		g-BHC (lindane)		< 0.24	< 0.22	< 0.24	< 0.25		< 0.1
	ug/kg		Heptachlor		< 0.18	< 0.17	< 0.24	< 0.25		< 0.08
	ug/kg		Aldrin		< 0.24	< 0.22				< 0.1
	ug/kg		Heptachlorepoxide		< 0.3	< 0.28				< 0.13
	ug/kg		Endosulfan I		< 0.3	< 0.28				< 0.13
	ug/kg		Dieldrin	< 10	< 0.3	< 0.28	< 0.47	< 0.49	0	< 0.13
	ug/kg		4,4'-DDE	10	< 0.24	< 0.22	< 0.47	< 0.49	0	< 0.1
	ug/kg		Endrin	< 10	< 0.53	< 0.5	< 0.47	< 0.49	0	< 0.23
	ug/kg		Endosulfan II		< 0.59	< 0.55				< 0.25
	ug/kg		4,4'-DDD	< 10	< 0.65	< 0.61	< 0.47	< 0.49	0.3	< 0.28
	ug/kg		Endrinaldehyde		< 0.65	< 0.61				< 0.28
	ug/kg		Sulfan sulfate		< 0.65	< 0.61				< 0.28
	ug/kg		4,4'-DDT	< 10	< 0.77	< 0.72	< 0.47	< 0.49	0	< 0.33
	ug/kg		Methoxychlor		< 1.3	< 1.21				< 0.55
	ug/kg		Endrinketone		< 0.65	< 0.61				< 0.28
	ug/kg		Chlorodane	< 10	< 3.54	< 3.31	< 0.24	< 0.25	1	< 1.5
	ug/kg		Toxaphene		< 3.54	< 3.31				< 1.5
METALS	mg/kg		Ag (silver)							
	mg/kg		Al (aluminum)							
	mg/kg		As (arsenic)	< 0.7	7.9	11.2	1	0.78	0	1.2
	mg/kg		B (boron)							
	mg/kg		Ba (barium)						70	
	mg/kg		Be (beryllium)							
	mg/kg		Cd (cadmium)	< 1	< 2.7	< 2.6	0.37	0.38	< 10	1.1
	mg/kg		Cr (chromium)	23	27	30	6.5	5.2	10	5.1
	mg/kg		Cu (copper)	8	9.4	17.2	3.9	2.6	10	2.7
	mg/kg		Fe (iron)						12000	
	mg/kg		Hg (mercury)	0.4	< 0.29	< 0.28	< 0.05	< 0.05	0	< 0.12
	mg/kg		Mg (magnesium)							
	mg/kg		Mn (manganese)		1280	929	291	234	550	223
	mg/kg		Mo (molybdenum)							
	mg/kg		Ni (nickel)	17	16	21.2	6	4.7	20	< 5.7
	mg/kg		Pb (lead)	28	11.6	16	1.3	1.8	20	< 0.52
	mg/kg		Sb (antimony)							
	mg/kg		Se (selenium)		< 2	< 1.9				< 0.87
	mg/kg		Sn (tin)							
	mg/kg		Sr (strontium)							
	mg/kg		Ti (titanium)							
	mg/kg		Zn (zinc)	17	70.5	85.2	14.6	12.7	40	13.5
	mg/kg		V (vanadium)							
PCB'S	ug/kg		Aroclor-1006		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1221		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1232		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1242		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1248		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1254		< 7.38	< 6.9	< 4.7	< 4.9		< 3.13
	ug/kg		Aroclor-1260		< 7.38	< 6.9	< 4.7	< 4.9		< 3.13
	ug/kg		Total PCB's	0					15	
PARTICLE SIZE %FINER	SAND	coarse	3 in	100					100	
			1 1/2	100					100	
			3/4	100					100	
			3/8	100					100	
			4	100	100	100	100		100	99.7389
			8	98						
			10		100	100	95.3	100	100	99.1158
		medium	16	95.0	98.6	99.7				93.5
			20				75.7	99.1	100	
			30		97.2	96.8				51.9
			40	50.0			29.1	68.8	90.0	
			50		97.2	96.8				51.9
		fine	70							
			80		95.7	86.9			63.0	4.3
			100	4.0	86.9	78.0	0.7	2.0		0.0
			140		82.3	75.8	0.5	1.0		
	SILT CLAY		200	0.0	50.3	60.2	0.4	0.8	56.0	
			270		32.6	42.7				
			0.20 mm	0.0	25.1	32.0			26.0	
			0.05 mm	0.0	16.6	23.5			7.0	
MISC	%		Total Organic Carb		14.8	5.61	0.021			0.009
	mg/kg		Chem Oxy Demand	5867					48000	
	mg/kg		Kjedahl Nitrogen	273					6300	
	mg/kg		Total Phosph	166					1300	
	mg/kg		Oil and Grease	624					0	
	mg/kg		Cyanide, Total		< 1.5	< 1.4	< 0.06	< 0.07		< 0.62
	mg/kg		Ammonia		149	76				0.37
	mg/l		Ammonia Elutriate				< 0.06	< 0.06		
	%		Moisture		65.9	64.1	16	25.5		19.3
	%		Total Solids		34.1	35.9	84	74.5		80.7
	%		Volatile Solids		8.5	7.7	1	0.82		0.4

Table 7. Contaminant Data for Pool 5 of the Upper Mississippi River

			Record #	454	453	348	351	353	355	352	350	349	354	157	707	158	159
			River Mile	752.7	752.6	752.5	752.5	752.5	752.5	752.5	752.5	752.5	752.5	752.0	749.9	749.0	749.0
			Location	LOWER APPROACH LD4	LOWER APPROACH LD4	R-Island 40-1	R-Island 40-3 -Prec	R-Island 40-4 -Prec	R-Island 40-5	R-Island 40-3 -Pace	R-Island 40-2 -Pace	R-Island 40-2 -Prec	R-Island 40-4 -Pace		R-1st Bwtr. Down Zumbro R	MULE BEND	MULE BEND
			Year	1989	1989	1987	1987	1987	1987	1987	1987	1987	1987	1979	1985	1979	1979
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	3	3	3	3	3	3	3	3	1	3	1	1
			Pool	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	2	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	FWS	COE	COE
CHC'S	ug/kg		a-BHC	< 0.07	< 0.07	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		b-BHC	< 0.14	< 0.14	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		BHC	< 0.22	< 0.21												
	ug/kg		g-BHC (lindane)	< 0.1	< 0.1	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		Heptachlor	< 0.07	< 0.07	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		Aldrin	< 0.1	< 0.1												
	ug/kg		Heptachlorepoxide	< 0.12	< 0.12												
	ug/kg		Endosulfan I	< 0.12	< 0.12												
	ug/kg		Dieldrin	< 0.12	< 0.12	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		4,4'-DDE	< 0.1	< 0.1	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Endrin	< 0.22	< 0.21	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Endosulfan II	< 0.24	< 0.24												
	ug/kg		4,4'-DDD	< 0.26	< 0.26	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Endrinaldehyde	< 0.26	< 0.26												
	ug/kg		Sulfan sulfate	< 0.26	< 0.26												
	ug/kg		4,4'-DDT	< 0.31	< 0.31	< 5	< 5	< 5	< 5			< 5		0	10	0	0
	ug/kg		Methoxychlor	< 0.53	< 0.52												
	ug/kg		Endrinketone	< 0.26	< 0.26												
	ug/kg		Chlorodane	< 1.44	< 1.43	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Toxaphene	< 1.44	< 1.43												
METALS	mg/kg		Ag (silver)												< 0.4		
	mg/kg		Al (aluminum)												11900		
	mg/kg		As (arsenic)	1.4	1.8	84.1	77.7	130.8	< 1.2	0.79	0.74	< 1.2	0.92	0	< 7	0	0
	mg/kg		B (boron)												5		
	mg/kg		Ba (barium)											20	146	30	30
	mg/kg		Be (beryllium)												0.63		
	mg/kg		Cd (cadmium)	< 1.2	< 1.1	< 1.5	< 1.5	< 1.5	< 1.5	< 0.1	< 0.1	< 1.5	< 0.1	< 10	< 0.3	< 10	< 10
	mg/kg		Cr (chromium)	4.5	9	< 3.7	< 3.7	< 3.7	< 3.7	6	5.2	< 3.7	4.4	< 10	20	< 10	< 10
	mg/kg		Cu (copper)	3.4	7.1	< 3.2	< 3.2	< 3.2	< 3.2	4.4	3.2	2.1	3.2	< 10	15	< 10	< 10
	mg/kg		Fe (iron)											3300	19300	2600	3600
	mg/kg		Hg (mercury)	< 0.12	< 0.12	< 0.8	< 0.8	< 0.8	< 0.8	< 0.02	< 0.02	< 0.8	< 0.02	0	0.05	0	0
	mg/kg		Mg (magnesium)												5850		
	mg/kg		Mn (manganese)	320	510	207.8	187	116	73.9	130	190	208	130	180	< 688	150	260
	mg/kg		Mo (molybdenum)												2		
	mg/kg		Ni (nickel)	5.3	11	< 12.9	< 12.9	< 12.9	< 12.9	8.4	6.7	< 12.9	6.8	< 10	19	< 10	10
	mg/kg		Pb (lead)	1.2	0.91	6.3	3.4	3.3	3.4	< 1	< 1	3.1	< 1	< 10	15	< 10	< 10
	mg/kg		Sb (antimony)												< 4		
	mg/kg		Se (selenium)	< 0.87	< 0.84										< 10		
	mg/kg		Sn (tin)												< 2		
	mg/kg		Sr (strontium)												29.4		
	mg/kg		Ti (titanium)												20		
	mg/kg		Zn (zinc)	15.2	25.4	25.4	16.7	5.9	10.2	10	9.8	23.3	9.5	10	64.2	10	10
	mg/kg		V (vanadium)												< 20		
PCB'S	ug/kg		Aroclor-1006	< 1.44	< 1.43												
	ug/kg		Aroclor-1221	< 1.44	< 1.43												
	ug/kg		Aroclor-1232	< 1.44	< 1.43												
	ug/kg		Aroclor-1242	< 1.44	< 1.43												
	ug/kg		Aroclor-1248	< 1.44	< 1.43												
	ug/kg		Aroclor-1254	< 3	< 2.98												
	ug/kg		Aroclor-1260	< 3	< 2.98												
	ug/kg		Total PCB's			0	0	0	0	0	0	0	0	2	0	0	0
PARTICLE SIZE %FINER			3 in											100		100	100
			1 1/2											100		100	100
			3/4											100		100	100
			3/8											100		100	100
	SAND	coarse	4	100	96.5									100		100	99
			8														
			10	99.7	84.3		19.2					66.4		96		99	94
		medium	16	95.6	58.8												
			20											70.0		91.0	72.0
			30	52.2	27.8												
			40				1.6					2.5		15.0		53.0	21.0
			50	52.2	27.8												
		fine	70														
			80	2.9	11.6									2.0		2.0	3.0
			100	0.3	8.1												
			140	0.2			0.2					0.8					
	SILT CLAY		200	0.1										1.0		1.0	2.0
			270				0.0					0.5					
			0.20 mm											1.0		0.0	1.0
			0.05 mm											0.0		0.0	0.0
MISC	%		Total Organic Carb	0.036	0.066	0.45	0.57					0.18					
	mg/kg		Chem Oxy Demand											970		3700	1800
	mg/kg		Kjedahl Nitrogen											400		300	300
	mg/kg		Total Phosph											190		140	230
	mg/kg		Oil and Grease											0		0	0
	mg/kg		Cyanide, Total	< 0.63	< 0.6												
	mg/kg		Ammonia	0.5	1.00												
	mg/l		Ammonia Elutriate														
	%		Moisture	20	16.8												
	%		Total Solids	80	83.2												
	%		Volatile Solids	0.5	0.7												

Table 7. Contaminant Data for Pool 5 of the Upper Mississippi River

			Record #	160	447	161	162	163	164	448	165	449	166	167	450	168	169
			River Mile	748.2	747.9	747.8	747.72	747.7	747.3	747.1	746.3	746.3	746.0	746.0	745.8	745.3	745.2
			Location	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	BELOW WEST NEWTON	BELVEDERE ISLAND	BELOW WEST NEWTON	BELOW WEST NEWTON	FISCHER ISLAND	R-WEAVER BOTTOMS	FISCHER ISLAND
			Year	1980	1989	1980	1974	1975	1980	1989	1980	1989	1979	1979	1989	1984	1975
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	3	1
			Pool	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 0.74					< 0.07		< 0.07			< 0.07		
	ug/kg		b-BHC		< 1.49					< 0.15		< 0.14			< 0.15		
	ug/kg		BHC		< 2.23					< 0.22		< 0.21			< 0.22		
	ug/kg		g-BHC (lindane)		< 0.99					< 0.1		< 0.1			< 0.1		
	ug/kg		Heptachlor		< 0.74					< 0.07		< 0.07			< 0.07		
	ug/kg		Aldrin		< 0.99					< 0.1		< 0.1			< 0.1		
	ug/kg		Heptachlorepoxide		< 1.24					< 0.12		< 0.12			< 0.12		
	ug/kg		Endosulfan I		< 1.24					< 0.12		< 0.12			< 0.12		
	ug/kg		Dieldrin	0	< 1.24	< 0.2	< 10		0	< 0.12	0	< 0.12	0	0	< 0.12	< 0.5	
	ug/kg		4,4'-DDE	0	< 0.99	< 0.2	10		0	< 0.1	0	< 0.1	0	0	< 0.1	< 0.5	
	ug/kg		Endrin	0	< 2.23	< 0.2	< 10		0	< 0.22	0	< 0.21	0	0	< 0.22	< 0.5	
	ug/kg		Endosulfan II		< 2.48					< 0.27		< 0.24			< 0.25		
	ug/kg		4,4'-DDD	0	< 2.73	< 0.2	< 10		0	< 0.27	0	< 0.26	0	0	< 0.27	< 0.5	
	ug/kg		Endrinaldehyde		< 2.73					< 0.27		< 0.26			< 0.27		
	ug/kg		Sulfan sulfate		< 2.73					< 0.31		< 0.26			< 0.27		
	ug/kg		4,4'-DDT	0	< 3.22	< 0.4	< 10		0	< 0.53	0	< 0.31	0	0	< 0.32	< 0.5	
	ug/kg		Methoxychlor		< 5.46					< 0.27		< 0.52			< 0.54		
	ug/kg		Endriniketone		< 2.73					< 1.45		< 0.26			< 0.27		
	ug/kg		Chlorodane	0	< 14.88	< 0.4	< 10		0	< 1.45	0	< 1.43	0	0	< 1.48	< 0.5	
	ug/kg		Toxaphene		< 14.88					< 1.45		< 1.43			< 1.48		
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	< 0.76		< 0.6	0.57	0	< 0.72	0	1.4	0	0	1.1	13	0.38
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	30					30		40		20	30			
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 1.2	0.812	1	< 0.1	< 10	< 1.1	< 10	< 1.1	< 10	< 10	< 1.1	1.1	< 0.1
	mg/kg		Cr (chromium)	< 10	5	28.3	7	7.7	10	5.2	< 10	7	< 10	< 10	5.5	26	5.9
	mg/kg		Cu (copper)	< 10	4.3	7.44	7	19.8	< 10	11.2	< 10	10.9	< 10	< 10	7	13	5.7
	mg/kg		Fe (iron)	1800		8930			1900		2300		2800	2900		21000	
	mg/kg		Hg (mercury)	0	< 0.13	< 0.01	0.9	0.059	0	< 0.12	0	< 0.12	0	0	< 0.12		0.031
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	180	375				220	267	300	324	240	190	315		
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	8.3	23.7	5		< 10	5.7	10	9.2	< 10	< 10	8.4	23	
	mg/kg		Pb (lead)	< 10	1.6	3.82	< 10	< 0.1	< 10	0.86	< 10	2.7	< 10	< 10	0.6	17	< 0.1
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)		< 0.88					< 0.84		< 0.85			< 0.87		
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Tl (titanium)														
	mg/kg		Zn (zinc)	6.3	15.2	37.3	30	21.1	8.2	16	9.9	16.6	10	10	15.3	55	19
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1221		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1232		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1242		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1248		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1254		< 31					< 3.03		< 2.98			< 3.08		
	ug/kg		Aroclor-1260		< 31					< 3.03		< 2.98			< 3.08		
	ug/kg		Total PCB's	1		1	0	0	0		2		0	0		16	0
PARTICLE SIZE %FINER	SAND	coarse	3 in	100		100	100	100	100		100		100	100		100	100
			1 1/2	100		100	100	100	100		100		100	100		100	100
			3/4	100		100	100	100	100		100		100	100		100	100
			3/8	100		100	100	100	95		100		100	100		100	100
			4	100	99.8	95	100	97	88	99.5	97	94.5	100	96	99.0	99	100
			8	100		91	98	94	79		90					99	99
			10		99.1					97.3		85.8	100	79	96.7	98	
		medium	16	96.0	95.3	86.0	94.0	90.0	70.0	90.7	79.0	71.4			91.9	97.0	98.0
			20										91.0	55.0		96.0	
			30		58.7					52.3		34.4			54.5	95.0	
			40	35.0		32.0	34.0	39.0	22.0		22.0		37.0	13.0		93.0	37.0
			50		58.7					52.3		34.4			54.5	90.0	
		fine	70													87.0	
			80		6.5					10.9		1.7	1.0	2.0	3.8	86.0	
			100	0.0	0.3	0.0	1.0	4.0	0.0	0.1	0.0	0.1			0.2	84.0	4.0
			140		0.2												
	SILT CLAY		200	0.0		0.0	0.0	3.0	0.0		0.0		1.0	1.0		67.0	3.0
			270													46.0	
			0.20 mm	0.0		0.0	0.0		0.0		0.0		0.0	0.0		17.0	
			0.05 mm	0.0		0.0	0.0		0.0		0.0		0.0	0.0		5.0	
MISC	%		Total Organic Carb		0.035					0.044		0.045			0.038		
	mg/kg		Chem Oxy Demand	710		1110	1096	4340	930		710		1000	550		82000	2810
	mg/kg		Kjedahl Nitrogen	75			52		4300		450		400	300		1300	
	mg/kg		Total Phosph			589	177						170	230		14000	
	mg/kg		Oil and Grease	0		2130	699	1471	0		0		0	0		18000	973
	mg/kg		Cyanide, Total		< 0.63					< 0.6		< 0.61			< 0.62		
	mg/kg		Ammonia		0.50					< 0.24		0.3			0.37		
	mg/l		Ammonia Elutriate														
	%		Moisture		20.6					16.7		17.8			19.9		
	%		Total Solids		79.4					83.3		82.2			80.1		
	%		Volatile Solids		0.4					0.4		0.5			0.4		

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	36	37	38	407			39	40	417	408	41	418	42	410
			River Mile	843.36	840.71	840.7	840.5	840.5	840.5	840.4	840.32	840.2	840	839.7	839.6	839.5	839.2
			Location	LOW. MOUTH MN. RIVER	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	SMITH AVE BRIDGE 2	SMITH AVE BRIDGE 1	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	AB&BW SMITH AVE BR	ST. PAUL SM BOAT	ST. PAUL SM BOAT HRBR	HARRIET IS.	HARRIET IS.
			Year	1974	1978	1978	1989	1994	1994	1975	1974	1989	1989	1981	1989	1980	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	2	2	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.1	< 0.24	< 0.22			< 0.08	< 0.08		< 0.09		< 0.15
	ug/kg		b-BHC				< 0.2	1.7	< 0.22			< 0.16	< 0.15		< 0.19		< 0.3
	ug/kg		BHC				< 0.29	< 0.24	< 0.22			< 0.24	< 0.23		< 0.28		< 0.45
	ug/kg		g-BHC (lindane)				< 0.13	< 0.24	< 0.22			< 0.11	< 0.1		< 0.13		< 0.2
	ug/kg		Heptachlor				< 0.1	< 0.24	< 0.22			< 0.08	< 0.08		< 0.09		< 0.15
	ug/kg		Aldrin				< 0.13					< 0.11	< 0.1		< 0.13		< 0.2
	ug/kg		Heptachlorepoxide				< 0.16					< 0.14	< 0.13		< 0.16		< 0.25
	ug/kg		Endosulfan I				< 0.16					< 0.14	< 0.13		< 0.16		< 0.25
	ug/kg		Dieldrin	< 10	0	0	< 0.16	< 0.48	< 0.44		< 10	< 0.14	< 0.13	1.5	< 0.16	0	< 0.25
	ug/kg		4,4'-DDE	< 10	0	0	< 0.13	< 0.48	< 0.44		< 10	< 0.11	< 0.1	< 0.1	< 0.13	0.8	< 0.2
	ug/kg		Endrin	< 10	0	1	< 0.29	< 0.48	< 0.44		< 10	< 0.24	< 0.23	< 0.1	< 0.28	0	< 0.45
	ug/kg		Endosulfan II				< 0.33					< 0.27	< 0.26		< 0.31		< 0.5
	ug/kg		4,4'-DDD	< 10	0.4	0	< 0.36	< 0.48	< 0.44		< 10	< 0.3	< 0.28	1.5	< 0.35	0	< 0.55
	ug/kg		Endrinaldehyde				< 0.36					< 0.3	< 0.28		< 0.35		< 0.55
	ug/kg		Sulfan sulfate				< 0.36					< 0.3	< 0.28		< 0.35		< 0.55
	ug/kg		4,4'-DDT	< 10	0	0	< 0.42	< 0.48	< 0.44		< 10	< 0.35	< 0.33	0.9	< 0.41	0	< 0.65
	ug/kg		Methoxychlor				< 0.72					< 0.59	< 0.56		< 0.69		< 1.1
	ug/kg		Endrinketone				< 0.36					< 0.3	< 0.28		< 0.35		< 0.55
	ug/kg		Chlorodane	< 10	0	0	< 1.96	< 0.24	< 0.22		< 10	< 1.62	< 1.54	7	< 1.88	0	< 3
	ug/kg		Toxaphene				< 1.54					< 1.88	< 1.38		< 1.46		< 2.68
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	< 0.8	0	0	2.7	0.72	0.68	0.36	< 0.8	2.7	< 1	29	2.5	0	5.8
	mg/kg		B (boron)														
	mg/kg		Ba (barium)		20	20								100		30	
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 1	< 10	< 10	< 1.7	< 0.11	< 0.11	< 0.1	< 1	< 1.7	< 1.1	3	< 1.5	< 10	< 2.4
	mg/kg		Cr (chromium)	15	< 10	< 10	11.75	6.7	5.9	8.6	12	7.4	6.4	10	7.7	10	26.2
	mg/kg		Cu (copper)	10	< 10	< 10	19.8	2.6	5.3	3.5	3	10.9	8	18	10.4	30	24
	mg/kg		Fe (iron)		3500	3400								1200		2700	
	mg/kg		Hg (mercury)	4.6	0	0	0.64	< 0.04	< 0.04	0.079	0.6	0.034	< 0.01	< 0.01	0.037	0	0.093
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)		210	210	777.5	197	632			427	81.1	1100	558	240	1400
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	12	< 10	< 10	11.15	6.2	8.4		12	< 8.4	< 5.7	20	8.6	10	19
	mg/kg		Pb (lead)	< 10	< 10	< 10	23.75	1.9	2.3	< 0.1	12	26.9	3.8	40	8.1	10	32
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				1.7					< 1.2	< 0.81		< 1.1		2.8
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	19	10	10	55.55	11.5	14.9	16.1	18	38	24.7	67	40.8	1.9	97.1
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1221				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1232				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1242				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1248				< 1.96	< 4.8	< 4.4			< 1.62	< 1.54		< 1.88		< 3
	ug/kg		Aroclor-1254				< 4.08	< 4.8	< 4.4			< 3.38	< 3.2		< 3.93		< 6.25
	ug/kg		Aroclor-1260				< 4.08	< 4.8	< 4.4			< 3.38	< 3.2		< 3.93		< 6.25
	ug/kg		Total PCB's	0	5	0					0	0		8		6	
PARTICLE SIZE %FINER		SAND coarse	3 in		100	100				100	100					100	
			1 1/2	96	100	100				100	100			100		100	
			3/4	90	100	100				100	100			100		100	
			3/8	83	100	79				89	100			100		94	
			4	72	99	60	100	99.3	58.3	79	98	100	96.9	100	100	82	100
			8	56						57	90			100		82	
			10		95	34	99.7	96.3	42.6			96.6	86.1		100		99.2
		SAND medium	16	40.0			96.1			43.0	23.0	91.5	68.7	100	99.7	80.0	99.2
			20		75.0	15.0		75.4	30.7								
			30				84.1					87.6	35.0	100	98.8		96.8
			40	12.0	38.0	7.0		23.9	12.9	7.0	12.0			100		58.0	
			50				84.1					87.6	35.0	100	98.8		96.8
		SAND fine	70											99.0			
			80		7.0	4.0	69.3					83.3	16.4		97.5		94.4
			100	0.0			29.7	5.5	1.0	1.0	0.0	25.9	1.3	98.0	48.4	26.0	75.4
			140				24.8	4.6	0.7			19.0	1.1		40.0		69.1
		SILT CLAY	200	0.0	3.0	3.0	18.2	3.0	0.4	0.0	0.0	16.0	0.9	92.0	27.0	20.0	48.4
			270				13.6					9.7	0.7	85.0	17.5		33.6
			0.20 mm	0.0	0.5	0.0	10.5			0.0	0.0	6.7	0.5	51.0	12.9	12.0	25.2
			0.05 mm	0.0	0.0	0.0	7.0			0.0	0.0	6.0	0.4	22.0	10.4	4.0	16.1
MISC	%		Total Organic Carb				2.43	0.061	0.069			4.37	2.61		3.39		5.58
	mg/kg		Chem Oxy Demand	1401	4400	2900				1850	< 487			62000		9100	
	mg/kg		Kjedahl Nitrogen	186	330	330				--	447			6030		900	
	mg/kg		Total Phosph	192	160	470				--	216			--		--	
	mg/kg		Oil and Grease	256	0	0				47	773			0		0	
	mg/kg		Cyanide, Total				< 0.91	< 0.06	< 0.06			< 0.91	< 0.62		< 0.83		< 1.3
	mg/kg		Ammonia				87					94	5.3		90		176
	mg/l		Ammonia Elutriate					< 0.06	< 0.06								
	%		Moisture				44.6	16.3	15.7			45.1	18.9		39.5		62.2
	%		Total Solids				55.4	83.7	84.3			54.9	81.1		60.5		37.8
	%		Volatile Solids				4.5	1.19	1.23			4.8	0.8		4.2		7.8

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	43	44	45	1094	1100	1097	1113	1109	1105	1114	1127	1122	1126	1118
		River Mile	839.02	839.01	839	839	839	839	839	839	839	839	839	839	839	839
		Location	HARRIET IS.	HARRIET IS.	HARRIET IS.	St. Paul -North	St. Paul - south	St. Paul - mid	St. Paul - south	St. Paul - mid	St. Paul -North	St. Paul - mean	St. Paul - mean	St. Paul - mid	St. Paul - south	St. Paul - north
		Year	1978	1978	1978	1981	1981	1981	1982	1982	1982	1982	1983	1983	1983	1983
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	1	1	1	3	3	3	3	3	3	3	3	3	3	3
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg	a-BHC										< 5	5	< 0.53	< 0.53	5.7
	ug/kg	b-BHC										< 10	< 1.1	< 1.1	< 1.1	< 1.1
	ug/kg	BHC														
	ug/kg	g-BHC (lindane)										20	< 0.53	< 0.53	< 0.53	< 0.53
	ug/kg	Heptachlor										4	< 0.53	< 0.53	< 0.53	< 0.53
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin	0	0	0							< 20	< 1.6	< 1.6	< 1.6	< 1.6
	ug/kg	4,4'-DDE	0	0.5	0							< 7	< 1.6	< 1.6	< 1.6	< 1.6
	ug/kg	Endrin	0	0	0							< 10	< 2.1	< 2.1	< 2.1	< 2.1
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD	0	2.1	0.2							< 14	< 3.2	< 3.2	< 3.2	< 3.2
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT	0	0	0							< 20	< 4.2	< 4.2	< 4.2	< 4.2
	ug/kg	Methoxychlor														
	ug/kg	Endriniketone														
	ug/kg	Chlorodane	0	4	0							< 2	< 11	< 11	< 11	< 11
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)				0.13	0.071	0.199	0.228	0.129	0.121			0.136	0.329	0.076
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	0	2	0	4.51	0.98	1.09	5.09	2.31	1.11			2.95	2.91	1.38
	mg/kg	B (boron)														
	mg/kg	Ba (barium)	30	140	10											
	mg/kg	Be (beryllium)				0.38	0.137	0.266	0.553	0.28	0.117			0.119	0.168	0.129
	mg/kg	Cd (cadmium)	< 10	< 10	< 10	0.1	0.219	0.096	0.316	0.087	0.079			0.138	0.156	0.093
	mg/kg	Cr (chromium)	< 10	10	< 10	24.5	17.3	26.3	24.4	22.2	7.9			24	36.7	17.2
	mg/kg	Cu (copper)	10	20	< 10	5.6	5.6	7.7	14.3	6.4	4.2			6.9	11.2	3.9
	mg/kg	Fe (iron)	3700	14000	4000											
	mg/kg	Hg (mercury)	0	0	0	0.05	0.05	0.17	0.05	0.06	0.06			0.05	0.05	0.05
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	140	1900	290				908.7	525	266.2					
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	30	20	10	15.3	14.2	14.1	15.6	11	6			10.9	16.8	9.8
	mg/kg	Pb (lead)	30	60	40	31.1	8.4	20.4	14.4	7.8	6			13.1	18.2	16.5
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)				0.16	0.37	0.52	0.07	0.06	0.06			0.08	0.05	0.05
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)							0.9	0.7	0.7			0.4	0.6	0.6
	mg/kg	Zn (zinc)	68	80	20	54.7	22.3	37.7	60.1	29	18.7			26.9	35	15.3
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006										50	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg	Aroclor-1221														
	ug/kg	Aroclor-1232														
	ug/kg	Aroclor-1242														
	ug/kg	Aroclor-1248														
	ug/kg	Aroclor-1254										1100	54	11	16	34
	ug/kg	Aroclor-1260										< 20	47	6.3	29	16
	ug/kg	Total PCB's	0	66	10											
PARTICLE SIZE %FINER	SAND coarse	3 in	100	100	100											
		1 1/2	100	100	100											
		3/4	100	100	98											
		3/8	100	100	83											
		4	100	100	63											
		8														
		10	98	98	27											
	SAND medium	16														
		20	92.0	87.0	9.0											
		30														
		40	33.0	77.0	5.0											
		50														
	SAND fine	70														
		80	15.0	72.0	4.0											
		100														
		140														
	SILT CLAY	200	5.0	68.0	3.0											
		270														
		0.20 mm	1.0	48.0	0.0											
		0.05 mm	0.0	25.0	0.0											
MISC	%	Total Organic Carb														
	mg/kg	Chem Oxy Demand	3300	66000	3500											
	mg/kg	Kjedahl Nitrogen	300	9800	250											
	mg/kg	Total Phosph	140	1100	370											
	mg/kg	Oil and Grease	0	0	0											
	mg/kg	Cyanide, Total														
	mg/kg	Ammonia														
	mg/l	Ammonia Elutriate														
	%	Moisture														
	%	Total Solids														
	%	Volatile Solids														

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	1139	1135	1131	1139	1138	1152	1147	1151	1143	409	46	411	47	48
		River Mile	839	839	839	839	839	839	839	839	839	839	838.5	837.8	837.52	837.51
		Location	St. Paul - mean -dup	St. Paul - mid	St. Paul - north	St. Paul - mean	St. Paul - south	St. Paul - mean	St. Paul - mid	St. Paul - south	St. Paul - north	HARRIET IS.	HARRIET IS.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.
		Year	1984	1984	1984	1984	1984	1985	1985	1985	1985	1989	1980	1989	1975	1975
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	3	3	3	3	3	3	3	3	3	1	1	1	1	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Cit.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE	COE	COE	COE	COE
CHC'S	ug/kg	a-BHC	6.8	< 0.32	7.9	6.2	1.2	0.98				< 0.07		< 0.13		
	ug/kg	b-BHC	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.53				< 0.14		< 0.27		
	ug/kg	BHC										< 0.21		< 0.4		
	ug/kg	g-BHC (lindane)	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.26				< 0.09		< 0.18		
	ug/kg	Heptachlor	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.26				< 0.07		< 0.13		
	ug/kg	Aldrin										< 0.09		1.1		
	ug/kg	Heptachlorepoxide										< 0.12		< 0.22		
	ug/kg	Endosulfan I										< 0.12		< 0.22		
	ug/kg	Dieldrin	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.79				< 0.12	0	< 0.22		
	ug/kg	4,4'-DDE	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 0.79				< 0.09	7.3	< 0.18		
	ug/kg	Endrin	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.1				< 0.21	0	< 0.4		
	ug/kg	Endosulfan II										< 0.23		< 0.45		
	ug/kg	4,4'-DDD	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.6				< 0.25	5.9	< 0.49		
	ug/kg	Endrinaldehyde										< 0.25		< 0.49		
	ug/kg	Sulfan sulfate										< 0.25		< 0.49		
	ug/kg	4,4'-DDT	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.1				< 0.3	0	< 0.58		
	ug/kg	Methoxychlor										< 0.51		< 0.98		
	ug/kg	Endrinketone										< 0.25		< 0.49		
	ug/kg	Chlorodane	< 6.4	< 6.4	< 6.4	< 6.4	< 6.4	267				< 1.38	5	< 2.68		
	ug/kg	Toxaphene										< 3		< 2.09		
METALS	mg/kg	Ag (silver)		0.105	0.039		0.196		0.144	0.025	0.013					
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)		1.95	5.49		3.88		3.78	2.88	2.12	< 0.98	0	4.5	1.56	1.5
	mg/kg	B (boron)														
	mg/kg	Ba (barium)											120			
	mg/kg	Be (beryllium)		0.219	0.187		0.68		0.231	0.216	0.111					
	mg/kg	Cd (cadmium)		0.181	0.083		0.675		0.28	0.037	0.022	< 1.1	< 10	< 2.2	0.9	1
	mg/kg	Cr (chromium)		12.8	9.1		22.5		22	16.9	7.8	8	20	13.6	10.9	13.3
	mg/kg	Cu (copper)		7.7	4		13.9		9.6	6.7	2.5	15.1	< 10	11	9.7	10.4
	mg/kg	Fe (iron)											8800			
	mg/kg	Hg (mercury)		0.15	0.05		0.05		0.06	0.05	0.05	< 0.01	0	0.066	0.058	0.051
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)		359	553.5		991.9		561.4	246.7	223.3	230	1400	713		
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)		7.5	6.8		17.8		11.5	9.2	5.4	6.1	20	< 11		
	mg/kg	Pb (lead)		10.8	4.1		15.5		22.2	4.7	5	9.5	50	36.7	28.4	36.5
	mg/kg	Sb (antimony)							12.2	7.7	5.8					
	mg/kg	Se (selenium)		0.12	0.12		0.12		0.12	0.12	0.13	< 0.77		< 1.6		
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)		0.6	0.6		0.6		4.5	3.2	2.4					
	mg/kg	Zn (zinc)		26.3	17.5		59.6		28.7	17.2	12.7	16	77	50.9	41.3	42.7
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	< 3.2	< 3.2	< 3.2	< 3.2	< 3.2	145				< 1.38		< 2.68		
	ug/kg	Aroclor-1221										< 1.38		< 2.68		
	ug/kg	Aroclor-1232										< 1.38		< 2.68		
	ug/kg	Aroclor-1242										< 1.38		< 2.68		
	ug/kg	Aroclor-1248										< 1.38		< 2.68		
	ug/kg	Aroclor-1254	63	14	37	51	19	< 5.3				< 2.88		< 5.58		
	ug/kg	Aroclor-1260	34	8.8	17	30	33	12.2				< 2.88		< 5.58		
	ug/kg	Total PCB's											29		0	0
PARTICLE SIZE %FINER	SAND coarse	3 in											100		100	100
		1 1/2											100		100	100
		3/4											100		100	100
		3/8											100		100	100
		4										90.4	100	99.2	99	99
		8											100		99	99
		10										76.9		94.6		
	medium	16										53.7	99.0	93.7	96.0	96.0
		20														
		30										31.2		76.0		
		40											85.0		53.0	53.0
		50										31.2		76.0		
	fine	70														
		80										14.4		60.9		
		100										0.1	58.0	41.1	19.0	19.0
		140												35.7		
	SILT CLAY	200											36.0	24.0	9.0	9.0
		270												16.5		
		0.20 mm											19.0	14.9		
		0.05 mm											9.0	8.5		
MISC	%	Total Organic Carb										0.034		6.24		
	mg/kg	Chem Oxy Demand											690		15755	16600
	mg/kg	Kjedahl Nitrogen											7400		--	--
	mg/kg	Total Phosph											--		--	--
	mg/kg	Oil and Grease											0		1625	1712
	mg/kg	Cyanide, Total										< 0.58		< 1.2		
	mg/kg	Ammonia										0.81		110		
	mg/l	Ammonia Elutriate														
	%	Moisture										14.1		59		
	%	Total Solids										85.9		41		
	%	Volatile Solids										0.9		6.5		

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	1C	1T		2C	3C	2T	2B	3B	3T	49	50	4B	5B	5C
			River Mile	837.5	837.5	837.5	837.4	837.4	837.4	837.4	837.4	837.4	837.21	837.2	837.2	837.2	837.2
			Location	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	STPBH 1	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.
			Year	1992	1992	1994	1992	1992	1992	1992	1992	1992	1978	1974	1992	1992	1992
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	2	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	4	4	1	4	4	4	4	4	4	1	1	4	4	4
			Sam. Depth	10-244	10	10	10-128	10-259	10	128	259	10	10	10	207	229	10-229
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg		b-BHC	< 1.1	< 1	0.92	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg		BHC	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg		g-BHC (lindane)	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg		Heptachlor	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8			< 0.79	< 0.79	< 0.9
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	1.9	< 10	< 0.79	< 0.79	< 0.9
	ug/kg		4,4'-DDE	1.5	2.6	< 0.62	< 1	< 1	< 0.7	3.6	1.4	< 0.8	0	< 10	< 0.79	< 0.79	< 0.9
	ug/kg		Endrin	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	0	< 10	< 0.79	< 0.79	< 0.9
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	3.8	< 10	< 0.79	< 0.79	< 0.9
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT	< 1.1	< 1	< 0.62	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	0	< 10	< 0.79	< 0.79	< 0.9
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane	< 1.1	< 1	< 0.31	< 1	< 1	< 0.7	< 1.2	< 1	< 0.8	9	< 10	< 0.79	< 0.79	< 0.9
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	5.9	3.2	3.5	4.5	5.1	2.2	6.9	3.6	1.9	2	< 0.8	1.3	2.3	5.4
	mg/kg		B (boron)														
	mg/kg		Ba (barium)										100				
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	0.41	0.36	0.43	0.35	0.29	0.12	1	0.26	0.09	< 10	0.9	0.06	0.17	0.29
	mg/kg		Cr (chromium)	11	6.5	14	8.5	10	3.4	15	8.7	4.9	10	9	2.5	5.6	8.6
	mg/kg		Cu (copper)	19	6.5	9	16	16	4	42	13	4.3	20	2	1.4	5.8	10
	mg/kg		Fe (iron)										12000				
	mg/kg		Hg (mercury)	< 0.1	< 0.1	< 0.05	< 0.1	< 0.1	< 0.1	0.13	< 0.1	< 0.1	0	1.1	< 0.1	< 0.1	< 0.1
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	1100	390	563	926	940	260	1400	690	280	1300		140	300	620
	mg/kg		Mo (molybdenum)	<													
	mg/kg		Ni (nickel)	12	8.2	11	11	14	4.7	13	11	6.2	30	5	2.9	7	11
	mg/kg		Pb (lead)	21	< 2.5	10	9.2	8.9	< 2.5	35	< 9.7	< 2.5	60	< 9	< 2.5	6.5	7
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)														
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	66	26	40.7	48	49	15	100	45	21	70	12	9.4	27	40
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg		Aroclor-1221	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg		Aroclor-1232	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg		Aroclor-1242	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg		Aroclor-1248	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg		Aroclor-1254	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg		Aroclor-1260	< 11	< 10	< 6.2	< 10	< 10	< 7	< 12	< 10	< 8			< 7.9	< 7.9	< 9
	ug/kg		Total PCB's										200	0			
PARTICLE SIZE %FINER		SAND coarse	3 in										100	100			
			1 1/2										100	100			
			3/4										100	100			
			3/8										100	100			
			4										100	100			
			8											96			
			10			100							100				
		SAND medium	16											90.0			
			20			99.8							100				
			30														
			40			99.5							100	20.0			
			50														
		SAND fine	70														
			80										94.0				
			100			95.6								0.0			
			140			86.3											
		SILT CLAY	200			76.0							83.0	0.0			
			270														
			0.20 mm										45.0	0.0			
			0.05 mm										22.0	0.0			
MISC	%		Total Organic Carb			0.744											
	mg/kg		Chem Oxy Demand										73000	1874			
	mg/kg		Kjedahl Nitrogen										7300	134			
	mg/kg		Total Phosph										960	210			
	mg/kg		Oil and Grease										0	318			
	mg/kg		Cyanide, Total	0.5	0.5	0.63	0.5	0.5	0.5	0.5	0.5	0.5			0.5	0.5	0.5
	mg/kg		Ammonia	28	2.1		19	15	0.49	30	14	1.7			3.7	4.7	8.3
	mg/l		Ammonia Elutriate			1.5											
	%		Moisture			36.2											
	%		Total Solids	57.5	72.1	63.8	60.1	63	78.3	47.8	57.6	68.1			76.3	72.8	67.2
	%		Volatile Solids	6.5	2.7	4.66	5.8	4.8	1.2	9.4	4.9	1.7			1.2	2.7	4.5

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	5T	4C		51	52	W3	W1	W2	412	53	54	55	413	56
			River Mile	837.2	837.2	837.2	837.19	837	836.8	836.8	836.8	836.6	835.07	833.03	832.4	832.1	831.5
			Location	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	STPBH 2	ST. PAUL BARGE TERM.	ST. PAUL BARGE TERM.	Wetland/Holme n Field	Wetland/Holme n Field	Wetland/Holme n Field	ST. PAUL BARGE TERM.			BELOW CUDAHY	BELOW CUDAHY	BELOW CUDAHY
			Year	1992	1992	1994	1978	1980	1992	1992	1992	1989	1974	1974	1981	1989	1980
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	2	1	1				1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	4	4	1	1	1				1	1	1	1	1	1
			Sam. Depth	10	10-207	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.1				< 0.1	
	ug/kg		b-BHC	< 0.9	< 0.86	0.45			< 1.2	< 1.4	< 1.2	< 0.21				< 0.21	
	ug/kg		BHC	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.31				< 0.31	
	ug/kg		g-BHC (lindane)	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.14				< 0.14	
	ug/kg		Heptachlor	< 0.9	< 0.86	< 0.23			< 1.2	< 1.4	< 1.2	< 0.1				< 0.1	
	ug/kg		Aldrin									< 0.14				1	
	ug/kg		Heptachlorepoxide									< 0.17				< 0.17	
	ug/kg		Endosulfan I									< 0.17				< 0.17	
	ug/kg		Dieldrin	< 0.9	< 0.86	< 0.45	0	0.66	< 1.2	< 1.4	< 1.2	< 0.17	< 10	< 10	0.8	< 0.17	< 0.2
	ug/kg		4,4'-DDE	< 0.9	< 0.86	< 0.45	0	< 0.2	2.6	2.2	2.6	< 0.14	< 10	< 10	< 0.1	< 2.1	< 0.2
	ug/kg		Endrin	< 0.9	< 0.86	< 0.45	0	0.2	< 1.2	< 1.4	< 1.2	< 0.31	< 10	< 10	< 0.1	< 0.31	< 0.2
	ug/kg		Endosulfan II									< 0.35				< 0.34	
	ug/kg		4,4'-DDD	< 0.9	< 0.86	< 0.45	0.3	1.43	1.8	< 1.4	2.4	< 0.38	< 10	< 10	1.9	< 0.38	0.6
	ug/kg		Endrinaldehyde									< 0.38				< 0.38	
	ug/kg		Sulfan sulfate									< 0.38				< 0.38	
	ug/kg		4,4'-DDT	< 0.9	< 0.86	< 0.45	0	1.68	< 1.2	< 1.4	< 1.2	< 0.45	< 10	< 10	0.4	< 0.44	< 0.4
	ug/kg		Methoxychlor									< 0.77				< 0.75	
	ug/kg		Endrinketone									< 0.38				< 0.38	
	ug/kg		Chlorodane	< 0.9	< 0.86	< 0.23	1	3.05	< 1.2	< 1.4	< 1.2	< 2.09	< 10	< 10	4	< 2.05	0.83
	ug/kg		Toxaphene									< 2.05				< 2.42	
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	3.9	3	1.9	0		4.8	5.7	7	3.1	1.8	1.2	9	2.5	
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				10								50		
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	0.23	0.16	0.41	< 10	0.75	1.1	1	0.89	< 1.6	6	15	2	< 0.81	1.91
	mg/kg		Cr (chromium)	8.3	6.7	11.3	< 10	38.5	20	18	18	11.1	43	115	10	8.7	56.1
	mg/kg		Cu (copper)	10	7	3.4	< 10	8.8	37	34	32	10.8	33	36	11	7.3	9.58
	mg/kg		Fe (iron)				2600	14500							5000		12400
	mg/kg		Hg (mercury)	< 0.1	< 0.1	< 0.04	0	< 0.01	0.14	< 0.1	0.12	0.048	0.8	0.8	0.02	0.03	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	600	400	345	130		1200	1200	1300	609			490	283	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	10	7.5	11.1	< 10	22.4	21	20	19	9.2	33	42	< 10	5.8	22.9
	mg/kg		Pb (lead)	4.2	3.7	2.3	10	19.5	37	36	40	21.8	95	73	20	27.7	7.44
	mg/kg		Sb (antimony)		<												
	mg/kg		Se (selenium)									< 1.2				< 1.1	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	38	27	17.6	10	202	110	100	98	55.6	143	170	40	32.2	157
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1221	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1232	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1242	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1248	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 2.09				< 2.05	
	ug/kg		Aroclor-1254	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 4.35				< 4.28	
	ug/kg		Aroclor-1260	< 9	< 8.6	< 4.5			< 12	< 14	< 12	< 4.35				< 4.28	
	ug/kg		Total PCB's				11	15.9					0	0	20		4.81
PARTICLE SIZE %FINER	SAND	coarse	3 in				100	100									100
			1 1/2				100	100							100		100
			3/4				100	100							100		100
			3/8				100	100							100		100
			4			71.6	100	100				100			100	100	100
			8					100							96		100
			10			52.7	100					100				99.4	
		medium	16					100				99.5			88.0	98.2	88.0
			20			35.0	90.0										
			30									97.8			73.0	92.5	
			40			16.0	34.0	100							81.0		35.0
			50									97.8			50.0	92.5	
		fine	70												46.0		
			80				9.0					85.6				76.3	
			100			3.8		76.0				33.0			43.0	38.9	11.0
			140			3.6						29.0				34.9	
	SILT CLAY		200			3.0	4.0	42.0				19.5			34.0	24.9	11.0
			270									13.3			29.0	16.9	
			0.20 mm				0.0					9.3			15.0	12.3	
			0.05 mm				0.0	19.0				8.8			7.0	8.3	6.0
MISC	%		Total Organic Carb			0.075						6.69				2.19	
	mg/kg		Chem Oxy Demand				3500	18400					101355	75148	23000		6600
	mg/kg		Kjedahl Nitrogen				230	--					422	2797	4090		--
	mg/kg		Total Phosph				100	1770					1130	1687	--		1770
	mg/kg		Oil and Grease				0	560					1269	884	0		12400
	mg/kg		Cyanide, Total	0.5	0.5	< 0.06			0.5	0.5	0.5	< 0.89				< 0.87	
	mg/kg		Ammonia	4.1	5.1				0.82	3.8	0.18	77				164	
	mg/l		Ammonia Elutriate			< 0.06											
	%		Moisture			15.7						43.7				42.5	
	%		Total Solids	63.6	70.3	84.3			43.4	44.2	50	56.3				57.5	
	%		Volatile Solids	5.1	3.5	1.21			11.5	10.7	10.3	4				4.8	

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	78				1359		1229	1233	1236	1272	1298	1291	1254	1310
			River Mile	819.1	818.8	818.7	818.7	818.6	818.5	816.0	816.0	816.0	816.0	816.0	816.0	816.0	816
			Location	BOUL. BEND LOW LIGHT	NIN 818.8	818.4 - 818.9 NIN CDF 8/21	818.4 - 818.9 NIN CDF 8/29	Boul Bend Low Light 1	NIN 818.5	Ab. L/D 2 - east	Ab. L/D 2 - mid	Ab. L/D 2 - west	Ab. L/D 2 - mid	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - east	Ab. L/D 2 - east
			Year	1981	1995	1995	1995	1994	1995	1981	1981	1981	1982	1982	1982	1982	1983
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	1	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1			3	1	3	3	3	3	3	3	3	3
			Sam. Depth	10	10			10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC's	ug/kg		a-BHC		< 0.7	< 0.4	< 0.5	< 0.43	< .06					< 5			2.4
	ug/kg		b-BHC		< 0.7	< 0.4	< 0.5	1.6	< .06					< 10			< 1.1
	ug/kg		BHC		< 0.7	< 0.4	< 0.5	< 0.43	< .06								
	ug/kg		g-BHC (lindane)		< 0.7	< 0.4	< 0.5	< 0.43	< .06					11			< 0.53
	ug/kg		Heptachlor		< 0.7	< 0.4	< 0.5	< 0.43	< .06					5			< 0.53
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin	2.9	< 0.7	< 0.4	< 0.5	< 0.94	< .06					< 20			< 1.6
	ug/kg		4,4'-DDE	2.4	< 0.7	< 0.4	< 0.5	< 0.48	< .06					< 7			< 1.6
	ug/kg		Endrin	< 0.1	< 0.7	< 0.4	< 0.5	< 0.48	< .06					< 10			< 2.1
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD	6.30	< 0.7	1.20	1.90	< 0.48	< .06					< 14			< 3.2
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT	9.70	< 0.7	1.70	2.70	< 0.48	< .06					< 20			< 4.2
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane	7.00	< 1.1	< 0.6	< 0.8	< 0.43	< 0.9					< 2			< 11
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)							1.1	1.08	0.69	0.67		0.54	1.07	0.592
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	21	4.1	2.8	3.3	4.7	3.1	6.3	6.14	5.68	5.2		7	15	6.2
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	80													
	mg/kg		Be (beryllium)							0.641	0.54	0.529	0.43		0.5	0.77	0.281
	mg/kg		Cd (cadmium)	4	0.3	0.43	0.5	0.93	0.3	3.159	2.93	2.61	1.4		1	2.23	1.075
	mg/kg		Cr (chromium)	30	27	15	17	26.2	17	63.6	62.6	58.2	33.8		36.4	58.5	62.4
	mg/kg		Cu (copper)	18	17	13	18	21.5	14	33.8	31.5	28.3	17.2		18.8	31.3	17.7
	mg/kg		Fe (iron)	7100													
	mg/kg		Hg (mercury)	< 0.01	0.046	0.02	0.033	0.14	0.035	0.25	0.19	0.2	0.15		0.14	0.22	0.05
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	700	1300	970	1300	1210	830				698		906	1305	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	30	20	14	15	21.3	15	29.2	25.6	28.3	18.3		19.2	28.9	21.4
	mg/kg		Pb (lead)	30	10	12	15	16.5	11	40	37.7	33.5	19.4		18	32.7	18.2
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)							0.22	0.21	0.2	0.06		0.07	0.1	0.05
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)										0.8		0.8	0.9	0.3
	mg/kg		Zn (zinc)	62	71	64	67	82.8	56	152.7	128	113.4	70.6		75.9	153.4	84
	mg/kg		V (vanadium)														
PCB's	ug/kg		Aroclor-1006		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9					60			24
	ug/kg		Aroclor-1221		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1232		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1242		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1248		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg		Aroclor-1254		< 8.4	< 4.9	< 5.9	16	< 6.9					1100			5.7
	ug/kg		Aroclor-1260		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9					< 20			< 5.3
	ug/kg		Total PCB's	170													
PARTICLE SIZE %FINER		SAND coarse	3 in														
			1 1/2	100													
			3/4	100													
			3/8	100													
			4	100													
			8	100													
			10														
		SAND medium	16	99.0	100	100	100		100								
			20		99.5	99.6	99.5	100.0	99.4								
			30	97.0	99.3	99.0	99.5		99.1								
			40	95.0	98.3	97.6	98.8	99.7	98.8								
			50	92.0	83.2	60.6	83.5		70.2								
		SAND fine	70	90.0	82.9	60.1	83.1		70.0								
			80		82.9	60.1	83.1		70.0								
			100	88.0	82.9	60.1	83.1	98.9	70.0								
			140		82.9	60.1	83.1	96.7	70.0								
		SILT CLAY	200	87.0	82.9	60.1	83.1	96.2	70.0								
			270	85.0													
			0.20 mm	63.0													
			0.05 mm	29.0													
MISC	%		Total Organic Carb		2.3	3.4	2.1	> 1.6	1.4								
	mg/kg		Chem Oxy Demand	51000				86900									
	mg/kg		Kjedahl Nitrogen	4860													
	mg/kg		Total Phosph	--													
	mg/kg		Oil and Grease	0				1.7									
	mg/kg		Cyanide, Total		< 0.5	< 0.5	< 0.5	<0.11	< 0.5								
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate		1.7	< 0.1	11	1.7	0.7								
	%		Moisture		59	39	46	54.9	52.0								
	%		Total Solids		41	61	54	45.1	48.0								
	%		Volatile Solids		6.1	5	5.3	8.7	4.4								

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	1316	1326	1324	1338	1330	1334	1337	1130	1357	1357	1356	1352	1342	496
		River Mile	816.0	816.0	816.0	816.0	816	816.0	816.0	816.0	816.0	816.0	816.0	816.0	816.0	815.7
		Location	Ab. L/D 2 - mid	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - mean	Ab. L/D 2 - east	Ab. L/D 2 - mid	Ab. L/D 2 - west	Ab. L/D 2 - east	Ab. L/D 2 - mean-dup	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - mid	Ab. L/D 2 - east	ABOVE L/D 2
		Year	1983	1983	1983	1984	1984	1984	1984	1984	1985	1985	1985	1985	1985	1989
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	3	3	3	3	3	3	3	3	3	3	3	3	3	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE
CHC'S	ug/kg	a-BHC	2.000	9.70	12.000	13		1.600	1.2	12.000	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.08
	ug/kg	b-BHC	< 1.1	< 1.1	< 1.1	< 0.64		< 0.64	< 0.64	< 0.64	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.17
	ug/kg	BHC														< 0.25
	ug/kg	g-BHC (lindane)	< 0.53	< 0.53	< 0.53	4.1		< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.11
	ug/kg	Heptachlor	< 0.53	< 0.53	< 0.53	< 0.32		< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.08
	ug/kg	Aldrin														< 0.11
	ug/kg	Heptachlorepoxide														< 0.14
	ug/kg	Endosulfan I														< 0.14
	ug/kg	Dieldrin	< 1.6	< 1.6	< 1.6	< 0.96		< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79	< 0.14
	ug/kg	4,4'-DDE	< 1.6	< 1.6	< 1.6	< 0.96		< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79	< 0.11
	ug/kg	Endrin	< 2.1	< 2.1	< 2.1	< 1.3		< 1.3	< 1.3	< 1.3	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 0.25
	ug/kg	Endosulfan II														< 0.28
	ug/kg	4,4'-DDD	< 3.2	< 3.2	< 3.2	< 1.9		< 1.9	< 1.9	< 1.9	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 0.31
	ug/kg	Endrinaldehyde														< 0.31
	ug/kg	Sulfan sulfate														< 0.31
	ug/kg	4,4'-DDT	< 4.2	< 4.2	< 4.2	< 2.5		< 2.5	< 2.5	< 2.5	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 0.36
	ug/kg	Methoxychlor														< 0.62
	ug/kg	Endrinketone														< 0.31
	ug/kg	Chlorodane	< 11	< 11	< 11	< 6.4		< 6.4	< 6.4	< 6.4	< 5.3	< 5.3	< 5.3	115.00	< 5.3	< 1.68
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)	0.4885		0.1515		1.374	0.395	0.085				0.297	0.374	1.1	
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	7.6		7.4		5.06	2.99	5				6.79	9.92	8.53	< 1.18
	mg/kg	B (boron)														
	mg/kg	Ba (barium)														
	mg/kg	Be (beryllium)	0.2755		0.298		0.642	0.36	0.538				0.48	0.444	0.432	
	mg/kg	Cd (cadmium)	0.683		0.4895		3.101	0.875	0.252				1.244	1.242	1.618	< 1.3
	mg/kg	Cr (chromium)	80.7		92.6		49.2	22.6	31.4				27.3	27.2	27.2	12.1
	mg/kg	Cu (copper)	16.5		13.15		26.1	13.4	11.6				15	15.6	18.5	5.64
	mg/kg	Fe (iron)														
	mg/kg	Hg (mercury)	0.1		0.05		0.05	0.1	0.05				0.1	0.09	0.24	< 0.01
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)					932.6	649.9	1052.2				711.7	721.4	693.7	1860
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	24.55		25.4		24.3	15.5	22.2				15.5	14.7	14	15
	mg/kg	Pb (lead)	16.85		10.2		32.3	14.2	8.7				14.8	14.9	23.6	4.73
	mg/kg	Sb (antimony)											14	14.2	13.5	
	mg/kg	Se (selenium)	0.06		0.07		0.12	0.12	0.12				0.13	0.12	0.13	< 0.99
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)	0.7		0.6		0.6	0.6	0.6				5.4	5.4	5.2	
	mg/kg	Zn (zinc)	70.95		53.55		123.5	57.6	48.9				60.4	62.1	77.3	37
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	40.00	146	195.00	214		25	41	176.00	424	387	171	95	485	< 1.68
	ug/kg	Aroclor-1221														< 1.68
	ug/kg	Aroclor-1232														< 1.68
	ug/kg	Aroclor-1242														< 1.68
	ug/kg	Aroclor-1248														< 1.68
	ug/kg	Aroclor-1254	16	24	44	52		7.8	20	26	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3	< 3.5
	ug/kg	Aroclor-1260	6.1	10	21	27		< 3.2	10	13	7.7	7.2	27.2	31	29.4	< 3.5
	ug/kg	Total PCB's														
PARTICLE SIZE %FINER	SAND coarse	3 in														
		1 1/2														
		3/4														
		3/8														
		4														100
		8														
		10														97.0
	SAND medium	16														88.0
		20														
		30														69.5
		40														
		50														69.5
	SAND fine	70														
		80														53.9
		100														45.8
		140														35.7
	SILT CLAY	200														25.8
		270														17.8
		0.20 mm														12.6
		0.05 mm														9.4
MISC	%	Total Organic Carb														1.32
	mg/kg	Chem Oxy Demand														
	mg/kg	Kjedahl Nitrogen														
	mg/kg	Total Phosph														
	mg/kg	Oil and Grease														
	mg/kg	Cyanide, Total														< 0.68
	mg/kg	Ammonia														12
	mg/l	Ammonia Elutriate														
	%	Moisture														27
	%	Total Solids														73
	%	Volatile Solids														2.8

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	414	57	1164	1160	1156	416	58	59	60	1364	61	62	1365	63
			River Mile	831.2	831.1	831	831	831	828.2	828	827.91	827.9	827.9	827.85	827.84	827.8	827.7
			Location	BELOW CUDAHY	BELOW CUDAHY	Newport - west	Newport - mid	Newport - east	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	Grey Cloud Slough 2	GREY CLOUD SLOUGH	GREY CLOUD SLOUGH	Grey Cloud Slough 1	GREY CLOUD SLOUGH
			Year	1989	1981	1985	1985	1985	1989	1980	1978	1978	1994	1974	1974	1994	1975
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1	3	3	3	1	1	1	1	3	1	1	3	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	MWCC	MWCC	MWCC	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.12					< 0.77				< 0.25			< 0.24	
	ug/kg		b-BHC	< 0.24					< 1.54				< 0.25			< 0.24	
	ug/kg		BHC	< 0.36					< 2.3				< 0.25			< 0.24	
	ug/kg		g-BHC (lindane)	< 0.16					< 1.02				< 0.25			< 0.24	
	ug/kg		Heptachlor	< 0.12					< 0.77				< 0.25			< 0.24	
	ug/kg		Aldrin	0.4					< 1.02								
	ug/kg		Heptachlorepoxide	< 0.2					< 1.28								
	ug/kg		Endosulfan I	< 0.2					< 1.28								
	ug/kg		Dieldrin	< 0.2	2.7				< 1.28	< 0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		4,4'-DDE	< 0.16	< 0.1				< 1.02	< 0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Endrin	< 0.36	< 0.1				< 2.3	< 0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Endosulfan II	< 0.4					< 2.56								
	ug/kg		4,4'-DDD	< 0.44	5.6				< 2.82	0.2	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Endrinaldehyde	< 0.44					< 2.82								
	ug/kg		Sulfan sulfate	< 0.44					< 2.82								
	ug/kg		4,4'-DDT	< 0.53	1.2				< 3.33	< 0.4	0	0	< 0.49	< 10	< 10	< 0.48	
	ug/kg		Methoxychlor	< 0.89					< 5.63								
	ug/kg		Endrinketone	< 0.44					< 2.82								
	ug/kg		Chlorodane	< 2.42	8				< 15.36	< 0.4	0	0	< 0.25	< 10	< 10	< 0.24	
	ug/kg		Toxaphene	< 1.44					< 1.62								
METALS	mg/kg		Ag (silver)			0.055	0.064	0.068									
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	2.4	14	2.16	2.06	4.59	1.6		0	0	0.77	< 0.8	< 0.9	1.4	0.45
	mg/kg		B (boron)														
	mg/kg		Ba (barium)		60						10	10					
	mg/kg		Be (beryllium)			0.14	0.136	0.349									
	mg/kg		Cd (cadmium)	< 1.6	3	0.064	0.06	0.15	< 1.2	0.96	< 10	< 10	0.38	< 1	< 1	0.39	< 0.1
	mg/kg		Cr (chromium)	15.1	10	7.8	7.5	17.3	5.9	33.2	< 10	< 10	7.8	12	10	8.7	16.5
	mg/kg		Cu (copper)	10.9	16	3.5	2.4	6.1	< 1.5	6.64	< 10	< 10	2.4	5	2	2	7.9
	mg/kg		Fe (iron)		6100					11100	3000	1700					
	mg/kg		Hg (mercury)	0.038	< 0.01	0.05	0.05	0.05	< 0.01	< 0.01	0.06	0	< 0.04	0.7	0.4	< 0.04	0.097
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	606	680	265.5	266.1	812.6	257		170	100	256			487	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	10.9	10	5.9	5.6	9.4	< 5.8	28.7	< 10	< 10	6.8	10	7	8.2	
	mg/kg		Pb (lead)	15.3	30	3.9	3.1	4.6	2.8	4.9	< 10	< 10	2.6	< 10	< 10	6.7	< 0.1
	mg/kg		Sb (antimony)			5.2	4.9	14.1									
	mg/kg		Se (selenium)	< 1.1		0.12	0.12	0.12	< 0.83								
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)			2.3	1.8	5.4									
	mg/kg		Zn (zinc)	52.6	54	13.5	11.6	25.7	13.4	66.4	20	8	14	19	20	15.3	29.7
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1221	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1232	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1242	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1248	< 2.42					< 15.36				< 4.9			< 4.8	
	ug/kg		Aroclor-1254	< 5.05					< 32				< 4.9			< 4.8	
	ug/kg		Aroclor-1260	< 5.05					< 32				< 4.9			< 4.8	
	ug/kg		Total PCB's		38					1.2	0	0		0	0		0
PARTICLE SIZE %FINER	SAND	coarse	3 in							100		100		100	100		100
			1 1/2		100					100		100		100	100		100
			3/4		100					100		100		100	100		100
			3/8		100					100		100		100	100		100
			4	100	100				98.4	100		100	99.9	100	100	96.2	99
			8		100					100				98	98		98
			10	98.4					95.9			96	96.4			82	
		medium	16	93.4	100				88.2	90.0				92.0	92.0		88.0
			20									84.0	70.4			59.2	
			30	60.2	99.0				35.1								
			40		95.0					35.0		34.0	7.9	18.0	18.0	29.1	26.0
			50	60.2	89.0				35.1								
		fine	70		87.0												
			80	31.0					2.4			3.0					
			100	22.7	85.0				0.4	3.0			0.4	0.0	0.0	4.1	3.0
			140	20.8					0.3				0.0			1.6	
	SILT CLAY		200	15.7	76.0					2.0		2.0	0.0	0.0	0.0	1.1	3.0
			270	10.7	70.0												
			0.20 mm	8.1	42.0							0.0		0.0	0.0		
			0.05 mm	5.7	16.0					2.0		0.0		0.0	0.0		
MISC	%		Total Organic Carb	1.39					0.068				0.066			0.043	
	mg/kg		Chem Oxy Demand		44000					2760	1900	2800	11500	950	511	10600	4850
	mg/kg		Kjedahl Nitrogen		4150					--	350	302		236	138		--
	mg/kg		Total Phosph		--					853	85	97		177	250		--
	mg/kg		Oil and Grease		0					7870	0	0	< 0.06	76	64	< 0.06	133
	mg/kg		Cyanide, Total	< 0.85					< 0.63				<0.06			0.09	
	mg/kg		Ammonia	58					1.2								
	mg/l		Ammonia Elutriate										<0.06			<0.06	
	%		Moisture	41.2					20.8				20.2			15.8	
	%		Total Solids	58.8					79.2				79.8			84.2	
	%		Volatile Solids	3					0.5				1.15			1.06	

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	415	1168	1174	1171	1188	1187	1183	1179	1192	1201	1196	1200	1212	1213
			River Mile	827.6	827	827	827	827	827	827	827	827	827	827	827	827	827
			Location	GREY CLOUD SLOUGH	Grey Cloud - east	Grey Cloud - west	Grey Cloud - mid	Grey Cloud - mean	Grey Cloud - west	Grey Cloud - mid	Grey Cloud - east	Grey Cloud - east	Grey Cloud - mean	Grey Cloud - mid	Grey Cloud - west	Grey Cloud - west	Grey Cloud - mean-du
			Year	1989	1981	1981	1981	1982	1982	1982	1982	1983	1983	1983	1983	1984	1984
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC	< 0.07				< 5				< 5	< 0.53	< 5	< 5	< 0.32	3.5
	ug/kg		b-BHC	< 0.14				< 10				< 10	< 1.1	< 10	< 10	< 0.64	< 0.64
	ug/kg		BHC	< 0.22													
	ug/kg		g-BHC (lindane)	< 0.1				8				< 7	< 0.53	< 7	< 7	< 0.32	< 0.32
	ug/kg		Heptachlor	< 0.07				9				< 5	< 0.53	< 5	< 5	< 0.32	< 0.32
	ug/kg		Aldrin	< 0.1													
	ug/kg		Heptachlorepoxide	< 0.12													
	ug/kg		Endosulfan I	< 0.12													
	ug/kg		Dieldrin	< 0.12				< 20				< 20	< 1.6	< 20	< 20	< 0.96	< 0.96
	ug/kg		4,4'-DDE	< 0.1				< 7				< 7	< 1.6	< 7	< 7	< 0.96	< 0.96
	ug/kg		Endrin	< 0.22				< 10				< 10	< 2.1	< 10	< 10	< 1.3	< 1.3
	ug/kg		Endosulfan II	< 0.24													
	ug/kg		4,4'-DDD	< 0.26				< 14				< 14	< 3.2	< 14	< 14	< 1.9	< 1.9
	ug/kg		Endrinaldehyde	< 0.26													
	ug/kg		Sulfan sulfate	< 0.26													
	ug/kg		4,4'-DDT	< 0.84				< 20				< 20	< 4.2	< 20	< 20	< 2.5	< 2.5
	ug/kg		Methoxychlor	< 0.53													
	ug/kg		Endrinketone	< 0.26													
	ug/kg		Chlorodane	< 1.44				< 2				< 2	< 11	< 2	< 2	< 6.4	< 6.4
	ug/kg		Toxaphene	< 15.36													
METALS	mg/kg		Ag (silver)		0.094	0.588	0.175		0.28	0.06	0.124	0.144		0.041	0.042	0.136	
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1	1.83	8.82	1.44		3.3	1.71	2.13	2.09		1.15	2.16	1.65	
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														
	mg/kg		Be (beryllium)		0.174	0.588	0.218		0.36	0.119	0.233	0.137		0.107	0.149	0.158	
	mg/kg		Cd (cadmium)	< 1.1	0.085	1.024	0.346		0.341	0.123	0.38	0.202		0.309	0.47	0.355	
	mg/kg		Cr (chromium)	6.7	22.6	50.2	31.8		19	14.8	18.8	33.5		17.3	38.7	10.8	
	mg/kg		Cu (copper)	7.7	5.3	24.8	8.4		10.4	4.3	7.4	6.2		6.2	12.3	5.4	
	mg/kg		Fe (iron)														
	mg/kg		Hg (mercury)	< 0.01	0.02	0.1	0.22		0.08	0.05	0.06	0.05		0.05	0.05	0.06	
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	537					539	415.8	923.8					257.9	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	5.6	15.4	25.5	18.9		11.5	9.8	13.2	15.8		11.7	16	6.6	
	mg/kg		Pb (lead)	1.5	5.5	25.8	13.7		10.6	2.2	4.2	4.2		3	11.9	4.8	
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	< 0.79	0.19	0.2	0.64		0.08	0.05	0.07	0.05		0.05	0.16	0.12	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)						0.7	0.6	0.6	0.6		0.6	0.7	0.6	
	mg/kg		Zn (zinc)	15.6	30	102	40.3		44.4	19	28.9	27.1		19.3	44.7	23.6	
	mg/kg		V (vanadium)														
PCBS	ug/kg		Aroclor-1006	< 1.44				80				< 20	32	9.8	13	< 3.2	< 3.2
	ug/kg		Aroclor-1221	< 1.44													
	ug/kg		Aroclor-1232	< 1.44													
	ug/kg		Aroclor-1242	< 1.44													
	ug/kg		Aroclor-1248	< 1.44													
	ug/kg		Aroclor-1254	< 3				1000				42	60	17	14	34	62
	ug/kg		Aroclor-1260	< 3				< 20				9.8	8.5	< 20	< 20	12	19
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER		SAND coarse	3 in														
			1 1/2														
			3/4														
			3/8														
			4	100													
			8														
			10	96.4													
		SAND medium	16	84.4													
			20														
			30	30.6													
			40														
			50	30.6													
		SAND fine	70														
			80	2.1													
			100	0.6													
			140	0.5													
		SILT CLAY	200	0.5													
			270	0.4													
			0.20 mm	0.3													
			0.05 mm	0.2													
MISC	%		Total Organic Carb	0.049													
	mg/kg		Chem Oxy Demand														
	mg/kg		Kjedahl Nitrogen														
	mg/kg		Total Phosph														
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total	< 0.6													
	mg/kg		Ammonia	< 0.24													
	mg/l		Ammonia Elutriate														
	%		Moisture	16.6													
	%		Total Solids	83.4													
	%		Volatile Solids	0.7													

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	1213	1205	1209	1221	1226	1225	1217	64	65	66	493	1361	1362	67
			River Mile	827	827	827	827	827	827	827	826.8	826.4	824.4	823.7	823.7	823.4	823.39
			Location	Grey Cloud - mean	Grey Cloud - east	Grey Cloud - mid	Grey Cloud - mid	Grey Cloud - mean	Grey Cloud - west	Grey Cloud - east	ROBINSONS ROCKS	ROBINSONS ROCKS	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	Pine Bend Foot Light 1	Pine Bend Foot Light 2	PINE BEND FOOT LIGHT
			Year	1984	1984	1984	1985	1985	1985	1985	1982	1982	1982	1989	1994	1994	1974
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	3	3	3	3	3	3	3	1	1	1	1	3	3	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	3	4.9	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26				< 0.07	< 0.24	< 0.26	
	ug/kg		b-BHC	< 0.64	< 0.64	< 0.64	< 0.53	< 0.53	< 0.53	< 0.53				< 0.15	< 0.24	0.52	
	ug/kg		BHC											< 0.22	< 0.24	< 0.26	
	ug/kg		g-BHC (lindane)	< 0.32	1.2	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26				< 0.1	< 0.24	< 0.26	
	ug/kg		Heptachlor	< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	0.33	< 0.26				< 0.07	< 0.24	< 0.26	
	ug/kg		Aldrin											< 0.1			
	ug/kg		Heptachlorepoxide											< 0.12			
	ug/kg		Endosulfan I											< 0.12			
	ug/kg		Dieldrin	< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.1	< 0.1	< 0.1	< 0.12	< 0.49	< 0.51	< 10
	ug/kg		4,4'-DDE	< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.1	< 0.1	< 0.1	< 0.1	< 0.49	< 0.51	< 10
	ug/kg		Endrin	< 1.3	< 1.3	< 1.3	< 1.1	< 1.1	< 1.1	< 1.1	< 0.1	< 0.1	< 0.1	< 0.22	< 0.49	< 0.51	< 10
	ug/kg		Endosulfan II											< 0.24			
	ug/kg		4,4'-DDD	< 1.9	< 1.9	< 1.9	< 1.6	< 1.6	< 1.6	< 1.6	< 0.1	< 0.1	< 0.1	< 0.27	< 0.49	< 0.51	< 10
	ug/kg		Endrinaldehyde											< 0.27			
	ug/kg		Sulfan sulfate											< 0.27			
	ug/kg		4,4'-DDT	< 2.5	< 2.5	< 2.5	< 2.1	< 2.1	< 2.1	< 2.1	< 0.1	< 0.1	< 0.1	< 0.32	< 0.49	< 0.51	< 10
	ug/kg		Methoxychlor											< 0.54			
	ug/kg		Endrinketone											< 0.27			
	ug/kg		Chlorodane	< 6.4	< 6.4	< 6.4	< 5.3	< 5.3	< 5.3	< 5.3	< 1	< 1	< 1	< 1.46	< 0.24	< 0.26	< 10
	ug/kg		Toxaphene											< 2.38			
METALS	mg/kg		Ag (silver)		0.024	0.026	0.011		1.139	0.02							
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)		2.9	1.48	1.66		6.34	3.25	1.5	1.3	1.1	< 1.11	0.97	1.2	< 1
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														
	mg/kg		Be (beryllium)		0.159	0.102	0.091		0.235	0.167							
	mg/kg		Cd (cadmium)		0.141	0.126	0.052		4.5	0.112	< 0.2	< 0.2	< 0.15	< 1.21	< 0.12	< 0.12	1
	mg/kg		Cr (chromium)		13.1	7.4	7.5		41.8	14.5	6	6	5.3	8.7	5.6	8.1	29
	mg/kg		Cu (copper)		4.3	2.8	1.9		23.4	4.9	3	3	2.3	4.5	1.9	3.4	5
	mg/kg		Fe (iron)								5600	4700	5400				
	mg/kg		Hg (mercury)		0.05	0.07	0.05		0.12	0.05	0.028	0.05	0.018	< 0.01	< 0.05	< 0.05	0.8
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)		2090.7	275.8	196.8		478.2	2227.8				264	180	289	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)		9.7	6.7	5.7		13.7	9.5	8	7	6	8.78	4.7	6.4	19
	mg/kg		Pb (lead)		2.7	2.5	2.2		25.2	3.2	4	4	5	5.4	3.4	4.2	< 11
	mg/kg		Sb (antimony)				4.7		7.9	14.1							
	mg/kg		Se (selenium)		0.12	0.12	0.12		0.12	0.13				< 0.92			
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)		0.6	0.6	1.9		3.3	5.4							
	mg/kg		Zn (zinc)		18.5	16.1	11.6		61.6	18.5	15	16	13	23.6	12.8	20	14
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 3.2	< 3.2	18	30.6	27.9	387	23.1				< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1221											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1232											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1242											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1248											< 1.46	< 4.9	< 5.1	
	ug/kg		Aroclor-1254	61	45	37	< 5.3	< 5.3	< 5.3	< 5.3				< 3.05	< 4.9	< 5.1	
	ug/kg		Aroclor-1260	18	12	11	< 5.3	< 5.3	9.3	< 5.3				< 3.05	< 4.9	< 5.1	
	ug/kg		Total PCB's								0	0	0				0
PARTICLE SIZE %FINER		SAND coarse	3 in														100
			1 1/2								100	100	100				100
			3/4								100	100	100				100
			3/8								99	100	100				100
			4								95	100	99	100	100	100	100
			8								88	99	95				100
			10											100	99.6	99.3	
		SAND medium	16								76.0	96.0	81.0	98.6			100.0
			20												92.2	96.7	
			30								44.0	78.0	47.0	82.9			
			40								17.0	49.0	24.0		31.4	68.1	94.0
			50								6.0	14.0	9.0	82.9			
		SAND fine	70								5.0	8.0	6.0				
			80											33.4			
			100								5.0	6.0	5.0	6.8	2.8	12.2	4.0
			140											5.5	1.8	10.5	
	SILT CLAY		200								4.0	5.0	4.0	4.1	1.3	10.2	0.0
			270								4.0	5.0	3.0	3.2			
			0.20 mm								1.0	1.0	1.0	2.1			0.0
			0.05 mm								0.0	0.0	0.0	1.5			0.0
MISC	%		Total Organic Carb											0.58	0.062	0.101	
	mg/kg		Chem Oxy Demand								2590	4400	1630		11800	18800	4079
	mg/kg		Kjedahl Nitrogen								130	190	64				99
	mg/kg		Total Phosph								190	170	250				143
	mg/kg		Oil and Grease								< 50	60	< 50		0.2	0.48	285
	mg/kg		Cyanide, Total											< 0.65	0.09	0.11	
	mg/kg		Ammonia											14			
	mg/l		Ammonia Elutriate												0.2	0.48	
	%		Moisture											22.6	20.7	23.5	
	%		Total Solids											77.4	79.3	76.5	
	%		Volatile Solids											1.2	1.18	1.88	

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	68	69	318	70	71	72	73	74	494	1363	319	383	379	377
			River Mile	823.21	823.2	823	822.94	822.93	822.92	822.91	822.9	822.9	822.9	822.5	821.8	821.8	821.8
			Location	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	R-Spring Lake 1	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	PINE BEND FOOT LIGHT	Pine Bend Foot Light 3	R-Spring Lake 2	Spring Lake-Pool 2/Ser-2	Spring Lake-Pool 2/Pac-1	Spring Lake-Pool 2/Key-2
			Year	1978	1978	1984	1982	1975	1975	1975	1975	1989	1994	1984	1988	1988	1988
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	3	1	1	1	1	1	1	1	3	3	3	3
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	1	1	2	1	1	1	1	1	1	3	2	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC									< 0.12	< 0.24		< 0.06	< 0.17	< 0.002
	ug/kg		b-BHC									< 0.24	< 0.24		< 0.12	< 0.42	< 0.006
	ug/kg		BHC									< 0.36	< 0.24				
	ug/kg		g-BHC (lindane)									< 0.16	< 0.24		< 0.08	< 0.22	< 0.006
	ug/kg		Heptachlor			< 0.5						< 0.12	< 0.24	< 0.5	< 0.06	< 0.22	< 0.006
	ug/kg		Aldrin									< 0.16					
	ug/kg		Heptachlorepoxide									< 0.2					
	ug/kg		Endosulfan I									< 0.2					
	ug/kg		Dieldrin	0	0	< 0.5	< 0.1					< 0.2	< 0.48	< 0.5	< 0.04	< 0.4	< 0.01
	ug/kg		4,4'-DDE	0	0	< 0.5	< 0.1					< 0.16	< 0.48	< 0.5	< 0.08	< 0.58	< 0.01
	ug/kg		Endrin	0	0	< 0.5	< 0.1					< 0.36	< 0.48	< 0.5	< 0.12	< 4.4	< 0.02
	ug/kg		Endosulfan II									< 0.4					
	ug/kg		4,4'-DDD	0	0	< 0.5	< 0.1					< 0.44	< 0.48	< 0.5	< 0.22	< 1.3	< 0.01
	ug/kg		Endrinaldehyde									< 0.44					
	ug/kg		Sulfan sulfate									< 0.44					
	ug/kg		4,4'-DDT	0	0	< 0.5	< 0.1					< 0.51	< 0.48	< 0.5	< 0.24	< 0.87	< 0.01
	ug/kg		Methoxychlor									< 0.87					
	ug/kg		Endrinketone									< 0.44					
	ug/kg		Chlorodane	0	0	< 0.5	< 1					< 2.38	< 0.24	< 0.5	< 0.28	< 1.2	< 0.04
	ug/kg		Toxaphene									< 1.63					
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	0	13	1	0	0	0.67	0.94	2.6	0.91	12	31	1.8	4.94
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	10	10												
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 10	2	< 0.19	< 0.1	< 0.1	1.6	2.7	< 1.77	0.41	1.5	1.8	1.2	1.14
	mg/kg		Cr (chromium)	< 10	< 10	23	3.8	9.2	9.2	16.5	31.7	20	6.6	29	33	19	19
	mg/kg		Cu (copper)	< 10	< 10	15	1.9	4.9	5	9	13.9	18.3	1.8	18	22	11	20.6
	mg/kg		Fe (iron)	3400	2600		4400										
	mg/kg		Hg (mercury)	0	0	< 0.099	0.031	0.093	0.069	0.048	0.07	< 0.02	< 0.04	< 0.091	0.14	0.02	0.17
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	130	120							1080	167		750	380	622
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	< 10	18	6					15.8	5.7	29	22	10	15
	mg/kg		Pb (lead)	< 10	< 10	30	4	< 0.1	< 0.1	9.7	10	10.9	9.1	15	31	14	25.9
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)									< 1.34			44	< 0.75	< 0.35
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	20	20	71	13	20.5	21.3	30.7	55.3	74	12.9	50	96	44	75.9
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006									< 2.38	< 4.8		< 1.2	< 3	< 0.15
	ug/kg		Aroclor-1221									< 2.38	< 4.8				
	ug/kg		Aroclor-1232									< 2.38	< 4.8				
	ug/kg		Aroclor-1242									< 2.38	< 4.8				
	ug/kg		Aroclor-1248									< 2.38	< 4.8				
	ug/kg		Aroclor-1254									< 4.95	< 4.8		< 2.4	< 3	< 98
	ug/kg		Aroclor-1260									< 4.95	< 4.8		< 2.4	< 3	< 0.25
	ug/kg		Total PCB's	0	8	40	0	0	0	0	0			4			
PARTICLE SIZE %FINER		SAND coarse	3 in	100	100			100	100	100	100						
			1 1/2	100	100		100	100	100	100	100						
			3/4	100	100	100	100	100	100	100	100			100			
			3/8	100	100		100	100	100	100	100						
			4	100	100	100	100	99	99	98	98	99.9	100	100			
			8				99	96	96	94	94						
			10	100	100	100						99.8	98.6	99			
		SAND medium	16				94.0	87.0	87.0	89.0	91.0	99.2					
			20	99.0	100.0								91.1				
			30				77.0					97.5					
			40	85.0	91.0	100.0	66.0	41.0	41.0	54.0	76.0		56.6	98.0			
			50				41.0					97.5					
		SAND fine	70				18.0										
			80	13.0	11.0							83.4					
			100			99.0	8.0	5.0	5.0	9.0	34.0	65.3	3.2	87.0			
			140									48.4	1.3				
		SILT CLAY	200	6.0	3.0	93.0	4.0	2.0	2.0	8.0	31.0	28.4	1.0	79.0			
			270			86.0	4.0					19.0		76.0			
			0.20 mm	0.0	0.0	27.0	1.0					14.1		53.0			
			0.05 mm	0.0	0.0	12.0	0.0					9.1		19.0			
MISC	%		Total Organic Carb									5.73	0.375				1.21
	mg/kg		Chem Oxy Demand	5600	4300		1630	1848	2386	7050	15600		10200	119000			
	mg/kg		Kjedahl Nitrogen	520	450	1500	94	--	--	--	--			3600			
	mg/kg		Total Phosph	88	190	88000	940	--	--	--	--			75000			
	mg/kg		Oil and Grease	0	0		< 50	204	284	374	483		< 0.06				
	mg/kg		Cyanide, Total									< 1.06	0.11				
	mg/kg		Ammonia									175					
	mg/l		Ammonia Elutriate										<0.06				
	%		Moisture									52.7	16				
	%		Total Solids									47.3	84				
	%		Volatile Solids									4.4	1.02				

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	384	381	375	380	382	378	376	320	75	76	1358	1360	321	77
		River Mile	821.8	821.8	821.8	821.8	821.8	821.8	821.8	821.6	821.1	821	820.9	820.6	820.5	819.7
		Location	Spring Lake-Pool 2/Ser-3	Spring Lake-Pool 2/Pac-3	Spring Lake-Pool 2/Key-1	Spring Lake-Pool 2/Pac-2	Spring Lake-Pool 2/Ser-1	Spring Lake-Pool 2/Key-3	Spring Lake-Pool 2/Key-1	R-Spring Lake 3	BOULANGER BEND	BOULANGER BEND	Boulander Bend 1	Boulander Bend 2	R-Spring Lake 4	BOUL. BEND LOW LIGHT
		Year	1988	1988	1988	1988	1988	1988	1988	1984	1978	1974	1994	1994	1984	1981
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	3	3	3	3	3	3	3	3	1	1	1	1	3	1
		Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	1	1	1	1	1	1	1	2	1	1	3	3	2	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg	a-BHC	< 0.06	< 0.17	< 0.002	< 0.17	< 0.06	< 0.002					< 0.24	< 0.25		
	ug/kg	b-BHC	< 0.12	< 0.42	< 0.006	< 0.42	< 0.12	< 0.006					< 0.24	1.3		
	ug/kg	BHC											< 0.24	< 0.25		
	ug/kg	g-BHC (lindane)	< 0.08	< 0.22	< 0.006	< 0.22	< 0.08	< 0.006					< 0.24	< 0.25		
	ug/kg	Heptachlor	< 2.4	< 0.22	< 0.006	< 0.22	< 0.06	< 0.006		< 0.5			< 0.24	< 0.25	< 0.5	
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin	< 0.04	< 0.4	< 0.01	< 0.4	< 0.04	< 0.01		< 0.5	< 1	< 10	< 0.48	1.10	< 0.5	1.6
	ug/kg	4,4'-DDE	< 0.08	< 0.58	< 0.01	< 1.4	< 0.08	< 0.01		< 0.5		< 10	0.74	< 0.48	< 0.5	< 0.1
	ug/kg	Endrin	< 0.12	< 4.4	< 0.02	< 4.4	< 0.12	< 0.02		< 0.5	< 1	< 10	< 0.48	< 0.48	< 0.5	< 0.1
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD	< 0.22	< 1.3	< 0.01	< 1.3	< 0.22	< 0.01		< 0.5		< 10	< 0.48	< 0.48	< 0.5	7
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT	< 0.24	< 0.87	< 0.01	< 0.87	< 0.24	< 0.01		< 0.5	< 4	< 10	< 0.48	< 0.48	< 0.5	0.8
	ug/kg	Methoxychlor														
	ug/kg	Endrinketone														
	ug/kg	Chlorodane	< 0.28	< 1.2	< 0.04	< 1.2	< 0.28	< 0.04		< 0.5		< 10	< 0.24	< 0.25	< 0.5	11
	ug/kg	Toxaphene	< 1.96													
METALS	mg/kg	Ag (silver)														
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	23	1.8	5.67	1.9	36	3.95	4.71	12	2.3	< 0.8	0.9	1.2	12	29
	mg/kg	B (boron)														
	mg/kg	Ba (barium)														100
	mg/kg	Be (beryllium)														
	mg/kg	Cd (cadmium)	1	0.82	1.67	1.1	2.6	0.54	1.61	2.7	4.5	1	0.42	0.45	4	8
	mg/kg	Cr (chromium)	24	16	23.8	20	47	16.1	21.6	30	54.7	8	8	6.9	30	
	mg/kg	Cu (copper)	16	8.2	32.4	11	31	14.3	24.6	20	25.3	2	3	2.4	20	38
	mg/kg	Fe (iron)									16000					13000
	mg/kg	Hg (mercury)	0.11	0.02	0.18	0.02	0.23	0.12	0.18	< 0.125	0.118	1.8	< 0.05	< 0.05	< 0.16	< 0.01
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	720	370	712	360	1000	629	653		652		245	222		1400
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	17	10	16.8	12	28	13.5	14.4	23	24	5	6.5	5.3	34	30
	mg/kg	Pb (lead)	28	12	31.5	13	41	22.6	28.5	34	104	< 10	5.7	3.8	30	30
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)	35	< 0.75	< 0.34	< 0.75	< 26	< 0.32	0.34							
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)														
	mg/kg	Zn (zinc)	73	38	84.8	47	130	64.1	75.7	80	93.4	19	18	17.2	83	130
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	< 1.2	< 3	< 0.15	< 3	< 1.2	< 0.15					< 4.8	< 5.1		
	ug/kg	Aroclor-1221											< 4.8	< 5.1		
	ug/kg	Aroclor-1232											< 4.8	< 5.1		
	ug/kg	Aroclor-1242											< 4.8	< 5.1		
	ug/kg	Aroclor-1248											< 4.8	< 5.1		
	ug/kg	Aroclor-1254	< 2.4	< 3	96	< 3	< 2.4	< 53					< 4.8	< 5.1		
	ug/kg	Aroclor-1260	< 2.4	< 3	< 0.25	< 3	< 2.4	< 0.25					< 4.8	< 5.1		
	ug/kg	Total PCB's								41	90	0			55	68
PARTICLE SIZE %FINER	SAND coarse	3 in									100	100				
		1 1/2									100	100				100
		3/4								100	100	100			99	100
		3/8									100	100				100
		4								100	100	99	100		99	100
		8										99				100
		10								100			99.5	100	99	
	SAND medium	16										95.0				99.0
		20											90.1	99.2		
		30														97.0
		40								99.0		48.0	58.9	95.3	94.0	95.0
		50														92.0
	SAND fine	70														90.0
		80														
		100								98.0		0.0	11.8	21.3	87.0	88.0
		140											10.0	11.1		
	SILT CLAY	200								97.0	45.0	0.0	9.7	10.4	74.0	82.0
		270								95.0					70.0	78.0
		0.20 mm								44.0		0.0			41.0	49.0
		0.05 mm								14.0	30.0	0.0			18.0	23.0
MISC	%	Total Organic Carb			1.11			3.11					0.132	0.125		
	mg/kg	Chem Oxy Demand								51900	27000	2872	15800	19400	58900	110000
	mg/kg	Kjedahl Nitrogen								1900	1870	73			2200	7680
	mg/kg	Total Phosph								32000	867	217			41000	--
	mg/kg	Oil and Grease									230	204	< 0.06	0.57		0
	mg/kg	Cyanide, Total											<0.06	<0.07		
	mg/kg	Ammonia														
	mg/l	Ammonia Elutriate											<0.06	0.6		
	%	Moisture											21.1	24.9		
	%	Total Solids											78.9	75.1		
	%	Volatile Solids											1.58	1.9		

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

		Record #	78				1359		1229	1233	1236	1272	1298	1291	1254	1310
		River Mile	819.1	818.8	818.7	818.7	818.6	818.5	816.0	816.0	816.0	816.0	816.0	816.0	816.0	816
		Location	BOUL. BEND LOW LIGHT	NIN 818.8	818.4 - 818.9 NIN CDF 8/21	818.4 - 818.9 NIN CDF 8/29	Boul Bend Low Light 1	NIN 818.5	Ab. L/D 2 - east	Ab. L/D 2 - mid	Ab. L/D 2 - west	Ab. L/D 2 - mid	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - east	Ab. L/D 2 - east
		Year	1981	1995	1995	1995	1994	1995	1981	1981	1981	1982	1982	1982	1982	1983
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	2	1	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Gear	1	1			3	1	3	3	3	3	3	3	3	3
		Sam. Depth	10	10			10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	COE	COE	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg	a-BHC		< 0.7	< 0.4	< 0.5	< 0.43	< .06					< 5			2.4
	ug/kg	b-BHC		< 0.7	< 0.4	< 0.5	1.6	< .06					< 10			< 1.1
	ug/kg	BHC		< 0.7	< 0.4	< 0.5	< 0.43	< .06								
	ug/kg	g-BHC (lindane)		< 0.7	< 0.4	< 0.5	< 0.43	< .06					11			< 0.53
	ug/kg	Heptachlor		< 0.7	< 0.4	< 0.5	< 0.43	< .06					5			< 0.53
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin	2.9	< 0.7	< 0.4	< 0.5	< 0.94	< .06					< 20			< 1.6
	ug/kg	4,4'-DDE	2.4	< 0.7	< 0.4	< 0.5	< 0.48	< .06					< 7			< 1.6
	ug/kg	Endrin	< 0.1	< 0.7	< 0.4	< 0.5	< 0.48	< .06					< 10			< 2.1
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD	6.30	< 0.7	1.20	1.90	< 0.48	< .06					< 14			< 3.2
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT	9.70	< 0.7	1.70	2.70	< 0.48	< .06					< 20			< 4.2
	ug/kg	Methoxychlor														
	ug/kg	Endrinketone														
	ug/kg	Chlorodane	7.00	< 1.1	< 0.6	< 0.8	< 0.43	< 0.9					< 2			< 11
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)							1.1	1.08	0.69	0.67		0.54	1.07	0.592
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	21	4.1	2.8	3.3	4.7	3.1	6.3	6.14	5.68	5.2		7	15	6.2
	mg/kg	B (boron)														
	mg/kg	Ba (barium)	80													
	mg/kg	Be (beryllium)							0.641	0.54	0.529	0.43		0.5	0.77	0.281
	mg/kg	Cd (cadmium)	4	0.3	0.43	0.5	0.93	0.3	3.159	2.93	2.61	1.4		1	2.23	1.075
	mg/kg	Cr (chromium)	30	27	15	17	26.2	17	63.6	62.6	58.2	33.8		36.4	58.5	62.4
	mg/kg	Cu (copper)	18	17	13	18	21.5	14	33.8	31.5	28.3	17.2		18.8	31.3	17.7
	mg/kg	Fe (iron)	7100													
	mg/kg	Hg (mercury)	< 0.01	0.046	0.02	0.033	0.14	0.035	0.25	0.19	0.2	0.15		0.14	0.22	0.05
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	700	1300	970	1300	1210	830				698		906	1305	
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	30	20	14	15	21.3	15	29.2	25.6	28.3	18.3		19.2	28.9	21.4
	mg/kg	Pb (lead)	30	10	12	15	16.5	11	40	37.7	33.5	19.4		18	32.7	18.2
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)							0.22	0.21	0.2	0.06		0.07	0.1	0.05
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)										0.8		0.8	0.9	0.3
	mg/kg	Zn (zinc)	62	71	64	67	82.8	56	152.7	128	113.4	70.6		75.9	153.4	84
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9					60			24
	ug/kg	Aroclor-1221		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg	Aroclor-1232		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg	Aroclor-1242		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg	Aroclor-1248		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9								
	ug/kg	Aroclor-1254		< 8.4	< 4.9	< 5.9	16	< 6.9					1100			5.7
	ug/kg	Aroclor-1260		< 8.4	< 4.9	< 5.9	< 8.6	< 6.9					< 20			< 5.3
	ug/kg	Total PCB's	170													
PARTICLE SIZE %FINER	SAND coarse	3 in														
		1 1/2	100													
		3/4	100													
		3/8	100													
		4	100													
		8	100													
		10														
	SAND medium	16	99.0	100	100	100		100								
		20		99.5	99.6	99.5	100.0	99.4								
		30	97.0	99.3	99.0	99.5		99.1								
		40	95.0	98.3	97.6	98.8	99.7	98.8								
		50	92.0	83.2	60.6	83.5		70.2								
	SAND fine	70	90.0	82.9	60.1	83.1		70.0								
		80		82.9	60.1	83.1		70.0								
		100	88.0	82.9	60.1	83.1	98.9	70.0								
		140		82.9	60.1	83.1	96.7	70.0								
	SILT CLAY	200	87.0	82.9	60.1	83.1	96.2	70.0								
		270	85.0													
		0.20 mm	63.0													
		0.05 mm	29.0													
MISC	%	Total Organic Carb		2.3	3.4	2.1	> 1.6	1.4								
	mg/kg	Chem Oxy Demand	51000				86900									
	mg/kg	Kjedahl Nitrogen	4860													
	mg/kg	Total Phosph	--													
	mg/kg	Oil and Grease	0				1.7									
	mg/kg	Cyanide, Total		< 0.5	< 0.5	< 0.5	<0.11	< 0.5								
	mg/kg	Ammonia														
	mg/l	Ammonia Elutriate		1.7	< 0.1	11	1.7	0.7								
	%	Moisture		59	39	46	54.9	52.0								
	%	Total Solids		41	61	54	45.1	48.0								
	%	Volatile Solids		6.1	5	5.3	8.7	4.4								

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	1316	1326	1324	1338	1330	1334	1337	1130	1357	1357	1356	1352	1342	496
			River Mile	816.0	816.0	816.0	816.0	816	816.0	816.0	816.0	816.0	816.0	816.0	816.0	816.0	815.7
			Location	Ab. L/D 2 - mid	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - mean	Ab. L/D 2 - east	Ab. L/D 2 - mid	Ab. L/D 2 - west	Ab. L/D 2 - east	Ab. L/D 2 - mean-dup	Ab. L/D 2 - mean	Ab. L/D 2 - west	Ab. L/D 2 - mid	Ab. L/D 2 - east	ABOVE L/D 2
			Year	1983	1983	1983	1984	1984	1984	1984	1984	1985	1985	1985	1985	1985	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sam. Gear	3	3	3	3	3	3	3	3	3	3	3	3	3	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE
CHC'S	ug/kg		a-BHC	2.000	9.70	12.000	13		1.600	1.2	12.000	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.08
	ug/kg		b-BHC	< 1.1	< 1.1	< 1.1	< 0.64		< 0.64	< 0.64	< 0.64	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.17
	ug/kg		BHC														< 0.25
	ug/kg		g-BHC (lindane)	< 0.53	< 0.53	< 0.53	4.1		< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.11
	ug/kg		Heptachlor	< 0.53	< 0.53	< 0.53	< 0.32		< 0.32	< 0.32	< 0.32	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.08
	ug/kg		Aldrin														< 0.11
	ug/kg		Heptachlorepoxide														< 0.14
	ug/kg		Endosulfan I														< 0.14
	ug/kg		Dieldrin	< 1.6	< 1.6	< 1.6	< 0.96		< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79	< 0.14
	ug/kg		4,4'-DDE	< 1.6	< 1.6	< 1.6	< 0.96		< 0.96	< 0.96	< 0.96	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79	< 0.11
	ug/kg		Endrin	< 2.1	< 2.1	< 2.1	< 1.3		< 1.3	< 1.3	< 1.3	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 0.25
	ug/kg		Endosulfan II														< 0.28
	ug/kg		4,4'-DDD	< 3.2	< 3.2	< 3.2	< 1.9		< 1.9	< 1.9	< 1.9	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 0.31
	ug/kg		Endrinaldehyde														< 0.31
	ug/kg		Sulfan sulfate														< 0.31
	ug/kg		4,4'-DDT	< 4.2	< 4.2	< 4.2	< 2.5		< 2.5	< 2.5	< 2.5	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 0.36
	ug/kg		Methoxychlor														< 0.62
	ug/kg		Endrinketone														< 0.31
	ug/kg		Chlorodane	< 11	< 11	< 11	< 6.4		< 6.4	< 6.4	< 6.4	< 5.3	< 5.3	< 5.3	115.00	< 5.3	< 1.68
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)	0.4885		0.1515		1.374	0.395	0.085				0.297	0.374	1.1	
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	7.6		7.4		5.06	2.99	5				6.79	9.92	8.53	< 1.18
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														
	mg/kg		Be (beryllium)	0.2755		0.298		0.642	0.36	0.538				0.48	0.444	0.432	
	mg/kg		Cd (cadmium)	0.683		0.4895		3.101	0.875	0.252				1.244	1.242	1.618	< 1.3
	mg/kg		Cr (chromium)	80.7		92.6		49.2	22.6	31.4				27.3	27.2	27.2	12.1
	mg/kg		Cu (copper)	16.5		13.15		26.1	13.4	11.6				15	15.6	18.5	5.64
	mg/kg		Fe (iron)														
	mg/kg		Hg (mercury)	0.1		0.05		0.05	0.1	0.05				0.1	0.09	0.24	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)					932.6	649.9	1052.2				711.7	721.4	693.7	1860
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	24.55		25.4		24.3	15.5	22.2				15.5	14.7	14	15
	mg/kg		Pb (lead)	16.85		10.2		32.3	14.2	8.7				14.8	14.9	23.6	4.73
	mg/kg		Sb (antimony)											14	14.2	13.5	
	mg/kg		Se (selenium)	0.06		0.07		0.12	0.12	0.12				0.13	0.12	0.13	< 0.99
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)	0.7		0.6		0.6	0.6	0.6				5.4	5.4	5.2	
	mg/kg		Zn (zinc)	70.95		53.55		123.5	57.6	48.9				60.4	62.1	77.3	37
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	40.00	146	195.00	214		25	41	176.00	424	387	171	95	485	< 1.68
	ug/kg		Aroclor-1221														< 1.68
	ug/kg		Aroclor-1232														< 1.68
	ug/kg		Aroclor-1242														< 1.68
	ug/kg		Aroclor-1248														< 1.68
	ug/kg		Aroclor-1254	16	24	44	52		7.8	20	26	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3	< 3.5
	ug/kg		Aroclor-1260	6.1	10	21	27		< 3.2	10	13	7.7	7.2	27.2	31	29.4	< 3.5
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER	SAND	coarse	3 in														
			1 1/2														
			3/4														
			3/8														
			4														100
			8														
			10														97.0
		medium	16														88.0
			20														
			30														69.5
			40														
			50														69.5
		fine	70														
			80														53.9
			100														45.8
			140														35.7
	SILT CLAY		200														25.8
			270														17.8
			0.20 mm														12.6
			0.05 mm														9.4
MISC	%		Total Organic Carb														1.32
	mg/kg		Chem Oxy Demand														
	mg/kg		Kjedahl Nitrogen														
	mg/kg		Total Phosph														
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total														< 0.68
	mg/kg		Ammonia														12
	mg/l		Ammonia Elutriate														
	%		Moisture														27
	%		Total Solids														73
	%		Volatile Solids														2.8

Table 4. Contaminant Data for Pool 2 of the Upper Mississippi River

			Record #	79	80	81	495
			River Mile	815.5	815.5	815.4	815.4
			Location	ABOVE L/D 2	ABOVE L/D 2	ABOVE L/D 2	ABOVE L/D 2
			Year	1982	1982	1974	1989
			System	1	1	1	1
			Habitat Type	1	1	1	1
			Pool	2	2	2	2
			Sam. Gear	1	1	1	1
			Sam. Depth	10	10	10	10
			Data Clt.	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.08
	ug/kg		b-BHC				< 0.16
	ug/kg		BHC				< 0.24
	ug/kg		g-BHC (lindane)				< 0.11
	ug/kg		Heptachlor				< 0.08
	ug/kg		Aldrin				< 0.11
	ug/kg		Heptachlorepoxide				< 0.14
	ug/kg		Endosulfan I				< 0.14
	ug/kg		Dieldrin	< 0.1	< 0.1	< 10	< 0.14
	ug/kg		4,4'-DDE	< 0.1	< 0.1	< 10	< 0.11
	ug/kg		Endrin	< 0.1	< 0.1	< 10	< 0.24
	ug/kg		Endosulfan II				< 0.27
	ug/kg		4,4'-DDD	< 0.1	< 0.1	< 10	< 0.3
	ug/kg		Endrinaldehyde				< 0.3
	ug/kg		Sulfan sulfate				< 0.3
	ug/kg		4,4'-DDT	< 0.1	< 0.1	< 10	< 0.35
	ug/kg		Methoxychlor				< 0.6
	ug/kg		Endrinketone				< 0.3
	ug/kg		Chlorodane	< 1	< 1	< 10	< 1.63
	ug/kg		Toxaphene				< 1.68
METALS	mg/kg		Ag (silver)				
	mg/kg		Al (aluminum)				
	mg/kg		As (arsenic)	2.8	2.7	1	2.9
	mg/kg		B (boron)				
	mg/kg		Ba (barium)				
	mg/kg		Be (beryllium)				
	mg/kg		Cd (cadmium)	0.77	1.2	3	< 1.33
	mg/kg		Cr (chromium)	10	12	39	14.6
	mg/kg		Cu (copper)	10	13	10	5.4
	mg/kg		Fe (iron)	6800	6300		
	mg/kg		Hg (mercury)	0.038	0.02	0.7	< 0.01
	mg/kg		Mg (magnesium)				
	mg/kg		Mn (manganese)				674
	mg/kg		Mo (molybdenum)				
	mg/kg		Ni (nickel)	10	9	29	19.2
	mg/kg		Pb (lead)	13	18	< 13	5.3
	mg/kg		Sb (antimony)				
	mg/kg		Se (selenium)				< 1.01
	mg/kg		Sn (tin)				
	mg/kg		Sr (strontium)				
	mg/kg		Ti (titanium)				
	mg/kg		Zn (zinc)	46	54	44	43.5
	mg/kg		V (vanadium)				
PCB'S	ug/kg		Aroclor-1006				< 1.63
	ug/kg		Aroclor-1221				< 1.63
	ug/kg		Aroclor-1232				< 1.63
	ug/kg		Aroclor-1242				< 1.63
	ug/kg		Aroclor-1248				< 1.63
	ug/kg		Aroclor-1254				< 3.4
	ug/kg		Aroclor-1260				< 3.4
	ug/kg		Total PCB's	0	1460	0	
PARTICLE SIZE %FINER	SAND	coarse	3 in				
			1 1/2	100	100		
			3/4	100	100		
			3/8	100	100		
			4	100	100		100
			8	99	100		
			10				95.4
		medium	16	99.0	99.0		84.6
			20				
			30	97.0	95.0		65.8
			40	96.0	89.0		
			50	95.0	77.0		65.8
		fine	70	94.0	65.0		
			80				50.8
			100	93.0	58.0		41.2
			140				34.6
	SILT CLAY		200	91.0	56.0		24.2
			270	90.0	55.0		17.7
			0.20 mm	69.0	39.0		12.4
			0.05 mm	33.0	17.0		8.5
MISC	%		Total Organic Carb				1.23
	mg/kg		Chem Oxy Demand	19200	35600	14184	
	mg/kg		Kjedahl Nitrogen	1100	1200	288	
	mg/kg		Total Phosph	1100	1400	980	
	mg/kg		Oil and Grease	175	370	163	
	mg/kg		Cyanide, Total				< 0.71
	mg/kg		Ammonia				9.8
	mg/l		Ammonia Elutriate				
	%		Moisture				29.9
	%		Total Solids				70.1
	%		Volatile Solids				3.9

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	541	82	83	539	540		84	529	85	86	87	88	530	89
			River Mile	815.1	815.0	815.0	813.1	813.1	813.1	813.0	811.5	811.0	811.0	811.0	811.0	810.9	809.6
			Location	Below L/D 2	LOWER APPRO. L/D 2	LOWER APPRO. L/D 2	HASTINGS SM BOAT	HASTINGS SM BOAT	HASTINGS SM BOAT	HASTINGS SM BOAT	PRESCOTT	PRESCOTT	PRESCOTT	PRESCOTT	PRESCOTT	PRESCOTT	PINE COULEE
			Year	1989	1982	1982	1989	1989	1994	1979	1989	1982	1982	1978	1978	1989	1982
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	2	2	1	2	1	1	1	1	1	1	1
			Pool	2	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.07	< 0.11	< 0.38		< 0.07					< 0.07	
	ug/kg		b-BHC				< 0.14	< 0.22	2.4		< 0.14					< 0.14	
	ug/kg		BHC				< 0.21	< 0.33	< 0.38		< 0.22					< 0.21	
	ug/kg		g-BHC (lindane)				< 0.09	< 0.15	< 0.38		< 0.1					< 0.1	
	ug/kg		Heptachlor				< 0.07	< 0.11	0.58		< 0.07					< 0.07	
	ug/kg		Aldrin				< 0.09	< 0.15			< 0.1					< 0.1	
	ug/kg		Heptachlorepoxide				< 0.12	< 0.18			< 0.12					< 0.12	
	ug/kg		Endosulfan I				< 0.12	< 0.18			< 0.12					< 0.12	
	ug/kg		Dieldrin		< 0.1	< 0.1	< 0.12	< 0.18	< 0.76	0	< 0.12	< 0.1	< 0.1	0	0	< 0.12	< 0.1
	ug/kg		4,4'-DDE		< 0.1	< 0.1	< 0.09	< 0.15	< 2.3	4.6	< 0.1	< 0.1	< 0.1	0	0	< 0.1	< 0.1
	ug/kg		Endrin		< 0.1	< 0.1	< 0.21	< 0.33	< 0.76	0	< 0.22	< 0.1	< 0.1	0	0	< 0.21	< 0.1
	ug/kg		Endosulfan II				< 0.24	< 0.36			< 0.24					< 0.24	
	ug/kg		4,4'-DDD		< 0.1	< 0.1	< 0.26	< 0.4	< 1.4	4.9	< 0.26	< 0.1	< 0.1	0	0	< 0.26	< 0.1
	ug/kg		Endrinaldehyde				< 0.26	< 0.4			< 0.26					< 0.26	
	ug/kg		Sulfan sulfate				< 0.26	< 0.4			< 0.26					< 0.26	
	ug/kg		4,4'-DDT		< 0.1	< 0.1	< 0.31	< 0.4	< 0.76	0.4	< 0.31	< 0.1	< 0.1	0	0	< 0.31	< 0.1
	ug/kg		Methoxychlor				< 0.52	< 0.8			< 0.53					< 0.52	
	ug/kg		Endrinketone				< 0.26	< 0.4			< 0.26					< 0.26	
	ug/kg		Chlorodane		< 1	< 1	< 1.42	< 2.18	< 0.38	8	< 1.44	< 1	< 1	0	0	< 1.43	< 1
	ug/kg		Toxaphene				< 1.42	< 2.18			< 0.144					< 1.43	
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)		1.8	2.5	< 0.98	< 1.6	4.5	2	1.9	2	2.5	0	0	1.6	2.9
	mg/kg		B (boron)														
	mg/kg		Ba (barium)							110				20	10		
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)		< 0.19	< 0.18	< 1.1	< 1.7	1.4	< 10	< 1	< 0.17	< 0.18	< 10	< 10	< 1.1	< 0.19
	mg/kg		Cr (chromium)		5.6	8	6.4	22.8	31.3	40	5.2	6.8	5.5	< 10	< 10	7.3	5.8
	mg/kg		Cu (copper)		2.8	7.1	2.9	18.3	24.1	30	14.4	2.5	2.8	< 10	< 10	11.1	2.9
	mg/kg		Fe (iron)		6200	10000				11000		6000	5700	3200	3000		8500
	mg/kg		Hg (mercury)		0.01	0.015	< 0.01	0.32	0.11	0	< 0.01	0.072	0.045	0	0	< 0.12	0.034
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)				358	741	1020	910	404			180	340	349	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)		8	12	8.5	14.3	19.7	20	5.5	8	7	< 10	< 10	6.7	9
	mg/kg		Pb (lead)		1.9	7	1.5	< 18.9	19.6	40	2	3	4	< 10	< 10	2.3	6
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				< 0.82	< 1.3			< 0.79					< 0.83	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)		16	28	17.3	< 81.9	87.6	90	16.2	13	14	10	10	18.2	16
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1221				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1232				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1242				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1248				< 1.42	< 2.18	< 4.9		< 1.44					< 1.43	
	ug/kg		Aroclor-1254				< 2.95	< 4.55	54		< 3					< 2.98	
	ug/kg		Aroclor-1260				< 2.95	< 4.55	< 4.9		< 3					< 2.98	
	ug/kg		Total PCB's		0	0				74		0	0	0	0		0
PARTICLE SIZE %FINER		SAND coarse	3 in									100			100		100
			1 1/2			100				100		100	100	100	100		100
			3/4			100				100		100	100	100	100		100
			3/8			100				100		100	100	100	100		100
			4	99.7		100	98.4	100		100	95.3	99	97	100	100	99.1	90
			8			98				100			90	99			
			10	99.0			95.4	99.8			83.9	97			99	92.5	49
		SAND medium	16	95.4		89.0	82.4	98.4		99.0	57.8		76.0	91.0		69.6	
			20						100			87.0			92.0		22.0
			30	71.2		67.0	37.3	96.9		97.0	17.0		39.0	53.0		19.8	
			40			35.0			99.7	94.0		53.0	16.0	26.0	34.0		11.0
			50	71.2		14.0	37.3	96.9		90.0	17.0		6.0	9.0		19.8	
		SAND fine	70			9.0				87.0			4.0	5.0			
			80	16.5			9.7	96.0			0.9	40.0			1.0	3.1	5.0
			100	0.5		8.0	1.3	84.5	99.0	85.0	0.0		4.0	4.0		2.5	
			140	0.4			1.1	59.9	98.5							2.4	
		SILT CLAY	200	0.3		7.0	0.9	34.0	96.9	83.0		37.0	3.0	3.0	0.0	2.2	3.0
			270	0.3		7.0	0.5	19.6		82.0			3.0	3.0		1.6	
			0.20 mm	0.2		1.0	0.3	14.2		60.0		22.0	1.0	1.0	0.0	1.2	1.0
			0.05 mm	0.2		0.0	0.3	10.8		32.0		10.0	0.0	0.0	0.0	0.8	0.0
MISC	%		Total Organic Carb	0.011			0.17	1.53			0.017					0.15	
	mg/kg		Chem Oxy Demand			2245				7910		57000	1050	1990	1900		2800
	mg/kg		Kjedahl Nitrogen			94				760		9700	55	92	240		220
	mg/kg		Total Phosph			175				400		1100	210	160	46		270
	mg/kg		Oil and Grease			50				60		0	< 50	< 50	0		0
	mg/kg		Cyanide, Total				< 0.61	< 0.6	< 0.11		< 0.59					< 0.63	
	mg/kg		Ammonia				3.2	20.00			< 0.24					16	
	mg/l		Ammonia Elutriate						0.9								
	%		Moisture				19.1	17.3	54.1		15.3					20.4	
	%		Total Solids				80.9	82.7	45.9		84.7					79.6	
	%		Volatile Solids				0.7	1.1	7.35		0.1					1.3	

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	90	91	531	92	93	94	95	532	96	97	533		98	99
			River Mile	809.6	808.5	808.3	808.0	808.0	807.8	807.8	807.3	805.6	804.6	802.8	802.7	802.7	802.5
			Location	PINE COULEE	TRUEDALE SLOUGH	TRUEDALE SLOUGH	TRUEDALE SLOUGH	TRUEDALE SLOUGH	FOUR MILE ISLAND	FOUR MILE ISLAND	FOUR MILE ISLAND	BIG RIVER	BIG RIVER	MORGANS COULEE	COULTERS IS MORGANS 1	COULTERS IS MORGANS	COULTERS IS MORGANS
			Year	1982	1980	1989	1979	1979	1978	1978	1989	1981	1981	1989	1994	1974	1981
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC's	ug/kg		a-BHC			< 0.07					< 0.07			< 0.07	< 0.24		
	ug/kg		b-BHC			< 0.15					< 0.15			< 0.14	< 0.24		
	ug/kg		BHC			< 0.22					< 0.22			< 0.22	< 0.24		
	ug/kg		g-BHC (lindane)			< 0.1					< 0.1			< 0.1	< 0.24		
	ug/kg		Heptachlor			< 0.07					< 0.07			< 0.07	< 0.24		
	ug/kg		Aldrin			< 0.1					< 0.1			< 0.1			
	ug/kg		Heptachlorepoxide			< 0.12					< 0.12			< 0.12			
	ug/kg		Endosulfan I			< 0.12					< 0.12			< 0.12			
	ug/kg		Dieldrin	< 0.1	< 0.2	< 0.12	0	0	0	0	< 0.12	1	< 0.1	< 0.12	< 0.48	< 10	< 0.1
	ug/kg		4,4'-DDE	< 0.1	< 0.2	< 0.1	0	0	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.48	< 10	< 0.1
	ug/kg		Endrin	< 0.1	< 0.2	< 0.22	0	0	0	0	< 0.22	< 0.1	< 0.1	< 0.22	< 0.48	< 10	< 0.1
	ug/kg		Endosulfan II			< 0.24					< 0.24			< 0.24			
	ug/kg		4,4'-DDD	< 0.1	< 0.2	< 0.27	0	0	0	0	< 0.27	1.4	< 0.1	< 0.26	< 0.48	< 10	< 0.1
	ug/kg		Endrinaldehyde			< 0.27					< 0.27			< 0.26			
	ug/kg		Sulfan sulfate			< 0.27					< 0.27			< 0.26			
	ug/kg		4,4'-DDT	1	< 0.4	< 0.32	0	0	0	0	< 0.32	0.7	< 0.1	< 0.31	< 0.48	< 10	< 0.1
	ug/kg		Methoxychlor			< 0.54					< 0.54			< 0.53			
	ug/kg		Endrinketone			< 0.27					< 0.27			< 0.26			
	ug/kg		Chlorodane	< 1	0.4	< 1.46	0	0	0	0	< 1.46	3	< 1	< 1.44	< 0.24	< 10	< 1
	ug/kg		Toxaphene			< 1.46					< 1.46			< 1.44			
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1.7		< 1	0	0	0	0	1.4	3	10	< 1	1	< 0.9	10
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				30	30	10	30		20	20				30
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 0.18	1.01	< 1.1	< 10	< 10	< 10	< 10	< 1.1	< 1	< 1	< 1.1	< 0.11	< 1	< 1
	mg/kg		Cr (chromium)	5.6	26.8	3.2	< 10	< 10	< 10	< 10	7.9	< 10	30	5.5	6.3	5	< 10
	mg/kg		Cu (copper)	2.8	2.16	8.7	20	< 10	< 10	< 10	4	2	2	1.8	1.3	3	3
	mg/kg		Fe (iron)	5900	7859		4300	5600	2400	5000		3000	2000				2800
	mg/kg		Hg (mercury)	0.028	< 0.01	< 0.01	0	0	0	0	< 0.02	< 0.01	< 0.01	< 0.01	0.13	0.5	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)			222	260	580	200	450	2600	310	150	3170	181		190
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	8	14.3	< 5.5	10	< 10	< 10	< 10	9.5	< 10	< 10	< 5.5	5	3	< 10
	mg/kg		Pb (lead)	4	3.4	2.4	< 10	< 10	< 10	< 10	2.3	< 10	< 10	2	4.7	< 9	< 10
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)			< 0.84					< 0.82			< 0.85			
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	14	14.4	12.7	20	10	10	20	16.9	14	11	18.1	11.8	76	15
	mg/kg		V (vanadium)														
PCB's	ug/kg		Aroclor-1006			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1221			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1232			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1242			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1248			< 1.46					< 1.46			< 1.44	< 4.8		
	ug/kg		Aroclor-1254			< 3.05					< 3.05			< 3	< 4.8		
	ug/kg		Aroclor-1260			< 3.05					< 3.05			< 3	< 4.8		
	ug/kg		Total PCB's	0	0		0	3	0	0		2	0			0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in				100	100	100	100		100					100
			1 1/2	100	100		100	100	100	100		100	100			100	100
			3/4	100	100		100	100	100	100		100	100			100	100
			3/8	99	100		100	100	100	100		100	100			100	100
			4	92	100		100	100	94	100	93.0722	96	100	96.878	99.1	100	99
			8	75	97		98						98			98	95
			10					98	78	99	82.9801	90		94.471	93.8		
		medium	16	54.0	91.0		87.0				67.0		92.0	91.0		81.0	82.0
			20					65.0	35.0	95.0		74.0			88.8		
			30	32.0	65.0						26.4		65.0	71.7		53.0	
			40	21.0	34.0		50.0	13.0	10.0	59.0		31.0	37.0		66.5	14.0	8.0
			50	10.0	6.0						26.4		6.0	71.7		1.0	
		fine	70	6.0	3.0								0.0			0.0	
			80					2.0	4.0	2.0	0.6	3.0		8.6			
			100	5.0	3.0		1.0				0.0		0.0	0.6	1.2	0.0	0.0
			140											0.6	0.8		
	SILT CLAY		200	4.0	3.0		1.0	2.0	3.0	0.0		2.0	0.0	0.5	0.5	0.0	0.0
			270	3.0	2.0								0.0	0.4		0.0	
			0.20 mm	1.0	2.0			0.0	1.0	0.0		0.0	0.0	0.3		0.0	0.0
			0.05 mm	0.0	0.0		1.0	0.0	0.0	0.0		0.0	0.0	0.3		0.0	0.0
MISC	%		Total Organic Carb			0.091					0.17			0.28	0.022		
	mg/kg		Chem Oxy Demand	2100	1040		624	10000	3000	1800		1600	5200			1500	431
	mg/kg		Kjedahl Nitrogen	90	18		--	1100	5200	280		190	294			244	235
	mg/kg		Total Phosph	160	140		511	260	290	170		440	--				247
	mg/kg		Oil and Grease	55	< 50		670	0	0	0		100	0			0	< 6
	mg/kg		Cyanide, Total			< 0.59					< 0.61			< 0.62	< 0.06		
	mg/kg		Ammonia			< 0.24					< 0.24			0.50			
	mg/l		Ammonia Elutriate												< 0.06		
	%		Moisture			15.9					17.6			19.8	17.8		
	%		Total Solids			84.1					82.4			80.2	82.2		
	%		Volatile Solids			0.6					0.7			0.8	1.0		

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #			534	100	101	535	102	536		1360	1366	1363	103	538
			River Mile	802.5	802.5	802.1	801.9	801.9	801.8	801.4	801.1	800.5	800.0	800.0	800.0	800.0	800.0
			Location	COULTERS IS MORGANS 2	COULTERS IS MORGANS 2dup	MORGANS COULEE	COULTERS IS MORGANS	COULTERS IS MORGANS	COULTERS IS M.SLOUGH	COULTERS IS MORGANS	COULTERS IS M.SLOUGH	LARSON LAKE	Ab. L/D 3 - east	Ab. L/D 3 - west	Ab. L/D 3 - mid	BLW DIAMOND BLUFF	BLW DIAMOND BLUFF
			Year	1994	1994	1989	1978	1978	1989	1981	1989	1994	1981	1981	1981	1981	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	3	1	1	1	1	1
			Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	1	1	1	1	1	1	1	3	3	3	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	MWCC	MWCC	MWCC	COE	COE
CHC's	ug/kg		a-BHC	< 0.24	< 0.25	< 0.07			< 0.07		< 0.07	0.12					< 0.08
	ug/kg		b-BHC	< 0.24	< 0.25	< 0.14			< 0.15		< 0.15	0.24					< 0.16
	ug/kg		BHC	< 0.24	< 0.25	< 0.22			< 0.22		< 0.22	0.36					< 0.25
	ug/kg		g-BHC (lindane)	< 0.24	< 0.25	< 0.1			< 0.1		< 0.1	0.16					< 0.11
	ug/kg		Heptachlor	< 0.24	< 0.25	< 0.07			< 0.07		< 0.07	0.12					< 0.08
	ug/kg		Aldrin			< 0.1			< 0.1		< 0.1	0.16					< 0.11
	ug/kg		Heptachlorepoxide			< 0.12			< 0.12		< 0.12	0.2					< 0.14
	ug/kg		Endosulfan I			< 0.12			< 0.12		< 0.12	0.2					< 0.14
	ug/kg		Dieldrin	< 0.47	< 0.49	< 0.12	0	0	< 0.12	< 0.1	< 0.12	0.2				< 0.1	< 0.14
	ug/kg		4,4'-DDE	< 0.47	< 0.49	< 0.1	0	0	< 0.1	< 0.1	< 0.1	0.16				< 0.1	< 0.11
	ug/kg		Endrin	< 0.47	< 0.49	< 0.22	0	0	< 0.22	< 0.1	< 0.22	0.36				< 0.1	< 0.25
	ug/kg		Endosulfan II			< 0.24			< 0.24		< 0.24	0.4					< 0.27
	ug/kg		4,4'-DDD	< 0.47	< 0.49	< 0.26	0	0	< 0.27	< 0.1	< 0.27	0.44				< 0.1	< 0.3
	ug/kg		Endrinaldehyde			< 0.26			< 0.27		< 0.27	0.44					< 0.3
	ug/kg		Sulfan sulfate			< 0.26			< 0.27		< 0.27	0.44					< 0.3
	ug/kg		4,4'-DDT	< 0.47	< 0.49	< 0.31	0	0	< 0.32	< 0.1	< 0.32	0.52				< 0.1	< 0.36
	ug/kg		Methoxychlor			< 0.53			< 0.54		< 0.54	0.88					< 0.6
	ug/kg		Endrinketone			< 0.26			< 0.27		< 0.27	0.44					< 0.3
	ug/kg		Chlorodane	< 0.24	< 0.25	< 1.44	0	0	< 1.46	< 1	< 1.46	2.41				< 1	< 1.64
	ug/kg		Toxaphene			< 1.44			< 1.46		< 1.46	2.41					< 1.64
METALS	mg/kg		Ag (silver)										0.167	0.069	1.07		
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1.5		< 1	0	0	< 1	6	< 1	5	2.53	0.53	1.07	10	< 1.2
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				10	20		20						30	
	mg/kg		Be (beryllium)										0.175	0.127	0.14		
	mg/kg		Cd (cadmium)	0.25		< 1.1	< 10	< 10	< 1.1	< 1	< 1.1	< 2	0.361	0.066	0.11	< 1	< 1.3
	mg/kg		Cr (chromium)	6.9		19.4	< 10	< 10	6.6	< 10	5	33.1	18.3	7.7	9.4	< 10	7.9
	mg/kg		Cu (copper)	2.3		4.4	< 10	< 10	3.7	2	1.9	18.6	6.8	2.2	2.6	3	4.4
	mg/kg		Fe (iron)				3700	2300		2900						3000	
	mg/kg		Hg (mercury)	< 0.04		< 0.01	0	0.04	< 0.01	< 0.01	< 0.01	< 0.2	0.03	0.02	0.01	< 0.01	< 0.01
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	325		356	160	160	270	190	169	817				170	562
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	6.3		10	< 10	< 10	< 5.5	< 10	< 5.6	22.1	10.2	5.5	4.2	< 10	7.1
	mg/kg		Pb (lead)	2.7		1.9	< 10	< 10	3.8	< 10	6.9	16.1	9.1	4.2	3.3	< 10	4.1
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)			< 0.85			< 0.84		< 0.85	< 1.6	0.13	0.13	0.11		< 1
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	15.5		22.7	20	10	20.1	15	14.4	63.7	33.1	15.8	13.9	18	26.4
	mg/kg		V (vanadium)														
PCB's	ug/kg		Aroclor-1006	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1221	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1232	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1242	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1248	< 4.7	< 4.9	< 1.44			< 1.46		< 1.46	2.41					< 1.64
	ug/kg		Aroclor-1254	< 4.7	< 4.9	< 3			< 3.05		< 3.05	5.03					< 3.43
	ug/kg		Aroclor-1260	< 4.7	< 4.9	< 3			< 3.05		< 3.05	5.03					< 3.43
	ug/kg		Total PCB's				0	0		0						0	
PARTICLE SIZE %FINER	SAND	coarse	3 in					100		100							
			1 1/2				100	100		100						100	
			3/4				100	100		100						100	
			3/8				100	100		100						100	
			4	98		99.84	100	100	98.4027	100	99.4601					99	99.5146
			8				98									95	
			10	95.8		99.243		99	96.4716	97	98.1938						96.8648
		medium	16			93.0	94.0		89.1		94.9					89.0	91.7
			20	86.2				91.0		84.0							
			30			48.6	76.0		62.4		75.7					69.0	67.9
			40	31.0			53.0	59.0		49.0						52.0	
			50			48.6	17.0		62.4		75.7					21.0	67.9
		fine	70				2.0									3.0	
			80			3.8		1.0	9.2	2.0	7.6						21.7
			100	1.0		0.5	0.0		0.3		0.7					0.0	7.8
			140	0.9		0.5			0.3		0.7						7.0
	SILT		200	0.3		0.4	0.0	0.0	0.2	1.0	0.5					0.0	5.2
			270			0.3	0.0				0.4					0.0	3.7
	CLAY		0.20 mm				0.0	0.0		0.0	0.3					0.0	3.0
			0.05 mm				0.0	0.0		0.0	0.2					0.0	2.0
MISC	%		Total Organic Carb	0.026	0.026	0.25			0.086		0.13						0.69
	mg/kg		Chem Oxy Demand				2200	2200		2200						2700	
	mg/kg		Kjedahl Nitrogen				422	300		260						242	
	mg/kg		Total Phosph				--	110		260						--	
	mg/kg		Oil and Grease				100	0		0						100	
	mg/kg		Cyanide, Total			< 0.62			< 0.62		< 0.63	< 0.98					< 0.82
	mg/kg		Ammonia			0.25			0.56		< 0.25						43.00
	mg/l		Ammonia Elutriate	< 0.06	< 0.06							113.00					
	%		Moisture	14.2	16.0	19.8			19.6		20.9						38.7
	%		Total Solids	85.8	84.0	80.2			80.4		79.1						61.3
	%		Volatile Solids	0.9	1.0	0.6			0.7		0.6	6.2					3.4

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	537			104				344	341	342	340	347	346	345
			River Mile	800.0	800.0	799.5	799.2	799.2	799.0	798.5	797.3	797.3	797.3	797.3	797.3	797.3	797.3
			Location	BLW DIAMOND BLUFF	BLW DIAMOND BLUFF 1	UPPER GOOSE LAKE	BLW DIAMOND BLUFF	BLW DIAMOND BLUFF 2	MID GOOSE LAKE	LOWER GOOSE LAKE	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3	Above lock and dam 3
			Year	1989	1994	1994	1981	1994	1994	1994	1986	1986	1986	1986	1986	1986	1986
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	3	1	1	3	3	1	1	1	1	1	1	1
			Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.08	< 0.24	0.13		< 0.24	0.13	0.14							
	ug/kg		b-BHC	< 0.15	< 0.24	0.27		< 0.24	0.26	0.27							
	ug/kg		BHC	< 0.23	< 0.24	0.4		< 0.24	0.39	0.41							
	ug/kg		g-BHC (lindane)	< 0.1	< 0.24	0.18		< 0.24	0.17	0.18							
	ug/kg		Heptachlor	< 0.08	< 0.24	0.13		< 0.24	0.13	0.14							
	ug/kg		Aldrin	< 0.1		0.18			0.17	0.18							
	ug/kg		Heptachlorepoxide	< 0.13		0.22			0.21	0.23							
	ug/kg		Endosulfan I	< 0.13		0.22			0.21	0.23							
	ug/kg		Dieldrin	< 0.13	< 0.49	0.22	< 0.1	< 0.49	0.21	0.23							
	ug/kg		4,4'-DDE	< 0.1	< 0.49	0.18	< 0.1	< 0.49	0.17	0.18							
	ug/kg		Endrin	< 0.23	< 0.49	0.4	< 0.1	< 0.49	0.39	0.41							
	ug/kg		Endosulfan II	< 0.25		0.44			0.43	0.45							
	ug/kg		4,4'-DDD	< 0.28	< 0.49	0.49	< 0.1	< 0.49	0.47	0.5							
	ug/kg		Endrinaldehyde	< 0.28		0.49			0.47	0.5							
	ug/kg		Sulfan sulfate	< 0.28		0.49			0.47	0.5							
	ug/kg		4,4'-DDT	< 0.33	< 0.49	0.57	< 0.1	< 0.49	0.56	0.59							
	ug/kg		Methoxychlor	< 0.56		0.97			0.94	0.99							
	ug/kg		Endrinketone	< 0.28		0.49			0.47	0.5							
	ug/kg		Chlorodane	< 1.52	< 0.24	2.65	< 1	< 0.24	2.57	2.71							
	ug/kg		Toxaphene	< 1.52		2.65			2.57	2.71							
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)								2600	2700	1800	2600	1700	2100	3250
	mg/kg		As (arsenic)	< 1.1	0.81	2.5	17	1.1	5.1	3.8	0.48	0.2	1.13	0.31	0.78	0.37	1.38
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				20				17	18	13	10	13	13	24
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 1.2	< 0.12	< 2.2	< 2	0.37	< 2.2	< 2.3	0.21	0.23	0.24	0.19	0.17	0.21	0.33
	mg/kg		Cr (chromium)	5.4	5.8	25.3	< 10	6.5	26.2	24.6	6.4	9	5	5	4.5	5.3	9.4
	mg/kg		Cu (copper)	3.2	1.4	14.2	3	2	20.7	19.2	1.9	2.1	1.4	1.3	1.3	1.9	4.3
	mg/kg		Fe (iron)				2200										
	mg/kg		Hg (mercury)	< 0.01	< 0.04	< 0.22	< 0.01	0.12	< 0.22	< 0.23	0.028	0.005	0.007	0.007	0.007	0.009	0.046
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	370	192	1010	130	221	1150	1100	190	250	180	120	120	140	210
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 5.8	4.5	21.3	< 10	4.7	24.2	17.9	6	5.8	4.4	4.8	3.7	4.9	5.6
	mg/kg		Pb (lead)	14.9	3.2	8.8	< 20	3.2	18.2	17.3	7.6	7.1	6.6	5.6	5.7	6.3	11.6
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	< 0.89		< 1.8			< 1.7	< 1.8	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	19.9	12.4	74.8	16	13.9	107	75	13	13	11.5	10	9.4	11	19.5
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg		Aroclor-1221	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg		Aroclor-1232	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg		Aroclor-1242	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg		Aroclor-1248	< 1.52	< 4.9	2.65		< 4.9	2.57	2.71							
	ug/kg		Aroclor-1254	< 3.18	< 4.9	5.53		< 4.9	5.35	5.65							
	ug/kg		Aroclor-1260	< 3.18	< 4.9	5.53		< 4.9	5.35	5.65							
	ug/kg		Total PCB's				0				0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in														
			1 1/2				100										
			3/4				100										
			3/8				100										
			4	98.926	100		100	99.4									
			8				96										
			10	82.5677	99.7			91.9									
		medium	16	79.5			83.0										
			20		96.3			88.0									
			30	66.6			49.0										
			40		65.8		28.0	62.1									
			50	66.6			9.0										
		fine	70				1.0										
			80	19.6													
			100	5.0	1.5		0.0	4.3									
			140	4.7	1.0			3.1									
	SILT CLAY		200	3.9	0.6		0.0	2.7									
			270	3.1			0.0										
			0.20 mm	2.5			0.0										
			0.05 mm	1.6			0.0										
MISC	%		Total Organic Carb	0.42	0.03			0.054									
	mg/kg		Chem Oxy Demand				2400										
	mg/kg		Kjedahl Nitrogen				249										
	mg/kg		Total Phosph				--										
	mg/kg		Oil and Grease				0										
	mg/kg		Cyanide, Total	< 0.73	< 0.06	< 1.1		< 0.06	< 1.1	< 1.1							
	mg/kg		Ammonia	24.00													
	mg/l		Ammonia Elutriate		< 0.06	204.00		< 0.06	388.00	249.00							
	%		Moisture	31.2	21.4			21.7									
	%		Total Solids	68.8	78.6			78.3									
	%		Volatile Solids	2.1	0.9	6.7		1.1	8.4	11.8							

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	339	343	1371	1397	1375	1379	1380	1393	1392	1384	1388	1401	1405	1406
			River Mile	797.3	797.3	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0	797.0
			Location	Above lock and dam 3	Above lock and dam 3	Ab. L/D 3 - east	Ab. L/D 3 - west	Ab. L/D 3 - mid	Ab. L/D 3 - west	Ab. L/D 3 - mean	Ab. L/D 3 - mean	Ab. L/D 3 - west	Ab. L/D 3 - east	Ab. L/D 3 - mid	Ab. L/D 3 - mid	Ab. L/D 3 - west	Ab. L/D 3 - mean
			Year	1986	1986	1982	1982	1982	1982	1982	1983	1983	1983	1983	1984	1984	1984
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Gear	1	1	3	3	3	3	3	3	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC							< 0.53	6.1						< 0.32
	ug/kg		b-BHC							< 10	< 1.1						< 0.64
	ug/kg		BHC														
	ug/kg		g-BHC (lindane)							8	2.1						< 0.32
	ug/kg		Heptachlor							7	< 0.53						< 0.32
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin							< 20	< 1.6						< 0.96
	ug/kg		4,4'-DDE							< 7	< 1.6						< 0.96
	ug/kg		Endrin							< 10	< 2.1						< 1.3
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD							< 14	< 3.2						< 1.9
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT							< 20	< 4.2						< 2.5
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane							< 2	< 11						< 6.4
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)			0.099	0.108	0.099	0.157			0.064	0.031	0.06	0.081	0.083	
	mg/kg		Al (aluminum)	1950	3000												
	mg/kg		As (arsenic)	0.25	0.72	1.96	1.34	1.62	5.03			1.9	1.01	1.54	1.79	2.04	
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	9.9	25												
	mg/kg		Be (beryllium)			0.171	0.126	0.096	0.515			0.117	0.084	0.117	0.119	0.224	
	mg/kg		Cd (cadmium)	0.19	0.465	0.124	0.209	0.082	0.214			0.064	0.114	0.082	0.124	0.24	
	mg/kg		Cr (chromium)	5	9.4	11.4	11	14.5	28.5			26.2	25	30.3	9.9	12.1	
	mg/kg		Cu (copper)	1.7	3.6	3.2	4.5	2.5	13			3.4	2.2	2.9	3.7	6.1	
	mg/kg		Fe (iron)														
	mg/kg		Hg (mercury)	0.007	0.022	0.05	0.05	0.05	0.05			0.05	0.05	0.05	0.05	0.05	
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	130	250	580.8	334.6	400.6	1408.8						441.9	469	
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	4.3	8.6	7.4	7.5	9.3	18.7			9.5	7.7	11.9	6.9	8.6	
	mg/kg		Pb (lead)	5.2	10.8	3.5	5.1	2.6	6			3.8	3.8	2.9	30.2	4.7	
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	< 0.2	< 0.2	0.05	0.12	0.05	0.06			0.06	0.05	0.05	0.12	0.12	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)			0.6	0.6	0.7	0.8			0.6	0.6	0.6	0.6	0.6	
	mg/kg		Zn (zinc)	10.5	20.5	19.2	22.8	17.2	52.2			16.1	15.5	15	17.4	28.4	
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006							70.00	16.00						16.00
	ug/kg		Aroclor-1221														
	ug/kg		Aroclor-1232														
	ug/kg		Aroclor-1242														
	ug/kg		Aroclor-1248														
	ug/kg		Aroclor-1254							90	9.8						10
	ug/kg		Aroclor-1260							< 20	< 5.3						< 3.2
	ug/kg		Total PCB's	0	0												
PARTICLE SIZE %FINER		SAND coarse	3 in														
			1 1/2	100													
			3/4	100													
			3/8	100													
			4	100													
			8	100													
			10														
		SAND medium	16	99.0													
			20														
			30	87.0													
			40	71.0													
			50	40.0													
		SAND fine	70	10.0													
			80														
			100	1.0													
			140														
	SILT CLAY		200	1.0													
			270	0.0													
			0.20 mm	0.0													
			0.05 mm	0.0													
MISC	%		Total Organic Carb														
	mg/kg		Chem Oxy Demand	1800													
	mg/kg		Kjedahl Nitrogen	295													
	mg/kg		Total Phosph	--													
	mg/kg		Oil and Grease	0													
	mg/kg		Cyanide, Total														
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate														
	%		Moisture														
	%		Total Solids														
	%		Volatile Solids														

Table 5. Contaminant Data for Pool 3 of the Upper Mississippi River

			Record #	1419	1419	1410	1418	1414
			River Mile	797.0	797.0	797.0	797.0	797.0
			Location	Ab. L/D 3 - mean	Ab. L/D 3 - mean-dup	Ab. L/D 3 - east	Ab. L/D 3 - west	Ab. L/D 3 - mid
			Year	1985	1985	1985	1985	1985
			System	1	1	1	1	1
			Habitat Type	1	1	1	1	1
			Pool	3	3	3	3	3
			Sam. Gear	3	3	3	3	3
			Sam. Depth	10	10	10	10	10
			Data Clt.	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
	ug/kg		b-BHC	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
	ug/kg		BHC					
	ug/kg		g-BHC (lindane)	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
	ug/kg		Heptachlor	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
	ug/kg		Aldrin					
	ug/kg		Heptachlorepoxide					
	ug/kg		Endosulfan I					
	ug/kg		Dieldrin	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79
	ug/kg		4,4'-DDE	< 0.79	< 0.79	< 0.79	< 0.79	< 0.79
	ug/kg		Endrin	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
	ug/kg		Endosulfan II					
	ug/kg		4,4'-DDD	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
	ug/kg		Endrinaldehyde					
	ug/kg		Sulfan sulfate					
	ug/kg		4,4'-DDT	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
	ug/kg		Methoxychlor					
	ug/kg		Endrinketone					
	ug/kg		Chlorodane	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg		Toxaphene					
METALS	mg/kg		Ag (silver)			0.01	0.012	0.011
	mg/kg		Al (aluminum)					
	mg/kg		As (arsenic)			1.79	1.44	1.62
	mg/kg		B (boron)					
	mg/kg		Ba (barium)					
	mg/kg		Be (beryllium)			0.113	0.082	0.091
	mg/kg		Cd (cadmium)			0.083	0.063	0.061
	mg/kg		Cr (chromium)			9.2	7.5	6.7
	mg/kg		Cu (copper)			6.3	1.4	1.6
	mg/kg		Fe (iron)					
	mg/kg		Hg (mercury)			0.05	0.05	0.05
	mg/kg		Mg (magnesium)					
	mg/kg		Mn (manganese)			206.4	135	221.5
	mg/kg		Mo (molybdenum)					
	mg/kg		Ni (nickel)			6.7	4.6	4.9
	mg/kg		Pb (lead)			3.9	2.5	3
	mg/kg		Sb (antimony)			4	3.4	3.3
	mg/kg		Se (selenium)			0.11	0.13	0.12
	mg/kg		Sn (tin)					
	mg/kg		Sr (strontium)					
	mg/kg		Ti (titanium)			1.9	1.4	1.4
	mg/kg		Zn (zinc)			18.3	11.6	13.1
	mg/kg		V (vanadium)					
PCB'S	ug/kg		Aroclor-1006	22.10	17.10	< 5.3	35.00	27.70
	ug/kg		Aroclor-1221					
	ug/kg		Aroclor-1232					
	ug/kg		Aroclor-1242					
	ug/kg		Aroclor-1248					
	ug/kg		Aroclor-1254	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg		Aroclor-1260	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3
	ug/kg		Total PCB's					
PARTICLE SIZE %FINER	SAND	coarse	3 in					
			1 1/2					
			3/4					
			3/8					
			4					
			8					
			10					
		medium	16					
			20					
			30					
			40					
			50					
		fine	70					
			80					
			100					
			140					
	SILT CLAY		200					
			270					
			0.20 mm					
			0.05 mm					
MISC	%		Total Organic Carb					
	mg/kg		Chem Oxy Demand					
	mg/kg		Kjedahl Nitrogen					
	mg/kg		Total Phosph					
	mg/kg		Oil and Grease					
	mg/kg		Cyanide, Total					
	mg/kg		Ammonia					
	mg/l		Ammonia Elutriate					
	%		Moisture					
	%		Total Solids					
	%		Volatile Solids					

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	105	106	107	485	108	109		110	486		111	491	492	
			River Mile	794.5	794.1	793.1	793.1	792.8	792.8	792.8	792.5	792.5	792.5	792.2	791.5	791.5	791.5
			Location	TRENTON	TRENTON	CANNON RIVER	CANNON RIVER	CANNON RIVER	CANNON RIVER	CANNON RIVER 1	CANNON RIVER	CANNON RIVER	CANNON RIVER 2	CANNON RIVER	REDWING COMM	REDWING COMM	REDWING COMM 1
			Year	1981	1981	1982	1989	1978	1978	1994	1974	1989	1994	1982	1989	1989	1994
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	2	2	1
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.07			< 0.24		< 0.07	< 0.24		< 0.1	< 0.16	< 0.32
	ug/kg		b-BHC				< 0.15			< 0.24		< 0.15	< 0.24		< 0.2	< 0.32	1
	ug/kg		BHC				< 0.22			< 0.24		< 0.22	< 0.24		< 0.3	< 0.48	< 0.32
	ug/kg		g-BHC (lindane)				< 0.1			< 0.24		< 0.1	< 0.24		< 0.14	< 0.21	< 0.32
	ug/kg		Heptachlor				< 0.07			< 0.24		< 0.07	< 0.24		< 0.1	< 0.16	< 0.32
	ug/kg		Aldrin				< 0.1					< 0.1			< 0.14	< 0.21	
	ug/kg		Heptachlorepoxide				< 0.12					< 0.12			< 0.17	< 0.26	
	ug/kg		Endosulfan I				< 0.12					< 0.12			< 0.17	< 0.26	
	ug/kg		Dieldrin	< 0.1	< 0.1	< 0.1	< 0.12	0	0	< 0.48	< 10	< 0.12	< 0.48	< 0.1	< 0.17	< 0.26	< 0.65
	ug/kg		4,4'-DDE	< 0.1	< 0.1	< 0.1	< 0.1	0	0	< 0.48	< 10	< 0.1	< 0.48	< 0.1	< 0.14	< 0.21	< 0.65
	ug/kg		Endrin	< 0.1	< 0.1	< 0.1	< 0.22	0	0	< 0.48	< 10	< 0.22	< 0.48	< 0.1	< 0.3	< 0.48	< 0.65
	ug/kg		Endosulfan II				< 0.24					< 0.25			< 0.34	< 0.53	
	ug/kg		4,4'-DDD	< 0.1	< 0.1	< 0.1	< 0.27	0	0	< 0.48	< 10	< 0.27	< 0.48	< 0.1	< 0.37	< 0.58	< 0.65
	ug/kg		Endrinaldehyde				< 0.27					< 0.27			< 0.37	< 0.58	
	ug/kg		Sulfan sulfate				< 0.27					< 0.27			< 0.37	< 0.58	
	ug/kg		4,4'-DDT	< 0.1	< 0.1	1	< 0.31	0	0	< 0.48	< 10	< 0.32	< 0.48	< 0.1	< 0.44	< 0.69	< 0.65
	ug/kg		Methoxychlor				< 0.53					< 0.55			< 0.74	< 1.16	
	ug/kg		Endrinketone				< 0.27					< 0.27			< 0.37	< 0.58	
	ug/kg		Chlorodane	< 1	< 1	< 1	< 1.45	0	0	< 0.24	< 10	< 1.49	< 0.24	< 1	< 2.03	< 3.17	< 0.32
	ug/kg		Toxaphene				< 1.45					< 1.49			< 2.03	< 3.17	
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	< 1	0	1.2	< 1.05	0	0	1.5	< 0.7	< 1	1.4	1.3	2.5	2.9	2.8
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	10	10			10	10								
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 1	< 1	< 0.18	< 1.5	< 10	< 10	< 0.13	< 1	< 1.1	< 0.11	0.18	< 1.64	2.5	0.74
	mg/kg		Cr (chromium)	< 10	< 10	3.5	3.7	< 10	< 10	8.7	17	4.3	5.1	4.6	23.3	51	25.2
	mg/kg		Cu (copper)	< 10	< 10	1.8	2.2	< 10	< 10	3.1	10	< 1.45	1.2	2.3	8.3	25	11.6
	mg/kg		Fe (iron)	2300	2600	4100		1700	2400					4500			
	mg/kg		Hg (mercury)	< 0.01	< 0.01	0.042	< 0.01	0.47	0.66	0.11	0.4	< 0.01	< 0.04	0.066	< 0.02	0.13	0.08
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	140	140		201	970	180	308		165	234		734	986	781
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	< 10	5	6.8	< 10	< 10	6.4	77	< 5.46	4.9	5	8.7	26	13.2
	mg/kg		Pb (lead)	< 10	< 10	2	< 0.85	< 10	< 10	7.1	< 6	1.2	4	3.4	11.2	24.9	10.5
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				< 0.88					< 0.83			< 1.25	< 1.84	
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	7	10	10	12.8	< 10	10	18.6	15	12	11	14	49.2	114	50.3
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1221				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1232				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1242				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1248				< 1.45			< 4.8		< 1.49	< 4.8		< 2.03	< 3.17	< 6.5
	ug/kg		Aroclor-1254				< 3.03			< 4.8		< 3.1	< 4.8		< 4.23	< 6.6	< 6.5
	ug/kg		Aroclor-1260				< 3.03			< 4.8		< 3.1	< 4.8		< 4.23	< 6.6	< 6.5
	ug/kg		Total PCB's	0	0	0		0	0		0			0			
PARTICLE SIZE %FINER	SAND	coarse	3 in					100	100		100						
			1 1/2	100	100	100		100	100		100			100			
			3/4	100	100	100		100	100		100			100			
			3/8	100	100	100		100	100		100			100			
			4	100	100	100	100	100	100	99.5	100	100	100	100	100	100	100
			8	98	98	99					100			100			
			10				100	100	98	97.7		99.8	98.6		99.9	99.9	99.7
		medium	16	93.0	90.0	95.0	99.2				99.0	98.0		99.0	99.5	99.4	
			20					97.0	88.0	90.1			89.2				99.2
			30	74.0	70.0	72.0	71.8					81.7		91.0	97.9	98.4	
			40	60.0	50.0	46.0		69.0	58.0	65.7	90.0		49.7	78.0			97.8
			50	40.0	18.0	16.0	71.8					81.7		60.0	97.9	98.4	
		fine	70	23.0	5.0	5.0								38.0			
			80				10.3	8.0	5.0			14.7			89.9	97.1	
			100	11.0	2.0	2.0	0.6			24.4	2.0	0.4	0.9	18.0	55.4	88.5	77.9
			140				0.5			22.9		0.6	0.6		39.6	76.7	69.0
	SILT CLAY		200	5.0	1.0	2.0	0.5	2.0	1.0	22.4	0.0	0.4	0.5	11.0	24.9	49.3	64.8
			270	1.0	0.0	2.0	0.4							10.0	17.9	30.2	
			0.20 mm	0.0	0.0	1.0		1.0	1.0		0.0			3.0	14.5	22.5	
			0.05 mm	0.0	0.0	0.0		0.0	0.0		0.0			1.0	9.6	12.1	
MISC	%		Total Organic Carb				0.47			0.134		0.5	0.038		4	11.9	1.02
	mg/kg		Chem Oxy Demand	430	15000	984		1800	2400		2553			5595			
	mg/kg		Kjedahl Nitrogen	215	695	27		200	390		61			157			
	mg/kg		Total Phosph	--	--	140		37	80		164			295			
	mg/kg		Oil and Grease	0	0	< 50		0	100		58			55			
	mg/kg		Cyanide, Total				< 0.6			< 0.07		< 0.61	< 0.06		< 0.9	< 1.4	< 0.09
	mg/kg		Ammonia				< 0.24					0.9			47.00	86	
	mg/l		Ammonia Elutriate							5.40			< 0.06				1.10
	%		Moisture				16.9			24.1		17.8	15.6		44.4	63	42.7
	%		Total Solids				83.1			75.9		82.2	84.4		55.6	37	57.3
	%		Volatile Solids				0.7			1.5		0.5	0.95		5.4	6.7	5.2

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #		112	113	489	490	114	115	488	487	116	333	335	334	374
			River Mile	791.5	791.4	791.4	791.2	791.2	791.0	791.0	791.0	790.1	789.8	786.5	786.0	786.0	786.0
			Location	REDWING SM BOAT 1	REDWING COMM	AB&BW REDWING HWY BR	REDWING SM BOAT	REDWING SM BOAT	REDWING SM BOAT	REDWING SM BOAT	AB&BW REDWING HWY BR	AB&BW REDWING HWY BR	AB&BW REDWING HWY BR	L-Lk Pepin-Bay City 1-1	L-Lk Pepin-Bay City 2-2	L-Lk Pepin-Bay City 2-1	Lk Pepin-Bay City/Ser-5
			Year	1994	1980	1980	1989	1989	1979	1979	1989	1989	1980	1987	1987	1987	1988
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	2	2	1	2	2	2	2	1	1	1	3	3	3	3
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	4	4	4	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	76	77-152	76	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.39			< 0.09	< 0.11			< 0.07	< 0.07		< 5	< 5	< 5	< 0.06
	ug/kg		b-BHC	2.6			< 0.19	< 0.21			< 0.15	< 0.15		< 5	< 5	< 5	< 0.12
	ug/kg		BHC	< 0.39			< 0.28	< 0.32			< 0.22	< 0.22					
	ug/kg		g-BHC (lindane)	< 0.39			< 0.12	< 0.14			< 0.1	< 0.1		< 5	< 5	< 5	< 0.08
	ug/kg		Heptachlor	< 0.39			< 0.09	< 0.11			< 0.07	< 0.07		< 5	< 5	< 5	< 0.06
	ug/kg		Aldrin				< 0.12	< 0.14			< 0.1	< 0.1					
	ug/kg		Heptachlorepoxide				< 0.16	< 0.18			< 0.12	< 0.12					
	ug/kg		Endosulfan I				< 0.16	< 0.18			< 0.12	< 0.12					
	ug/kg		Dieldrin	< 0.79	0.92	0	< 0.16	< 0.18	1.2	0	< 0.12	< 0.12	0.2	< 5	< 5	< 5	< 0.04
	ug/kg		4,4'-DDE	1.5	0.28	0	< 0.12	< 0.14	5.3	1.1	< 0.1	< 0.1	0	< 5	< 5	< 5	< 0.08
	ug/kg		Endrin	< 0.79	0.24	0	< 0.28	< 0.32	0	0	< 0.22	< 0.22	0	< 5	< 5	< 5	< 0.12
	ug/kg		Endosulfan II				< 0.31	< 0.36			< 0.25	< 0.25					
	ug/kg		4,4'-DDD	0.93	5.28	0	< 0.34	< 0.39	4.2	1.6	< 0.27	< 0.27	1.5	< 5	< 5	< 5	< 0.22
	ug/kg		Endrinaldehyde				< 0.34	< 0.39			< 0.27	< 0.27					
	ug/kg		Sulfan sulfate				< 0.34	< 0.39			< 0.27	< 0.27					
	ug/kg		4,4'-DDT	< 0.79	0.56	0	< 0.41	< 0.46	1.2	0	< 0.32	< 0.32	0.3	< 5	< 5	< 5	< 0.24
	ug/kg		Methoxychlor				< 0.69	< 0.78			< 0.55	< 0.55					
	ug/kg		Endrinketone				< 0.34	< 0.39			< 0.27	< 0.27					
	ug/kg		Chlorodane	< 0.39	7.1	0	< 1.87	< 2.14	9	0	< 1.49	< 1.49	0	< 5	< 5	< 5	< 0.29
	ug/kg		Toxaphene				< 1.87	< 2.14			< 1.49	< 1.49					
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	4		0	< 1.36	< 1.52	3	6	< 0.98	< 1.11	0	58.2	< 1.2	< 1.2	24
	mg/kg		B (boron)														
	mg/kg		Ba (barium)			40			150	170			40				
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	1.3	4.23	< 10	< 1.49	< 1.67	< 10	< 10	< 1.07	< 1.22	< 10	< 1.5	< 1.5	< 1.5	2.3
	mg/kg		Cr (chromium)	27.5	84.7	10	18.1	21.2	40	60	6.9	6.9	10	< 3.7	< 3.7	8.9	38
	mg/kg		Cu (copper)	17.8	17.8	< 10	6.8	9.9	30	30	< 1.4	2.57	< 10	15.8	8.9	8.9	21
	mg/kg		Fe (iron)		22900	6100			17000	21000			6900				
	mg/kg		Hg (mercury)	0.14	0.035	0	< 0.02	< 0.02	0	0	< 0.01	< 0.01	0	< 0.8	< 0.8	< 0.8	0.26
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	936		550	62.2	7.8	1200	1200	213	237	500	1077.5	721.8	721.8	850
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	16.2	57.4	< 10	8.8	11.6	20	20	< 5.17	6.9	< 10	< 12.9	27.8	< 12.9	23
	mg/kg		Pb (lead)	19.8	8.08	< 10	11.4	13.4	60	50	2.3	35.2	< 10	37.2	34.7	33.2	34
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)				< 1.14	< 1.27			< 0.81	< 0.93					< 38
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	78.3	216	30	50.2	59.3	100	110	11.1	21.5	40	124.8	111.7	103	110
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					< 1.2
	ug/kg		Aroclor-1221	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1232	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1242	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1248	< 7.9			< 1.87	< 2.14			< 1.49	< 1.49					
	ug/kg		Aroclor-1254	41			< 3.9	< 4.45			< 3.1	< 3.1					< 2.4
	ug/kg		Aroclor-1260	< 7.9			< 3.9	< 4.45			< 3.1	< 3.1					< 2.4
	ug/kg		Total PCB's		59.8	0			51	82			18	0	0	0	
PARTICLE SIZE %FINER	SAND	coarse	3 in		100	100			100	100			100				
			1 1/2		100	100			100	100			100				
			3/4		100	100			100	100			100				
			3/8		100	100			100	100			100				
			4		100	100	99.9	100	100	100	100	100	100				
			8		100	84							100				
			10				99.9	100	100	98	100	99.9					
		medium	16		100.0	70.0	99.4	99.5			99.3	99.1	99.0				
			20	100.0					99.0	98.0							
			30				98.4	98.5			71.7	95.2					
			40	99.7		51.0			99.0	98.0			68.0				
			50				98.4	98.5			71.7	95.2					
		fine	70														
			80				95.0	95.9	99.0	96.0	19.8	49.9					
			100	99.2	98.0	27.0	46.0	54.9			1.8	9.3	30.0				
			140	97.9			30.6	34.2			1.6	7.6			94.3	97.8	
	SILT CLAY		200	96.4	96.0	13.0	19.6	23.4	98.0	93.0	1.0	7.0	27.0				
			270				17.2	15.1				5.2			75.5	70.4	
			0.20 mm			3.0	11.7	13.0	60.0	65.0		4.5	15.0		44.4	36.8	
			0.05 mm		50.0	1.0	8.3	9.0	20.0	29.0		3.0	7.0		44.4	36.8	
MISC	%		Total Organic Carb	> 1.6			1.42	2.84			0.2	0.9			4.06	4.88	
	mg/kg		Chem Oxy Demand		35200	7600			180000	99000			17000				
	mg/kg		Kjedahl Nitrogen		--	1100			8400	6800			1600				
	mg/kg		Total Phosph		3140	--			1200	1200			--				
	mg/kg		Oil and Grease		530	0			0	0			0				
	mg/kg		Cyanide, Total	< 0.11			< 0.84	< 0.95			< 0.64	< 0.66					
	mg/kg		Ammonia				20	33.0			1.4	10.8					
	mg/l		Ammonia Elutriate	0.7													
	%		Moisture	53.5			40.8	47.4			21.5	24.7					
	%		Total Solids	46.5			59.2	52.6			78.5	75.3					
	%		Volatile Solids	7.03			4.3	5.0			0.6	1.3					

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	370	373	369	371	372	117	336	337	118	119	120	121	122	338
			River Mile	786.0	786.0	786.0	786	786	785.9	785.6	785.4	785.32	785.31	785.3	785.01	785	785.0
			Location	Lk Pepin-Bay City/Key-5	Lk Pepin-Bay City/Ser-4	Lk Pepin-Bay City/Key-4	Lk Pepin-Bay City/Pac-4	Lk Pepin-Bay City/Pac-5	BAY CITY SM BOAT	L-Lk Pepin-Bay City 3-1	L-Lk Pepin-Bay City 4-1	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	L-Lk Pepin-Bay City 5-1
			Year	1988	1988	1988	1988	1988	1982	1987	1987	1978	1978	1978	1974	1974	1987
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	3	3	3	3	3	2	3	3	1	1	1	1	1	3
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	4	4	1	1	1	1	1	4
			Sam. Depth	10	10	10	10	10	10	90	76	10	10	10	10	10	45
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.002	< 0.06	< 0.002	< 0.17	< 0.17		< 5	< 5						< 5
	ug/kg		b-BHC	< 0.006	< 0.12	< 0.006	< 0.42	< 0.42		< 5	< 5						< 5
	ug/kg		BHC														
	ug/kg		g-BHC (lindane)	< 0.006	< 0.08	< 0.006	< 0.22	< 0.22		< 5	< 5						< 5
	ug/kg		Heptachlor	< 0.006	< 0.06	< 0.006	< 0.22	< 0.22		< 5	< 5						< 5
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin	< 0.01	< 0.04	< 0.01	< 0.4	< 0.4	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg		4,4'-DDE	< 0.01	< 0.08	< 0.01	< 0.58	< 0.58	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg		Endrin	< 0.02	< 0.12	< 0.02	< 4.4	< 4.4	< 0.1	< 5	< 5	0	0	0	< 10	< 10	5.9
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD	< 0.01	< 0.22	< 0.01	< 1.3	< 1.3	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT	< 0.01	< 0.24	< 0.01	< 0.87	< 0.87	< 0.1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane	< 0.04	< 0.28	< 0.04	< 1.2	< 1.2	< 1	< 5	< 5	0	0	0	< 10	< 10	< 5
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	4.43	11	3.96	1.8	1.9	3.2	< 1.2	19.3	0	0	0	< 1	< 1	24.5
	mg/kg		B (boron)														
	mg/kg		Ba (barium)									0	0	0			
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	1.66	1.1	0.8	1	1.4	0.66	< 1.5	< 1.5	< 10	< 10	< 10	< 1	< 1	< 1.5
	mg/kg		Cr (chromium)	23.8	18	12.8	16	22	11	< 3.7	< 3.7	< 10	< 10	< 10	29	30	< 3.7
	mg/kg		Cu (copper)	16.3	11	9.17	7.5	10	8.8	22.6	22.6	< 10	< 10	< 10	2	5	8.9
	mg/kg		Fe (iron)						7400			2600	2400	2100			
	mg/kg		Hg (mercury)	0.29	0.18	0.15	0.08	0.22	0.027	< 0.8	< 0.8	0	0	0	< 0.1	< 0.1	< 0.8
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	730	640	548	400	400		757	1035.2	120	130	130			862.7
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	15.8	13	9.66	9.2	10	8	27.8	27.8	< 10	< 10	< 10	17	18	< 12.9
	mg/kg		Pb (lead)	31.2	22	17.5	12	13	6.6	37.1	31.5	20	20	20	< 9	< 9	30
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)	< 0.35	< 18	< 0.3	< 0.75	< 0.75									
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	85.1	58	45.7	38	46	35	129.1	137.8	10	20	< 10	13	12	116.1
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	< 0.15	< 1.2	< 0.15	< 3	< 3									
	ug/kg		Aroclor-1221														
	ug/kg		Aroclor-1232														
	ug/kg		Aroclor-1242														
	ug/kg		Aroclor-1248														
	ug/kg		Aroclor-1254	100	< 2.4	72	< 3	< 3									
	ug/kg		Aroclor-1260	< 0.25	< 2.4	< 0.25	< 3	< 3									
	ug/kg		Total PCB's						0	0	0	2	1	1	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in									100	100	100	100	100	
			1 1/2						100			100	100	100	100	100	
			3/4						100			100	100	100	100	100	
			3/8						100			100	100	100	100	100	
			4						100			100	99	99	100	100	
			8						100						100	100	
			10									90	75	80			
		medium	16						100						98.0	98.0	
			20									78.0	67.0	65.0			
			30						98.0								
			40						93.0			18.0	16.0	15.0	76.0	76.0	
			50						85.0								
		fine	70						76.0								
			80									12.0	10.0	10.0			
			100						71.0						5.0	5.0	
			140							99.3	93.8						
	SILT CLAY		200						67.0			10.0	8.0	8.0	0.0	0.0	
			270						66.0	76.3	72.2						
			0.20 mm						48.0	33.9	35.0	8.0	6.0	7.0	0.0	0.0	
			0.05 mm						23.0	33.8	35.0	5.0	5.0	5.0	0.0	0.0	
MISC	%		Total Organic Carb	0.71		1.7				5.98	3.03						
	mg/kg		Chem Oxy Demand						47500			2300	1100	6600	1712	2303	
	mg/kg		Kjedahl Nitrogen						1400			380	280	320	88	148	
	mg/kg		Total Phosph						590			170	84	110	205	225	
	mg/kg		Oil and Grease						430			0	0	0	149	147	
	mg/kg		Cyanide, Total														
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate														
	%		Moisture														
	%		Total Solids														
	%		Volatile Solids														

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	123	124	125	617	126	481	482	127	128	483	484	129	130	131
			River Mile	784.61	784.6	784.2	780	773	772.8	772.8	772.79	767.1	766.9	766.9	763.51	763.5	763.0
			Location	WACOUTA POINT	WACOUTA POINT	WACOUTA POINT	L-Lake Pepin Maiden	LAKE CITY SM BOAT	LAKE CITY SM BOAT	LAKE CITY SM BOAT		PEPIN SM BOAT	PEPIN SM BOAT	PEPIN SM BOAT	MOUTH OF CHIP. RIVER	MOUTH OF CHIP. RIVER	READS LANDING
			Year	1978	1978	1978	1987	1981	1989	1989	1974	1982	1989	1989	1982	1982	1974
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	3	2	2	2	1	2	2	2	1	1	1
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	3	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	45	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	WDNR	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC						< 0.2	< 0.07			< 0.07	< 0.09			
	ug/kg		b-BHC						< 0.39	< 0.15			< 0.15	< 0.18			
	ug/kg		BHC						< 0.59	< 0.22			< 0.22	< 0.26			
	ug/kg		g-BHC (lindane)						< 0.26	< 0.1			< 0.1	< 0.12			
	ug/kg		Heptachlor						< 0.2	< 0.07			< 0.07	< 0.09			
	ug/kg		Aldrin						< 0.26	< 0.01			< 0.1	< 0.12			
	ug/kg		Heptachlorepoxide						< 0.33	< 0.12			< 0.12	< 0.15			
	ug/kg		Endosulfan I						< 0.33	< 0.12			< 0.12	< 0.15			
	ug/kg		Dieldrin	0		< 1			< 0.33	< 0.12	< 10	< 0.1	< 0.12	< 0.15	< 0.1	< 0.1	< 10
	ug/kg		4,4'-DDE	0					< 0.26	< 0.1	50	< 0.1	< 0.1	< 0.12	< 0.1	< 0.1	< 10
	ug/kg		Endrin	0		< 1			< 0.59	< 0.22	< 10	< 0.1	< 0.22	< 0.26	< 0.1	< 0.1	< 10
	ug/kg		Endosulfan II						< 0.65	< 0.24			< 0.25	< 0.29			
	ug/kg		4,4'-DDD	0					< 0.72	< 0.27	< 10	< 0.1	< 0.27	< 0.32	2.2	< 0.1	< 10
	ug/kg		Endrinaldehyde						< 0.72	< 0.27			< 0.27	< 0.32			
	ug/kg		Sulfan sulfate						< 0.72	< 0.27			< 0.27	< 0.32			
	ug/kg		4,4'-DDT	0		< 4			< 0.85	< 0.31	< 10	700	< 0.32	< 0.38	16.7	< 0.1	< 10
	ug/kg		Methoxychlor						< 1.44	< 0.53			< 0.55	< 0.65			
	ug/kg		Endrinketone						< 0.72	< 0.27			< 0.27	< 0.32			
	ug/kg		Chlorodane	0					< 3.92	< 1.45	< 10	< 1	< 1.49	< 1.76	< 1	< 1	< 10
	ug/kg		Toxaphene						< 3.92	< 1.45			< 1.49	< 1.76			
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	0	3.15		1	3.4	1.7	4	1.8	< 1.14	< 1.11	1.3	1.1	< 0.9
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	30	10			90									
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 10	4	< 1	2	< 2.98	< 1.24	9	0.35	< 1.24	< 1.22	< 0.19	< 0.19	< 1
	mg/kg		Cr (chromium)	< 10	10	63.6		10	31.3	15.7	115	7.1	9.9	7.8	4.8	3.8	8
	mg/kg		Cu (copper)	< 10	< 10	23.5		20	79.8	20.9	58	7.1	8.4	7.9	3.9	2.8	10
	mg/kg		Fe (iron)	3600	2200	22800		14000				4900			5100	3800	
	mg/kg		Hg (mercury)	2.2	1.4	0.077		< 0.01	0.2	< 0.01	5.4	0.031	< 0.01	< 0.01	< 0.01	< 0.01	0.3
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	290	130	879		900	1290	264			311	268			
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	< 10	30		20	25.5	14.7	35	6	10.3	9.9	5	5	8
	mg/kg		Pb (lead)	20	< 10	42	< 10	460	29.7	84	47	11	7.3	7.7	2	2	< 7
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)						< 2.3	< 0.95			< 0.95	< 0.93			
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	18	< 10	88.8		78	117	< 0.65	185	28	22.7	27.8	14	13	19
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1221						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1232						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1242						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1248						< 3.92	< 1.45			< 1.49	< 1.76			
	ug/kg		Aroclor-1254						< 8.18	< 3.03			< 3.1	< 3.68			
	ug/kg		Aroclor-1260						< 8.18	< 3.03			< 3.1	< 3.68			
	ug/kg		Total PCB's	1	0	65	0	0			0	0			0	0	0
PARTICLE SIZE %FINER		SAND coarse	3 in	100	100	100											
			1 1/2	100	100	100		100				100			100	100	
			3/4	100	100	100		100				100			100	100	
			3/8	100	100	100		100				98			100	100	
			4	100	100	100		100	100	85.0		97	100		98	100	
			8					100				95			96	99	
			10	100	99				100	79.0			97.9				
		SAND medium	16					100	98.9	68.0		92.0	91.1		93.0	97.0	
			20	100.0	90.0												
			30					98.0	95.9	25.2		81.0	67.1		79.0	69.0	
			40	99.0	41.0			90.0				65.0			45.0	49.0	
			50					72.0	95.9	25.2		42.0	67.1		11.0	30.0	
		SAND fine	70					52.0				27.0			4.0	10.0	
			80	67.0	3.0				91.6	4.7			23.7				
			100					35.0	82.7	0.7		21.0	3.2		3.0	4.0	
			140						78.8	0.7			2.5				
		SILT CLAY	200	22.0	1.0	67.0		22.0	70.0	0.4		18.0	1.8		2.0	3.0	
			270					21.0	55.6			17.0	1.5		2.0	3.0	
			0.20 mm	8.0	0.0			13.0	46.3			9.0	1.4		1.0	1.0	
			0.05 mm	2.0	0.0	44.0		4.0	31.2			4.0	1.1		0.0	0.0	
MISC	%		Total Organic Carb						25.4	0.6			0.7	1.7			
	mg/kg		Chem Oxy Demand	15000	2800	89800		110000			113005	12800			585	1686	772
	mg/kg		Kjedahl Nitrogen	1200	410	1690		11300			4121	600			26	35	48
	mg/kg		Total Phosph	430	93	951		--			1769	230			94	111	232
	mg/kg		Oil and Grease	0	0	710		--			2825	205			< 50	< 50	85
	mg/kg		Cyanide, Total						< 2.2	< 0.63			< 0.63	< 0.68			
	mg/kg		Ammonia						232	2.3			3.3	10			
	mg/l		Ammonia Elutriate														
	%		Moisture						76.9	21.1			20.8	26.6			
	%		Total Solids						23.1	78.9			79.2	73.4			
	%		Volatile Solids						12.3	1.6			1.3	1.3			

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

		Record #	132	480	133	134	479	135	136	137	138	139	140	141	142	705
		River Mile	763	763	762.5	762.3	762.1	761.9	760	759.08	759.07	759.03	759.02	759.01	759	758.6
		Location	READS LANDING	READS LANDING	READS LANDING	READS LANDING	READS LANDING	READS LANDING	WABASHA SM BOAT	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	ABOVE CRATS ISLAND	R-Bay Lower End of Island
		Year	1974	1989	1980	1980	1989	1980	1981	1974	1974	1982	1982	1978	1978	1985
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	2	1	1	1	1	1	1	3
		Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	2
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	FWS
CHC'S	ug/kg	a-BHC		< 0.08			< 0.74									< 10
	ug/kg	b-BHC		< 0.15			< 1.48									< 10
	ug/kg	BHC		< 0.23			< 2.21									
	ug/kg	g-BHC (lindane)		< 0.1			< 0.98									< 10
	ug/kg	Heptachlor		< 0.08			< 0.74									< 10
	ug/kg	Aldrin		< 0.1			< 0.98									
	ug/kg	Heptachlorepoxide		< 0.13			< 1.23									
	ug/kg	Endosulfan I		< 0.13			< 1.23									
	ug/kg	Dieldrin	< 10	< 0.13	< 0.2	0	< 1.23	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg	4,4'-DDE	< 10	< 0.1	< 0.2	0	< 0.98	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg	Endrin	< 10	< 0.23	< 0.2	0	< 2.21	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg	Endosulfan II		< 0.26			< 2.46									
	ug/kg	4,4'-DDD	< 10	< 0.28	< 0.2	0	< 2.71	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg	Endrinaldehyde		< 0.28			< 2.71									
	ug/kg	Sulfan sulfate		< 0.28			< 2.71									
	ug/kg	4,4'-DDT	< 10	< 0.33	< 0.4	0	< 3.2	0		< 10	< 10	< 0.1	< 0.1	0	0	< 10
	ug/kg	Methoxychlor		< 0.56			< 5.41									
	ug/kg	Endrinketone		< 0.28			< 2.71									
	ug/kg	Chlorodane	< 10	< 1.54	< 0.4	0	< 14.76	0		< 10	< 10	< 1	< 1	0	0	< 10
	ug/kg	Toxaphene		< 1.54			< 14.76									
METALS	mg/kg	Ag (silver)														< 0.4
	mg/kg	Al (aluminum)														6520
	mg/kg	As (arsenic)	< 1	1		0	1.4	0	< 1	< 0.9	1	3	1.7	0	0	< 7
	mg/kg	B (boron)														7
	mg/kg	Ba (barium)				20		10	80					30	30	203
	mg/kg	Be (beryllium)														0.44
	mg/kg	Cd (cadmium)	< 1	< 1.2	0.755	< 10	< 1.1	< 10	1	1	1	< 0.19	0.2	< 10	< 10	1.3
	mg/kg	Cr (chromium)	5	5.9	14.5	< 10	8.4	< 10	< 10	7	7	15	4	< 10	20	25
	mg/kg	Cu (copper)	7	< 1.6	1.62	< 10	2.1	< 10	10	7	7	5.7	4	< 10	< 10	19
	mg/kg	Fe (iron)			10320	4200		4000	11000			10000	5200	2700	2400	20400
	mg/kg	Hg (mercury)	0.4	< 0.14	< 0.01	0	< 0.12	0	< 0.01	1.4	0.6	0.017	0.015	0	0	0.06
	mg/kg	Mg (magnesium)														3570
	mg/kg	Mn (manganese)		292		240	269	180	920					260	310	< 2340
	mg/kg	Mo (molybdenum)														2
	mg/kg	Ni (nickel)	5	< 6.2	12.8	< 10	8.44	< 10	< 10	7	7	10	6	< 10	< 10	20
	mg/kg	Pb (lead)	< 7	3.1	2.56	< 10	0.79	< 10	80	< 7	< 7	4	2	< 10	< 10	25
	mg/kg	Sb (antimony)														< 4
	mg/kg	Se (selenium)		< 0.95			< 0.84									< 10
	mg/kg	Sn (tin)														< 2
	mg/kg	Sr (strontium)														61.1
	mg/kg	Tl (titanium)														20
	mg/kg	Zn (zinc)	13	15.1	48	20	17	40	72	17	17	26	15	10	10	74.9
	mg/kg	V (vanadium)														< 17
PCB'S	ug/kg	Aroclor-1006		< 1.54			< 14.76									
	ug/kg	Aroclor-1221		< 1.54			< 14.76									
	ug/kg	Aroclor-1232		< 1.54			< 14.76									
	ug/kg	Aroclor-1242		< 1.54			< 14.76									
	ug/kg	Aroclor-1248		< 1.54			< 14.76									
	ug/kg	Aroclor-1254		< 3.2			< 30.75									
	ug/kg	Aroclor-1260		< 3.2			< 30.75									
	ug/kg	Total PCB's	0		0	0		0	0	0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND coarse	3 in	100		100	100		100		100	100			100	100	
		1 1/2	100		100	100		100	100	100	100	100	100	100	100	
		3/4	96		100	100		100	100	100	100	98	100	100	100	
		3/8	89		100	100		100	100	100	100	96	100	100	100	
		4	84	100	100	100	94.0	98	100	99	99	88	100	100	95	
		8	74		98	98		95	100	93	93	83	98			
		10		100			90.7							96	87	
	SAND medium	16	58.0	99.8	90.0	91.0	79.5	87.0	97.0	80.0	80.0	74.0	91.0			
		20												76.0	66.0	
		30		98.8			15.8		85.0			49.0	65.0			
		40	4.0		30.0	17.0		33.0	71.0	12.0	12.0	26.0	33.0	30.0	27.0	
		50		98.8			15.8		54.0			6.0	6.0			
	SAND fine	70							40.0			2.0	3.0			
		80		81.8			0.4							2.0	2.0	
		100	0.0	3.2	2.0	1.0	0.1	1.0	28.0	0.0	0.0	1.0	2.0			
		140		2.0												
	SILT CLAY	200	0.0	1.4	1.0	0.0		0.0	21.0	0.0	0.0	1.0	2.0	1.0	1.0	
		270		0.7					20.0			1.0	2.0			
		0.20 mm	0.0	0.5	1.0	0.0		0.0	11.0	0.0	0.0	1.0	1.0	0.0	0.0	
		0.05 mm	0.0		1.0	0.0		0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	
MISC	%	Total Organic Carb		0.18			0.009									
	mg/kg	Chem Oxy Demand	960		527	1600		1300	16000	< 481	< 453	952	956	1600	1700	
	mg/kg	Kjedahl Nitrogen	44		--	600		460	1280	117	42	68	44	130	250	
	mg/kg	Total Phosph	227		672	--		--	--	235	188	270	233	67	240	
	mg/kg	Oil and Grease	60		185	0		0	--	101	126	< 50	< 50	0	0	
	mg/kg	Cyanide, Total		< 0.68			< 0.6									
	mg/kg	Ammonia		5.6			0.36									
	mg/l	Ammonia Elutriate														
	%	Moisture		26			16.7									
	%	Total Solids		74			83.3									
	%	Volatile Solids		0.8			0.5									

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	143	144	145	146	147	706	148	149	150	151	455	152	153	154
			River Mile	757.53	757.52	757.51	757.5	757.49	757.3	756.8	756.32	755.8	754.6	754.5	754.4	754.21	754.2
			Location	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	AB. TEEPEEOTA POINT	L-Bay Down. of Disposal	GRAND ENCAMPMENT	GRAND ENCAMPMENT	GRAND ENCAMPMENT	BEEF SLOUGH	ALMA SM BOAT	BEEF SLOUGH	BEEF SLOUGH	BEEF SLOUGH
			Year	1982	1982	1978	1978	1974	1985	1980	1974	1980	1982	1989	1982	1978	1978
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	3	1	1	1	1	2	1	1	1
			Pool	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	2	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC						< 10					< 0.08			
	ug/kg		b-BHC						< 10					< 0.14			
	ug/kg		BHC											< 0.22			
	ug/kg		g-BHC (lindane)						< 10					< 0.1			
	ug/kg		Heptachlor						< 10					< 0.07			
	ug/kg		Aldrin											< 0.1			
	ug/kg		Heptachlorepoxide											< 0.12			
	ug/kg		Endosulfan I											< 0.12			
	ug/kg		Dieldrin	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.12	< 0.1	0	0
	ug/kg		4,4'-DDE	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.1	< 0.1	0	0
	ug/kg		Endrin	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.22	< 0.1	0	0
	ug/kg		Endosulfan II											< 0.24			
	ug/kg		4,4'-DDD	< 0.1	< 0.1	0	0	< 10	< 10	0	< 10	0	< 0.1	< 0.26	< 0.1	0	0
	ug/kg		Endrinaldehyde											< 0.26			
	ug/kg		Sulfan sulfate											< 0.26			
	ug/kg		4,4'-DDT	< 0.1	< 0.1	0	0	< 10	10	0	< 10	0	< 0.1	< 0.31	27	0	0
	ug/kg		Methoxychlor											< 0.53			
	ug/kg		Endrinketone											< 0.26			
	ug/kg		Chlorodane	< 1	< 1	0	0	< 10	< 10	0	< 10	0	< 1	< 1.44	< 1	0	0
	ug/kg		Toxaphene											< 1.44			
METALS	mg/kg		Ag (silver)						< 0.4								
	mg/kg		Al (aluminum)						11500								
	mg/kg		As (arsenic)	1.4	1.8	0	0	0.9	< 7	0	< 0.8	0	2	1.5	1.5	0	0
	mg/kg		B (boron)						5								
	mg/kg		Ba (barium)			30	30		141	20		20				10	10
	mg/kg		Be (beryllium)						0.65								
	mg/kg		Cd (cadmium)	< 0.2	0.19	< 10	< 10	1	0.8	< 10	< 1	< 10	< 0.2	< 1.2	< 0.2	< 10	< 10
	mg/kg		Cr (chromium)	4	3.9	< 10	< 10	6	34	< 10	7	< 10	5.9	7	4	< 10	< 10
	mg/kg		Cu (copper)	3	3.5	< 10	< 10	6	26	< 10	10	< 10	3.9	3.2	3	< 10	< 10
	mg/kg		Fe (iron)	4000	4550	1900	2300		24500	3400		3400	6200		4400	2000	2200
	mg/kg		Hg (mercury)	0.027	0.01	0	0	0.4	0.06	0	0.4	0	< 0.01	< 0.12	0.01	0	0
	mg/kg		Mg (magnesium)						5110								
	mg/kg		Mn (manganese)			250	250		< 866	220		160		376		180	130
	mg/kg		Mo (molybdenum)						3								
	mg/kg		Ni (nickel)	10	5	< 10	< 10	6	22	< 10	5	< 10	7	6.1	6	< 10	< 10
	mg/kg		Pb (lead)	2	2	< 10	< 10	< 11	26	< 10	< 7	< 10	2	< 0.52	2	< 10	< 10
	mg/kg		Sb (antimony)						< 4								
	mg/kg		Se (selenium)						< 10					< 0.88			
	mg/kg		Sn (tin)						< 2								
	mg/kg		Sr (strontium)						25.4								
	mg/kg		Ti (titanium)						20								
	mg/kg		Zn (zinc)	26	14	10	10	16	98.8	14	15	12	16	17	14	12	10
	mg/kg		V (vanadium)						< 25								
PCB'S	ug/kg		Aroclor-1006											< 1.44			
	ug/kg		Aroclor-1221											< 1.44			
	ug/kg		Aroclor-1232											< 1.44			
	ug/kg		Aroclor-1242											< 1.44			
	ug/kg		Aroclor-1248											< 1.44			
	ug/kg		Aroclor-1254											< 3			
	ug/kg		Aroclor-1260											< 3			
	ug/kg		Total PCB's	0	0	0	0	0	0	0	0	4	0		0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in			100	100	100		100	100	100				100	100
			1 1/2	100	100	100	100	100		100	100	100	100		100	100	100
			3/4	100	100	100	100	100		100	100	100	100		100	100	100
			3/8	100	100	100	100	100		100	100	100	100		100	100	100
			4	99	100	98	99	96		100	100	100	100	99.1	99	100	100
			8	98	99			92		100	98	100	99		99		
			10			96	90							98.0		99	100
		medium	16	97.0	95.0			82.0		98.0	95.0	95.0	96.0	93.7	97.0		
			20			83.0	73.0									93.0	95.0
			30	75.0	66.0								59.0	61.9	86.0		
			40	46.0	31.0	44.0	36.0	28.0		48.0	21.0	37.0	31.0		69.0	59.0	46.0
			50	17.0	8.0								14.0	61.9	31.0		
		fine	70	5.0	2.0								6.0		10.0		
			80			2.0	3.0							5.7		3.0	2.0
			100	4.0	2.0			0.0		1.0	0.0	3.0	4.0	0.4	4.0		
			140											0.3			
	SILT CLAY		200	4.0	1.0	1.0	0.0	0.0		0.0	0.0	1.0	3.0		3.0	0.0	1.0
			270	3.0	1.0								2.0		3.0		
			0.20 mm	1.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	1.0		1.0	0.0	0.0
			0.05 mm	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
MISC	%		Total Organic Carb											0.042			
	mg/kg		Chem Oxy Demand	803	730	2200	2800	< 515		550	< 400	1700	959		1713	1800	2000
	mg/kg		Kjedahl Nitrogen	177	44	260	200	66		160	13	220	29		82	220	170
	mg/kg		Total Phosph	270	186	140	35	117		--	229	--	147		184	180	35
	mg/kg		Oil and Grease	< 50	< 50	0	0	801		0	756	0	< 50		< 50	0	0
	mg/kg		Cyanide, Total											< 0.63			
	mg/kg		Ammonia											0.31			
	mg/l		Ammonia Elutriate														
	%		Moisture											20.3			
	%		Total Solids											79.7			
	%		Volatile Solids											0.4			

Table 6. Contaminant Data for Pool 4 of the Upper Mississippi River

			Record #	155	457	458			156	456
			River Mile	754	754	754	754	754	753.99	753.9
			Location	BEEF SLOUGH	BEEF SLOUGH	BEEF SLOUGH	BEEF SLOUGH 1	BEEF SLOUGH 1	ALMA SM BOAT	ALMA SM BOAT
			Year	1974	1989	1989	1994	1994	1979	1989
			System	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	2	2
			Pool	4	4	4	4	4	4	4
			Sam. Gear	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE
CHC's	ug/kg		a-BHC		< 0.18	< 0.17	< 0.24	< 0.25		< 0.08
	ug/kg		b-BHC		< 0.35	< 0.33	< 0.24	< 0.25		< 0.15
	ug/kg		BHC		< 0.53	< 0.5	< 0.24	< 0.25		< 0.23
	ug/kg		g-BHC (lindane)		< 0.24	< 0.22	< 0.24	< 0.25		< 0.1
	ug/kg		Heptachlor		< 0.18	< 0.17	< 0.24	< 0.25		< 0.08
	ug/kg		Aldrin		< 0.24	< 0.22				< 0.1
	ug/kg		Heptachlorepoxide		< 0.3	< 0.28				< 0.13
	ug/kg		Endosulfan I		< 0.3	< 0.28				< 0.13
	ug/kg		Dieldrin	< 10	< 0.3	< 0.28	< 0.47	< 0.49	0	< 0.13
	ug/kg		4,4'-DDE	10	< 0.24	< 0.22	< 0.47	< 0.49	0	< 0.1
	ug/kg		Endrin	< 10	< 0.53	< 0.5	< 0.47	< 0.49	0	< 0.23
	ug/kg		Endosulfan II		< 0.59	< 0.55				< 0.25
	ug/kg		4,4'-DDD	< 10	< 0.65	< 0.61	< 0.47	< 0.49	0.3	< 0.28
	ug/kg		Endrinaldehyde		< 0.65	< 0.61				< 0.28
	ug/kg		Sulfan sulfate		< 0.65	< 0.61				< 0.28
	ug/kg		4,4'-DDT	< 10	< 0.77	< 0.72	< 0.47	< 0.49	0	< 0.33
	ug/kg		Methoxychlor		< 1.3	< 1.21				< 0.55
	ug/kg		Endrinketone		< 0.65	< 0.61				< 0.28
	ug/kg		Chlorodane	< 10	< 3.54	< 3.31	< 0.24	< 0.25	1	< 1.5
	ug/kg		Toxaphene		< 3.54	< 3.31				< 1.5
METALS	mg/kg		Ag (silver)							
	mg/kg		Al (aluminum)							
	mg/kg		As (arsenic)	< 0.7	7.9	11.2	1	0.78	0	1.2
	mg/kg		B (boron)							
	mg/kg		Ba (barium)						70	
	mg/kg		Be (beryllium)							
	mg/kg		Cd (cadmium)	< 1	< 2.7	< 2.6	0.37	0.38	< 10	1.1
	mg/kg		Cr (chromium)	23	27	30	6.5	5.2	10	5.1
	mg/kg		Cu (copper)	8	9.4	17.2	3.9	2.6	10	2.7
	mg/kg		Fe (iron)						12000	
	mg/kg		Hg (mercury)	0.4	< 0.29	< 0.28	< 0.05	< 0.05	0	< 0.12
	mg/kg		Mg (magnesium)							
	mg/kg		Mn (manganese)		1280	929	291	234	550	223
	mg/kg		Mo (molybdenum)							
	mg/kg		Ni (nickel)	17	16	21.2	6	4.7	20	< 5.7
	mg/kg		Pb (lead)	28	11.6	16	1.3	1.8	20	< 0.52
	mg/kg		Sb (antimony)							
	mg/kg		Se (selenium)		< 2	< 1.9				< 0.87
	mg/kg		Sn (tin)							
	mg/kg		Sr (strontium)							
	mg/kg		Ti (titanium)							
	mg/kg		Zn (zinc)	17	70.5	85.2	14.6	12.7	40	13.5
	mg/kg		V (vanadium)							
PCB's	ug/kg		Aroclor-1006		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1221		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1232		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1242		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1248		< 3.54	< 3.31	< 4.7	< 4.9		< 1.5
	ug/kg		Aroclor-1254		< 7.38	< 6.9	< 4.7	< 4.9		< 3.13
	ug/kg		Aroclor-1260		< 7.38	< 6.9	< 4.7	< 4.9		< 3.13
	ug/kg		Total PCB's	0					15	
PARTICLE SIZE %FINER	SAND	coarse	3 in	100					100	
			1 1/2	100					100	
			3/4	100					100	
			3/8	100					100	
			4	100	100	100	100		100	99.7389
			8	98						
			10		100	100	95.3	100	100	99.1158
		medium	16	95.0	98.6	99.7				93.5
			20				75.7	99.1	100	
			30		97.2	96.8				51.9
			40	50.0			29.1	68.8	90.0	
			50		97.2	96.8				51.9
		fine	70							
			80		95.7	86.9			63.0	4.3
			100	4.0	86.9	78.0	0.7	2.0		0.0
			140		82.3	75.8	0.5	1.0		
	SILT CLAY		200	0.0	50.3	60.2	0.4	0.8	56.0	
			270		32.6	42.7				
			0.20 mm	0.0	25.1	32.0			26.0	
			0.05 mm	0.0	16.6	23.5			7.0	
MISC	%		Total Organic Carb		14.8	5.61	0.021			0.009
	mg/kg		Chem Oxy Demand	5867					48000	
	mg/kg		Kjedahl Nitrogen	273					6300	
	mg/kg		Total Phosph	166					1300	
	mg/kg		Oil and Grease	624					0	
	mg/kg		Cyanide, Total		< 1.5	< 1.4	< 0.06	< 0.07		< 0.62
	mg/kg		Ammonia		149	76				0.37
	mg/l		Ammonia Elutriate				< 0.06	< 0.06		
	%		Moisture		65.9	64.1	16	25.5		19.3
	%		Total Solids		34.1	35.9	84	74.5		80.7
	%		Volatile Solids		8.5	7.7	1	0.82		0.4

Table 7. Contaminant Data for Pool 5 of the Upper Mississippi River

			Record #	454	453	348	351	353	355	352	350	349	354	157	707	158	159
			River Mile	752.7	752.6	752.5	752.5	752.5	752.5	752.5	752.5	752.5	752.5	752.0	749.9	749.0	749.0
			Location	LOWER APPROACH LD4	LOWER APPROACH LD4	R-Island 40-1	R-Island 40-3 -Prec	R-Island 40-4 -Prec	R-Island 40-5	R-Island 40-3 -Pace	R-Island 40-2 -Pace	R-Island 40-2 -Prec	R-Island 40-4 -Pace		R-1st Bwtr. Down Zumbro R	MULE BEND	MULE BEND
			Year	1989	1989	1987	1987	1987	1987	1987	1987	1987	1987	1979	1985	1979	1979
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	3	3	3	3	3	3	3	3	1	3	1	1
			Pool	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	2	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	FWS	COE	COE
CHC'S	ug/kg		a-BHC	< 0.07	< 0.07	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		b-BHC	< 0.14	< 0.14	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		BHC	< 0.22	< 0.21												
	ug/kg		g-BHC (lindane)	< 0.1	< 0.1	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		Heptachlor	< 0.07	< 0.07	< 5	< 5	< 5	< 5			< 5			< 10		
	ug/kg		Aldrin	< 0.1	< 0.1												
	ug/kg		Heptachlorepoxide	< 0.12	< 0.12												
	ug/kg		Endosulfan I	< 0.12	< 0.12												
	ug/kg		Dieldrin	< 0.12	< 0.12	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		4,4'-DDE	< 0.1	< 0.1	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Endrin	< 0.22	< 0.21	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Endosulfan II	< 0.24	< 0.24												
	ug/kg		4,4'-DDD	< 0.26	< 0.26	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Endrinaldehyde	< 0.26	< 0.26												
	ug/kg		Sulfan sulfate	< 0.26	< 0.26												
	ug/kg		4,4'-DDT	< 0.31	< 0.31	< 5	< 5	< 5	< 5			< 5		0	10	0	0
	ug/kg		Methoxychlor	< 0.53	< 0.52												
	ug/kg		Endrinketone	< 0.26	< 0.26												
	ug/kg		Chlorodane	< 1.44	< 1.43	< 5	< 5	< 5	< 5			< 5		0	< 10	0	0
	ug/kg		Toxaphene	< 1.44	< 1.43												
METALS	mg/kg		Ag (silver)												< 0.4		
	mg/kg		Al (aluminum)												11900		
	mg/kg		As (arsenic)	1.4	1.8	84.1	77.7	130.8	< 1.2	0.79	0.74	< 1.2	0.92	0	< 7	0	0
	mg/kg		B (boron)												5		
	mg/kg		Ba (barium)											20	146	30	30
	mg/kg		Be (beryllium)												0.63		
	mg/kg		Cd (cadmium)	< 1.2	< 1.1	< 1.5	< 1.5	< 1.5	< 1.5	< 0.1	< 0.1	< 1.5	< 0.1	< 10	< 0.3	< 10	< 10
	mg/kg		Cr (chromium)	4.5	9	< 3.7	< 3.7	< 3.7	< 3.7	6	5.2	< 3.7	4.4	< 10	20	< 10	< 10
	mg/kg		Cu (copper)	3.4	7.1	< 3.2	< 3.2	< 3.2	< 3.2	4.4	3.2	2.1	3.2	< 10	15	< 10	< 10
	mg/kg		Fe (iron)											3300	19300	2600	3600
	mg/kg		Hg (mercury)	< 0.12	< 0.12	< 0.8	< 0.8	< 0.8	< 0.8	< 0.02	< 0.02	< 0.8	< 0.02	0	0.05	0	0
	mg/kg		Mg (magnesium)												5850		
	mg/kg		Mn (manganese)	320	510	207.8	187	116	73.9	130	190	208	130	180	< 688	150	260
	mg/kg		Mo (molybdenum)												2		
	mg/kg		Ni (nickel)	5.3	11	< 12.9	< 12.9	< 12.9	< 12.9	8.4	6.7	< 12.9	6.8	< 10	19	< 10	10
	mg/kg		Pb (lead)	1.2	0.91	6.3	3.4	3.3	3.4	< 1	< 1	3.1	< 1	< 10	15	< 10	< 10
	mg/kg		Sb (antimony)												< 4		
	mg/kg		Se (selenium)	< 0.87	< 0.84										< 10		
	mg/kg		Sn (tin)												< 2		
	mg/kg		Sr (strontium)												29.4		
	mg/kg		Ti (titanium)												20		
	mg/kg		Zn (zinc)	15.2	25.4	25.4	16.7	5.9	10.2	10	9.8	23.3	9.5	10	64.2	10	10
	mg/kg		V (vanadium)												< 20		
PCB'S	ug/kg		Aroclor-1006	< 1.44	< 1.43												
	ug/kg		Aroclor-1221	< 1.44	< 1.43												
	ug/kg		Aroclor-1232	< 1.44	< 1.43												
	ug/kg		Aroclor-1242	< 1.44	< 1.43												
	ug/kg		Aroclor-1248	< 1.44	< 1.43												
	ug/kg		Aroclor-1254	< 3	< 2.98												
	ug/kg		Aroclor-1260	< 3	< 2.98												
	ug/kg		Total PCB's			0	0	0	0	0	0	0	0	2	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in											100		100	100
			1 1/2											100		100	100
			3/4											100		100	100
			3/8											100		100	100
			4	100	96.5									100		100	99
			8														
			10	99.7	84.3		19.2					66.4		96		99	94
		medium	16	95.6	58.8												
			20											70.0		91.0	72.0
			30	52.2	27.8												
			40				1.6					2.5		15.0		53.0	21.0
			50	52.2	27.8												
		fine	70														
			80	2.9	11.6									2.0		2.0	3.0
			100	0.3	8.1												
			140	0.2			0.2					0.8					
	SILT CLAY		200	0.1										1.0		1.0	2.0
			270				0.0					0.5					
			0.20 mm											1.0		0.0	1.0
			0.05 mm											0.0		0.0	0.0
MISC	%		Total Organic Carb	0.036	0.066	0.45	0.57					0.18					
	mg/kg		Chem Oxy Demand											970		3700	1800
	mg/kg		Kjedahl Nitrogen											400		300	300
	mg/kg		Total Phosph											190		140	230
	mg/kg		Oil and Grease											0		0	0
	mg/kg		Cyanide, Total	< 0.63	< 0.6												
	mg/kg		Ammonia	0.5	1.00												
	mg/l		Ammonia Elutriate														
	%		Moisture	20	16.8												
	%		Total Solids	80	83.2												
	%		Volatile Solids	0.5	0.7												

Table 7. Contaminant Data for Pool 5 of the Upper Mississippi River

			Record #	160	447	161	162	163	164	448	165	449	166	167	450	168	169
			River Mile	748.2	747.9	747.8	747.72	747.7	747.3	747.1	746.3	746.3	746.0	746.0	745.8	745.3	745.2
			Location	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	WEST NEWTON	BELOW WEST NEWTON	BELVEDERE ISLAND	BELOW WEST NEWTON	BELOW WEST NEWTON	FISCHER ISLAND	R-WEAVER BOTTOMS	FISCHER ISLAND
			Year	1980	1989	1980	1974	1975	1980	1989	1980	1989	1979	1979	1989	1984	1975
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	3	1
			Pool	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 0.74					< 0.07		< 0.07			< 0.07		
	ug/kg		b-BHC		< 1.49					< 0.15		< 0.14			< 0.15		
	ug/kg		BHC		< 2.23					< 0.22		< 0.21			< 0.22		
	ug/kg		g-BHC (lindane)		< 0.99					< 0.1		< 0.1			< 0.1		
	ug/kg		Heptachlor		< 0.74					< 0.07		< 0.07			< 0.07		
	ug/kg		Aldrin		< 0.99					< 0.1		< 0.1			< 0.1		
	ug/kg		Heptachlorepoxide		< 1.24					< 0.12		< 0.12			< 0.12		
	ug/kg		Endosulfan I		< 1.24					< 0.12		< 0.12			< 0.12		
	ug/kg		Dieldrin	0	< 1.24	< 0.2	< 10		0	< 0.12	0	< 0.12	0	0	< 0.12	< 0.5	
	ug/kg		4,4'-DDE	0	< 0.99	< 0.2	10		0	< 0.1	0	< 0.1	0	0	< 0.1	< 0.5	
	ug/kg		Endrin	0	< 2.23	< 0.2	< 10		0	< 0.22	0	< 0.21	0	0	< 0.22	< 0.5	
	ug/kg		Endosulfan II		< 2.48					< 0.27		< 0.24			< 0.25		
	ug/kg		4,4'-DDD	0	< 2.73	< 0.2	< 10		0	< 0.27	0	< 0.26	0	0	< 0.27	< 0.5	
	ug/kg		Endrinaldehyde		< 2.73					< 0.27		< 0.26			< 0.27		
	ug/kg		Sulfan sulfate		< 2.73					< 0.31		< 0.26			< 0.27		
	ug/kg		4,4'-DDT	0	< 3.22	< 0.4	< 10		0	< 0.53	0	< 0.31	0	0	< 0.32	< 0.5	
	ug/kg		Methoxychlor		< 5.46					< 0.27		< 0.52			< 0.54		
	ug/kg		Endrinketone		< 2.73					< 1.45		< 0.26			< 0.27		
	ug/kg		Chlorodane	0	< 14.88	< 0.4	< 10		0	< 1.45	0	< 1.43	0	0	< 1.48	< 0.5	
	ug/kg		Toxaphene		< 14.88					< 1.45		< 1.43			< 1.48		
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	0	< 0.76		< 0.6	0.57	0	< 0.72	0	1.4	0	0	1.1	13	0.38
	mg/kg		B (boron)														
	mg/kg		Ba (barium)	30					30		40		20	30			
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 10	< 1.2	0.812	1	< 0.1	< 10	< 1.1	< 10	< 1.1	< 10	< 10	< 1.1	1.1	< 0.1
	mg/kg		Cr (chromium)	< 10	5	28.3	7	7.7	10	5.2	< 10	7	< 10	< 10	5.5	26	5.9
	mg/kg		Cu (copper)	< 10	4.3	7.44	7	19.8	< 10	11.2	< 10	10.9	< 10	< 10	7	13	5.7
	mg/kg		Fe (iron)	1800		8930			1900		2300		2800	2900		21000	
	mg/kg		Hg (mercury)	0	< 0.13	< 0.01	0.9	0.059	0	< 0.12	0	< 0.12	0	0	< 0.12		0.031
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	180	375				220	267	300	324	240	190	315		
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	< 10	8.3	23.7	5		< 10	5.7	10	9.2	< 10	< 10	8.4	23	
	mg/kg		Pb (lead)	< 10	1.6	3.82	< 10	< 0.1	< 10	0.86	< 10	2.7	< 10	< 10	0.6	17	< 0.1
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)		< 0.88					< 0.84		< 0.85			< 0.87		
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	6.3	15.2	37.3	30	21.1	8.2	16	9.9	16.6	10	10	15.3	55	19
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1221		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1232		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1242		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1248		< 14.88					< 1.45		< 1.43			< 1.48		
	ug/kg		Aroclor-1254		< 31					< 3.03		< 2.98			< 3.08		
	ug/kg		Aroclor-1260		< 31					< 3.03		< 2.98			< 3.08		
	ug/kg		Total PCB's	1		1	0	0	0		2		0	0		16	0
PARTICLE SIZE %FINER		SAND coarse	3 in	100		100	100	100	100		100		100	100		100	100
			1 1/2	100		100	100	100	100		100		100	100		100	100
			3/4	100		100	100	100	100		100		100	100		100	100
			3/8	100		100	100	100	95		100		100	100		100	100
			4	100	99.8	95	100	97	88	99.5	97	94.5	100	96	99.0	99	100
			8	100		91	98	94	79		90					99	99
			10		99.1					97.3		85.8	100	79	96.7	98	
		SAND medium	16	96.0	95.3	86.0	94.0	90.0	70.0	90.7	79.0	71.4			91.9	97.0	98.0
			20										91.0	55.0		96.0	
			30		58.7					52.3		34.4			54.5	95.0	
			40	35.0		32.0	34.0	39.0	22.0		22.0		37.0	13.0		93.0	37.0
			50		58.7					52.3		34.4			54.5	90.0	
		SAND fine	70													87.0	
			80		6.5					10.9		1.7	1.0	2.0	3.8	86.0	
			100	0.0	0.3	0.0	1.0	4.0	0.0	0.1	0.0	0.1			0.2	84.0	4.0
			140		0.2												
		SILT CLAY	200	0.0		0.0	0.0	3.0	0.0		0.0		1.0	1.0		67.0	3.0
			270													46.0	
			0.20 mm	0.0		0.0	0.0		0.0		0.0		0.0	0.0		17.0	
			0.05 mm	0.0		0.0	0.0		0.0		0.0		0.0	0.0		5.0	
MISC	%		Total Organic Carb		0.035					0.044		0.045			0.038		
	mg/kg		Chem Oxy Demand	710		1110	1096	4340	930		710		1000	550		82000	2810
	mg/kg		Kjedahl Nitrogen	75			52		4300		450		400	300		1300	
	mg/kg		Total Phosph			589	177						170	230		14000	
	mg/kg		Oil and Grease	0		2130	699	1471	0		0		0	0		18000	973
	mg/kg		Cyanide, Total		< 0.63					< 0.6		< 0.61			< 0.62		
	mg/kg		Ammonia		0.50					< 0.24		0.3			0.37		
	mg/l		Ammonia Elutriate														
	%		Moisture		20.6					16.7		17.8			19.9		
	%		Total Solids		79.4					83.3		82.2			80.1		
	%		Volatile Solids		0.4					0.4		0.5			0.4		

Table 7. Contaminant Data for Pool 5 of the Upper Mississippi River

			Record #	170	171	172	708	173	174	315	316	317	175	451	176	177	178
			River Mile	745.2	745.2	745.2	745.2	745.01	745	745	745	745	744.9	744.9	744.8	744.21	744.2
			Location	FISCHER ISLAND	FISCHER ISLAND	FISCHER ISLAND	R-Upper Weaver Bottoms	FISCHER ISLAND	FISCHER ISLAND	R-Weaver Bottoms	R-Weaver Bottoms	R-Weaver Bottoms	FISCHER ISLAND	LOWER ZUMBRO	R-WEAVER BOTTOMS	LOWER ZUMBRO	LOWER ZUMBRO
			Year	1975	1975	1975	1985	1974	1974	1987	1987	1987	1980	1989	1984	1979	1979
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	3	1	1	3	3	3	1	1	3	1	1
			Pool	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			Sam. Gear	1	1	1	2	1	1	1	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 10			< 0.1	< 0.1	< 0.1		< 0.07			
	ug/kg		b-BHC				< 10			< 0.1	< 0.1	< 0.1		< 0.15			
	ug/kg		BHC											< 0.22			
	ug/kg		g-BHC (lindane)				< 10			< 0.1	< 0.1	< 0.1		< 0.1			
	ug/kg		Heptachlor				< 10			< 0.1	< 0.1	< 0.1		< 0.07			
	ug/kg		Aldrin											< 0.1			
	ug/kg		Heptachlorepoxide											< 0.12			
	ug/kg		Endosulfan I											< 0.12			
	ug/kg		Dieldrin				< 10	< 10	< 10	< 0.1	< 0.1	< 0.1	0	< 0.12	< 0.5	0	0
	ug/kg		4,4'-DDE				< 10	< 10	< 10	< 0.1	< 0.1	< 0.1	0	< 0.1	< 0.5	0	0
	ug/kg		Endrin				< 10	< 10	< 10	< 0.1	< 0.1	< 0.1	0	< 0.22	< 0.5	0	0
	ug/kg		Endosulfan II											< 0.24			
	ug/kg		4,4'-DDD				< 10	< 10	< 10	< 0.1	< 0.1	< 0.1	0	< 0.27	< 0.5	0	0
	ug/kg		Endrinaldehyde											< 0.27			
	ug/kg		Sulfan sulfate											< 0.27			
	ug/kg		4,4'-DDT				10	< 10	< 10	< 0.1	< 0.1	< 0.1	0	< 0.31	< 0.5	0	0
	ug/kg		Methoxychlor											< 0.53			
	ug/kg		Endrinketone											< 0.27			
	ug/kg		Chlorodane				< 10	< 10	< 10	< 0.1	< 0.1	< 0.1	0	< 1.45	< 0.5	0	0
	ug/kg		Toxaphene											< 1.45			
METALS	mg/kg		Ag (silver)				< 0.4										
	mg/kg		Al (aluminum)				9700										
	mg/kg		As (arsenic)	0.45	0.41	0.4	< 7	10.9	0.9	8.6	4.6	1.8	0	1.2	13	0	0
	mg/kg		B (boron)				4										
	mg/kg		Ba (barium)				154						30			30	20
	mg/kg		Be (beryllium)				0.69										
	mg/kg		Cd (cadmium)	< 0.1	< 0.1	< 0.1	0.9	< 1	< 1	0.13			< 10	< 1.1	1.3	< 10	< 10
	mg/kg		Cr (chromium)	5.8	4.9	5.9	22	5	5	15	12	12	< 10	7.1	34	< 10	< 10
	mg/kg		Cu (copper)	5.4	6	6.6	20	10	8	6.1	5.6	5.6	< 10	5.8	14	< 10	< 10
	mg/kg		Fe (iron)				19100						1500		38000	2400	2100
	mg/kg		Hg (mercury)	0.029	0.035	0.036	0.08	0.3	0.2	0.026	0.031	0.045	0	< 0.12		0	0
	mg/kg		Mg (magnesium)				4960										
	mg/kg		Mn (manganese)				< 946			1000	960	420	190	245		100	100
	mg/kg		Mo (molybdenum)				2										
	mg/kg		Ni (nickel)				24	5	5	14	11	9.3	< 10	< 5.7	25	< 10	< 10
	mg/kg		Pb (lead)	< 0.1	< 0.1	< 0.1	19	< 10	< 10	14	8.5	9.3	< 10	0.67	19	< 10	< 10
	mg/kg		Sb (antimony)				< 4										
	mg/kg		Se (selenium)				< 10			0.12	0.28	< 0.1		< 0.87			
	mg/kg		Sn (tin)				< 2										
	mg/kg		Sr (strontium)				43.8										
	mg/kg		Ti (titanium)				20										
	mg/kg		Zn (zinc)	16.4	16.2	24.5	69.2	13	13	50	31	25	7.6	31.1	79	10	< 10
	mg/kg		V (vanadium)				< 15										
PCB'S	ug/kg		Aroclor-1006											< 1.45			
	ug/kg		Aroclor-1221											< 1.45			
	ug/kg		Aroclor-1232											< 1.45			
	ug/kg		Aroclor-1242											< 1.45			
	ug/kg		Aroclor-1248											< 1.45			
	ug/kg		Aroclor-1254											< 3.03			
	ug/kg		Aroclor-1260											< 3.03			
	ug/kg		Total PCB's	0	0	0	0	0	0	9.7	9.3	25	6		7.6	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in	100	100	100		100	100				100		100	100	100
			1 1/2	100	100	100		100	100				100		100	100	100
			3/4	100	100	100		100	100				100		100	100	100
			3/8	100	100	100		100	100				100		99	100	100
			4	99	100	100		100	100				100	99.5	99	100	100
			8	98	100	100		99	99				99		99		
			10											97.1	98	100	100
		medium	16	95.0	99.0	99.0		97.0	97.0				98.0	88.6	96.0		
			20												95.0	100.0	100.0
			30											49.3	93.0		
			40	40.0	28.0	28.0		71.0	71.0				44.0		91.0	96.0	93.0
			50											49.3	88.0		
		fine	70												85.0		
			80											1.9	84.0	11.0	18.0
			100	1.0	0.0	0.0		0.0	0.0				0.0	0.1	82.0		
			140														
	SILT CLAY		200	0.0	0.0	0.0		0.0	0.0				0.0		72.0	2.0	3.0
			270												53.0		
			0.20 mm	0.0	0.0	0.0		0.0	0.0				0.0		27.0	2.0	2.0
			0.05 mm	0.0	0.0	0.0		0.0	0.0				0.0		14.0	0.0	0.0
MISC	%		Total Organic Carb											0.028			
	mg/kg		Chem Oxy Demand	1274	1103	1226		1278	964				800		56400	1400	1900
	mg/kg		Kjedahl Nitrogen					52	134				30		1600	500	300
	mg/kg		Total Phosph					104	119						14000	180	160
	mg/kg		Oil and Grease	29	15	62		< 6	< 6				0		26000	0	0
	mg/kg		Cyanide, Total											< 0.62			
	mg/kg		Ammonia											0.31			
	mg/l		Ammonia Elutriate														
	%		Moisture											19.6			
	%		Total Solids											80.4			
	%		Volatile Solids											0.3			

Table 7. Contaminant Data for Pool 5 of the Upper Mississippi River

			Record #	452	179	180		181	709	710	182	183	184	185	186
			River Mile	744.2	743.9	743.22	743.1	743	742.8	742.4	741.82	741.81	741.8	741.51	741.5
			Location	SOMERFIELD ISLAND	R-WEAVER BOTTOMS	SOMERFIELD ISLAND	SOMERFIELD ISLAND	SOMERFIELD ISLAND	R-Lower Weaver Bottoms	L-Behind Is N&W Spring Lk.	MOUNT VERNON LIGHT	MOUNT VERNON LIGHT	MOUNT VERNON LIGHT	MOUNT VERNON LIGHT	MOUNT VERNON LIGHT
			Year	1989	1984	1974	1994	1980	1985	1985	1978	1978	1978	1979	1979
			System	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	3	1	1	1	3	3	1	1	1	1	1
			Pool	5	5	5	5	5	5	5	5	5	5	5	5
			Sam. Gear	1	1	1	1	1	2	2	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	FWS	FWS	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.07			< 0.25		< 10	< 10					
	ug/kg		b-BHC	< 0.14			< 0.25		< 10	< 10					
	ug/kg		BHC	< 0.22			< 0.25								
	ug/kg		g-BHC (lindane)	< 0.1			< 0.25		< 10	< 10					
	ug/kg		Heptachlor	< 0.07			< 0.25		< 10	< 10					
	ug/kg		Aldrin	< 0.1											
	ug/kg		Heptachlorepoxide	< 0.12											
	ug/kg		Endosulfan I	< 0.12											
	ug/kg		Dieldrin	< 0.12	< 0.5	< 10	< 0.5	< 0.2	< 10	< 10	0	0	0	0	0
	ug/kg		4,4'-DDE	< 0.1	< 0.5	10	< 0.5	< 0.2	< 10	< 10	0	0	0	0	0
	ug/kg		Endrin	< 0.22	< 0.5	< 10	< 0.5	< 0.2	< 10	< 10	0	0	0	0	0
	ug/kg		Endosulfan II	< 0.24											
	ug/kg		4,4'-DDD	< 0.26	< 0.5	< 10	< 0.5	< 0.2	< 10	< 10	0	0	0	0	0
	ug/kg		Endrinaldehyde	< 0.26											
	ug/kg		Sulfan sulfate	< 0.26											
	ug/kg		4,4'-DDT	< 0.31	< 0.5	< 10	< 0.5	< 0.4	< 10	< 10	0	0	0	0	0
	ug/kg		Methoxychlor	< 0.53											
	ug/kg		Endrinketone	< 0.26											
	ug/kg		Chlorodane	< 1.44	< 0.5	< 10	< 0.25	< 0.4	< 10	< 10	0	0	0	0	0
	ug/kg		Toxaphene	< 1.44											
METALS	mg/kg		Ag (silver)						< 0.4	< 0.4					
	mg/kg		Al (aluminum)						9020	10500					
	mg/kg		As (arsenic)	2.1	11	< 0.6	0.83		< 7	< 7	0		0	0	0
	mg/kg		B (boron)						4	5					
	mg/kg		Ba (barium)						148	139	10		30	30	40
	mg/kg		Be (beryllium)						0.62	0.57					
	mg/kg		Cd (cadmium)	< 1.1	2	< 0.7	0.39	1.43	< 0.3	0.6	< 10		< 10	< 10	< 10
	mg/kg		Cr (chromium)	7.5	24	33	4.6	28	19	29	< 10		< 10	< 10	< 10
	mg/kg		Cu (copper)	6.9	12	5	2.1	4.48	11	22	< 10		< 10	< 10	< 10
	mg/kg		Fe (iron)		18000			14100	21800	21800	1800		3200	3900	2800
	mg/kg		Hg (mercury)	< 0.12		0.4	< 0.05	< 0.01	0.05	0.05	0		0.75	0	0
	mg/kg		Mg (magnesium)						4140	4390					
	mg/kg		Mn (manganese)	477			170		< 1020	< 825	170		270	290	200
	mg/kg		Mo (molybdenum)						3	2					
	mg/kg		Ni (nickel)	7.4	20	26	3.9	22.6	18	20	20		< 10	< 10	< 10
	mg/kg		Pb (lead)	1.3	20	< 7	1.6	0.12	14	21	< 10		< 10	< 10	< 10
	mg/kg		Sb (antimony)						< 4	< 4					
	mg/kg		Se (selenium)	< 0.87					< 10	< 10					
	mg/kg		Sn (tin)						< 2	< 2					
	mg/kg		Sr (strontium)						26.9	28.5					
	mg/kg		Ti (titanium)						20	20					
	mg/kg		Zn (zinc)	19	48	13	10.1	75.4	61.5	83.2	4		< 10	10	10
	mg/kg		V (vanadium)						< 12	< 23					
PCB'S	ug/kg		Aroclor-1006	< 1.44			< 5								
	ug/kg		Aroclor-1221	< 1.44			< 5								
	ug/kg		Aroclor-1232	< 1.44			< 5								
	ug/kg		Aroclor-1242	< 1.44			< 5								
	ug/kg		Aroclor-1248	< 1.44			< 5								
	ug/kg		Aroclor-1254	< 3			< 5								
	ug/kg		Aroclor-1260	< 3			< 5								
	ug/kg		Total PCB's		14	0		0	0	0	0	0	6	0	3
PARTICLE SIZE %FINER		SAND coarse	3 in		100	100		100			100	100	100	100	100
			1 1/2		100	100		100			100	100	100	100	100
			3/4		100	100		100			100	100	100	100	100
			3/8		99	100		100			98	100	100	100	100
			4	99.7	99	100		100			97	100	97	100	100
			8		99	100		99							
			10	97.9	99		100				97	100	93	97	96
		SAND medium	16	88.9	98.0	100		94.0							
			20		98.0		98.5				94.0	95.0	80.0	89.0	78.0
			30	45.4	98.0										
			40		98.0	88.0	78.5	62.0			72.0	64.0	41.0	69.0	33.0
			50	45.4	97.0										
		SAND fine	70		97.0										
			80	5.3	97.0						5.0	4.0	10.0	10.0	3.0
			100	0.2	96.0	2.0	1.8	7.0							
			140				0.6								
		SILT CLAY	200		87.0	0.0	0.4	4.0			1.0	1.0	8.0	5.0	2.0
			270		69.0										
			0.20 mm		40.0	0.0		0.0			0.0	0.0	2.0	1.0	2.0
			0.05 mm		27.0	0.0		0.0			0.0	0.0	0.0	0.0	1.0
MISC	%		Total Organic Carb	0.088			0.027								
	mg/kg		Chem Oxy Demand		41600	1397		1170			2000		8100	7300	2100
	mg/kg		Kjedahl Nitrogen		2300	109					490		1000	2100	300
	mg/kg		Total Phosph		14000	142		684			150		100	200	220
	mg/kg		Oil and Grease		36000	530		180			0	0	0	0	0
	mg/kg		Cyanide, Total	< 0.62			< 0.06								
	mg/kg		Ammonia	0.87											
	mg/l		Ammonia Elutriate				< 0.06								
	%		Moisture	19.8			22.7								
	%		Total Solids	80.2			77.3								
	%		Volatile Solids	0.6			0.76								

Table 8. Contaminant Data for Pool 5A of the Upper Mississippi River

			Record #	187	466	711	188	465	189	190	712	464	191	192	193	194	195
			River Mile	735.1	734.9	734.8	734.5	734.1	734.0	734.0	733.7	733.7	733.6	733.6	733.5	733.5	733.4
			Location	ISLAND 58	ISLAND 58	R-Bay Mouth Jct 2 Chutes	ISLAND 58	ISLAND 58	ISLAND 58	ISLAND 58	L-Bay Dwn Fntn City Bay	FOUNTAIN CITY	FOUNTAIN CITY	FOUNTAIN CITY	FOUNTAIN CITY	FOUNTAIN CITY	FOUNT. CITY B. YARD
			Year	1980	1989	1985	1980	1989	1974	1980	1985	1989	1978	1978	1979	1979	1982
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	3	1	1	1	1	3	1	1	1	1	1	2
			Pool	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
			Sam. Gear	1	1	2	1	1	1	1	2	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	FWS	COE	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 0.07	< 10		< 0.07			< 10	< 0.07					
	ug/kg		b-BHC		< 0.14	< 10		< 0.14			< 10	< 0.14					
	ug/kg		BHC		< 0.21			< 0.21				< 0.21					
	ug/kg		g-BHC (lindane)		< 0.09	< 10		< 0.1			< 10	< 0.09					
	ug/kg		Heptachlor		< 0.07	< 10		< 0.07			< 10	< 0.07					
	ug/kg		Aldrin		< 0.09			< 0.1				< 0.09					
	ug/kg		Heptachlorepoxide		< 0.12			< 0.12				< 0.12					
	ug/kg		Endosulfan I		< 0.12			< 0.12				< 0.12					
	ug/kg		Dieldrin	0	< 0.12	< 10	< 0.2	< 0.1	< 10	0	< 10	< 0.12	0	0	0	0	< 0.1
	ug/kg		4,4'-DDE	0	< 0.09	< 10	< 0.2	< 0.21	10	0	< 10	< 0.09	0	0	0	0	< 0.1
	ug/kg		Endrin	0	< 0.21	< 10	< 0.2	< 0.24	< 10	0	< 10	< 0.21	0	0	0	0	< 0.1
	ug/kg		Endosulfan II		< 0.23			< 0.26				< 0.23					
	ug/kg		4,4'-DDD	0	< 0.26	< 10	< 0.2	< 0.26	< 10	0	< 10	< 0.26	0	0	0	0	1.2
	ug/kg		Endrinaldehyde		< 0.26			< 0.26				< 0.26					
	ug/kg		Sulfan sulfate		< 0.26			< 0.26				< 0.26					
	ug/kg		4,4'-DDT	0	< 0.3	10	< 0.4	< 0.31	< 10	0	< 10	< 0.3	0	0	0	0	< 0.1
	ug/kg		Methoxychlor		< 0.51			< 0.52				< 0.51					
	ug/kg		Endriniketone		< 0.26			< 0.26				< 0.26					
	ug/kg		Chlorodane	0	< 1.4	< 10	< 0.4	< 1.43	< 10	0	< 10	< 1.39	0	0	0	0	< 1
	ug/kg		Toxaphene		< 1.4			< 1.43				< 1.39					
METALS	mg/kg		Ag (silver)			< 0.4					< 0.4						
	mg/kg		Al (aluminum)			6190					6390						
	mg/kg		As (arsenic)	0	0.82	< 6		1.1	0.8	0	< 6	1.8	0	0	0	0	3.3
	mg/kg		B (boron)			4					< 4						
	mg/kg		Ba (barium)	30		89.4				20	104		30	30	30	30	
	mg/kg		Be (beryllium)			0.38					0.41						
	mg/kg		Cd (cadmium)	< 10	< 1.1	0.5	0.949	< 1.1	< 1	< 10	0.5	< 1.1	< 10	< 10	< 10	< 10	0.2
	mg/kg		Cr (chromium)	10	7.9	16	28.7	6.4	7	30	18	10.7	< 10	< 10	< 10	< 10	8
	mg/kg		Cu (copper)	< 10	4.1	12	6.08	1.9	5	< 10	13	4.4	< 10	< 10	< 10	< 10	7
	mg/kg		Fe (iron)	2500		13300	11000			1600	16100		1900	2200	3700	3200	7500
	mg/kg		Hg (mercury)	0	< 0.12	0.11	< 0.01	< 0.12	0.2	0	0.06	< 0.12	0.08	0.16	0	0	0.021
	mg/kg		Mg (magnesium)			4860					2580						
	mg/kg		Mn (manganese)	260	365	< 764		452		220	< 676	506	240	310	290	290	
	mg/kg		Mo (molybdenum)			2					2						
	mg/kg		Ni (nickel)	< 10	10.8	13	10.7	6	10	10	14	9.8	< 10	< 10	< 10	< 10	8
	mg/kg		Pb (lead)	< 10	< 0.49	13	3.09	< 0.48	< 9	< 10	12	< 0.5	< 10	< 10	< 10	< 10	6
	mg/kg		Sb (antimony)			< 4					< 4						
	mg/kg		Se (selenium)		< 0.82	< 10		< 0.81			< 10	< 0.85					
	mg/kg		Sn (tin)			< 2					< 2						
	mg/kg		Sr (strontium)			19.6					18.6						
	mg/kg		Ti (titanium)			20					20						
	mg/kg		Zn (zinc)	8.5	18.4	50.2	77.6	16	23	7.8	49.8	20.2	< 10	< 10	10	10	24
	mg/kg		V (vanadium)			< 12					< 17						
PCB'S	ug/kg		Aroclor-1006		< 1.4			< 1.43				< 1.39					
	ug/kg		Aroclor-1221		< 1.4			< 1.43				< 1.39					
	ug/kg		Aroclor-1232		< 1.4			< 1.43				< 1.39					
	ug/kg		Aroclor-1242		< 1.4			< 1.43				< 1.39					
	ug/kg		Aroclor-1248		< 1.4			< 1.43				< 1.39					
	ug/kg		Aroclor-1254		< 2.93			< 2.98				< 2.9					
	ug/kg		Aroclor-1260		< 2.93			< 2.98				< 2.9					
	ug/kg		Total PCB's	0		0	0		0	0	0		0	0	0	0	0
PARTICLE SIZE %FINER		SAND coarse	3 in	100			100		100	100			100	100	100	100	
			1 1/2	100			100		100	100			100	100	100	100	100
			3/4	100			100		100	100			100	100	100	100	100
			3/8	99			100		100	100			100	100	100	100	100
			4	95	99.5		100		98	100		88.7	100	100	97	100	100
			8	92			100		91	100							100
			10		95.8							78.2	96	95	94	99	
		SAND medium	16	79.0	81.7		90.0		82.0	99.0		63.7					99.0
			20										68.0	84.0	80.0	90.0	
			30		26.7							22.6					96.0
			40	15.0			37.0		14.0	59.0			22.0	55.0	32.0	32.0	90.0
			50		26.7							22.6					86.0
		SAND fine	70														85.0
			80		1.1							1.2	3.0	4.0	2.0	2.0	
			100	0.0	0.2		1.0		0.0	0.0		0.1					85.0
			140		0.2												
		SILT CLAY	200	0.0	0.1		1.0		0.0	0.0			1.0	2.0	1.0	1.0	84.0
			270		0.1												83.0
			0.20 mm	0.0	0.1				0.0	0.0			0.0	0.0	1.0	0.0	31.0
			0.05 mm	0.0	0.1		1.0		0.0	0.0			0.0	0.0	0.0	0.0	12.0
MISC	%		Total Organic Carb		0.017			0.016				0.027					
	mg/kg		Chem Oxy Demand	870			830		414	610			1600	1300	1300	2100	14700
	mg/kg		Kjedahl Nitrogen	80					48	450			180	210	190	450	650
	mg/kg		Total Phosph				676		140				85	42	200	180	371
	mg/kg		Oil and Grease	0			1840		398	0			100	0	0	0	< 50
	mg/kg		Cyanide, Total		< 0.59			< 0.58				< 0.6					
	mg/kg		Ammonia		< 0.23			0.23				0.37					
	mg/l		Ammonia Elutriate														
	%		Moisture		14.6			13.4				17.9					
	%		Total Solids		85.4			86.6				82.1					
	%		Volatile Solids		0.6			0.7				0.6					

Table 8. Contaminant Data for Pool 5A of the Upper Mississippi River

		Record #	468	466	463	467	196	462	197	198	199	200	201	202	461	203
		River Mile	733.4	733.4	733.3	733.3	732.6	731.9	731.8	731.5	731.5	731.5	731.5	731.2	731.1	730.85
		Location	FOUNTIAN CITY B. YARD	FOUNT. CITY B. YARD	FOUNTAIN CITY	FOUNTIAN CITY B. YARD		HEAD OF BETSY SLOUGH	HEAD OF BETSY SLOUGH	HEAD OF BETSY SLOUGH	HEAD OF BETSY SLOUGH	HEAD OF BETSY SLOUGH	HEAD OF BETSY SLOUGH	HEAD OF BETSY SLOUGH	HEAD OF BETSY SLOUGH	WILDS BEND
		Year	1989	1989	1989	1989	1974	1989	1981	1978	1978	1978	1978	1981	1989	1978
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
		Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg	a-BHC	< 0.08		< 0.07	< 0.07		< 0.07							< 0.08	
	ug/kg	b-BHC	< 0.17		< 0.14	< 0.14		< 0.14							< 0.15	
	ug/kg	BHC	< 0.25		< 0.22	< 0.21		< 0.21							< 0.23	
	ug/kg	g-BHC (lindane)	< 0.11		< 0.1	< 0.1		< 0.09							< 0.1	
	ug/kg	Heptachlor	< 0.08		< 0.07	< 0.07		< 0.07							< 0.08	
	ug/kg	Aldrin	< 0.11		< 0.1	< 0.1		< 0.09							< 0.1	
	ug/kg	Heptachlorepoxide	< 0.14		< 0.12	< 0.12		< 0.12							< 0.13	
	ug/kg	Endosulfan I	< 0.14		< 0.12	< 0.12		< 0.12							< 0.13	
	ug/kg	Dieldrin	< 0.14		< 0.12	< 0.12	< 10	< 0.12	< 0.1	0		0	0	< 0.1	< 0.13	0
	ug/kg	4,4'-DDE	< 0.11		< 0.1	< 0.1	10	< 0.09	< 0.1	0		0	0	< 0.1	< 0.23	0
	ug/kg	Endrin	< 0.25		< 0.22	< 0.21	< 10	< 0.21	< 0.1	0		0	0	< 0.1	< 0.25	0
	ug/kg	Endosulfan II	< 0.28		< 0.24	< 0.24		< 0.24							< 0.28	
	ug/kg	4,4'-DDD	< 0.31		< 0.26	< 0.26	< 10	< 0.26	< 0.1	0		0	0	< 0.1	< 0.28	0
	ug/kg	Endrinaldehyde	< 0.31		< 0.26	< 0.26		< 0.26							< 0.28	
	ug/kg	Sulfan sulfate	< 0.31		< 0.26	< 0.26		< 0.26							< 0.33	
	ug/kg	4,4'-DDT	< 0.37		< 0.31	< 0.31	< 10	< 0.31	< 0.1	0		0	0	< 0.1	< 0.55	0
	ug/kg	Methoxychlor	< 0.62		< 0.53	< 0.52		< 0.52							< 0.28	
	ug/kg	Endrinketone	< 0.31		< 0.26	< 0.26		< 0.26							< 1.51	
	ug/kg	Chlorodane	< 1.69		< 1.44	< 1.43	< 10	< 1.42	< 1	0		0	0	< 1	< 1.51	0
	ug/kg	Toxaphene	< 1.69		< 1.44	< 1.43		< 1.42							< 1.51	
METALS	mg/kg	Ag (silver)														
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	1.1		0.99	1.1	0.7	1.8	0	0	0	0	0	0	< 0.75	0
	mg/kg	B (boron)														
	mg/kg	Ba (barium)							40	40	60	90	60	30		30
	mg/kg	Be (beryllium)														
	mg/kg	Cd (cadmium)	< 1.3		< 1.1	< 1.1	< 0.8	< 1.1	< 1	< 10	< 10	< 10	< 10	< 1	< 1.1	< 10
	mg/kg	Cr (chromium)	9		9.9	6.3	8	7.4	< 10	< 10	< 10	< 10	< 10	< 10	5.4	< 10
	mg/kg	Cu (copper)	3		3.5	2.4	6	4.4	< 10	< 10	< 10	< 10	< 10	< 10	< 1.5	< 10
	mg/kg	Fe (iron)							3200	1900	3200	2900	2600	2500		1850
	mg/kg	Hg (mercury)	< 0.14		< 0.12	< 0.12	0.3	< 0.12	< 0.01	0	0.7	0	0.34	< 0.01	< 0.12	0
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	376		219	427		539	490	330	490	780	500	350	491	340
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	8.2		9	7.2	6	11.6	< 10	20	< 10	< 100	< 10	< 10	6.4	12
	mg/kg	Pb (lead)	3.8		1.4	< 0.5	< 8	0.98	< 10	< 100	< 10	< 100	< 10	< 10	< 0.52	< 10
	mg/kg	Sb (antimony)														
	mg/kg	Se (selenium)	< 1		< 0.87	< 0.83		< 0.86							< 0.87	
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)														
	mg/kg	Zn (zinc)	21.1		20.1	15.9	35	17.4	11	15	10	15	10	12	13.8	< 10
	mg/kg	V (vanadium)														
PCB'S	ug/kg	Aroclor-1006	< 1.69		< 1.44	< 1.43		< 1.42							< 1.51	
	ug/kg	Aroclor-1221	< 1.69		< 1.44	< 1.43		< 1.42							< 1.51	
	ug/kg	Aroclor-1232	< 1.69		< 1.44	< 1.43		< 1.42							< 1.51	
	ug/kg	Aroclor-1242	< 1.69		< 1.44	< 1.43		< 1.42							< 1.51	
	ug/kg	Aroclor-1248	< 1.69		< 1.44	< 1.43		< 1.42							< 1.51	
	ug/kg	Aroclor-1254	< 3.53		< 3	< 2.98		< 2.95							< 3.15	
	ug/kg	Aroclor-1260	< 3.53		< 3	< 2.98		< 2.95							< 3.15	
	ug/kg	Total PCB's					0		0	0	0	0	0	0		0
PARTICLE SIZE %FINER	SAND coarse	3 in					100			100	100	100	100			100
		1 1/2					100		100	100	100	100	100	100		100
		3/4					100		100	100	100	100	100	100		100
		3/8					100		100	100	100	100	100	100		100
		4		100	92.6	93.8	100	96.2	98	100	98	100	97	100	99.5	97
		8					96		96					99		
		10		99.6	83.0	86.8		91.6		99	93	96	85		97.5	36
	SAND medium	16		98.8	61.6	66.9	84.0	79.5	82.0					96.0	89.8	
		20								95.0	71.0	68.0	61.0			28.0
		30		89.8	23.5	22.3		32.3	43.0					76.0	46.2	
		40					31.0		13.0	52.0	22.0	22.0	28.0	50.0		1.0
		50		89.8	23.5	22.3		32.3	5.0					11.0	46.2	
	SAND fine	70							1.0					1.0		
		80		63.9	2.0	1.7		1.8		1.0	3.0	3.0	3.0		2.2	1.0
		100		16.9	0.8	0.4	0.0	0.0	0.0					0.0	0.1	
		140		13.3	0.1	0.3										
	SILT CLAY	200		9.2	0.1	0.3	0.0		0.0	1.0	2.0	1.0	1.0	0.0		1.0
		270		6.7	0.1	0.2			0.0					0.0		
		0.20 mm		5.5	0.1	0.2	0.0		0.0	0.0	1.0	1.0	0.0	0.0		1.0
		0.05 mm		4.1		0.2	0.0		0.0	0.0	0.0	0.0	0.0	0.0		1.0
MISC	%	Total Organic Carb		0.94	0.05	0.066		0.035							0.031	
	mg/kg	Chem Oxy Demand					< 401		860	2300	1700	2100	1800	1000		1550
	mg/kg	Kjedahl Nitrogen					123		227	120	220	270	410	228		235
	mg/kg	Total Phosph					152			240	960	110	680			115
	mg/kg	Oil and Grease					385		0	0	0	0	0	0		0
	mg/kg	Cyanide, Total	< 0.72		< 0.62	< 0.6		< 0.61							< 0.62	
	mg/kg	Ammonia	20		4.8	< 0.24		< 0.25							< 0.25	
	mg/l	Ammonia Elutriate														
	%	Moisture	30.9		19.4	16.1		18.4							19.9	
	%	Total Solids	69.1		80.6	83.9		81.6							80.1	
	%	Volatile Solids	2.2		0.8	0.6		0.5							0.4	

Table 8. Contaminant Data for Pool 5A of the Upper Mississippi River

			Record #	204	205	206	207	460	208	209	713	459	210	211	212	470	213
			River Mile	730.8	730.8	730.8	730.7	730.7	730.5	730.32	730.2	730.2	728.9	728.6	728.5	728.2	728
			Location	WILDS BEND	WILDS BEND	WILDS BEND	WILDS BEND	WILDS BEND	WILDS BEND	WILDS BEND	L-Backwtr Lwr Betsy Slou.	WILDS BEND	UPPER APPROACH L/D 5A	UPPER APPROACH L/D 5A	UPPER APPROACH L/D 5A	LOWER APPROACH L/D 5A	LOWER APPROACH L/D 5A
			Year	1978	1978	1978	1982	1989	1982	1974	1985	1989	1981	1981	1980	1989	1980
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	3	1	1	1	1	1	1
			Pool	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
			Sam. Gear	1	1	1	1	1	1	1	2	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC					< 0.07			< 10	< 0.07				< 0.07	
	ug/kg		b-BHC					< 0.14			< 10	< 0.14				< 0.15	
	ug/kg		BHC					< 0.22				< 0.21				< 0.22	
	ug/kg		g-BHC (lindane)					< 0.1			< 10	< 0.09				< 0.1	
	ug/kg		Heptachlor					< 0.07			< 10	< 0.07				< 0.07	
	ug/kg		Aldrin					< 0.1				< 0.09				< 0.1	
	ug/kg		Heptachlorepoxide					< 0.12				< 0.12				< 0.12	
	ug/kg		Endosulfan I					< 0.12				< 0.12				< 0.12	
	ug/kg		Dieldrin	0	0	0	< 0.1	< 0.12	< 0.1	< 10	< 10	< 0.12	< 0.1	< 0.1	0	< 0.12	0
	ug/kg		4,4'-DDE	0	0	0	< 0.1	< 0.1	< 0.1	10	< 10	< 0.09	< 0.1	< 0.1	0	< 0.1	0
	ug/kg		Endrin	0	0	0	< 0.1	< 0.22	< 0.1	< 10	< 10	< 0.21	< 0.1	< 0.1	0	< 0.22	0
	ug/kg		Endosulfan II					< 0.24				< 0.23				< 0.24	
	ug/kg		4,4'-DDD	0	0	0	< 0.1	< 0.26	< 0.1	< 10	< 10	< 0.26	< 0.1	< 0.1	0	< 0.27	0
	ug/kg		Endrinaldehyde					< 0.26				< 0.26				< 0.27	
	ug/kg		Sulfan sulfate					< 0.26				< 0.26				< 0.27	
	ug/kg		4,4'-DDT	0	0	0	< 0.1	< 0.31	< 0.1	< 10	< 10	< 0.3	< 0.1	< 0.1	0	< 0.32	0
	ug/kg		Methoxychlor					< 0.53				< 0.51				< 0.54	
	ug/kg		Endrinketone					< 0.26				< 0.26				< 0.27	
	ug/kg		Chlorodane	0	0	0	< 1	< 1.44	< 1	< 10	< 10	< 1.39	< 1	< 1	0	< 1.46	0
	ug/kg		Toxaphene					< 1.44				< 1.39				< 1.46	
METALS	mg/kg		Ag (silver)								< 0.4						
	mg/kg		Al (aluminum)								4440						
	mg/kg		As (arsenic)	0	0	0	2.5	< 0.71	1.3	< 0.8	< 6	1.1	0	0	0		
	mg/kg		B (boron)								10						
	mg/kg		Ba (barium)	30	40	55					80.9		10	20	20		
	mg/kg		Be (beryllium)								0.32						
	mg/kg		Cd (cadmium)	< 10	< 10	< 10	< 0.19	< 1.1	< 0.17	< 0.8	< 0.3	< 1.1	< 1	< 1	< 10		
	mg/kg		Cr (chromium)	< 10	< 10	< 10	4.8	4.9	3.4	6	17	4.2	< 10	< 10	< 10		
	mg/kg		Cu (copper)	< 10	< 10	< 10	3.8	< 1.4	2.6	6	9.3	< 1.4	< 10	< 10	< 10		
	mg/kg		Fe (iron)	1800	1600	1900	6100		3700		11900		1800	3300	2000		
	mg/kg		Hg (mercury)	0	0	0	0.013	< 0.12	0.02	0.3	0.05	< 0.12	< 0.01	< 0.01	0		
	mg/kg		Mg (magnesium)								3970						
	mg/kg		Mn (manganese)	345	390	570		298			< 743	362	130	180	190		
	mg/kg		Mo (molybdenum)								2						
	mg/kg		Ni (nickel)	< 10	< 10	< 10	8	< 5.4	5	6	11	< 5.4	< 10	< 10	10		
	mg/kg		Pb (lead)	< 10	8	< 10	2	< 0.5	2	< 8	11	< 0.5	< 10	< 10	< 10		
	mg/kg		Sb (antimony)								< 4						
	mg/kg		Se (selenium)					< 0.83			< 10	< 0.83					
	mg/kg		Sn (tin)								< 2						
	mg/kg		Sr (strontium)								15.3						
	mg/kg		Ti (titanium)								20						
	mg/kg		Zn (zinc)	< 10	< 10	8	16	11.8	12	16	42.1	11.8	7	11	7.9		
	mg/kg		V (vanadium)								< 11						
PCB'S	ug/kg		Aroclor-1006					< 1.44				< 1.39				< 1.46	
	ug/kg		Aroclor-1221					< 1.44				< 1.39				< 1.46	
	ug/kg		Aroclor-1232					< 1.44				< 1.39				< 1.46	
	ug/kg		Aroclor-1242					< 1.44				< 1.39				< 1.46	
	ug/kg		Aroclor-1248					< 1.44				< 1.39				< 1.46	
	ug/kg		Aroclor-1254					< 3				< 2.9				< 3.05	
	ug/kg		Aroclor-1260					< 3				< 2.9				< 3.05	
	ug/kg		Total PCB's	0	0	0	0		0	0	0		0	0	0		0
PARTICLE SIZE %FINER	SAND	coarse	3 in	100	100	100				100					100		
			1 1/2	100	100	100	100		100	100			100	100	100		
			3/4	100	100	100	100		100	100			100	100	100		
			3/8	100	100	100	100		100	100			100	97	100		
			4	92	92	96	100	99.9	100	100		99.4	100	93	100	100	
			8				97		100	99			99	88	100		
			10	23	21	30		99.3				98.2				98.9	
		medium	16				87.0	95.0	100	94.0		94.6	95.0	76.0	100	95.2	
			20	20.0	16.0	23.0											
			30				62.0	63.2	89.0			63.1	70.0	40.0		48.2	
			40	2.0	1.0	3.0	36.0		65.0	43.0			43.0	19.0	63.0		
			50				11.0	63.2	32.0			63.1	10.0	5.0		48.2	
		fine	70				3.0		4.0				2.0	1.0			
			80	2.0	1.0	3.0		6.3				6.3				3.0	
			100				1.0	0.2	2.0	0.0		0.2	0.0	0.0	0.0	0.1	
			140					0.1				0.2					
	SILT		200	2.0	1.0	3.0	1.0	0.1	2.0	0.0		0.1	0.0	0.0	0.0		
	CLAY		270				1.0	0.1	2.0			0.1	0.0	0.0			
			0.20 mm	1.0	1.0	2.0	1.0	0.0	1.0	0.0			0.0	0.0	0.0		
			0.05 mm	1.0	1.0	1.0	0.0		0.0	0.0			0.0	0.0	0.0		
MISC	%		Total Organic Carb					0.035				0.038				0.011	
	mg/kg		Chem Oxy Demand	1260	1050	1900	1730		988	< 458			740	1600	890		
	mg/kg		Kjedahl Nitrogen	180	165	160	33		22	90			324	218	300		
	mg/kg		Total Phosph	114	68	97.5	149		113	142							
	mg/kg		Oil and Grease	0	0	0	< 50		< 50	64			0	0	0		
	mg/kg		Cyanide, Total					< 0.59				< 0.59					
	mg/kg		Ammonia					0.83				0.36					
	mg/l		Ammonia Elutriate														
	%		Moisture					16				15.6					
	%		Total Solids					84				84.4					
	%		Volatile Solids					0.4				0.5					

Table 8. Contaminant Data for Pool 5A of the Upper Mississippi River

			Record #	469
			River Mile	728
			Location	LOWER APPROACH L/D 5A
			Year	1989
			System	1
			Habitat Type	1
			Pool	5.1
			Sam. Gear	1
			Sam. Depth	10
			Data Clt.	COE
CHC'S	ug/kg		a-BHC	< 0.08
	ug/kg		b-BHC	< 0.15
	ug/kg		BHC	< 0.23
	ug/kg		g-BHC (lindane)	< 0.1
	ug/kg		Heptachlor	< 0.08
	ug/kg		Aldrin	< 0.1
	ug/kg		Heptachlorepoxide	< 0.13
	ug/kg		Endosulfan I	< 0.13
	ug/kg		Dieldrin	< 0.13
	ug/kg		4,4'-DDE	< 0.1
	ug/kg		Endrin	< 0.23
	ug/kg		Endosulfan II	< 0.25
	ug/kg		4,4'-DDD	< 0.28
	ug/kg		Endrinaldehyde	< 0.28
	ug/kg		Sulfan sulfate	< 0.28
	ug/kg		4,4'-DDT	< 0.33
	ug/kg		Methoxychlor	< 0.55
	ug/kg		Endrinketone	< 0.28
	ug/kg		Chlorodane	< 1.5
	ug/kg		Toxaphene	< 1.5
METALS	mg/kg		Ag (silver)	
	mg/kg		Al (aluminum)	
	mg/kg		As (arsenic)	
	mg/kg		B (boron)	
	mg/kg		Ba (barium)	
	mg/kg		Be (beryllium)	
	mg/kg		Cd (cadmium)	
	mg/kg		Cr (chromium)	
	mg/kg		Cu (copper)	
	mg/kg		Fe (iron)	
	mg/kg		Hg (mercury)	
	mg/kg		Mg (magnesium)	
	mg/kg		Mn (manganese)	
	mg/kg		Mo (molybdenum)	
	mg/kg		Ni (nickel)	
	mg/kg		Pb (lead)	
	mg/kg		Sb (antimony)	
	mg/kg		Se (selenium)	
	mg/kg		Sn (tin)	
	mg/kg		Sr (strontium)	
	mg/kg		Ti (titanium)	
	mg/kg		Zn (zinc)	
	mg/kg		V (vanadium)	
PCB'S	ug/kg		Aroclor-1006	< 1.5
	ug/kg		Aroclor-1221	< 1.5
	ug/kg		Aroclor-1232	< 1.5
	ug/kg		Aroclor-1242	< 1.5
	ug/kg		Aroclor-1248	< 1.5
	ug/kg		Aroclor-1254	< 3.13
	ug/kg		Aroclor-1260	< 3.13
	ug/kg		Total PCB's	
PARTICLE SIZE %FINER	SAND	coarse	3 in	
			1 1/2	
			3/4	
			3/8	
			4	98.79
			8	
			10	96.7545
		medium	16	89.2
			20	
			30	52.2
			40	
			50	52.2
		fine	70	
			80	2.3
			100	0.2
			140	
	SILT CLAY		200	
			270	
			0.20 mm	
			0.05 mm	
MISC	%		Total Organic Carb	0.017
	mg/kg		Chem Oxy Demand	
	mg/kg		Kjedahl Nitrogen	
	mg/kg		Total Phosph	
	mg/kg		Oil and Grease	
	mg/kg		Cyanide, Total	
	mg/kg		Ammonia	
	mg/l		Ammonia Elutriate	
	%		Moisture	
	%		Total Solids	
	%		Volatile Solids	

Table 9. Contaminant Data for Pool 6 of the Upper Mississippi River

			Record #	470	213	469	472	214	471	714	215	216		477	478	217	218
			River Mile	728.2	728.0	728.0	726.5	726.4	726.4	726.2	726.0	726.0	726.0	726.0	726.0	726.0	724.2
			Location	LOWER APPRO L/D 5A	LOWER APPRO L/D 5A	LOWER APPRO L/D 5A	WINONA COMM	ISLAND 71	WINONA COMM	R-Bay S of Crooked Slough	WINONA COMM	WINONA SM BOAT	WINONA SM BOAT	WINONA SM BOAT	WINONA SM BOAT	WINONA SM BOAT	AB LOW. WINONA RR BR
			Year	1989	1980	1989	1989	1974	1989	1985	1979	1979	1980	1989	1989	1980	1981
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	2	1	2	3	2	2	2	2	2	2	1
			Pool	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Sam. Gear	1	1	1	1	1	1	2	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC				< 0.11		< 0.73	< 10			< 0.26	< 0.72	< 0.13		
	ug/kg		b-BHC				< 0.22		< 1.46	< 10			< 0.26	< 1.44	< 0.26		
	ug/kg		BHC				< 0.33		< 2.2				< 0.26	< 2.16	< 0.39		
	ug/kg		g-BHC (lindane)				< 0.15		< 0.98	< 10			< 0.26	< 0.96	< 0.17		
	ug/kg		Heptachlor				< 0.11		< 0.73	< 10			< 0.26	< 0.72	< 0.13		
	ug/kg		Aldrin				< 0.15		< 0.98					< 0.96	< 0.17		
	ug/kg		Heptachlorepoxide				< 0.18		< 1.22					< 1.2	< 0.22		
	ug/kg		Endosulfan I				< 0.18		< 1.22					< 1.2	< 0.22		
	ug/kg		Dieldrin				< 0.18	< 10	< 1.22	< 10	0	0	< 0.51	< 1.2	< 0.22	0.21	< 0.1
	ug/kg		4,4'-DDE				< 0.15	10	< 0.98	< 10	0	0.3	< 0.51	< 0.96	< 0.17	< 0.2	< 0.1
	ug/kg		Endrin				< 0.33	< 10	< 2.2	< 10	0	0	< 0.51	< 2.16	< 0.39	< 0.2	< 0.1
	ug/kg		Endosulfan II				< 0.36		< 2.44					< 2.4	< 0.43		
	ug/kg		4,4'-DDD				< 0.4	< 10	< 2.68	< 10	0	0.2	< 0.51	< 2.64	< 0.48	0.59	< 0.1
	ug/kg		Endrinaldehyde				< 0.4		< 2.68					< 2.64	< 0.48		
	ug/kg		Sulfan sulfate				< 0.4		< 2.68					< 2.64	< 0.48		
	ug/kg		4,4'-DDT				< 0.47	< 10	< 3.17	< 10	0	1.5	< 0.51	< 3.12	< 0.56	< 0.4	< 0.1
	ug/kg		Methoxychlor				< 0.8		< 5.37					< 5.28	< 0.95		
	ug/kg		Endrinketone				< 0.4		< 2.68					< 2.64	< 0.48		
	ug/kg		Chlorodane				< 2.18	< 10	< 14.64	< 10	0	0	< 0.26	< 14.4	< 2.6	0.63	< 1
	ug/kg		Toxaphene				< 2.18		< 14.64					< 14.4	< 2.6		
METALS	mg/kg		Ag (silver)							< 0.4							
	mg/kg		Al (aluminum)							10800							
	mg/kg		As (arsenic)	< 0.76	0	0.85	2.4	< 1	0.8	< 7	0	0	1.1	0.79	2.7		0
	mg/kg		B (boron)							5							
	mg/kg		Ba (barium)		20					152	50	50					40
	mg/kg		Be (beryllium)							0.61							
	mg/kg		Cd (cadmium)	< 1.2	< 10	< 1.1	< 1.6	0.7	< 1.1	0.8	< 10	< 10	0.38	< 1.1	< 2	1.58	< 1
	mg/kg		Cr (chromium)	4.3	< 10	5.1	11.6	5	4.2	25	< 10	< 10	7.3	6.6	16.3	35	< 10
	mg/kg		Cu (copper)	2.2	< 10	2	6.1	4	< 1.4	18	< 10	< 10	3.7	3.1	8.2	8.88	< 10
	mg/kg		Fe (iron)		2600					20600	6400	7000				11000	3400
	mg/kg		Hg (mercury)	< 0.13	0	< 0.12	< 0.17	0.3	< 0.12	0.06	0	0	< 0.05	< 0.12	< 0.21	< 0.01	< 0.01
	mg/kg		Mg (magnesium)							5050							
	mg/kg		Mn (manganese)	205	260	323	280		173	< 1190	390	340	269	292	654		390
	mg/kg		Mo (molybdenum)							2							
	mg/kg		Ni (nickel)	4.9	< 10	6.2	12.9	4	4.7	19	< 10	< 10	5.8	6	11.3	22.8	< 10
	mg/kg		Pb (lead)	0.96	< 10	1	3.5	< 7	0.9	20	< 10	20	4.8	2.4	14.7	3.44	< 10
	mg/kg		Sb (antimony)							< 4							
	mg/kg		Se (selenium)	< 0.88		< 0.87	< 1.2		< 0.83	< 10				< 0.87	< 1.5		
	mg/kg		Sn (tin)							< 2							
	mg/kg		Sr (strontium)							26							
	mg/kg		Ti (titanium)							20							
	mg/kg		Zn (zinc)	11.2	7.4	22.4	31.2	13	10.7	81.2	20	30	17.3	15.3	48.8	66.2	11
	mg/kg		V (vanadium)							< 19							
PCB'S	ug/kg		Aroclor-1006				< 2.18		< 14.64				< 5.1	< 14.4	< 2.6		
	ug/kg		Aroclor-1221				< 2.18		< 14.64				< 5.1	< 14.4	< 2.6		
	ug/kg		Aroclor-1232				< 2.18		< 14.64				< 5.1	< 14.4	< 2.6		
	ug/kg		Aroclor-1242				< 2.18		< 14.64				< 5.1	< 14.4	< 2.6		
	ug/kg		Aroclor-1248				< 2.18		< 14.64				< 5.1	< 14.4	< 2.6		
	ug/kg		Aroclor-1254				< 4.55		< 3.05				< 5.1	< 30	< 5.43		
	ug/kg		Aroclor-1260				< 4.55		< 3.05				< 5.1	< 30	< 5.43		
	ug/kg		Total PCB's					0		0	13	19				24.9	0
PARTICLE SIZE %FINER	SAND	coarse	3 in		100			100			100	100				100	
			1 1/2		100			100			100	100				100	100
			3/4		100			100			100	100				100	100
			3/8		100			100			100	100				100	100
			4		99		95.6	100	99.2		96	100		100	100	100	95
			8		99			99								100	84
			10				92.4		97.0		92	100		99.7	99.0		
		medium	16		96.0		86.6	96.0	88.1					97.3	97.1	99.0	68.0
			20								83.0	100					
			30				55.9		50.5					72.8	95.3		38.0
			40		31.0			46.0			63.0	91.0				91.0	22.0
			50				55.9		50.5					72.8	95.3		8.0
		fine	70														3.0
			80				30.2		10.9		36.0	35.0		23.3	82.0		
			100		0.0		21.5	0.0	0.3					1.4	18.8	48.0	1.0
			140						0.3					1.1	15.9		
	SILT CLAY		200		0.0			0.0	0.3		26.0	19.0		0.7	12.0	38.0	0.0
			270						0.2					0.5	9.5		0.0
			0.20 mm		0.0			0.0	0.2		14.0	13.0		0.5	7.6		0.0
			0.05 mm		0.0			0.0	0.1		6.0	5.0		0.5	5.7	14.0	0.0
MISC	%		Total Organic Carb				1.05		0.033					0.4	2.26		
	mg/kg		Chem Oxy Demand		2600			404			24000	24000				14000	1600
	mg/kg		Kjedahl Nitrogen		260			270			2900	3200					176
	mg/kg		Total Phosph					155			820	460				1070	
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total	< 0.63		< 0.62	< 0.86		< 0.59				< 0.07	< 0.62	< 1.1		
	mg/kg		Ammonia	0.25		< 0.25	34		2.4				0.19	3.7	53		
	mg/l		Ammonia Elutriate														
	%		Moisture	20.7		19.7	41.9		15.9				24	19.2	52.9		
	%		Total Solids	79.3		80.3	58.1		84.1				76	80.8	47.1		
	%		Volatile Solids	0.4		0.4	4		0.5				1.46	0.7	6.7		

Table 9. Contaminant Data for Pool 6 of the Upper Mississippi River

			Record #	219	473	220	221	474	222	715	223	224	225	475	226	227	228
			River Mile	723.9	723.7	723.4	723.4	723.3	722.7	722.7	722.0	721.1	721.0	721.0	720.8	720.8	720.46
			Location	AB LOW. WINONA RR BR	BW LOW. WINONA RR BR	BW LOW. WINONA RR BR	BW LOW. WINONA RR BR	BW LOW. WINONA RR BR	GRAVEL POINT	L-Bay Behind U-shaped Isl	GRAVEL POINT	HOMER	HOMER	HOMER	HOMER	HOMER	HOMER
			Year	1981	1989	1982	1982	1989	1981	1985	1981	1982	1982	1989	1978	1978	1974
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	3	1	1	1	1	1	1	1
			Pool	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Sam. Gear	1	1	1	1	1	1	2	1	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 0.09			< 0.07		< 10				< 0.07			
	ug/kg		b-BHC		< 0.18			< 0.15		< 10				< 0.14			
	ug/kg		BHC		< 0.27			< 0.22						< 0.21			
	ug/kg		g-BHC (lindane)		< 0.12			< 0.1		< 10				< 0.09			
	ug/kg		Heptachlor		< 0.09			< 0.07		< 10				< 0.07			
	ug/kg		Aldrin		< 0.12			< 0.1						< 0.09			
	ug/kg		Heptachlorepoxide		< 0.15			< 0.12						< 0.12			
	ug/kg		Endosulfan I		< 0.15			< 0.12						< 0.12			
	ug/kg		Dieldrin	< 0.1	< 0.15	< 0.1	< 0.1	< 0.12	< 0.1	< 10	< 0.1	< 0.1	< 0.1	< 0.12	0	0	< 10
	ug/kg		4,4'-DDE	< 0.1	< 0.12	< 0.1	< 0.1	< 0.1	< 0.1	< 10	< 0.1	< 0.1	< 0.1	< 0.09	0	0	10
	ug/kg		Endrin	< 0.1	< 0.27	< 0.1	< 0.1	< 0.22	< 0.1	< 10	< 0.1	< 0.1	< 0.1	< 0.21	0	0	< 10
	ug/kg		Endosulfan II		< 0.3			< 0.25						< 0.23			
	ug/kg		4,4'-DDD	< 0.1	< 0.33	< 0.1	< 0.1	< 0.27	< 0.1	< 10	< 0.1	< 0.1	< 0.1	< 0.26	0	0	< 10
	ug/kg		Endrinaldehyde		< 0.33			< 0.27						< 0.26			
	ug/kg		Sulfan sulfate		< 0.33			< 0.27						< 0.26			
	ug/kg		4,4'-DDT	< 0.1	< 0.4	< 0.1	< 0.1	< 0.32	< 0.1	< 10	< 0.1	< 0.1	< 0.1	< 0.3	0	0	< 10
	ug/kg		Methoxychlor		< 0.67			< 0.54						< 0.51			
	ug/kg		Endrinketone		< 0.33			< 0.27						< 0.26			
	ug/kg		Chlorodane	< 1	< 1.82	< 1	< 1	< 1.48	< 1	< 10	< 1	< 1	< 1	< 1.39	0	0	< 10
	ug/kg		Toxaphene		< 1.82			< 1.48						< 1.39			
METALS	mg/kg		Ag (silver)							< 0.4							
	mg/kg		Al (aluminum)							9670							
	mg/kg		As (arsenic)	0	1.4	1.3	2.8	1.5	0	< 7	1	1.5	2.5	1.3	0	0	< 0.7
	mg/kg		B (boron)							4							
	mg/kg		Ba (barium)	40					50	123	30				30	10	
	mg/kg		Be (beryllium)							0.56							
	mg/kg		Cd (cadmium)	< 1	< 1.1	< 0.18	< 0.2	< 1.1	< 1	0.8	< 1	< 0.18	< 0.19	< 1.1	< 10	< 10	< 1
	mg/kg		Cr (chromium)	< 10	6.6	3.7	7.9	9.5	< 10	25	< 10	3.6	5.7	5.3	< 10	< 10	7
	mg/kg		Cu (copper)	< 10	7.3	3	5.9	7.3	< 10	19	< 10	2.7	5.7	< 1.4	< 10	< 10	5
	mg/kg		Fe (iron)	2900		7100	8800		2800	20700	2800	4100	6800		2200	1900	
	mg/kg		Hg (mercury)	< 0.01	< 0.12	0.01	0.018	< 0.12	< 0.01	0.07	< 0.01	0.017	0.013	< 0.12	0	0	0.2
	mg/kg		Mg (magnesium)							5060							
	mg/kg		Mn (manganese)	400	582			840	450	< 857	300			302	42	35	
	mg/kg		Mo (molybdenum)							2							
	mg/kg		Ni (nickel)	< 10	7.2	6	11	10.9	< 10	18	< 10	6	8	6.1	< 10	< 10	5
	mg/kg		Pb (lead)	< 10	0.98	2.4	4	1.5	< 10	21	< 10	2	2	1.5	< 10	30	< 9
	mg/kg		Sb (antimony)							< 4							
	mg/kg		Se (selenium)		< 0.86			< 0.86		< 10				< 0.84			
	mg/kg		Sn (tin)							< 2							
	mg/kg		Sr (strontium)							27.7							
	mg/kg		Ti (titanium)							20							
	mg/kg		Zn (zinc)	10	18.6	12	17	25.4	11	75	12	11	17	13.6	10	10	17
	mg/kg		V (vanadium)							< 17							
PCB'S	ug/kg		Aroclor-1006		< 1.82			< 1.48						< 1.39			
	ug/kg		Aroclor-1221		< 1.82			< 1.48						< 1.39			
	ug/kg		Aroclor-1232		< 1.82			< 1.48						< 1.39			
	ug/kg		Aroclor-1242		< 1.82			< 1.48						< 1.39			
	ug/kg		Aroclor-1248		< 1.82			< 1.48						< 1.39			
	ug/kg		Aroclor-1254		< 3.8			< 3.08						< 2.9			
	ug/kg		Aroclor-1260		< 3.8			< 3.08						< 2.9			
	ug/kg		Total PCB's	0		0	0		0	0	0	0	0		0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in												100	100	100
			1 1/2	100		100	100		100		100	100	100		100	100	100
			3/4	100		100	100		100		100	100	100		100	100	100
			3/8	100		98	100		100		100	100	99		100	100	100
			4	98	96.0	96	98	96.5	96		99	100	94	97.8	100	100	99
			8	87		92	92		91		98	99	88				95
			10		89.4			87.5						91.0	100	100	
		medium	16	66.0	71.1	85.0	77.0	67.3	80.0		93.0	97.0	78.0	76.3			86.0
			20												94.0	94.0	
			30	34.0	14.7	59.0	44.0	18.7	49.0		63.0	78.0	50.0	36.3			
			40	16.0		25.0	22.0		27.0		37.0	51.0	31.0		51.0	55.0	8.0
			50	4.0	14.7	4.0	6.0	18.7	5.0		12.0	27.0	16.0	36.3			
		fine	70	1.0		3.0	1.0		1.0		2.0	17.0	13.0				
			80		0.5			0.5						1.2	3.0	2.0	
			100	0.0	0.1	3.0	1.0	0.0	1.0		0.0	15.0	12.0	0.0			0.0
			140														
	SILT CLAY		200	0.0		3.0	1.0		1.0		0.0	15.0	12.0		1.0	1.0	0.0
			270	0.0		2.0	1.0		1.0		0.0	15.0	12.0				
			0.20 mm	0.0		1.0	0.0		0.0		0.0	2.0	1.0		0.0	0.0	0.0
			0.05 mm	0.0		0.0	0.0		0.0		0.0	0.0	0.0		0.0	0.0	0.0
MISC	%		Total Organic Carb		0.03			0.019						0.015			
	mg/kg		Chem Oxy Demand	1700		1175	1000		1800		1300	920	1120		1800	2100	484
	mg/kg		Kjedahl Nitrogen	297		54	53		137		290	52	41		240	800	180
	mg/kg		Total Phosph			130	254					89	222		230	74	167
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total		< 0.61			< 0.61						< 0.61			
	mg/kg		Ammonia		< 0.25			< 0.24						< 0.24			
	mg/l		Ammonia Elutriate														
	%		Moisture		18.4			18.2						16.8			
	%		Total Solids		81.6			81.8						83.2			
	%		Volatile Solids		0.5			0.6						0.5			

Table 9. Contaminant Data for Pool 6 of the Upper Mississippi River

			Record #	476	716
			River Mile	720.5	718.4
			Location	HOMER	R-Bay Lwr Linear Is
			Year	1989	1985
			System	1	1
			Habitat Type	1	3
			Pool	6	6
			Sam. Gear	1	2
			Sam. Depth	10	10
			Data Clt.	COE	FWS
CHC's	ug/kg		a-BHC	< 0.07	< 10
	ug/kg		b-BHC	< 0.14	< 10
	ug/kg		BHC	< 0.21	
	ug/kg		g-BHC (lindane)	< 0.1	< 10
	ug/kg		Heptachlor	< 0.07	< 10
	ug/kg		Aldrin	< 0.1	
	ug/kg		Heptachlorepoxide	< 0.12	
	ug/kg		Endosulfan I	< 0.12	
	ug/kg		Dieldrin	< 0.12	< 10
	ug/kg		4,4'-DDE	< 0.1	< 10
	ug/kg		Endrin	< 0.21	< 10
	ug/kg		Endosulfan II	< 0.24	
	ug/kg		4,4'-DDD	< 0.26	< 10
	ug/kg		Endrinaldehyde	< 0.26	
	ug/kg		Sulfan sulfate	< 0.26	
	ug/kg		4,4'-DDT	< 0.31	< 10
	ug/kg		Methoxychlor	< 0.52	
	ug/kg		Endrinketone	< 0.26	
	ug/kg		Chlorodane	< 1.43	< 10
	ug/kg		Toxaphene	< 1.43	
METALS	mg/kg		Ag (silver)		< 0.4
	mg/kg		Al (aluminum)		5310
	mg/kg		As (arsenic)	1.4	< 6
	mg/kg		B (boron)		< 4
	mg/kg		Ba (barium)		76
	mg/kg		Be (beryllium)		0.32
	mg/kg		Cd (cadmium)	< 1.1	< 0.3
	mg/kg		Cr (chromium)	8.3	13
	mg/kg		Cu (copper)	2	9.2
	mg/kg		Fe (iron)		10700
	mg/kg		Hg (mercury)	< 0.12	0.21
	mg/kg		Mg (magnesium)		3310
	mg/kg		Mn (manganese)	339	< 422
	mg/kg		Mo (molybdenum)		2
	mg/kg		Ni (nickel)	7.1	11
	mg/kg		Pb (lead)	2.1	9
	mg/kg		Sb (antimony)		< 4
	mg/kg		Se (selenium)	< 0.81	< 10
	mg/kg		Sn (tin)		< 2
	mg/kg		Sr (strontium)		28.9
	mg/kg		Ti (titanium)		20
	mg/kg		Zn (zinc)	15.8	45.9
	mg/kg		V (vanadium)		< 13
PCB's	ug/kg		Aroclor-1006	< 1.43	
	ug/kg		Aroclor-1221	< 1.43	
	ug/kg		Aroclor-1232	< 1.43	
	ug/kg		Aroclor-1242	< 1.43	
	ug/kg		Aroclor-1248	< 1.43	
	ug/kg		Aroclor-1254	< 2.98	
	ug/kg		Aroclor-1260	< 2.98	
	ug/kg		Total PCB's		0
PARTICLE SIZE %FINER		SAND coarse	3 in		
			1 1/2		
			3/4		
			3/8		
			4	67.4	
			8		
			10	52.7	
		SAND medium	16	48.7	
			20		
			30	35.7	
			40		
			50	35.7	
		SAND fine	70		
			80	6.1	
			100	0.8	
			140	0.5	
		SILT CLAY	200	0.4	
			270	0.3	
			0.20 mm	0.2	
			0.05 mm	0.2	
MISC	%		Total Organic Carb	0.58	
	mg/kg		Chem Oxy Demand		
	mg/kg		Kjedahl Nitrogen		
	mg/kg		Total Phosph		
	mg/kg		Oil and Grease		
	mg/kg		Cyanide, Total	< 0.58	
	mg/kg		Ammonia	1.6	
	mg/l		Ammonia Elutriate		
	%		Moisture	14.0	
	%		Total Solids	86.0	
	%		Volatile Solids	0.7	

Table 10. Contaminant Data for Pool 7 of the Upper Mississippi River

			Record #	229	230	231	232	717	233	524	234	235	523	236	237	718	238
			River Mile	714.1	713.9	712.7	712.7	712.6	712.0	712.0	711.6	711.5	711.4	710.6	710.3	709.7	709.1
			Location	LOWER APPROACH L/D 6	LOWER APPROACH L/D 6	HEAD OF RICHMOND IS.	HEAD OF RICHMOND IS.	L-Bay Entr @ Lwr end Isl	RICHMOND ISLAND	RICHMOND ISLAND	RICHMOND ISLAND	RICHMOND ISLAND	RICHMOND ISLAND	BELOW QUEENS BLUFF	BELOW QUEENS BLUFF	L-Sm Bay Dwn Shingle Cr	WINTERS LANDING
			Year	1981	1981	1979	1979	1985	1980	1989	1974	1980	1989	1981	1981	1985	1981
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	3	1	1	1	1	1	1	1	3	1
			Pool	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Sam. Gear	1	1	1	1	2	1	1	1	1	1	1	1	2	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	FWS	COE	COE	COE	COE	COE	COE	COE	FWS	COE
CHC'S	ug/kg		a-BHC					< 10		< 0.07			< 0.07			< 10	
	ug/kg		b-BHC					< 10		< 0.14			< 0.14			< 10	
	ug/kg		BHC							< 0.21			< 0.21				
	ug/kg		g-BHC (lindane)					< 10		< 0.09			< 0.1			< 10	
	ug/kg		Heptachlor					< 10		< 0.07			< 0.07			< 10	
	ug/kg		Aldrin							< 0.09			< 0.1				
	ug/kg		Heptachlorepoxide							< 0.12			< 0.12				
	ug/kg		Endosulfan I							< 0.12			< 0.12				
	ug/kg		Dieldrin	< 0.1	< 0.1	0	0	< 10	0	< 0.12	< 10	0	< 0.12	< 0.1	< 0.1	< 10	< 0.1
	ug/kg		4,4'-DDE	< 0.1	< 0.1	0	0	< 10	0	< 0.09	10	0	< 0.1	< 0.1	< 0.1	< 10	< 0.1
	ug/kg		Endrin	< 0.1	< 0.1	0	0	< 10	0	< 0.21	< 10	0	< 0.21	< 0.1	< 0.1	< 10	< 0.1
	ug/kg		Endosulfan II							< 0.24			< 0.24				
	ug/kg		4,4'-DDD	< 0.1	< 0.1	0	0	< 10	0	< 0.26	< 10	0	< 0.26	< 0.1	< 0.1	< 10	< 0.1
	ug/kg		Endrinaldehyde							< 0.26			< 0.26				
	ug/kg		Sulfan sulfate							< 0.26			< 0.26				
	ug/kg		4,4'-DDT	< 0.1	< 0.1	0	0	< 10	0	< 0.31	< 10	0	< 0.31	< 0.1	< 0.1	< 10	< 0.1
	ug/kg		Methoxychlor							< 0.52			< 0.52				
	ug/kg		Endriniketone							< 0.26			< 0.26				
	ug/kg		Chlorodane	< 1	< 1	0	0	< 10	0	< 1.42	< 10	0	< 1.43	< 1	< 1	< 10	< 1
	ug/kg		Toxaphene							< 1.42			< 1.43				
METALS	mg/kg		Ag (silver)					< 0.4								< 0.4	
	mg/kg		Al (aluminum)					7830								12400	
	mg/kg		As (arsenic)	0	0	1	0	< 6	0	1.2	< 0.9	0	< 1	0	0	< 7	0
	mg/kg		B (boron)					< 4								5	
	mg/kg		Ba (barium)	20	30	30	20	108	10			10		20	20	153	40
	mg/kg		Be (beryllium)					0.45								0.72	
	mg/kg		Cd (cadmium)	< 1	< 1	< 10	< 10	0.5	< 10	< 1.1	< 1	< 10	< 1.1	< 1	< 1	0.5	< 1
	mg/kg		Cr (chromium)	< 10	< 10	< 10	< 10	20	< 10	3.3	7	< 10	3.3	< 10	< 10	24	< 10
	mg/kg		Cu (copper)	< 10	< 10	< 10	< 10	13	< 10	< 1.44	5	< 10	1.9	< 10	< 10	17	< 10
	mg/kg		Fe (iron)	3100	3400	4600	3200	17900	2400			2300		3500	2500	22200	4000
	mg/kg		Hg (mercury)	< 0.01	< 0.01	0	0	0.14	0	< 0.01	0.2	0	< 0.01	< 0.01	< 0.01	0.17	< 0.01
	mg/kg		Mg (magnesium)					4020								3520	
	mg/kg		Mn (manganese)	280	310	220	150	< 783	270	809		230	234	280	200	< 476	370
	mg/kg		Mo (molybdenum)					2								3	
	mg/kg		Ni (nickel)	< 10	< 10	< 10	< 10	14	< 10	< 5.5	9	< 10	< 5.48	10	< 10	20	10
	mg/kg		Pb (lead)	< 10	< 10	< 10	< 10	16	< 10	1.1	< 9	< 10	0.9	< 10	< 10	17	< 10
	mg/kg		Sb (antimony)					< 4								< 4	
	mg/kg		Se (selenium)					< 10		< 0.84			< 0.84			< 10	
	mg/kg		Sn (tin)					< 2								< 2	
	mg/kg		Sr (strontium)					20.4								21.1	
	mg/kg		Ti (titanium)					20								20	
	mg/kg		Zn (zinc)	10	10	10	< 10	59.4	13	12.2	16	17	13	10	8	88.2	12
	mg/kg		V (vanadium)					< 15								< 21	
PCB'S	ug/kg		Aroclor-1006							< 1.42			< 1.43				
	ug/kg		Aroclor-1221							< 1.42			< 1.43				
	ug/kg		Aroclor-1232							< 1.42			< 1.43				
	ug/kg		Aroclor-1242							< 1.42			< 1.43				
	ug/kg		Aroclor-1248							< 1.42			< 1.43				
	ug/kg		Aroclor-1254							< 2.95			< 2.98				
	ug/kg		Aroclor-1260							< 2.95			< 2.98				
	ug/kg		Total PCB's	0	0	0	0	0	0		0	0		0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in			100	100		100		100	100					
			1 1/2	100	100	100	100		100		100	100		100	100		100
			3/4	100	100	100	100		100		100	100		100	100		100
			3/8	100	100	100	100		100		100	100		100	100		100
			4	99	100	99	100		98	99.2	98	100	100	98	100		100
			8	96	99				95		93	95		97	100		94
			10			90	100			96.9			99.4				
		medium	16	85.0	93.0				63.0	90.5	81.0	77.0	94.1	95.0	98.0		81.0
			20			61.0	89.0										
			30	46.0	54.0					53.9			55.6	74.0	85.0		46.0
			40	18.0	23.0	16.0	52.0		20.0		11.0	2.0		41.0	63.0		25.0
			50	3.0	4.0					53.9			55.6	11.0	17.0		6.0
		fine	70	1.0	1.0									2.0	2.0		1.0
			80			2.0	3.0			4.7			3.7				
			100	0.0	0.0				0.0	0.3	0.0	0.0	0.3	0.0	0.0		0.0
			140							0.3							
	SILT CLAY		200	0.0	0.0	1.0	1.0		0.0		0.0	0.0		0.0	0.0		0.0
			270	0.0	0.0									0.0	0.0		0.0
			0.20 mm	0.0	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0		0.0
			0.05 mm	0.0	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0		0.0
MISC	%		Total Organic Carb							0.045			0.017				
	mg/kg		Chem Oxy Demand	1400	1300	1700	1200		1500		< 461	1500		1100	1500		1300
	mg/kg		Kjedahl Nitrogen	146	250	120	320		90		11	120		171	147		217
	mg/kg		Total Phosph			170	62				209						
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total							< 0.6			< 0.6				
	mg/kg		Ammonia							< 0.24			< 0.24				
	mg/l		Ammonia Elutriate														
	%		Moisture							16.5			16.5				
	%		Total Solids							83.5			83.5				
	%		Volatile Solids							0.4			0.4				

Table 10. Contaminant Data for Pool 7 of the Upper Mississippi River

			Record #	239	240	522	241	242	243	521	611	614	616	615	613	612	610
			River Mile	709.0	709.0	709.0	708.5	708.5	708	708.0	707	707	707	707	707	707	707.0
			Location	WINTERS LANDING	WINTERS LANDING	WINTERS LANDING	WINTERS LANDING	WINTERS LANDING	WINTERS LANDING	WINTERS LANDING	L-Halfway Ck. Ab.RD.	L-Halfway Ck. Bw.RD.	L-Halfway Ck. Bw.RD.	L-Halfway Ck. Bw.RD.	L-Halfway Ck. Bw.RD.	L-Halfway Ck. Ab.RD.	L-Halfway Ck. Ab.RD.
			Year	1974	1974	1989	1978	1978	1981	1989	1984	1984	1984	1984	1984	1984	1984
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	3	3	3	3	3	3	3
			Pool	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Sam. Gear	1	1	1	1	1	1	1	3	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	COE	COE	WDNR	WDNR	WDNR	WDNR	WDNR	WDNR	WDNR
CHC'S	ug/kg		a-BHC			< 0.07				< 0.07							
	ug/kg		b-BHC			< 0.14				< 0.14							
	ug/kg		BHC			< 0.21				< 0.21							
	ug/kg		g-BHC (lindane)			< 0.1				< 0.1							
	ug/kg		Heptachlor			< 0.07				< 0.07							
	ug/kg		Aldrin			< 0.1				< 0.1							
	ug/kg		Heptachlorepoxide			< 0.12				< 0.12							
	ug/kg		Endosulfan I			< 0.12				< 0.12							
	ug/kg		Dieldrin	< 10	< 10	< 0.12	0	0	< 0.1	< 0.12							
	ug/kg		4,4'-DDE	< 10	< 10	< 0.1	0	0	< 0.1	< 0.1							
	ug/kg		Endrin	< 10	< 10	< 0.21	0	0	< 0.1	< 0.21							
	ug/kg		Endosulfan II			< 0.24				< 0.24							
	ug/kg		4,4'-DDD	< 10	< 10	< 0.26	0	0	< 0.1	< 0.26							
	ug/kg		Endrinaldehyde			< 0.26				< 0.26							
	ug/kg		Sulfan sulfate			< 0.26				< 0.26							
	ug/kg		4,4'-DDT	< 10	< 10	< 0.31	0	0	< 0.1	< 0.31							
	ug/kg		Methoxychlor			< 0.52				< 0.52							
	ug/kg		Endriketone			< 0.26				< 0.26							
	ug/kg		Chlorodane	< 10	< 10	< 1.43	0	0	< 1	< 1.43							
	ug/kg		Toxaphene			< 1.43				< 1.43							
METALS	mg/kg		Ag (silver)														
	mg/kg		Al (aluminum)								20000	13000	13000	18000	21000	17000	12000
	mg/kg		As (arsenic)	< 0.9	< 0.8	1.4	0	0	0	< 1.01							
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				30	10	10								
	mg/kg		Be (beryllium)														
	mg/kg		Cd (cadmium)	< 0.9	1	< 1.1	< 10	< 10	< 1	< 1.1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
	mg/kg		Cr (chromium)	7	8	3.5	< 10	< 10	< 10	2.99	47	38	38	29	48	42	29
	mg/kg		Cu (copper)	4	5	< 1.44	< 10	< 10	< 10	< 1.44	26	25	26	27	28	25	19
	mg/kg		Fe (iron)				2200	2500	4500								
	mg/kg		Hg (mercury)	0.3	0.4	< 0.01	0	0	< 0.01	< 0.01	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)			248	29	24	280	255							
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	7	5	< 5.49	< 10	< 10	< 10	< 5.5	33	30	30	29	29	33	23
	mg/kg		Pb (lead)	< 9	10	0.9	10	< 10	< 10	1.1	19	28	38	24	19	19	21
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)			< 0.84				< 0.84							
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)	16	15	12.2	10	10	13	11.7	110	98	93	120	100	96	76
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006			< 1.43				< 1.43							
	ug/kg		Aroclor-1221			< 1.43				< 1.43							
	ug/kg		Aroclor-1232			< 1.43				< 1.43							
	ug/kg		Aroclor-1242			< 1.43				< 1.43							
	ug/kg		Aroclor-1248			< 1.43				< 1.43							
	ug/kg		Aroclor-1254			< 2.98				< 2.98							
	ug/kg		Aroclor-1260			< 2.98				< 2.98							
	ug/kg		Total PCB's	0	0		0	0	0		0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in	100	100		100	100									
			1 1/2	100	100		100	100	100								
			3/4	100	100		100	100	100								
			3/8	100	100		100	100	100								
			4	100	100	99.5	100	100	100	98.6							
			8	95	95				100								
			10			98.4	98	98		96.4							
		medium	16	81.0	81.0	93.5			97.0	90.6							
			20				87.0	85.0									
			30			62.9			71.0	66.2							
			40	12.0	12.0		53.0	36.0	42.0								
			50			62.9			9.0	66.2							
		fine	70						1.0								
			80			4.3	5.0	2.0		12.0							
			100	0.0	0.0	0.0			0.0	0.1							
			140														
	SILT CLAY		200	0.0	0.0		1.0	0.0	0.0								
			270						0.0								
			0.20 mm	0.0	0.0		0.0	0.0	0.0								
			0.05 mm	0.0	0.0		0.0	0.0	0.0								
MISC	%		Total Organic Carb			0.026				0.025							
	mg/kg		Chem Oxy Demand	1417	418		1800	1200	1200								
	mg/kg		Kjedahl Nitrogen	145	123		180	210	230								
	mg/kg		Total Phosph	207	205		180	190									
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total			< 0.61				< 0.59							
	mg/kg		Ammonia			< 0.55				< 0.24							
	mg/l		Ammonia Elutriate														
	%		Moisture			18.1				15.8							
	%		Total Solids			81.9				84.2							
	%		Volatile Solids			0.4				0.5							

Table 10. Contaminant Data for Pool 7 of the Upper Mississippi River

			Record #	766	719	244	520	245	519	246	720	247	518	765	721	332	331
			River Mile	706.8	706.8	706.5	706.4	706.3	706.1	706.0	706	705.4	705.1	705	705	705	705.0
			Location	L-Lk Onalaska celery-4	L-Bay Is Across Dakota	DAKOTA	DAKOTA	DAKOTA	DAKOTA	DAKOTA	L-Entrnc Black R. Chute	HEAD OF DRESBACH CUT	HEAD OF DRESBACH CUT	L-Lk Onalaska celery 3	R-Bay Nr Hd Dresbach Isl	L-Lk Onalaska Rosebud 3-2	L-Lk Onalaska Rosebud 3-1
			Year	1983	1985	1980	1989	1974	1989	1980	1985	1980	1989	1983	1985	1987	1987
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	3	3	1	1	1	1	1	3	1	1	3	3	3	3
			Pool	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Sam. Gear	2	2	1	1	1	1	1	2	1	1	2	2	4	4
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	60-120	60
			Data Clt.	FWS	FWS	COE	COE	COE	COE	COE	FWS	COE	COE	FWS	FWS	COE	COE
CHC'S	ug/kg		a-BHC		< 10		< 0.07		< 0.07		< 10		< 0.07		< 10	< 5	< 5
	ug/kg		b-BHC		< 10		< 0.14		< 0.14		< 10		< 0.14		< 10	< 5	< 5
	ug/kg		BHC				< 0.21		< 0.21				< 0.21				
	ug/kg		g-BHC (lindane)		< 10		< 0.09		< 0.09		< 10		< 0.09		< 10	< 5	< 5
	ug/kg		Heptachlor		< 10		< 0.07		< 0.07		< 10		< 0.07		< 10	< 5	< 5
	ug/kg		Aldrin				< 0.09		< 0.09				< 0.09				
	ug/kg		Heptachlorepoxide				< 0.12		< 0.12				< 0.12				
	ug/kg		Endosulfan I				< 0.12		< 0.12				< 0.12				
	ug/kg		Dieldrin		< 10	0	< 0.12	< 10	< 0.12	0	< 10	0	< 0.12		< 10	< 5	< 5
	ug/kg		4,4'-DDE		< 10	0	< 0.09	10	< 0.09	0	< 10	0	< 0.09		< 10	< 5	< 5
	ug/kg		Endrin		< 10	0	< 0.21	< 10	< 0.21	0	< 10	0	< 0.21		< 10	< 5	< 5
	ug/kg		Endosulfan II				< 0.24		< 0.24				< 0.23				
	ug/kg		4,4'-DDD		< 10	0	< 0.26	< 10	< 0.26	0	< 10	0	< 0.26		< 10	< 5	< 5
	ug/kg		Endrinaldehyde				< 0.26		< 0.26				< 0.26				
	ug/kg		Sulfan sulfate				< 0.26		< 0.26				< 0.26				
	ug/kg		4,4'-DDT		< 10	0	< 0.31	< 10	< 0.31	0	< 10	0	< 0.3		< 10	< 5	< 5
	ug/kg		Methoxychlor				< 0.52		< 0.52				< 0.51				
	ug/kg		Endriniketone				< 0.26		< 0.26				< 0.26				
	ug/kg		Chlorodane		< 10	0	< 1.42	< 10	< 1.42	0	< 10	0	< 1.39		< 10	< 5	< 5
	ug/kg		Toxaphene				< 1.42		< 1.42				< 1.39				
METALS	mg/kg		Ag (silver)	7.6	< 0.4						< 0.5			1.48	< 0.4		
	mg/kg		Al (aluminum)	8360	5490						16100			5624	5520		
	mg/kg		As (arsenic)	< 40	< 6	0	1.6	< 0.9	1.5	0	< 8	0	< 1	< 40	< 6	5.2	< 2.2
	mg/kg		B (boron)	< 5	6						5			< 5	13		
	mg/kg		Ba (barium)	99	105	10				20	246	50		87	85		
	mg/kg		Be (beryllium)	0.3	0.4						0.91			0.3	0.37		
	mg/kg		Cd (cadmium)	0.26	< 0.3	< 10	< 1.1	< 0.9	< 1.06	< 10	0.5	< 10	< 1.09	0.31	0.4	5.8	5.8
	mg/kg		Cr (chromium)	16.7	14	< 10	3.3	7	3.5	< 10	31	< 10	2.8	11.4	14	20.2	20.2
	mg/kg		Cu (copper)	7.6	11	< 10	< 1.44	5	< 1.38	< 10	23	< 10	1.5	7	11	11.5	11.5
	mg/kg		Fe (iron)	18240	13800	2400				3400	27900	3800		8584	12600		
	mg/kg		Hg (mercury)	< 0.05	0.22	0	< 0.01	0.1	< 0.01	0	0.15	0	< 0.01	< 0.05	0.07	< 0.6	< 0.6
	mg/kg		Mg (magnesium)	2128	3240						3800			1332	4990		
	mg/kg		Mn (manganese)	< 654	< 956	120	229		260	240	< 760	450	282	< 141	< 745	4.5	4.5
	mg/kg		Mo (molybdenum)	2	2						3			2	2		
	mg/kg		Ni (nickel)	11.4	13	< 10	< 5.48	5	< 5.27	10	24	10	< 5.43	8	13	< 25	< 25
	mg/kg		Pb (lead)	6.4	12	< 10	1.1	9	0.9	10	22	10	1.07	5.5	14	17.4	12
	mg/kg		Sb (antimony)	< 40	< 4						< 4			< 40	< 4		
	mg/kg		Se (selenium)	< 20	< 10		< 0.84		< 0.8		< 10		< 0.83	< 20	< 10		
	mg/kg		Sn (tin)	< 20	< 2						< 3			< 20	< 2		
	mg/kg		Sr (strontium)	12.5	15.7						26.7			8.1	16.7		
	mg/kg		Ti (titanium)	20	20						20			20	20		
	mg/kg		Zn (zinc)	38	50.1	11	10.7	14	11.6	2.1	109	11	10.7	34	51.8	11	8.4
	mg/kg		V (vanadium)	< 38	< 10						< 25			< 34	< 9.4		
PCB'S	ug/kg		Aroclor-1006				< 1.42		< 1.42				< 1.39				
	ug/kg		Aroclor-1221				< 1.42		< 1.42				< 1.39				
	ug/kg		Aroclor-1232				< 1.42		< 1.42				< 1.39				
	ug/kg		Aroclor-1242				< 1.42		< 1.42				< 1.39				
	ug/kg		Aroclor-1248				< 1.42		< 1.42				< 1.39				
	ug/kg		Aroclor-1254				< 2.95		< 2.95				< 2.9				
	ug/kg		Aroclor-1260				< 2.95		< 2.95				< 2.9				
	ug/kg		Total PCB's	0	0	0		0		0	0	0		0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in			100		100		100		100					
			1 1/2			100		100		100		100					
			3/4			100		100		100		100					
			3/8			100		100		100		100					
			4			100	97.7	100	99.3	100		100	98.7				
			8			100		96		100		100					
			10				95.4		98.4				95.3			92.1	93.76
		medium	16			99.0	83.5	87.0	92.1	100		96.0	83.5				
			20														
			30				30.3		54.5				34.6				
			40			58.0		11.0		100		44.0				57.1	81.9
			50				30.3		54.5				34.6				
		fine	70														
			80				1.4		8.6				1.8				
			100			1.0	0.1	0.0	0.0	97.0		0.0	0.0				
			140				0.0									53.5	73.2
	SILT CLAY		200			0.0	0.0	0.0		38.0		0.0					
			270													42.1	49.9
			0.20 mm			0.0		0.0		0.0		0.0				24.8	21.7
			0.05 mm			0.0		0.0		0.0		0.0				24.8	21.8
MISC	%		Total Organic Carb				0.061		0.02				0.03			5.92	7.95
	mg/kg		Chem Oxy Demand			460		444		1000		1100					
	mg/kg		Kjedahl Nitrogen			70		112		440		250					
	mg/kg		Total Phosph					200									
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total				< 0.59		< 0.6				< 0.6				
	mg/kg		Ammonia				< 0.24		< 0.24				< 0.24				
	mg/l		Ammonia Elutriate														
	%		Moisture				15.6		16.0				16.4				
	%		Total Solids				84.4		84.0				83.6				
	%		Volatile Solids				0.5		0.4				0.6				

Table 10. Contaminant Data for Pool 7 of the Upper Mississippi River

			Record #	327	322	330	323	326	329	324	325	328	248	764	249	763	760
			River Mile	705	705	705	705	705	705	705	705	705	704.9	704.4	704.3	704.2	704.2
			Location	L-Lk Onalaska Rosebud 2-2	L-Lk Onalaska Rosebud 1-1	L-Lk Onalaska Rosebud 2/3	L-Lk Onalaska Rosebud 1-2	L-Lk Onalaska Rosebud 2-1	L-Lk Onalaska Rosebud b-2	L-Lk Onalaska Rosebud a-1	L-Lk Onalaska Rosebud a-2	L-Lk Onalaska Rosebud b-1	HEAD OF DRESBACH CUT	L-Lk Onalaska celery-2	HEAD OF DRESBACH CUT	L-Lk Onalaska celery-1	L-Lk Onalaska celery-5
			Year	1987	1987	1987	1987	1987	1988	1988	1988	1988	1974	1983	1980	1983	1983
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	3	3	3	3	3	3	3	3	3	1	3	1	3	3
			Pool	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			Sam. Gear	4	4	4	4	4	4	4	4	4	1	2	1	2	2
			Sam. Depth	60-120	60	120	60-120	60	60-120	76	76-120	60	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	FWS	COE	FWS	FWS
CHC'S	ug/kg		a-BHC	< 5	< 5	< 5	< 5	< 5	< 4.8	< 4.8	< 4.8	< 4.8					
	ug/kg		b-BHC	< 5	< 5	< 5	< 5	< 5	< 4.8	< 4.8	< 4.8	< 4.8					
	ug/kg		BHC														
	ug/kg		g-BHC (lindane)	< 5	< 5	< 5	< 5	< 5	< 4.8	< 4.8	< 4.8	< 4.8					
	ug/kg		Heptachlor	< 5	< 5	< 5	< 5	< 5	< 2.2	< 2.2	< 2.2	< 2.2					
	ug/kg		Aldrin														
	ug/kg		Heptachlorepoxide														
	ug/kg		Endosulfan I														
	ug/kg		Dieldrin	< 5	< 5	< 5	< 5	< 5	< 4	< 4	< 4	< 4	< 10		0		
	ug/kg		4,4'-DDE	< 5	< 5	< 5	< 5	< 5	< 5.8	< 5.8	< 5.8	< 5.8	< 10		0		
	ug/kg		Endrin	< 5	< 5	< 5	< 5	< 5	< 13	< 13	< 13	< 13	< 10		0		
	ug/kg		Endosulfan II														
	ug/kg		4,4'-DDD	< 5	< 5	< 5	< 5	< 5	< 13	< 13	< 13	< 13	< 10		0		
	ug/kg		Endrinaldehyde														
	ug/kg		Sulfan sulfate														
	ug/kg		4,4'-DDT	< 5	< 5	< 5	< 5	< 5	< 8.7	< 8.7	< 8.7	< 8.7	< 10		0		
	ug/kg		Methoxychlor														
	ug/kg		Endrinketone														
	ug/kg		Chlorodane	< 5	< 5	< 5	< 5	< 5	< 12	< 12	< 12	< 12	< 10		0		
	ug/kg		Toxaphene														
METALS	mg/kg		Ag (silver)											< 1		< 1	1.8
	mg/kg		Al (aluminum)											1182		19872	6660
	mg/kg		As (arsenic)	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	0.06	0.89	0.15	0.82	< 0.9	< 40	0	< 40	< 40
	mg/kg		B (boron)											< 5		< 5	< 5
	mg/kg		Ba (barium)											15	30	251	104
	mg/kg		Be (beryllium)											< 0.1		0.86	0.36
	mg/kg		Cd (cadmium)	5.8	< 3.1	5.8	5.8	12.3	0.33	0.48	0.35	0.43	< 0.6	0.15	< 10	0.66	0.58
	mg/kg		Cr (chromium)	30.9	30.9	20.2	20.2	30.9	6	11	16	9	6	3.9	< 10	28.8	16.6
	mg/kg		Cu (copper)	18.2	18.2	18.2	11.5	25	3.6	5.4	6.4	5.1	6	< 1	< 10	25.9	12.2
	mg/kg		Fe (iron)											3152	2400	34560	15120
	mg/kg		Hg (mercury)	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.02	< 0.02	< 0.02	< 0.02	0.4	< 0.05	0	< 0.05	< 0.05
	mg/kg		Mg (magnesium)											374		4896	3060
	mg/kg		Mn (manganese)	216	1171.8	744.2	312.2	1208.3	28	150	18	80		< 77	230	< 950	< 486
	mg/kg		Mo (molybdenum)											2		2	2
	mg/kg		Ni (nickel)	54.5	54.5	54.5	< 25	100	6.3	9.9	9.6	9.6	6	2	10	27.1	13
	mg/kg		Pb (lead)	11.5	10.6	22.9	13.8	14	< 2.5	8.4	5.3	21	< 6	2.4	10	26.8	13.1
	mg/kg		Sb (antimony)											< 40		< 40	< 40
	mg/kg		Se (selenium)											< 20		< 20	< 20
	mg/kg		Sn (tin)											< 20		< 20	< 20
	mg/kg		Sr (strontium)											3.9		43.2	14.2
	mg/kg		Ti (titanium)											20		20	20
	mg/kg		Zn (zinc)	77.3	90.1	44.1	23.7	105.4	6	28	15	23	19	8.7	9.4	100.8	50.4
	mg/kg		V (vanadium)											< 8.7		< 100.8	< 50.4
PCB'S	ug/kg		Aroclor-1006														
	ug/kg		Aroclor-1221														
	ug/kg		Aroclor-1232														
	ug/kg		Aroclor-1242														
	ug/kg		Aroclor-1248														
	ug/kg		Aroclor-1254														
	ug/kg		Aroclor-1260														
	ug/kg		Total PCB's	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in										100		100		
			1 1/2										100		100		
			3/4										100		100		
			3/8										100		100		
			4										100		100		
			8										94		100		
			10	89.9		92.9		90.9									
		medium	16										77.0		99.0		
			20														
			30														
			40	41.1		66.8		54.8					10.0		63.0		
			50														
		fine	70														
			80														
			100										0.0		0.0		
			140	27.6		62.1		43.0									
	SILT CLAY		200										0.0		0.0		
			270	19.5		36.0		32.5									
			0.20 mm	12.4		18.3		17.7					0.0		0.0		
			0.05 mm	12.4		18.3		17.7					0.0		0.0		
MISC	%		Total Organic Carb	8.48		9.09		15.29									
	mg/kg		Chem Oxy Demand										475		750		
	mg/kg		Kjedahl Nitrogen										108		1210		
	mg/kg		Total Phosph										375				
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total														
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate														
	%		Moisture														
	%		Total Solids														
	%		Volatile Solids														

Table 10. Contaminant Data for Pool 7 of the Upper Mississippi River

		Record #	517	701	702	703	704	700	722	723	762	761
		River Mile	704.2	704	704	704	704	704	704	703.8	703.5	703.3
		Location	HEAD OF DRESBACH CUT	L-Lk Onalaska Rosebud Isl	L-Lake Onalaska Halfway	L-Lake Onalaska Halfway	L-Lk Onalaska Rosebud Isl	L-Lk Onalaska Rosebud Isl	L-Lk Onalaska Rosebud Isl	L-Confluence 1/2 mi. Cr.	L-Lk Onalaska celery-7	L-Lk Onalaska celery-6
		Year	1989	1984	1984	1984	1984	1984	1985	1985	1983	1983
		System	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	3	3	3	3	3	3	3	3	3
		Pool	7	7	7	7	7	7	7	7	7	7
		Sam. Gear	1	2	2	2	2	2	2	2	2	2
		Sam. Depth	10	10	10	10	10	10	10	10	10	10
		Data Cit.	COE	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS
CHC'S	ug/kg	a-BHC	< 0.07						< 10	< 10		
	ug/kg	b-BHC	< 0.14						< 10	< 10		
	ug/kg	BHC	< 0.22									
	ug/kg	g-BHC (lindane)	< 0.1						< 10	< 10		
	ug/kg	Heptachlor	< 0.07						< 10	< 10		
	ug/kg	Aldrin	< 0.1									
	ug/kg	Heptachlorepoxide	< 0.12									
	ug/kg	Endosulfan I	< 0.12									
	ug/kg	Dieldrin	< 0.12						< 10	< 10		
	ug/kg	4,4'-DDE	< 0.1						< 10	< 10		
	ug/kg	Endrin	< 0.22						< 10	< 10		
	ug/kg	Endosulfan II	< 0.24									
	ug/kg	4,4'-DDD	< 0.26						< 10	< 10		
	ug/kg	Endrinaldehyde	< 0.26									
	ug/kg	Sulfan sulfate	< 0.26									
	ug/kg	4,4'-DDT	< 0.31						< 10	< 10		
	ug/kg	Methoxychlor	< 0.53									
	ug/kg	Endrinketone	< 0.26									
	ug/kg	Chlorodane	< 1.44						< 10	< 10		
	ug/kg	Toxaphene	< 1.44									
METALS	mg/kg	Ag (silver)		< 1	< 1	< 1	< 1	< 1	< 0.5	< 0.5	3.04	1.51
	mg/kg	Al (aluminum)		11000	6440	5730	15900	13200	13100	12900	8360	9664
	mg/kg	As (arsenic)	2.2	< 40	< 40	< 40	< 40	< 40	< 8	< 8	< 40	< 40
	mg/kg	B (boron)		4	4	4	7	7	6	7	< 5	< 5
	mg/kg	Ba (barium)		195	82	82	215	203	159	189	108	149
	mg/kg	Be (beryllium)		0.82	0.41	0.41	1	0.96	0.74	0.81	< 0.1	0.45
	mg/kg	Cd (cadmium)	< 1.08	0.61	0.23	0.21	0.44	0.42	0.4	< 0.3	0.35	0.39
	mg/kg	Cr (chromium)	5.5	18	11	10	24	20	21	23	16.7	22.6
	mg/kg	Cu (copper)	2.3	19	10	10	23	22	23	23	9	16.6
	mg/kg	Fe (iron)		27000	13400	13300	36900	34300	27700	27700	15048	21140
	mg/kg	Hg (mercury)	< 0.01	0.05	0.05	0.05	0.05	0.05	0.07	0.14	< 0.05	< 0.05
	mg/kg	Mg (magnesium)		3460	2940	2850	6080	5830	4180	4450	1976	3020
	mg/kg	Mn (manganese)	403	< 1340	< 718	< 711	< 2070	< 2010	< 2030	< 1970	< 304	< 544
	mg/kg	Mo (molybdenum)		3	2	2	3	3	3	3	2	2
	mg/kg	Ni (nickel)	5.4	20	11	11	24	22	19	20	11.4	13.7
	mg/kg	Pb (lead)	1.1	27	12	11	32	30	20	23	9.9	9.1
	mg/kg	Sb (antimony)		< 40	< 40	< 40	< 40	< 40	< 4	< 4	< 40	< 40
	mg/kg	Se (selenium)	< 0.82	< 20	< 20	< 20	< 20	< 20	< 10	< 10	< 20	< 20
	mg/kg	Sn (tin)		< 20	< 20	< 20	< 20	< 20	< 2	< 2	< 20	< 20
	mg/kg	Sr (strontium)		30	15	15	39	38	53	27.2	14	16.6
	mg/kg	Ti (titanium)		20	20	20	20	20	20	20	20	20
	mg/kg	Zn (zinc)	15.8	78	43	42	94	86	85.1	88.3	42.6	57.4
	mg/kg	V (vanadium)		26	< 15	< 15	33	29	< 26	< 18	< 42.6	< 57.4
PCB'S	ug/kg	Aroclor-1006	< 1.44									
	ug/kg	Aroclor-1221	< 1.44									
	ug/kg	Aroclor-1232	< 1.44									
	ug/kg	Aroclor-1242	< 1.44									
	ug/kg	Aroclor-1248	< 1.44									
	ug/kg	Aroclor-1254	< 3									
	ug/kg	Aroclor-1260	< 3									
	ug/kg	Total PCB's		0	0	0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND coarse	3 in										
		1 1/2										
		3/4										
		3/8										
		4	99.6									
		8										
		10	96.1									
	SAND medium	16	75.9									
		20										
		30	28.8									
		40										
		50	28.8									
	SAND fine	70										
		80	2.2									
		100	0.0									
		140										
	SILT CLAY	200										
		270										
		0.20 mm										
		0.05 mm										
MISC	%	Total Organic Carb	0.039									
	mg/kg	Chem Oxy Demand										
	mg/kg	Kjedahl Nitrogen										
	mg/kg	Total Phosph										
	mg/kg	Oil and Grease										
	mg/kg	Cyanide, Total	< 0.61									
	mg/kg	Ammonia	< 0.24									
	mg/l	Ammonia Elutriate										
	%	Moisture	17.8									
	%	Total Solids	82.2									
	%	Volatile Solids	0.5									

Table 11. Contaminant Data for Pool 8 of the Upper Mississippi River

			Record #	516	250	251	724	515	252	253	725	254	726	255	509	256	257
			River Mile	700.3	699.9	699.9	699.8	699.8	694.9	694.7	694.6	694.1	693.8	692.4	692.3	692.0	692.0
			Location	AB&BW LACROSSE RR BR	AB&BW LACROSSE RR BR	AB&BW LACROSSE RR BR	L-Bay @ Lwr End of MN Isl	AB&BW LACROSSE RR BR	SAND SLOUGH	SAND SLOUGH	L-Bay Cnfinc Bluff & Run Sl	SAND SLOUGH	R-R Desc Bank Root R.	PICAYUNE ISLAND	PICAYUNE ISLAND	PICAYUNE ISLAND	PICAYUNE ISLAND
			Year	1989	1979	1979	1985	1989	1981	1974	1985	1981	1985	1981	1989	1974	1974
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	3	1	1	1	3	1	3	1	1	1	1
			Pool	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Sam. Gear	1	1	1	2	1	1	1	2	1	2	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	FWS	COE	COE	COE	FWS	COE	FWS	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.07			< 10	< 0.07			< 10		< 10		< 0.07		
	ug/kg		b-BHC	< 0.14			< 10	< 0.14			< 10		< 10		< 0.15		
	ug/kg		BHC	< 0.21				< 0.21							< 0.22		
	ug/kg		g-BHC (lindane)	< 0.09			< 10	< 0.09			< 10		< 10		< 0.1		
	ug/kg		Heptachlor	< 0.07			< 10	< 0.07			< 10		< 10		< 0.07		
	ug/kg		Aldrin	< 0.09				< 0.09							< 0.1		
	ug/kg		Heptachlorepoxide	< 0.12				< 0.12							< 0.12		
	ug/kg		Endosulfan I	< 0.12				< 0.12							< 0.12		
	ug/kg		Dieldrin	< 0.12	0	0	< 10	< 0.12	< 0.1	< 10	< 10	< 0.1	< 10	< 0.1	< 0.12	< 10	< 10
	ug/kg		4,4'-DDE	< 0.09	0	0	< 10	< 0.09	< 0.1	< 10	< 10	< 0.1	< 10	< 0.1	< 0.1	< 10	< 10
	ug/kg		Endrin	< 0.21	0	0	< 10	< 0.21	< 0.1	< 10	< 10	< 0.1	< 10	< 0.1	< 0.22	< 10	< 10
	ug/kg		Endosulfan II	< 0.23				< 0.24							< 0.24		
	ug/kg		4,4'-DDD	< 0.26	0	0	< 10	< 0.26	< 0.1	< 10	< 10	< 0.1	< 10	< 0.1	< 0.27	< 10	< 10
	ug/kg		Endrinaldehyde	< 0.26				< 0.26							< 0.27		
	ug/kg		Sulfan sulfate	< 0.26				< 0.26							< 0.27		
	ug/kg		4,4'-DDT	< 0.3	0	0	< 10	< 0.31	< 0.1	< 10	< 10	< 0.1	< 10	< 0.1	< 0.31	< 10	< 10
	ug/kg		Methoxychlor	< 0.51				< 0.52							< 0.53		
	ug/kg		Endrinketone	< 0.26				< 0.26							< 0.27		
	ug/kg		Chlorodane	< 1.39	0	0	< 10	< 1.42	< 1	< 10	< 10	< 1	< 10	< 1	< 1.45	< 10	< 10
	ug/kg		Toxaphene	< 1.39				< 1.42							< 1.45		
METALS	mg/kg		Ag (silver)				< 0.4				< 0.4		< 0.4				
	mg/kg		Al (aluminum)				4560				10100		7460				
	mg/kg		As (arsenic)	< 0.99	0	0	< 6	< 1.01	2	< 0.7	< 7	1	< 6	1	< 1.01	< 0.7	< 0.7
	mg/kg		B (boron)				10				10		6				
	mg/kg		Ba (barium)		30	30	69.3		20		139	10	120	30			
	mg/kg		Be (beryllium)				0.3				0.7		0.51				
	mg/kg		Cd (cadmium)	< 1.09	< 10	< 10	< 3	< 1.11	< 1	< 0.9	0.8	< 1	< 0.3	< 1	< 1.1	0.9	< 0.8
	mg/kg		Cr (chromium)	3.7	< 10	< 10	13	2.8	< 10	7	28	< 10	12	10	4.3	7	6
	mg/kg		Cu (copper)	2	< 10	< 10	8.4	< 1.45	< 10	5	24	< 10	11	< 10	< 1.24	5	6
	mg/kg		Fe (iron)		3600	3500	11200		2600		19200	2100	13100	1800			
	mg/kg		Hg (mercury)	< 0.01	0	0	0.02	< 0.01	< 0.01	0.4	0.05	< 0.01	0.05	< 0.01	< 0.01	< 0.1	0.2
	mg/kg		Mg (magnesium)				3900				4000		6220				
	mg/kg		Mn (manganese)	24.2	270	250	< 552	170	190		< 556	130	< 961	250	245		
	mg/kg		Mo (molybdenum)				2				2		2				
	mg/kg		Ni (nickel)	< 5.41	< 10	< 10	11	< 5.52	< 10	7	19	< 10	15	< 10	6.9	7	8
	mg/kg		Pb (lead)	0.8	< 10	< 10	9.66	< 0.83	< 10	< 9	25	< 10	12	< 10	1.2	< 8	< 9
	mg/kg		Sb (antimony)				< 4				< 4		< 4				
	mg/kg		Se (selenium)	< 0.83			< 10	< 0.84			< 10		< 10		< 0.84		
	mg/kg		Sn (tin)				< 2				< 2		< 2				
	mg/kg		Sr (strontium)				15.1				21.7		23.6				
	mg/kg		Ti (titanium)				20				20		20				
	mg/kg		Zn (zinc)	14	< 10	10	39.6	8	10	14	87.6	9	52.7	9	11.4	14	15
	mg/kg		V (vanadium)				< 8.9				< 14		< 12				
PCB'S	ug/kg		Aroclor-1006	< 1.39				< 1.42							< 1.45		
	ug/kg		Aroclor-1221	< 1.39				< 1.42							< 1.45		
	ug/kg		Aroclor-1232	< 1.39				< 1.42							< 1.45		
	ug/kg		Aroclor-1242	< 1.39				< 1.42							< 1.45		
	ug/kg		Aroclor-1248	< 1.39				< 1.42							< 1.45		
	ug/kg		Aroclor-1254	< 2.9				< 2.95							< 3.03		
	ug/kg		Aroclor-1260	< 2.9				< 2.95							< 3.03		
	ug/kg		Total PCB's		0	0	0		0	0	0	0	0	0		0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in		100	100				100	100					100	100
			1 1/2		100	100			100	100	100	100	100	100		100	100
			3/4		100	100			100	100	100	95	100	100		100	100
			3/8		100	100			100	100	100	92	100	100		100	100
			4	100	100	98	100	99.8	100	100	100	89	100	100	98.2	98	98
			8						99	99	100	86	100	99		94	94
			10	97.9	98.0	94.0	98.7	96.7							95.8		
		medium	16	86.9			93.4	76.7	92.0	94.0	99.0	80.0	100	93.0	85.2	77.0	77.0
			20		78.0	67.0											
			30	39.7			69.5	23.1	56.0			59.0	98.0	74.0	29.4		
			40		16.0	12.0			15.0	10.0	73.0	38.0	93.0	54.0		6.0	6.0
			50	39.7			69.5	23.1	6.0			12.0	68.0	17.0	29.4		
		fine	70						1.0			3.0	21.0	4.0			
			80	2.4	2.0	1.0	14.5	1.8							0.9		
			100	0.0			0.5	0.3	0.0	0.0	0.0	1.0	4.0	0.0	0.1	0.0	0.0
			140				0.4	0.2									
	SILT CLAY		200		1.0	1.0	0.3	0.2	0.0	0.0	0.0	0.0	1.0	0.0		0.0	0.0
			270				0.2	0.2	0.0			0.0	0.0	0.0			
			0.20 mm		0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
			0.05 mm		0.0	0.0	0.1		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
MISC	%		Total Organic Carb	0.012			0.06	0.046							0.021		
	mg/kg		Chem Oxy Demand		1000	1300			1300	3073	1400	1200	1700	770		3378	3306
	mg/kg		Kjedahl Nitrogen		300	190			296	187	50	40	245	145		147	123
	mg/kg		Total Phosph		280	220				191						190	194
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total	< 0.59				< 0.6							< 0.62		
	mg/kg		Ammonia	< 0.24				0.5							< 0.25		
	mg/l		Ammonia Elutriate														
	%		Moisture	16.1				17.1							18.9		
	%		Total Solids	83.9				82.9							81.1		
	%		Volatile Solids	0.4				0.4							0.4		

Table 11. Contaminant Data for Pool 8 of the Upper Mississippi River

		Record #	258	510	728	259	511	727	260	261	262	512	263	759	264	366
		River Mile	691.5	691.5	691	690.8	690.8	690.4	690.3	690.3	690.2	690.0	689.3	689.2	688.9	688.6
		Location	PICAYUNE ISLAND	PICAYUNE ISLAND	L-Bay Lwr IslAW Wigwam Sl	ABOVE BROWNSVILLE E	ABOVE BROWNSVILLE E	R-Smbay Entr Lawrence Lk	ABOVE BROWNSVILLE E	ABOVE BROWNSVILLE E	ABOVE BROWNSVILLE E	ABOVE BROWNSVILLE E	BROWNSVILLE E	L-Lower Pool 8 - 14	BROWNSVILLE E	EMP-Island-81
		Year	1981	1989	1985	1982	1989	1985	1978	1978	1982	1989	1980	1983	1980	1988
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	1	1	3	1	1	3	1	1	1	1	1	3	1	3
		Pool	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		Sam. Gear	1	1	2	1	1	2	1	1	1	1	1	2	1	1
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	COE	FWS	COE	COE	FWS	COE	COE	COE	COE	COE	FWS	COE	COE
CHC's	ug/kg	a-BHC		< 0.07	< 10		< 0.07	< 10				< 0.07				< 0.003
	ug/kg	b-BHC		< 0.15	< 10		< 0.15	< 10				< 0.14				< 0.009
	ug/kg	BHC		< 0.22			< 0.22					< 0.21				
	ug/kg	g-BHC (lindane)		< 0.1	< 10		< 0.1	< 10				< 0.09				< 0.009
	ug/kg	Heptachlor		< 0.07	< 10		< 0.07	< 10				< 0.07				< 0.009
	ug/kg	Aldrin		< 0.1			< 0.1					< 0.09				
	ug/kg	Heptachlorepoxide		< 0.12			< 0.12					< 0.12				
	ug/kg	Endosulfan I		< 0.12			< 0.12					< 0.12				
	ug/kg	Dieldrin	< 0.1	< 0.12	< 10	< 0.1	< 0.12	< 10	0	0	< 0.1	< 0.12	0		0	< 0.02
	ug/kg	4,4'-DDE	< 0.1	< 0.1	< 10	< 0.1	< 0.1	< 10	0	0	< 0.1	< 0.09	0		0	< 0.009
	ug/kg	Endrin	< 0.1	< 0.22	< 10	< 0.1	< 0.22	< 10	0	0	< 0.1	< 0.21	0		0	< 0.03
	ug/kg	Endosulfan II		< 0.24			< 0.24					< 0.24				
	ug/kg	4,4'-DDD	< 0.1	< 0.27	< 10	< 0.1	< 0.27	< 10	0	0	< 0.1	< 0.26	0		0	< 0.02
	ug/kg	Endrinaldehyde		< 0.27			< 0.27					< 0.26				
	ug/kg	Sulfan sulfate		< 0.27			< 0.27					< 0.26				
	ug/kg	4,4'-DDT	< 0.1	< 0.32	< 10	< 0.1	< 0.31	< 10	0	0	< 0.1	< 0.31	0		0	< 0.04
	ug/kg	Methoxychlor		< 0.54			< 0.53					< 0.52				
	ug/kg	Endrinketone		< 0.27			< 0.27					< 0.26				
	ug/kg	Chlorodane	< 1	< 1.46	< 10	< 1	< 1.45	< 10	0	0	< 1	< 1.42	0		0	< 0.23
	ug/kg	Toxaphene		< 1.46			< 1.45					< 1.42				
METALS	mg/kg	Ag (silver)			< 0.4			< 0.4						1.37		
	mg/kg	Al (aluminum)			9030			5660						5206		
	mg/kg	As (arsenic)	1	< 1	< 6	1.9	< 0.97	< 6	0	0	1.4	< 1	0	< 40	0	0.99
	mg/kg	B (boron)			10			13						< 5		
	mg/kg	Ba (barium)	20		142			88.1	10	10			20	60	20	
	mg/kg	Be (beryllium)			0.61			0.39						< 0.1		
	mg/kg	Cd (cadmium)	< 1	< 1.09	0.5	< 0.19	< 1.07	< 0.3	< 10	< 10	< 0.19	< 1.09	< 10	0.41	< 10	0.12
	mg/kg	Cr (chromium)	10	3.7	23	3.7	3	11	< 10	< 10	3.8	2.6	< 10	13.7	< 10	4.4
	mg/kg	Cu (copper)	< 10	3.8	17	2.8	2.3	9.7	< 10	< 10	1.9	1.9	< 10	7.9	< 10	3.3
	mg/kg	Fe (iron)	1600		18000	5300		11100	1200	1500	4300		2300	10275	2500	
	mg/kg	Hg (mercury)	< 0.01	< 0.01	0.05	0.011	< 0.01	0.05	0	0.08	0.021	< 0.01	0	< 0.05	0	< 0.01
	mg/kg	Mg (magnesium)			4010			5080						5480		
	mg/kg	Mn (manganese)	160	330	< 1400		158	< 537	93	270		249	140	< 329	170	226
	mg/kg	Mo (molybdenum)			2			2						2		
	mg/kg	Ni (nickel)	< 10	5.9	18	6	6.3	11	< 100	< 100	4	< 5.43	< 10	10.1	< 10	4.7
	mg/kg	Pb (lead)	< 10	0.9	17	2	1	11	20	< 100	2	1.1	< 10	10.4	< 10	9.6
	mg/kg	Sb (antimony)			< 4			< 4						< 40		
	mg/kg	Se (selenium)		< 0.83	< 10		< 0.81	< 10				< 0.83		< 20		< 1
	mg/kg	Sn (tin)			< 2			< 2						< 20		
	mg/kg	Sr (strontium)			20.2			29.3						13.4		
	mg/kg	Ti (titanium)			20			20						20		
	mg/kg	Zn (zinc)	7	12.3	71.6	12	7.8	44.3	< 10	< 10	9	11	30	38.4	30	19.8
	mg/kg	V (vanadium)			< 14			< 9.5						< 38.4		
PCB's	ug/kg	Aroclor-1006		< 1.46			< 1.45					< 1.42				< 0.23
	ug/kg	Aroclor-1221		< 1.46			< 1.45					< 1.42				
	ug/kg	Aroclor-1232		< 1.46			< 1.45					< 1.42				
	ug/kg	Aroclor-1242		< 1.46			< 1.45					< 1.42				
	ug/kg	Aroclor-1248		< 1.46			< 1.45					< 1.42				
	ug/kg	Aroclor-1254		< 3.05			< 3.03					< 2.95				< 0.39
	ug/kg	Aroclor-1260		< 3.05			< 3.03					< 2.95				< 0.39
	ug/kg	Total PCB's	0		0	0		0	0	0	0		0	0	0	
PARTICLE SIZE %FINER	SAND coarse	3 in							100	100			100		100	
		1 1/2		100	100		100		100	100	100		100		100	
		3/4		100	100		100		100	100	100		100		100	
		3/8		100	100		100		100	100	100		100		100	
		4	98.7	100	100	100	100		100	100	100	100	100		100	
		8		100	99		97				100		100		100	
		10	96.2			99.9		98.5	100	98		98.6		99.9		99.76
	SAND medium	16	85.2	98.0	97.0	98.7	90.0				97.0	91.5	100		99.0	
		20							99.0	88.0						
		30	32.9	86.0	86.0	67.3	55.0				63.0	54.6				
		40		59.0	74.0		27.0	92.6	84.0	48.0	36.0		81.0	97.4	81.0	98.1
		50	32.9	12.0	50.0	67.3	5.0				16.0	54.6				
	SAND fine	70		1.0	24.0		2.0				6.0					
		80	2.1			2.4			3.0	5.0		6.5				
		100	0.1	0.0	7.0	0.4	2.0				3.0	0.5	1.0		0.0	
		140				0.2		80.5				0.4		90.2		93.2
	SILT CLAY	200		0.0	4.0		2.0		0.0	5.0	2.0	0.3	0.0		0.0	
		270		0.0	2.0		1.0	42.1			2.0			73.6		60.7
		0.20 mm		0.0	0.0		1.0	29.0	0.0	0.0	1.0		0.0	60.2	0.0	40.7
		0.05 mm		0.0	0.0		0.0	18.5	0.0	0.0	0.0		0.0	36.1	0.0	14.5
MISC	%	Total Organic Carb	0.021			0.02		2.1				0.032		3.02		2.49
	mg/kg	Chem Oxy Demand		690	2700		779		2200	2400	522		1400		1300	
	mg/kg	Kjedahl Nitrogen		1160	724		14		79	83	17		40		90	
	mg/kg	Total Phosph					172		60	58	271					
	mg/kg	Oil and Grease														
	mg/kg	Cyanide, Total		< 0.5			< 0.59					< 0.6				
	mg/kg	Ammonia		< 0.24			< 0.24					< 0.24				
	mg/l	Ammonia Elutriate														
	%	Moisture		17.5			15.7					17.3				
	%	Total Solids		82.2			84.3					82.7				
	%	Volatile Solids		0.5			0.4					0.4				

Table 11. Contaminant Data for Pool 8 of the Upper Mississippi River

			Record #	265	513	364	365	363	362	266	514	267	758	268	751	269	367
			River Mile	688.5	688.5	688.4	688.4	688.4	688.4	688.1	687.9	687.8	687.5	687.3	687.2	686.7	686.4
			Location	HEAD OF RAFT CHANNEL	HEAD OF RAFT CHANNEL	Wildcat 2	Wildcat 3	Wildcat 1 Dup	Wildcat 1	HEAD OF RAFT CHANNEL	HEAD OF RAFT CHANNEL	HEAD OF RAFT CHANNEL	L-Lower Pool 8 - 13	DEADMANS SLOUGH	L-Lower Pool 8 - 12	DEADMANS SLOUGH	EMP-Island-82
			Year	1980	1989	1988	1988	1988	1988	1974	1989	1980	1983	1981	1983	1981	1988
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	3	3	3	3	1	1	1	3	1	3	1	3
			Pool	8	8	8	8	8	8	8	8	8	8	8	8	8	8
			Sam. Gear	1	1	1	1	1	1	1	1	1	2	1	2	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	COE	FWS	COE	COE	COE	FWS	COE	FWS	COE	COE
CHC'S	ug/kg		a-BHC		< 0.73	< 0.003	< 0.003	< 0.004	< 0.004		< 0.07						< 0.003
	ug/kg		b-BHC		< 1.46	< 0.01	< 0.01	< 0.011	< 0.011		< 0.15						< 0.01
	ug/kg		BHC		< 2.2						< 0.22						
	ug/kg		g-BHC (lindane)		< 0.98	< 0.01	< 0.01	< 0.011	< 0.011		< 0.1						< 0.01
	ug/kg		Heptachlor		< 0.73	< 0.01	< 0.01	< 0.011	< 0.011		< 0.07						< 0.01
	ug/kg		Aldrin		< 0.98						< 0.1						
	ug/kg		Heptachlorepoxide		< 1.22						< 0.12						
	ug/kg		Endosulfan I		< 1.22						< 0.12						
	ug/kg		Dieldrin	0	< 1.22	< 0.02	< 0.02	< 0.02	< 0.02	< 10	< 0.12	0		< 0.1		< 0.1	< 0.02
	ug/kg		4,4'-DDE	0	< 0.98	< 0.01	0.38	0.3	< 0.3	< 10	< 0.1	0		< 0.1		< 0.1	< 0.01
	ug/kg		Endrin	0	< 2.2	< 0.02	< 0.03	< 0.04	< 0.03	< 10	< 0.22	0		< 0.1		< 0.1	< 0.03
	ug/kg		Endosulfan II		< 2.44						< 0.24						
	ug/kg		4,4'-DDD	0	< 2.68	< 0.02	< 0.02	< 0.02	< 0.02	< 10	< 0.27	0		< 0.1		< 0.1	< 0.02
	ug/kg		Endrinaldehyde		< 2.68						< 0.27						
	ug/kg		Sulfan sulfate		< 2.68						< 0.27						
	ug/kg		4,4'-DDT	0	< 3.17	< 0.04	< 0.04	< 0.05	< 0.05	< 10	< 0.31	0		< 0.1		< 0.1	< 0.04
	ug/kg		Methoxychlor		< 5.37						< 0.53						
	ug/kg		Endrinketone		< 2.68						< 0.27						
	ug/kg		Chlorodane	0	< 14.64	< 0.25	< 0.25	0.08	0.43	< 10	< 1.45	0		< 1		< 1	< 0.25
	ug/kg		Toxaphene		< 14.64						< 1.45						
METALS	mg/kg		Ag (silver)			< 1							3.53				
	mg/kg		Al (aluminum)			5434							6707				
	mg/kg		As (arsenic)	0	< 1.03	< 40	0.67	0.96	1.8	< 0.8	2.9	0	< 40	3	0.68	3	< 0.12
	mg/kg		B (boron)			< 5							< 5				
	mg/kg		Ba (barium)	20		103						10	81	10		10	
	mg/kg		Be (beryllium)			0.43							< 0.1				
	mg/kg		Cd (cadmium)	< 10	< 1.12	0.27	0.16	< 0.1	0.1	0.9	< 1.11	< 10	0.2	< 1	0.1	< 1	0.1
	mg/kg		Cr (chromium)	< 10	< 1.58	12.9	7.1	4.2	6	106	3.2	< 10	15.5	< 10	7.5	< 10	10.6
	mg/kg		Cu (copper)	< 10	< 1.47	9.2	4.8	3.2	4.7	7	< 1.46	< 10	7.1	< 10	1.9	< 10	5
	mg/kg		Fe (iron)	2000		11726						3000	13767	1100		1600	
	mg/kg		Hg (mercury)	0	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	0.3	< 0.01	0	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01
	mg/kg		Mg (magnesium)			2574							2047				
	mg/kg		Mn (manganese)	150	156	< 443	134	256	457		203	16	< 353	95	234	170	393
	mg/kg		Mo (molybdenum)			2							2				
	mg/kg		Ni (nickel)	< 10	< 5.59	9.6	6.8	4.8	6.4	36	6.4	< 10	10.6	< 10	5.4	< 10	7.6
	mg/kg		Pb (lead)	< 10	1.1	7.7	11.8	9	12.5	< 9	1.3	< 10	6	< 10	7.7	< 10	11.4
	mg/kg		Sb (antimony)			< 40							< 40				
	mg/kg		Se (selenium)		< 0.86	< 20	< 1	< 1	< 1		< 0.84		< 20		< 1		< 1
	mg/kg		Sn (tin)			< 20							< 20				
	mg/kg		Sr (strontium)			10.9							11.6				
	mg/kg		Ti (titanium)			20							20				
	mg/kg		Zn (zinc)	20	7.5	32.9	25.6	19.2	27	16	10.5	20	31.8	7	16.1	8	29.6
	mg/kg		V (vanadium)			< 32.9							< 31.8				
PCB'S	ug/kg		Aroclor-1006		< 14.64	< 0.25	< 0.25	< 0.27	< 0.27		< 1.45						< 0.25
	ug/kg		Aroclor-1221		< 14.64						< 1.45						
	ug/kg		Aroclor-1232		< 14.64						< 1.45						
	ug/kg		Aroclor-1242		< 14.64						< 1.45						
	ug/kg		Aroclor-1248		< 14.64						< 1.45						
	ug/kg		Aroclor-1254		< 3.05	< 0.41	< 0.42	< 0.45	< 0.45		< 3.03						< 0.41
	ug/kg		Aroclor-1260		< 3.05	< 0.41	< 0.42	< 0.45	< 0.45		< 3.03						< 0.41
	ug/kg		Total PCB's	0						0		0	0	0	0	0	
PARTICLE SIZE %FINER	SAND	coarse	3 in		100											100	
			1 1/2		100											100	
			3/4		100											100	
			3/8		100											100	
			4	100	100											100	
			8		100											100	
			10	99.4						99.3		99.8		99.8			
		medium	16	96.5	100											100	
			20														
			30	85.0													
			40		46.0					97.9		97.9		97.6		86.0	
			50	85.0													
		fine	70														
			80	19.6													
			100	0.8	1.0											0.0	
			140	0.7						96.9		95.9		95.6			
	SILT		200	0.5	0.0											0.0	
	CLAY		270	0.3						94.3		92.8		87.4			
			0.20 mm		0.0					60.8		69.7		67.2		0.0	
			0.05 mm		0.0					24.2		32.2		29.4		0.0	
MISC	%		Total Organic Carb	0.098						5.2	4.63	3.82		3.74			
	mg/kg		Chem Oxy Demand		1700											1333	
	mg/kg		Kjedahl Nitrogen		130											105	
	mg/kg		Total Phosph													101	
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total		< 0.63						< 0.61						
	mg/kg		Ammonia		0.3						< 0.24						
	mg/l		Ammonia Elutriate														
	%		Moisture		20.0						18.5						
	%		Total Solids		80.0						81.5						
	%		Volatile Solids		0.4						0.4						

Table 11. Contaminant Data for Pool 8 of the Upper Mississippi River

		Record #	368	750	756	757	748	749	755	729	752	747	744	745	753	754
		River Mile	686.2	686	685.6	685.6	685.4	685.4	684.4	684.2	683.5	683.3	683.3	683	681.5	680.8
		Location	EMP-Island-83	L-Lower Pool 8 - 11	L-Lower Pool 8 - 10	L-Lower Pool 8 - 10	L-Lower Pool 8 - 9	L-Lower Pool 8 - 9	L-Lower Pool 8 - 8	L-Bay S Stoddard, 30' RR	R-Lower Pool 8 - 1	R-Lower Pool 8 - 7	R-Lower Pool 8 - 2	R-Lower Pool 8 - 3	R-Lower Pool 8 - 4	R-Lower Pool 8 - 6
		Year	1988	1983	1983	1983	1983	1983	1983	1985	1983	1983	1983	1983	1983	1983
		System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Habitat Type	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		Pool	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		Sam. Gear	1	2	2	2	2	2	2	2	2	2	2	2	2	2
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Clt.	COE	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS
CHC'S	ug/kg	a-BHC	< 0.003							< 10						
	ug/kg	b-BHC	< 0.01							< 10						
	ug/kg	BHC														
	ug/kg	g-BHC (lindane)	< 0.01							< 10						
	ug/kg	Heptachlor	< 0.01							< 10						
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin	< 0.02							< 10						
	ug/kg	4,4'-DDE	1.3							< 10						
	ug/kg	Endrin	< 0.03							< 10						
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD	1.3							< 10						
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT	< 0.04							< 10						
	ug/kg	Methoxychlor														
	ug/kg	Endrinketone														
	ug/kg	Chlorodane	< 0.24							< 10						
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)		< 1	1.77	< 1	< 1	1.29	1.52	< 0.4	1.43	< 1	1.37	< 1	< 1	1.48
	mg/kg	Al (aluminum)		3350	9027	9360	1965	2709	6840	3680	4576	1918	4110	3375	4832	9768
	mg/kg	As (arsenic)	< 0.1	< 40	< 40	< 40	< 40	< 40	< 40	< 5	< 40	< 40	< 40	< 40	< 40	< 40
	mg/kg	B (boron)		< 5	< 5	< 5	< 5	< 5	< 5	10	< 5	< 5	< 5	< 5	< 5	< 5
	mg/kg	Ba (barium)		35	101	110	26	27	97	69.6	67	21	63	45	68	132
	mg/kg	Be (beryllium)		< 0.1	0.35	0.18	< 0.1	< 0.1	0.3	0.3	0.29	< 0.1	0.14	< 0.1	0.15	0.44
	mg/kg	Cd (cadmium)	0.12	0.29	0.62	0.59	0.28	0.22	0.38	< 0.3	0.2	0.13	0.25	0.16	0.5	0.34
	mg/kg	Cr (chromium)	5.4	8	21.2	21.6	5.6	6.6	11.1	8	10.9	5.2	10.8	7.3	10.4	23.7
	mg/kg	Cu (copper)	2.7	4.3	14	14.8	3.4	3.6	12	6.3	6.9	1.4	6.2	3.9	8.4	11.1
	mg/kg	Fe (iron)		6164	16107	16740	4454	5418	14288	9260	8866	4247	11234	7290	9211	23680
	mg/kg	Hg (mercury)	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	mg/kg	Mg (magnesium)		1474	4425	4680	4323	3999	11552	11400	1573	1507	1781	1620	7701	3256
	mg/kg	Mn (manganese)	215	< 147	< 407	< 468	< 170	< 181	< 821	< 758	< 186	< 164	< 507	< 243	< 408	< 873
	mg/kg	Mo (molybdenum)		2	2	2	2	2	2	2	2	2	2	2	2	2
	mg/kg	Ni (nickel)	4.6	5.9	14.5	14.6	5	6.3	14.7	6.6	7	3.7	9.2	5.8	9.7	17.8
	mg/kg	Pb (lead)	7.3	5.5	17.5	18	4.6	4.4	24.3	12	5.4	3	4.8	4.6	10.7	8.1
	mg/kg	Sb (antimony)		< 40	< 40	< 40	< 40	< 40	< 40	< 4	< 40	< 40	< 40	< 40	< 40	< 40
	mg/kg	Se (selenium)	< 1	< 20	< 20	< 20	< 20	< 20	< 20	< 10	< 20	< 20	< 20	< 20	< 20	< 20
	mg/kg	Sn (tin)		< 20	< 20	< 20	< 20	< 20	< 20	< 2	< 20	< 20	< 20	< 20	< 20	< 20
	mg/kg	Sr (strontium)		7.8	17.7	18	8.9	10.1	16.7	17.8	9	6.4	8.4	8.1	19.6	16.3
	mg/kg	Ti (titanium)		20	20	20	20	20	20	20	20	20	20	20	20	20
	mg/kg	Zn (zinc)	17.2	21.4	65.5	66.6	18.3	19.4	88.2	45.9	27.2	12.5	28.8	20.2	39.3	56.2
	mg/kg	V (vanadium)		< 21.4	< 65.5	< 66.6	< 18.3	< 19.4	< 88.2	< 8.1	< 27.2	< 12.5	< 28.8	< 20.2	< 39.3	< 56.2
PCB'S	ug/kg	Aroclor-1006	< 0.24													
	ug/kg	Aroclor-1221														
	ug/kg	Aroclor-1232														
	ug/kg	Aroclor-1242														
	ug/kg	Aroclor-1248														
	ug/kg	Aroclor-1254	24													
	ug/kg	Aroclor-1260	< 0.4													
	ug/kg	Total PCB's		0	0	0	0	0	0	0	0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND coarse	3 in														
		1 1/2														
		3/4														
		3/8														
		4														
		8														
		10														
	SAND medium	16														
		20														
		30														
		40														
		50														
	SAND fine	70														
		80														
		100														
		140														
	SILT CLAY	200														
		270														
		0.20 mm														
		0.05 mm														
MISC	%	Total Organic Carb														
	mg/kg	Chem Oxy Demand														
	mg/kg	Kjedahl Nitrogen														
	mg/kg	Total Phosph														
	mg/kg	Oil and Grease														
	mg/kg	Cyanide, Total														
	mg/kg	Ammonia														
	mg/l	Ammonia Elutriate														
	%	Moisture														
	%	Total Solids														
	%	Volatile Solids														

Table 11. Contaminant Data for Pool 8 of the Upper Mississippi River

			Record #	746			
			River Mile	680.7			
			Location	R-Lower Pool 8 - 5	Islands project	Islands project	Islands project
			Year	1983	1994	1994	1994
			System	1	1	1	1
			Habitat Type	3	3	3	3
			Pool	8	8	8	8
			Sam. Gear	2	4	4	4
			Sam. Depth	10	44	45	46
			Data Clt.	FWS	COE	COE	COE
CHC'S	ug/kg		a-BHC		< 1.0	< 1.0	< 1.0
	ug/kg		b-BHC		< 1.0	< 1.0	< 1.0
	ug/kg		BHC		< 1.0	< 1.0	< 1.0
	ug/kg		g-BHC (lindane)		< 1.0	< 1.0	< 1.0
	ug/kg		Heptachlor		< 1.0	< 1.0	< 1.0
	ug/kg		Aldrin		< 1.0	< 1.0	< 1.0
	ug/kg		Heptachlorepoxide				
	ug/kg		Endosulfan I				
	ug/kg		Dieldrin		< 1.0	< 1.0	< 1.0
	ug/kg		4,4'-DDE		< 1.0	< 1.0	< 1.0
	ug/kg		Endrin		< 1.0	< 1.0	< 1.0
	ug/kg		Endosulfan II				
	ug/kg		4,4'-DDD		< 1.0	< 1.0	< 1.0
	ug/kg		Endrinaldehyde				
	ug/kg		Sulfan sulfate				
	ug/kg		4,4'-DDT		< 1.0	< 1.0	< 1.0
	ug/kg		Methoxychlor				
	ug/kg		Endrinketone				
	ug/kg		Chlorodane		< 1.0	< 1.0	< 1.0
	ug/kg		Toxaphene				
METALS	mg/kg		Ag (silver)	< 1			
	mg/kg		Al (aluminum)	2224			
	mg/kg		As (arsenic)	< 40			
	mg/kg		B (boron)	< 5			
	mg/kg		Ba (barium)	33			
	mg/kg		Be (beryllium)	< 0.1			
	mg/kg		Cd (cadmium)	0.19	0.13	< 0.13	< 0.13
	mg/kg		Cr (chromium)	5	10.6	11.1	14.2
	mg/kg		Cu (copper)	3.8	3.6	3.21	6.87
	mg/kg		Fe (iron)	4448			
	mg/kg		Hg (mercury)	< 0.05	0.037	0.01	0.014
	mg/kg		Mg (magnesium)	1126			
	mg/kg		Mn (manganese)	< 153	91.9	348	155
	mg/kg		Mo (molybdenum)	2			
	mg/kg		Ni (nickel)	5.3	18.7	9.41	12.1
	mg/kg		Pb (lead)	4.7	4.1	2.8	4.6
	mg/kg		Sb (antimony)	< 40			
	mg/kg		Se (selenium)	< 20			
	mg/kg		Sn (tin)	< 20			
	mg/kg		Sr (strontium)	6.7			
	mg/kg		Ti (titanium)	20			
	mg/kg		Zn (zinc)	16.7	22	20.5	21.5
	mg/kg		V (vanadium)	< 16.7			
PCB'S	ug/kg		Aroclor-1006		< 10	< 10	< 10
	ug/kg		Aroclor-1221		< 10	< 10	< 10
	ug/kg		Aroclor-1232		< 10	< 10	< 10
	ug/kg		Aroclor-1242		< 10	< 10	< 10
	ug/kg		Aroclor-1248		< 10	< 10	< 10
	ug/kg		Aroclor-1254		< 10	< 10	< 10
	ug/kg		Aroclor-1260		< 10	< 10	< 10
	ug/kg		Total PCB's	0			
PARTICLE SIZE %FINER	SAND	coarse	3 in				
			1 1/2				
			3/4				
			3/8				
			4				
			8				
			10		98.4	100	96.5
		medium	16				
			20		97.7	98.5	88.7
			30				
			40		96.6	87.2	58.8
			50				
		fine	70				
			80				
			100		49.8	43.7	17.3
			140		29.6	21.6	11.5
	SILT CLAY		200		23.3	17.2	9.3
			270				
			0.20 mm				
			0.05 mm				
MISC	%		Total Organic Carb				
	mg/kg		Chem Oxy Demand				
	mg/kg		Kjedahl Nitrogen				
	mg/kg		Total Phosph				
	mg/kg		Oil and Grease				
	mg/kg		Cyanide, Total		0.184	< 0.05	< 0.05
	mg/kg		Ammonia				
	mg/l		Ammonia Elutriate		0.12	0.71	0.64
	%		Moisture		22.4	20.4	20.5
	%		Total Solids		77	79.7	80.1
	%		Volatile Solids		1.62	0.85	1.6

Table 12. Contaminant Data for Pool 9 of the Upper Mississippi River

			Record #	505	270	271	272	273	506	732	730	274	507	275	508	276	503
			River Mile	678.3	677.91	677.9	677.8	677.6	677.5	677	676.7	676.4	675.2	675.6	675.5	671.8	671.8
			Location	ISLAND 126	ISLAND 126	ISLAND 126	ISLAND 126	ISLAND 126	ISLAND 126	R-N of Millstone Landing	L-Bh Sandpt Dwn Dairyl PP	TWIN ISLAND	TWIN ISLAND	BELOW TWIN ISLAND	TWIN ISLAND	HEAD OF BATTLE IS.	HEAD OF BATTLE IS.
			Year	1989	1978	1978	1982	1982	1989	1985	1985	1980	1989	1980	1989	1981	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	3	3	1	1	1	1	1	1
			Pool	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Sam. Gear	1	1	1	1	1	1	2	2	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	FWS	FWS	COE	COE	COE	COE	COE	COE
CHC's	ug/kg		a-BHC	< 0.07					< 0.07	< 10	< 10		< 0.07		< 0.07		< 0.07
	ug/kg		b-BHC	< 0.14					< 0.14	< 10	< 10		< 0.15		< 0.15		< 0.15
	ug/kg		BHC	< 0.21					< 0.22				< 0.22		< 0.22		< 0.22
	ug/kg		g-BHC (lindane)	< 0.1					< 0.1	< 10	< 10		< 0.1		< 0.1		< 0.1
	ug/kg		Heptachlor	< 0.07					< 0.07	< 10	< 10		< 0.07		< 0.07		< 0.12
	ug/kg		Aldrin	< 0.1					< 0.1				< 0.1		< 0.1		< 0.12
	ug/kg		Heptachlorepoxide	< 0.12					< 0.12				< 0.12		< 0.12		< 0.12
	ug/kg		Endosulfan I	< 0.12					< 0.12				< 0.12		< 0.12		< 0.12
	ug/kg		Dieldrin	< 0.12	0	0	< 0.1	< 0.1	< 0.12	< 10	< 10	0	< 0.12		< 0.12	< 0.1	< 0.12
	ug/kg		4,4'-DDE	< 0.1	0	0	< 0.1	< 0.1	< 0.1	< 10	< 10	0	< 0.1		< 0.1	< 0.1	< 0.1
	ug/kg		Endrin	< 0.21	0	0	< 0.1	< 0.1	< 0.22	< 10	< 10	0	< 0.22		< 0.22	< 0.1	< 0.22
	ug/kg		Endosulfan II	< 0.24					< 0.24				< 0.25		< 0.24		< 0.24
	ug/kg		4,4'-DDD	< 0.26	0	0	< 0.1	< 0.1	< 0.26	< 10	< 10	0	< 0.27		< 0.27	< 0.1	< 0.27
	ug/kg		Endrinaldehyde	< 0.26					< 0.26				< 0.27		< 0.27		< 0.27
	ug/kg		Sulfan sulfate	< 0.26					< 0.26				< 0.27		< 0.27		< 0.27
	ug/kg		4,4'-DDT	< 0.31	0	0	< 0.1	< 0.1	< 0.31	< 10	< 10	0	< 0.32		< 0.32	< 0.1	< 0.31
	ug/kg		Methoxychlor	< 0.52					< 0.53				< 0.54		< 0.54		< 0.53
	ug/kg		Endrinketone	< 0.26					< 0.26				< 0.27		< 0.27		< 0.27
	ug/kg		Chlorodane	< 1.43	0	0	< 1	< 1	< 1.44	< 10	< 10	0	< 1.48		< 1.46	< 1	< 1.45
	ug/kg		Toxaphene	< 1.43					< 1.44				< 1.48		< 1.46		< 1.45
METALS	mg/kg		Ag (silver)							< 0.4	< 0.4						
	mg/kg		Al (aluminum)							7200	4720						
	mg/kg		As (arsenic)	< 1.01	0	0	1.5	1.2	< 1.01	< 6	< 6	0	< 1.03	0	< 1.01	2	< 0.96
	mg/kg		B (boron)							14	< 4						
	mg/kg		Ba (barium)		20	10				123	81.1	10		20		30	
	mg/kg		Be (beryllium)							0.54	0.36						
	mg/kg		Cd (cadmium)	< 1.11	< 10	< 10	< 0.2	< 0.19	< 1.1	< 0.3	< 0.3	< 10	< 1.13	< 10	< 1.1	< 1	< 1.06
	mg/kg		Cr (chromium)	3.9	< 10	30	3	2.8	2.8	15	14	< 10	2.2	< 10	2.7	< 10	2.9
	mg/kg		Cu (copper)	< 1.44	< 10	< 10	2	1.9	< 1.44	14	9.4	< 10	< 1.48	< 10	< 1.44	< 10	< 1.18
	mg/kg		Fe (iron)		1600	2000	4500	4300		16700	11400	1600		1900		750	
	mg/kg		Hg (mercury)	< 0.01	0	0	0.017	0.021	< 0.01	0.08	0.05	0	< 0.01	0	< 0.01	< 0.01	< 0.01
	mg/kg		Mg (magnesium)							5630	4970						
	mg/kg		Mn (manganese)	217	12	22			190	< 871	< 665	130	137	140	259	210	366
	mg/kg		Mo (molybdenum)							2	2						
	mg/kg		Ni (nickel)	6.3	< 10	< 10	5	5	5.9	14	10	< 10	< 5.64	< 10	< 5.49	< 10	6.6
	mg/kg		Pb (lead)	< 0.82	< 10	< 10	2	2	< 0.82	17	9.9	< 10	1.2	< 10	1.1	< 10	< 0.78
	mg/kg		Sb (antimony)							< 4	< 4						
	mg/kg		Se (selenium)	< 0.84					< 0.84	< 10	< 10		< 0.86		< 0.84		< 0.8
	mg/kg		Sn (tin)							< 2	< 2						
	mg/kg		Sr (strontium)							18.2	15						
	mg/kg		Ti (titanium)							20	20						
	mg/kg		Zn (zinc)	10.7	< 10	< 10	9	8	8.6	63.2	42.2	6.7	7.5	16	8.8	3	9.9
	mg/kg		V (vanadium)							< 12	< 9.2						
PCB's	ug/kg		Aroclor-1006	< 1.43					< 1.44				< 1.48		< 1.46		< 1.45
	ug/kg		Aroclor-1221	< 1.43					< 1.44				< 1.48		< 1.46		< 1.45
	ug/kg		Aroclor-1232	< 1.43					< 1.44				< 1.48		< 1.46		< 1.45
	ug/kg		Aroclor-1242	< 1.43					< 1.44				< 1.48		< 1.46		< 1.45
	ug/kg		Aroclor-1248	< 1.43					< 1.44				< 1.48		< 1.46		< 1.45
	ug/kg		Aroclor-1254	< 2.98					< 3				< 3.08		< 3.05		< 3.03
	ug/kg		Aroclor-1260	< 2.98					< 3				< 3.08		< 3.05		< 3.03
	ug/kg		Total PCB's		0	0	0	0		0	0	0		0		0	
PARTICLE SIZE %FINER	SAND	coarse	3 in		100	100						100		100			
			1 1/2		100	100	100	100				100		100		100	
			3/4		100	100	100	100				100		100		100	
			3/8		100	100	100	100				100		100		100	
			4	98.2	100	100	98	100	100			100	100	100	100	100	100
			8				96	99				100		100		100	
			10	95.7	100	99			99.7				100.0		99.4		99.9
		medium	16	85.5			93.0	97.0	98.2			99.0	99.9	100	95.7	96.0	97.0
			20		100	93.0											
			30	49.6			71.0	53.0	74.4				93.5		54.8	61.0	59.6
			40		100	52.0	45.0	26.0				82.0		70.0		35.0	
			50	49.6			16.0	5.0	74.4				93.5		54.8	10.0	59.6
		fine	70				3.0	2.0								2.0	
			80	2.5	89.0	3.0			9.1				22.1		6.1		5.7
			100	0.0			1.0	1.0	0.3			0.0	0.2	0.0	0.1	0.0	0.3
			140														0.0
	SILT CLAY		200		8.0	1.0	1.0	1.0				0.0		0.0		0.0	
			270				1.0	1.0								0.0	
			0.20 mm		0.0	0.0	0.0	1.0				0.0		0.0		0.0	
			0.05 mm		0.0	0.0	0.0	0.0				0.0		0.0		0.0	
MISC	%		Total Organic Carb	0.019					0.021				0.036		0.019		0.027
	mg/kg		Chem Oxy Demand		1300	2000	1470	882				1400		1200		1700	
	mg/kg		Kjedahl Nitrogen		190	420	59	35				70		170		1600	
	mg/kg		Total Phosph		110	380	98	117									
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total	< 0.62					< 0.6				< 0.63		< 0.63		< 0.62
	mg/kg		Ammonia	< 0.24					0.2				< 0.25		0.3		< 0.25
	mg/l		Ammonia Elutriate														
	%		Moisture	19.3					16.8				21.1		20		19.6
	%		Total Solids	80.7					83.2				78.9		80		80.4
	%		Volatile Solids	0.4					0.3				0.4		0.5		0.5

Table 12. Contaminant Data for Pool 9 of the Upper Mississippi River

			Record #	277	278	504	731	604	605	606	733	497	279	280	281	282	496
			River Mile	671.44	671.2	671.2	671	671	671	671	666.0	665.8	665.7	665.7	665.4	665.4	665.2
			Location	HEAD OF BATTLE IS.	HEAD OF BATTLE IS.	HEAD OF BATTLE IS.	R-R Desc Brk Iowa R Chan	L-Blackhawk Ab Rd.	L-Blackhawk Bw. Rd.	L-Cold Springs South	R-Blwtr W Lansing Big Lk	INDIAN CAMP LIGHT	INDIAN CAMP LIGHT	INDIAN CAMP LIGHT	INDIAN CAMP LIGHT	INDIAN CAMP LIGHT	Indian Camp Light
			Year	1974	1981	1989	1985	1986	1987	1987	1985	1989	1982	1982	1978	1978	1989
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	3	3	3	3	3	1	1	1	1	1	1
			Pool	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Sam. Gear	1	1	1	2	3	3	3	2	1	1	1	1	1	1
			Sam. Depth	10	10	10	10	60	76	45	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	FWS	WDNR	WDNR	WDNR	FWS	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC			< 0.07	< 10				< 10	< 0.07					
	ug/kg		b-BHC			< 0.14	< 10				< 10	< 0.14					
	ug/kg		BHC			< 0.21						< 0.21					
	ug/kg		g-BHC (lindane)			< 0.1	< 10				< 10	< 0.09					
	ug/kg		Heptachlor			< 0.07	< 10		< 10	< 10	< 10	< 0.07					
	ug/kg		Aldrin			< 0.1						< 0.09					
	ug/kg		Heptachlorepoxide			< 0.12						< 0.12					
	ug/kg		Endosulfan I			< 0.12						< 0.12					
	ug/kg		Dieldrin	< 10	< 0.1	< 0.12	< 10		< 10	< 10	< 10	< 0.12	< 0.1	< 0.1		0	
	ug/kg		4,4'-DDE	< 10	< 0.1	< 0.1	< 10	< 10	< 10	< 10	< 10	< 0.09	< 0.1	< 0.1		0	
	ug/kg		Endrin	< 10	< 0.1	< 0.21	< 10				< 10	< 0.21	< 0.1	< 0.1		0	
	ug/kg		Endosulfan II			< 0.24						< 0.23					
	ug/kg		4,4'-DDD	< 10	< 0.1	< 0.26	< 10				< 10	< 0.26	< 0.1	< 0.1		0	
	ug/kg		Endrinaldehyde			< 0.26						< 0.26					
	ug/kg		Sulfan sulfate			< 0.26						< 0.26					
	ug/kg		4,4'-DDT	< 10	< 0.1	< 0.31	< 10				< 10	< 0.3	< 0.1	< 0.1		0	
	ug/kg		Methoxychlor			< 0.52						< 0.51					
	ug/kg		Endrinketone			< 0.26						< 0.26					
	ug/kg		Chlorodane	< 10	< 1	< 1.43	< 10		< 10	< 10	< 10	< 1.4	< 1	< 1		0	
	ug/kg		Toxaphene			< 1.43						< 1.4					
METALS	mg/kg		Ag (silver)				< 0.4				< 0.4						
	mg/kg		Al (aluminum)				13100	10000			11700						
	mg/kg		As (arsenic)	< 0.9	2	< 1.02	< 7	5	9.6	2.4	< 7	< 0.97	1.3	0.67	1	0	
	mg/kg		B (boron)				10				16						
	mg/kg		Ba (barium)		20		199				167				10	10	
	mg/kg		Be (beryllium)				0.79				0.77						
	mg/kg		Cd (cadmium)	0.9	< 1	< 1.11	< 0.3	< 1	< 1	< 1	< 0.3	< 1.06	< 0.17	< 0.19	< 10	< 10	
	mg/kg		Cr (chromium)	14	10	2.5	18	43	28	10	22	2.1	2.6	1.9	< 10	< 10	
	mg/kg		Cu (copper)	4	< 10	< 1.45	17	14	23	7	18	< 1.39	1.7	0.9	< 10	< 10	
	mg/kg		Fe (iron)		1600		19300				21000		3800	2400	1900	1800	
	mg/kg		Hg (mercury)	0.1	< 0.01	< 0.01	0.05	< 0.1			0.05	< 0.01	0.018	0.013	0.04	0	
	mg/kg		Mg (magnesium)				5870				5000						
	mg/kg		Mn (manganese)		240	306	< 1300		890	180	< 1270	281			240	260	
	mg/kg		Mo (molybdenum)				2				2						
	mg/kg		Ni (nickel)	7	< 10	< 5.55	21	10	33	10	21	< 5.3	3	3	< 100	< 100	
	mg/kg		Pb (lead)	< 9	< 10	< 0.82	23	10	14	< 5	19	1.3	2	2	20	20	
	mg/kg		Sb (antimony)				< 4				< 4						
	mg/kg		Se (selenium)			< 0.85	< 10				< 10	< 0.81					
	mg/kg		Sn (tin)				< 2				< 2						
	mg/kg		Sr (strontium)				34.2				28.9						
	mg/kg		Ti (titanium)				20				20						
	mg/kg		Zn (zinc)	15	7	9.1	102	67	120	34	84.9	8.5	9	2	< 10	< 10	
	mg/kg		V (vanadium)				< 20				< 13						
PCB'S	ug/kg		Aroclor-1006			< 1.43						< 1.4					
	ug/kg		Aroclor-1221			< 1.43						< 1.4					
	ug/kg		Aroclor-1232			< 1.43						< 1.4					
	ug/kg		Aroclor-1242			< 1.43						< 1.4					
	ug/kg		Aroclor-1248			< 1.43						< 1.4					
	ug/kg		Aroclor-1254			< 2.98						< 2.93					
	ug/kg		Aroclor-1260			< 2.98						< 2.93					
	ug/kg		Total PCB's	0	0		0	90	0	0	0		0	0	0	0	
PARTICLE SIZE %FINER	SAND	coarse	3 in	100											100	100	
			1 1/2	100	100								100	100	100	100	
			3/4	100	100								100	100	100	100	
			3/8	100	100								100	100	100	100	
			4	99	100	100						98.7	100	100	100	100	100
			8	95	100								99	100			
			10			99.1						94.1			100	100	99.6
		medium	16	82.0	100	95.3						84.0	97.0	100			98.5
			20												99.0	97.0	
			30		91.0	64.3						50.3	86.0	97.0			86.2
			40	19.0	71.0								66.0	89.0	84.0	66.0	
			50		23.0	64.3						50.3	24.0	59.0			86.2
		fine	70		5.0								5.0	14.0			
			80			7.1						4.6			5.0	2.0	17.2
			100	0.0	0.0	0.4						0.1	2.0	2.0			0.1
			140														
	SILT CLAY		200	0.0	0.0								2.0	1.0	1.0	0.0	
			270		0.0								2.0	1.0			
			0.20 mm	0.0	0.0								1.0	0.0	0.0	0.0	
			0.05 mm	0.0	0.0								0.0	0.0	0.0	0.0	
MISC	%		Total Organic Carb			0.032						0.016					0.084
	mg/kg		Chem Oxy Demand	2903	1100								964	680	2700	120	
	mg/kg		Kjedahl Nitrogen	134	524								130	40	22	66	
	mg/kg		Total Phosph	126									110	73	170	18	
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total			< 0.62						< 0.58					
	mg/kg		Ammonia			< 0.25						< 0.23					
	mg/l		Ammonia Elutriate														
	%		Moisture			18.8						13.3					
	%		Total Solids			81.2						86.7					
	%		Volatile Solids			0.4						0.4					

Table 12. Contaminant Data for Pool 9 of the Upper Mississippi River

			Record #	498	283	499	284	285	286	287	500	734	735	736	361	359	358
			River Mile	665.2	664.8	664.7	664.4	664.3	664.3	664.1	664.1	661.7	659.6	657.6	655.5	655.5	655.5
			Location	INDIAN CAMP LIGHT	LANSING UPPER LIGHT	LANSING UPPER LIGHT	LANSING UPPER LIGHT	LANSING UPPER LIGHT	LANSING UPPER LIGHT	LANSING UPPER LIGHT	LANSING UPPER LIGHT	L-Veg in Bay @ Lwr End Is	R-Land. Sunk Barge DwnPP	L-Bh One of Many Sm Isls	Lower pool 9 - 9	Lower pool 9 - 5	Lower pool 9 - 3
			Year	1989	1981	1989	1974	1978	1978	1981	1989	1985	1985	1985	1987	1987	1987
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	3	3	3	3	3	3
			Pool	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			Sam. Gear	1	1	1	1	1	1	1	1	2	2	2	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10			
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	FWS	FWS	FWS	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.07		< 0.07					< 0.07	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		b-BHC	< 0.14		< 0.14					< 0.14	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		BHC	< 0.22		< 0.22					< 0.22						
	ug/kg		g-BHC (lindane)	< 0.1		< 0.1					< 0.1	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		Heptachlor	< 0.07		< 0.07					< 0.07	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		Aldrin	< 0.1		< 0.1					< 0.1						
	ug/kg		Heptachlorepoxide	< 0.12		< 0.12					< 0.12						
	ug/kg		Endosulfan I	< 0.12		< 0.12					< 0.12						
	ug/kg		Dieldrin	< 0.12	< 0.1	< 0.12	< 10	< 0.1	0	< 0.1	< 0.12	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		4,4'-DDE	< 0.1	< 0.1	< 0.1	< 10	< 0.1	0	< 0.1	< 0.1	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		Endrin	< 0.22	< 0.1	< 0.22	< 10	< 0.1	0	< 0.1	< 0.22	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		Endosulfan II	< 0.24		< 0.24					< 0.24						
	ug/kg		4,4'-DDD	< 0.26	< 0.1	< 0.26	< 10	< 0.1	0	< 0.1	< 0.26	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		Endrinaldehyde	< 0.26		< 0.26					< 0.26						
	ug/kg		Sulfan sulfate	< 0.26		< 0.26					< 0.26						
	ug/kg		4,4'-DDT	< 0.31	< 0.1	< 0.31	< 10	< 0.1	0	< 0.1	< 0.31	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		Methoxychlor	< 0.53		< 0.53					< 0.53						
	ug/kg		Endrinketone	< 0.26		< 0.26					< 0.26						
	ug/kg		Chlorodane	< 1.44	< 1	< 1.44	< 10	< 1	0	< 1	< 1.44	< 10	< 10	< 10	< 5	< 5	< 5
	ug/kg		Toxaphene	< 1.44		< 1.44					< 1.44						
METALS	mg/kg		Ag (silver)									< 0.4	< 0.4	< 0.4			
	mg/kg		Al (aluminum)									9500	4920	5450			
	mg/kg		As (arsenic)	< 0.72	2	< 0.97	< 0.7		0	1	< 0.98	< 7	< 6	< 6	< 2.2	< 2.2	< 2.2
	mg/kg		B (boron)									10	10	14			
	mg/kg		Ba (barium)		50				40	20		128	83	85			
	mg/kg		Be (beryllium)									0.65	0.38	0.41			
	mg/kg		Cd (cadmium)	< 1.08	< 1	< 1.06	0.9		< 10	< 1	< 1.08	0.6	< 0.3	0.4	< 3.1	< 3.1	5.8
	mg/kg		Cr (chromium)	2.28	< 10	2.3	2		< 10	< 10	2.1	23	11	12	20.2	9.6	20.2
	mg/kg		Cu (copper)	< 1.4	< 10	< 1.39	4		< 10	< 10	< 1.4	20	9.3	11	11.5	11.5	18.2
	mg/kg		Fe (iron)		2500				2300	2500		19300	10800	11700			
	mg/kg		Hg (mercury)	< 0.01	< 0.01	< 0.01	0.5		0	< 0.01	< 0.01	0.05	0.05	0.05	< 0.6	< 0.6	< 0.6
	mg/kg		Mg (magnesium)									4990	10200	3400			
	mg/kg		Mn (manganese)	231	500	215			470	220	167	< 599	< 803	< 399	560.3	878.8	547.4
	mg/kg		Mo (molybdenum)									2	2	2			
	mg/kg		Ni (nickel)	< 5.34	< 10	< 5.29	4		< 100	< 10	< 5.36	19	10	12	54.5	< 25	54.5
	mg/kg		Pb (lead)	0.8	< 10	0.9	9		20	< 10	< 0.8	19	9.8	11	17.4	15.2	28.7
	mg/kg		Sb (antimony)									< 4	< 4	< 4			
	mg/kg		Se (selenium)	< 0.82		< 0.81					< 0.82	< 10	< 10	< 10			
	mg/kg		Sn (tin)									< 2	< 2	< 2			
	mg/kg		Sr (strontium)									24.4	21.2	17.6			
	mg/kg		Ti (titanium)									20	20	20			
	mg/kg		Zn (zinc)	9.1	11	7.5	12		< 10	10	7.9	80.3	43	48.7	67.1	56.9	86.7
	mg/kg		V (vanadium)									< 15	< 9.1	< 11			
PCB'S	ug/kg		Aroclor-1006	< 1.44		< 1.44					< 1.44						
	ug/kg		Aroclor-1221	< 1.44		< 1.44					< 1.44						
	ug/kg		Aroclor-1232	< 1.44		< 1.44					< 1.44						
	ug/kg		Aroclor-1242	< 1.44		< 1.44					< 1.44						
	ug/kg		Aroclor-1248	< 1.44		< 1.44					< 1.44						
	ug/kg		Aroclor-1254	< 3		< 3					< 3						
	ug/kg		Aroclor-1260	< 3		< 3					< 3						
	ug/kg		Total PCB's		0		0	0	0	0		0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in				100	100	100								
			1 1/2		100		100	100	100	100							
			3/4		100		100	100	100	100							
			3/8		100		100	100	100	100							
			4		100	100	100	100	100	100	99.6						
			8		100		99			100							
			10			100		100	100		99.3						
		medium	16		96.0	99.1	98.0			100.0	99.2						
			20					100.0	97.0								
			30		80.0	76.5				93.0	88.3						
			40		65.0		62.0	94.0	78.0	76.0							
			50		33.0	76.5				41.0	88.3						
		fine	70		6.0					15.0							
			80			13.9		20.0	6.0		32.3						
			100		0.0	0.6	0.0			2.0	0.6						
			140			0.0					0.4						
	SILT CLAY		200		0.0		0.0	3.0	1.0	1.0							
			270		0.0					0.0							
			0.20 mm		0.0		0.0	1.0	0.0	0.0							
			0.05 mm		0.0		0.0	0.0	0.0	0.0							
MISC	%		Total Organic Carb			0.061					0.052						
	mg/kg		Chem Oxy Demand		1900		3488		2400	3000							
	mg/kg		Kjedahl Nitrogen		299		147		40	205							
	mg/kg		Total Phosph				95		14								
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total	< 0.58		< 0.61					< 0.58						
	mg/kg		Ammonia	< 0.23		0.4					0.5						
	mg/l		Ammonia Elutriate														
	%		Moisture	14.2		17.5					13.7						
	%		Total Solids	85.8		82.5					86.3						
	%		Volatile Solids	0.4		0.5					0.3						

Table 12. Contaminant Data for Pool 9 of the Upper Mississippi River

			Record #	360	502	357	501	609	356	607	608	737	288
			River Mile	655.5	655.1	655.0	654.8	653.8	653.8	653.8	653.8	652.5	651
			Location	Lower pool 9 - 7	AB CROOKED SLOUGH	Lower pool 9 - 1	AB CROOKED SLOUGH	L-Halfway Ck. Ab.RD.	L-Cold Springs North	L-Cold Springs South	L-Cold Springs South	R-Bh Isl Border Channel	
			Year	1987	1989	1987	1989	1984	1987	1987	1987	1985	1974
			System	1	1	1	1	1	1	1	1	1	1
			Habitat Type	3	1	1	1	3	3	3	3	3	1
			Pool	9	9	9	9	9	9	9	9	9	9
			Sam. Gear	1	1	1	1	3	4	3	3	2	1
			Sam. Depth		10	10	10	10	91	45-91	91-152	10	10
			Data Cit.	COE	COE	COE	COE	WDNR	COE	WDNR	WDNR	FWS	COE
CHC'S	ug/kg		a-BHC	< 5	< 0.07	< 5	< 0.1		< 5			< 10	
	ug/kg		b-BHC	< 5	< 0.14	< 5	< 0.19		< 5			< 10	
	ug/kg		BHC		< 0.22		< 0.29						
	ug/kg		g-BHC (lindane)	< 5	< 0.1	< 5	< 0.13		< 5			< 10	
	ug/kg		Heptachlor	< 5	< 0.07	< 5	< 0.1		< 5		< 10	< 10	
	ug/kg		Aldrin		< 0.1		< 0.13						
	ug/kg		Heptachlorepoxide		< 0.12		< 0.16						
	ug/kg		Endosulfan I		< 0.12		< 0.16						
	ug/kg		Dieldrin	< 5	< 0.12	< 5	< 0.16		< 5		< 10	< 10	< 10
	ug/kg		4,4'-DDE	< 5	< 0.1	< 5	< 0.13		< 5		< 10	< 10	< 10
	ug/kg		Endrin	< 5	< 0.22	< 5	< 0.29		< 5			< 10	< 10
	ug/kg		Endosulfan II		< 0.24		< 0.32						
	ug/kg		4,4'-DDD	< 5	< 0.26	< 5	< 0.35		< 5			< 10	< 10
	ug/kg		Endrinaldehyde		< 0.26		< 0.35						
	ug/kg		Sulfan sulfate		< 0.26		< 0.35						
	ug/kg		4,4'-DDT	< 5	< 0.31	< 5	< 0.42		< 5			< 10	< 10
	ug/kg		Methoxychlor		< 0.53		< 0.7						
	ug/kg		Endrinketone		< 0.26		< 0.35						
	ug/kg		Chlorodane	< 5	< 1.44	< 5	< 1.92		< 5		< 10	< 10	< 10
	ug/kg		Toxaphene		< 1.44		< 1.92						
METALS	mg/kg		Ag (silver)									< 0.4	
	mg/kg		Al (aluminum)					17700				4890	
	mg/kg		As (arsenic)	< 2.2	< 1.04	< 2.2	< 1.55		< 2.2	2.1	9.9	< 6	< 0.8
	mg/kg		B (boron)									6	
	mg/kg		Ba (barium)									88.3	
	mg/kg		Be (beryllium)									0.47	
	mg/kg		Cd (cadmium)	5.8	< 1.13	5.8	< 1.7	< 1	< 3.1	< 1	< 1	< 0.3	0.9
	mg/kg		Cr (chromium)	20.2	2.4	9.6	8.1	48	20.2	9	25	11	11
	mg/kg		Cu (copper)	11.5	< 1.48	11.5	3.2	28	18.2	4	22	9.2	4
	mg/kg		Fe (iron)									11700	
	mg/kg		Hg (mercury)	< 0.6	< 0.01	< 0.6	< 0.02	0.1	< 0.6			0.05	0.2
	mg/kg		Mg (magnesium)									2580	
	mg/kg		Mn (manganese)	534.6	152	432.1	544		840.4	250	990	< 717	
	mg/kg		Mo (molybdenum)									2	
	mg/kg		Ni (nickel)	< 25	< 5.6	< 25	9.3	31	54.5	14	30	11	4
	mg/kg		Pb (lead)	16	1.1	14.7	3.7	19	9.8	< 5	15	9.7	< 9
	mg/kg		Sb (antimony)									< 4	
	mg/kg		Se (selenium)		< 0.86		< 1.29					< 10	
	mg/kg		Sn (tin)									< 2	
	mg/kg		Sr (strontium)									16.7	
	mg/kg		Ti (titanium)									20	
	mg/kg		Zn (zinc)	74.7	8.9	23.7	30.6	110	87.5	21	100	42.1	13
	mg/kg		V (vanadium)									< 6.4	
PCB'S	ug/kg		Aroclor-1006		< 1.44		< 1.92						
	ug/kg		Aroclor-1221		< 1.44		< 1.92						
	ug/kg		Aroclor-1232		< 1.44		< 1.92						
	ug/kg		Aroclor-1242		< 1.44		< 1.92						
	ug/kg		Aroclor-1248		< 1.44		< 1.92						
	ug/kg		Aroclor-1254		< 3		< 4						
	ug/kg		Aroclor-1260		< 3		< 4						
	ug/kg		Total PCB's	0		0		0	0	0	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in										100
			1 1/2										100
			3/4										100
			3/8										100
			4		100		100						100
			8										100
			10		99.8		99.8						
		medium	16		99.0		99.2						99.0
			20										
			30		90.6		98.0						
			40										57.0
			50		90.6		98.0						
		fine	70										
			80		51.2		89.8						
			100		0.6		34.9						4.0
			140		0.4		28.9						
	SILT CLAY		200		0.3		8.8						3.0
			270		0.2		4.9						
			0.20 mm				3.4						0.0
			0.05 mm				3.7						0.0
MISC	%		Total Organic Carb		0.016		2.47						
	mg/kg		Chem Oxy Demand										5797
	mg/kg		Kjedahl Nitrogen										160
	mg/kg		Total Phosph										164
	mg/kg		Oil and Grease										
	mg/kg		Cyanide, Total		< 0.59		< 0.83						
	mg/kg		Ammonia		1.5		15.00						
	mg/l		Ammonia Elutriate										
	%		Moisture		14.7		40.0						
	%		Total Solids		85.3		60.0						
	%		Volatile Solids		0.8		3.2						

Table 13. Contaminant Data for Pool 10 of the Upper Mississippi River

			Record #	289	290	291	446	292	293	445	294	295	738	296	739	297	740
			River Mile	646.5	646.2	646.1	644.5	644.3	644.3	644.1	643.3	642.8	641.5	635.5	633.4	633.2	631.4
			Location	HAY POINT	HAY POINT	HAY POINT	JACKSON ISLAND	JACKSON ISLAND	JACKSON ISLAND	JACKSON ISLAND	MISSISSIPPI GARDENS	MISSISSIPPI GARDENS	L-Sm Bay Nr Entr Off SI	PRAIRIE DuCHIEN BOAT	R-Chnl McGregor WTF Dis	McGREGOR	L-L Bank Chute on WI R
			Year	1981	1974	1981	1989	1979	1979	1989	1981	1981	1985	1981	1985	1974	1985
			System	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	1	1	1	1	1	3	2	3	1	3
			Pool	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Sam. Gear	1	1	1	1	1	1	1	1	1	2	1	2	1	2
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	FWS	COE	FWS	COE	FWS
CHC'S		ug/kg	a-BHC				< 0.08			< 0.08			< 10		< 10		< 10
		ug/kg	b-BHC				< 0.16			< 0.15			< 10		< 10		< 10
		ug/kg	BHC				< 0.23			< 0.23							
		ug/kg	g-BHC (lindane)				< 0.1			< 0.1			< 10		< 10		< 10
		ug/kg	Heptachlor				< 0.08			< 0.08			< 10		< 10		< 10
		ug/kg	Aldrin				< 0.1			< 0.1							
		ug/kg	Heptachlorepoxide				< 0.13			< 0.13							
		ug/kg	Endosulfan I				< 0.13			< 0.13							
		ug/kg	Dieldrin	< 0.1	< 10	< 0.1	< 0.13	0	0	< 0.13	< 0.1	< 0.1	< 10	< 0.1	< 10	< 10	< 10
		ug/kg	4,4'-DDE	< 0.1	< 10	< 0.1	< 0.1	0	0	< 0.1	< 0.1	< 0.1	< 10	< 0.1	< 10	< 10	< 10
		ug/kg	Endrin	< 0.1	< 10	< 0.1	< 0.23	0	0	< 0.23	< 0.1	< 0.1	< 10	< 0.1	< 10	< 10	< 10
		ug/kg	Endosulfan II				< 0.26			< 0.26							
		ug/kg	4,4'-DDD	< 0.1	< 10	< 0.1	< 0.29	0	0	< 0.28	< 0.1	< 0.1	< 10	1.2	< 10	< 10	< 10
		ug/kg	Endrinaldehyde				< 0.29			< 0.28							
		ug/kg	Sulfan sulfate				< 0.29			< 0.28							
		ug/kg	4,4'-DDT	< 0.1	< 10	< 0.1	< 0.34	0	0	< 0.33	< 0.1	< 0.1	< 10	< 0.1	< 10	< 10	< 10
		ug/kg	Methoxychlor				< 0.57			< 0.56							
		ug/kg	Endrinketone				< 0.29			< 0.28							
		ug/kg	Chlorodane	< 1	< 10	< 1	< 1.56	0	0	< 1.54	< 1	< 1	< 10	5	< 10	< 10	< 10
		ug/kg	Toxaphene				< 1.56			< 1.54							
METALS		mg/kg	Ag (silver)										< 0.4		< 0.4		< 0.4
		mg/kg	Al (aluminum)										9170		3480		10100
		mg/kg	As (arsenic)	3	< 0.8	2	< 0.72	0	0	< 0.75	6	2	< 7	29	< 5	0.9	< 7
		mg/kg	B (boron)										8		8		< 4
		mg/kg	Ba (barium)	40		40		20	30		20	80	141	170	63.3		126
		mg/kg	Be (beryllium)										0.63		0.27		0.66
		mg/kg	Cd (cadmium)	< 1	< 0.9	< 1	< 1.1	< 10	< 10	< 1.2	< 1	< 1	0.6	1	< 0.3	1	< 0.3
		mg/kg	Cr (chromium)	< 10	4	< 10	3.6	< 10	< 10	4.1	< 10	< 10	20	20	8.4	94	18
		mg/kg	Cu (copper)	< 10	2	< 10	< 1.4	< 10	< 10	< 1.5	< 10	< 10	16	28	13	5	13
		mg/kg	Fe (iron)	3200		3700		2700	2700		3300	3200	18600	16000	7330		20800
		mg/kg	Hg (mercury)	< 0.01	0.6	< 0.01	< 0.12	0	0	< 0.12	< 0.01	< 0.01	0.2	0.01	0.45	0.2	0.11
		mg/kg	Mg (magnesium)										4850		15000		4790
		mg/kg	Mn (manganese)	480		620	354	190	180	205	260	1100	< 1170	960	< 418		< 1530
		mg/kg	Mo (molybdenum)										2		1		2
		mg/kg	Ni (nickel)	< 10	4	< 10	< 5.6	< 10	< 10	< 5.8	< 10	< 10	17	30	8	28	15
		mg/kg	Pb (lead)	< 10	< 9	< 10	1.3	< 10	< 10	1.2	< 10	< 10	17	40	25	11	15
		mg/kg	Sb (antimony)										< 4		< 4		< 5
		mg/kg	Se (selenium)				< 0.84			< 0.88			< 10		< 10		< 10
		mg/kg	Sn (tin)										< 2		< 2		< 2
		mg/kg	Sr (strontium)										24		24.5		14.6
		mg/kg	Ti (titanium)										20		20		20
		mg/kg	Zn (zinc)	8	9	8	10.3	< 10	< 10	8.4	8	8	73	83	58.5	25	75.1
		mg/kg	V (vanadium)										< 12		< 8.9		< 21
PCB'S		ug/kg	Aroclor-1006				< 1.56			< 1.54							
		ug/kg	Aroclor-1221				< 1.56			< 1.54							
		ug/kg	Aroclor-1232				< 1.56			< 1.54							
		ug/kg	Aroclor-1242				< 1.56			< 1.54							
		ug/kg	Aroclor-1248				< 1.56			< 1.54							
		ug/kg	Aroclor-1254				< 3.25			< 3.2							
		ug/kg	Aroclor-1260				< 3.25			< 3.2							
		ug/kg	Total PCB's	0	0	0		0	0		0	0	0	29	0	0	0
PARTICLE SIZE %FINER	SAND	coarse	3 in		100			100	100							100	
			1 1/2	100	100	100		100	100		100	100		100		100	
			3/4	100	100	100		100	100		100	100		100		100	
			3/8	100	100	100		100	100		100	100		100		100	
			4	100	100	100	99.9	100	100	100.0	100	100		100		100	
			8	97	100	99					100	100		100		100	
			10				99.6	100	100	99.8							
		medium	16	92.0	100	84.0	98.1			98.8	99.0	100		100		100	
			20					100	100								
			30	70.0		59.0	77.5			80.3	89.0	95.0		100			
			40	50.0	64.0	54.0		92.0	98.0		67.0	86.0		100		47.0	
			50	19.0		23.0	77.5			80.3	29.0	49.0		99.0			
		fine	70	4.0		4.0					7.0	13.0		99.0			
			80				11.6	8.0	35.0	17.3							
			100	0.0	0.0	0.0	0.3			0.6	1.0	1.0		99.0		0.0	
			140				0.2										
	SILT CLAY		200	0.0	0.0	0.0		1.0	13.0		0.0	1.0		98.0		0.0	
			270	0.0		0.0					0.0	0.0		97.0			
			0.20 mm	0.0	0.0	0.0		0.0	6.0		0.0	0.0		71.0		0.0	
			0.05 mm	0.0	0.0	0.0		0.0	2.0		0.0	0.0		34.0		0.0	
MISC		%	Total Organic Carb				0.047			0.083							
		mg/kg	Chem Oxy Demand	1800	3271	1600		1700	1900		1600	2000		52000		12705	
		mg/kg	Kjedahl Nitrogen	224	90	286		8400	2300		292	276		10700		379	
		mg/kg	Total Phosph		102			38	87							358	
		mg/kg	Oil and Grease														
		mg/kg	Cyanide, Total				< 0.6			< 0.63							
		mg/kg	Ammonia				< 0.24			0.65							
		mg/l	Ammonia Elutriate														
		%	Moisture				17.2			20.3							
		%	Total Solids				82.8			79.7							
		%	Volatile Solids				0.4			0.3							

Table 13. Contaminant Data for Pool 10 of the Upper Mississippi River

			Record #	443	298	299	444	741	742	441	300	442	387	386	388	385
			River Mile	627.8	627.6	627.5	627.2	625.8	621.0	619.3	618.6	618.5	617.0	617.0	617.0	617.0
			Location	WYALUSING	WYALUSING	WYALUSING	WYALUSING	R-Center of Methodist Lk	L-Bh Isl @ Lwrend Duck Lk	McMILLAN	McMILLAN	McMILLAN	Bussey Lake -3	Bussey Lake -2	Bussey Lake -4	Bussey Lake -1
			Year	1989	1974	1974	1989	1985	1985	1989	1974	1989	1988	1988	1988	1988
			System	1	1	1	1	1	1	1	1	1	1	1	1	1
			Habitat Type	1	1	1	1	3	3	1	1	1	3	3	3	3
			Pool	10	10	10	10	10	10	10	10	10	10	10	10	10
			Sam. Gear	1	1	1	1	2	2	1	1	1	4	4	4	4
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	COE	COE	COE	COE	FWS	FWS	COE	COE	COE	COE	COE	COE	COE
CHC'S	ug/kg		a-BHC	< 0.08			< 0.08	< 10	< 10	< 0.08		< 0.08	< 0.003	< 0.003	< 0.004	< 0.033
	ug/kg		b-BHC	< 0.16			< 0.16	< 10	< 10	< 0.16		< 0.16	< 0.009	< 0.009	< 0.013	< 0.1
	ug/kg		BHC	< 0.23			< 0.23			< 0.23		< 0.23				
	ug/kg		g-BHC (lindane)	< 0.1			< 0.1	< 10	< 10	< 0.1		< 0.1	< 0.009	< 0.009	< 0.013	< 0.1
	ug/kg		Heptachlor	< 0.08			< 0.08	< 10	< 10	< 0.08		< 0.08	< 0.009	< 0.009	< 0.013	< 0.1
	ug/kg		Aldrin	< 0.1			< 0.1			< 0.1		< 0.1				
	ug/kg		Heptachlorepoxide	< 0.13			< 0.13			< 0.13		< 0.13				
	ug/kg		Endosulfan I	< 0.13			< 0.13			< 0.13		< 0.13				
	ug/kg		Dieldrin	< 0.13	< 10	< 10	< 0.13	< 10	< 10	< 0.13	< 10	< 0.13	< 0.02	< 0.02	< 0.02	< 0.17
	ug/kg		4,4'-DDE	< 0.1	< 10	< 10	< 0.1	< 10	< 10	< 0.1	< 10	< 0.1	0.29	< 0.009	0.8	< 0.1
	ug/kg		Endrin	< 0.23	< 10	< 10	< 0.23	< 10	< 10	< 0.23	< 10	< 0.23	< 0.03	< 0.03	< 0.04	< 0.3
	ug/kg		Endosulfan II	< 0.26			< 0.26			< 0.26		< 0.26				
	ug/kg		4,4'-DDD	< 0.29	< 10	< 10	< 0.29	< 10	< 10	< 0.29	< 10	< 0.29	< 0.02	< 0.02	0.65	< 0.17
	ug/kg		Endrinaldehyde	< 0.29			< 0.29			< 0.29		< 0.29				
	ug/kg		Sulfan sulfate	< 0.29			< 0.29			< 0.29		< 0.29				
	ug/kg		4,4'-DDT	< 0.34	< 10	< 10	< 0.34	< 10	< 10	< 0.34	< 10	< 0.34	< 0.04	< 0.04	< 0.06	< 0.43
	ug/kg		Methoxychlor	< 0.57			< 0.57			< 0.57		< 0.57				
	ug/kg		Endrinketone	< 0.29			< 0.29			< 0.29		< 0.29				
	ug/kg		Chlorodane	< 1.56	< 10	< 10	< 1.56	< 10	< 10	< 1.56	< 10	< 1.56	0.2	< 0.23	0.61	< 2.55
	ug/kg		Toxaphene	< 1.56			< 1.56			< 1.56		< 1.56				
METALS	mg/kg		Ag (silver)					< 0.4	< 0.4							
	mg/kg		Al (aluminum)					11500	6450							
	mg/kg		As (arsenic)	< 0.75	< 0.8	< 0.9	< 0.74	< 7	< 6	< 0.77	< 0.8	< 0.76	< 0.1	< 0.1	0.61	< 0.1
	mg/kg		B (boron)					6	8							
	mg/kg		Ba (barium)					162	86.3							
	mg/kg		Be (beryllium)					0.77	0.45							
	mg/kg		Cd (cadmium)	< 1.1	< 0.9	< 0.9	< 1.1	0.6	< 0.3	< 1.2	< 0.9	< 1.2	< 0.1	0.16	< 0.1	< 0.1
	mg/kg		Cr (chromium)	3.4	9	9	4.1	23	14	4	4	4.5	5.2	5.2	< 1	3.3
	mg/kg		Cu (copper)	3.5	2	2	1.7	19	10	5.5	2	4.4	3.8	3.6	< 1	2.2
	mg/kg		Fe (iron)					21200	14200							
	mg/kg		Hg (mercury)	< 0.12	< 0.1	< 0.1	< 0.12	0.05	0.05	< 0.13	0.3	< 0.12	< 0.01	< 0.01	< 0.01	< 0.01
	mg/kg		Mg (magnesium)					4680	3910							
	mg/kg		Mn (manganese)	178			155	< 1240	< 751	188		196	185	158	1	118
	mg/kg		Mo (molybdenum)					2	2							
	mg/kg		Ni (nickel)	< 5.7	2	2	< 5.7	22	12	< 5.9	2	< 5.8	6.4	49.8	< 1	3
	mg/kg		Pb (lead)	0.87	< 9	< 9	0.74	22	13	1.6	< 9	0.93	9.6	8.5	11.7	5.1
	mg/kg		Sb (antimony)					< 4	< 4							
	mg/kg		Se (selenium)	< 0.87			< 0.87	< 10	< 10	< 0.89		< 0.88	< 1	< 1	< 1	< 1
	mg/kg		Sn (tin)					< 2	< 2							
	mg/kg		Sr (strontium)					25.4	13.3							
	mg/kg		Ti (titanium)					20	20							
	mg/kg		Zn (zinc)	14.8	11	11	7.6	85.3	52	10.5	10	11.8	0.71	19.8	< 1	12.2
	mg/kg		V (vanadium)					< 13	< 11							
PCB'S	ug/kg		Aroclor-1006	< 1.56			< 1.56			< 1.56		< 1.56	< 0.23	< 0.23	< 0.33	< 2.5
	ug/kg		Aroclor-1221	< 1.56			< 1.56			< 1.56		< 1.56				
	ug/kg		Aroclor-1232	< 1.56			< 1.56			< 1.56		< 1.56				
	ug/kg		Aroclor-1242	< 1.56			< 1.56			< 1.56		< 1.56				
	ug/kg		Aroclor-1248	< 1.56			< 1.56			< 1.56		< 1.56				
	ug/kg		Aroclor-1254	< 3.25			< 3.25			< 3.25		< 3.25	< 6.1	< 0.39	23	< 4.2
	ug/kg		Aroclor-1260	< 3.25			< 3.25			< 3.25		< 3.25	< 0.39	< 0.39	< 0.54	< 4.2
	ug/kg		Total PCB's		0	0		0	0		0					
PARTICLE SIZE %FINER	SAND	coarse	3 in			100					100					
			1 1/2			100					100					
			3/4			100					100					
			3/8			100					100					
			4			100	99.9			100	100	99.9				
			8			95					100					
			10				99.6			100		99.7	100	98.8	100	100
		medium	16			87.0	98.7			99.4	99.0	98.4				
			20													
			30				71.6			83.3		84.3				
			40			27.0					56.0		96.3	98.5	90.1	79.2
			50				71.6			83.3		84.3				
		fine	70													
			80				2.9			11.2		12.0				
			100			0.0	0.1			1.3	0.0	0.1				
			140							1.2						
	SILT CLAY		200			0.0				0.9	0.0					
			270							0.9			72.5	96.0	55.4	65.8
			0.20 mm			0.0				0.7	0.0		61.1	66.8	86.6	89.7
			0.05 mm			0.0				0.6	0.0		33.2	26.9	59.4	47.1
MISC	%		Total Organic Carb				0.025			0.032		0.018	3.5	3.91	6.21	2.55
	mg/kg		Chem Oxy Demand			2189					3514					
	mg/kg		Kjedahl Nitrogen			135					75					
	mg/kg		Total Phosph			158					82					
	mg/kg		Oil and Grease													
	mg/kg		Cyanide, Total	< 0.63			< 0.62			< 0.64		< 0.63				
	mg/kg		Ammonia	1.5			0.62			1.3		0.82				
	mg/l		Ammonia Elutriate													
	%		Moisture	19.7			19.3			21.7		20.5				
	%		Total Solids	80.3			80.7			78.3		79.5				
	%		Volatile Solids	0.3			0.2			0.2		0.2				

Table 14. Contaminant Data for Minnesota River

			Record #	1427	1431	1423	1432	1442	1443	1438	1435	1455	1451	1447	402	301	302
			River Mile	39	39	39	39	39	39	39	39	39	39	39	14.6	14.52	14.51
			Location	MN R. Jordan - mid	MN R. Jordan - south	MN R. Jordan - north	MN R. Jordan - mean	MN R. Jordan - west	MN R. Jordan - mean	MN R. Jordan - mid	MN R. Jordan - east	MN R. Jordan - west	MN R. Jordan - mid	MN R. Jordan - east	AB SAVAGE RR BR.	AB SAVAGE RR BR.	AB SAVAGE RR BR.
			Year	1983	1983	1983	1983	1984	1984	1984	1984	1985	1985	1985	1989	1982	1982
			System	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
			Sam. Gear	3	3	3	3	3	3	3	3	3	3	3	1	1	1
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE	COE	COE
CHC'S	ug/kg		a-BHC				10		13						< 0.01		
	ug/kg		b-BHC				< 1.1		< 0.64						< 0.2		
	ug/kg		BHC												< 0.3		
	ug/kg		g-BHC (lindane)				< 0.53		9.8						< 0.13		
	ug/kg		Heptachlor				< 0.53		< 0.32						< 0.1		
	ug/kg		Aldrin												< 0.13		
	ug/kg		Heptachlorepoxide												< 0.17		
	ug/kg		Endosulfan I												< 0.17		
	ug/kg		Dieldrin				< 1.6		< 0.96						< 0.17	< 0.1	< 0.1
	ug/kg		4,4'-DDE				< 1.6		< 0.96						< 0.13	< 0.1	< 0.1
	ug/kg		Endrin				< 2.1		< 1.3						< 0.3	< 0.1	< 0.1
	ug/kg		Endosulfan II												< 0.33		
	ug/kg		4,4'-DDD				< 3.2		< 1.9						< 0.36	< 0.1	< 0.1
	ug/kg		Endrinaldehyde												< 0.36		
	ug/kg		Sulfan sulfate												< 0.36		
	ug/kg		4,4'-DDT				< 4.2		< 2.5						< 0.43	< 0.1	< 0.1
	ug/kg		Methoxychlor												< 0.73		
	ug/kg		Endrinketone												< 0.36		
	ug/kg		Chlorodane				< 11		< 6.4						< 1.98	< 1	< 1
	ug/kg		Toxaphene												< 1.98		
METALS	mg/kg		Ag (silver)	0.01	0.022	0.019		0.012		0.011	0.012	0.001	0.02	0.028			
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	1.2	1.9	1.91		2.51		1.23	1.2	0.75	1.31	4.23	< 1.2	1.6	2.2
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														
	mg/kg		Be (beryllium)	0.073	0.168	0.088		0.152		0.065	0.067	0.067	0.081	0.328			
	mg/kg		Cd (cadmium)	0.044	0.064	0.07		0.099		0.033	0.039	0.023	0.021	0.061	< 1.3	< 0.2	< 0.19
	mg/kg		Cr (chromium)	21.7	15.2	27.5		11.4		5	9.1	5.2	4.2	7.9	3.8	3.9	4.2
	mg/kg		Cu (copper)	1.2	3.3	1.8		4.8		1.1	1.1	1.2	1.4	2.5	8.7	2.9	3.3
	mg/kg		Fe (iron)													4300	5500
	mg/kg		Hg (mercury)	0.05	0.05	0.05		0.05		0.05	0.05	0.05	0.05	0.05	< 0.01	0.015	0.0165
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)					494.5		155	121.2	100.2	131.9	1237.3	254		
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	7	9.2	8.2		10.2		3.3	4.9	2.8	3.3	6.2	7.5	7	7
	mg/kg		Pb (lead)	2.8	3.8	3.5		3.1		1.3	2.2	2.1	2.3	3.5	4.4	4	4.4
	mg/kg		Sb (antimony)									4.9	6.7	19.7			
	mg/kg		Se (selenium)	0.05	0.05	0.21		0.12		0.12	0.12	0.12	0.13	0.12	< 0.92		
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)														
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006				< 5.3		< 3.2						< 1.98		
	ug/kg		Aroclor-1221												< 1.98		
	ug/kg		Aroclor-1232												< 1.98		
	ug/kg		Aroclor-1242												< 1.98		
	ug/kg		Aroclor-1248												< 1.98		
	ug/kg		Aroclor-1254				6.5		< 3.2						< 4.13		
	ug/kg		Aroclor-1260				< 5.3		< 3.2						< 4.13		
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER		SAND coarse	3 in														
			1 1/2													100	100
			3/4													100	100
			3/8													100	100
			4												100.0	100	100
			8													100	100
			10												99.8		
		SAND medium	16												99.5	100	100
			20														
			30												98.5	100	100
			40													100	99.0
			50												98.5	98.0	96.0
		SAND fine	70													87.0	79.0
			80												84.8		
			100												13.5	58.0	50.0
			140												8.5		
		SILT CLAY	200												4.8	31.0	36.0
			270												4.5	25.0	32.0
			0.20 mm												3.5	11.0	19.0
			0.05 mm												2.1	5.0	8.0
MISC	%		Total Organic Carb												0.43		
	mg/kg		Chem Oxy Demand													10000	10580
	mg/kg		Kjedahl Nitrogen													440	520
	mg/kg		Total Phosph													290	230
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total														
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate														
	%		Moisture														
	%		Total Solids														
	%		Volatile Solids														

Table 14. Contaminant Data for Minnesota River

			Record #	303	401	404	304	305	403	306	405	307	406	308	1465	1459	1462
			River Mile	14.5	14.4	13.4	13.21	13.2	13.2	12.5	12.4	12.0	11.7	11.4	3.0	3.0	3
			Location	AB SAVAGE RR BR.	AB SAVAGE RR BR.	AB & BLW CARGILL	AB & BLW CARGILL	AB & BLW CARGILL	AB & BLW CARGILL	AB&BW PETERSON BAR	AB&BW PETERSON BAR	AB&BW PETERSON BAR	AB&BW PETERSON BAR	AB&BW PETERSON BAR	Ft. Snelling - west	Ft. Snelling - east	Ft. Snelling - mid
			Year	1978	1989	1989	1979	1979	1989	1980	1989	1975	1989	1980	1981	1981	1981
			System	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
			Sam. Gear	1	1	1	1	1	1	1	1	1	1	1	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	COE	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC		< 0.08	< 0.07			< 0.11		< 0.07		< 0.09				
	ug/kg		b-BHC		< 0.16	< 0.15			< 0.21		< 0.14		< 0.18				
	ug/kg		BHC		< 0.24	< 0.22			< 0.32		< 0.22		< 0.27				
	ug/kg		g-BHC (lindane)		< 0.11	< 0.1			< 0.14		< 0.1		< 0.12				
	ug/kg		Heptachlor		< 0.08	< 0.07			< 0.11		< 0.07		< 0.09				
	ug/kg		Aldrin		< 0.11	< 0.1			< 0.14		< 0.1		< 0.12				
	ug/kg		Heptachlorepoxide		< 0.13	< 0.12			< 0.18		< 0.12		< 0.15				
	ug/kg		Endosulfan I		< 0.13	< 0.12			< 0.18		< 0.12		< 0.15				
	ug/kg		Dieldrin	< 1	< 0.13	< 0.12	0	0	< 0.18	0	< 0.12		< 0.15	0.5			
	ug/kg		4,4'-DDE		< 0.11	< 0.1	0	0	< 0.14	0	< 0.1		< 0.12	0			
	ug/kg		Endrin	< 1	< 0.24	< 0.22	0	0	< 0.32	0	< 0.22		< 0.27	0			
	ug/kg		Endosulfan II		< 0.26	< 0.25			< 0.35		< 0.24		< 0.3				
	ug/kg		4,4'-DDD		< 0.29	< 0.27	0	0	< 0.39	0	< 0.26		< 0.33	0.8			
	ug/kg		Endrinaldehyde		< 0.29	< 0.27			< 0.39		< 0.26		< 0.33				
	ug/kg		Sulfan sulfate		< 0.29	< 0.27			< 0.39		< 0.26		< 0.33				
	ug/kg		4,4'-DDT	< 4	< 0.34	< 0.32	0	0	< 0.46	0	< 4.8		< 0.4	0			
	ug/kg		Methoxychlor		< 0.58	< 0.55			< 0.77		< 0.53		< 0.67				
	ug/kg		Endriniketone		< 0.29	< 0.27			< 0.39		< 0.26		< 0.33				
	ug/kg		Chlorodane		< 1.58	< 1.49	0	0	< 2.11	0	< 1.44		< 1.82	1			
	ug/kg		Toxaphene		< 1.58	< 1.49			< 2.11		< 1.44		< 1.82				
METALS	mg/kg		Ag (silver)												0.198	0.08	0.075
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	2.54	< 1.2	1.6	0	0	2.7	0	1.8	0.83	3.2	0	4.6	4.21	4.2
	mg/kg		B (boron)														
	mg/kg		Ba (barium)				40	80		40				60			
	mg/kg		Be (beryllium)												0.531	0.426	0.37
	mg/kg		Cd (cadmium)	1.18	< 1.3	< 1.3	< 10	< 10	< 1.6	< 10	< 1.2	< 0.1	< 1.6	< 10	0.245	0.259	0.111
	mg/kg		Cr (chromium)	28.7	4.3	5	< 10	< 10	8.1	20	3.4	7	7.1	10	32.1	27.4	23.6
	mg/kg		Cu (copper)	12	13.3	4.8	< 10	< 10	15	< 10	3.9	2.8	12.1	< 10	14.9	13.9	9.2
	mg/kg		Fe (iron)	10700			3800	9700		2600				5200			
	mg/kg		Hg (mercury)	0.031	< 0.01	< 0.01	0	0	< 0.02	0	< 0.01	0.13	< 0.02	0	0.09	0.09	0.06
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	419	263	232	160	720	56.8	170	163		59.3	660			
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	16.7	< 6.4	7	< 10	20	9.4	< 10	< 6.2		11.5	10	19.5	17.3	13.4
	mg/kg		Pb (lead)	44	4.6	3.6	< 10	20	5.8	< 10	3	< 0.1	11.6	10	17	19.9	10.9
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)		< 0.93	< 0.93			< 1.2		< 0.89		2.2		0.18	0.16	0.17
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)														
	mg/kg		Zn (zinc)														
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006		< 1.58	< 1.49			< 2.11		< 1.44		< 1.82				
	ug/kg		Aroclor-1221		< 1.58	< 1.49			< 2.11		< 1.44		< 1.82				
	ug/kg		Aroclor-1232		< 1.58	< 1.49			< 2.11		< 1.44		< 1.82				
	ug/kg		Aroclor-1242		< 1.58	< 1.49			< 2.11		< 1.44		< 1.82				
	ug/kg		Aroclor-1248		< 1.58	< 1.49			< 2.11		< 1.44		< 1.82				
	ug/kg		Aroclor-1254		< 3.3	< 3.1			< 4.4		< 3		< 3.8				
	ug/kg		Aroclor-1260		< 3.3	< 3.1			< 4.4		< 3		< 3.8				
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER		SAND coarse	3 in	100			100	100		100		100		100			
			1 1/2	100			100	100		100		100		100			
			3/4	100			100	100		100		100		100			
			3/8	100			100	100		100		100		100			
			4	100	99.9	100	100	100	99.5	100	99.4	99	100	100			
			8							100		95		100			
			10		99.8	99.9	100	100	99.3		98.7		99.9				
		SAND medium	16		99.3	99.4			98.9	100	96.2	84.0	99.6	100			
			20				100	100									
			30		94.0	92.9			96.6		83.8		98.6				
			40				100	100		99.0		41.0		98.0			
			50		94.0	92.9			96.6		83.8		98.6				
		SAND fine	70														
			80		83.1	68.9	92.0	80.0	92.7		41.9		81.7				
			100		10.4	14.6			42.5	42.0	17.5	6.0	52.1	83.0			
			140		6.4	9.9			26.4		10.7		40.5				
	SILT CLAY		200	34.0	4.4	7.2	12.0	46.0	17.4	20.0	6.8	2.0	27.0	70.0			
			270		2.9	5.2			11.9		4.7		17.6				
			0.20 mm		2.1	3.6	5.0	35.0	8.5	7.0	3.3		13.3	33.0			
			0.05 mm	21.0	1.0	2.1	2.0	19.0	4.5	2.0	2.3		9.2	18.0			
MISC	%		Total Organic Carb		0.91	1.13			1.02		1.11		1.2				
	mg/kg		Chem Oxy Demand	19700			8700	29000		5300		1950		31000			
	mg/kg		Kjedahl Nitrogen	740			1300	4100		1600				3700			
	mg/kg		Total Phosph	561			400	510									
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total														
	mg/kg		Ammonia														
	mg/l		Ammonia Elutriate														
	%		Moisture														
	%		Total Solids														
	%		Volatile Solids														

Table 14. Contaminant Data for Minnesota River

		Record #	1476	1471	1480	1481	1485	1494	1493	1489	1497	1500	1504	1503	1513	1514
		River Mile	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3
		Location	Ft. Snelling - mid	Ft. Snelling - east	Ft. Snelling - west	Ft. Snelling - mean	Ft. Snelling - east	Ft. Snelling - mean	Ft. Snelling - west	Ft. Snelling - mid	Ft. Snelling - east	Ft. Snelling - mid	Ft. Snelling - mean	Ft. Snelling - west	Ft. Snelling - west	Ft. Snelling - mean
		Year	1982	1982	1982	1982	1983	1983	1983	1983	1984	1984	1984	1984	1985	1985
		System	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Pool	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
		Sam. Gear	3	3	3	3	3	3	3	3	3	3	3	3	3	3
		Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		Data Cit.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC's	ug/kg	a-BHC				< 5		16					15			< 0.26
	ug/kg	b-BHC				< 10		< 1.1					< 0.64			< 0.53
	ug/kg	BHC														
	ug/kg	g-BHC (lindane)				20		< 0.53					< 0.32			< 0.26
	ug/kg	Heptachlor				7		< 0.53					< 0.32			< 0.26
	ug/kg	Aldrin														
	ug/kg	Heptachlorepoxide														
	ug/kg	Endosulfan I														
	ug/kg	Dieldrin				< 20		< 1.6					< 0.96			< 0.79
	ug/kg	4,4'-DDE				7		< 1.6					< 0.96			< 0.79
	ug/kg	Endrin				< 10		< 2.1					< 1.3			< 1.1
	ug/kg	Endosulfan II														
	ug/kg	4,4'-DDD				< 14		< 3.2					< 1.9			< 1.6
	ug/kg	Endrinaldehyde														
	ug/kg	Sulfan sulfate														
	ug/kg	4,4'-DDT				< 20		< 4.2					< 2.5			< 2.1
	ug/kg	Methoxychlor														
	ug/kg	Endrinketone														
	ug/kg	Chlorodane				< 2		< 11					< 6.4			32.6
	ug/kg	Toxaphene														
METALS	mg/kg	Ag (silver)	0.107	0.167	0.175		0.163		0.243	0.152	0.104	0.065		0.196	0.08	
	mg/kg	Al (aluminum)														
	mg/kg	As (arsenic)	1.2	5.34	6.25		3.78		5.09	2.21	3.6	1.03		3.72	5.53	
	mg/kg	B (boron)														
	mg/kg	Ba (barium)														
	mg/kg	Be (beryllium)	0.11	0.45	0.581		0.163		0.29	0.163	0.334	0.123		0.337	0.374	
	mg/kg	Cd (cadmium)	0.057	0.247	0.214		0.2		0.203	0.131	0.199	0.069		0.247	0.189	
	mg/kg	Cr (chromium)	7.2	22.3	22.8		50.1		65.1	39.7	17.5	8.1		18.4	17.1	
	mg/kg	Cu (copper)	1.4	11.1	11.6		6.8		10	5	11.4	2.3		8.6	7.2	
	mg/kg	Fe (iron)														
	mg/kg	Hg (mercury)	0.05	0.05	0.05		0.05		0.05	0.05	0.05	0.05		0.05	0.05	
	mg/kg	Mg (magnesium)														
	mg/kg	Mn (manganese)	143	499	686.1						351.2	147.4		429.1	462.7	
	mg/kg	Mo (molybdenum)														
	mg/kg	Ni (nickel)	4.3	12.9	14.1		15.3		18.9	10.6	12.2	5.9		12.8	10.1	
	mg/kg	Pb (lead)	2.4	6.8	16.8		6.4		9.2	5.6	15.6	3.2		7.2	6.7	
	mg/kg	Sb (antimony)													14.1	
	mg/kg	Se (selenium)	0.06	0.06	0.07		0.09		0.16	0.05	0.12	0.12		0.12	0.13	
	mg/kg	Sn (tin)														
	mg/kg	Sr (strontium)														
	mg/kg	Ti (titanium)														
	mg/kg	Zn (zinc)														
	mg/kg	V (vanadium)														
PCB's	ug/kg	Aroclor-1006				800		< 5.3					< 3.2			< 5.3
	ug/kg	Aroclor-1221														
	ug/kg	Aroclor-1232														
	ug/kg	Aroclor-1242														
	ug/kg	Aroclor-1248														
	ug/kg	Aroclor-1254				1000		25					36			< 5.3
	ug/kg	Aroclor-1260				< 20		13.0					30.0			< 5.3
	ug/kg	Total PCB's														
PARTICLE SIZE %FINER	SAND coarse	3 in														
		1 1/2														
		3/4														
		3/8														
		4														
		8														
		10														
	SAND medium	16														
		20														
		30														
		40														
		50														
	SAND fine	70														
		80														
		100														
		140														
	SILT CLAY	200														
		270														
		0.20 mm														
		0.05 mm														
MISC	%	Total Organic Carb														
	mg/kg	Chem Oxy Demand														
	mg/kg	Kjedahl Nitrogen														
	mg/kg	Total Phosph														
	mg/kg	Oil and Grease														
	mg/kg	Cyanide, Total														
	mg/kg	Ammonia														
	mg/l	Ammonia Elutriate														
	%	Moisture														
	%	Total Solids														
	%	Volatile Solids														

Table 14. Contaminant Data for Minnesota River

			Record #	1507	1510	309	310
			River Mile	3.0	3.0	0.5	0.1
			Location	Ft. Snelling - east	Ft. Snelling - mid	MOUTH MN RIVER	MOUTH MN RIVER
			Year	1985	1985	1980	1980
			System	2	2	2	2
			Habitat Type	1	1	1	1
			Pool	2.5	2.5	2.5	2.5
			Sam. Gear	3	3	1	1
			Sam. Depth	10	10	10	10
			Data Clt.	MWCC	MWCC	COE	COE
CHC's	ug/kg		a-BHC				
	ug/kg		b-BHC				
	ug/kg		BHC				
	ug/kg		g-BHC (lindane)				
	ug/kg		Heptachlor				
	ug/kg		Aldrin				
	ug/kg		Heptachlorepoxide				
	ug/kg		Endosulfan I				
	ug/kg		Dieldrin			0	0.6
	ug/kg		4,4'-DDE			0	1
	ug/kg		Endrin			0	0
	ug/kg		Endosulfan II				
	ug/kg		4,4'-DDD			0	0.8
	ug/kg		Endrinaldehyde				
	ug/kg		Sulfan sulfate				
	ug/kg		4,4'-DDT			0	0.4
	ug/kg		Methoxychlor				
	ug/kg		Endrinketone				
	ug/kg		Chlorodane			0	1
	ug/kg		Toxaphene				
METALS	mg/kg		Ag (silver)	0.116	0.028		
	mg/kg		Al (aluminum)				
	mg/kg		As (arsenic)	7.62	2.15	0	0
	mg/kg		B (boron)				
	mg/kg		Ba (barium)			20	30
	mg/kg		Be (beryllium)	0.49	0.121		
	mg/kg		Cd (cadmium)	0.221	0.058	< 10	< 10
	mg/kg		Cr (chromium)	20.7	6.1	< 10	< 10
	mg/kg		Cu (copper)	12.4	2.6	< 10	< 10
	mg/kg		Fe (iron)			2300	3400
	mg/kg		Hg (mercury)	0.05	0.05	0	0
	mg/kg		Mg (magnesium)				
	mg/kg		Mn (manganese)	554.1	171.8	230	390
	mg/kg		Mo (molybdenum)				
	mg/kg		Ni (nickel)	12.9	4.3	< 10	< 10
	mg/kg		Pb (lead)	10.2	3.5	< 10	< 10
	mg/kg		Sb (antimony)	15.2	7.4		
	mg/kg		Se (selenium)	0.13	0.12		
	mg/kg		Sn (tin)				
	mg/kg		Sr (strontium)				
	mg/kg		Ti (titanium)				
	mg/kg		Zn (zinc)				
	mg/kg		V (vanadium)				
PCB's	ug/kg		Aroclor-1006				
	ug/kg		Aroclor-1221				
	ug/kg		Aroclor-1232				
	ug/kg		Aroclor-1242				
	ug/kg		Aroclor-1248				
	ug/kg		Aroclor-1254				
	ug/kg		Aroclor-1260				
	ug/kg		Total PCB's				
PARTICLE SIZE %FINER	SAND	coarse	3 in			100	100
			1 1/2			100	100
			3/4			98	100
			3/8			79	100
			4			63	100
			8			49	100
			10				
		medium	16			36.0	99
			20				
			30				
			40			18.0	86.0
			50				
		fine	70				
			80				
			100			2.0	74.0
			140				
	SILT CLAY		200			0.0	66.0
			270				
			0.20 mm			0.0	36.0
			0.05 mm			0.0	13.0
MISC	%		Total Organic Carb				
	mg/kg		Chem Oxy Demand			2200	17000
	mg/kg		Kjedahl Nitrogen			150	1800
	mg/kg		Total Phosph				
	mg/kg		Oil and Grease				
	mg/kg		Cyanide, Total				
	mg/kg		Ammonia				
	mg/l		Ammonia Elutriate				
	%		Moisture				
	%		Total Solids				
	%		Volatile Solids				

Table 15. Contaminant Data for St. Croix River

			Record #	1589	1593	1597	1611	1610	1606	1602	526	526	311	312	525	1528	1543
			River Mile	23.0	23.0	23.0	23.0	23.0	23.0	23.0	17.5	17.5	17.1	17.0	16.4	16.0	16.0
			Location	Stillwater - east	Stillwater - mid	Stillwater - west	Stillwater - mean	Stillwater - west	Stillwater - mid	Stillwater - east	HUDSON	HUDSON	HUDSON	HUDSON	HUDSON	Hudson - east	Hudson - mid
			Year	1984	1984	1984	1985	1985	1985	1985	1989	1989	1982	1982	1989	1982	1982
			System	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
			Sam. Gear	3	3	3	3	3	3	3	1	1	1	1	1	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Cit.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE	COE	COE	COE	COE	MWCC	MWCC
CHC'S	ug/kg		a-BHC	< 0.32			< 0.26					< 0.07			< 0.07		
	ug/kg		b-BHC	< 0.64			< 0.53					< 0.15			< 0.14		
	ug/kg		BHC									< 0.22			< 0.21		
	ug/kg		g-BHC (lindane)	< 0.32			< 0.26					< 0.1			< 0.1		
	ug/kg		Heptachlor	< 0.32			< 0.26					< 0.07			< 0.07		
	ug/kg		Aldrin									< 0.1			< 0.1		
	ug/kg		Heptachlorepoxide									< 0.12			< 0.12		
	ug/kg		Endosulfan I									< 0.12			< 0.12		
	ug/kg		Dieldrin	< 0.96			< 0.79					< 0.12	< 0.1	< 0.1	< 0.12		
	ug/kg		4,4'-DDE	< 0.96			< 0.79					< 0.1	< 0.1	< 0.1	< 0.1		
	ug/kg		Endrin	< 1.3			< 1.1					< 0.22	< 0.1	< 0.1	< 0.21		
	ug/kg		Endosulfan II									< 0.25			< 0.24		
	ug/kg		4,4'-DDD	< 1.9			< 1.6					< 0.27	< 0.1	< 0.1	< 0.26		
	ug/kg		Endrinaldehyde									< 0.27			< 0.26		
	ug/kg		Sulfan sulfate									< 0.27			< 0.26		
	ug/kg		4,4'-DDT	< 2.5			< 2.1					< 0.32	< 0.1	< 0.1	< 0.31		
	ug/kg		Methoxychlor									< 0.54			< 0.52		
	ug/kg		Endrinketone									< 0.27			< 0.26		
	ug/kg		Chlorodane	< 6.4			< 5.3					< 1.48	< 1	< 1	< 1.43		
	ug/kg		Toxaphene									< 1.48			< 1.43		
METALS	mg/kg		Ag (silver)	0.021	0.011	0.023		0.013	0.063	0.078						0.712	0.28
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)	2.59	3.67	3.43		4.54	6.59	12.52		< 1.06	1.5	1.7	1.6	8.6	4.5
	mg/kg		B (boron)														
	mg/kg		Ba (barium)														
	mg/kg		Be (beryllium)	0.187	0.181	0.215		0.16	0.266	0.439						0.5	0.25
	mg/kg		Cd (cadmium)	0.189	0.111	0.156		0.117	0.174	0.299		< 1.16	< 0.17	< 0.19	< 1.03	0.523	0.255
	mg/kg		Cr (chromium)	14	12.3	16.1		10.6	23.5	33.4		6.3	4.4	8.4	4.8	43.4	23.6
	mg/kg		Cu (copper)	7.8	5.3	20.2		4.1	12.2	18.5		< 1.52	2.6	7.5	< 1.35	27	10
	mg/kg		Fe (iron)										5100	7600			
	mg/kg		Hg (mercury)	0.05	0.05	0.05		0.06	0.05	0.07		< 0.01	0.023	0.034	< 0.01	0.45	0.11
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)	258.9	191	261.8		222.6	508.9	831.5		277			322	1085	878
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)	8.2	8	9.4		4.8	10.1	17.7		< 5.8	4	8	< 5.14	16.4	9.1
	mg/kg		Pb (lead)	77.7	115	177.9		3.2	7.2	12.1		2.3	2	2	1.2	80.8	41.4
	mg/kg		Sb (antimony)					5.1	7.5	10.4							
	mg/kg		Se (selenium)	0.12	0.12	0.12		0.12	0.13	0.17		< 0.89			< 0.79	0.08	0.07
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)	0.6	0.6	0.6		1.8	2.7	4						1	0.9
	mg/kg		Zn (zinc)	37.9	41.5	62.1		22.3	37.8	54		< 0.61	10	15	8.9	151.3	48.5
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	14			27.30					< 1.48			< 1.43		
	ug/kg		Aroclor-1221									< 1.48			< 1.43		
	ug/kg		Aroclor-1232									< 1.48			< 1.43		
	ug/kg		Aroclor-1242									< 1.48			< 1.43		
	ug/kg		Aroclor-1248									< 1.48			< 1.43		
	ug/kg		Aroclor-1254	19			< 5.3					< 3.08			< 2.98		
	ug/kg		Aroclor-1260	< 3.2			48.8					< 3.08			< 2.98		
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER		SAND coarse	3 in														
			1 1/2										100	100			
			3/4										100	100			
			3/8										100	100			
			4								96.5	99.5	100	98	99.8		
			8										98	87			
			10								93.7	98.8			98.3		
		SAND medium	16								84.5	96.5	94.0	70.0	88.9		
			20														
			30								42.6	86.4	67.0	35.0	49.8		
			40										39.0	16.0			
			50								42.6	86.4	14.0	6.0	49.8		
		SAND fine	70										6.0	3.0			
			80								2.9	56.0			5.3		
			100								0.3	0.5	4.0	2.0	0.1		
			140								0.2	0.6					
	SILT CLAY		200								0.1	0.5	4.0	2.0			
			270									0.5	3.0	2.0			
			0.20 mm									0.4	1.0	1.0			
			0.05 mm									0.3	0.0	0.0			
MISC	%		Total Organic Carb								0.008	0.18			0.033		
	mg/kg		Chem Oxy Demand										965	930			
	mg/kg		Kjedahl Nitrogen										41	48			
	mg/kg		Total Phosph										180	220			
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total									< 0.6			< 0.61		
	mg/kg		Ammonia									3.30			< 0.24		
	mg/l		Ammonia Elutriate														
	%		Moisture									16.6			17.5		
	%		Total Solids									83.4			82.5		
	%		Volatile Solids									1			0.6		

Table 15. Contaminant Data for St. Croix River

			Record #	1564	1558	1580	1576	1584	1585	1585	528	527	313	314	1640	1635	1639
			River Mile	16.0	16.0	16.0	16.0	16.0	16.0	16.0	6.5	6.1	6.0	6.0	1	1	1.0
			Location	Hudson - mean	Hudson - west	Hudson - mid	Hudson - east	Hudson - west	Hudson - mean -dup	Hudson - mean	KINNICK. BAR	KINNICK. BAR	KINNICK. BAR	KINNICK. BAR	Prescott - mean	Prescott - mid	Prescott - west
			Year	1982	1982	1983	1983	1983	1983	1983	1989	1989	1980	1980	1983	1983	1983
			System	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			Habitat Type	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Pool	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
			Sam. Gear	3	3	3	3	3	3	3	1	1	1	1	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10	10	10	10	10	10
			Data Clt.	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	COE	COE	COE	COE	MWCC	MWCC	MWCC
CHCS	ug/kg		a-BHC	< 5					< 0.53	< 0.53	< 0.07	< 0.08			< 0.53		
	ug/kg		b-BHC	< 10					< 1.1	< 1.1	< 0.14	< 0.15			< 1.1		
	ug/kg		BHC								< 0.21	< 0.23					
	ug/kg		g-BHC (lindane)	< 7					< 0.53	< 0.53	< 0.1	< 0.1			< 0.53		
	ug/kg		Heptachlor	< 5					< 0.53	< 0.53	< 0.07	< 0.08			< 0.53		
	ug/kg		Aldrin								< 0.1	< 0.1					
	ug/kg		Heptachlorepoxide								< 0.12	< 0.13					
	ug/kg		Endosulfan I								< 0.12	< 0.13					
	ug/kg		Dieldrin	< 20					< 1.6	< 1.6	< 0.12	< 0.13	< 0.02	< 0.02	< 1.6		
	ug/kg		4,4'-DDE	< 7					< 1.6	< 1.6	< 0.1	< 0.1	< 0.02	< 0.01	< 1.6		
	ug/kg		Endrin	< 10					< 2.1	< 2.1	< 0.21	< 0.23	< 0.04	< 0.04	< 2.1		
	ug/kg		Endosulfan II								< 0.24	< 0.25					
	ug/kg		4,4'-DDD	< 14					< 3.2	< 3.2	< 0.26	< 0.28	< 0.02	< 0	< 3.2		
	ug/kg		Endrinaldehyde								< 0.26	< 0.28					
	ug/kg		Sulfan sulfate								< 0.26	< 0.28					
	ug/kg		4,4'-DDT	< 20					< 4.2	< 4.2	< 0.31	< 0.33	< 0.06	< 0.06	< 4.2		
	ug/kg		Methoxychlor								< 0.52	< 0.56					
	ug/kg		Endrinketone								< 0.26	< 0.28					
	ug/kg		Chlorodane	< 2					< 11	< 11	< 1.43	< 1.52	< 0.05	< 0.1	< 11		
	ug/kg		Toxaphene								< 1.43	< 1.52					
METALS	mg/kg		Ag (silver)		0.103	0.003	0.021	0.001								0.024	0.015
	mg/kg		Al (aluminum)														
	mg/kg		As (arsenic)		1.3	1.44	1.18	2.07			1.2	< 1	< 4.4	< 4.8		1.24	1.21
	mg/kg		B (boron)														
	mg/kg		Ba (barium)										6.6	7.2			
	mg/kg		Be (beryllium)		0.14	0.134	0.106	0.131								0.131	0.129
	mg/kg		Cd (cadmium)		0.082	0.027	0.055	0.215			< 1.1	< 1.1	< 0.1	< 0.1		0.053	0.052
	mg/kg		Cr (chromium)		10.8	37.7	13.7	34.9			3.6	3.6	3.1	4.8		37.9	40.3
	mg/kg		Cu (copper)		6	5.6	3.3	9.2			18.5	27.9	1.8	2.9		2.9	2.8
	mg/kg		Fe (iron)										3500	4400			
	mg/kg		Hg (mercury)		0.05	0.05	0.05	0.05			< 0.02	< 0.01	0.03	0.02		0.05	0.05
	mg/kg		Mg (magnesium)														
	mg/kg		Mn (manganese)		538						127	108	71	140			
	mg/kg		Mo (molybdenum)														
	mg/kg		Ni (nickel)		6.6	10.3	8.7	15.8			< 5.3	< 5.7	2.6	3.4		10.8	12.1
	mg/kg		Pb (lead)		2	2.6	4.3	3.7			1	2.1	1.8	1.9		4.4	3.4
	mg/kg		Sb (antimony)														
	mg/kg		Se (selenium)		0.05	0.05	0.05	0.11			< 0.81	< 0.89				0.1	0.06
	mg/kg		Sn (tin)														
	mg/kg		Sr (strontium)														
	mg/kg		Ti (titanium)		0.7	0.6	0.6	0.6								0.6	0.6
	mg/kg		Zn (zinc)		16.9	15.3	16.1	17.8			9.4	1250	7.6	8.6		14.4	14.3
	mg/kg		V (vanadium)														
PCB'S	ug/kg		Aroclor-1006	20					< 5.3	< 5.3	< 1.43	< 1.52			< 5.3		
	ug/kg		Aroclor-1221								< 1.43	< 1.52					
	ug/kg		Aroclor-1232								< 1.43	< 1.52					
	ug/kg		Aroclor-1242								< 1.43	< 1.52					
	ug/kg		Aroclor-1248								< 1.43	< 1.52					
	ug/kg		Aroclor-1254	20					< 5.3	< 5.3	< 2.98	< 3.18			7.9		
	ug/kg		Aroclor-1260	< 20					< 5.3	< 5.3	< 2.98	< 3.18			< 5.3		
	ug/kg		Total PCB's														
PARTICLE SIZE %FINER	SAND	coarse	3 in										100				
			1 1/2										100				
			3/4										100				
			3/8										100				
			4									100	100	97			
			8										100	94			
			10									99.9	99	93			
		medium	16									99.5	96.0	89.0			
			20										92.0	84.0			
			30									97.9	80.0	73.0			
			40										48.0	51.0			
			50									97.9	28.0	28.0			
		fine	70										13.0	9.0			
			80									83.8	10.0	7.0			
			100									5.3	0.0	1.0			
			140									4.2					
	SILT CLAY		200									2.8	0.0	0.0			
			270									1.8	0.0	0.0			
			0.20 mm									1.2	0.0	0.0			
			0.05 mm									0.9	0.0	0.0			
MISC	%		Total Organic Carb									0.39					
	mg/kg		Chem Oxy Demand										520	600			
	mg/kg		Kjedahl Nitrogen										< 0.02	< 0.02			
	mg/kg		Total Phosph										14	17			
	mg/kg		Oil and Grease														
	mg/kg		Cyanide, Total								< 0.59	< 0.65					
	mg/kg		Ammonia								< 0.23	5.6					
	mg/l		Ammonia Elutriate														
	%		Moisture								14.8	23.5					
	%		Total Solids								85.2	76.5					
	%		Volatile Solids								0.6	1.4					

Table 15. Contaminant Data for St. Croix River

			Record #	1631	1648	1651	1644	1652	1660	1664	1656	1665
			River Mile	1	1	1	1	1	1	1	1	1.0
			Location	Prescott - east	Prescott - mid	Prescott - west	Prescott - east	Prescott - mean	Prescott - mid	Prescott - west	Prescott - east	Prescott - mean
			Year	1983	1984	1984	1984	1984	1985	1985	1985	1985
			System	3	3	3	3	3	3	3	3	3
			Habitat Type	1	1	1	1	1	1	1	1	1
			Pool	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
			Sam. Gear	3	3	3	3	3	3	3	3	3
			Sam. Depth	10	10	10	10	10	10	10	10	10
			Data Cit	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC	MWCC
CHC'S	ug/kg		a-BHC					< 0.32				< 0.26
	ug/kg		b-BHC					< 0.64				< 0.53
	ug/kg		BHC									
	ug/kg		g-BHC (lindane)					< 0.32				< 0.26
	ug/kg		Heptachlor					< 0.32				< 0.26
	ug/kg		Aldrin									
	ug/kg		Heptachlorepoxide									
	ug/kg		Endosulfan I									
	ug/kg		Dieldrin					< 0.96				< 0.79
	ug/kg		4,4'-DDE					< 0.96				< 0.79
	ug/kg		Endrin					< 1.3				< 1.1
	ug/kg		Endosulfan II									
	ug/kg		4,4'-DDD					< 1.9				< 1.6
	ug/kg		Endrinaldehyde									
	ug/kg		Sulfan sulfate									
	ug/kg		4,4'-DDT					< 2.5				< 2.1
	ug/kg		Methoxychlor									
	ug/kg		Endrinketone									
	ug/kg		Chlorodane					< 6.4				< 5.3
	ug/kg		Toxaphene									
METALS	mg/kg		Ag (silver)	0.049	0.013	0.01	0.035		0.022	0.036	0.01	
	mg/kg		Al (aluminum)									
	mg/kg		As (arsenic)	3.32	1.89	1.7	3.71		12.68	2.67	4.27	
	mg/kg		B (boron)									
	mg/kg		Ba (barium)									
	mg/kg		Be (beryllium)	0.196	0.124	0.113	0.169		0.304	0.153	0.177	
	mg/kg		Cd (cadmium)	0.115	0.057	0.033	0.09		0.138	0.079	0.06	
	mg/kg		Cr (chromium)	25.2	7	6.2	11.9		19.8	9.5	14.1	
	mg/kg		Cu (copper)	9.5	1.9	1.4	4.5		3.9	5.4	4.2	
	mg/kg		Fe (iron)									
	mg/kg		Hg (mercury)	0.06	0.05	0.05	0.06		0.05	0.05	0.05	
	mg/kg		Mg (magnesium)									
	mg/kg		Mn (manganese)		234.1	232.2	734.2		1853.2	274.4	315.7	
	mg/kg		Mo (molybdenum)									
	mg/kg		Ni (nickel)	12.9	5.5	3.9	5.7		5.1	4.8	5.6	
	mg/kg		Pb (lead)	14	1.8	1.7	14.1		7.2	4.9	6	
	mg/kg		Sb (antimony)						8.6	5.2	7.7	
	mg/kg		Se (selenium)	0.14	0.12	0.12	0.12		0.13	0.12	0.12	
	mg/kg		Sn (tin)									
	mg/kg		Sr (strontium)									
	mg/kg		Ti (titanium)	0.6	0.6	0.6	0.6		2.4	2.4	3	
	mg/kg		Zn (zinc)	29.3	11.4	10	22.3		31.6	17	15.8	
	mg/kg		V (vanadium)									
PCB'S	ug/kg		Aroclor-1006					8.6				17.9
	ug/kg		Aroclor-1221									
	ug/kg		Aroclor-1232									
	ug/kg		Aroclor-1242									
	ug/kg		Aroclor-1248									
	ug/kg		Aroclor-1254					7				< 5.3
	ug/kg		Aroclor-1260					< 3.2				6.1
	ug/kg		Total PCB's									
PARTICLE SIZE %FINER	SAND	coarse	3 in									
			1 1/2									
			3/4									
			3/8									
			4									
			8									
			10									
		medium	16									
			20									
			30									
			40									
			50									
		fine	70									
			80									
			100									
			140									
	SILT CLAY		200									
			270									
			0.20 mm									
			0.05 mm									
MISC	%		Total Organic Carb									
	mg/kg		Chem Oxy Demand									
	mg/kg		Kjedahl Nitrogen									
	mg/kg		Total Phosph									
	mg/kg		Oil and Grease									
	mg/kg		Cyanide, Total									
	mg/kg		Ammonia									
	mg/l		Ammonia Elutriate									
	%		Moisture									
	%		Total Solids									
	%		Volatile Solids									

TAB 6 - PLACEMENT SITE PLAN

TAB 6

PLACEMENT SITE ACTIONS, FIVE YEAR PLAN

PLACEMENT SITE ACTIONS, FIVE YEAR PLAN											
Site Name		X	2001	X	2002	X	2003	X	2004	X	2005
General			PUB-B								
MN-13.5-RMP	Cargill		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
MN-12.1-RMP	Kraemer Site		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
MN-10.1-RMP	NSP Site		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
MN-7.3-RMP	Hwy. 77 Br.		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
SC-6.7-LWP	Kinnickinnic Bar Upper						REA-B		REA-P		
SC-6.5-LWP	Kinnickinnic Bar Lower						REA-B		REA-P		
U-856.6-RMP	USAF Site		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
									REA-P		
1-853.2-LMP	Pool 1 Site		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
			INS-S				INS-S				
1-851.3-LME	Below Franklin Avenue										
1-849.5-RME	Below Lake Street										
2-840.4-RMP	Highbridge		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
2-836.8-RMP	Holman field (site filled)										
2-836.3-RMP	Southport		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
			GPL-O								
2-823.8-RMP	C.F. Industries		REA-P		REA-P		REA-P		REA-P		REA-P
2-823.8-LMT	Pine Bend		SPR-C								
2-822.5-LMP	Shiely Pit										REA-P
2-821.5-LMT	Upper Boulanger										
2-821.1-LMT	Lower Boulanger										
3-815.1-RMP	Hastings										
3-814.7-RMP	Koch		GPL-O		PUB-K						
			REA-P								
3-813.2-RMP	Hastings Harbor				REA-B		REA-F				
3-808.4-LWP	Dry Run Slough				REA-B		REA-F				
3-802.3-RME	Morgans										
3-801.7-LWE	Coulters				REA-B		REA-F				
3-798.0-LWP	County/Private Pits		REA-B		REA-F						
3-799.2-RMT	Corps Island		LAN-C								
			SPR-E								
4-794.3-RMP	Red Wing Yacht Club				REA-P						
4-791.6-RMP	Red Wing Commercial Harbor				REA-P						
4-788.5-RMP	Colvill Park				REA-P						
4-762.7-LWT	Reads Landing		LAN-P								
			LAN-C								
			SPR-E								
4-761.1-RMP	Carrels Pit				REA-B		REA-F				
4-761.0-RMP	Wabasha Gravel Pit		GPL-O		PUB-K						
					SPR-C						
4-760.2-RMP	MDNR.2 (site filled)										
4-759.5-RMP	4.19 (site filled)										
4-759.3-RMP	4.17 (site filled)										

PLACEMENT SITE ACTIONS, FIVE YEAR PLAN											
Site Name		X	2001	X	2002	X	2003	X	2004	X	2005
4-759.3-LWT	Crats Island		LAN-P								
			LAN-C								
			SPR-E								
4-757.5-LW	Teepeeota Point		LAN-P		EXC-P		EXC-C				
			LAN-C		EXC-S						
			SPR-E								
4-756.5-LWT	Grand Encampment		LAN-P								
			LAN-C								
			SPR-E								
4-754.0-LWP	Alma Marina		PUB-K								
5-749.8-RMP	West Newton Chute		GPL-O		SPR-U						
5-748.0-RMT	Above West Newton						EXC-P		EXC-S		EXC-C
5-745.8-RMT	Above Fisher Island										
5-744.7-LWT	Lost Island				EXC-P		EXC-C				
5-744.0-RMP	Weaver Bottoms		SPR-R								
5A-738.2-RMP	L/D 5 Site										
5A-734.5-LWE	Island 58										REA-P
5A-733.5-LWP	Ft. City Service Base		CAP-S								
5A-731.9-LWP	Fountain City 1		PUB-K								
5A-730.5-LWT	Wilds Bend		LAN-P		LAN-C						
					SPR-E						
6-726.3-RMP	Winona Commercial Harbor						REA-P				
6-726.0-LMP	Winona Harbor		REA-P								
6-720.5-RMP	Homer		REA-P								
7-714.1-LWP	Trempealeau										
7-713.1-RMP	Hot Fish Shop		GPL-O								
			REA-P								
7-708.7-LWE	Winters Landing										
7-707.3-RMP	Dakota Boat Ramp		GPL-O								
7-706.5-RMT	Dakota Island		EXC-C								
8-695.7-LWP	Isle La Plume		CAP-C		CAP-C		CAP-C		CAP-C		CAP-C
8-690.4-LWT	Above Brownsville		EXC-G								
8-688.7-RMP	Brownsville Containment				PUB-K						
9-677.7-LWP	Genoa Power Plant		GPL-O		REA-P						
9-670.5-LWP	Blackhawk Park										
9-665.8-RIE	Indian Camp Light										
9-664.3-RIT	Lansing		LAN-P		LAN-C						
9-663.5-LWP	Lansing Hwy Bridge		PUB-K		LAN-P						
			SPR-A		LAN-C						
			SPR-R								
10-647.1-LWP	Varo Property										INS-O
10-644.5-RIE	Jackson Island										
10-643.5-LWI	Jackson Rehandle										
10-642.4-LWP	Mississippi Gardens		INS-O		SPR-A						
			REA-F		SPR-D						
10-635.0-LWP	Prairie Municipal Dock								REA-B		REA-P
10-628.0-LWP	Wyalusing Pit		REA-B		REA-P						
10-627.8-LWP	Wyalusing Beach		REA-B		REA-P						

PLACEMENT SITE ACTIONS, FIVE YEAR PLAN											
Site Name		X	2001	X	2002	X	2003	X	2004	X	2005
10-618.7-RIT	McMillan Island		EXC-S		EXC-C		LAN-P		LAN-C		
			EXC-C								
10-618.0-RIP	Buck Creek		SPR-D		LAN-C						
			SPR-A								

Code Key	
CAP-C	Check status of capacity
CAP-S	Survey to determine capacity
EXC-C	Excavation by contract
EXC-G	Excavation by government
EXC-P	Excavation planning
EXC-S	Excavation specifications for contract
GPL-F	General planning floodplain evaluation
GPL-O	General planning for operations at sites
GPL-S	General planning status (outside parties)
INS-O	Inspection by OSIT
INS-S	Inspection of site structures
LAN-C	Landscape contract
LAN-P	Landscape planning
PUB-B	Public beneficial use notice
PUB-K	Public information kiosk at site
PUB-S	Public sign fabrication
REA-F	Real estate fee title purchase
REA-B	Real estate begin acquisition process
REA-P	Real estate permit acquisition
SPR-D	Site preparation of dike
SPR-C	Site preparation involving clearing/cleaning
SPR-U	Site preparation of unloading ramp
SPR-A	Site preparation for access improvement
SPR-E	Site preparation involving erosion protection (rock)
SPR-R	Site preparation involving reshaping
SPR-M	Site preparation mitigation

TAB 7 - CHANNEL MANAGEMENT PLAN

TAB 7

CHANNEL MANAGEMENT PLAN

Channel Management Plan

Upper Mississippi River 9-Foot Channel System
Corps of Engineers - St. Paul District

1.0 Purpose

The Channel Management Plan is intended to serve as a comprehensive guide for planning, scheduling, prioritizing and budgeting non-dredging channel maintenance related work on the St. Paul District's portion of the Upper Mississippi River system. It will be used as a mechanism for coordinating these activities with other agencies and interested parties. It includes studies, repair, maintenance, and construction work related to wing dams, closing dams, shoreline protection, sediment traps, and other channel control features. The primary objective of this work is to reduce or control dredging requirements to achieve environmental and economic benefits. Other objectives are to provide a safer navigation channel, to use the river's energy for moving sediment to more strategic placement site locations, to reduce shoreline or dredged material placement site erosion that is impacting channel maintenance, and to correct channel maintenance situations that are causing adverse impacts. A related objective of this program is to increase knowledge of sediment transport characteristics for applications to the dredging program. This should result in better decisions on dredging dimensions, predicting dredging requirements and understanding placement site impacts. Work accomplished through the channel management program must be justified by providing a direct benefit to the program or to correct a problem caused by channel maintenance activities.

2.0 Process

There are many locations in the District where channel control structures have been identified for potential repair, maintenance or improvement. Some channel management activities such as repair/maintenance of existing structures or shoreline protection are relatively straight forward or minor in scope, and may not require significant pre-construction study and design.

For more complicated projects the process will be more involved, typically beginning with a scoping phase. The scoping phase includes problem identification, establishment of objectives, definition of the study area, and other steps necessary to begin a study. By definition, scoping involves identifying and initiating coordination with other interested Government agencies and the public.

Alternative identification will be highly dependent on the scope and nature of the problem(s) being addressed. Alternatives are evaluated for their effectiveness in solving the problem, environmental effects, costs, project economic benefits, and other factors as applicable.

Alternatives will be evaluated for their attainment of project objectives, engineering

soundness, environmental acceptability, costs, and social acceptabililty. Plan selection would identify the alternative that best meets project objectives in a cost effective, environmentally acceptable manner.

3.0 Scoping/Early Planning

As noted earlier, the scoping phase includes problem identification, establishment of objectives, definition of the study area, and other steps necessary to begin a study. The following are the major tasks that will need to be completed for each study during the scoping and early planning phase.

A. Problem Identification - All studies will be initiated in response to an identified navigation or channel maintenance problem. The District will identify the navigation or channel maintenance problem the study is to address. The specific causal factors relating to the problem will be described and quantified to the extent possible with existing information. The degree to which causal factors can be managed will also be described.

B. Definition of the Study Area - The study area will be sufficiently inclusive to cover an area that can be considered a geomorphic and hydrologic unit. The study area will generally include the specific river reach of concern and any other areas that may be affected by a structural solution to the identified problem.

C. Identification of Planning Opportunities and Constraints - Opportunities pertinent to the study area, such as locations of beneficial use removal sites, environmental enhancement or restoration opportunities, recreational opportunities etc., will be identified.

All constraints and concerns associated with the study area as well as within the area of project influence will be identified. Beyond the mere identification of areas of concern, those constraints which would seriously affect project implementation would be specifically noted. Constraints may be institutional, hydrologic, engineering, economic, environmental, or social.

D. Define Goals and Objectives - Goals and objectives of the study from the navigation and channel maintenance perspectives will be identified by the District. Resource management agencies will be asked to define environmental goals and objectives for the study area.

E. Formulate Alternatives - Preliminary alternatives will be identified during the scoping phase. Each alternative would meet, at least to some degree, the goals and objectives for the study area. The alternatives need not be detailed at this stage, but a systemmatic array of alternatives and project features would be developed. This step would be conducted as a "brainstorming" session to draw out all potential alternatives and project features.

F. Preliminary Evaluation of Alternatives - A preliminary evaluation of alternatives will be conducted using available information and best educated estimates to assist in the early

screening of alternatives. The goal is to eliminate from further consideration those alternatives that appear to be technically infeasible, environmentally unacceptable, cost prohibitive, or otherwise not worthy of further evaluation. Data collection for this phase of the planning process may be necessary, but would be kept to the minimum possible.

1. Preliminary engineering evaluation - The preliminary engineering evaluation should consider the basic feasibility of the alternatives. Any alternative that has significant questions concerning its technical feasibility would be screened at this stage.

2. Preliminary environmental evaluation - The preliminary environmental evaluation would identify those alternatives that have significant environmental concerns (e.g., significant impacts to adjacent areas, compliance with water quality or other environmental standards, etc.).

3. Cost - A preliminary cost estimate would be obtained for the alternatives, to assist in identifying those alternatives that may be prohibitively expensive or unjustifiable in terms of benefits received.

4. Constraints - All alternatives would be evaluated in light of the identified project constraints. Those that violate a constraint would seriously be considered for elimination from further evaluation. If in the unusual situation that an alternative is not outright rejected because of a specific constraint, the method of evaluating the impact would be laid out.

G. Problem Appraisal Report - A Problem Appraisal Report (PAR) will be prepared which will document and summarize the scoping and early project planning. The PAR would screen the potential project alternatives as much as practicable. Once the PAR is endorsed by the River Resources Forum, the goals, objectives, and alternatives would not change without concurrence by the participating agencies.

4.0 PLAN EVALUATION AND SELECTION

A. Develop Alternatives - The remaining alternative plans would be developed in sufficient detail so that cost, beneficial effects, adverse effects, and probable degree of attainment of planning goals and objectives can be described. Plans would be developed with full consideration of constraints and opportunities that have been identified for the project area. Alternative plans would include all potential project features.

B. Compare Alternatives - The alternative plans would be compared objectively and systematically on the basis of cost, beneficial and adverse effects, and probable degree of attainment of goals and objectives.

C. Select Preferred Alternative - The alternative plan that would best meet the planning

goals and objectives in a cost effective, environmentally acceptable manner would be selected as the preferred alternative.

D. Definite Project Report - The proposed action will be described in detail in a Definite Project Report (DPR). The DPR will include a description of the project planning process, NEPA documentation, a Section 404(b) Clean Water Act Evaluation, and a plan for construction.

5.0 COORDINATION

Throughout the development, planning, and construction of projects, there are varying degrees of involvement with numerous agencies, local interests, and Corps hierarchy. Interagency and public coordination are discussed in further detail.

A. Interagency - With channel management projects, there is involvement with the U.S. Fish and Wildlife Service (USFWS), the U.S. Coast Guard (USCG) and the Departments of Natural Resources (DNR) and Transportation (DOT) from the State within which the project is located and the State bordering the project. This team effort approach has been referred to above, but will be discussed here with more specific details on how this involvement typically would occur. It should be noted that only the minimum number of points at which interagency involvement would be needed are given below. Meetings and telephone conversations with agency representatives which may be needed during plan formulation are not discussed.

1. Initial - When a study it initiated, the agencies will be contacted. Agency representatives who will be directly involved in the project are identified at this time. These representatives are then contacted by the Corps technical manager. Generally a meeting will be held to initiate the study and subsequent meetings/coordination conducted during the scoping phase as needed.

2. PAR Review - The problem appraisal report is prepared by the District technical manager in conjunction with in-house staff. Any assistance needed from the respective agencies will be solicited. A draft copy of this report is sent to each agency for review and comment. The minimum review period for agency review of the PAR would be 30 days. Once comments are received, the PAR will be finalized and submitted to the River Resource Forum for endorsement.

3. DPR Review - The draft Definite Project Report is prepared by the District technical manager in conjunction with in-house staff. Incluced with the draft DPR will be an intergrated environmental assessment, a Section 404(b)(1) evaluation, and other environmental documentation as needed. The public review period for the draft DPR will be, as a minimum, 30 days. Once the public review period has expired and comments are received, the DPR will be finalized and submitted to the River Resource Forum for endorsement.

4. Plans and Specifications - Involved agencies would be invited to attend the in-house meeting which initiates plans and specifications work. Thereafter, they would be invited to attend any meetings at which critical decisions will be made. If effluent discharge is part of the selected plan, the appropriate State water quality agency will be asked to provide input into the design to meet water quality requirements. Towards the end of preparation of the plans and specifications, a Special Use Permit would be obtained from the USFWS if construction is to take place on refuge land. Any other required permits would also be applied for during this time period.

5. Construction - Involved agencies would be invited to attend the pre-construction conference held with the contractor that is to do the work. The required involvement of USFWS, if the project is on refuge land, will be laid out in the Special Use Permit.

B. Public Involvement - The minimum level of public review in the planning process is given below. An increased level of public involvement may be required for the larger, more complex projects.

1. Initial - Public concerns would first be brought to the attention of the District through DNR and USFWS personnel. In instances where a citizen has certain valuable knowledge of the study area, that person may be contacted directly for information. The local entities most affected by a project as well as interested individuals should be identified, if possible.

2. PAR review - During the interagency review of the draft PAR, a public informational meeting may be held, depending on the complexity and scope of the project. This meeting would emphasize two-way communication in which local knowledge of the area and public concerns would be solicited on the one hand and agency thought (as reflected in the draft PAR) would be expressed on the other. Thirty days prior to this meeting, a public notice should be issued. Two weeks before the meeting is to be held, the District public affairs office would put out a news release announcing the meeting. The Minnesota-Wisconsin Boundary Area Commission (MWBAC) would be informed of all meetings as the public notice is sent out.

3. DPR review - Local units of government, organizations, and private citizens identified as having an interest in the project would be provided the opportunity to review the draft DPR. A second informational meeting may be held after the report has been sent out for public review if input received at the first public meeting and from other sources indicates holding the meeting would be desirable. Public notification for this meeting should follow the same protocol as given for the first public meeting.

Channel Control Structures Study and Implementation Schedule

Study	FY 97				FY 98				FY 99				FY 00				FY 01			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Lower Pool 8	FP			DD			FD				IC									
Pool 5		DP	FP						DD			FD/PS	IC							
Pool 3/U. Pool 4							SI						DP	FP				DD	FD	
Lower Pool 2													SI					DP	FP	
Lower Pool 4																	SI	DP	FP	
Lansing Reach																				
Pool 7																				
Pool 5A/Pool 6																				
McMillan Island																				
Unidentified #1																				

Study	FY 02				FY 03				FY 04				FY 05				FY 06			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Lower Pool 8				CC																
Pool 5																CC				
Pool 3/U. Pool 4	PS		IC		CC															
Lower Pool 2			DD	FD		PS	IC		CC											
Lower Pool 4			DD	FD		PS		IC				CC								
Lansing Reach	SI		DP	FP					DD	FD			PS		IC		CC			
Pool 7			SI		DP	FP					DD	FD		PS	IC		CC			
Pool 5A/Pool 6						SI		DP	FP					DD	FD		PS		IC	
McMillan Island									SI		DP	FP					DD	FD		
Unidentified #1											SI		DP	FP					DD	FD
Unidentified #2														SI		DP	FP			
Unidentified #3																	SI		DP	FP

Study	FY 07				FY 08				FY 09				FY 10				FY 11			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Pool 3/U. Pool 4																				
Lower Pool 2																				
Lower Pool 4																				
Lansing Reach																				
Pool 7																				
Pool 5A/Pool 6				CC																
McMillan Island	PS		IC		CC															
Unidentified #1		PS	IC		CC															
Unidentified #2		DD	FD			PS		IC			CC									
Unidentified #3			DD	FD			PS	IC			CC									

SI = study initiation
DP = draft Problem Appraisal Report
FP = final Problem Appraisal Report
DD = draft Definite Project Report
FD = final Definite Project Report
PS = completion of plans and specifications
IC = initiation of construction
CC = construction completion

Channel Management Studies Features Status Table				
Study	**Features**	**River Mile**	**Feature Description/Purpose**	**Completion Date (proposed)**
Pool 3/U4	Carter Slough	807.3R	Construct a spot dike at the mouth of Carter Slough. Dike needed to maintain the integrity of Pool 3 and eliminate the habitat degradation Miss. River flows are causing in Mud Hen Lake.	(2001/2002)
	Restoration of Wing Dams at Big River	805.25 - 804.9L	Restoration of 4 wing dams to improve navigation channel reliability and safety. Wing dams 805.25L, 805.2L, 805.1L, & 804.9L.	(2001/2002)
	Wing Dam Notching (19)	809.5 - 797.5	Improve local bathymetric diversity and enhance secondary channels to improve fish habitat quality. Notched material placed adjacent to each wing dam.	(2001/2002)
Pool 5	Wing Dam Notching (14)	739.8 - 751.8	Improve local bathymetric diversity and enhance secondary channels to improve fish habitat quality. Notched material placed adjacent to each wing dam.	(Spring 2001)
	Head of West Newton Chute, Is. 42 Stabilization	750.0R	Bank stabilization to prevent an increase in flows down West Newton Chute. Keep flows in main channel.	4/27/2000
	Wing Dam #9 at Belvidere Slough	748.1L	Fortify wing dam to prevent navigation channel from migrating towards the Head of Belvidere Slough.	4/27/2000
	Belvidere Slough/Probst Lake Bank Stabilization	748.0L	Stabilize the bank to prevent the channel from enlarging, which would result in the degradation of Probst Lake. Keep flows in main channel.	8/9/2000
	Wing Dam #84 Rehabilitation & Extension	746.6R	Modify the wing dam to concentrate navigation channel flows, in turn scouring a deeper navigation channel.	11/12/1999
	Roebuck's Run Bank Protection, Day Mark Wing Dam & Rock Liner Fortification	746.6L	Stabilize Roebuck's Run to prevent the channel from enlarging. Reduces the potential for future losses of flow from the navigation channel and associated channel maintenance problems. Also maintains hydraulic forces acting to enlarge openings to Weaver Bottoms, a desired condition for habitat restoration purposes.	11/12/1999
	Wing Dam #85 Rehabilitation & Extension	746.4R	Modify the wing dam to concentrate navigation channel flows, in turn scouring a deeper navigation channel.	11/12/1999
	Construct Small Island Complex in Lower Belvidere Slough	N/A	Restore and enhance habitat quality and diversity in lower Pool 5. May also result in more efficient and economical beneficial use of dredged material.	(Next dredging event in Lower Pool 5)
Pool 8	Root River Wing Dam Notch	694.0R	Improve localized fish habitat quality.	5/27/1999
	Crosby Slough Closing Dam Stabilization & Liner Construction	690.3L	Stabilize the existing closing dam and construct a rock liner to prevent the channel from deepening. Keep flows in main channel.	(Post Pool 8 Drawdown)
	Is. 116 (Lawerence Lake) Protection & Stabilization	690.2R	Stabilize & protect island from erosion & reduce flows down secondary channel/increase flows down main channel. Benefits local aquatic habitats and reduces local channel maintenance requirements.	7/21/2000
	Wing Dam Rehabilitation	690.2L	Raise and extend 3 wing dams to increase main channel velocities/reduce local channel maintenance requirements.	(Post Pool 8 Drawdown)
	Revetment Notching	683.5R	Stimulate growth of local backwater channels.	7/24/2000

TAB 8

DREDGE CUT
AND
PLACEMENT SITE
LOCATION MAPS

Channel Maintenance Management Plan
Dredge Cut and Placement Site Location Maps
Index of Maps and Legend

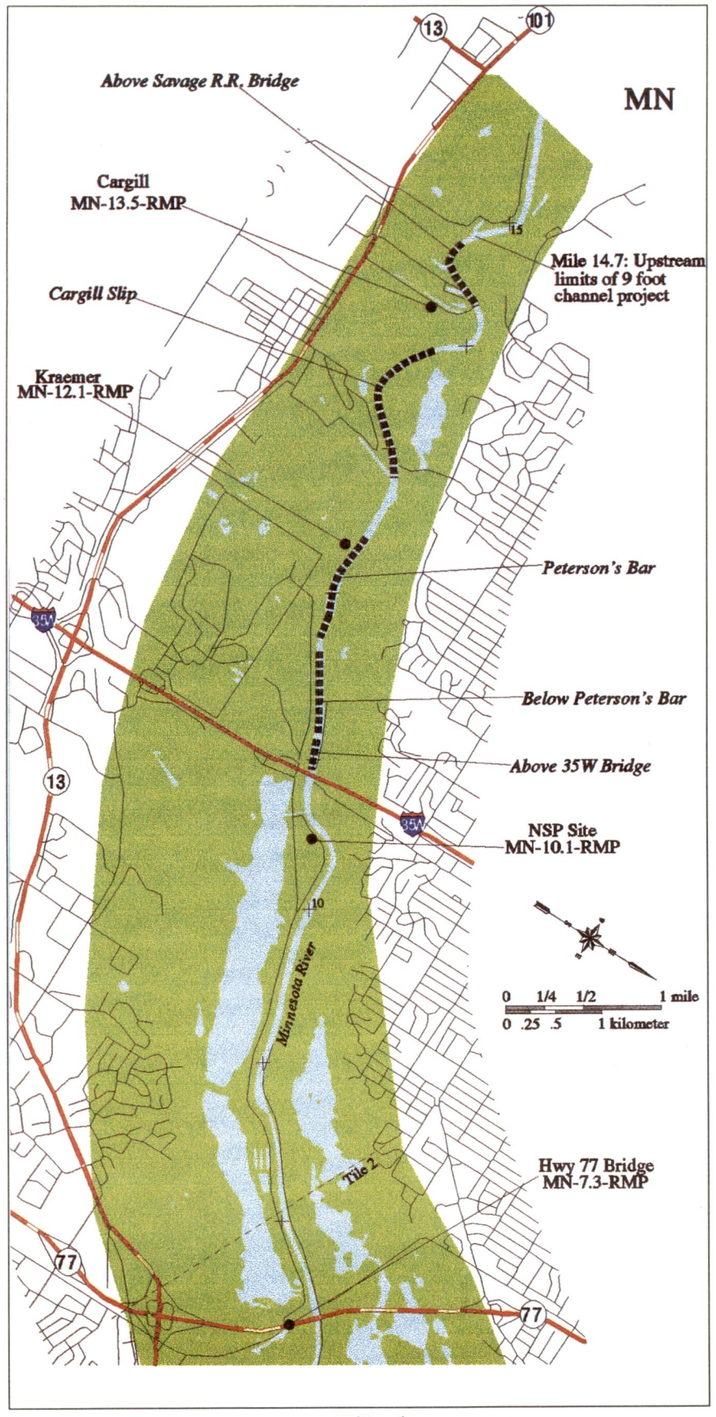


Legend

- Land
- Water
- Dredge Material Placement Sites
- Historic Dredging Location
- Primary Highways
- Secondary Highways
- Interstate
- U.S. Route
- State Route
- Match Line

Data for these maps were interpreted from aerial photographs. Photos used as base information for pools 1-3, 9, and 10 were taken in 1975. Photos used for pools 4-8 were taken in 1989. Data for the Minnesota River and upper pool 1 were compiled from the National Wetlands Inventory / U.S. Fish and Wildlife Service.

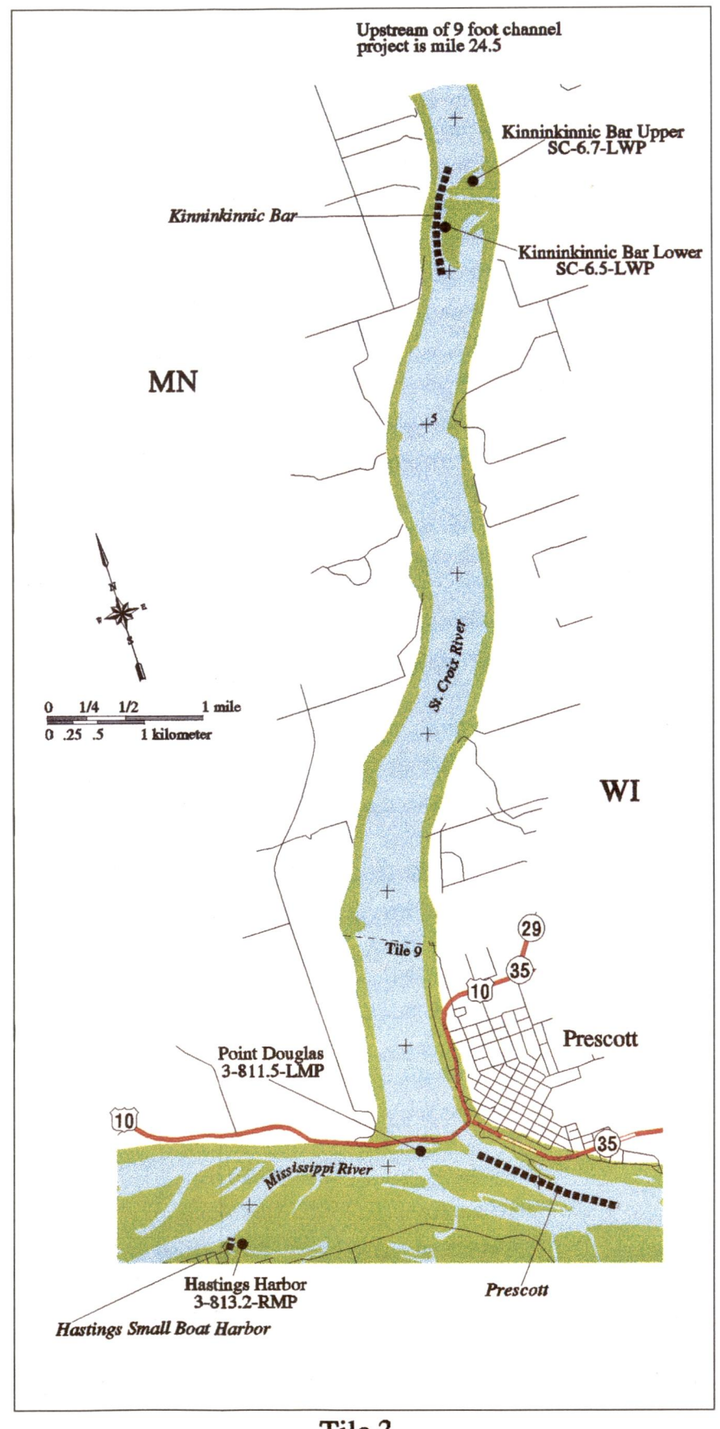
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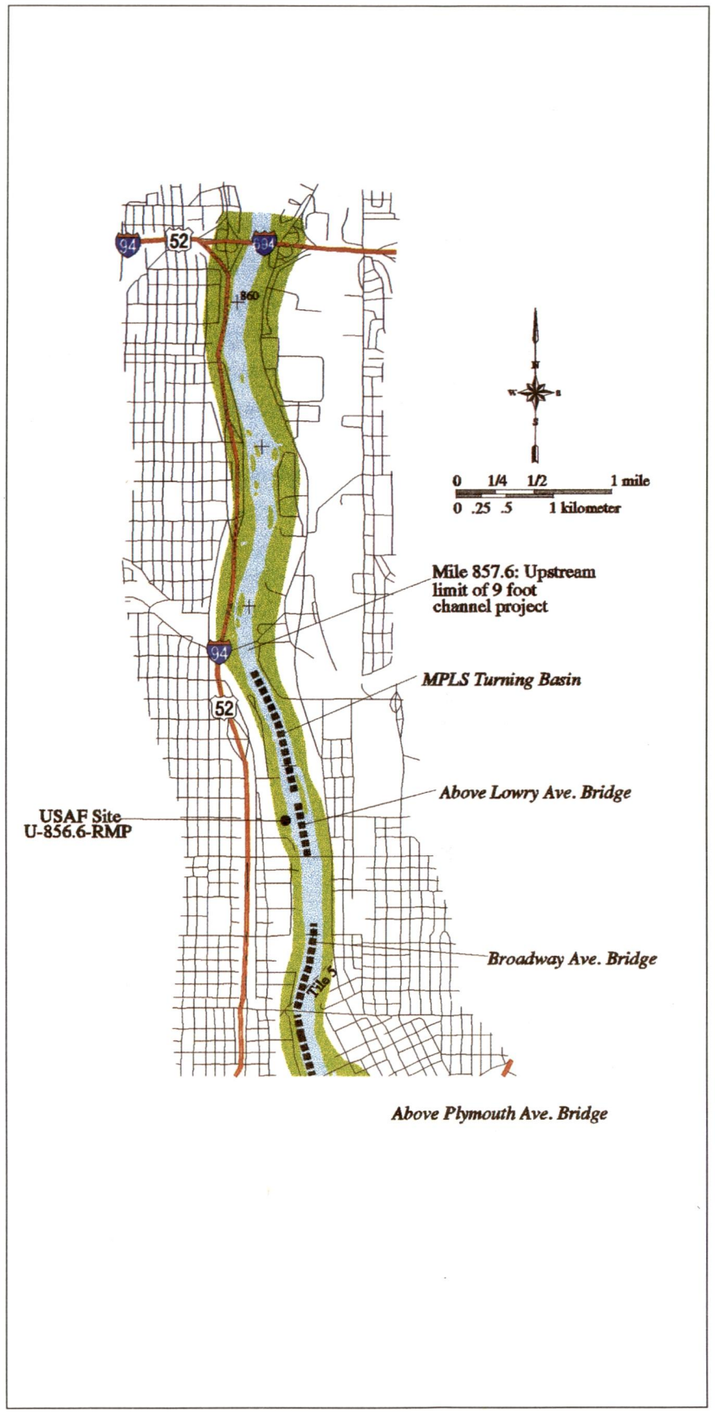


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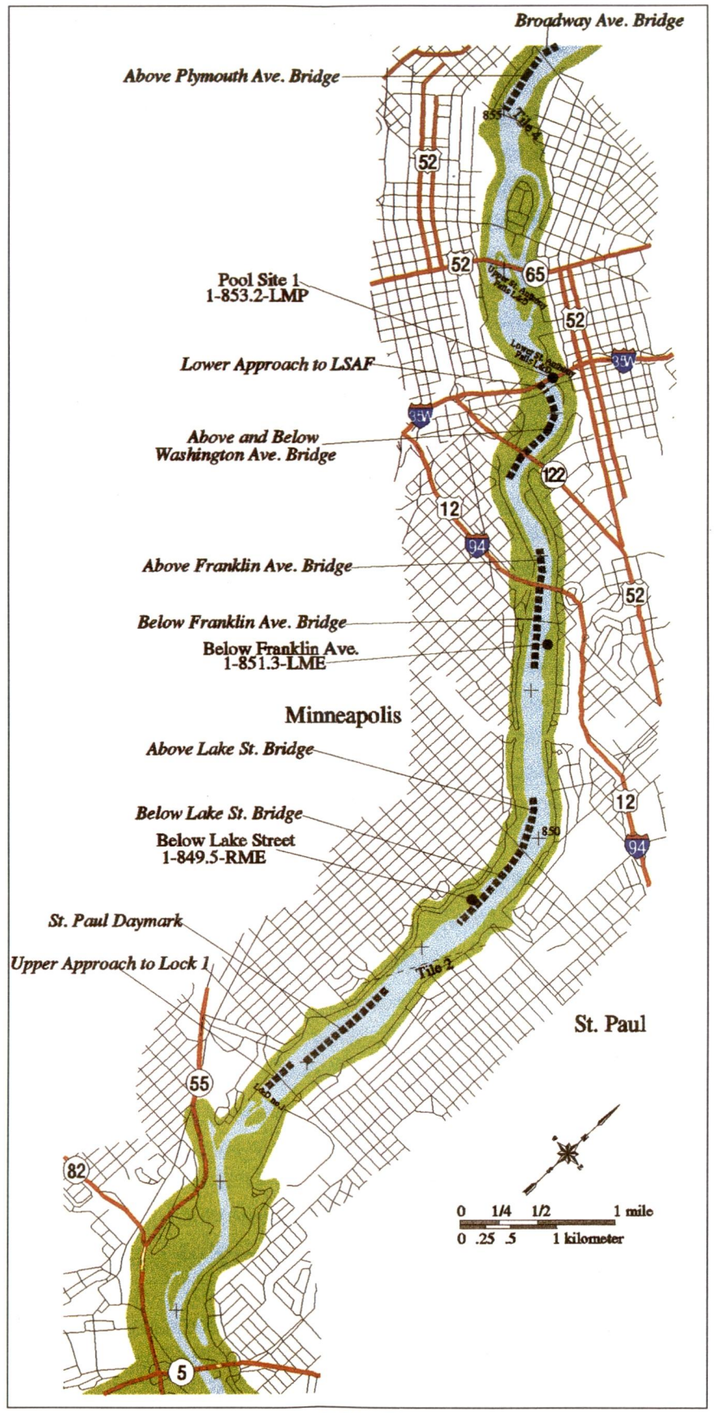


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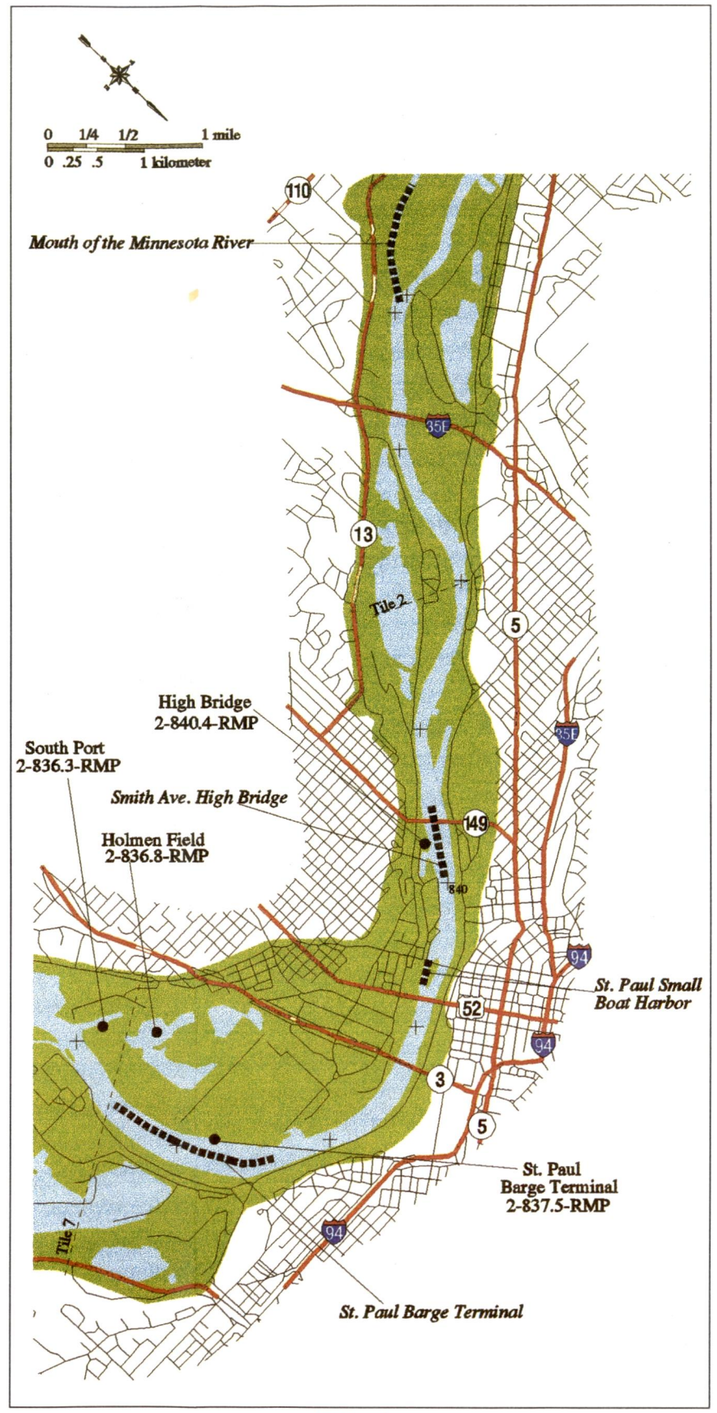
MN River: Mile 15 to 0 & St. Croix River: Mile 7 to 0



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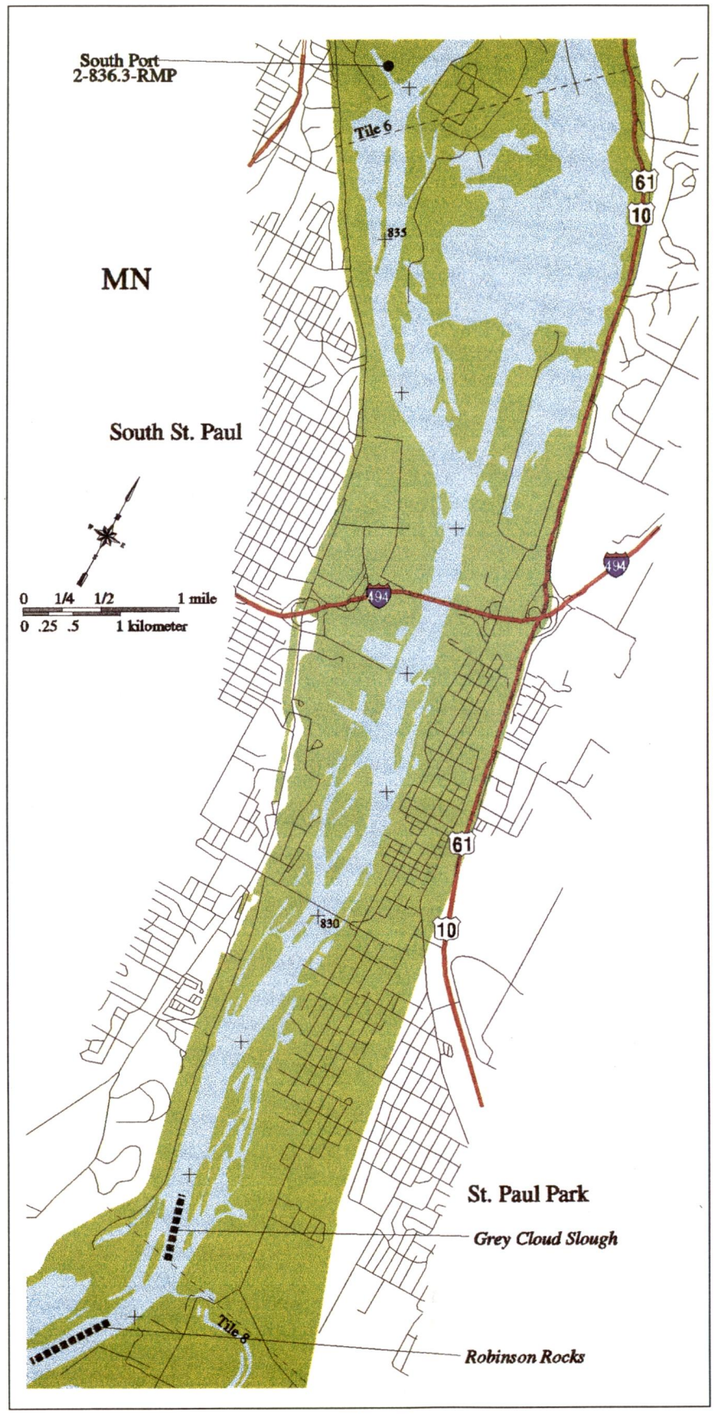


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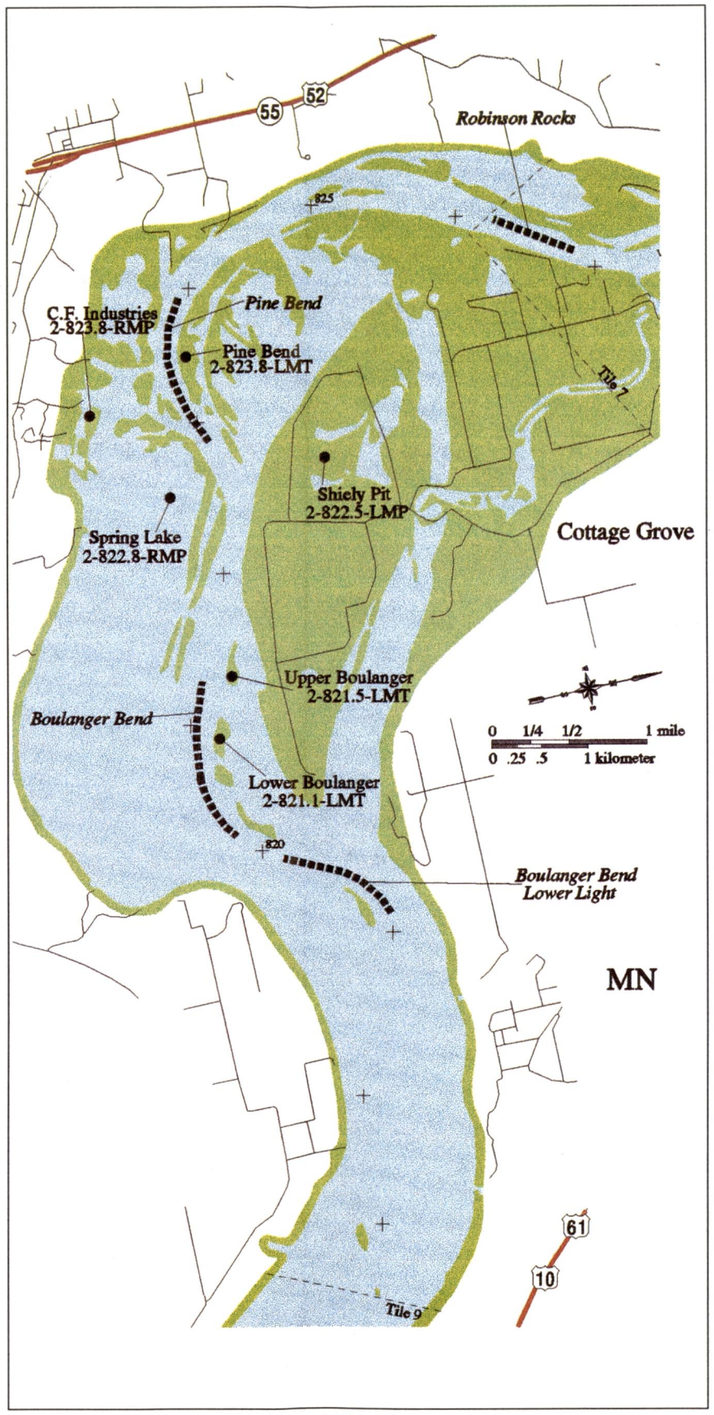


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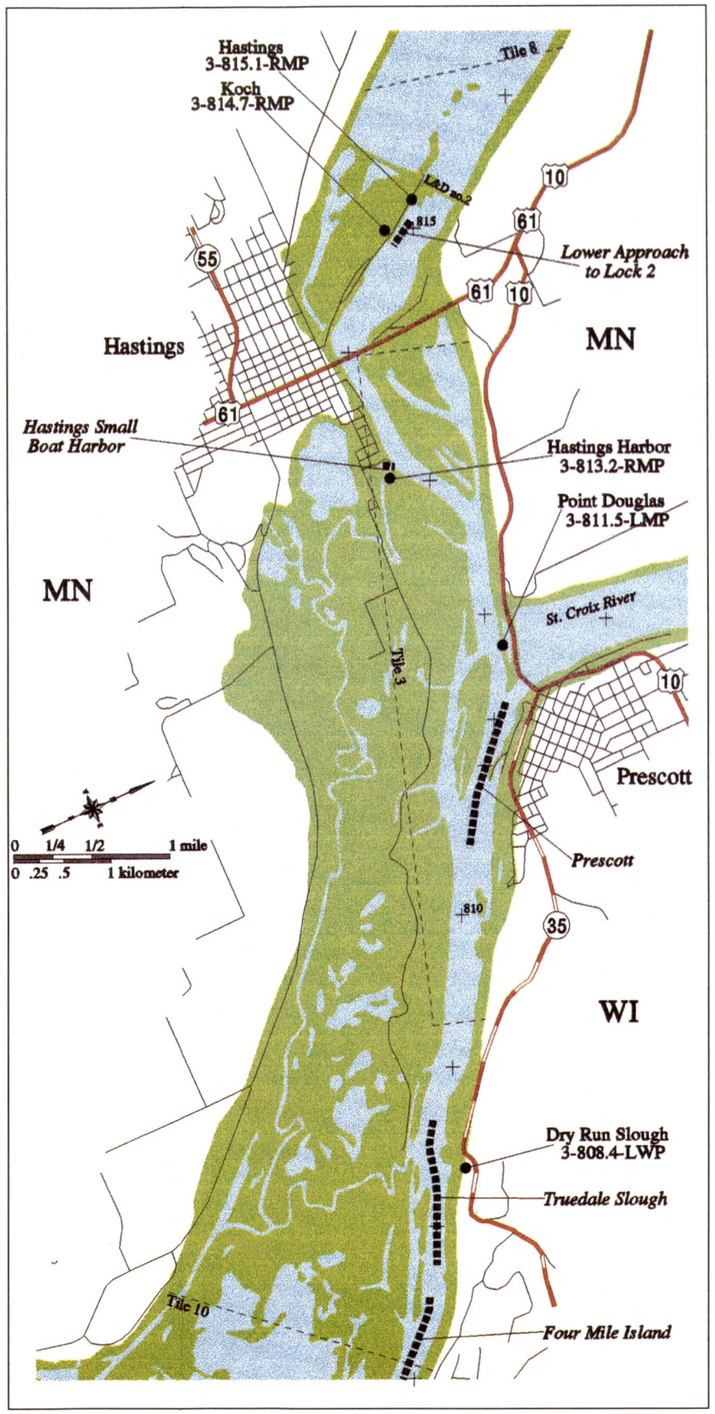
Pools USAF, 1, & 2: Mile 860 to 836



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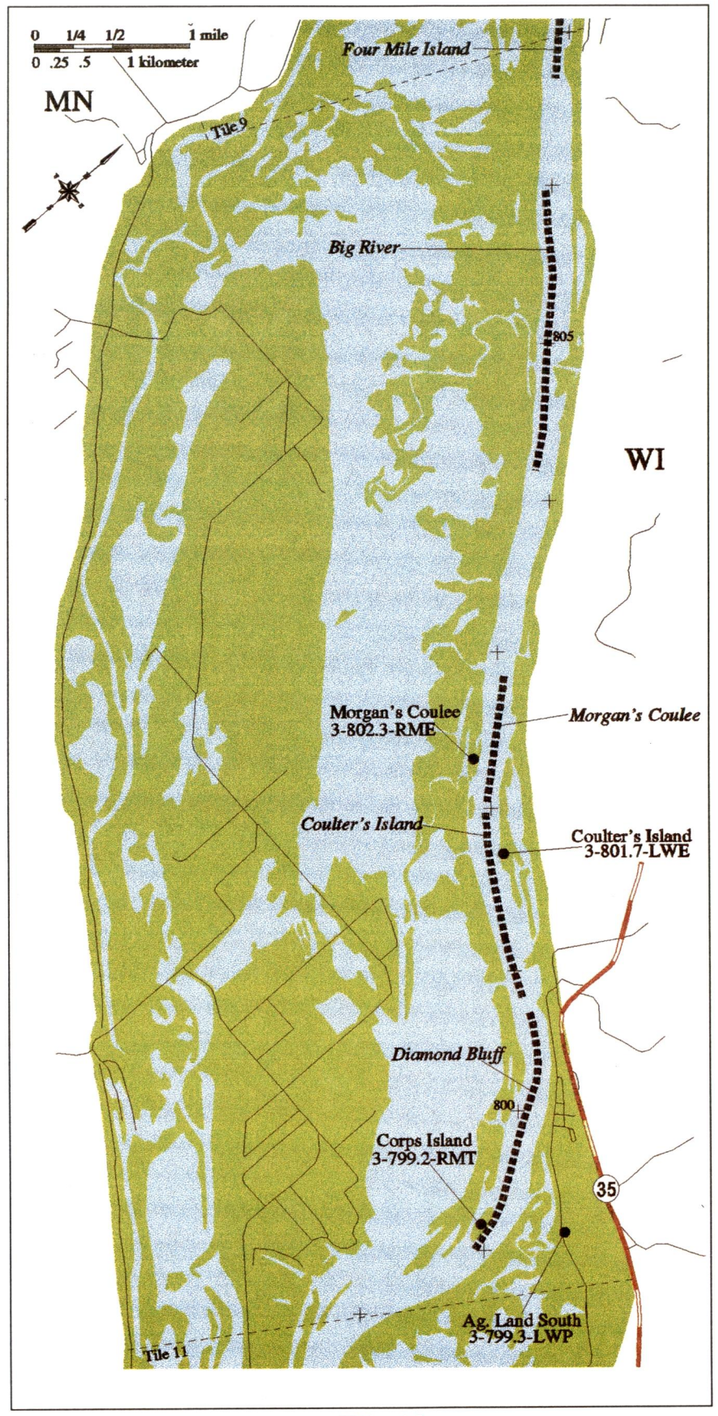


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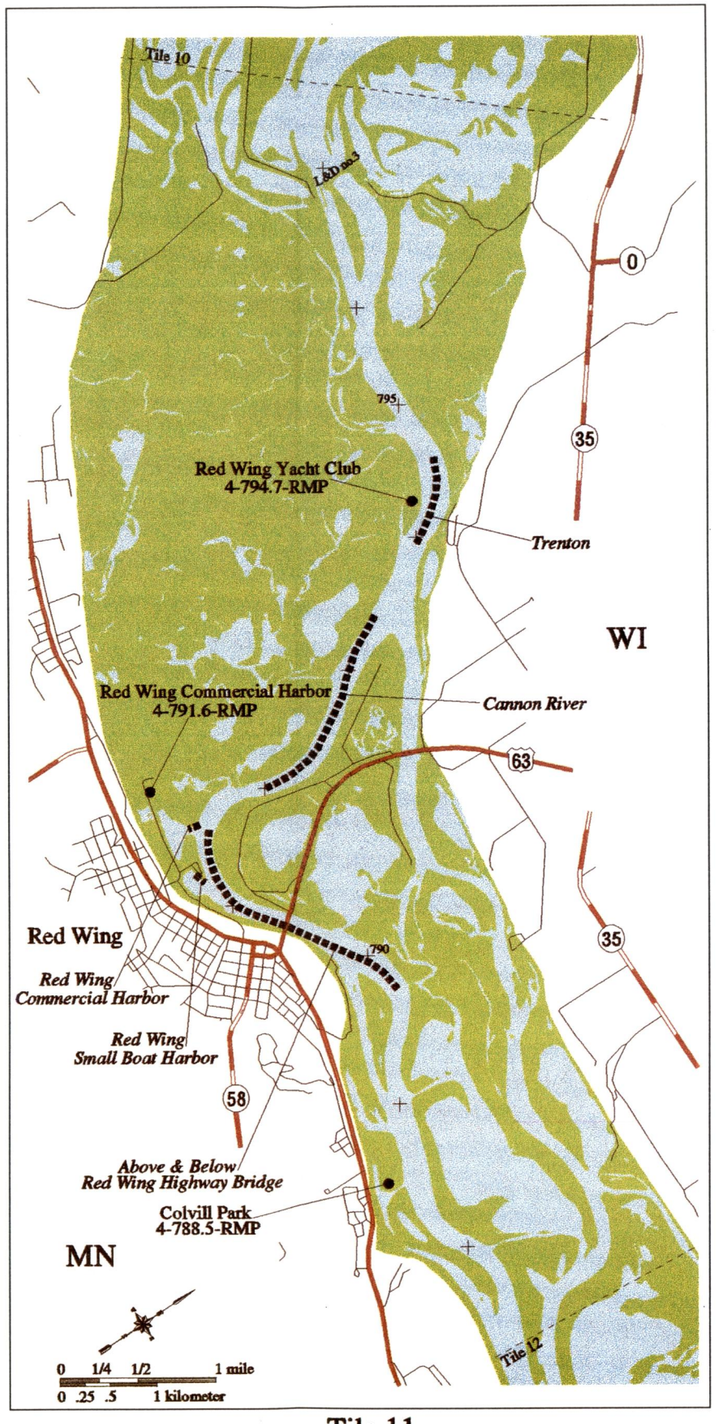


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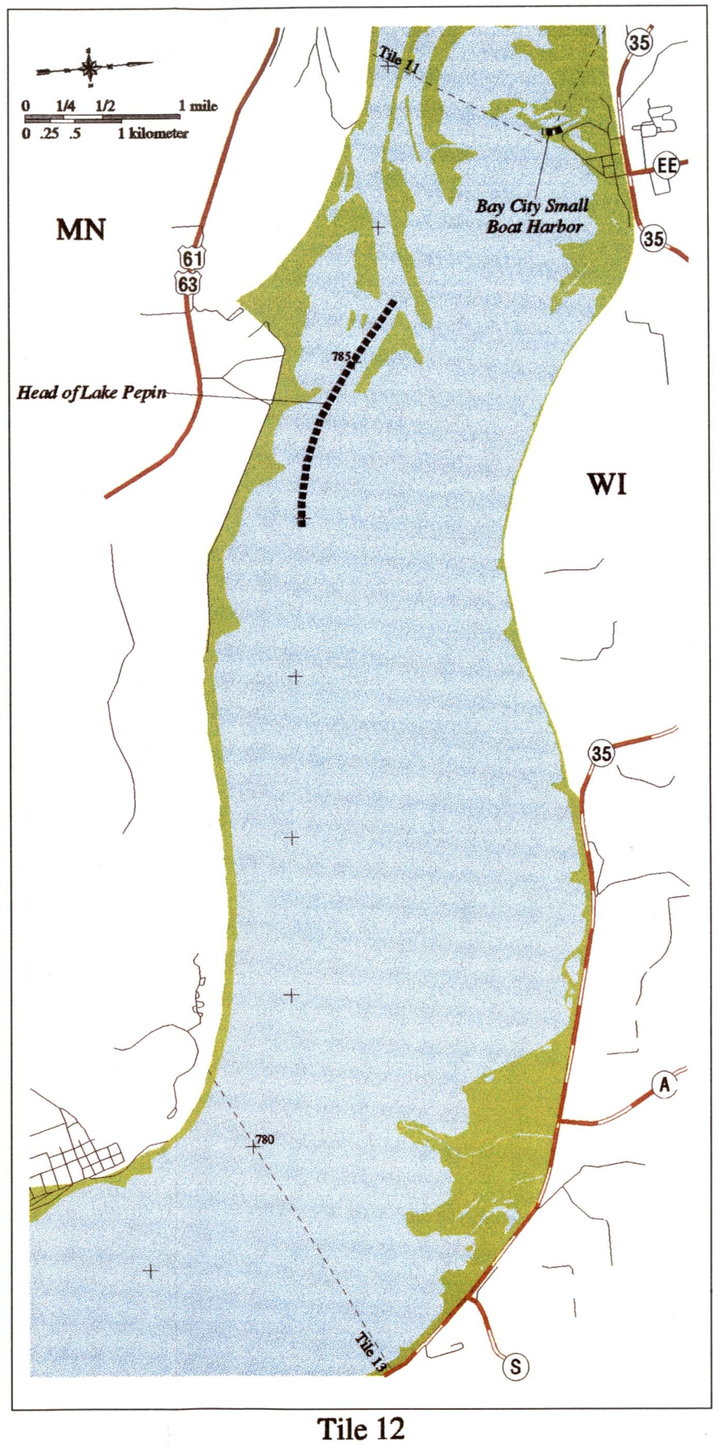
Pools 2 & 3: Mile 836 to 807



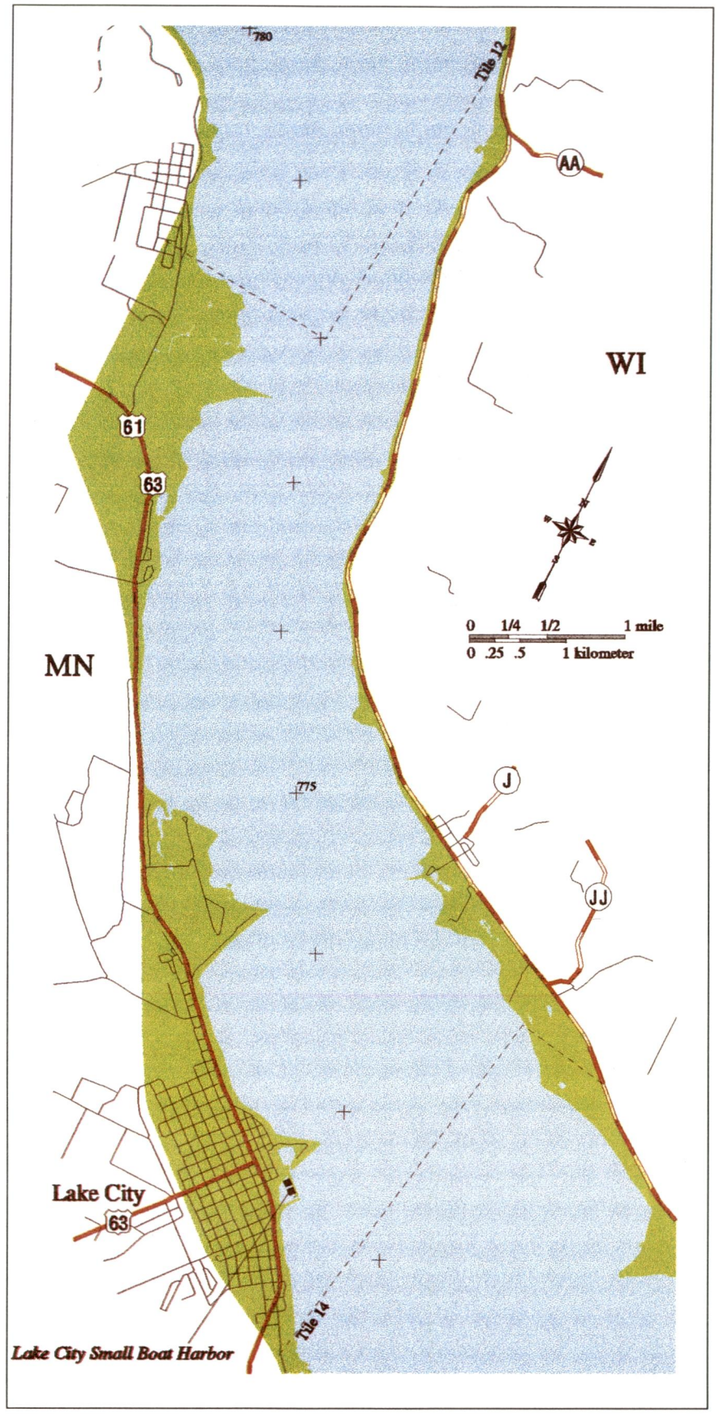
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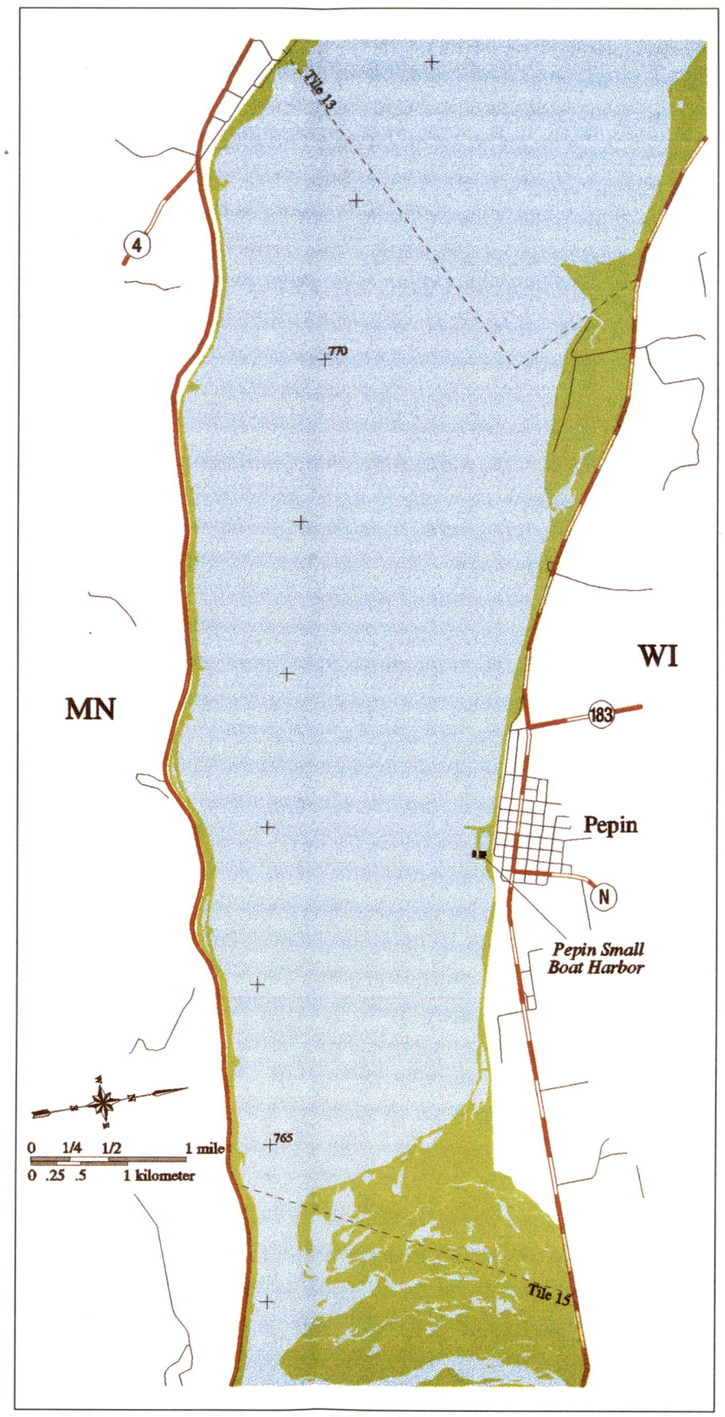
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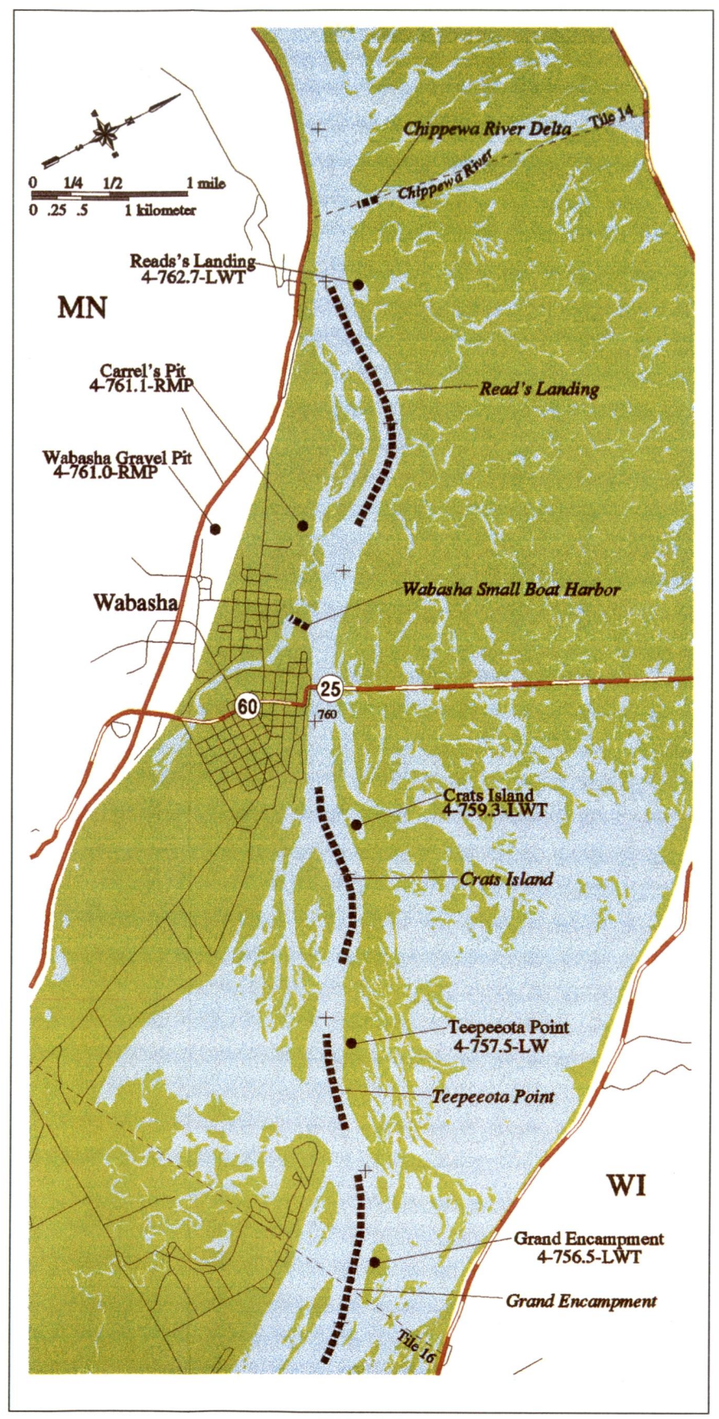
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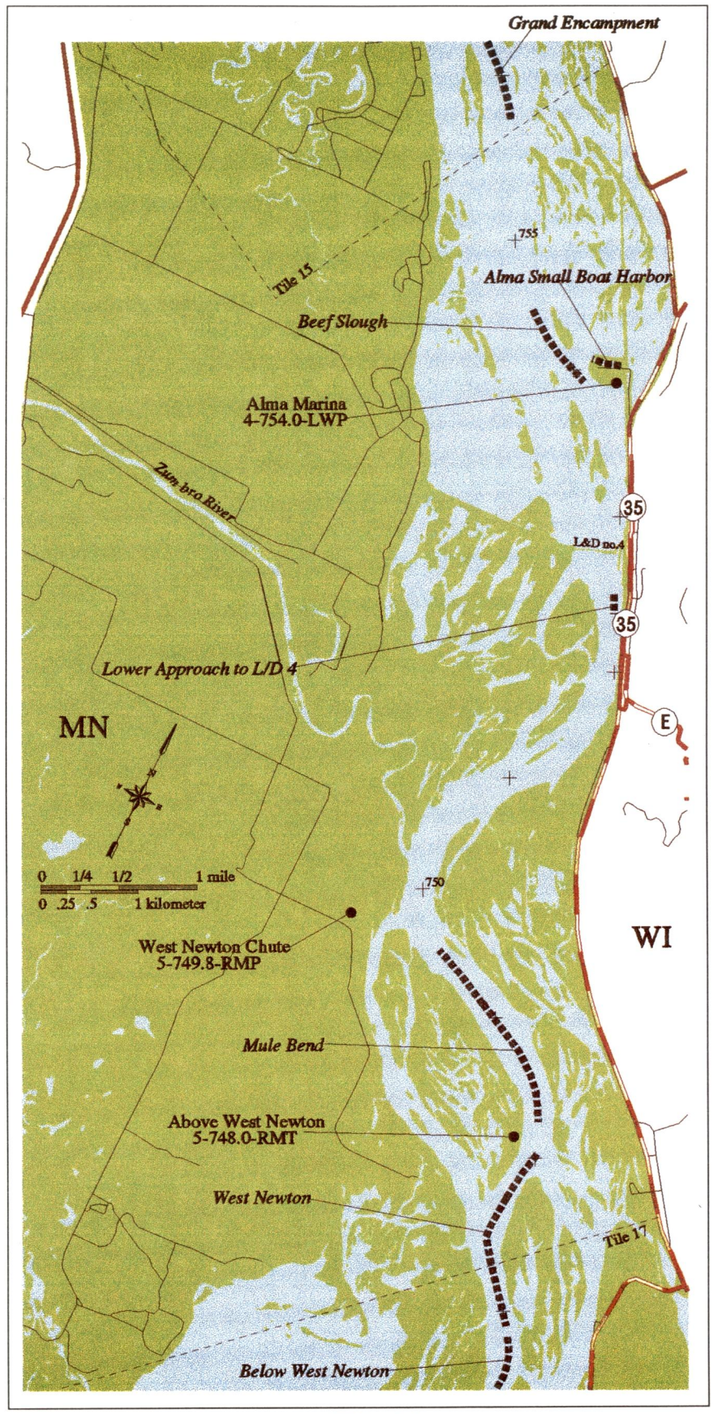


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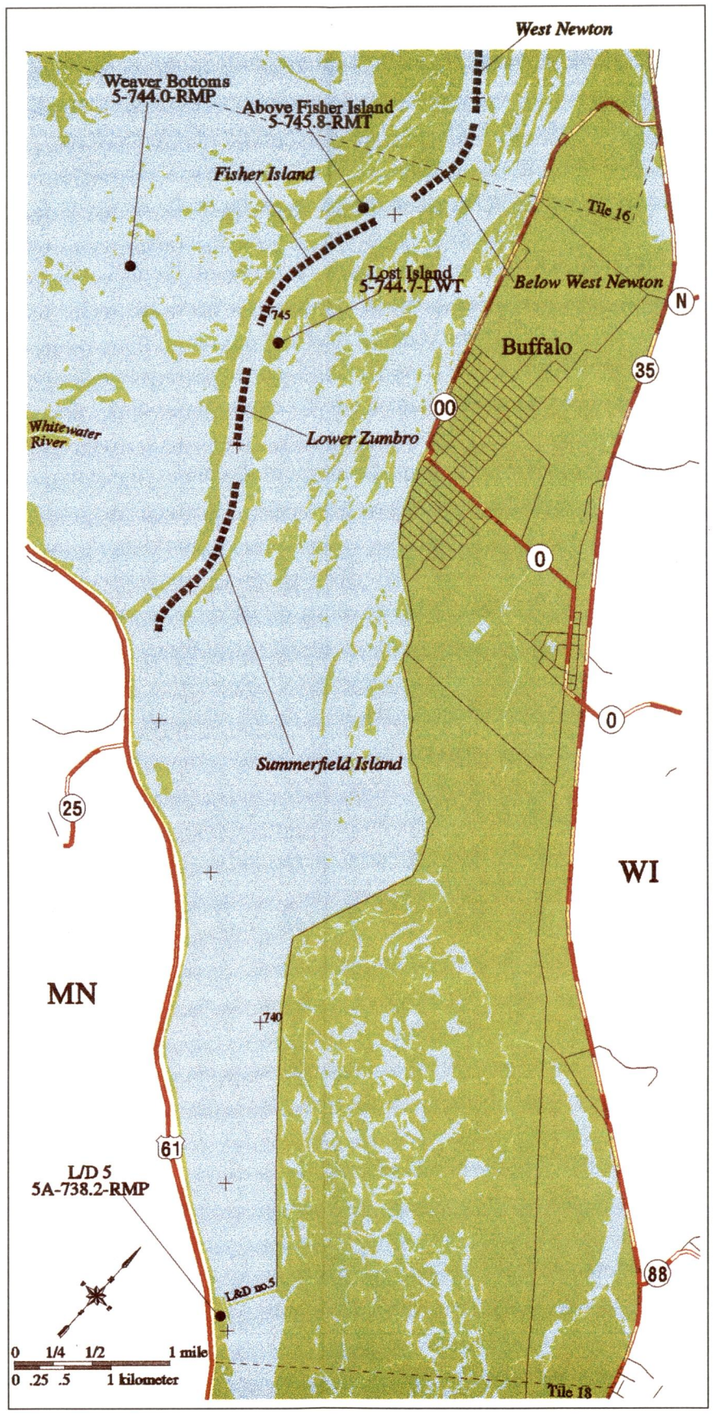


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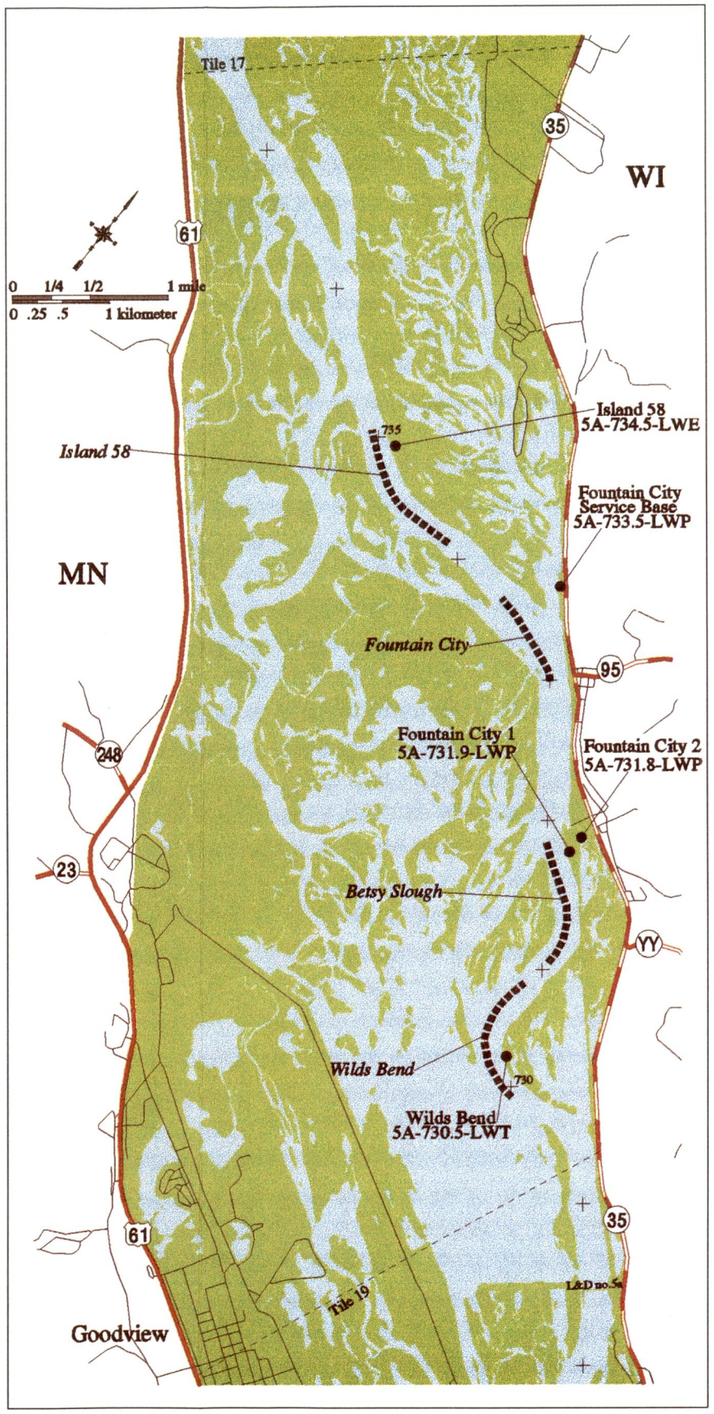
Pool 4: Mile 779 to 756



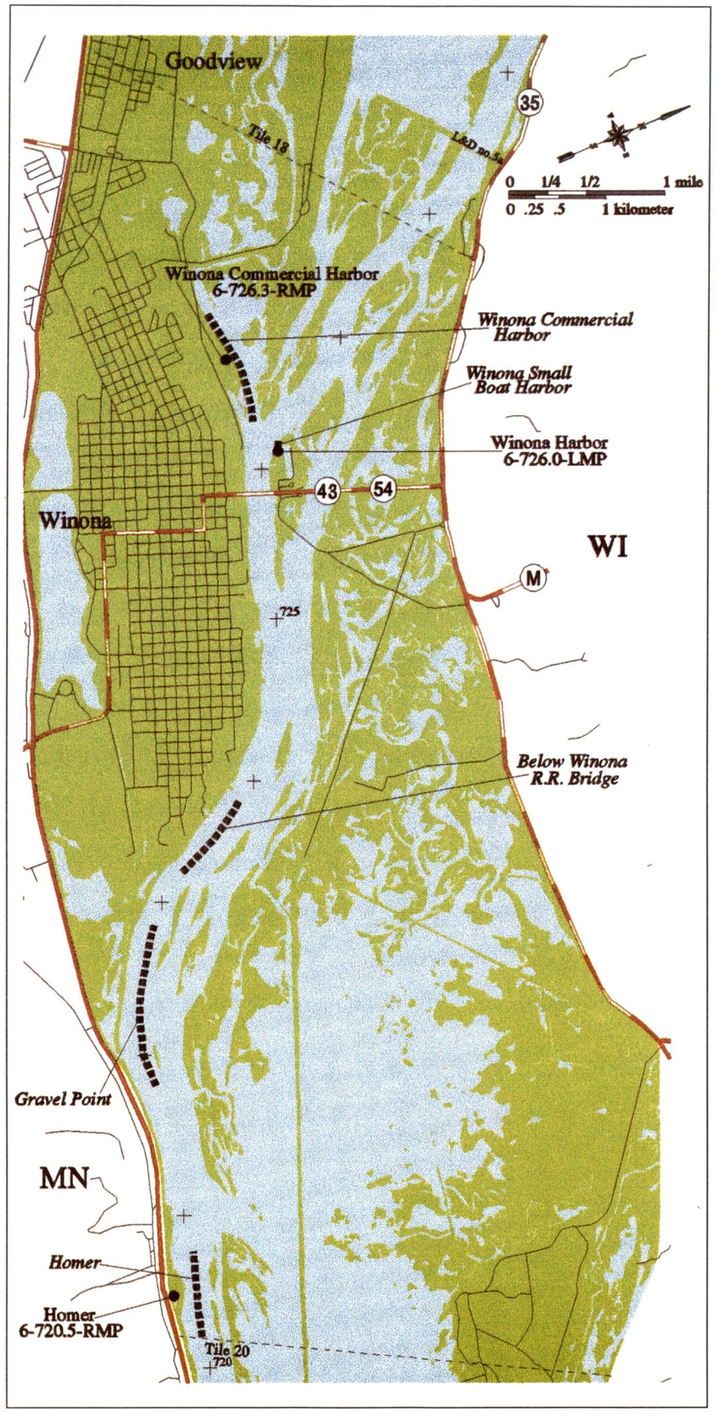
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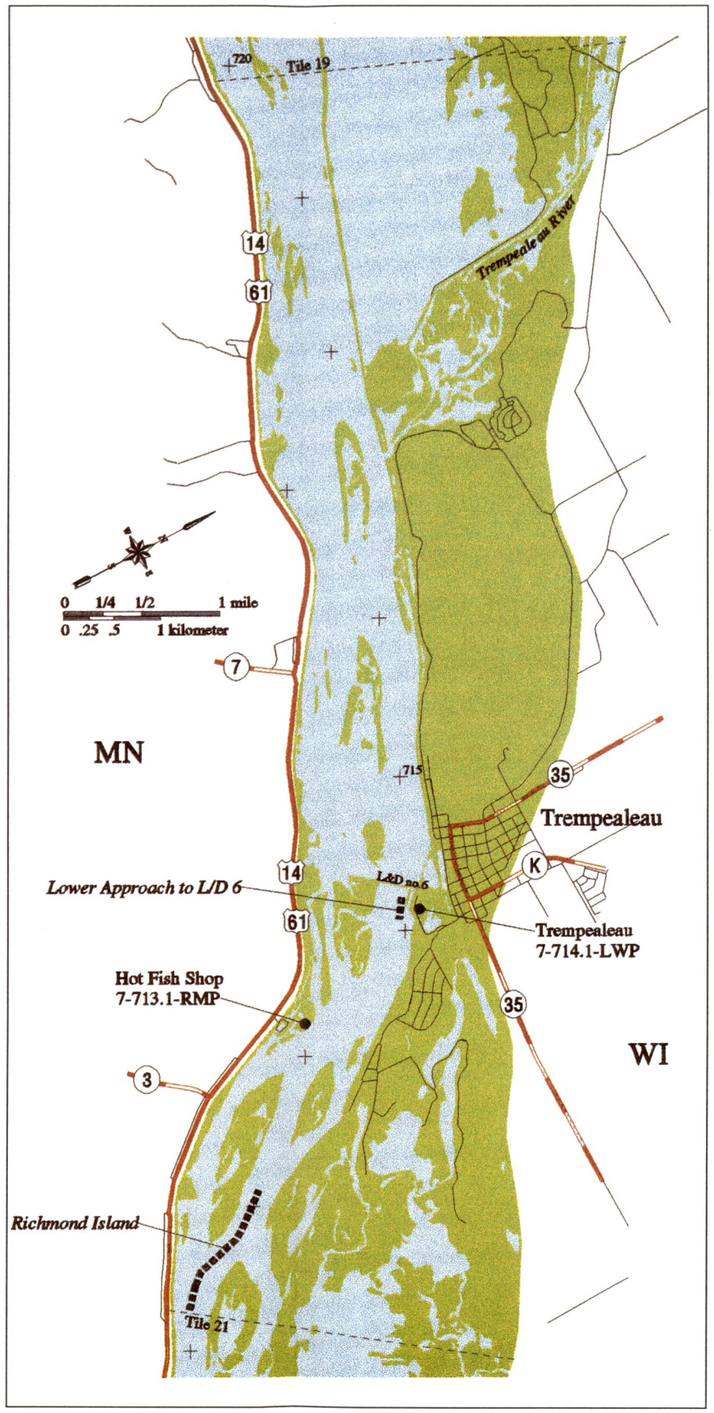
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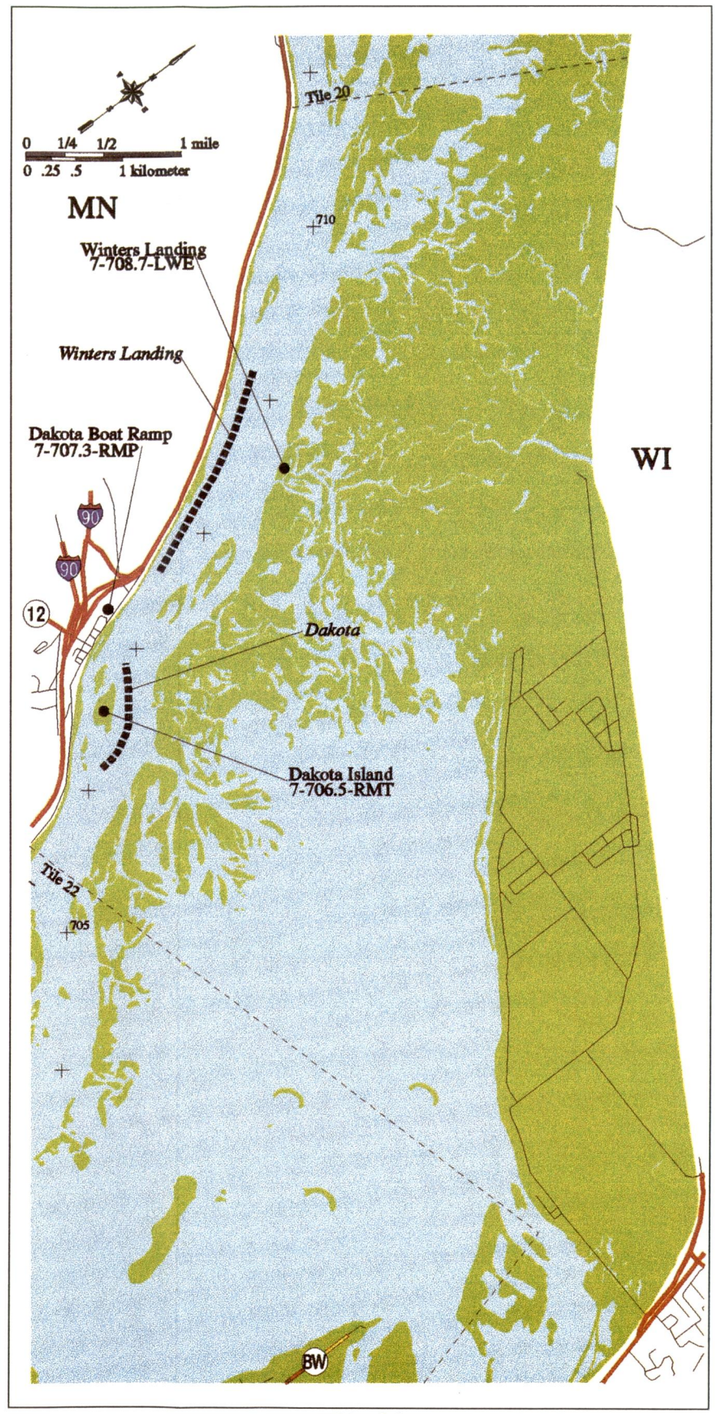
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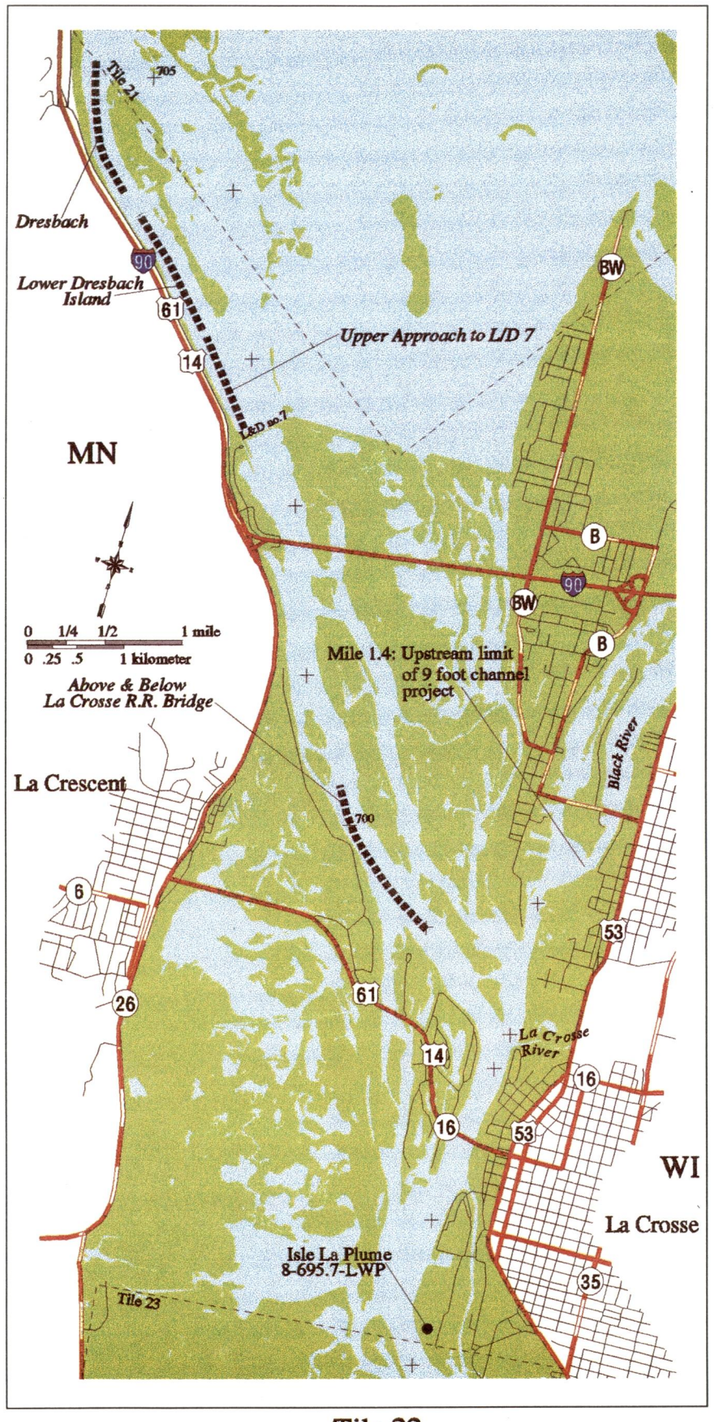


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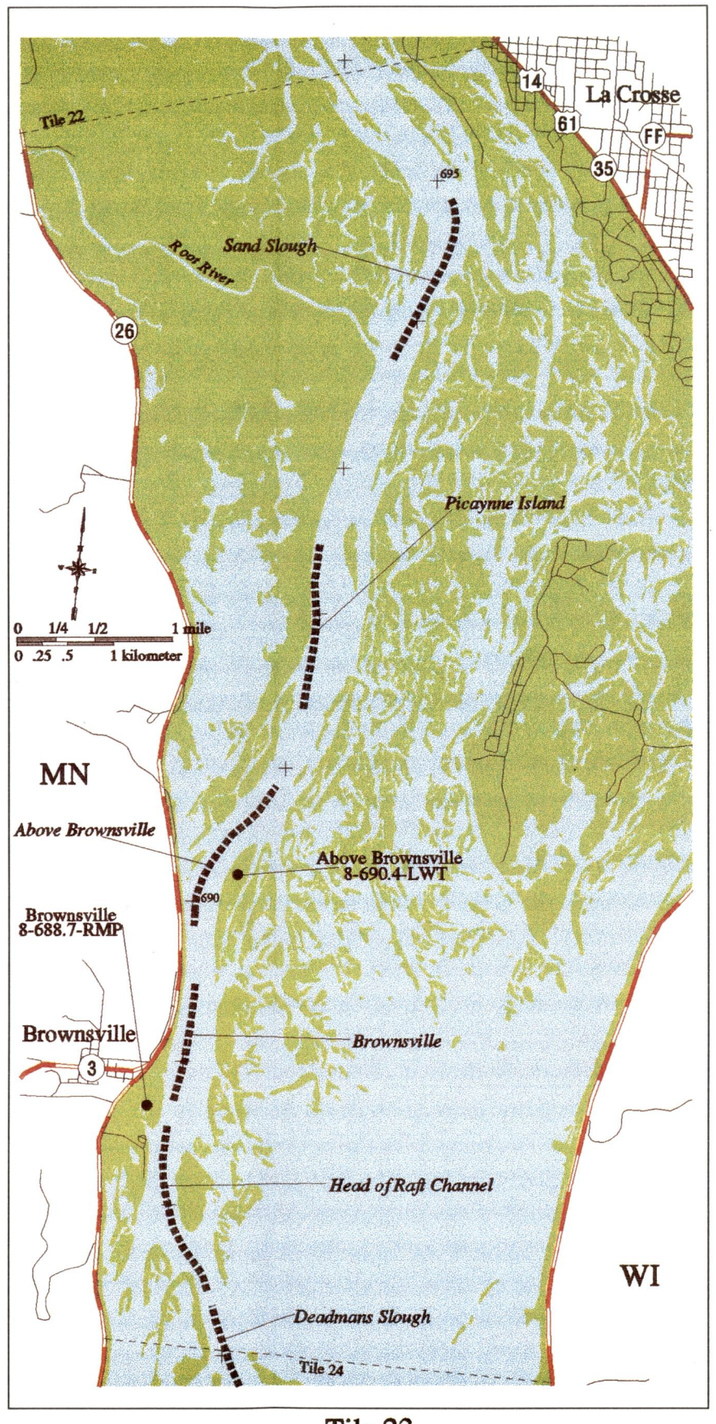


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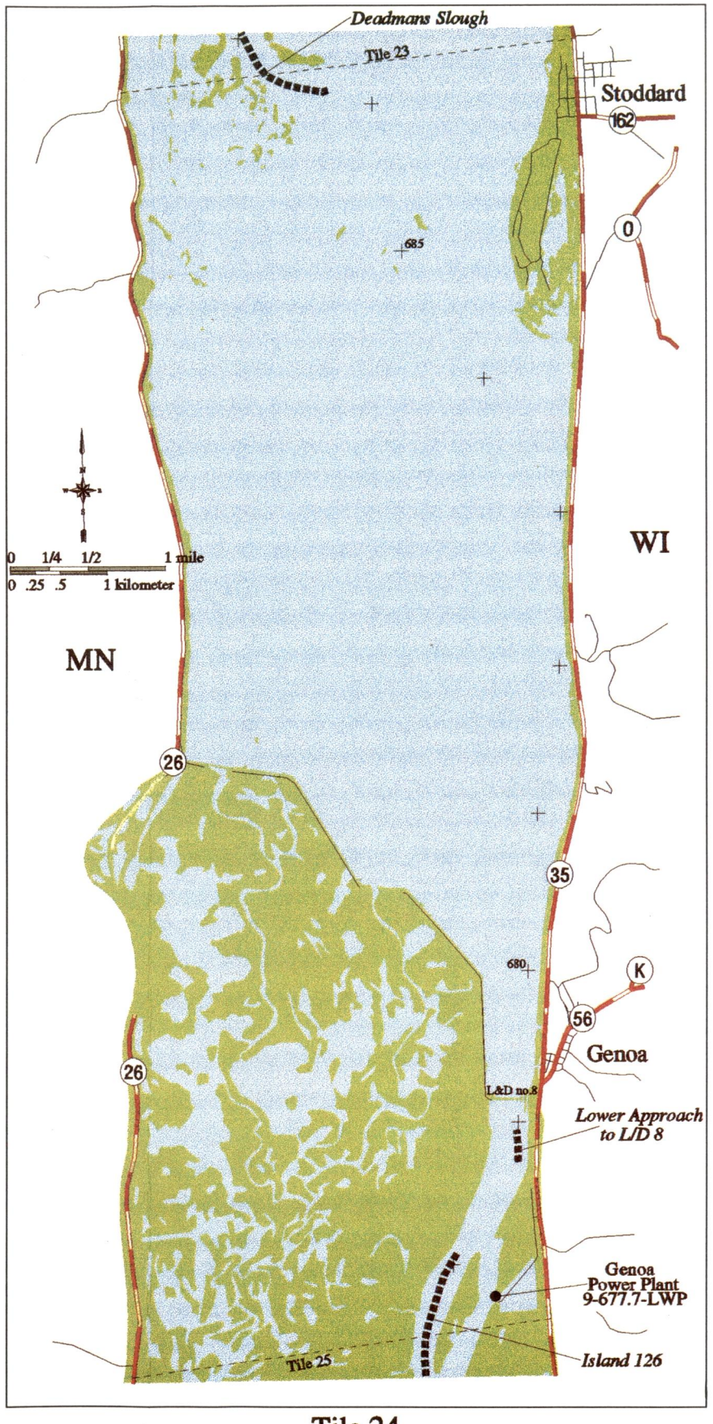
Pools 5A, 6, & 7: Mile 729 to 705



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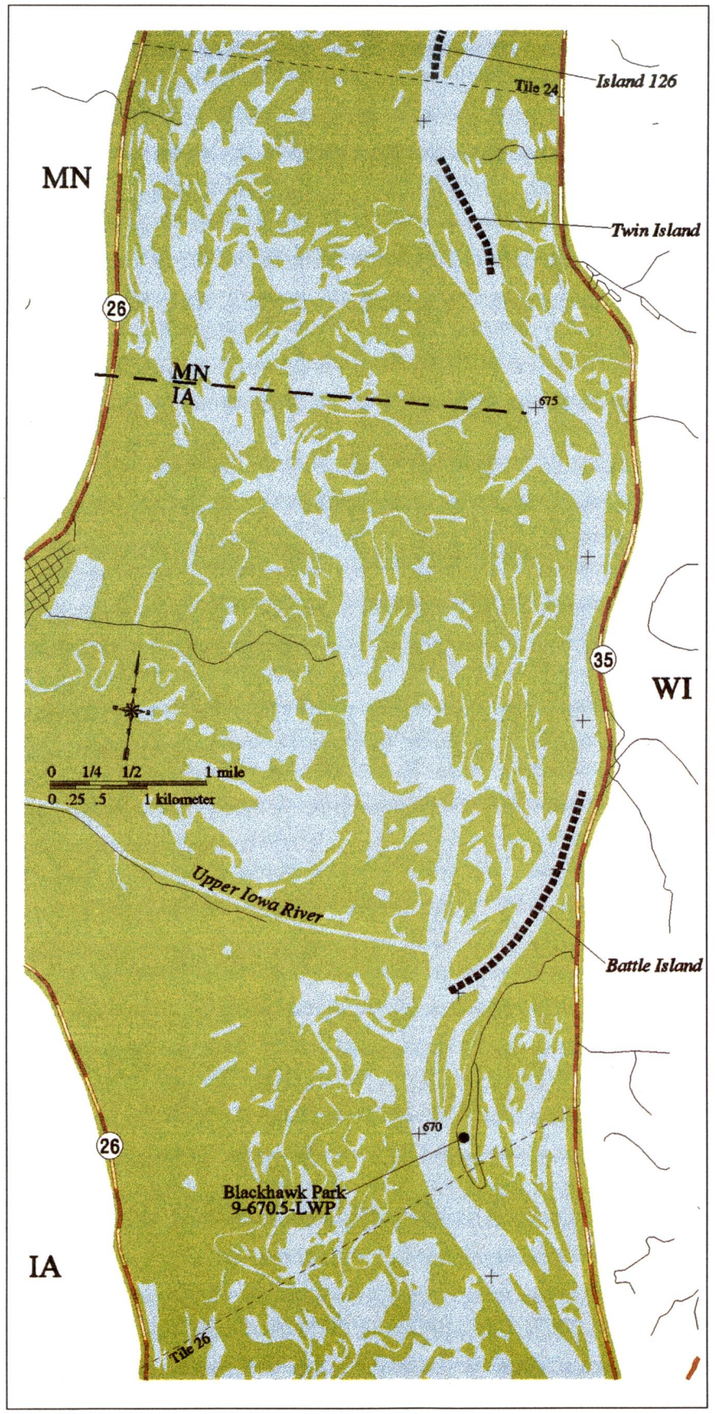


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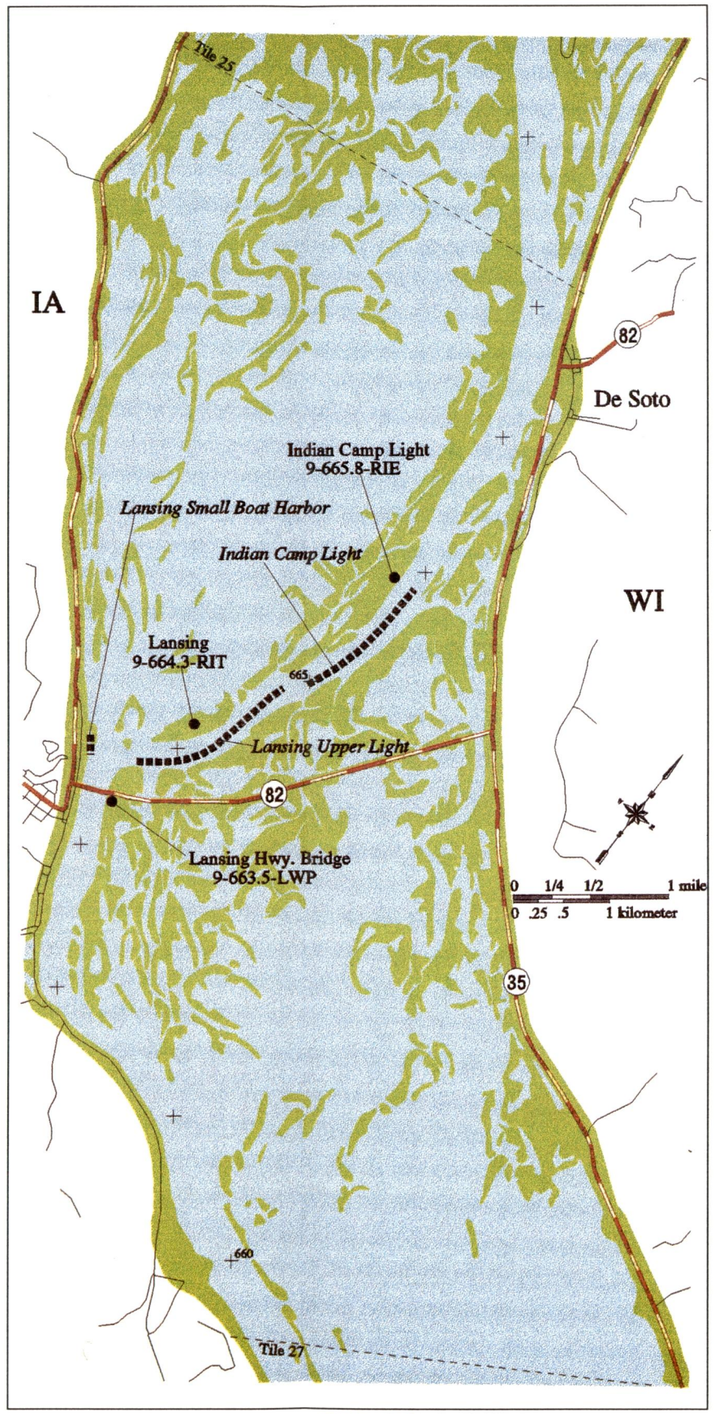


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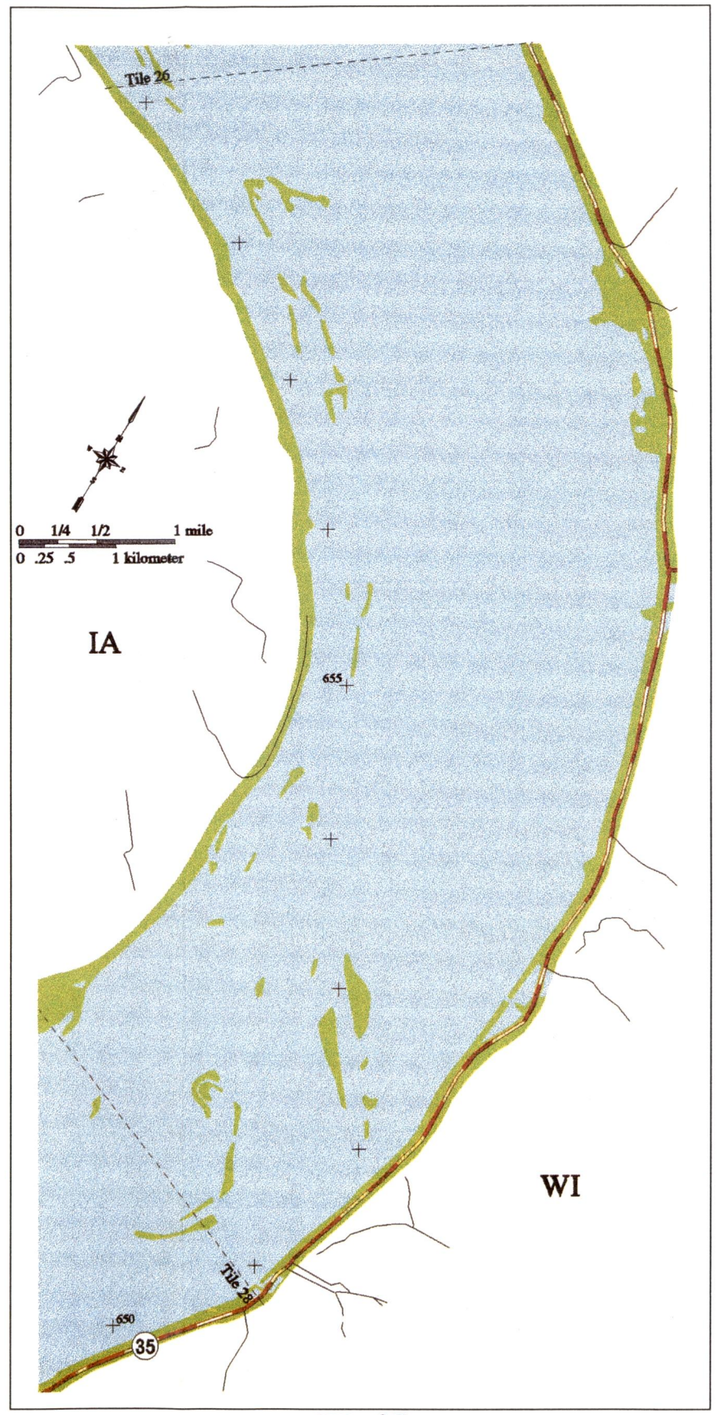
Pools 7, 8, & 9: Mile 705 to 678



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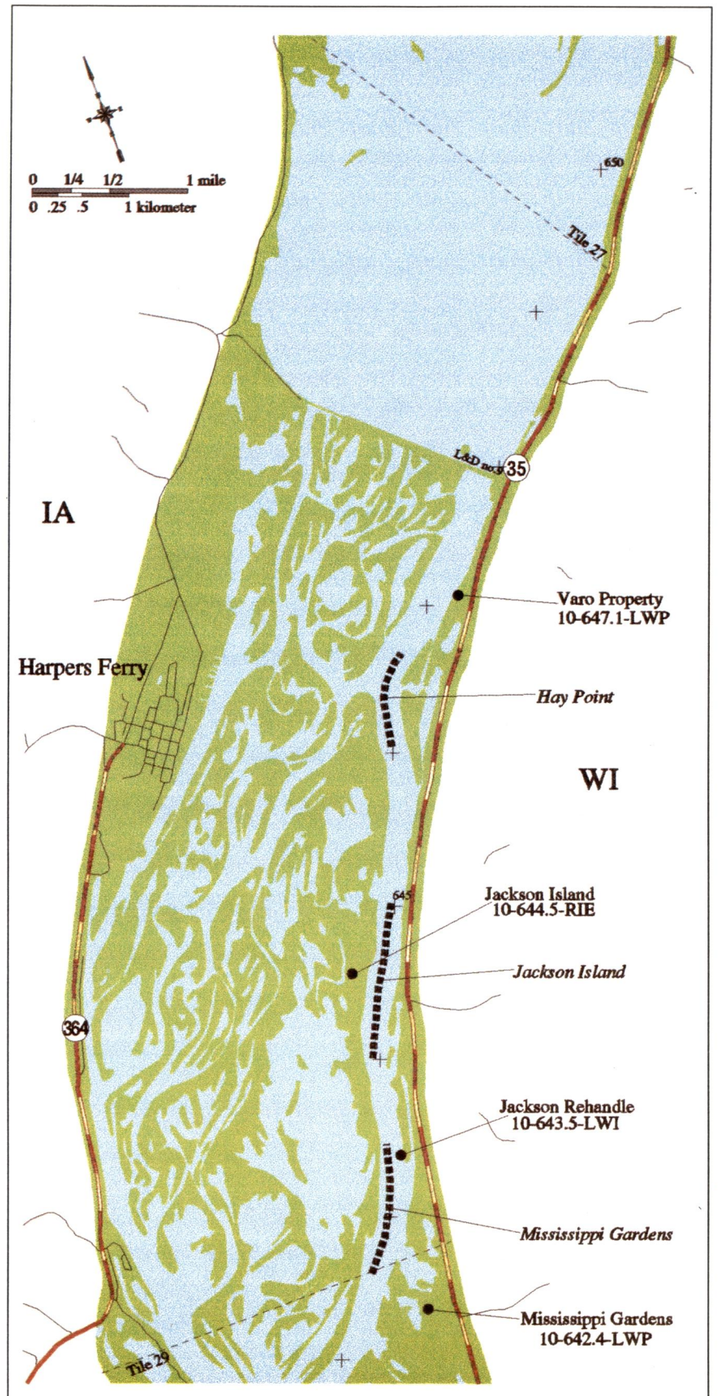


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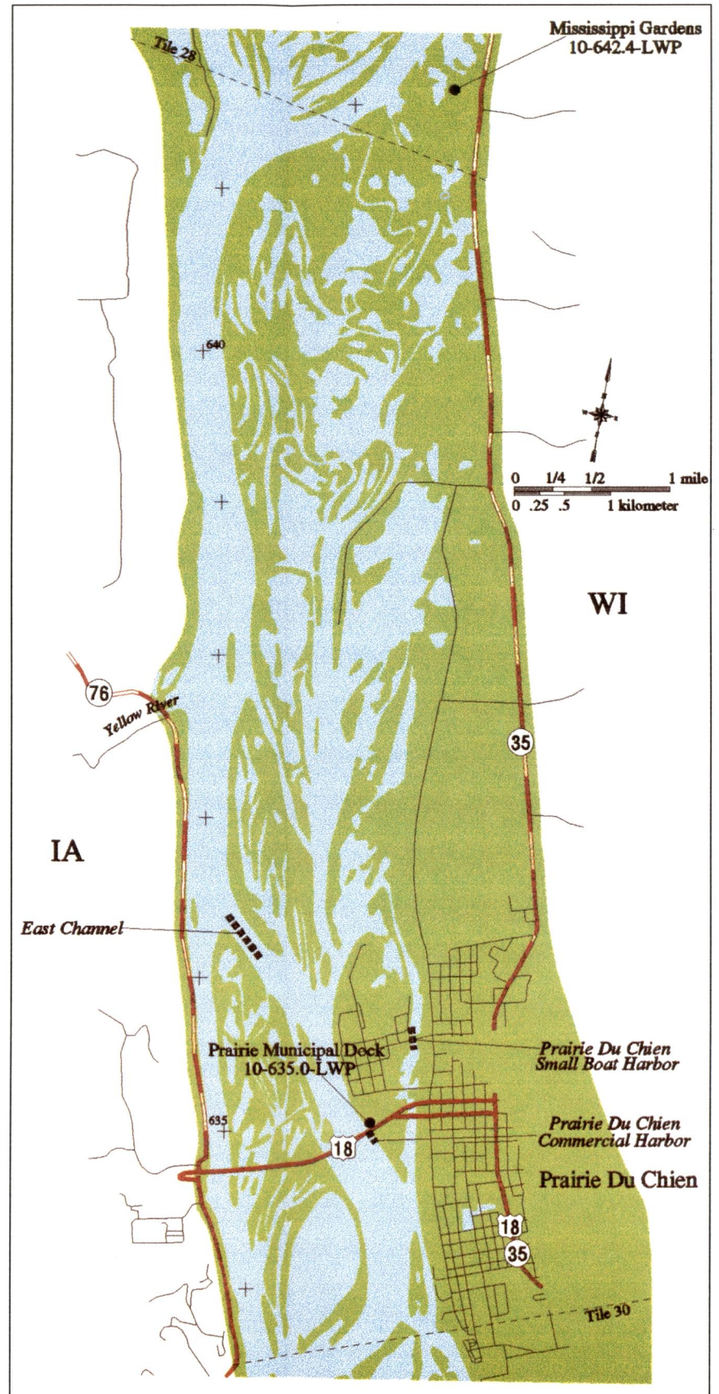


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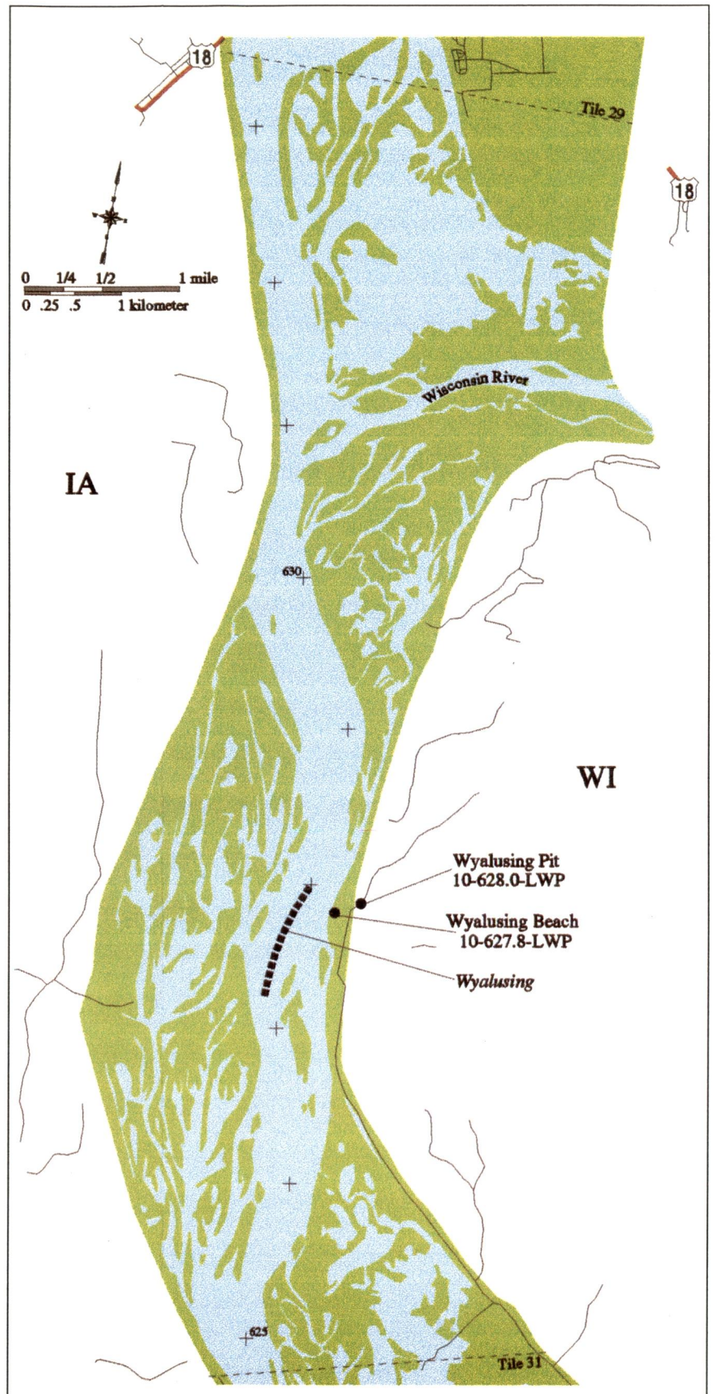
Pool 9: Mile 678 to 650



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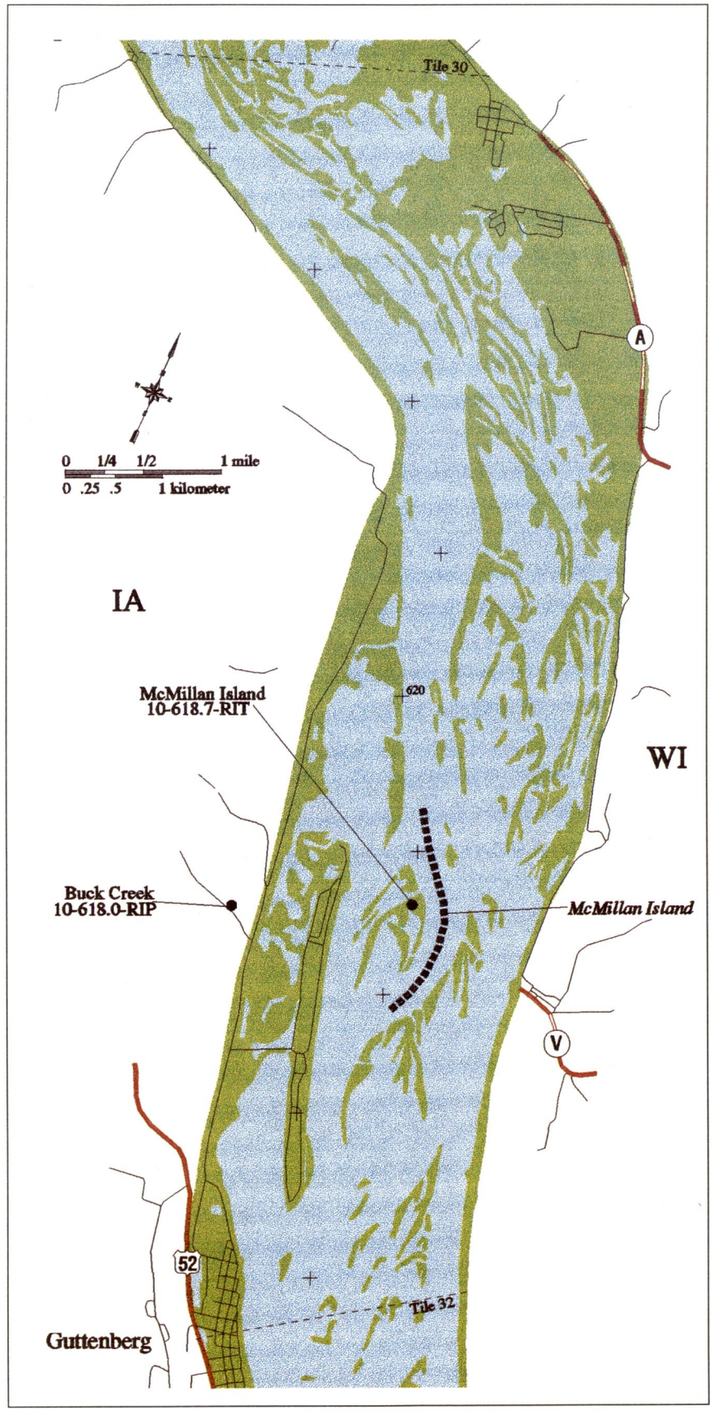


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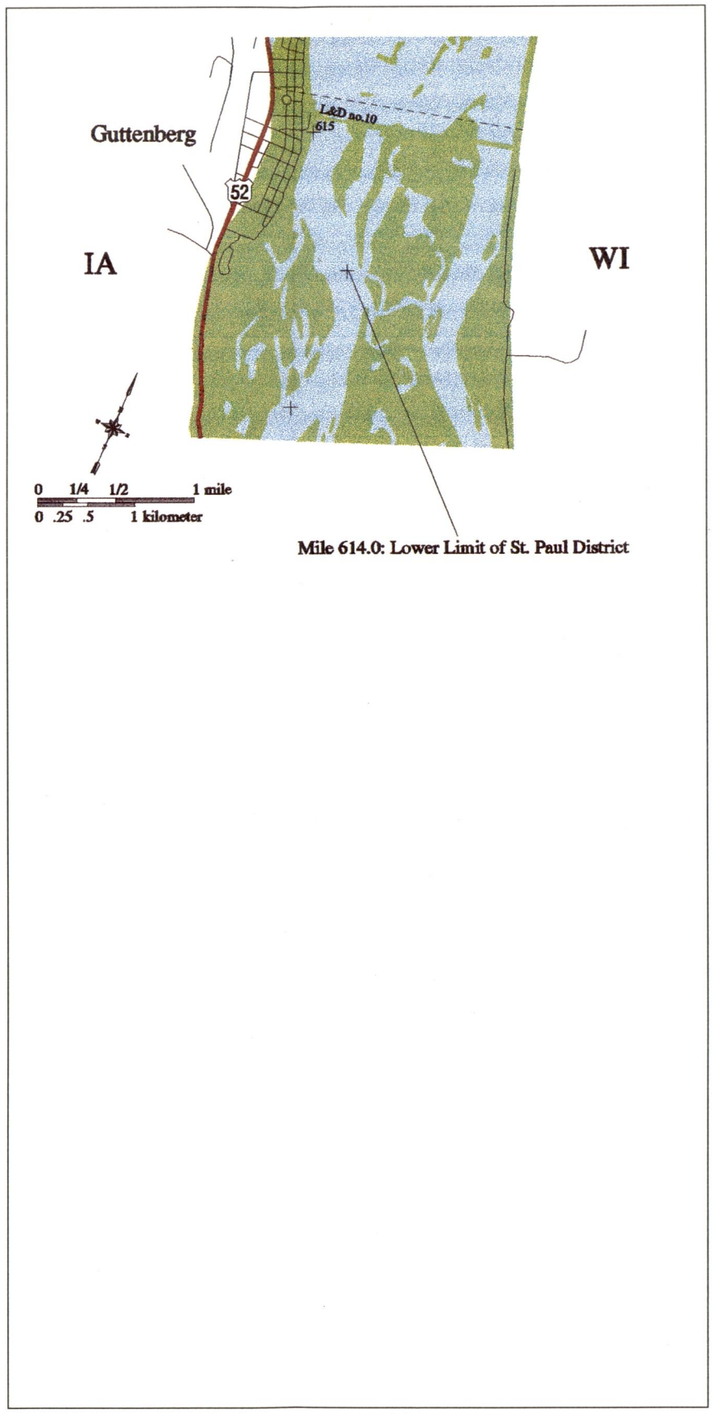


Tile 30

Pools 9 & 10: Mile 650 to 625



Tile 31



Tile 32

TAB 9

Placement Site Information Sheets and Operational Maps

MINNESOTA & ST. CROIX RIVERS

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

MN-13.5-RMP	Cargill	MN/Scott/Savage	Cargill
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. MN.03, Reference GREAT I Vol. 8-Part II). There was no RRF endorsement prior to the CMMP. GREAT selected 7 acres at this site for permanent placement of material from cuts 4-5. The Lower Minnesota River Watershed District (LMRWD) is the local sponsor for the Minnesota River project and is responsible for providing placement sites. They have obtained all property rights to allow use of the site and are responsible for insuring capacity or providing another location. They completed an engineering report dated March 1979 that selected this location. The site was designated as 79-1 in that report. No further studies have been completed. RRF endorsement will be requested following OSIT review and coordination.

SITE CHARACTERISTICS: GREAT identified the area as a Type 1 wetland. Adjacent land use consists of grain elevators, wetlands, and railroad. The site is within the floodplain and there is some potential for erosion.

SITE DIMENSIONS: Area = 7 acres. The area is 725 feet by 425 feet. Pre-Fill Elevation = 700.0. Maximum Fill Elevation = 715.0. LCP Elevation = 687.2. Estimated Capacity = 140,000 cubic yards.

BENEFICIAL USE: GREAT estimated no beneficial use demand. However, there is potential for beneficial use and since the LMRWD is not likely to acquire a new site, it is estimated that all material placed at this site will be removed for beneficial use. The LMRWD is responsible for promoting removal. Road access is available near the site but will require some work to get directly to the site.

EQUIPMENT REQUIREMENTS/LIMITATIONS: A ditch must be crossed with the pipeline if hydraulic dredging is used. This may require some special equipment or a special set-up.

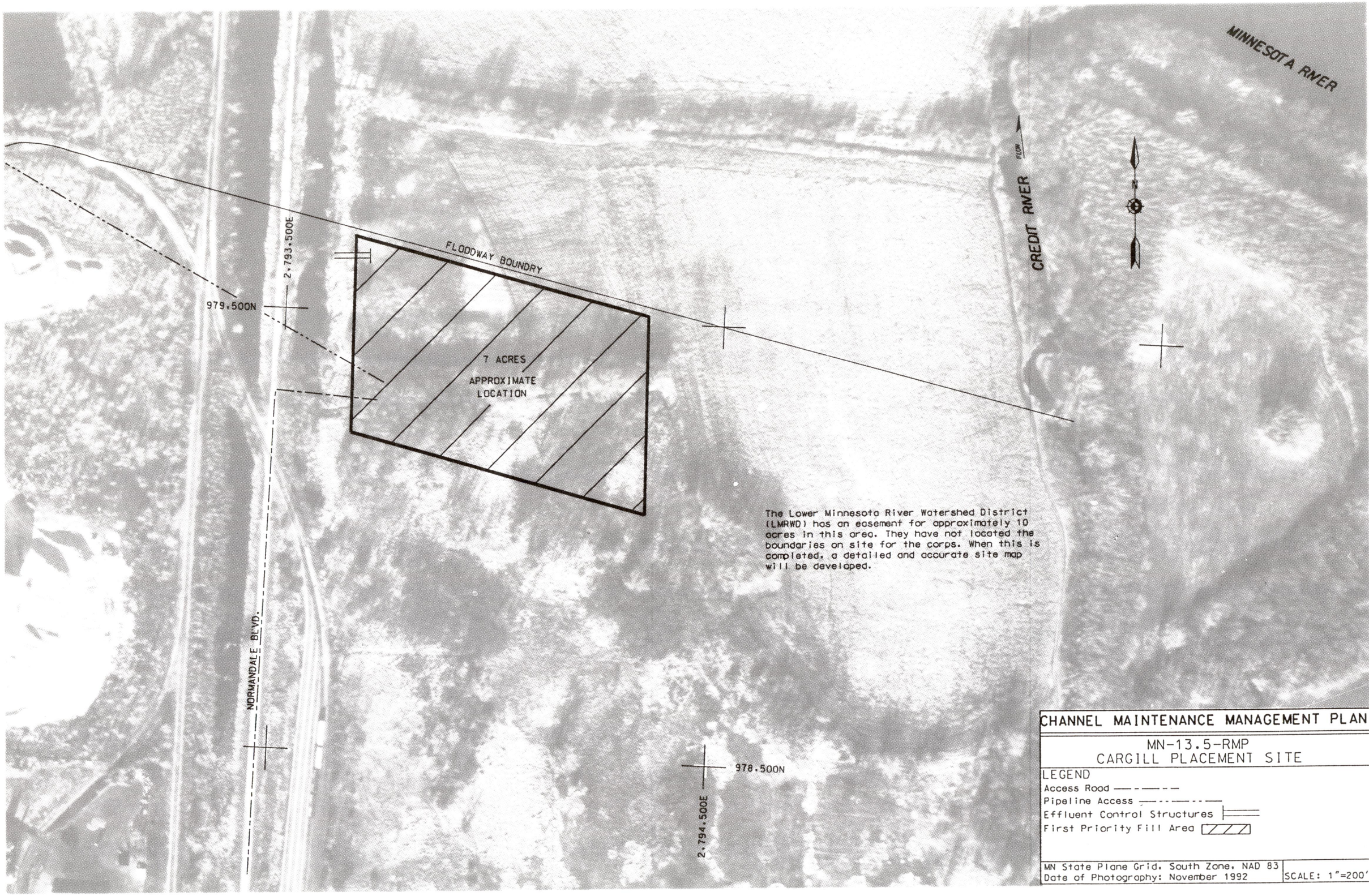
SPECIAL CONDITIONS/RESTRICTIONS: Adjacent wetlands must be protected. The LMRWD has provided access for pipeline across the Richards Asphalt property and under the railroad tracks. A containment dike is required. The LMRWD has acquired 10 acres at this location for dredged material placement. Site boundaries and details for use will be developed through the OSIT process.

FUTURE PLANS: Develop and maintain dikes at this site and use as a beneficial use stockpile site until the LMRWD provides an alternate location. Site map shows the general area. This site has not been used and the area acquired by the LMRWD needs to be identified in the field. Visit site with OSIT.

PERMITS/APPROVAL CHECKLIST:

		Remarks
	Cultural Resources	Review is required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	Analysis completed by MDNR
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	LMRWD has proper agreements in perpetuity
X	State	General permit with MPCA. Out of MDNR jurisdiction
	404(b)(1) Evaluation	Long term 404(b)(1) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Above Savage RR Bridge	14.3-14.7	H,M	5300	1500-2100	6800-7400	13-28
Abv. & Blw. Cargill Slip	12.8-13.6	H,M	1100	1500-2100	2600-3200	13-28



CHANNEL MAINTENANCE MANAGEMENT PLAN

MN-13.5-RMP
CARGILL PLACEMENT SITE

LEGEND

Access Road

Pipeline Access

Effluent Control Structures

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

MN-12.1-RMP	Kraemer Site	MN\Scott/Burnsville	Ed Kraemer & Sons
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. There was no RRF endorsement prior to the CMMP. The Lower Minnesota River Watershed District (LMRWD) is the local sponsor for the Minnesota River project and is responsible for providing placement sites. They have obtained all property rights to allow use of the site and are responsible for insuring capacity or providing another location. The LMRWD completed an engineering report dated March 1979 that selected this location (designated as site #79-2), which replaces GREAT sites MN.30 and MN.06. No further studies have been completed. Use of this site is established through past practices. The OSIT has accepted use of this site. RRF endorsement will be requested following OSIT review and coordination.

SITE CHARACTERISTICS: The site is in the floodplain adjacent to the Minnesota River. Heavy vegetation to the west provides for water quality filtration during hydraulic dredging. It has been used in the past for dredged material placement. It is an upland contained site and no wetlands exist within the site boundaries.

SITE DIMENSIONS: Area = 5 acres. The existing diked area is 850 feet by 255 feet. Pre-Fill Elevation = 704.0. Maximum Fill Elevation = 724.0. LCP Elevation = 687.2. Estimated Capacity = 140,000 cubic yards.

BENEFICIAL USE: There is potential for beneficial use and since the LMRWD is not likely to acquire a new site, it is estimated that all material placed at this site will be removed for beneficial use. The LMRWD is responsible for promoting removal. A stockpile does exist and access to the site is good. However, ownership is private and any removal would have to be with the owner's consent.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Placement at this site may be accomplished by mechanical or hydraulic methods.

SPECIAL CONDITIONS/RESTRICTIONS: Maintain containment dike and do not expand the size of the site beyond the existing dike. Powerlines may have to be raised or re-routed. Adjacent wetlands must be protected.

FUTURE PLANS: Continue use as a beneficial use stockpile until filled to capacity and LMRWD provides another site. Encourage the LMRWD to work with the landowner for beneficial use removal. Visit site with OSIT.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	Analysis completed by MDNR
	NEPA	
X	Real Estate	LMRWD has proper agreements
X	State	General permit with MPCA. Out of MDNR jurisdiction
	404(b)(1) Evaluation	Long term 404(b)(1) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Peterson Bar	11.8-12.4	H,M	200	100-1000	300-1200	17-37
Below Peterson Bar	11.2-11.8	M	3200	100-1000	3300-4200	17-37
Above Savage RR Bridge	14.3-14.7	M	7400	100-1000	7500-8400	17-37
Abv. & Blw. Cargill Slip	12.8-13.6	M	12600	100-1000	12700-13600	17-37

April 2, 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

MN-12.1-RMP
KRAEMER PLACEMENT SITE

LEGEND
Access Road
Pipeline Access
Barge Unloading Access
Effluent Control Structures
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

MN-10.1-RMP	NSP Site	MN/Scott/Burnsville	NSP
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. There was no RRF endorsement prior to the CMMP. The Lower Minnesota River Watershed District (LMRWD) is the local sponsor for the Minnesota River project and is responsible for providing placement sites. They have obtained all property rights to allow use of the site and are responsible for insuring capacity or providing another location. They completed an engineering report dated March 1979 that selected this location (designated as site #79-3), which replaces GREAT sites MN.30 and MN.06. No further studies have been completed. RRF endorsement will be requested following OSIT review and coordination.

SITE CHARACTERISTICS: The site is in the floodplain but is an upland site. No wetlands exist at this site. It is an open grass field and has a steep bank down to the river.

SITE DIMENSIONS: Area = 7 acres. The area is 1170 feet by 260 feet. Pre-Fill Elevation = 693.0. Maximum Fill Elevation = 708.0. LCP Elevation = 687.2. Estimated Capacity = 130,000 cubic yards.

BENEFICIAL USE: There is potential for beneficial use and since the LMRWD is not likely to acquire a new site, it is estimated that all material placed at this site will be removed for beneficial use. The LMRWD is responsible for promoting removal. A beneficial use stockpile will be developed. However, the site is privately owned and removal of any material would have to be with the consent of the owner.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

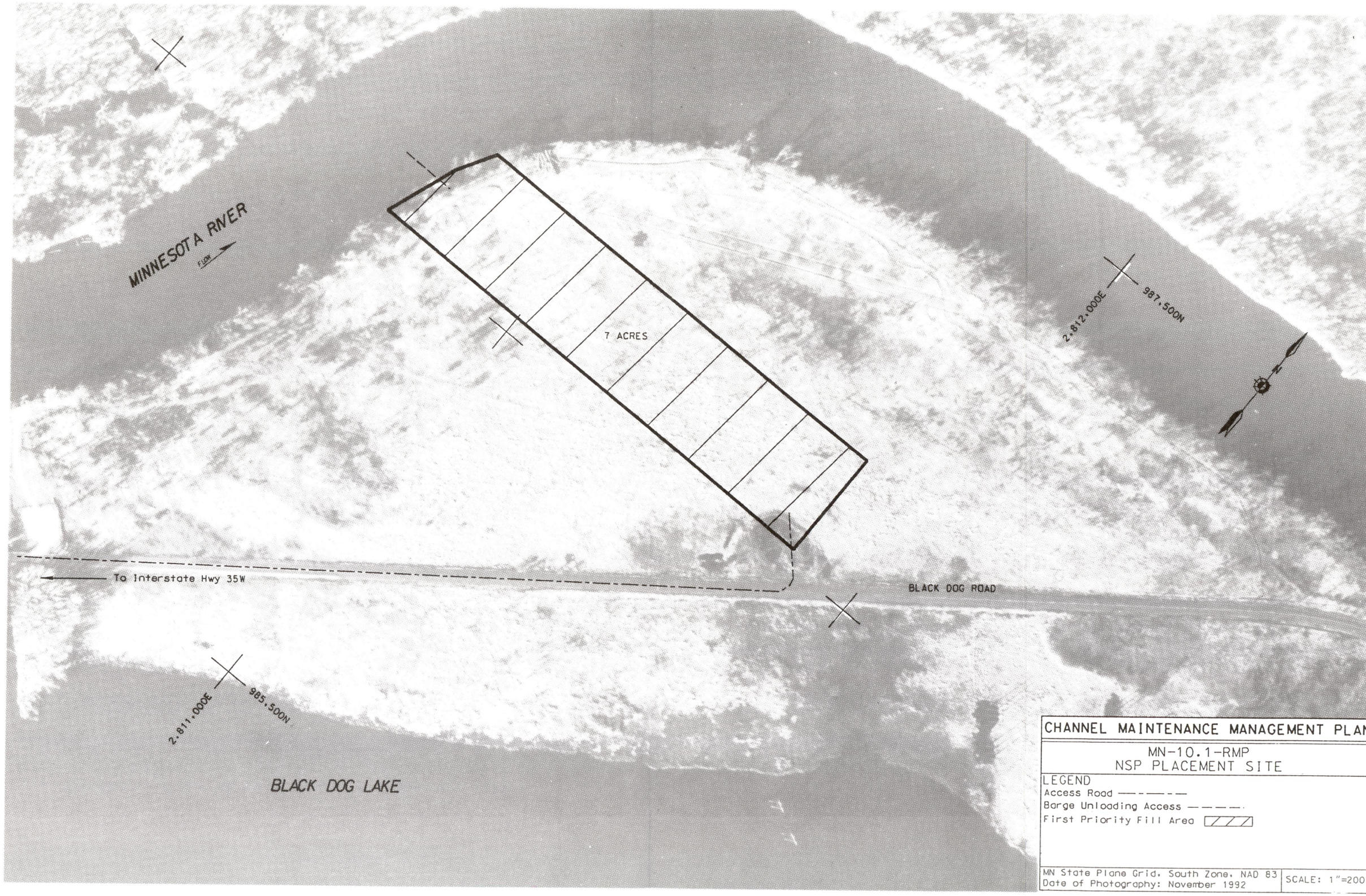
SPECIAL CONDITIONS/RESTRICTIONS: A barge unloading ramp may have to be constructed to facilitate dredged material placement at the site. Coordinate placement with the landowner through the LMRWD. The FWS has an easement for adjacent land for the purpose of providing eagle nesting habitat. This may require certain restrictions. Site boundaries and details for use will be developed through the OSIT process.

FUTURE PLANS: Develop and maintain dikes at this site and use as a beneficial use stockpile site until the LMRWD provides an alternate location. Visit site with OSIT.

PERMITS/APPROVAL CHECKLIST:		Remarks
	Cultural Resources	Review is required
X	Endangered Species	No impacts
X	Floodplain Impact Analysis	Analysis completed by MDNR
	NEPA	
X	Real Estate	LMRWD has proper agreements
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Above Savage RR Bridge	14.3-14.7	M	23200	200-2000	23400-25200	5-20
Abv. & Blw. Cargill Slip	12.8-13.6	M	16900	200-2000	17100-18900	5-20
Peterson's Bar	11.8-12.4	M	12700	200-2000	12900-14700	5-20
Below Peterson's Bar	11.2-11.8	H&M	7400	200-2000	7600-9400	5-20

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

MN-10.1-RMP
NSP PLACEMENT SITE

LEGEND
Access Road ——- - ——- - ——
Barge Unloading Access — — — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

MN-7.3-RMP	Hwy 77 Bridge	MN/Dakota/Burnsville	MDNR & MDOT
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. There was no RRF endorsement prior to the CMMP. The Lower Minnesota River Watershed District (LMRWD) is the local sponsor for the Minnesota River project and is responsible for providing placement sites. They have been negotiating for use of this site with the MDNR and the MDOT and are responsible for insuring capacity or providing another location. This site replaces the GREAT selected site MN.28. Site boundaries and details for use will be established through the OSIT process. RRF endorsement will be requested following OSIT review and coordination.

SITE CHARACTERISTICS: Upland area. No wetland impacts will be involved.

SITE DIMENSIONS: Area = 4 acres. The exact location and other site dimensions have not been determined. Pre-Fill and Maximum Fill Elevations are estimated because operation details have not been completed. Pre-Fill Elevation = 698.0. Maximum Fill Elevation = 708.0. LCP Elevation = 687.2. Estimated Capacity = 40,000 cubic yards.

BENEFICIAL USE: There is potential for beneficial use and since the LMRWD is not likely to acquire a new site, it is estimated that all material placed at this site will be removed for beneficial use. The LMRWD is responsible for promoting removal. A stockpile will be developed and access to the site is good. Removal would have to be with the landowners consent.

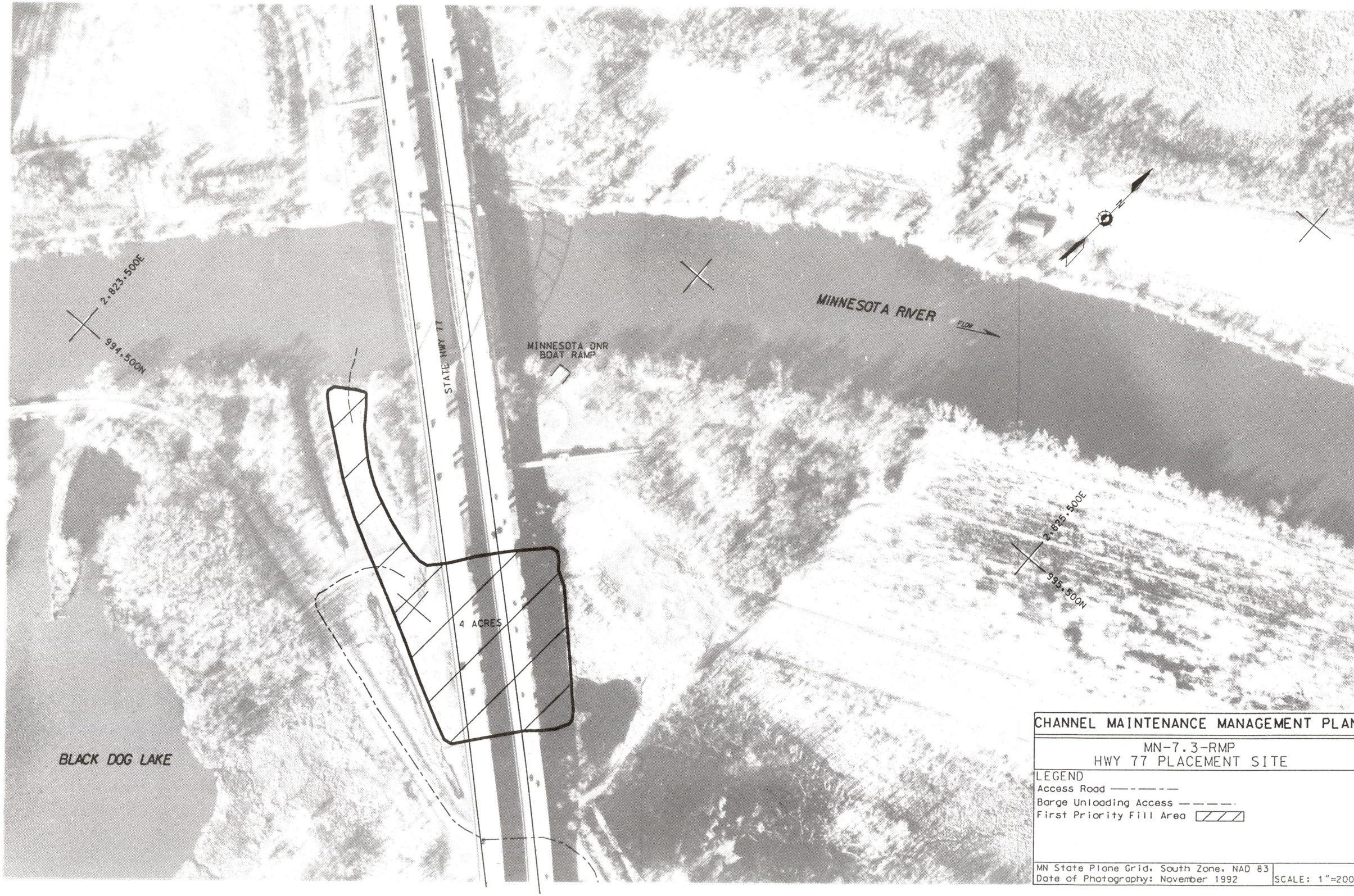
EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: Coordinate placement with the landowner through the LMRWD.

FUTURE PLANS: Develop site and use as a beneficial use stockpile until the LMRWD provides an alternate location. This site has not been used and the area acquired by the LMRWD needs to be identified in the field. Visit site with the OSIT.

PERMITS/APPROVAL CHECKLIST:	Remarks
Cultural Resources	Review is required
Endangered Species	Need determination from FWS
Floodplain Impact Analysis	Will be analyzed if necessary
NEPA	
Real Estate	LMRWD will obtain proper agreements
State	
404(b)(1) Evaluation	Long term 404(b)(1) proposed
Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
4 Mile Cut-Off	3.8-4.7	M	17400	?	?	11-21



CHANNEL MAINTENANCE MANAGEMENT PLAN

MN-7.3-RMP
HWY 77 PLACEMENT SITE

LEGEND
Access Road ——— — ———
Barge Unloading Access ——— . ———
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

SC-6.7-LWP	Kinnickinnic Bar Upper	WI/Pierce/Prescott	WDNR
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. SC.13, Reference GREAT I Vol. 8-Part II). There was no RRF endorsement prior to the CMMP. This site is within Kinnickinnic State Park. GREAT recommended use of 9 acres at this site for permanent placement of material from the Kinnickinnic Bar cut. This was changed to 13 acres by a letter from the WDNR dated 15 March 1985, based on a Park Development Plan. A meeting between the WDNR, MDNR, and Corps was held on 5 October 1995 at the park to re-define the fill areas according to WDNR future plans at the park. The acres were reduced to 4. First and second priority fill areas were identified and should be filled prior to placement at the Kinnickinnic Bar Lower site (SC-6.5-LWP).

SITE CHARACTERISTICS: A sand bar island created by the Kinnickinnic River. Placement of material is for use on recreational beaches which are part of the Kinnickinnic State Park. Habitat type for all 4 acres identified at this site is old dredged material.

SITE DIMENSIONS: Area = 4 acres. The first and second priority areas are both approximately 2 acres each and are irregular in shape. Pre-Fill Elevation = 678.0. Maximum Fill Elevation = 681.0. LCP Elevation = 675.0. Estimated Capacity = 17,000 cubic yards.

BENEFICIAL USE: This site is used beneficially as a recreational beach.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: The site must not form a connection to a private island either by direct placement or secondary movement. Caution must be used to avoid impacting the adjacent wetland unless approved park plans allow for filling. If this site is not available or implementable, the next priority site will be used. OSIT coordination will take place prior to use of this site.

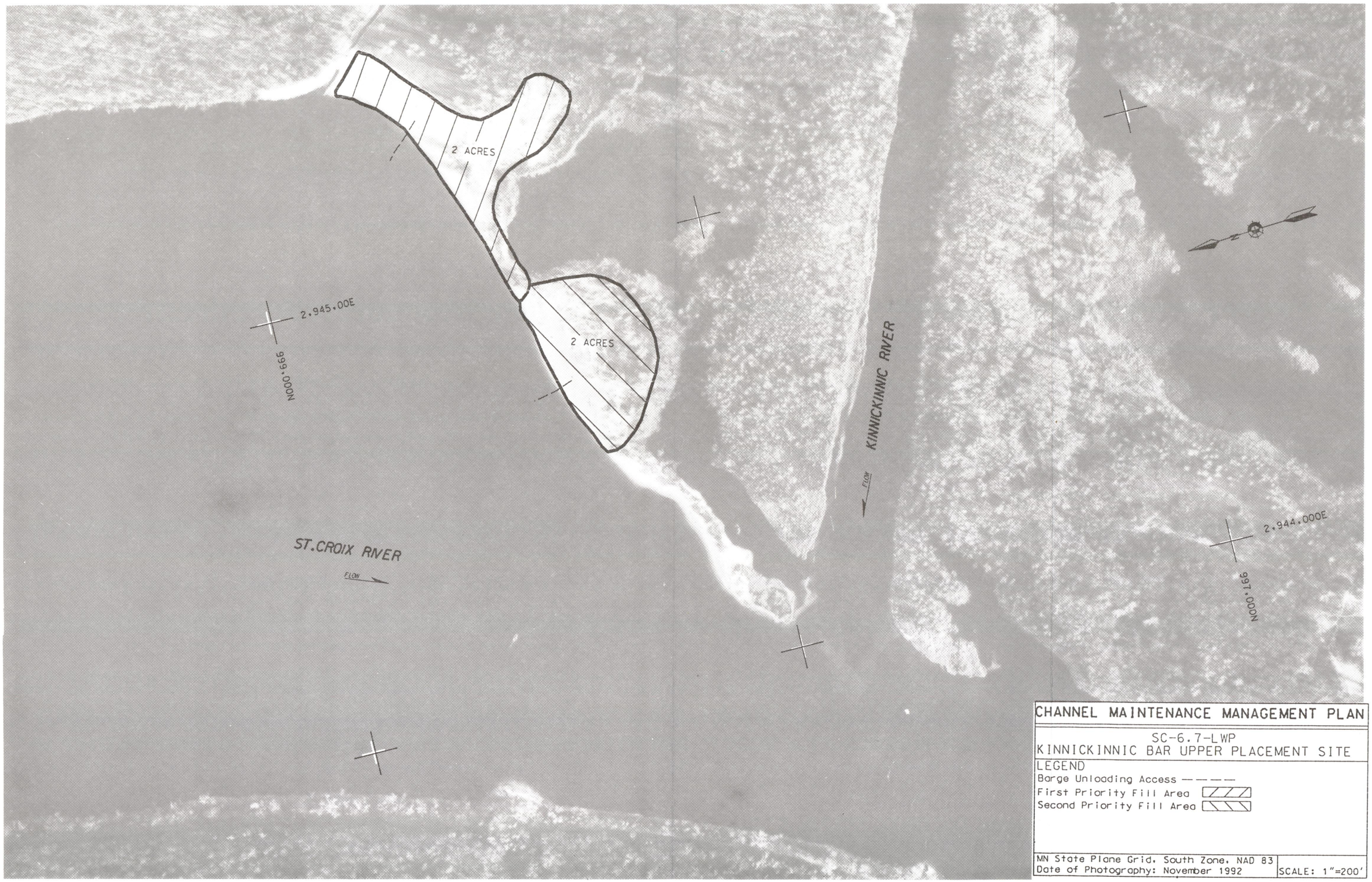
FUTURE PLANS: Dredged material from the Kinnickinnic Bar cut will be placed at the following sites listed in order of priority for development: SC-6.7-LWP (Kinnickinnic Bar Upper), SC-6.5-LWP (Kinnickinnic Bar Lower), 3-811.5-LMP (Point Douglas). Replenish beach as needed.

PERMITS/APPROVAL CHECKLIST:

		Remarks
	Cultural Resources	Review is required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Will be analyzed if necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires a permit from the landowner
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Kinnickinnic Bar	6.0-6.5	H,M	3000	0-500	3000-3500	3-6

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

SC-6.7-LWP
KINNICKINNIC BAR UPPER PLACEMENT SITE

LEGEND
Barge Unloading Access — — — —
First Priority Fill Area
Second Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

SC-6.5-LWP	Kinnickinnic Bar Lower	WI/Pierce/Prescott	WDNR
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. SC.12, Reference GREAT I Vol. 8-Part II). There was no RRF endorsement prior to the CMMP. This site is within Kinnickinnic State Park. GREAT recommended use of 17 acres at this site for permanent placement of material from the Kinnickinnic Bar cut. This was changed to 13 acres by a letter from the WDNR dated 15 March 1985, based on a Park Development Plan. A meeting between the WDNR, MDNR, and Corps was held on 5 October 1995 at the park to re-define the fill areas according to WDNR future plans at the park. The acres were reduced to 7. First, second, third, and fourth priority fill areas were identified at this site and will be filled after the first and second priority fill areas at the Kinnickinnic Bar Upper site (SC-6.7-LWP), but before the Point Douglas site (3-811.5-LMP) is filled.

SITE CHARACTERISTICS: A sand bar island created by the Kinnickinnic River. Placement of material is for use on recreational beaches which are part of the Kinnickinnic State Park. Habitat type for all 7 acres identified at this site is old dredged material.

SITE DIMENSIONS: Area = 7 acres. The first, second, third, and fourth priority fill areas are 1.7, 1.3, 2.1, and 1.9 acres respectively. Pre-Fill Elevation = 678.0. Maximum Fill Elevation = 683.0. LCP Elevation = 675.0. Estimated Capacity = 31,500 cubic yards.

BENEFICIAL USE: This site is used beneficially as a recreational beach.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: The site must not form a connection to a private island either by direct placement or secondary movement. Caution must be used to avoid impacting the adjacent wetland unless approved park plans allow for filling. If this site is not available or implementable, the next priority site will be used. OSIT coordination will take place prior to use of this site.

FUTURE PLANS: Dredged material from the Kinnickinnic Bar cut will be placed at the following sites, listed in order of priority for development: SC-6.7-LWP (Kinnickinnic Bar Upper), SC-6.5-LWP (Kinnickinnic Bar Lower), and 3-811.5-LMP (Point Douglas). Replenish beach as needed.

PERMITS/APPROVAL CHECKLIST:		Remarks
	Cultural Resources	Review is required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Will be analyzed if necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires a permit from the landowner
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Kinnickinnic Bar	6.0-6.5	H,M	1000	0-500	1000-1500	3-8

KINNICKINNIC RIVER

FLOW

2,944,000E

998,000N

ST.CROIX RIVER

FLOW

1.9 ACRES

2.1 ACRES

1.3 ACRES

1.7 ACRES

996,000N

2,943,000E

CHANNEL MAINTENANCE MANAGEMENT PLAN

SC-6.5-LWP
KINNICKINNIC BAR LOWER PLACEMENT SITE

LEGEND
Barge unloading Access — — — —
First Priority Fill Area
Second Priority Fill Area
Third Priority Fill Area
Fourth Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 10

Placement Site Information Sheets
and
Operational Maps

USAF & POOL 1

TAB 10 - USAF & POOL 1

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

U-856.6-RMP	USAF Site	MN/Hennepin/Mpls	City of Minneapolis
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. There was no RRF endorsement prior to the CMMP. GREAT selected sites U.02 (3 acres) and U.03 (7 acres). The city of Minneapolis is the local sponsor for the upper pool navigation project and is responsible for providing placement sites for dredged material. This includes acquiring all real estate and regulatory permits/agreements required. They have furnished the USAF site in lieu of the GREAT selected sites. No Reconnaissance Report has been completed.

SITE CHARACTERISTICS: This site is a 100% upland site which has been used for hydraulic and mechanical dredged material placement in the past.

SITE DIMENSIONS: Area = 7 acres. The area is 900 feet by 340 feet. Pre-Fill Elevation = 812.0. Maximum Fill Elevation = 837.0. LCP Elevation = 796.5. Estimated Capacity = 200,000 cubic yards.

BENEFICIAL USE: A stockpile exists and access is excellent. Although the site is owned by the city of Minneapolis it is managed by the leasee, River Services Inc., and any removal of material must have their consent. Beneficial use has been excellent in the past and since the city of Minneapolis is not likely to acquire a new site, it is estimated that all material placed at this site will be removed for beneficial use. The city of Minneapolis is responsible for promoting removal.

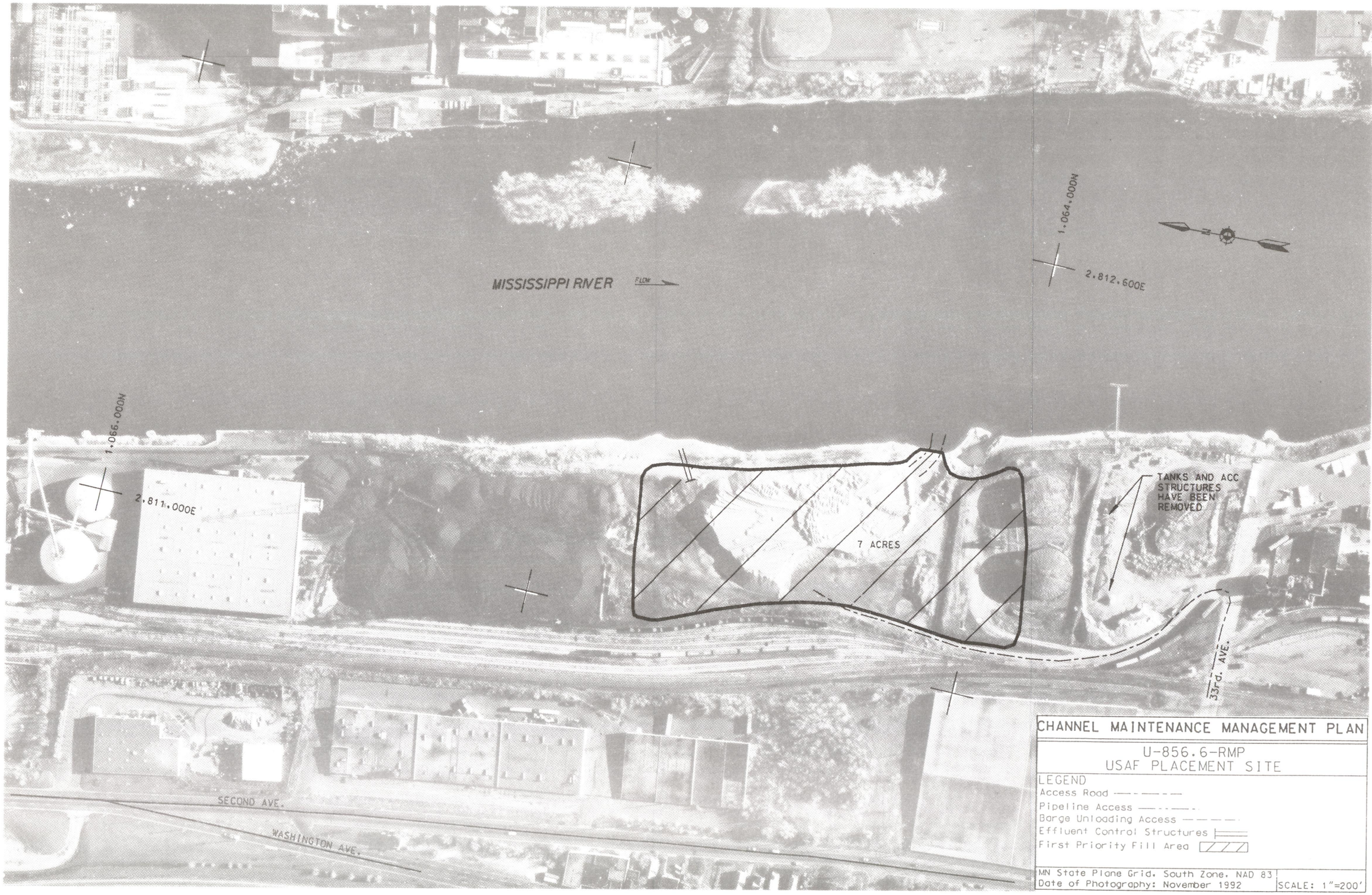
EQUIPMENT REQUIREMENTS/LIMITATIONS: The site is accessible to both a small hydraulic dredge and mechanical dredging equipment. The Corps dredge Dubuque has been successfully used in the past at this location.

SPECIAL CONDITIONS/RESTRICTIONS: The city of Minneapolis is planning to remove the over-head power lines at this site to allow a higher stockpile height. Until the power lines are removed, caution should be used. Berming and drop structures are required to contain the material if hydraulic placement methods are used.

FUTURE PLANS: Continue to promote the beneficial use removal from this site. Notify the city of Minneapolis in advance of dredging to insure that the site is ready for placement.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
	Real Estate	Renew permit with MPLS every 5 years
	State	MPCA certification. if effluent return
	404(b)(1) Evaluation	Long term 404(b) proposed
	Other: Mpls. Noise ord.	Required to obtain per event

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Mpls. Turning Basin	856.8-857.6	M,H	2000	50-200	2050-2200	15-40
Abv. Lowry Ave. Br.	856.4-856.8	M,H	1000	50-200	1050-1200	15-40
Abv. & Blw. Broadway Br.	855.5-856.1	M	5000	50-200	5050-5200	15-40
Abv. Plymouth Ave. Bridge	854.8-855.5	M	8000	50-300	8050-8200	15-40



CHANNEL MAINTENANCE MANAGEMENT PLAN

U-856.6-RMP
USAF PLACEMENT SITE

LEGEND

Access Road

Pipeline Access

Barge Unloading Access

Effluent Control Structures

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

1-853.2-LMP	Pool 1 Site	MN/Hennepin/Mpls	City of Minneapolis
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 1.01A). This site was endorsed by the RRF on 6 March 1984 (Proposed by Corps - Pool 1 Plan). GREAT selected 3.5 acres of upland at site 1.01. The Corps determined that the GREAT selected sites were justified and that implementation should begin. New permanent site 1.01A and use of temporary sites 1.03T and 1.07T were recommended by the city of Minneapolis and the Corps due to complications with use of site 1.01 and 1.02T. This is the primary site for all material dredged in Pool 1. Retaining walls were constructed by the Corps in 1986. Details are provided in the Pool 1 Plan dated October 1985.

SITE CHARACTERISTICS: It is an upland parcel situated beneath and between the I-35W and 10th Avenue bridges. The area has been used in the past by the University of Minnesota for storage of fly ash. The only practical means of placement are mechanical due to the distance of the cuts to the site and the small size of the placement site.

SITE DIMENSIONS: Area = 2 acres. The area is 320 feet by 250 feet. Pre-Fill Elevation = 745.0. Maximum Fill Elevation = 780.0. LCP Elevation = 722.8. Estimated Capacity = 70,000 cubic yards.

BENEFICIAL USE: A stockpile does exist and access is excellent. However, the city of Minneapolis owns the site and any removal must be done with their consent. It is expected that the entire 40 year dredging projection (3,034,000 cubic yards) will be used beneficially.

EQUIPMENT REQUIREMENTS/LIMITATIONS: No material should be placed higher than the reinforcing cap on the 35W bridge piers. Avoid placing around the piers unless necessary to accommodate large quantities. If placing material around the piers, it should be placed around them evenly.

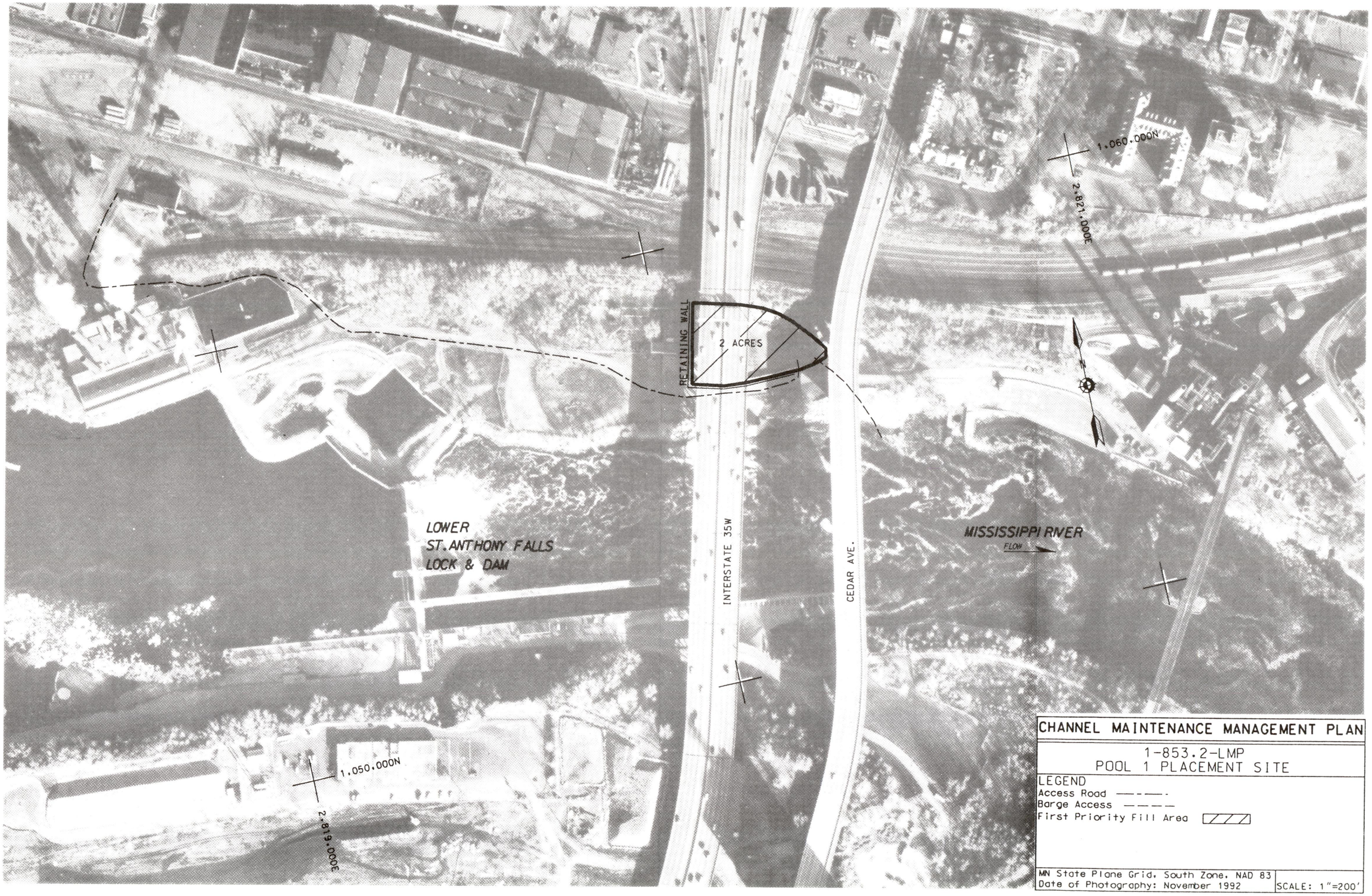
SPECIAL CONDITIONS/RESTRICTIONS: As per agreement on 7 October 1985, the city of Minneapolis is responsible for the removal of material from this site. The District is responsible for maintaining the retaining walls, unloading area, and any other structures for off-loading barges. Agreement takes care of need for DMP real estate permit.

FUTURE PLANS: The Corps will continue to use this site and it will be maintained as a beneficial use site as long as there is capacity or until the city of Minneapolis furnishes another site.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	Review completed 03/25/84
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Long term EA from 03/25/85-2025
X	Real Estate	Provided by City of MPLS in perpetuity
X	State	General permit with MDNR and MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other: Mpls. noise ord.	Required to obtain per event

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
All cuts in Pool 1	Varies	M	Varies	70-350	Varies	22-57

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

1-853.2-LMP
POOL 1 PLACEMENT SITE

LEGEND
Access Road ——-——-
Barge Access ————
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

1-851.3-LME	**Below Franklin Ave.**	MN/Hennepin/Mpls.	Mpls. Park & Rec. Board
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 1.07T, Reference GREAT I Vol. 8-Part II). This site was endorsed by the RRF on 6 March 1984 (proposed by Corps - Pool 1 Plan). GREAT selected 11.5 acres at this site. The Corps and the city of Minneapolis recommended use of the permanent site 1.01A and sites 1.03T and 1.07T due to complications with use of GREAT selected sites 1.01 and 1.02T. The Corps pre-excavated the site in 1986. This site will be used if there is no remaining capacity at site 1-853.2-LMP (Pool 1 Site) or if emergency/imminent closure dredging is required. Details are provided in the Pool 1 Plan dated October 1985.

SITE CHARACTERISTICS: Previously used site which is presently unvegetated. It is an upland site located in the floodplain and within the floodway.

SITE DIMENSIONS: Area = 5 acres. The area is 860 feet by 235 feet. Excavated 17,800 cubic yards Pre-Fill Elevation = 735.0. Maximum Fill Elevation = 755.0. LCP Elevation =722.8 Estimated Capacity = 85,000 cubic yards.

BENEFICIAL USE: There will be no beneficial use of material at this site, unless relocated to a beneficial use stockpile site.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Accessible to hydraulic and mechanical dredging.

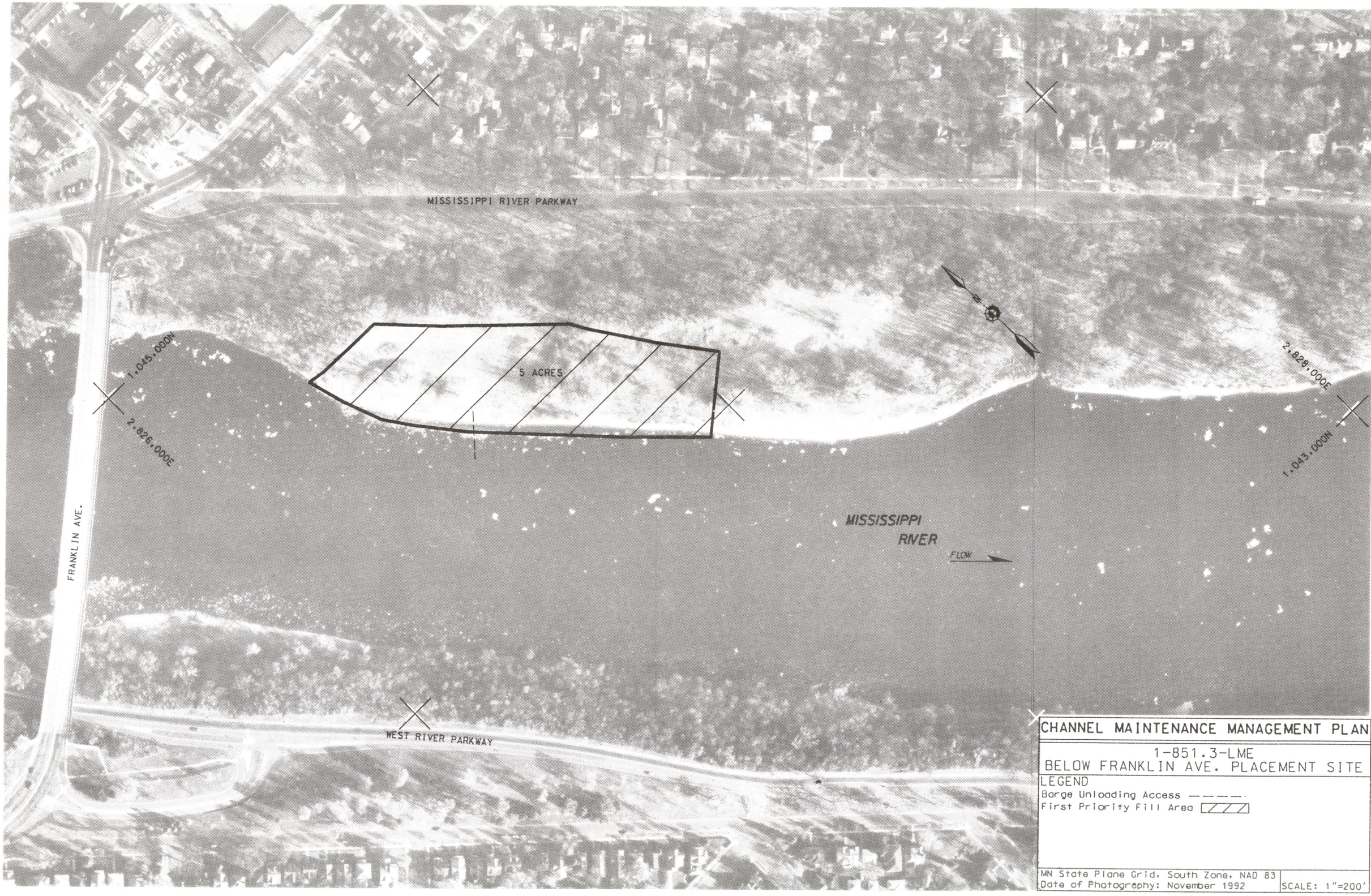
SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies. As per agreement on 7 October 1985 the city of Minneapolis is responsible for removal of material if this site is used and there is no capacity at site 1-853.2-LMP (Pool 1 Site). Otherwise, the District is responsible for removal. More information is available in the Pool 1 plan.

FUTURE PLANS: At this time, there are no plans to use the site, except for emergency/imminent closure purposes.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Long-term EA from 03/25/85-2025
X	Real Estate	Provided by City of MPLS in perpetuity
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other: Mpls. noise ord.	Required to obtain per event

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Abv.Franklin Ave.Bridge	851.6-853.4	H	3700	50-300	3750-4000	2-32
Blw. Franklin Ave.Bridge	850.7-851.4	H	200	50-300	250-500	2-32

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

1-851.3-LME
BELOW FRANKLIN AVE. PLACEMENT SITE

LEGEND
Barge Unloading Access ———.
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

1-849.5-RME	Below Lake Street	MN/Hennepin/Mpls.	Mpls. Park & Rec. Board
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 1.03T, Reference GREAT I Vol. 8-Part II). This site was endorsed by the RRF on 6 March 1984 (Proposed by Corps -Pool 1 Plan). GREAT selected 6 acres at this site. The Corps and the city of Minneapolis recommended use of the permanent site 1.01A and sites 1.03T and 1.07T due to complications with use of GREAT selected sites 1.01 and 1.02T. The Corps pre-excavated the site in 1986. This site will be used if there is no remaining capacity at site 1-853.2-LMP (Pool 1 site) or if emergency/imminent closure dredging is required. Details are provided in the Pool 1 Plan dated October 1985.

SITE CHARACTERISTICS: Previously used site which is presently unvegetated. It is an upland site located in the floodplain and within the floodway.

SITE DIMENSIONS: Area = 4 acres. The area is 1000 feet by 175 feet. Excavated 17,700 cubic yards Pre-Fill Elevation = 730.0. Maximum Fill Elevation = 755.0. LCP Elevation = 722.8. Estimated Capacity = 60,000 cubic yards.

BENEFICIAL USE: There will be no beneficial use of material at this site, unless relocated to a beneficial use stockpile.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Accessible to hydraulic and mechanical dredging.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies. As per agreement on 10/07/85, the city of Minneapolis is responsible for removal of material if this site is used and there is no capacity at site 1-583.2-LMP (Pool 1 site). Otherwise, the District is responsible for removal. More information is available in the Pool 1 plan.

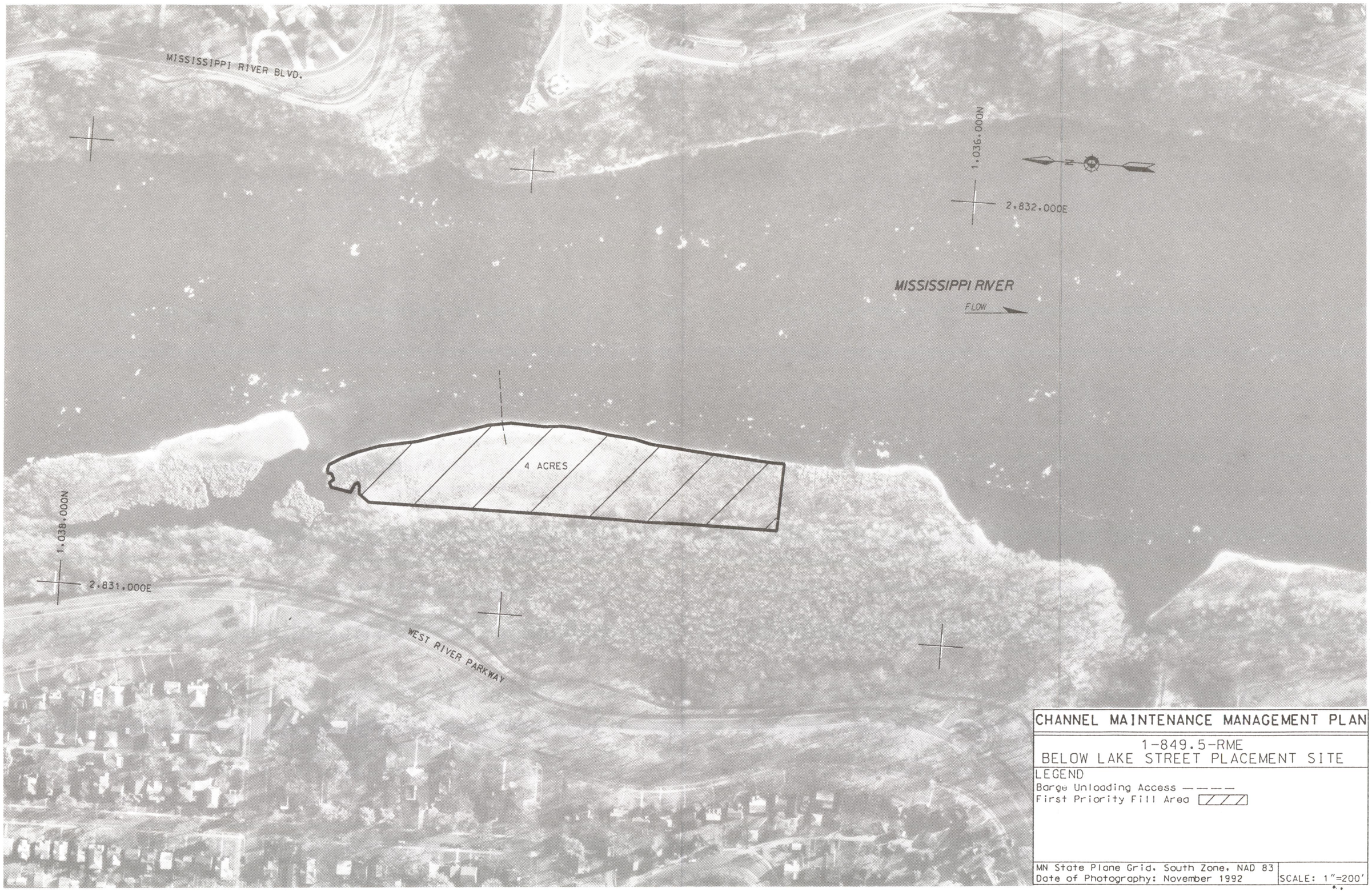
FUTURE PLANS: At this time, there are no plans to use the site, except for emergency/imminent closure purposes.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Long-term EA from 03/25/85-2025
X	Real Estate	Provided by city of MPLS in perpetuity
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other: Mpls. noise ord.	Required to obtain per event

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Above Lake St. Bridge	849.9-850.5	H	3700	50-300	3750-4000	7-32
Below Lake St. Bridge	848.9-849.9	H	1100	50-300	1150-1400	7-32

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

1-849.5-RME
BELOW LAKE STREET PLACEMENT SITE

LEGEND

Barge Unloading Access — — — —

First Priority Fill Area ▨

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 11

Placement Site Information Sheets and Operational Maps

POOL 2

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-840.4-RMP	Highbridge	MN/Ramsey/St. Paul	City of St. Paul
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 2.16, Reference GREAT I Vol 8-Part II). There was no RRF endorsement prior to the CMMP. GREAT selected 3.4 acres at this site for permanent placement of material from Cut 8, which the Corps determined is justified. The acres were rounded to 4. New Highbridge piers were designed to minimize the shoaling of sediments which has reduced the dredging frequency of cuts 8 & 9. The St. Paul Park & Rec. Dept. administers this site for the city of St. Paul. The city of St. Paul is the local sponsor for dredging the St. Paul Small Boat Harbor and they have provided this site for that material.

SITE CHARACTERISTICS: Previously filled wetland with some sparse trees and grasses. This upland site is within the floodplain and out of the floodway. A stockpile exists at the site and adjacent land uses include a barge repair facility, city small boat harbor, and county road.

SITE DIMENSIONS: Area = 4 acres. The area is 425 feet by 350 feet. Pre-Fill Elevation = 688.0. Fill Elevation - 713.0. LCP Elevation = 687.2. Estimated Capacity = 100,000 cubic yards.

BENEFICIAL USE: A stockpile does exist and access is excellent. However, the St. Paul Parks Dept. manages the site and any removal must be done with their consent. It is anticipated that all material placed at this site will be removed for beneficial use.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

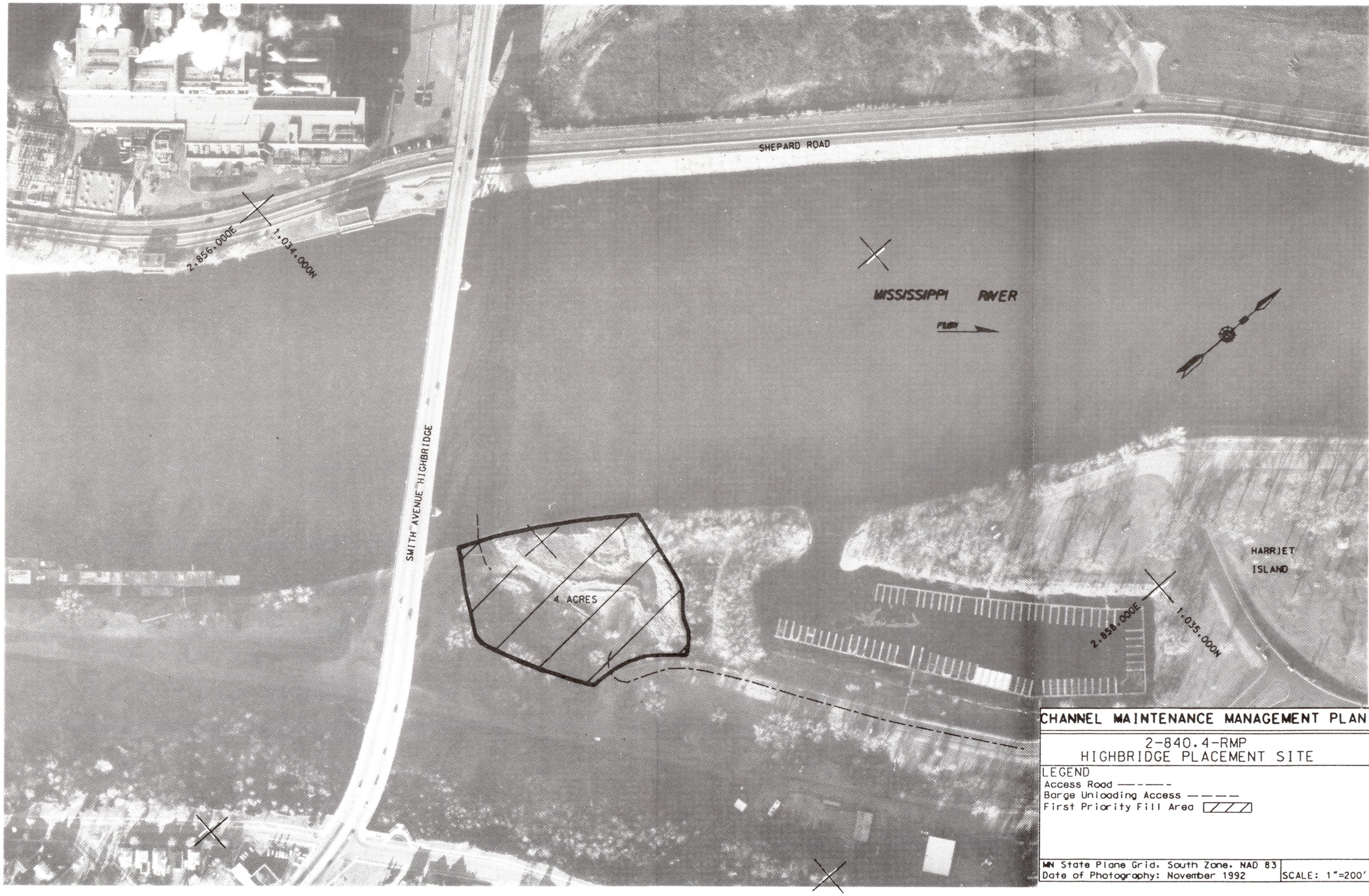
SPECIAL CONDITIONS/RESTRICTIONS: In addition to using this site for Cut 8 as recommended, it will be used for Cut 9 in lieu of site 2.37, Cut 10 (if necessary) in lieu of site 2.18, and MN River cut 1 in lieu of site 2.18.

FUTURE PLANS: Continue to promote beneficial use removal and coordinate placement with the Park and Recreation Department. If this site is unavailable in the future, GREAT sites 2.37 (2-841.3-LMP) and 2.18 (2-843.3-RMP) will be reconsidered.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Permit from St. Paul Park & Rec. Dept.
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Mouth of the MN River	0.0-0.5	M	20000	20-300	20020-20300	1-26
Abv. & Blw. Smith Ave. Br.	840.0-841.3	M,H	600	20-300	620-900	1-26
St. Paul SBH	839.6	M	4800	20-300	4820-5100	1-26

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

2-840.4-RMP
HIGHBRIDGE PLACEMENT SITE

LEGEND
Access Road ——-——-
Barge Unloading Access ———
First Priority Fill Area

MN State Plane Grid. South Zone. NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-837.5-RMP	St. Paul Barge Terminal	MN/Ramsey/St. Paul	State of MN
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 2.40, Reference GREAT I Vol 8-Part II). There was no RRF endorsement prior to the CMMP. GREAT selected 28 acres at this site for permanent placement, which the Corps determined is justified. GREAT selected use of sites for the St. Paul Barge Terminal cut dredging in this order: 2.14 (not endorsed), 2.15 (filled), 2.13, 2.40, and 2.02 (developed). The idea for use of this site is to place sheet piling along the shoreline to contain dredged material. This site has been used and will require OSIT review and coordination with industry for best configuration of sheet pile wall.

SITE CHARACTERISTICS: Minimal aquatic vegetation is present. This area is used for barge fleeting. Adjacent land use is the main navigation channel and the Holman Field Airport. Placement would be below the ordinary high water mark. Because of current use, there would be no appreciable adverse effects on fish and wildlife.

SITE DIMENSIONS: Area = 28 acres. The area is 4000 feet by 300 feet. Pre-Fill Elevation = 683.0. Fill Elevation = 713.0. LCP Elevation = 687.2. Estimated Capacity = 1,333,000 cubic yards.

BENEFICIAL USE: Material would be used beneficially on-site for improvements to the barge fleeting area. A beneficial use stockpile would also be created to meet some of the high demand for material in this area. Commercial development may also benefit.

EQUIPMENT REQUIREMENTS/LIMITATIONS: All equipment working in the area must not exceed an elevation higher than 705 MSL. If this elevation is exceeded, notify the MAC to shut their VASI off.

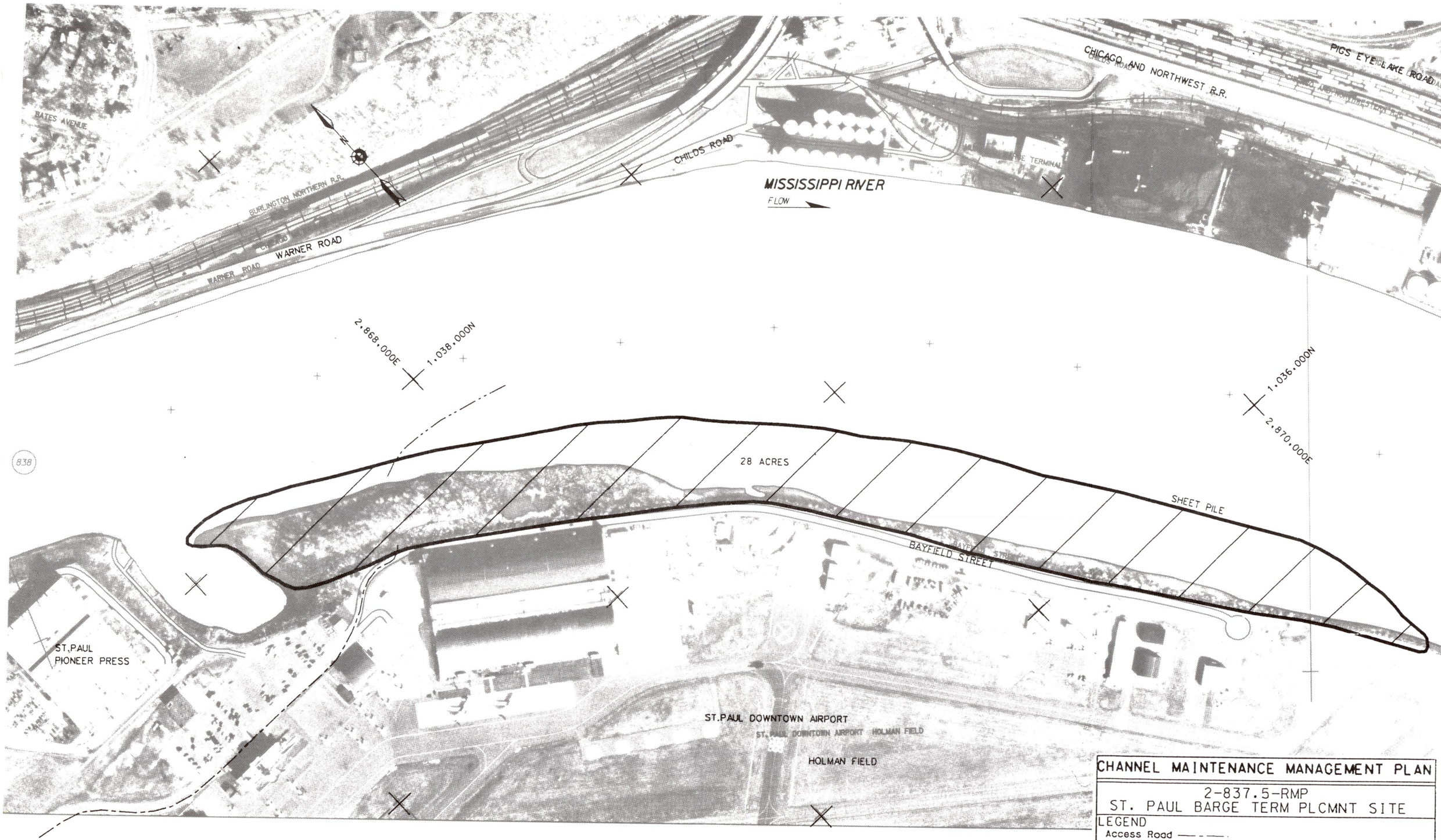
SPECIAL CONDITIONS/RESTRICTIONS: An FHA Form 7460-1 (Notice of Proposed Construction or Alteration) is required when dredging in the area. A floodplain impact analysis is required and this site may be unimplementable due to adverse impacts on flood stages.

FUTURE PLANS: Begin discussing implementation with OSIT and industry. Once filled, the area will become St. Paul Port Authority property.

PERMITS/APPROVAL CHECKLIST:

		Remarks
	Cultural Resources	Coordinate use w/Minnesota SHPO
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Analysis required
	NEPA	
	Real Estate	Requires long-term agreement
	State	Protected waters permit & MPCA certification.
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
St. Paul Barge Terminal	836.4-837.8	H,M	3000	0-4000	3000-7000	26



CHANNEL MAINTENANCE MANAGEMENT PLAN

2-837.5-RMP
ST. PAUL BARGE TERM PLCMNT SITE

LEGEND

Access Road ——— - ———

Pipeline Access ——— - ———

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83

Date of Photography: November 1992

SCALE: 1"=300'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-836.8-RMP	Holman Field	MN/Ramsey/St. Paul	Metro Airport Commission
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 2.14, Reference GREAT I Vol. 8-Part II). There was no RRF endorsement prior to the CMMP. GREAT selected 110 acres at this site for permanent placement, which the Corps determined is justified. GREAT did not endorse the site but noted that it would be approved only if the airport runway project is approved (does not indicate GREAT approval of airport expansion). The landowner is responsible for acquiring necessary permits and mitigation. Acres are not included in totals for wetland impacts because this is a Metropolitan Airport Commission (MAC) project. This site has been used in the past. GREAT selected sites for St. Paul Barge Terminal cut in this order: 2.14, 2.15, 2.13, 2.40, and 2.02.

SITE CHARACTERISTICS: GREAT described the area as 80 acres of Type 1 and 2 wetlands and 30 acres of Type 3&4 wetlands. This site is located within the floodplain. Adjacent land uses include, main navigation channel, barge terminal, railroad, and an airfield. Vegetation is characterized as cattails, cutgrass, and reed canary grass.

SITE DIMENSIONS: Area = 110 acres. The area is 3400 feet by 1400 feet. Only approximately 46 acres remains available (400,000 cubic yards). Pre-Fill Elevation = 695.0. Maximum Fill Elevation = 705.0. LCP Elevation = 687.2. Estimated Capacity = 1,008,000 cubic yards (past plus future placement).

BENEFICIAL USE: Material placed here will be used beneficially as landfill to develop an airport expansion. A stockpile should be developed if possible and beneficial use promoted.

EQUIPMENT REQUIREMENTS/LIMITATIONS: A culvert was installed at the site and will be used for pipeline access. All equipment working in the area must not exceed an elevation higher than 705 MSL. If this elevation is exceeded, notify the MAC to shut their VASI off.

SPECIAL CONDITIONS/RESTRICTIONS: An FAA Form 7460-1 (Notice of Proposed Construction of Alteration) is required when dredging in the area. The Corps has agreed to remove trees and brush, and push it away from the fill area.

FUTURE PLANS: MAC has plans for future expansion of airport facilities. Insure that MAC has acquired all necessary permits (Federal, State, etc...) and coordinate with the OSIT. The MAC will obtain a separate permit from the MDNR. GREAT site 2.15 has been filled and site 2.02 has been developed.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	DMP permit from MAC
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404 (b) proposed
	Other: FAA Form 7460-1	Required to give notice of construction

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
St. Paul Barge Terminal	836.4-837.8	H	3000	3000-5000	6000-8000	8-18

ST. PAUL DOWNTOWN AIRPORT
HOLMAN FIELD

30" CONCRETE CULVERT
FOR PIPELINE ACCESS

RUNWAY 14-32

TAXIWAY A-1

TAXIWAY A-2

TAXIWAY A

1,032,000N

2,869,000E

PROPOSED TAXIWAY B

48 ACRES

AIRPORT PROPERTY

ST. PAUL PORT AUTHORITY PROPERTY

2,867,000E

1,033,000N

PROPOSED ACCESS ROAD

CHANNEL MAINTENANCE MANAGEMENT PLA

2-836.8-RMP
HOLMAN FIELD PLACEMENT SITE

LEGEND
Pipeline Access
First Priority Fill Area

MN State Plane Grid. South Zone. NAD 83
Date of Photography: November 1992

SCALE: 1"=20

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-836.3-RMP	Southport	MN/Ramsey/St. Paul	St. Paul Port Authority
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 2.13, Reference GREAT I Vol. 8-Part II). There was no RRF endorsement prior to the CMMP. GREAT selected 18 acres at this site for permanent placement, which the Corps determined is justified. GREAT selected use of sites for the St. Paul Barge Terminal cut in this order: 2.14 (not endorsed), 2.15 (filled), 2.13, 2.40, and 2.02 (developed). The area has been used for temporary storage of barge tending equipment. Consolidation of this site with the adjacent Holman Field site may be considered. This site has not been used and will require OSIT review.

SITE CHARACTERISTICS: GREAT described the area as 18 acres of type 1 wetland. Vegetation is characterized as willows. Adjacent land uses include main navigation channel, barge terminal, and airfield. This site is located within the floodplain.

SITE DIMENSIONS: Area = 18 acres. The area is 1740 feet by 450 feet. Pre-Fill Elevation = 696.0. Maximum Fill Elevation = 706.0. LCP Elevation = 687.2. Estimated Capacity = 200,000 cubic yards.

BENEFICIAL USE: The material would be beneficially used as general landfill at the site. If possible, a long-term beneficial use stockpile site will be developed.

EQUIPMENT REQUIREMENTS/LIMITATIONS: All equipment working in the area must not exceed an elevation higher than 705 MSL. If this elevation is exceeded, notify the MAC to shut their VASI off.

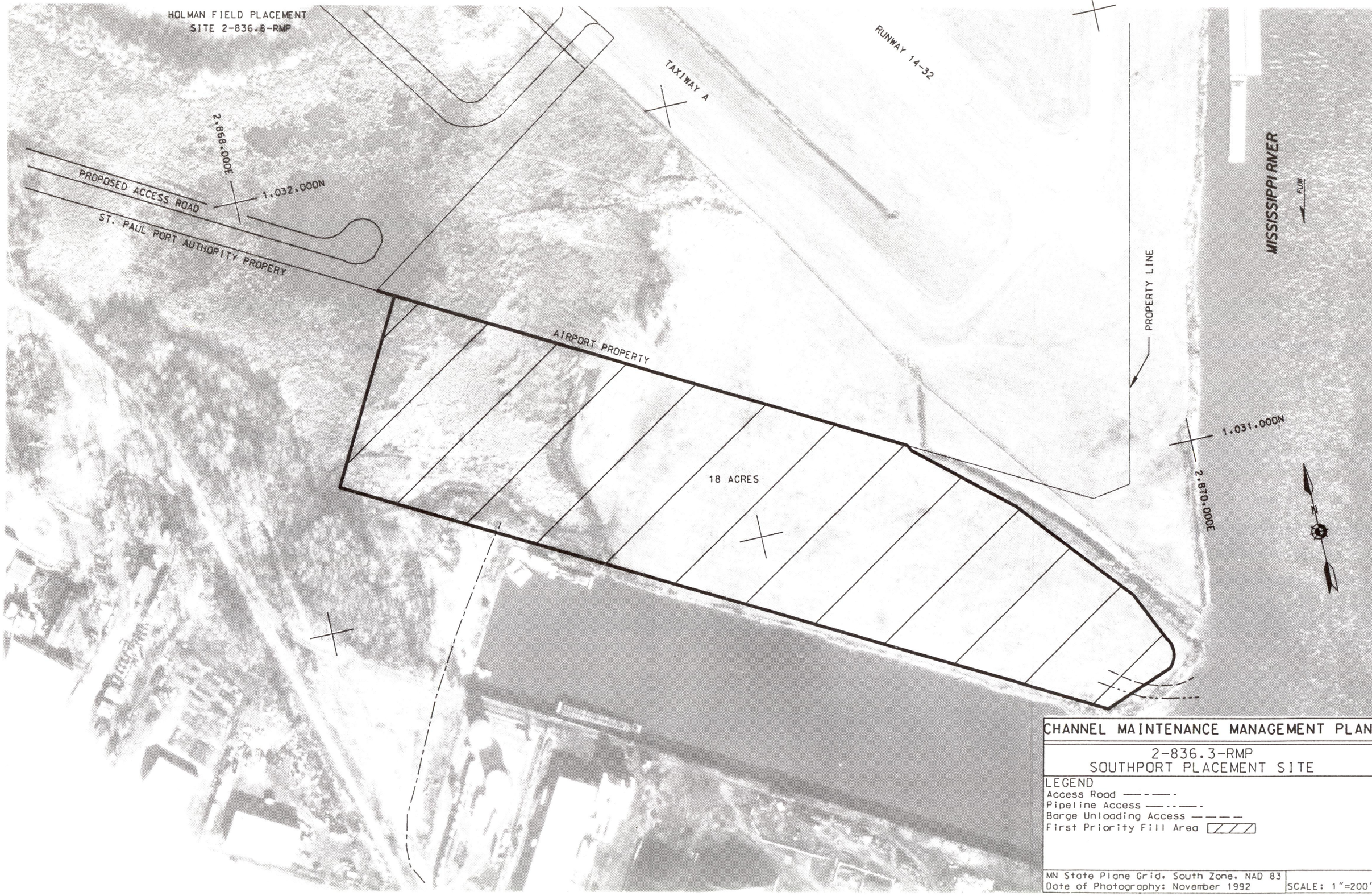
SPECIAL CONDITIONS/RESTRICTIONS: Plans for the development of the site have to be approved and ready to implement at the time of placement. An FAA Form 7460-1 (Notice of Proposed Construction or Alteration) is required when dredging in the area.

FUTURE PLANS: Pursue long-term agreement with St. Paul Port Authority and coordinate plans for use with the OSIT.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires a permit from the owner
X	State	General permit with MDNR & MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
St. Paul Barge Terminal	836.4-837.8	H	6300	500-2000	6800-8300	9-19

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

2-836.3-RMP
SOUTHPORT PLACEMENT SITE

LEGEND
Access Road ——-——-
Pipeline Access ——--——-
Barge Unloading Access ———
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-823.8-LMT	Pine Bend	MN/Washington/Cottage Grove	Federal Government
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 2.25T). This site was endorsed by the RRF on 23 April 1996 (1996 Lower Pool 2 Recon. Alt H2). GREAT selected site 2.10 (25 acres upland) for permanent placement of material from cuts 4-6. A Reconnaissance Report for Lower Pool 2 selecting a plan for environmental enhancement of Spring Lake. (site 2-822.8-RMP) was conceptually endorsed by the RRF (11/04/85). The Corps has determined that the Spring Lake project is not implementable and completed another Reconnaissance Report. The RRF endorsed Lower Pool 2 Recon. (Alt. H2) recommends using 8 acres at this site for all material from cuts 4 and 5.

SITE CHARACTERISTICS: The site lies on a long peninsula and is primarily old dredge material in various stages of revegetation. Dredged material placement in 1995 converted approximately 5 acres to bare sand. Prior to 1995, the site was approximately 10 feet above LCP and had slopes of 1V:8H.

SITE DIMENSIONS: Area = 8 acres. The area is 770 feet by 450 feet. Excavate to 30 feet below LCP to reach Pre-Fill Elevation. Pre-Fill Elevation = 657.0. Maximum Fill Elevation = 706.8. LCP Elevation = 686.8. Estimated Capacity = 379,500 cubic yards.

BENEFICIAL USE: The site is not land accessible for beneficial use removal. When excavated, material would be used beneficially for gravel pit reclamation or for implementation of the Spring Lake environmental enhancement project.

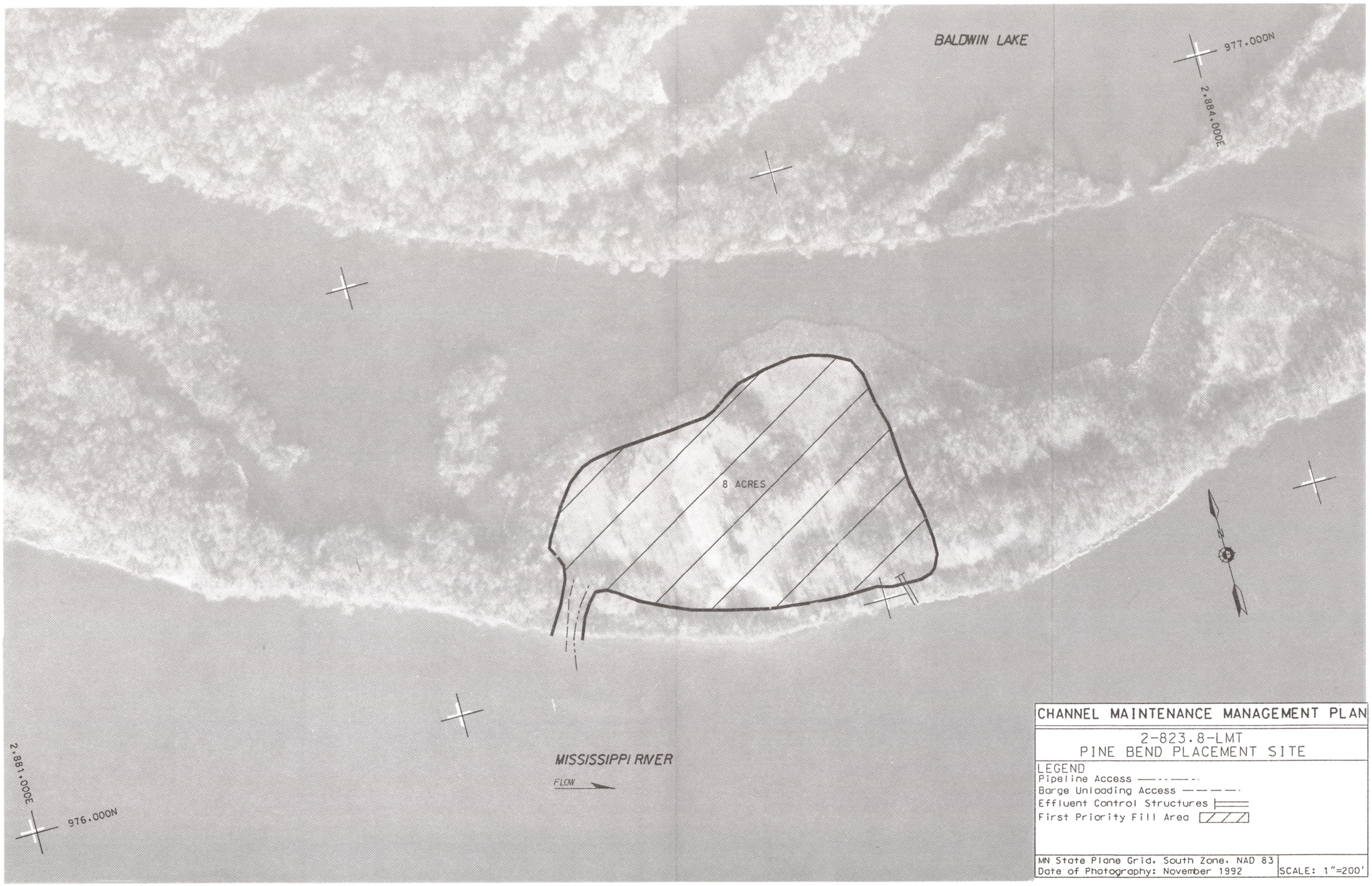
EQUIPMENT REQUIREMENTS/LIMITATIONS: The site may be used for hydraulic or mechanical placement.

SPECIAL CONDITIONS/RESTRICTIONS: Some dredging may be required to access the site from the main channel.

FUTURE PLANS: Excavation of this site to 30 feet below LCP is planned for 1997. Material will be transferred to the Shiely Co. gravel pit (2-822.5-LMP) located on Lower Grey Cloud Island. After pre-excavation, this site will be used for routine placement from cuts 4 and 5. A second excavation is expected after about 20 years. After 40 years, it is estimated that the site would cover 8 acres with a final fill elevation approximately 20 feet above LCP.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Will be analyzed if necessary
X	NEPA	Covered by O&M, EIS
X	Real Estate	Owned by Federal Government
	State	MPCA certificate if effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Pine Bend	822.7-823.7	H,M	4200	10-300	4210-4500	3-28
Grey Cloud Slough	827.5-828.3	M	21100	10-300	21110-21400	3-28
Boulanger Bend	820.8-821.4	M	18500	10-300	18510-18800	3-28
Boulanger Bend Lwr. Lt.	819.0-819.8	M	24300	10-300	24310-24600	3-28



CHANNEL MAINTENANCE MANAGEMENT PLAN

2-823.8-LMT
PINE BEND PLACEMENT SITE

LEGEND
Pipeline Access ——--——-·
Barge Unloading Access ——— —·
Effluent Control Structures |=|
First Priority Fill Area ▨

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-823.8-RMP	C. F. Industries	MN/Dakota/Rosemont	C. F. Industries
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. There was no RRF endorsement prior to the CMMP. GREAT selected site 2.10 (25 acres upland) for permanent placement of material from cuts 4-6. A Reconnaissance Report for Lower Pool 2 selecting a plan for environmental enhancement of Spring Lake (site 2-822.8-RMP) was conceptually endorsed by the RRF (11/04/85). Use of a 1 acre area by the C.F. Industries (CFI) dock was recommended by the OSIT as a stockpile to be used later in the construction of Spring Lake. A new CFI pit site approximately 2500 feet from the dock was endorsed by the OSIT in 1994. Material at the new location would not be used for Spring Lake. This site will supplement the Lower Pool 2 plan. Both the dock and the pit sites have been used in the past and are permitted by the landowner. Future use is uncertain.

SITE CHARACTERISTICS: CFI is located off the main channel near the Spring Lake backwater. Both the CFI dock site and the CFI pit site are upland areas. The dock site is in a disturbed area near the CFI dock. The pit site is out of the floodplain and was created when CFI needed fill for their building site.

SITE DIMENSIONS: Area = 1 acre. The area is 290 feet by 150 feet. The pit site is an additional 6.5 acres and has capacity for 150,000 cubic yards. Pre-Fill Elevation = 700.0. Maximum Fill Elevation = 725.0. LCP Elevation = 686.8. Estimated Capacity = 40,000 cubic yards at the dock site and 150,000 at the pit site.

BENEFICIAL USE: There is good truck access and the site has been used for beneficial use removal with the consent of CFI and the Corps of Engineers.

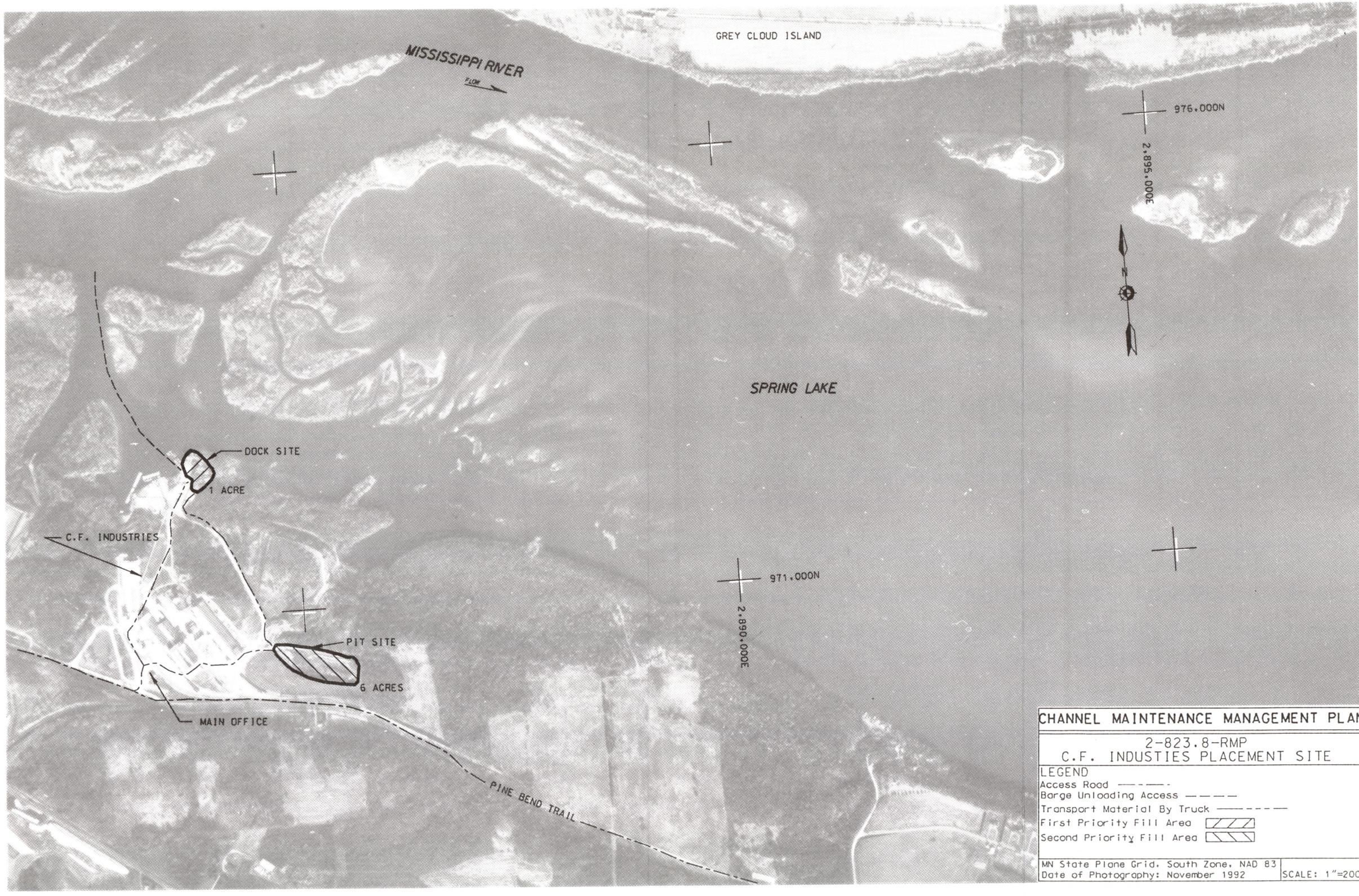
EQUIPMENT REQUIREMENTS/LIMITATIONS: Placement will be by mechanical methods only. Use of the CFI pit site will require trucks to haul material up a hill to the pit.

SPECIAL CONDITIONS/RESTRICTIONS: Conditional use permits to place material at the sites have been received. All material placed at the CFI dock site will remain the property of the Government and must be removed by the Government within 3 years. All material placed at the CFI pit site will become the landowners property.

FUTURE PLANS: The landowner has discretion over how much material is placed at the site and where it is placed, which makes the site unreliable in the future. Continue use for mechanical placement at dock site to keep the beneficial use stockpile full. Evaluate use of pit for each job.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
	Real Estate	Permit required from the landowner
X	State	General permit with MDNR & MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Pine Bend Foot Light	822.7-823.7	M	3200	50-200	3250-3400	13-38
Grey Cloud Slough	827.5-828.3	M	22700	50-200	22750-22900	13-38
Boulanger Bend	820.8-821.4	M	16400	50-200	16450-16600	13-38
Boulanger Bend Lwr. Lt.	819.0-819.8	M	22700	50-200	22750-22900	13-38



CHANNEL MAINTENANCE MANAGEMENT PLAN

2-823.8-RMP
C.F. INDUSTIES PLACEMENT SITE

LEGEND
Access Road
Barge Unloading Access
Transport Material By Truck
First Priority Fill Area
Second Priority Fill Area

MN State Plane Grid. South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-822.5-LMP	Shiely Pit	MN/Washington/Cottage Grove	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. This site was endorsed by the RRF on 23 April 1996, (1996 Lower Pool 2 Recon. Alts I1 and H2). GREAT selected sites 2.10 and 2.35 (both 25 acres upland) for permanent placement of material from cuts 2-6. A Recon. Report for Lower Pool 2 selecting a plan for environmental enhancement of Spring Lake (2-822.8-RMP) was conceptually endorsed by the RRF (11/04/85). The Corps determined that the Spring Lake project is not feasible and have prepared another Lower Pool 2 Recon. This site is used under all alternatives to varying degrees. For planning purposes, it is assumed that 15 acres is required to contain the projected amount of material placed for various alts.

SITE CHARACTERISTICS: This site is an active sand/gravel quarry. No specific portion of the pit has been identified for dredged material placement. The active quarry operations limit the revegetation. It is assumed that materials transferred from the island sites will contain fine material which will promote better growth.

SITE DIMENSIONS: Area = 15 acres. The area is 1500 by 435 feet. Pre-Fill Elevation = 707.0. Maximum Fill Elevation = 737.0. LCP Elevation = 686.8. Estimated Capacity = 1,445,500+ cubic yards.

BENEFICIAL USE: All of the material placed at this site would be used for passive beneficial use for reclamation of the Shiely Co. sand and gravel pit.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Material will be transferred from island sites 2-823.8-LMT (Pine Bend), 2-821.5-LMT (Upper Boulanger) and 2-821.1-LMT (Lower Boulanger) to this site hydraulically.

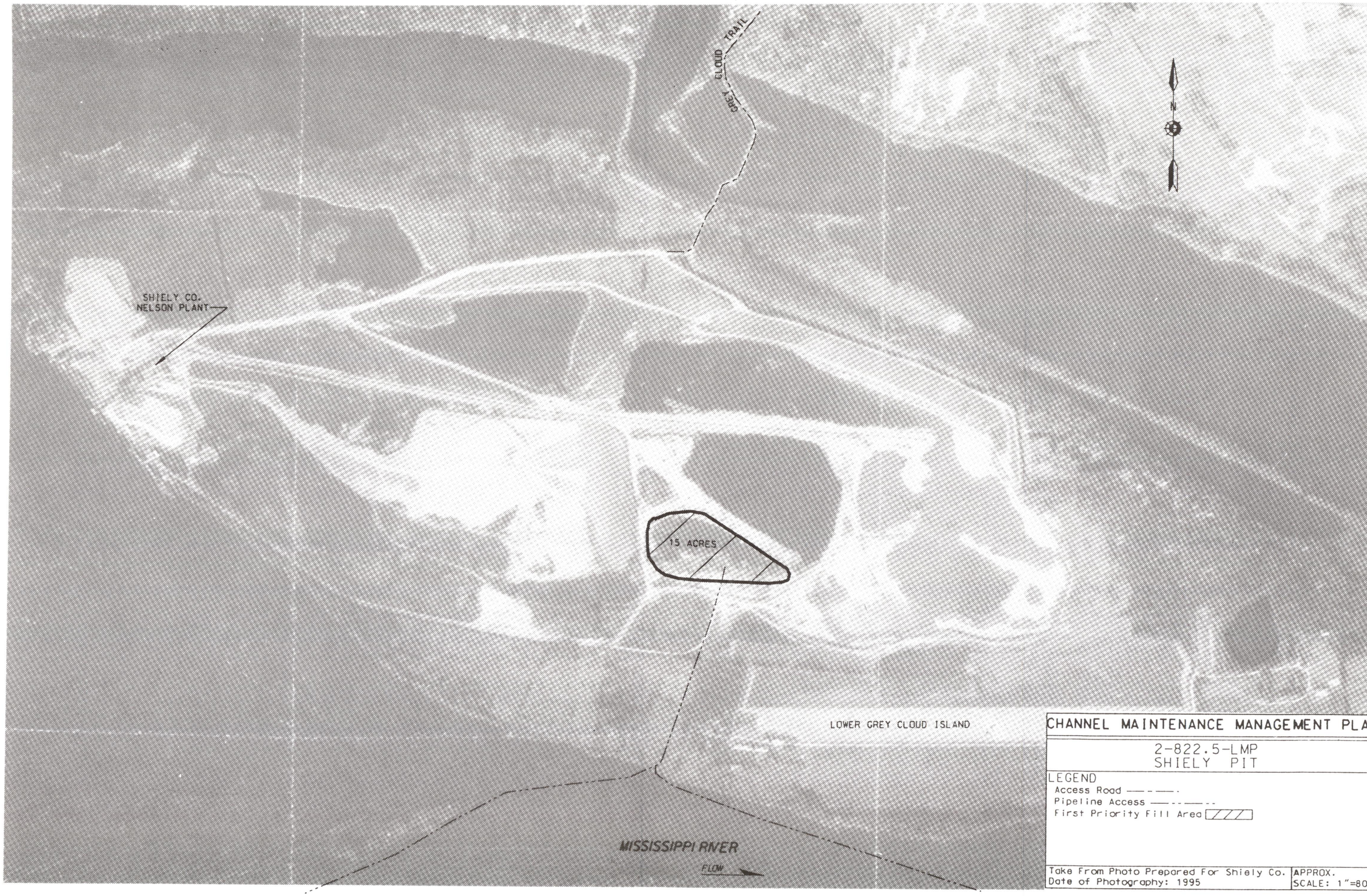
SPECIAL CONDITIONS/RESTRICTIONS: Unknown.

FUTURE PLANS: Excavate island sites in 1997 to this location and stabilize. Coordinate development of long term real estate and site use plans with Shiely Co., the landowners, Washington Co., Cottage Grove, and RRF agencies.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
	NEPA	
	Real Estate	Requires a permit from the landowner
	State	
	404(b)(1) Evaluation	
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Pine Bend site	2-823.8-LMT	H	6000	2200	8200	80
Upper Boulanger site	2-821.5-LMT	H	5200	2200	7400	80
Lower Boulanger site	2-821.1-LMT	H	7200	2200	9400	80



CHANNEL MAINTENANCE MANAGEMENT PLA

2-822.5-LMP
SHIELY PIT

LEGEND
Access Road ——-——·
Pipeline Access ——--——--
First Priority Fill Area

Take From Photo Prepared For Shiely Co.
Date of Photography: 1995

APPROX.
SCALE: 1"=80

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-821.5-LMT	Upper Boulanger	MN/Washington/Cottage Grove	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. This site was endorsed by the RRF on 23 April 1996 (1996 Lower Pool 2 Recon. Alt I1). GREAT selected site 2.35 (25 acres upland) for permanent placement of material from cuts 2 and 3. A Reconnaissance Report for Lower Pool 2 selecting a plan for environmental enhancement of Spring Lake (site 2-822.8-RMP) was conceptually endorsed by the RRF (11/04/85). This site was a potential source of initial material for construction of the Spring Lake project and a site for storage of material if the Spring Lake project would be completed in phases. The Corps has determined that the Spring Lake project is not implementable and completed another Recon. Report. The RRF endorsed 1995 Lower Pool 2 Recon. (Alt I1) recommends using 4 acres at this site for material from cuts 2 and 3.

SITE CHARACTERISTICS: An island site created by dredge material placement.

SITE DIMENSIONS: Area = 4 acres. The area is 560 feet by 310 feet. Excavate to 30 feet below LCP to reach Pre-Fill Elevation. Pre-Fill Elevation = 656.7. Maximum Fill Elevation = 706.7. LCP Elevation = 686.7. Estimated Capacity = 100,000 cubic yards.

BENEFICIAL USE: This site is not land accessible for beneficial use removal. When excavated, material would be used beneficially for gravel pit reclamation or for implementation of the Spring Lake environmental enhancement project.

EQUIPMENT REQUIREMENTS/LIMITATIONS: The site may be use for hydraulic or mechanical placement.

SPECIAL CONDITIONS/RESTRICTIONS: Unknown.

FUTURE PLANS: Excavation of this site to 30 feet below LCP is planned for 1997. Material will be transferred to the Shiely Co. gravel pit located on Lower Grey Cloud Island. After excavation and placement of 100,000 cubic yards use will be re-evaluated. After 40 years, it is estimated that the site would cover 4 acres with a final fill elevation approximately 20 feet above LCP.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Impacts will be analyzed
X	NEPA	Covered by O&M, EIS
	Real Estate	Requires a permit from the landowner
	State	MPCA certificate if effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Boulanger Bend	820.8-821.4	H,M	4000	10-300	4010-4300	3-28
Boulanger Bend Lwr. Lt.	819.0-819.8	M	9500	10-300	9510-9800	3-28
Pine Bend Foot Light	822.7-823.7	M	10600	10-300	10610-10900	3-28
Grey Cloud Slough	827.5-828.3	M	35900	10-300	35910-36200	3-28



CHANNEL MAINTENANCE MANAGEMENT PLAN

2-821.5-LMT
UPPER BOULANGER PLACEMENT SITE

LEGEND
Pipeline Access
Barge Unloading Access
Effluent Control Structures
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

2-821.1-LMT	**Lower Boulanger**	MN/Washington/Cottage Grove	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 2.31T). GREAT selected site 2.35 (25 acres upland) for permanent placement of material from cuts 2 and 3. A Reconnaissance Report for Lower Pool 2 selecting a plan for environmental enhancement of Spring Lake (site 2-822.8-RMP) was conceptually endorsed by the RRF (11/04/85). This site was a potential source of initial material for construction of the Spring Lake project and a site for storage of material if the Spring Lake project would be completed in phases. The Corps has determined that the Spring Lake project is not implementable and completed another Recon. Report. The RRF endorsed 1995 Lower Pool 2 Recon. (Alt I1) recommends using 8 acres at this site for material from cuts 2 and 3.

SITE CHARACTERISTICS: This is an island site created by dredged material placement. Five acres at this site are characterized as upland (sand from past placement) and three acres at this site are characterized as wetland (bottomland forest).

SITE DIMENSIONS: Area = 8 acres. The area is 1200 feet by 290 feet. Excavate to 30 feet below LCP to reach Pre-Fill Elevation. Pre-Fill Elevation = 657.0. Maximum Fill Elevation = 710.0. LCP Elevation = 686.7. Estimated Capacity = 355,500 cubic yards.

BENEFICIAL USE: This site is not land accessible for beneficial use removal. When excavated, material would be used beneficially for gravel pit reclamation or for implementation of the Spring Lake environmental enhancement project.

EQUIPMENT REQUIREMENTS/LIMITATIONS: The site may be used for hydraulic or mechanical placement.

SPECIAL CONDITIONS/RESTRICTIONS: Unknown.

FUTURE PLANS: Excavation to 30 feet below LCP is planned in 1997. Material will be transferred to the Shiely Co. gravel pit on Lower Grey Cloud Island. After 40 years, it is estimated that the site would cover 8 acres with a final fill elevation approximately 20 feet above LCP.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Impacts will be analyzed
	NEPA	
	Real Estate	Requires a permit from the landowner
	State	MPCA certificate if effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Boulanger Bend	820.8-821.4	H,M	1000	10-300	1010-1300	3-28
Boulanger Bend Lwr. Lt.	819.0-819.8	H,M	5300	10-300	5310-5600	3-28
Pine Bend Foot Light	822.7-823.7	M	14800	10-300	14810-15100	3-28
Grey Cloud Slough	827.5-828.3	M	40100	10-300	40110-40400	3-28

1995 RECON
ALT. 11

BARGE / PIPELINE ACCESS

8 ACRES

2,897,000E

975,000N

N

MISSISSIPPI RIVER
FLOW

974,000N

2,895,000E

CHANNEL MAINTENANCE MANAGEMENT PLAN

2-821.1-LMT
LOWER BOULANGER PLACEMENT SITE

LEGEND
Pipeline Access
Barge Unloading Access
Effluent Control Structures
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 12 - POOL 3

TAB 12

Placement Site Information Sheets and Operational Maps

POOL 3

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-815.1-RMP	Hastings	MN/Dakota/Hastings	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. This site was endorsed by the RRF on 10 April 90 (proposed by Corps). GREAT selected sites 3.47 (1.5 acres upland), 3.48 (undefined acres upland), and 3.42 (8.5 acres wetland) for permanent placement of material from the Lower Appch. to L/D 2 cut. The endorsed proposal recommends use of this site in lieu of the GREAT selected sites. The endorsed area is 6.1 acres but development of the L/D 2 access road has significantly reduced the size to 1 acre usable only for emergency placement. Material from cuts 5-7 may be placed at this site if no other sites are implementable but only under emergency conditions.

SITE CHARACTERISTICS: The area is adjacent to the lower approach to L/D 2. Adjacent land uses are Lock & Dam operations, abandoned land where Koch Refinery storage tanks were, and Lake Rebecca Park. This is a disturbed upland site within the floodplain but out of the floodway.

SITE DIMENSIONS: Approx. Area= 1 acre - The area is 480 feet by 95 feet. Pre-Fill Elevation = 690.0 Fill Elevation = 710.0 LCP Elevation = 675.0 Estimated Capacity: 17,000 cubic yards.

BENEFICIAL USE: Access to the site by road is excellent and there is a demand for a beneficial use stockpile in the area. The city of Hastings has expressed the greatest need for material.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

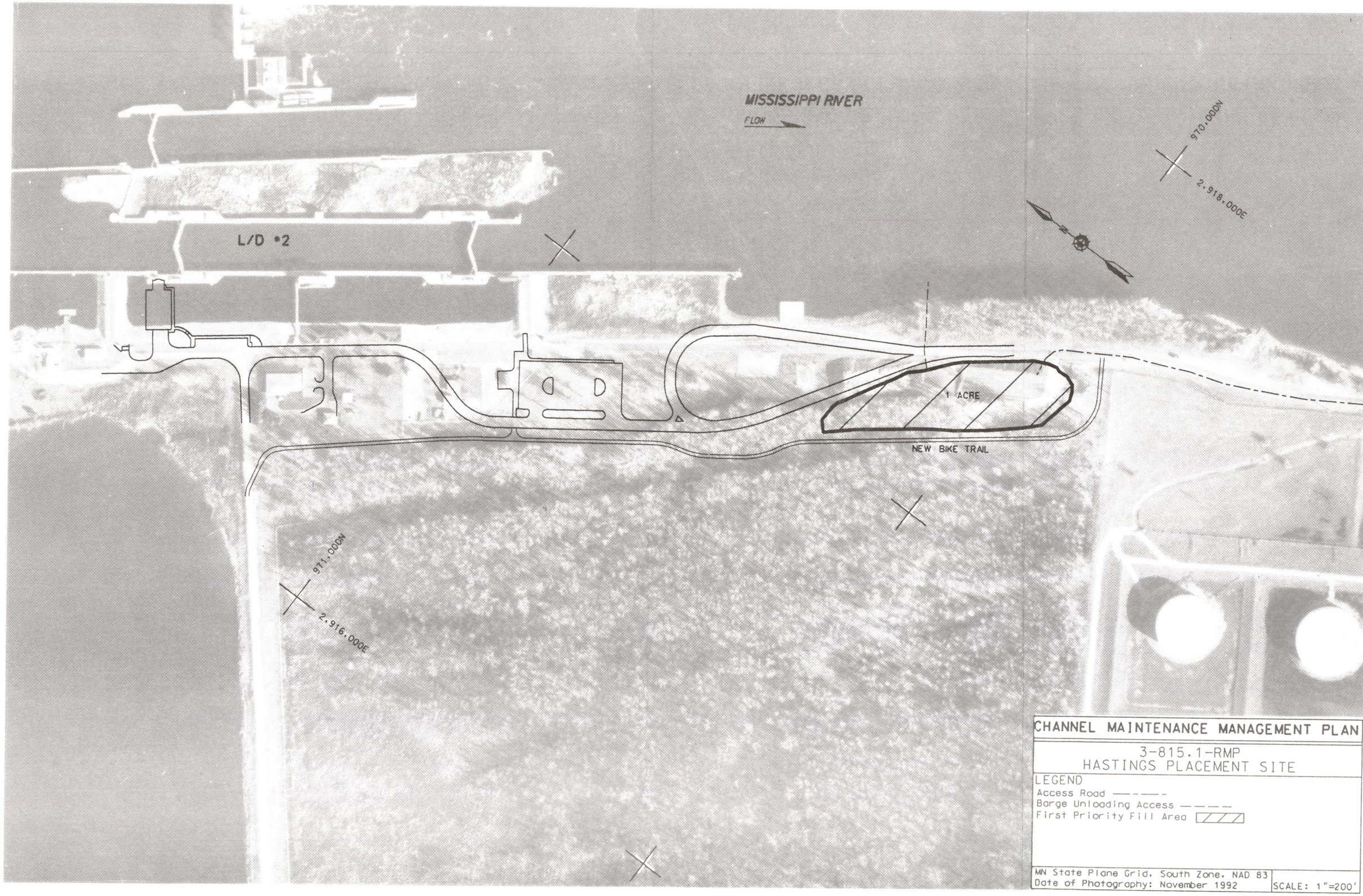
SPECIAL CONDITIONS/RESTRICTIONS: The L/D 2 access road has been relocated and most of the area available for stockpiling material is gone and trees have been planted. This site will only be used if emergency dredging is required and no other sites are acceptable for use.

FUTURE PLANS: Promote beneficial use to insure adequate capacity for future placement. If emergency dredging requires placement at this site, trees will have to be removed prior to placement. Beneficial use will be promoted and the site will be re-vegetated.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
X	Real Estate	Owned by federal government
X	State	General permit with MDNR and MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Lower Appch. to L/D 2	814.9-815.1	M	500	100-500	600-1000	15-33
Prescott	810.3-811.7	M	21600	100-500	21700-22100	15-33
Truedale Slough	807.9-808.6	M	34800	100-500	34900-35300	15-33
Four Mile Island	807.0-807.9	M	39600	100-500	39700-40100	15-33

April 2, 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

3-815.1-RMP
HASTINGS PLACEMENT SITE

LEGEND

Access Road ——————

Barge Unloading Access — — — —

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-814.7-RMP	Koch	MN/Dakota/Hastings	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. There was no RRF endorsement prior to the CMMP. GREAT selected sites 3.47 (1.5 acres upland), 3.48 (undefined acres upland), and 3.42 (8.5 acres wetland) for permanent placement of material from Lower appch. to L/D 2. In 1990, the RRF endorsed a Corps proposal to use site 3-815.1-RMP (Hastings) in lieu of the GREAT selected sites. Development of the L/D 2 access road has reduced the size and usefulness of the site. It will also conflict with visitor day use at the Lock. The Corps will pursue long-term agreement or acquisition of the Koch site to replace site 3-815.1-RMP.

SITE CHARACTERISTICS: This area has been used by Koch as a storage area for petroleum products. Use of the site by Koch has recently been abandoned and the storage tanks and pipelines have been removed. The area is upland and adjacent to the main channel.

SITE DIMENSIONS: Area = 7 acres. The area is 720 feet by 430 feet. Pre-Fill Elevation = 690.0. Maximum Fill Elevation = 700.0. LCP Elevation = 675.0. Estimated Capacity = 70,000 cubic yards.

BENEFICIAL USE: Access to the site would need to be developed. There is a high demand for a beneficial use stockpile in the area. The city of Hastings has expressed the greatest need for material.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: Because this site was used for the storage of petroleum products, there is a high potential for contaminants in the soils at this location. Extensive testing would be completed prior to any use or agreements being made for use.

FUTURE PLANS: If implementable, develop access and establish vegetation around the area for visual screening. Promote beneficial use of the material. Development of plans for use of this site will be coordinated with the OSIT.

PERMITS/APPROVAL CHECKLIST: Remarks

Cultural Resources
Endangered Species
Floodplain Impact Analysis
NEPA
Real Estate
State
404(b)(1) Evaluation
Other:

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Lower Appch. to L/D 2	814.9-815.1	M	1600	500-900	2100-2500	25
Prescott	810.3-811.7	M	19500	500-900	20000-20400	25
Truedale Slough	807.9-808.6	M	34500	500-900	35000-35400	25
Four Mile Island	807.0-807.9	M	38500	500-900	39000-39400	25

MISSISSIPPI RIVER

FLOW

970,000N

2,920,000E

BOAT RAMP

R-814.8 MON.

968,000N

2,920,000E

7 ACRES

KOCH STORAGE TANKS AND
EQUIPMENT HAVE BEEN REMOVED

CHANNEL MAINTENANCE MANAGEMENT PLAN

3-814.7-RMP
KOCH PLACEMENT SITE

LEGEND

Access Road ——- -

Barge Unloading Access — — —

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-813.2-RMP	Hastings Harbor	MN/Dakota/Hastings	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 3.46, Reference GREAT I Vol. 8-Part III). There was no RRF endorsement prior to the CMMP. GREAT selected 11 acres of upland at this site for permanent placement, which the Corps determined is justified. No Reconnaissance Report has been completed. This site has not been used and will require OSIT review. A long-term real estate agreement is required prior to placement of any material. Use of this site will be pursued if beneficial use does not keep up with placement at site 3-815.1-RMP (Hastings) and the potential Koch site (3-814.7-RMP) is not implementable.

SITE CHARACTERISTICS: The site is an agricultural field located adjacent to the main channel.

SITE DIMENSIONS: Area = 11 acres. The area is 1100 feet by 435 feet. Pre-Fill Elevation = 685.0. Maximum Fill Elevation = 697.0. LCP Elevation = 675.0. Estimated Capacity = 175,000 cubic yards.

BENEFICIAL USE: Access to the site by road is very poor and would have to be improved to allow any beneficial use removal by land. If access is improved beneficial use of all material is expected. The city of Hastings has expressed the greatest need for material.

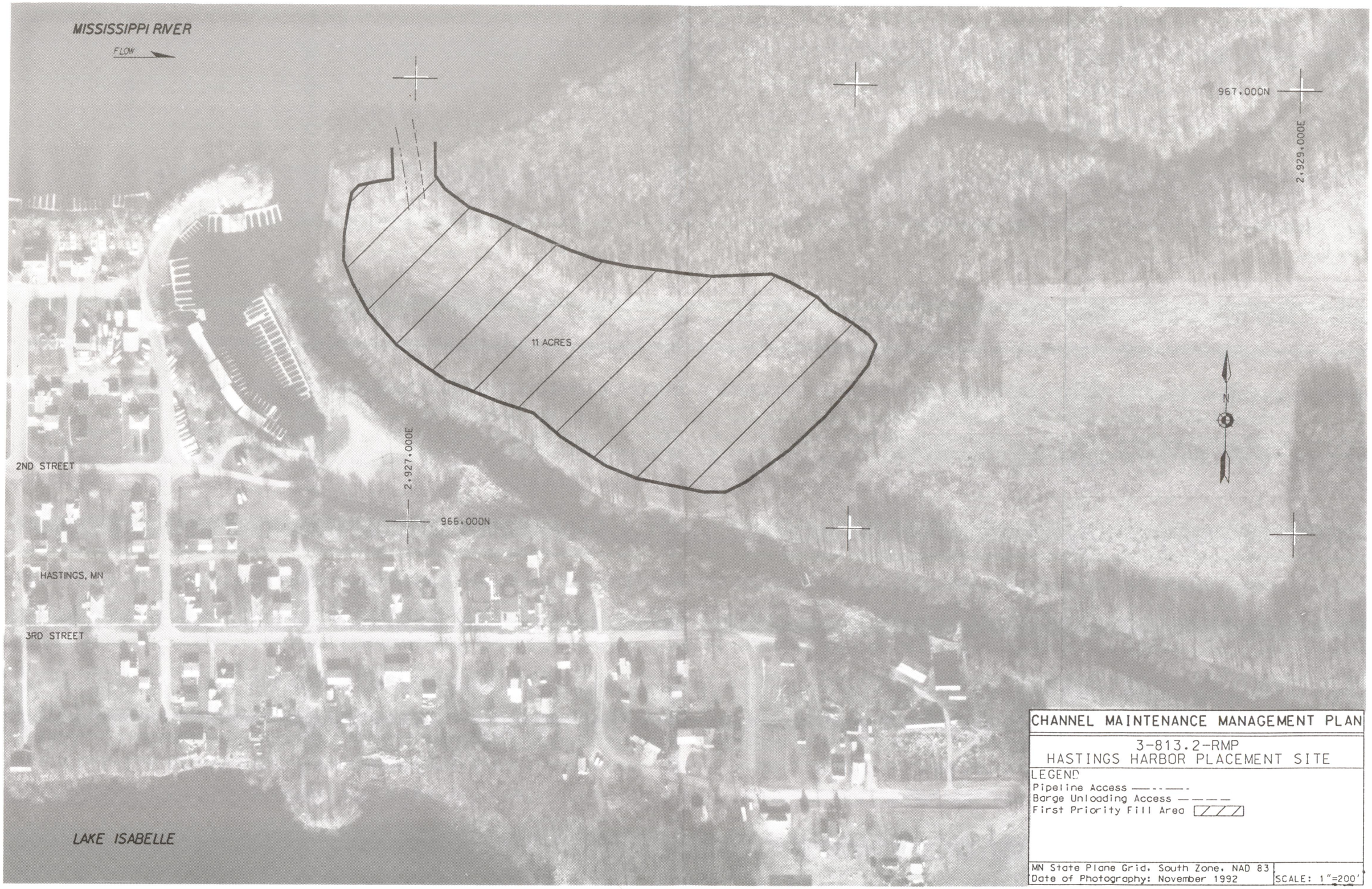
EQUIPMENT REQUIREMENTS/LIMITATIONS: Material from cut 8 would be direct hydraulic if equipment is available. However, mechanical dredging of cuts 5-9 is expected because of the low volume per job and low frequency of the cuts.

SPECIAL CONDITIONS/RESTRICTIONS: If material is placed hydraulically, a dike will be constructed and effluent control structures would be required. Effluent will be directed back to the main channel.

FUTURE PLANS: Improving land access to the site will be pursued following acquisition of long-term use agreements.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	MN SHPO approved use in 1984
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	May require further analysis
	NEPA	
	Real Estate	Requires long-term agreement with the landowner
	State	
	404(b)(1) Evaluation	
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Lower Appch. to L/D 2	814.9-815.1	M	9500	50-1100	9550-10600	10-22
Prescott	810.3-811.7	M	11600	50-1100	11650-12700	10-22
Truedale Slough	807.9-808.6	M	26400	50-1100	26450-27500	10-22
Four Mile Island	807.0-807.9	M	30600	50-1100	30650-31700	10-22



CHANNEL MAINTENANCE MANAGEMENT PLAN

3-813.2-RMP
HASTINGS HARBOR PLACEMENT SITE

LEGEND
Pipeline Access —--—-
Barge Unloading Access — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-811.5-LMP	**Point Douglas**	MN/Washington/Prescott,WI	MDOT & B.N.RR.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 3.34, Reference GREAT I Vol. 8-Part III). There was no RRF endorsement prior to the CMMP. GREAT selected 10 acres at this site for permanent placement from Cut 1 on the St. Croix and from cuts 4-7 in Pool 3. No further studies have been completed for the St. Croix or for Upper Pool 3 because the Corps has determined that the GREAT recommendations are justified. This site has not been used or developed because dredging in the area is infrequent and access to the site will be difficult. Because cut 4 has been included in the 1995 Lower Pool 3 Recon., that material will not be placed at this site. A meeting between the WDNR, MDNR, and Corps was held on 5 October 1995 at Kinnickinnic State Park to re-define the fill areas according to WDNR future plans at the park. A decision was made to use this site after capacity is reached at the Kinnickinnic Bar Upper (SC-6.7-LWP) and Lower (SC-6.5-LWP) sites.

SITE CHARACTERISTICS: GREAT described the area as 6 acres upland and 4 acres wetland. Vegetation is characterized as bottomland hardwoods and aquatic plants. Adjacent land use includes railroad, navigation channel and U. S. Highway.

SITE DIMENSIONS: Area = 10 acres. The area is 1930 feet by 225 feet. Pre-Fill Elevation = 705.0. Maximum Fill Elevation = 730.0. LCP Elevation = 675.0. Estimated Capacity = 400,000 cubic yards.

BENEFICIAL USE: GREAT projected a beneficial use demand of 240,000 cubic yards. Most material will be used as landfill on-site but a stockpile can be developed for beneficial use removal.

EQUIPMENT REQUIREMENTS/LIMITATIONS: The railroad tracks separate the site from the river so all placement will be hydraulic. Material from cut 7 in Pool 3 would be placed directly, while all other cuts will require mechanical dredging with hydraulic rehandling.

SPECIAL CONDITIONS/RESTRICTIONS: GREAT identified this as a fifth priority site for the St. Croix Cut 1, a third priority site for Pool 3 cuts 4-6, and a first priority site for Cut 7. If those cuts listed before this one in priority can not be developed or are not implementable, this site will be used.

FUTURE PLANS: Visit site with OSIT to develop details for implementing plans for this site. Obtain long-term real estate agreements and prepare site for use.

PERMITS/APPROVAL CHECKLIST: Remarks

	Cultural Resources	Review is required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
	Real Estate	Requires long-term agreement
	State	MPCA certification. if effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Kinnickinnic Bar	6.0-6.5	M,H	31680	100-2000	31780-33680	20-55
Prescott	810.3-811.7	H	2640	100-2000	2740-4640	20-55
Four Mile Island	807.0-807.9	M,H	19536	100-2000	19636-21536	20-55
Pine Coulee	809.5-809.8	M,H	9504	100-2000	9604-11504	20-55

April 1996

969,000N

2,933,000E

ST. CROIX RIVER

FLOW

PRESCOTT, WI

2,935,000E

968,000N

U.S. HIGHWAY 10

10 ACRES

B.N. INC.

MISSISSIPPI RIVER

FLOW

CHANNEL MAINTENANCE MANAGEMENT PLAN

3-811.5-LMP
POINT DOUGLAS PLACEMENT SITE

LEGEND

Access Road ——-——-

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83

Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-808.4-LWP	Dry Run Slough	WI/Pierce/Prescott	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 3.27, Reference GREAT I Vol. 8-Part III). There was no RRF endorsement prior to the CMMP. GREAT selected 31 acres at this site for permanent placement of material from cuts 4-6. A Recon. report for Middle Pool 3 (dated June 1984) recommended use of GREAT sites 3.28 and 3.44 for cuts 4-6 but endorsement was deferred pending further information. The Recon. also modified the GREAT alternative to reflect changes in site dimensions and updated beneficial use data. The modified alternative (Al) recommends 13 acres for cuts 4-6. The Corps has determined that the modified GREAT plan is justified and will pursue implementation of this site.

SITE CHARACTERISTICS: A total of 19 acres will be impacted. Relocation of the Dry Run Slough channel will disturb 4 acres of old field and 2 acres of forest in addition to the 13 acres (8 upland forest, 3 old field, and 2 dry run channel) disturbed through placement of dredged material. Adjacent to county road and railroad.

SITE DIMENSIONS: Area = 13 acres. The area is 2270 feet by 250 feet. Additional 6 acres will be impacted to relocate dry run. Pre-Fill Elevation = 696.0. Maximum Fill Elevation = 740.0. LCP Elevation = 675.0. Estimated Capacity = 500,000 cubic yards.

BENEFICIAL USE: The Middle Pool 3 Recon. projected beneficial use from this area to be 653,000 cubic yards. The remainder of material placed at this site will remain permanently.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Material from cuts 5-6 will be placed by direct hydraulic methods and material from cut 4 will be dredged mechanically and placed by hydraulic rehandling. Cut 4 will not be placed here unless capacity is exhausted at 3-799.2-RMT (Corps Island).

SPECIAL CONDITIONS/RESTRICTIONS: Use of this site will involve relocating the existing drainage channel from Dry Run Slough and installing a culvert through the railroad embankment. Effluent from hydraulic dredging will be directed to Dry Run Slough and eventually into the main channel.

FUTURE PLANS: Visit the site with the OSIT and begin developing an implementation plan. Once the site is established, promote beneficial use. Implementation has not been a high priority because of low dredging volumes and frequencies for cuts 4-6.

PERMITS/APPROVAL CHECKLIST: Remarks

	Cultural Resources	Review is required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Analyze impacts on Dry Run Slough
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires long-term agreement
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Big River	804.1-806.0	M,H	18000	300-2000	18300-20000	21-65
Four Mile Island	807.0-807.9	H	5000	300-2000	5300-7000	21-65
Pine Coulee	809.5-809.8	H	7100	300-2000	7400-9100	21-65

960.000N

2,950.000E

COUNTY ROAD Q

1.3 ACRES

L-808.2 FP

B.N. INC.

POTENTIAL ACCES

TBM RR SPK

MISSISSIPPI RIVER

FLOW

808

958.000N

2,950.000E

CHANNEL MAINTENANCE MANAGEMENT PLAN

3-808.4-LWP
DRY RUN SLOUGH PLACEMENT SITE

LEGEND

Access Road — - — -

Pipeline Access — — —

First Priority Fill Area ////

MN State Plane Grid, South Zone, NAD 83

Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-802.3-RME	Morgans	MN/Goodhue/Diamond Bluff	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 3.14T, Reference GREAT I Vol. 8-Part III). There was no RRF endorsement prior to the CMMP. GREAT selected 10.5 acres at this site for temporary placement of dredged material from the Morgans Coulee cut. The Corps has determined that the GREAT recommendation is justified. Howevèr, the size of the site is reduced to 3 acres. Reconnaissance Reports for Middle and Lower Pool 3 were completed but neither discussed continued use as a temporary site. Part of this site has been used historically for dredged material placement. The Corps will consider use of this site for emergency dredging operations. Use will be a second priority after considering the Coulters Island site (3-801.7-LWE).

SITE CHARACTERISTICS: The site is in the floodplain and the floodway. Vegetation consists of bottomland hardwoods, Cattails, Lotus, and Arrowhead.

SITE DIMENSIONS: Area = 3 acres. The area is 650 feet by 200 feet. Pre-Fill Elevation = 682.0. Maximum Fill Elevation = 697.0. LCP Elevation = 674.3. Estimated Capacity = 52,000 cubic yards.

BENEFICIAL USE: There is no road access to the site. If the site is used, material would likely be removed for beneficial use elsewhere.

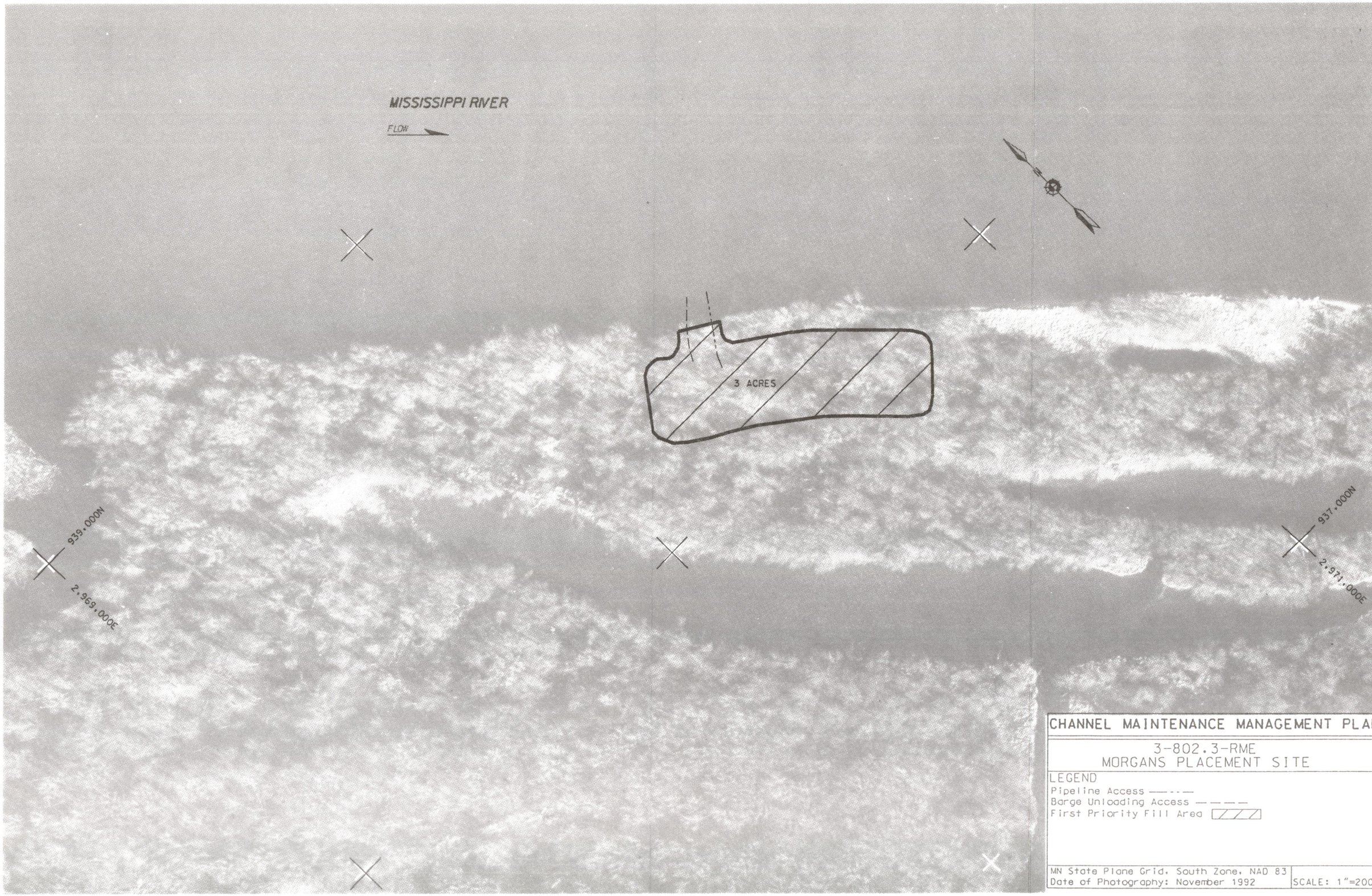
EQUIPMENT REQUIREMENTS/LIMITATIONS: Placement of material may be by mechanical or hydraulic methods. If hydraulic placement is used, the backwater and side channel areas must be protected.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies.

FUTURE PLANS: At this time, there are no plans to use the site except for emergency purposes.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Impacts will be analyzed
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Morgans Coulee	801.9-803.0	H,M	1200	10-2000	1210-3200	8-23
Coulters Island	800.8-801.8	H,M	6000	10-2000	6010-8000	8-23
Big River	804.1-806.0	M	13200	10-2000	13210-15200	8-23
Diamond Bluff	798.8-800.4	M	14800	10-2000	14810-16800	8-23



CHANNEL MAINTENANCE MANAGEMENT PLA

3-802.3-RME
MORGANS PLACEMENT SITE

LEGEND
Pipeline Access ——·——
Barge Unloading Access — — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-801.7-LWE	Coulters	WI/Pierce/Diamond Bluff	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 3.12T, Reference GREAT I Vol. 8-Part III). There was no RRF endorsement prior to the CMMP. GREAT selected 12 acres at this site for temporary placement of dredged material from the Coulters Island cut. The Corps has determined that the GREAT recommendation is justified. However, the size of the site is reduced to 3 acres. Reconnaissance Reports for Middle and Lower Pool 3 were completed but neither discussed continued use as a temporary site. This site has been used in the past for dredged material placement. The Corps will consider use of this site for emergency dredging operations. If practicable, site boundaries need to be designated prior to use and consideration will be given to beach placement.

SITE CHARACTERISTICS: The site is within the floodplain and the floodway. Vegetation consists of bottomland hardwoods, willows, and grasses.

SITE DIMENSIONS: Area = 3 acres. The area is 500 feet by 260 feet. Pre-Fill Elevation = 682.0. Maximum Fill Elevation = 697.0. LCP Elevation = 674.3. Estimated Capacity = 54,000 cubic yards.

BENEFICIAL USE: There is no road access to the site. If the site is used, material would likely be removed for beneficial use elsewhere.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Both mechanical and hydraulic placement methods will be acceptable.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies.

FUTURE PLANS: At this time, there are no plans to use the site except for emergency purposes. The Corps will pursue a long-term agreement with the landowner.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Impacts will be analyzed
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires a permit from the landowner
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Big River	804.1-806.0	M	17400	10-2000	7410-19400	8-23
Morgan's Coulee	801.9-803.0	H,M	3700	10-2000	3710-5700	8-23
Coulters Island	800.8-801.8	H,M	1000	10-2000	1010-3000	8-23
Diamond Bluff	798.8-800.4	M	11600	10-2000	11610-13600	8-23



CHANNEL MAINTENANCE MANAGEMENT PLAN

3-801.7-LWE
COULTERS PLACEMENT SITE

LEGEND
Pipeline Access ——--——-
Barge Unloading Access — — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-799.3-LWP	Ag. Land South	WI/Pierce/Diamond Bluff	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. This site was endorsed by the RRF on 6 December 1995 (1995 Lower Pool 3 Recon. Alt. D). GREAT selected 35 acres at 3-799.8-LWP (3.09) as a primary site for permanent placement of material from cuts 1-3 and a secondary site for cuts 4-6. The GREAT site has been developed and is no longer available. A 1983 Reconnaissance Report selected 12 acres at site 3-799.9-LWP (Diamond Bluff Beach), but the 1995 Reconnaissance Report did not select site 3-799.9-LWP because it would involve very negative social impacts. Use of 10 acres at this site was recommended for permanent placement of material from the selected Corps Island transfer site (3-799.2-RMT). Routine dredging from cuts 1-4 will go to the Corps Island site 3-799.2-RMT (7 acres).

SITE CHARACTERISTICS: This site is located on a sand terrace southeast of Diamond Bluff. Current habitat is mixed grasses and forbs. It is bordered by red oaks and sumac, a cemetery, and a township road. Landscaping along the township road will be completed to visually screen the site.

SITE DIMENSIONS: Area = 10 acres. The area is 1400 feet by 310 feet. Pre-Fill Elevation = 715.0. Maximum Fill Elevation = 745.0. LCP Elevation = 674.1. Estimated Capacity = 300,000 cubic yards.

BENEFICIAL USE: GREAT indicated that beneficial use from the Diamond Bluff area would be 258,000 cubic yards. This quantity was increased to 600,000 cubic yards based on results of a 1982 marketing study. This site has good road access and removal of all material is expected.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Placement will be by hydraulic pipeline from excavation of the Corps Island site (3-799.2-RMT). Mechanical placement requires trucking material to the site. Culverts will be installed through the township road for pipeline access and effluent return.

SPECIAL CONDITIONS/RESTRICTIONS: A submerged pipeline should be used when crossing the navigation channel to insure navigation traffic is not delayed during transfer of material to this site. Construct and maintain containment dikes. Mitigate for cultural resources on-site if necessary.

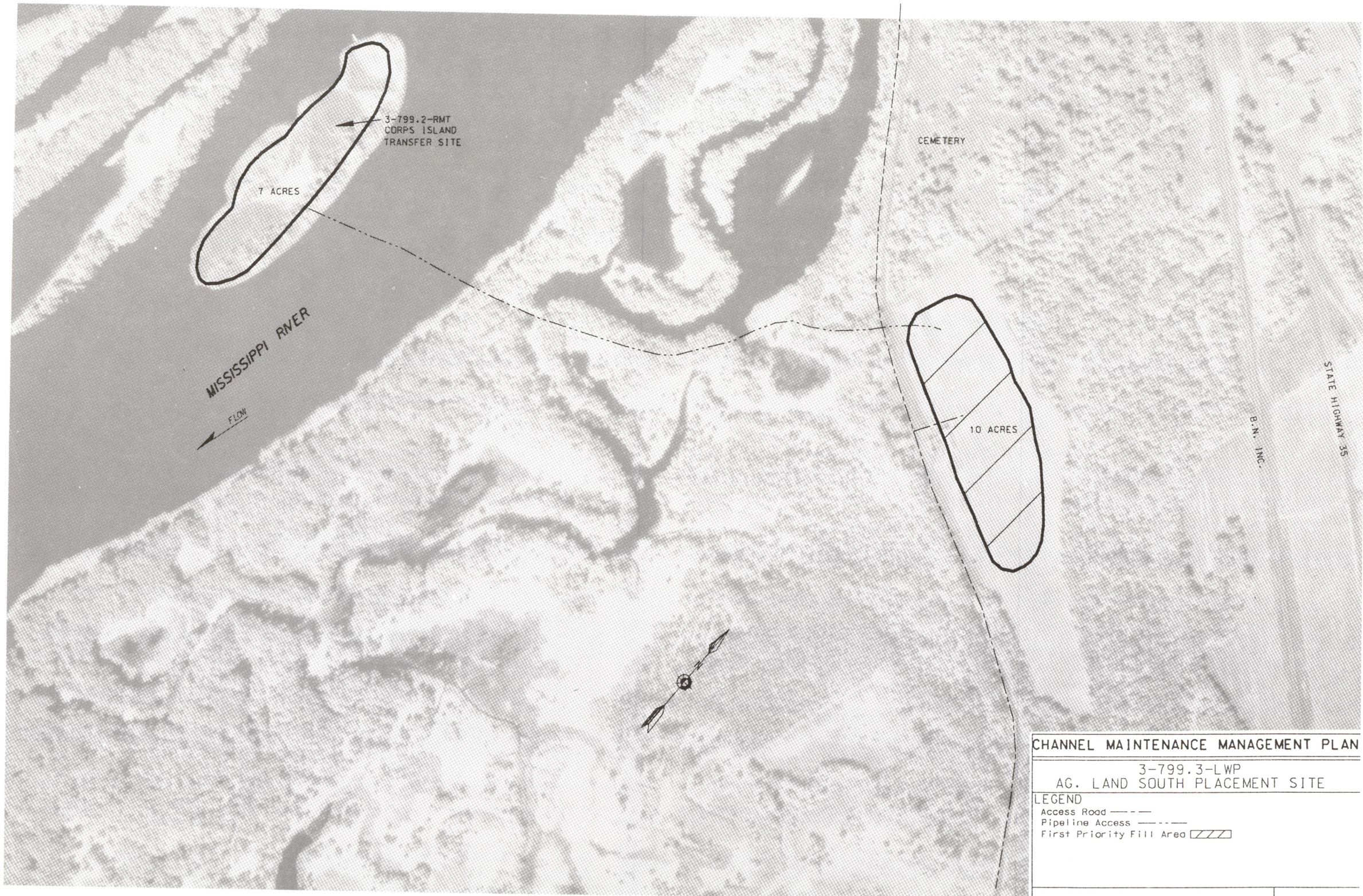
FUTURE PLANS: Acquire long-term real estate agreements for use. Develop landscaping and operational use plan. Install culverts for pipeline access and for effluent return. Construct containment dikes.

PERMITS/APPROVAL CHECKLIST:

		Remarks
	Cultural Resources	Further review & potential mitigation
	Endangered Species	
X	Floodplain Impact Analysis	No further analysis necessary
	NEPA	
	Real Estate	Requires a long-term agreement from the landowner
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b)(1) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Corps Island site	3-799.2-RMT	H	1500	2000-3200	3500-4700	41-71

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

3-799.3-LWP
AG. LAND SOUTH PLACEMENT SITE

LEGEND
Access Road ——- —
Pipeline Access ——-- ——
First Priority Fill Area ▨

Date of Photography: August 1973

SCALE: 1"=400'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

3-799.2-RMT	Corps Island	MN/Goodhue/Prairie Island	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 3.07). This site was endorsed by the RRF on 6 December 1995 (1995 Lower Pool 3 Recon. Alt. D). GREAT selected 35 acres at site 3-799.8-LWP (3.09) as a primary site for permanent placement of material from cuts 1-3 and a secondary site for cuts 4-6. The GREAT site has been developed and is no longer available. A 1983 Reconnaissance Report selected 12 acres at site 3-799.9-LWP (Diamond Bluff Beach), but the 1995 Reconnaissance Report did not select site 3-799.9-LWP because it would involve very negative social impacts. Use of 10 acres at the Ag Land South site (3-799.3-LWP) was recommended for permanent placement of material to be transferred from this 7 acre transfer site.

SITE CHARACTERISTICS: This is an island site created by dredged material placement. Prior to development in 1995, the site was 3 acres of sand, 2 acres of old dredged material with bottomland hardwoods, and 2 acres of willow. There are emergent vegetation beds on the west side of the island.

SITE DIMENSIONS: Area = 7 acres. The area is 1100 feet by 280 feet. Pre-Fill Elevation = 679.0. Maximum Fill Elevation = 709.0. LCP Elevation = 674.1. Estimated Capacity = 224,000 cubic yards.

BENEFICIAL USE: There is no beneficial use at this site due to lack of road access. The material may be used beneficially when it is excavated from the site.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Hydraulic dredging and placement is the most efficient and practical method for this site. There is no land access to the site. Both hydraulic and mechanical placement have been used in the past.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected from erosion and will be removed when it is economical or when capacity is reached.

FUTURE PLANS: When capacity is reached, material will be excavated to the Ag Land South site (3-799.3-LWP). A dike will be maintained and a vegetative screening plan will be developed and implemented.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Further analysis is required
	NEPA	
X	Real Estate	Owned by federal government
X	State	MPCA certification if effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Diamond Bluff	798.8-800.4	M	5400	50-250	5450-5650	5-35
Coulters Island	800.8-801.8	M	14300	50-250	14350-14550	5-35
Morgans Coulee	801.9-803.0	M	9500	50-250	19550-19750	5-35
Big River	804.1-806.0	M	33300	50-250	33350-33550	5-35

April 1996

PIPILINE ROUTE

TO SITE

3-799.3LWP

2,984,000E

926,000N

MISSISSIPPI RIVER

FLOW

799

926,000

2,984,000E

926,000N

7 ACRES

33

34

CHANNEL MAINTENANCE MANAGEMENT PLAN

3-799.2-RMT
CORPS ISLAND PLACEMENT SITE

LEGEND

Pipeline Access ——--——

Barge Unloading Access ——— —

Effluent Control Structures ⊨

First Priority Fill Area ▨

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 13

Placement Site Information Sheets
and
Operational Maps

UPPER POOL 4

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-794.7-RMP	Red Wing Yacht Club	MN/Goodhue/Red Wing	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.63, Reference GREAT I Vol. 8-Part III). This site was endorsed by the RRF on 4 November 1985 (Upper Pool 4 Recon. Alt. B*). GREAT selected 11 acres at this site for permanent placement of material from the Trenton Cut. A Reconnaissance Report for Upper Pool 4 also selected this site but reduced the acres required to 7. The RRF endorsed the site with conditions: 1) The Corps will consider mechanical dredging and transport to the Red Wing Commercial Harbor site (4-791.6-RMP) if the quantity is small and equipment is available, 2) Give further consideration to bank protection for reducing dredging, 3) Investigate structural modifications on a priority basis at locations of high probability for reducing dredging. The OSIT met with the landowner in 1995. As a result, the area was reduced to 6 acres and the capacity reduced from 179,000 cubic yards to 25,000 cubic yards.

SITE CHARACTERISTICS: This site has been used in the past for dredged material placement. Vegetation is characterized by moderately dense woods with dense underbrush. Dredged material placed at this site would be used for recreational enhancement.

SITE DIMENSIONS: Area = 6 acres. The area is irregular (see site map). Pre-Fill Elevation = 677.0. Maximum Fill Elevation = 680.0. LCP Elevation = 667.0. Estimated Capacity = 25,000 cubic yards.

BENEFICIAL USE: This site has no road access but does have barge access so there would be potential for beneficial use removal by barge. All material placed at this site would be considered passive beneficial use for recreational enhancement.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

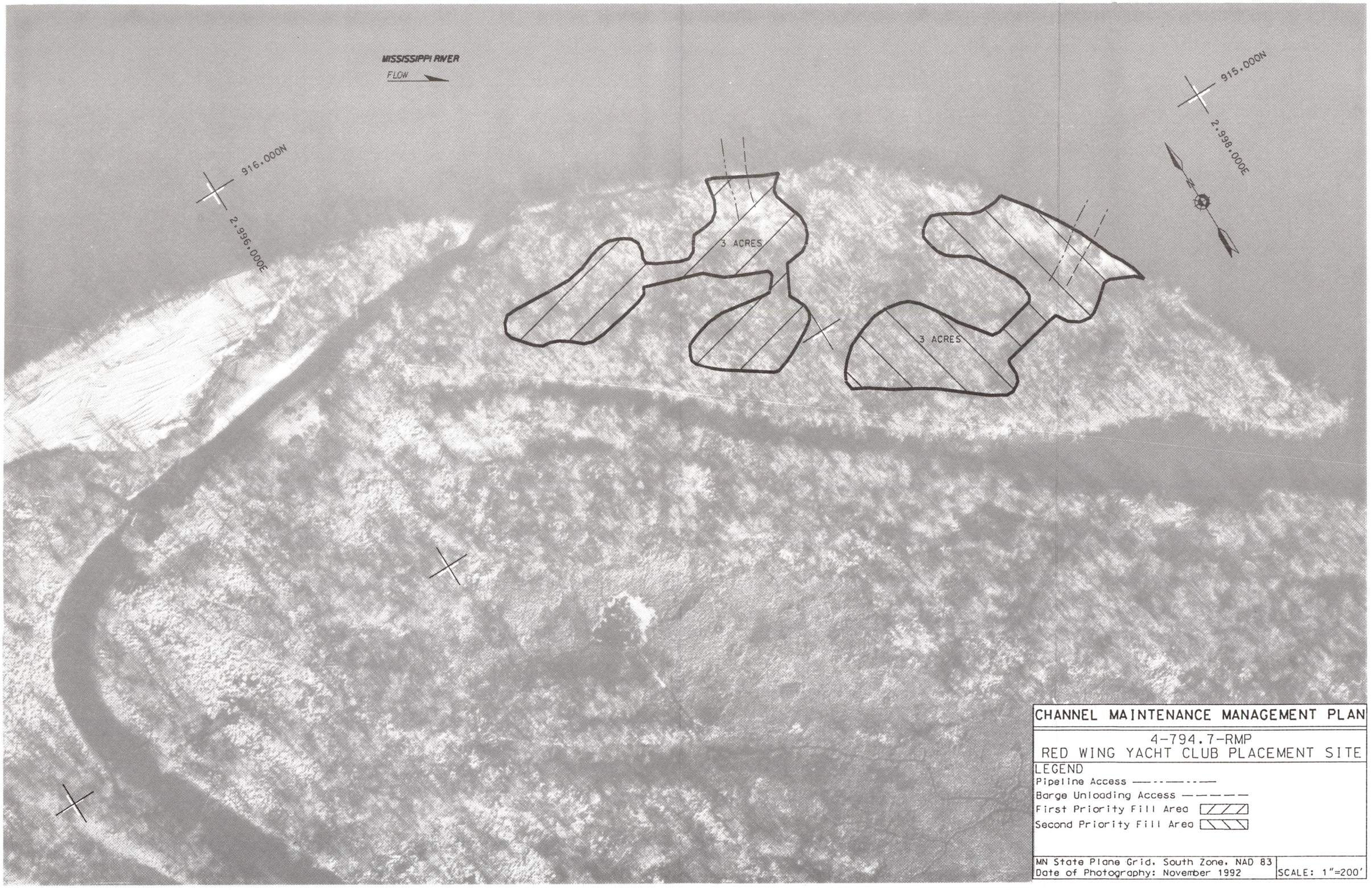
SPECIAL CONDITIONS/RESTRICTIONS: Maintain containment dikes to assure that material does not get into the adjacent backwater. Maintain a 30 foot buffer area between the toe of the material pile and the shoreline and avoid removing large trees. Consider landscape planting after placement is completed. Placement must be coordinated with the landowner.

FUTURE PLANS: Containment dikes need to be constructed and drop structures added if used for hydraulic placement.

	PERMITS/APPROVAL CHECKLIST:	Remarks
	Cultural Resources	Survey required in undisturbed areas.
	Endangered Species	Need determination from FWS
	Floodplain Impact Analysis	Will be analyzed if necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Permit required from landowner
	State	MPCA certification. if effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Trenton	794.0-794.6	H	4000	50-300	4050-4300	30

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

4-794.7-RMP
RED WING YACHT CLUB PLACEMENT SITE

LEGEND

Pipeline Access ——--——--——

Barge Unloading Access ——————

First Priority Fill Area

Second Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-791.6-RMP	**Red Wing Commercial Harbor**	MN/Goodhue/Red Wing	City of Red Wing
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.57, Reference GREAT I Vol. 8-Part III). This site was endorsed by the RRF on 4 November 1985 (Upper Pool 4 Recon. Alt. B*). GREAT selected 16 acres at this site for permanent placement from cuts 7-9 and 11. A Reconnaissance Report for Upper Pool 4 also selected this site but reduced the acres required to 13. The endorsed plan involves mechanical dredging of cuts 7-9 and rehandling by truck from the commercial harbor dock to the site.

SITE CHARACTERISTICS: The area is within the floodplain and floodway. Adjacent land uses include a commercial harbor, a backwater area, and a paved city road. It is currently used as a disposal/storage area for sand, gravel, and road salt. The area has previously been used by the city as a landfill. There are 11 acres upland and 2 acres wetland.

SITE DIMENSIONS: Area = 13 acres. The primary area is 9 acres (300,000cy) and the secondary area is 4 acres (100,000cy). Pre-Fill Elevation = 674.0. Maximum Fill Elevation = 704.0. LCP Elevation = 667.0. Estimated Capacity = 400,000 cubic yards.

BENEFICIAL USE: A beneficial use demand does exist from the city of Red Wing and Goodhue County. Removal has been projected at approximately 10,000 cubic yards per year. If this estimate is low, the entire 13 acres may not require development.

EQUIPMENT REQUIREMENTS/LIMITATIONS: This site will be used for mechanical placement only. Mechanical rehandling by truck or by conveyor will be required if an access channel is not dredged.

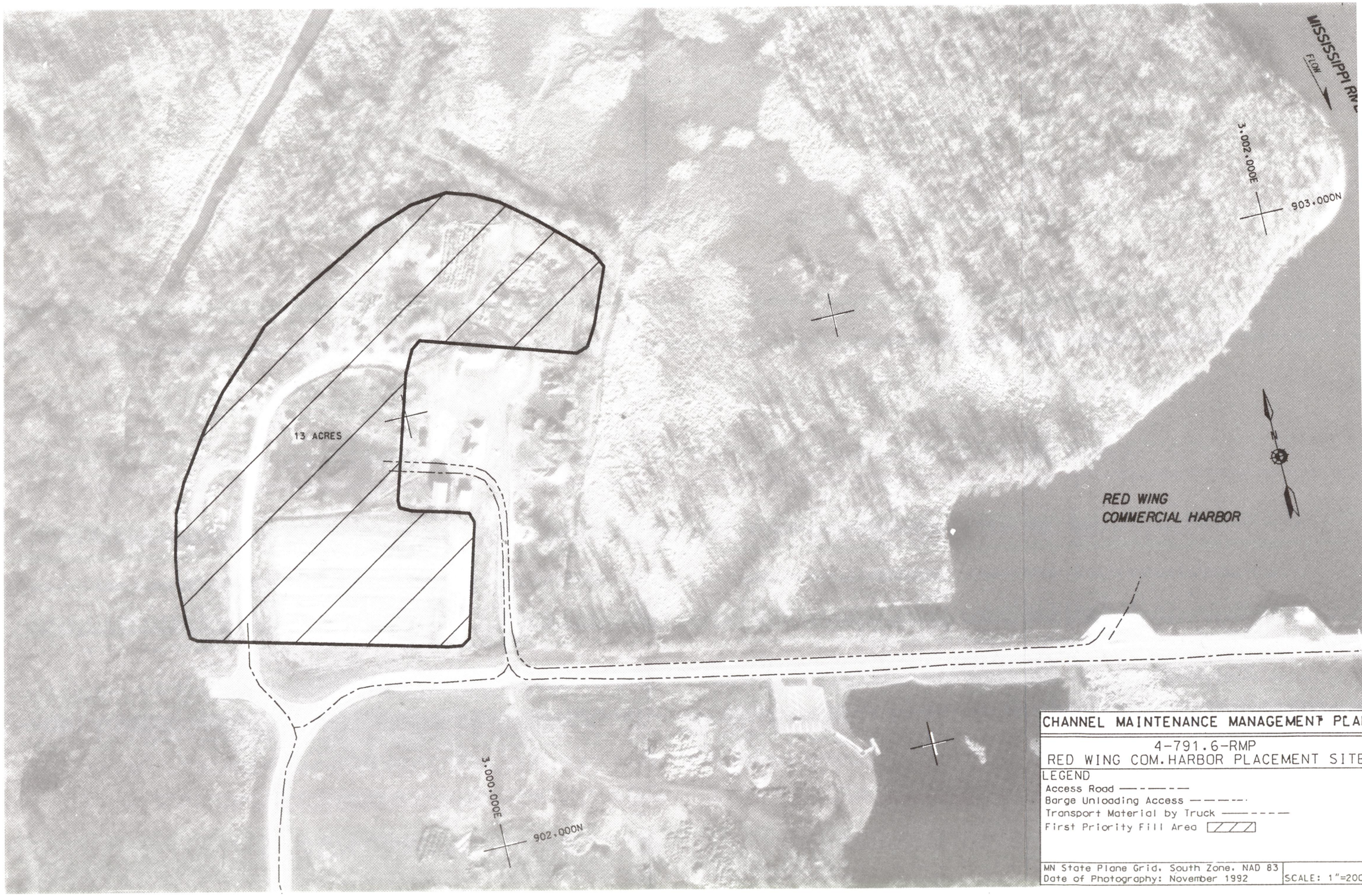
SPECIAL CONDITIONS/RESTRICTIONS: Coordinate unloading at the Commercial Harbor dock with the city of Red Wing, the Red Wing Port Authority, and the Harbor operator.

FUTURE PLANS: Development and continued use as a beneficial use stockpile site is anticipated. Vegetative screening may be required. The secondary stockpile will only be used if there is no capacity left in the primary stockpile.

PERMITS/APPROVAL CHECKLIST: Remarks

	Cultural Resources	Survey required in undisturbed areas
	Endangered Species	Coordinate analysis with FWS
X	Floodplain Impact Analysis	May require further analysis
X	NEPA	Covered by O&M, EIS
	Real Estate	Agreement required from landowner
X	State	General permit with MDNR and MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Trenton	794.0-794.6	M	15800	50-450	15850-16250	7-32
Cannon River	792.1-793.5	M	7408	50-450	7450-7850	7-32
Red Wing Commerc. Harbor	791.5	M	1000	50-450	1050-1450	7-32
Abv. & Blw. Red Wing Br.	789.5-791.2	M	6800	50-450	6850-7250	7-32



CHANNEL MAINTENANCE MANAGEMENT PLA

4-791.6-RMP
RED WING COM. HARBOR PLACEMENT SITE

LEGEND
Access Road
Barge Unloading Access
Transport Material by Truck
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-788.5-RMP	Colvill Park	MN/Goodhue/Red Wing	City of Red Wing
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.47, Reference GREAT I Vol. 8-Part III). There was no RRF endorsement prior to the CMMP. GREAT selected 11 acres at this site as a third priority site for permanent placement of material from Cut 7. The RRF endorsed the Upper Pool 4 Recon. Report on 4 November 1985, which did not recommend use of this site. The city of Red Wing is interested in receiving material at this site for the construction of a new aquatic center. Because the site is not in the recommended plan, the city will be responsible for any permits required for placement of material (this is the Corps normal practice for requests for material). The Corps regulatory staff has been notified that the city wishes to fill the area. Any use will be coordinated with the OSIT. The 11 acres that GREAT selected consists of 6 acres wetland and 5 acres upland. Since the Corps will not fill the wetland area until the city has proper agreements, the Corps will only identify the 5 acres of upland as being available.

SITE CHARACTERISTICS: The Corps has filled approximately 4 acres of upland at this site. An additional 1 acre of upland and 6 acres of wetland remain in the area. The site is in the floodplain and in the floodway. The wetland area vegetation is mainly bottomland hardwoods.

SITE DIMENSIONS: Area = 5 acres. The area is 520 feet by 420 feet. Pre-Fill Elevation = 670.0 Maximum Fill Elevation = 685.0. LCP Elevation = 667.0. Estimated Capacity = 95,000 cubic yards.

BENEFICIAL USE: Material placed at this site would be used beneficially as landfill. The city of Red Wing is proposing to construct a new aquatic center in this location once filled. A stockpile could be developed for removal and beneficial use at other locations.

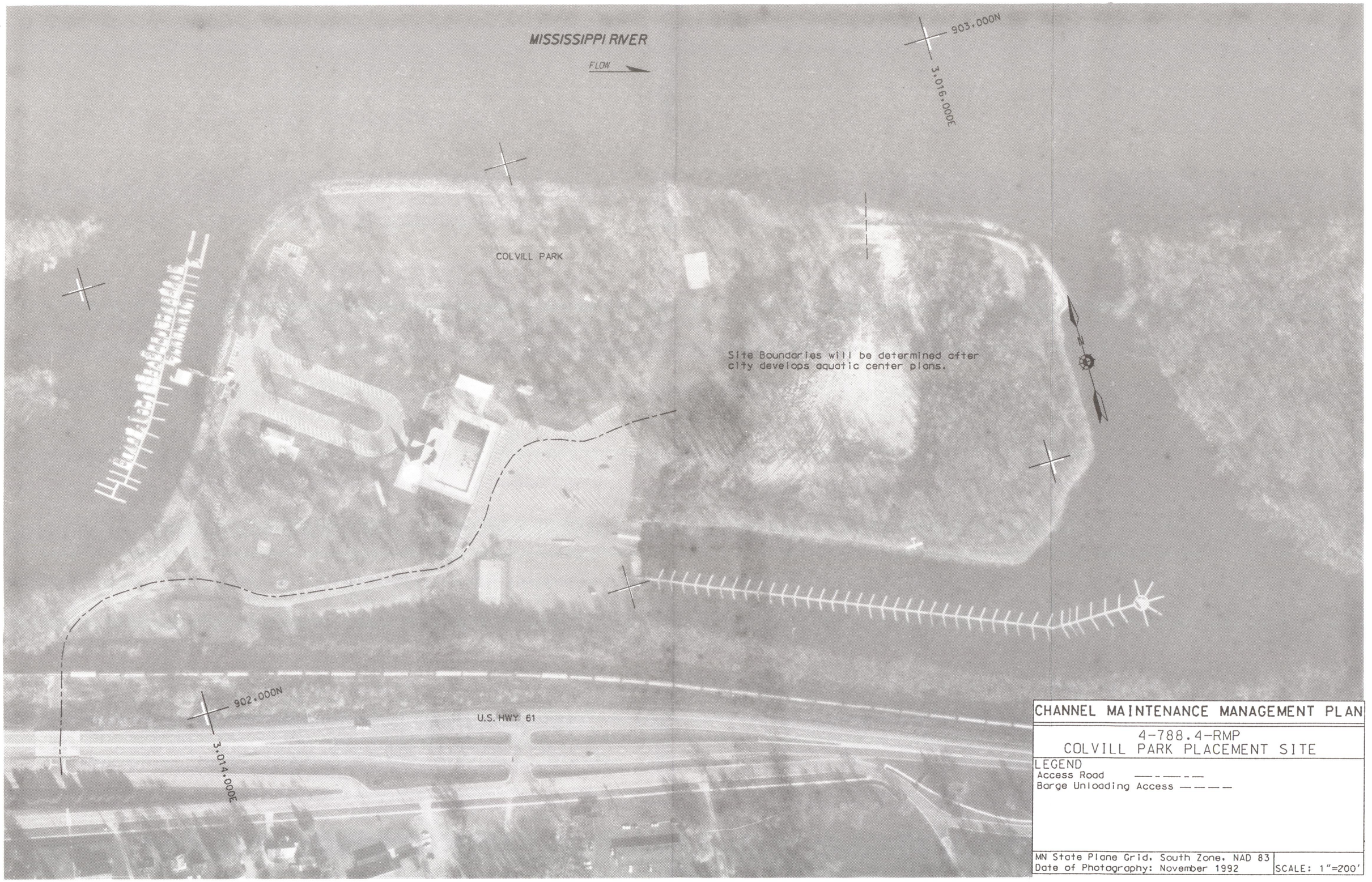
EQUIPMENT REQUIREMENTS/LIMITATIONS: Both mechanical and hydraulic placement methods may be used. Containment dikes would be required if hydraulic placement is used.

SPECIAL CONDITIONS/RESTRICTIONS: Tree clearing is required prior to placement in the wetland area.

FUTURE PLANS: Placement of material in the wetland portions of this site would be completed only after proper permits are acquired by the city of Red Wing.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	DMP permit from city of Red Wing
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	404(b) proposed
	Other: Wetland permit	Comply with wetland Conservation Act if wetland filled

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Abv. & Blw. Red Wing Br.	789.5-791.2	H,M	11500	20-500	115200-12000	5-20
Head of Lake Pepin	785.2-785.4	M	16900	20-500	16920-17400	5-20



CHANNEL MAINTENANCE MANAGEMENT PLAN

4-788.4-RMP
COLVILL PARK PLACEMENT SITE

LEGEND
Access Road — - — - —
Barge Unloading Access — — — —

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 14

Placement Site Information Sheets
and
Operational Maps

LOWER POOL 4

TAB 14 - LOWER POOL 4

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-762.7-LWT	**Reads Landing**	WI/Buffalo/Reads Landing	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.29T, Reference GREAT I Vol. 8-Part III). This site was endorsed by the RRF on 27 April 1982 (Reads Landing CMP Alt. G). GREAT selected 9.5 acres at this site for temporary placement of material from cut 5. The RRF endorsed Reconnaissance dated May 1982, recommended the following: 1) using the existing 9.5 acres at this site with an additional 5-8 acres for placement of material from cut 5; 2) dredging two sediment traps on the Chippewa River with placement at a site near Hwy 35 and a site at the Wabasha Gravel Pit (4-761.0-RMP); and 3) excavating material from this site to the permanent Wabasha Gravel Pit site (4-761.0-RMP). There are currently 22 acres based on measurements taken from 1992 aerial photography. The Corps will continue past practice and use as site to store material until practical to move. Approximately 1,279,000 cubic yards in 1985 and 1,094,200 cubic yards in 1995 were excavated from this site and transferred to the Wabasha Gravel Pit site (4-761.0-RMP).

SITE CHARACTERISTICS: The site is in the floodplain and in the floodway. It is bordered by the river, bottomland, hardwoods, and backwater slough. After each excavation, a harbor area open to the main channel will remain providing benefits for recreation. There is no vegetation within the diked containment site.

SITE DIMENSIONS: Area = 22 acres. The area is 1800 feet by 535 feet. This site was excavated to reach the Pre-Fill Elevation. Pre-Fill Elevation = 657.0. Maximum Fill Elevation = 712.0. LCP Elevation = 667.0. Estimated Capacity = 1,300,000 cubic yards.

BENEFICIAL USE: After excavation the large open harbor area has been used beneficially for recreational purposes and the riverward slopes have been shaped. The excavated material has been moved to the Wabasha Gravel Pit (4-761.0-RMP) for beneficial use removal and landfill.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Hydraulic dredging and placement is the most efficient and practical method for this site. There is no land access to this site.

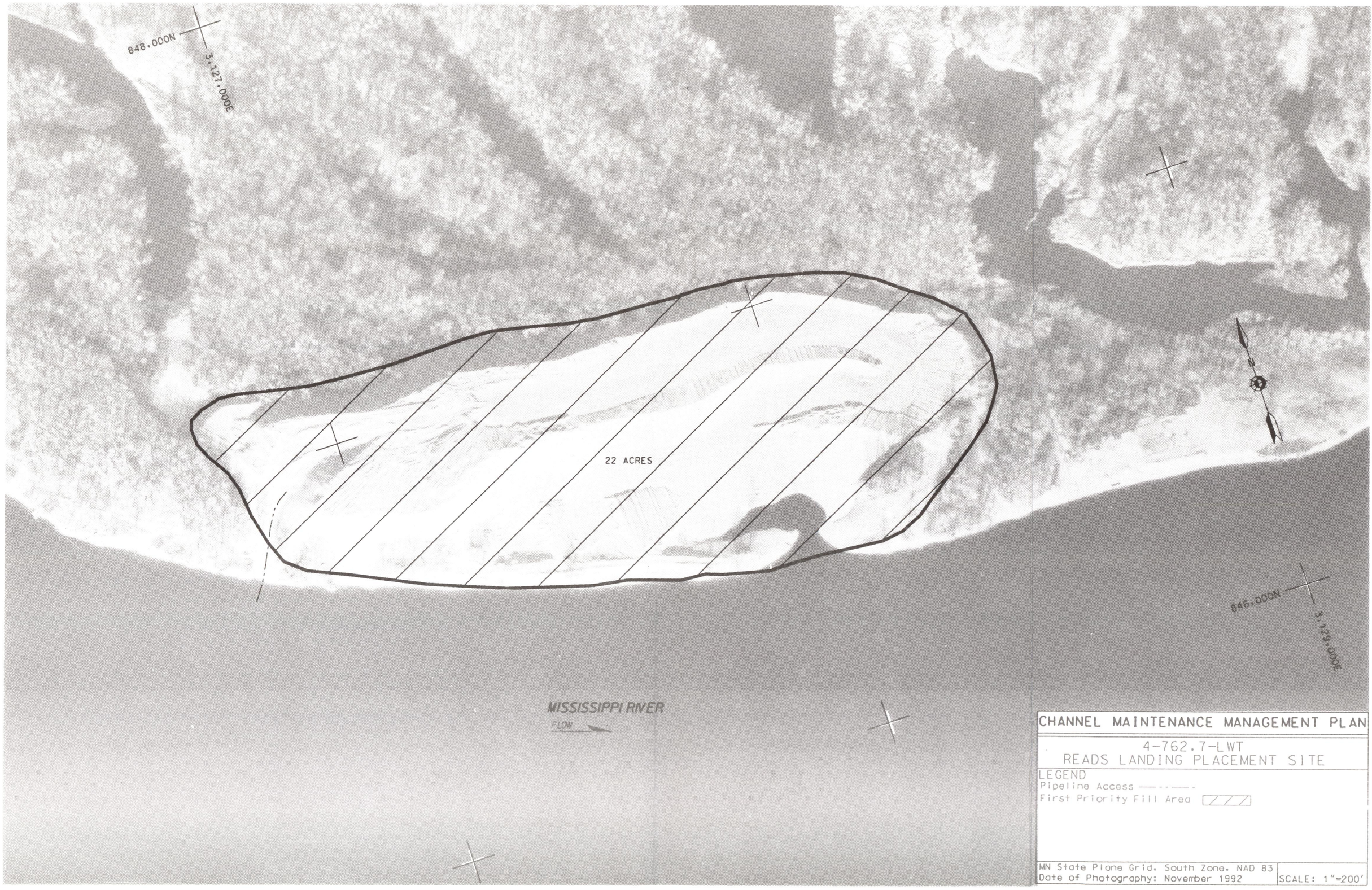
SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed when it is economical or when capacity has been reached. A submerged pipeline should be used when crossing the navigation channel to insure navigation traffic is not delayed during transfer to the Wabasha Gravel Pit site (4-761.0-RMP).

FUTURE PLANS: Material from the Chippewa Delta and the Reads Landing dredge cut will continue to be placed in this site. When capacity is reached material will be excavated. A dike will be maintained and a vegetative screening plan will be implemented.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	No impact at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Chippewa River Delta	763.2	H	1000	50-2000	1050-3000	0-45
Reads Landing	761.8-763.8	H	3000	50-2000	3050-5000	0-45

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

4-762.7-LWT
READS LANDING PLACEMENT SITE

LEGEND
Pipeline Access ——- - - ——-
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-761.1-RMP	Carrels Pit	MN/Wabasha/Wabasha	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.25, Reference GREAT I Vol. 8-Part III). There was no RRF endorsement prior to the CMMP. This site is located immediately upstream from the upper boat harbor in the city of Wabasha, MN. It has reviewed dredge material in the past, but at present there are no plans to use the site due to the current use of the Reads Landing and Wabasha Gravel Pit sites.

SITE CHARACTERISTICS: This site is an abandoned gravel pit. A moderate growth of vegetation has been reestablished. Adjacent land use is agricultural and residential.

SITE DIMENSIONS: Area = 18 acres. The area is 950 feet by 900 feet. Pre-Fill Elevation = 685.0. Maximum Fill Elevation = 710.0. LCP Elevation = 667.0. Estimated Capacity = 706,000 cubic yards.

BENEFICIAL USE: Located in Wabasha with good access by road, this site has high potential for beneficial use removal.

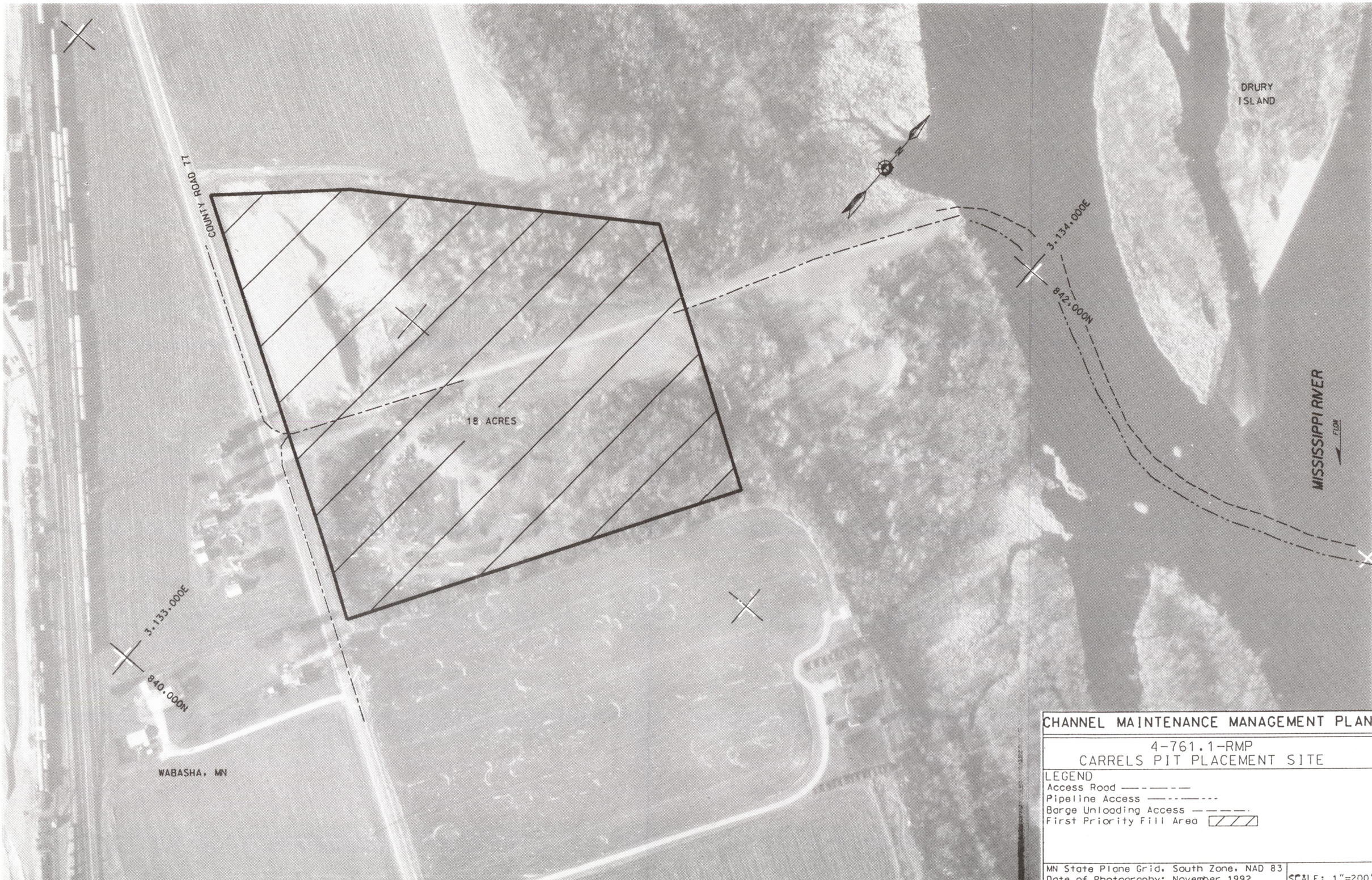
EQUIPMENT REQUIREMENTS/LIMITATIONS: Due to the distance, mechanical dredging with either mechanical rehandling (inland transport required), or hydraulic rehandling (diking required) from an inwater site would be necessary.

SPECIAL CONDITIONS/RESTRICTIONS: To gain access to the rehandling site in 1982, a wingdam had to be notched.

FUTURE PLANS: This site will be used to supplement the CMMP and provide greater longevity to the recommended sites.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires a permit from the landowner
X	State	General permits with MDNR & MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Crats Island	758.5-759.5	M	13200	500-1500	13700-14700	8-38
Reads Landing	761.8-763.8	H	5400	500-1500	5900-6900	8-38



CHANNEL MAINTENANCE MANAGEMENT PLAN

4-761.1-RMP
CARRELS PIT PLACEMENT SITE

LEGEND
Access Road
Pipeline Access
Barge Unloading Access
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-761.0-RMP	**Wabasha Gravel Pit**	MN/Wabasha/Wabasha	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.24, Reference GREAT I Vol. 8-Part III). This site was endorsed by the RRF on 27 April 1982 (Reads Landing CMP Alt. G). GREAT selected 60 acres at this site for permanent placement of material from cuts 4-5. The RRF endorsed Recon. dated May 1982, recommended placement of material at this site form cut 5 and from a sediment trap at the Chippewa Delta. Acres were revised to 86 based on real estate purchased by the Corps. A total of 3,170,183 cubic yards have been placed at this site (370,000 in 1984, 1,505,878 in 1985, and 1,294,305 in 1995) from the Reads Landing placement site (4-762.7-LWT) and the Chippewa River Delta. The Corps and the City of Wabasha are developing a final fill plan that will be coordinated with RRF agencies. At this time, the St. Paul District does not have the capability to reach the pit for each routine job.

SITE CHARACTERISTICS: This site is an upland abandoned gravel pit vegetated with trees, shrubs, and grasses. GREAT identified the original area as 60 acres of upland meadow. The Corps changed this to 10 acres wetland and 76 acres upland.

SITE DIMENSIONS: Area = 86 acres. The area is 4100 feet by 910 feet. Pre-Fill Elevation = 685.0. Maximum Fill Elevation = 735.0. LCP Elevation = 667.0. Estimated Capacity = 5,890,000 cubic yards.

BENEFICIAL USE: The site offers good beneficial use removal access and some material has been removed from the stockpile currently at the site. When filled, the land should be developable.

EQUIPMENT REQUIREMENTS/LIMITATIONS: The site is economically accessible only to hydraulic dredging equipment. The excavation of Reads Landing requires a submerged pipeline across the navigation channel to maintain river traffic.

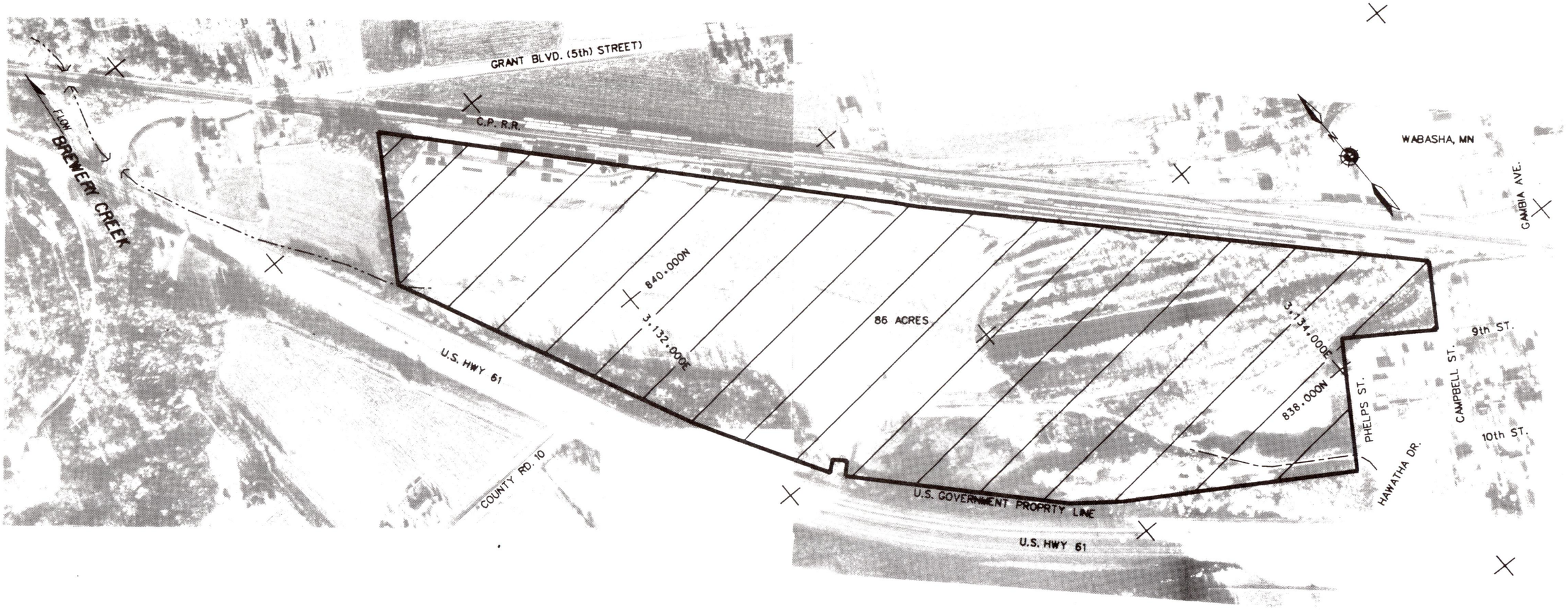
SPECIAL CONDITIONS/RESTRICTIONS: Monitoring of city and private wells near the pit was conducted in 1985 and 1995 before, during, and after placement of material. Insure that ponding effluent water does not inundate discarded railroad ties along the southeast side of the pit. Removing ties before next fill event is required. If necessary, effluent may be pumped through an enclosed pipeline to Brewery Creek.

FUTURE PLANS: A survey will be completed after filling in 1995 to determine remaining capacity. Detailed final fill plans need to be completed. When filled, the Corps will likely dispose of the property. Wabasha has an interest in commercial development.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	General permit with MDNR and MPCA
X	404(b)(1) Evaluation	Long-term 404(b) completed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Reads Landing site	4-762.7-LWT	H	1000	6000-9000	7000-10000	58-68
Chippewa River Delta	763.2	H	5000	6000-9000	11000-14000	58-68

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

4-761.0-RMP
WABASHA GRAVEL PIT PLACEMENT SITE

LEGEND
Access Road ——-——
Pipeline Access ——--——
First Proirity Fill Area [////]

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=400'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-759.3-LWT	Crats Island	WI/Buffalo/Wabasha, MN	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 4.16T). The RRF added this site to the temporary/emergency list contained in Action Item 8 of GREAT I on 30 March 1983. On 20 October 1983, the RRF endorsed the Crats Island Reconnaissance Report (Alt C.). The Recon. Report recommended hydraulic dredging of cut 4 to GREAT site 4.17 (4-759.3 RMP) for rehandling and transport by truck to site MDNR.2 (4-760.2-RMP). The Corps proposed a plan to excavate the Crats Island site (4-759.3-LWT) and relocate material to MDNR.2 (4-760.2-RMP) and then reuse the site for routine channel maintenance. On 4 November 1985, the RRF decided the Corps proposal was acceptable and did not require further endorsement. A total of 1,427,000 cubic yards were excavated in 1987. Site MDNR.2 (4-760.2-RMP) received 1,327,000 cubic yards, site 4.19 (4-759.5-RMP) received 90,000 cubic yards, and site 4.17 (4-759.3-RMP) received 10,000 cubic yards.

SITE CHARACTERISTICS: The excavation of 1,427,000 cubic yards in 1987 created a 22 acre containment site with open water (10' deep) in the middle. The notch for hydraulic dredge access was left open and the site has been used as a harbor for recreational boaters. The site is bound by bottomland forest and the main navigation channel.

SITE DIMENSIONS: Area = 22 acres. The area is 1800 feet by 535 feet. Excavated 1,427,000 cubic yards to reach the Pre-Fill Elevation. Pre-Fill Elevation = 657.0. Maximum Fill Elevation = 707.0. LCP Elevation = 667.0. Estimated Capacity = 1,427,000 cubic yards.

BENEFICIAL USE: There is no access to the site by road which limits the beneficial uses. The excavated material was used beneficially for landfill and stockpile purposes and the harbor created at the site after excavation has been used by recreational boaters.

EQUIPMENT REQUIREMENTS/LIMITATIONS: This site will be used for direct hydraulic placement from the Crats Island dredge cut.

SPECIAL CONDITIONS/RESTRICTIONS: Big Lake Bay EMP dredging reduced the area available for placement by 4.5 acres. The OSIT recommended using area "C" on the site map if necessary in the future to compensate. Area "C" on the site map will only be used after OSIT coordination. Resources agencies recommended dredging deeper the next time the site is excavated to compensate for the 4.5 acres. The Corps will consider the recommendation when the next excavation is required.

FUTURE PLANS: Use at this site is expected to continue. However, quantities placed may be smaller than anticipated due to the effectiveness of the Chippewa Delta sediment trap dredging.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis required
X	NEPA	Covered by O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge		Pipeline Distance		
Name	Mile	Type	Water	Land	Total	Lift
Crats Island	758.5-759.5	H	2000	50-650	2050-2650	0-40

April 1996

INDIAN SLOUGH

3,143,000E

839,000N

4.5 ACRES

17.5 ACRES

4.5 ACRES

OSIT RECOMMENDED USING THIS AREA
FOR PLACEMENT IF REQUIRED
IN THE FUTURE

HISTORIC DIKED CONTAINMENT AREA

HISTORIC DIKED CONTAINMENT AREA NO LONGER
USABLE AFTER BIG LAKE BAY EMP DREDGING.

838,000N

3,145,000E

MISSISSIPPI RIVER

FLOW

CHANNEL MAINTENANCE MANAGEMENT PLAN

4-759.3-LWT
CRATS ISLAND PLACEMENT SITE

LEGEND

Pipeline Access

First Priority Fill Area

Second Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-757.5-LW	Teepeeota Point	WI/Buffalo/Alma	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.13T, Reference GREAT I Vol. 8-Part III). This site was endorsed by the RRF on 22 June 1983 (Lower Pool 4 Recon. Alt. B). GREAT selected 7.5 acres as a temporary/emergency site. A Record of Decision was endorsed by RRF with the Recon. The Recon. recommended using 16 existing acres with expansion into 30 additional acres in 3 phases over the 40 year plan (see SPECIAL CONDITIONS 1&2) if dredging at cut 3 exceeded the beneficial use demand at the Alma Marina site (4-754.0-LWP). The RRF endorsed a Corps proposal on 8 December 1992 with the following conditions: 1) pursue taking existing material to the Genoa Power Plant; 2) this continues to be designated as a temporary site; 3) re-vegetation of the site does not preclude the excavation for beneficial use demand in the future. Expansion will start at the existing area and continue upstream as designated by the first, second, third, and fourth priority fill areas as shown on the site map.

SITE CHARACTERISTICS: The site is a bermed island containment area that has been elevated by past placement of dredged material. Original berms were constructed in 1979. Revegetation projects have been conducted on areas no longer used for dredged material placement.

SITE DIMENSIONS: Area = 46 acres. This area may be required. The area is 3800 feet by 525 feet. Currently at 16 acres. Pre-Fill Elevation = 675.0. Maximum Fill Elevation = 695.0. LCP Elevation = 666.8. Estimated Capacity = 972,000 cubic yards.

BENEFICIAL USE: Since this is an island site and road access is not possible, the only way material at this site would be used beneficially is through excavation and relocation after capacity is reached.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Both hydraulic and mechanical dredging may be used. However, material dredged from Above Teepeeota Point will be done hydraulically if possible.

SPECIAL CONDITIONS/RESTRICTIONS: 1) The Corps needs to amend the Memorandum of Understanding it has with the WDNR each time the site is expanded. 2) Before expansion of this site the Wabasha Gravel Pits will be reconsidered (Corps 92' proposal explains why use of Wabasha Pits for Teepeeota material will not be pursued).

FUTURE PLANS: This site does not meet the criteria to be a transfer site because there is no current designated permanent site and no ability from the Corps to transfer the material. The Corps will capitalize on opportunities as they arise and will continue to pursue an alternative long-term permanent site. The plan for this site is to expand when necessary, maintain the containment dikes, and continue to use the site for placement of dredge material until filled to capacity. Areas of the site that are filled to capacity and no longer used will be revegetated and stabilized. At this time the site is not designated as transfer or permanent.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site - 07/27/79
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Teepeeota Point	757.0-757.9	H	200	30-2000	230-2200	28-40

April 1996

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-756.5-LWT	**Grand Encampment**	WI/Buffalo/Alma	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.10T, Reference GREAT I Vol. 8-Part III). This site was endorsed by the RRF on 22 June 1983 (Lower Pool 4 Recon. Alt. B). GREAT selected 4 acres as a temporary/emergency site for cut 2. A Record of Decision was endorsed by the RRF with the Recon. The Recon. recommended using the existing 8 acres for temporary/emergency placement. Approximately 13,000 cubic yards were excavated in 1988. The Corps is planning to excavate approximately 200,000 cubic yards of material from this site in 1996 or 1997. Because there is no capacity at the permanent Alma Marina site (4-754.0-LWP), material will be trucked away to other suitable locations.

SITE CHARACTERISTICS: The site is a bermed island containment area that has been used in the past. Revegetation projects have been conducted on areas no longer used for dredged material placement.

SITE DIMENSIONS: Area = 8 acres. The area is 1000 feet by 350 feet. Pre-Fill Elevation = 678.0. Maximum Fill Elevation = 695.0. LCP Elevation = 666.8. Estimated Capacity = 147,500 cubic yards.

BENEFICIAL USE: There is no road access to the site. Material will likely be used for beneficial use when removed.

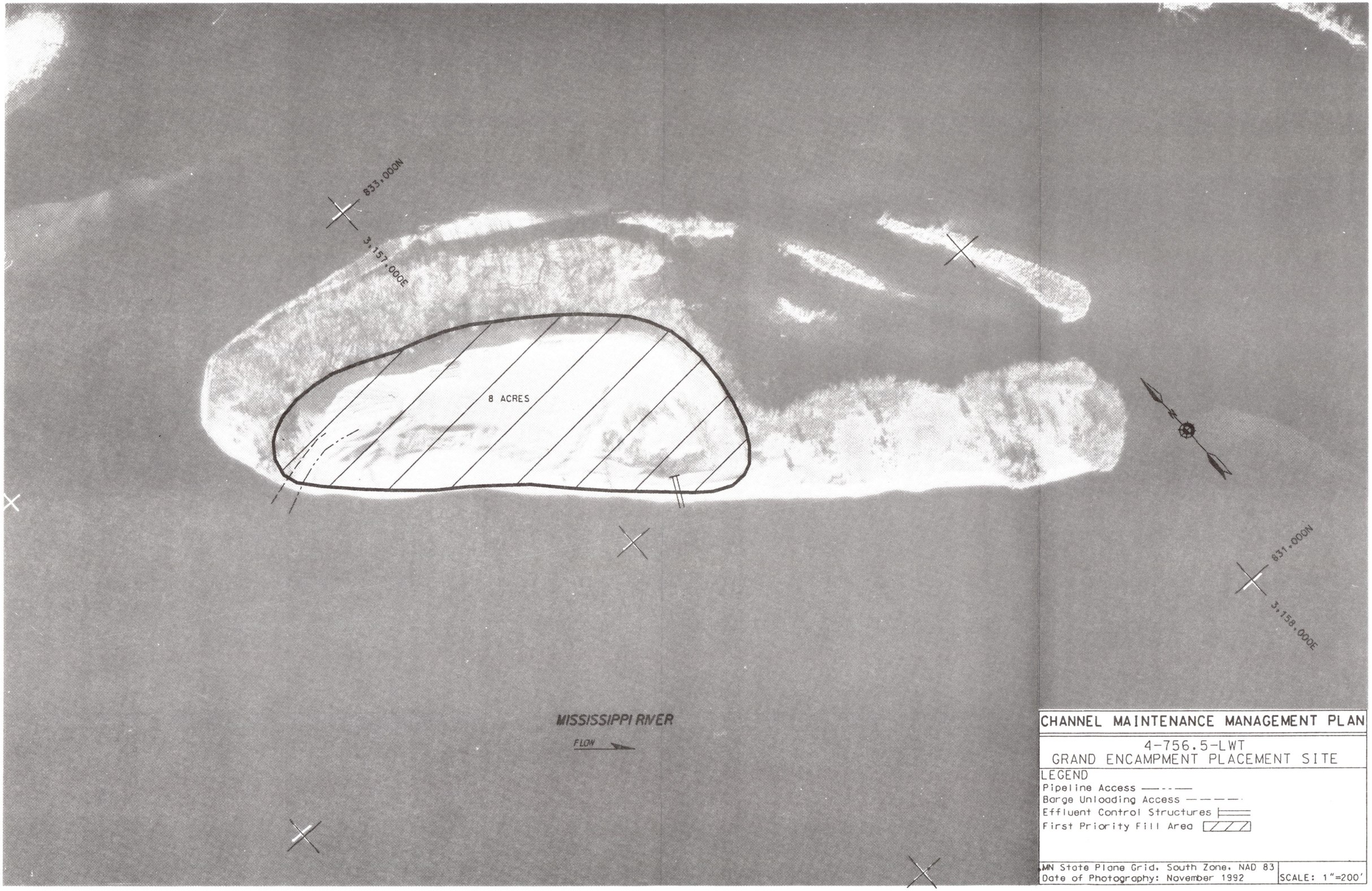
EQUIPMENT REQUIREMENTS/LIMITATIONS: The site is suited for hydraulic placements. However, mechanical placement may also be used.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed when it is economical or when capacity has been reached.

FUTURE PLANS: Continue to use as a transfer site until filled to capacity and then excavate. Material will be transferred to the permanent Alma Marina site (4-754.0-LWP).

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT AND O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Grand Encampment	755.8-756.9	H	1000	100-800	1100-1800	23-28



CHANNEL MAINTENANCE MANAGEMENT PLAN

4-756.5-LWT
GRAND ENCAMPMENT PLACEMENT SITE

LEGEND

Pipeline Access ——·——

Barge Unloading Access — — — —

Effluent Control Structures

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

4-754.0-LWP	Alma Marina	WI/Buffalo/Alma	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 4.02, Reference GREAT I Vol. 8-Part III). This site was endorsed by the RRF on 22 June 1983 (Lower Pool 4 Recon. Alt. B). GREAT selected 10.3 acres (open water) at this site for permanent placement from cuts 1-3. A Record of Decision was endorsed by RRF with the Recon. The Recon. recommended using 7 acres piled to elevation 677 with a 200'X300' stockpile with a maximum elevation of 702.0 (25 feet above initial fill elev. 677.0). Cuts 1-3 were taken to this site on a trial basis, but beneficial use did not meet the supply. A corps proposal endorsed by RRF (12/08/92) eliminates placement of cut 3 material at this site but material is still being supplied faster than it is being removed. The Corps is planning to excavate the site in 1996 to replenish the capacity. Material will be trucked away to other suitable locations.

SITE CHARACTERISTICS: The site is located in the city of Alma and is bound by the river, the Burlington Northern RR., and the Alma Small Boat Harbor. The Corps will use 4 acres of old dredge material and 3 acres of shallow open water. Most of the 7 acres is for landfill and 3 acres will remain for a stockpile.

SITE DIMENSIONS: Area = 7 acres. The area is 650 feet by 470 feet. The stockpile area will have a maximum fill elevation of 702.0 (25 feet higher than the adjacent fill elevation). Pre-Fill Elevation = 667.0 Maximum Fill Elevation = 702.0. LCP Elevation = 666.6. Estimated Capacity = 157,000 cubic yards (stockpile capacity is approximately 50,000 cubic yards).

BENEFICIAL USE: Approx. 15,000 cy/yr or 600,000 cubic yards for the 40-year period is projected for removal. Removal began in 1980 and since that time removal has been approximately 9,600 cy/yr. Some material has been used as fill at the site, but most has been removed for other uses.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Material from Beef Slough could be placed hydraulically or mechanically. Mechanical unloading may require a short access channel to be dredged.

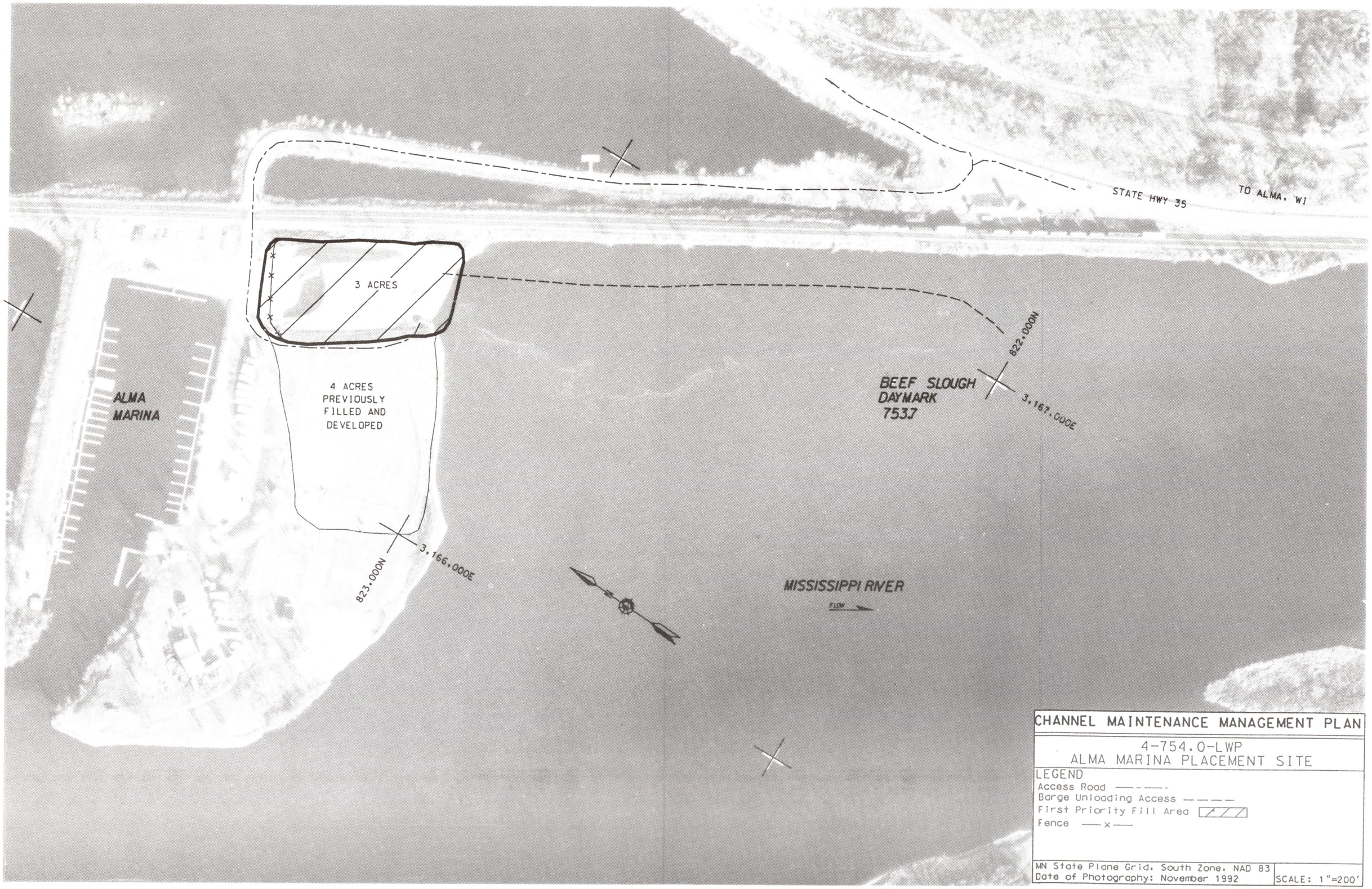
SPECIAL CONDITIONS/RESTRICTIONS: A culvert for circulating water exists at the site and extends from the back of the marina, through the placement site and out on the downstream side. The Corps will extend the culvert as needed for planned expansion of the site. If material is placed near the RR. a stability analysis may be needed.

FUTURE PLANS: Once the area is filled to grade a barge unloading facility may be installed. The site will be operated as a beneficial use removal site.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
X	404(b)(1) Evaluation	Long-term eval. from 7/28/83 to 2025
	Other: Stability analysis	May be required for placement near RR.

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Teepeeota Point	757.0-757.9	M	20000	10-200	20010-20200	1-25
Grand Encampment	755.8-756.9	M	14800	10-200	14810-15000	1-25
Grand Encamp. site	4-756.5-LWT	M,H	13200	10-200	13210-13400	1-25
Beef Slough	753.9-754.6	M,H	1500	10-200	1510-1700	1-25

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

4-754.0-LWP
ALMA MARINA PLACEMENT SITE

LEGEND
Access Road ——-——·
Barge Unloading Access — — — —
First Priority Fill Area
Fence ——x——

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 15

Placement Site Information Sheets
and
Operational Maps

POOL 5

TAB 15 - POOL 5

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5-749.8-RMP	West Newton Chute	MN/Wabasha/Kellogg	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5.24, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 20 October 1983 (Upper Pool 5 Recon. Alt. A2). GREAT selected an area of 36 acres to be used as a secondary site for permanent placement from cuts 5-8. The RRF endorsed Recon. dated March 1984, recommended the use of 39 acres with a fill depth of 25 feet (to elev. 705). The landowner was willing to sell but became unwilling after the Corps offer for the property. Guidance from Corps Headquarters said the Corps was authorized to pursue the property through condemnation if justified. The purchase was justified and approximately 158 acres were acquired. This site is the designated permanent site for material placed at the Above West Newton transfer site (5-748.0-RMT).

SITE CHARACTERISTICS: This site is part of a 181.3 acre agricultural field. It is an upland site and has good access by road. The placement site is bound by a bottomland hardwood forest, County Road 84, Greenfield Town Road, and an agricultural field.

SITE DIMENSIONS: Area = 39 acres. The area is a triangle with sides of 2830 feet, 2450 feet, and 1450 feet. Pre-Fill Elevation = 680.0. Maximum Fill Elevation = 705.0. LCP Elevation = 660.0. Estimated Capacity = 1,362,000 cubic yards.

BENEFICIAL USE: There is good access to the site by road but is located 4.7 miles from the main Highway (U.S. Hwy 61). Beneficial use removal is projected to be 41,000 cubic yards per 40 years.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Material from Mule Bend (cut 7) would be placed by direct hydraulic pumping. A closing dam blocks the head of West Newton Chute making barging material directly to the site difficult. The Corps will evaluate the potential to barge material directly to the site.

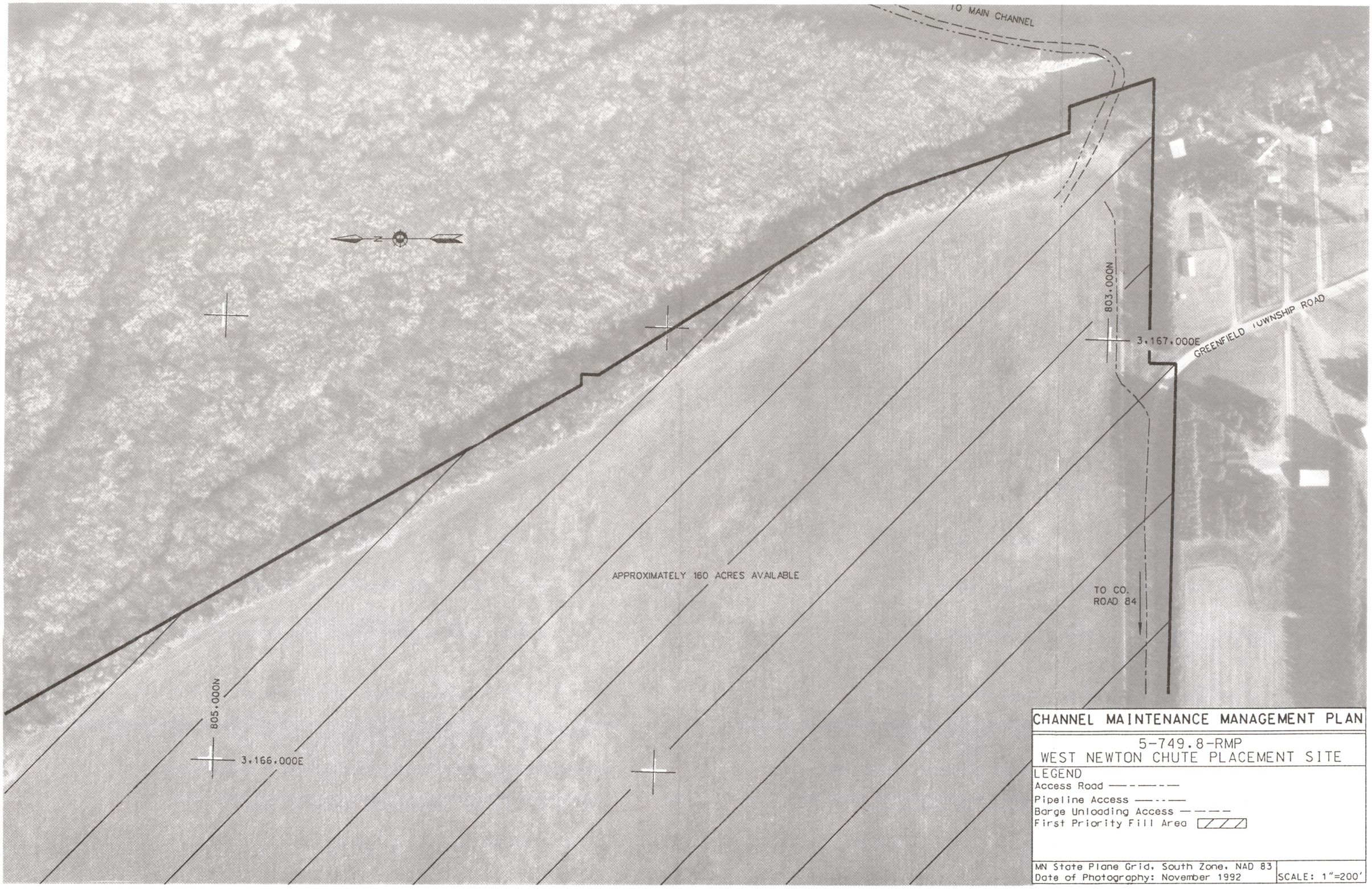
SPECIAL CONDITIONS/RESTRICTIONS: Landscape plantings should be employed to screen the dike and to act as a windbreak. Approval from MPCA is required for any inwater rehandling activities.

FUTURE PLANS: The site would be operated as a beneficial use stockpile site. Material not removed will be piled to grade and after abandonment of the site it could be managed as a wildlife area.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	Cult. Res. review completed 09/20/89
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by Federal Government
	State	MPCA approval for inwater handling
	404(b)(1) Evaluation	Long-term proposal for inwater
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Lower Appch. L/D #4	752.6-752.8	M&H	15500	100-2000	15600-17500	20-45
Mule Bend	748.6-749.6	M&H	6500	100-2000	6600-8500	20-45
West Newton	748.2-747.2	H	12000	100-2000	12100-14000	20-45
Below West Newton	746.0-746.8	M&H	17000	100-2000	17100-19000	20-45



CHANNEL MAINTENANCE MANAGEMENT PLAN

5-749.8-RMP
WEST NEWTON CHUTE PLACEMENT SITE

LEGEND
Access Road
Pipeline Access
Barge Unloading Access
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5-748.0-RMT	Above West Newton	MN/Wabasha/West Newton	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5.18T, Reference GREAT I Vol. 8-Part IV). There was no RRF endorsement prior to the CMMP. GREAT selected an area of 27.5 acres as a temporary/emergency site for cuts 6-7. The District has taken an approach that involves excavating large quantities from temporary sites and transferring that material cost effectively to a designated permanent site, which restores capacity at the temporary sites so they can be used again. The Corps future program for the GREAT I recommended Action Item 8 (Temporary material placement sites) is stated in the GREAT I Implementation Status Report And Future Program dated May 1992. This future program is supported by the RRF. This site is designated as a transfer site and material will be excavated and placed at the West Newton Chute site (5-749.8-RMP).

SITE CHARACTERISTICS: The site is an existing containment area that is 100% upland. It is located in the floodplain and in the floodway. Dredge material has been placed here in the past and containment berms have been constructed. Rock groins were constructed in 1990 to reduce shoreline erosion.

SITE DIMENSIONS: Area = 14 acres. The area is 1700 feet by 355 feet. Pre-Fill Elevation = 661.0. Maximum Fill Elevation = 696.0. LCP Elevation = 660.0. Estimated Capacity = 578,000 cubic yards.

BENEFICIAL USE: There is no beneficial use at this site due to the lack of road access. The material may be used beneficially when it is excavated from the site.

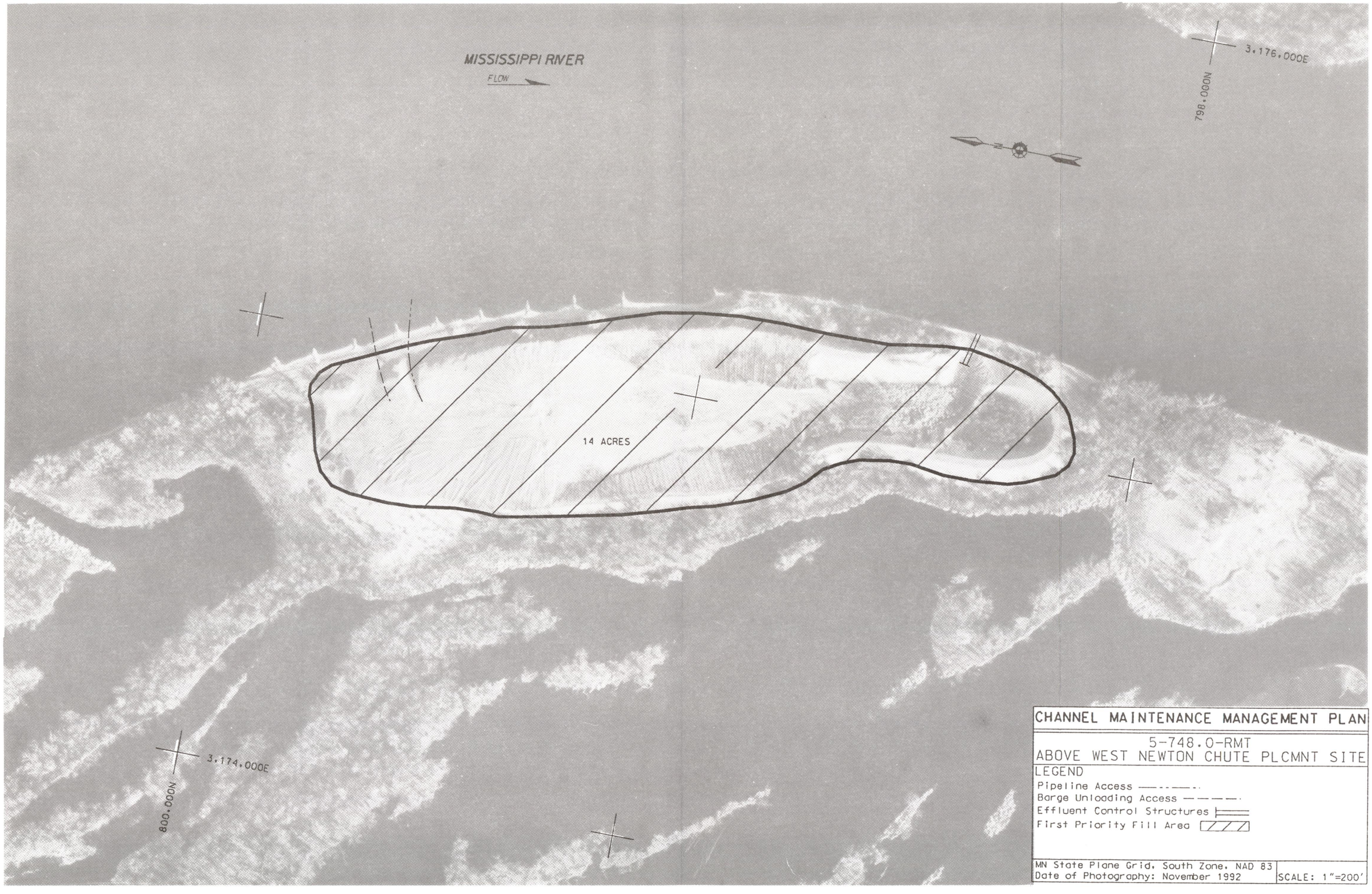
EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: Berms must be in adequate condition before material is placed hydraulically. Outside slopes of berms should be seeded to stabilize the site. Material must be protected against erosion and will be removed when it is economical or when capacity is reached. It will be transferred to the permanent West Newton Chute site (5-749.8-RMP).

FUTURE PLANS: The plan for this site is to maintain the containment berms and continue to use the site for temporary placement of dredge material until filled to capacity. Once capacity is reached it will be excavated and prepared for re-use.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by Federal Government
X	State	General permits with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Mule Bend	748.6-749.6	H	5000	75-500	5075-5500	1-36
West Newton	747.2-748.2	H	2000	75-500	2075-2500	1-36



CHANNEL MAINTENANCE MANAGEMENT PLAN

5-748.0-RMT
ABOVE WEST NEWTON CHUTE PLCMNT SITE

LEGEND

Pipeline Access

Barge Unloading Access

Effluent Control Structures

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5-754.8-RMT	**Above Fisher Island**	MN/Wabasha/West Newton	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5.12T, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 30 September 1985 (Lower Pool 5/Weaver Rehab.). GREAT selected an area of 5.5 acres as a temporary/emergency site for cut 5. GREAT also recommended implementing the Weaver Bottoms rehabilitation project through the use of dredged material. The RRF endorsed the Lower Pool 5 Channel Maintenance Plan/Weaver Bottoms Rehabilitation Plan, which identified use of this site as a borrow source for construction. Original containment dikes were constructed in 1977, covering an area of 14 acres. Approximately 782,000 cubic yards were excavated in 1987 for the Weaver Bottoms Phase I construction. Material from routine dredging will continue to be placed into this transfer site.

SITE CHARACTERISTICS: When the site was excavated, a large bathtub area was created. This bathtub was excavated to an elevation 10 feet below the normal pool level.

SITE DIMENSIONS: Area = 14 acres. The area is 1250 feet by 500 feet. Excavated 782,000 cubic yards to reach Pre-Fill Elevation. Pre-Fill Elevation = 650.0. Maximum Fill Elevation = 700.0. LCP Elevation = 659.9. Estimated Capacity = 782,000 cubic yards.

BENEFICIAL USE: Material from this site was removed for the Weaver Bottoms Rehabilitation project. When this site is filled, it may be used for further island construction in Weaver Bottoms. The containment site is also used beneficially for recreation.

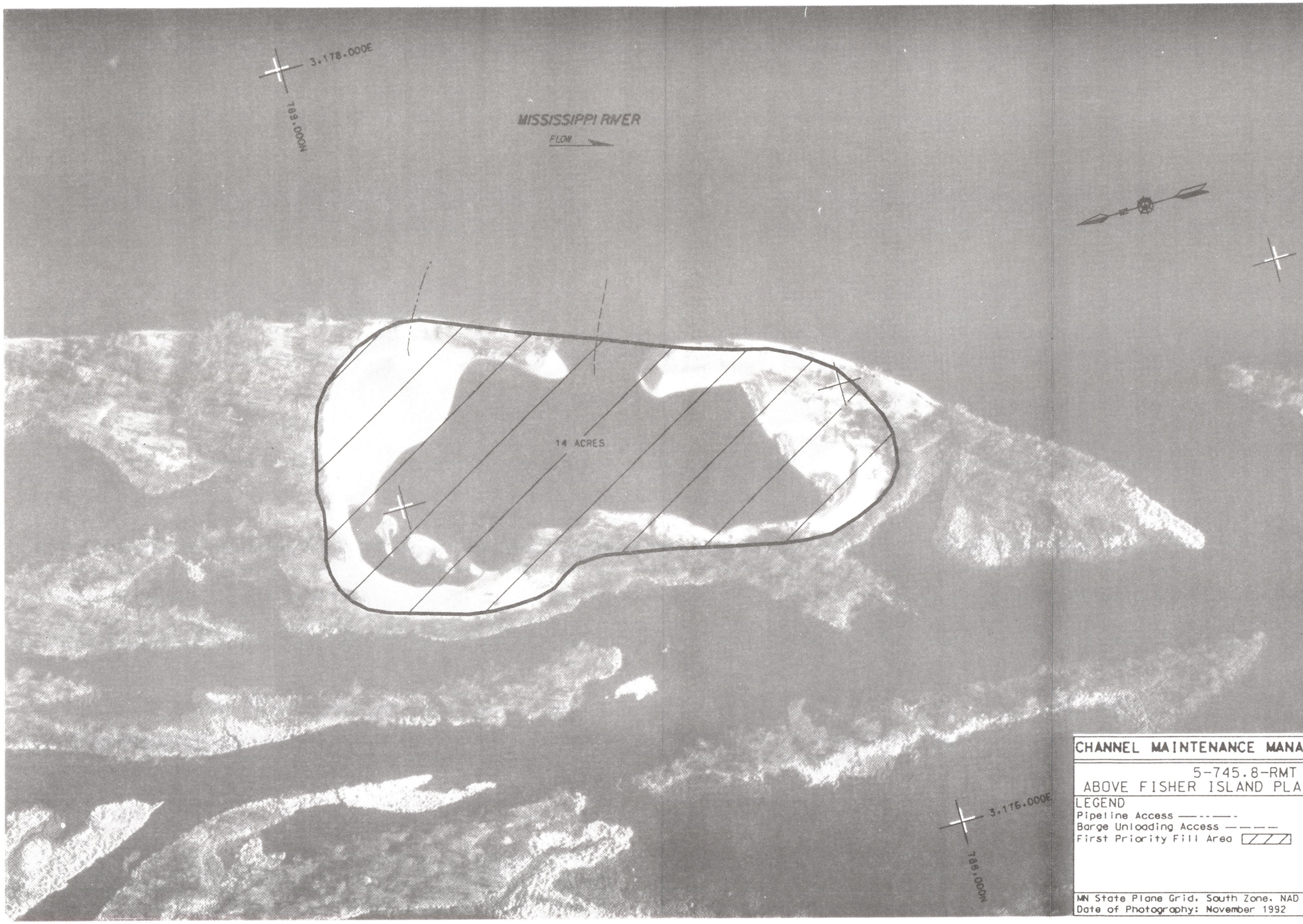
EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed when it is economical or when capacity has been reached. It will be transferred to a permanent site.

FUTURE PLANS: Use of this site as a borrow area for the Weaver Bottoms Rehabilitation project will continue. When there is no longer a demand for the material, the site will be filled to capacity and revegetated. The Corps will consider excavation of the site to a permanent site prior to stabilization and revegetation.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	General permits with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Fisher Island	744.8-746.0	H	3000	30-1500	3030-4500	0-50
Below West Newton	746.0-746.8	H	3000	30-1500	3030-4500	0-50



CHANNEL MAINTENANCE MANAGEMENT PLA

5-745.8-RMT
ABOVE FISHER ISLAND PLACEMENT SIT

LEGEND
Pipeline Access —--—-
Barge Unloading Access — — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5-744.7-LWT	Lost Island	WI/Buffalo/Buffalo City	Federal Government
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 5.08T). This site was endorsed by the RRF on 30 September 1985 (Lower Pool 5/Weaver Rehab.). GREAT recommended implementing the Weaver Bottoms rehabilitation project through use of dredged material. The RRF endorsed the Lower Pool 5 Channel Maintenance Plan/Weaver Bottoms Rehabilitation Plan, which identified use of this site as a borrow source for construction. Original containment dikes were constructed in 1978, covering an area of 18 acres. Approximately 585,000 cubic yards were excavated in 1987 for the Weaver Bottoms Phase I construction. The RRF added this site to the emergency/temporary list contained in GREAT Action Item 8 on 30 March 1983. Material from routine dredging will continue to be placed into this transfer site.

SITE CHARACTERISTICS: This is an island containment site used in the past for dredged material placement. Portions of the site were used for experimental revegetation efforts.

SITE DIMENSIONS: Area = 18 acres. The area is 1750 feet by 450 feet. Excavated 585,000 cubic yards to reach the Pre-Fill Elevation. Pre-Fill Elevation = 650.0. Maximum Fill Elevation = 700.0. LCP Elevation = 659.8. Estimated Capacity = 1,052,000 cubic yards.

BENEFICIAL USE: Material from this site was removed for the Weaver Bottoms Rehabilitation project. When this site is filled, it may be used for further island construction in Weaver Bottoms. The containment site is also used beneficially for recreation.

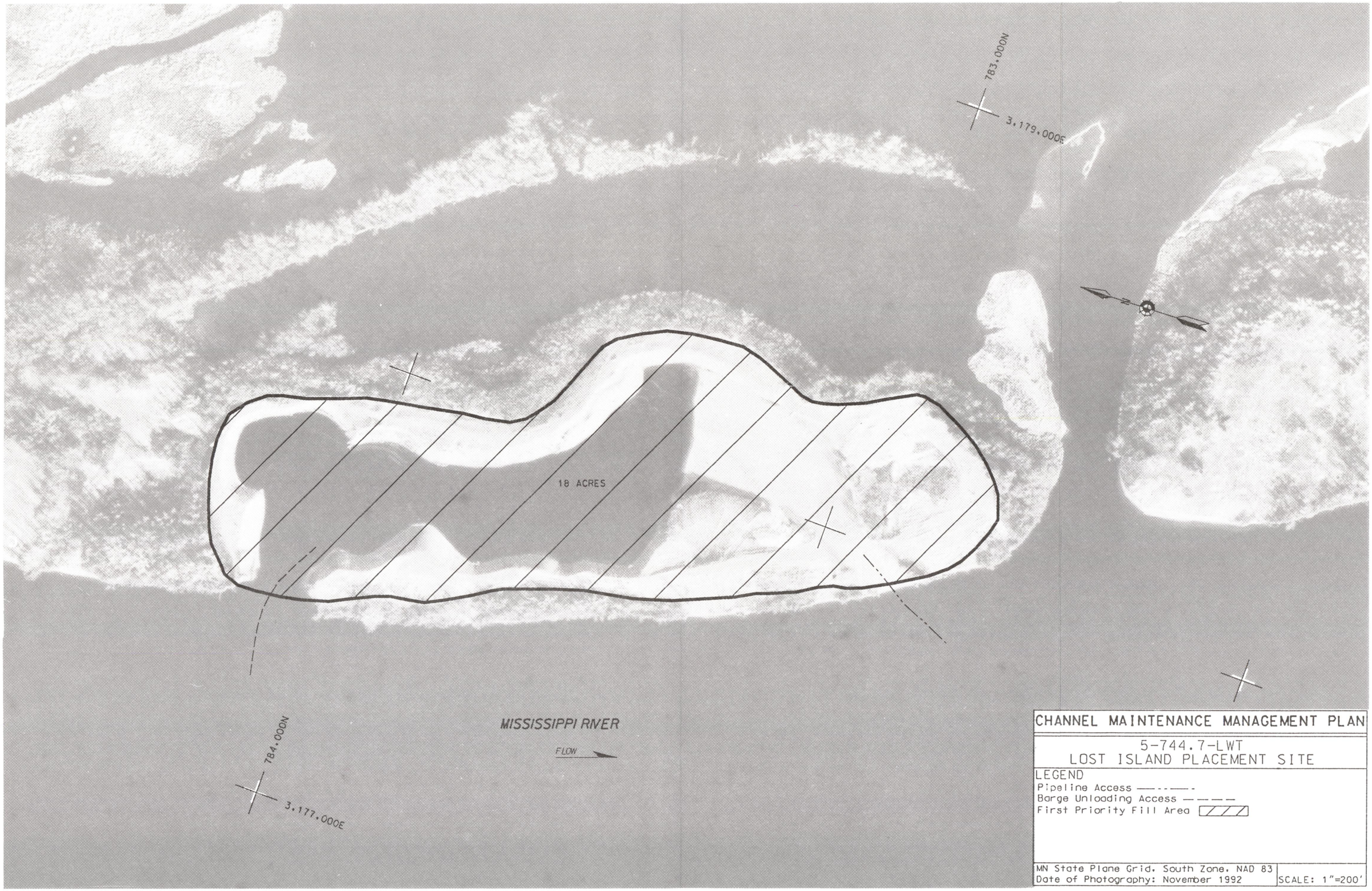
EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed when it is economical or when capacity has been reached. It will be transferred to a permanent site.

FUTURE PLANS: Use of this site as a borrow area for the Weaver Bottoms Rehabilitation project will continue. When there is no longer a demand for the material, the site will be filled to capacity and revegetated. The Corps will consider excavation of the site to a permanent site prior to stabilization and revegetation.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WNDR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Fisher Island	744.8-746.0	H	4000	30-1500	4030-5500	0-40
Lower Zumbro	744.0-744.6	H	3000	30-1500	3030-4500	0-40



CHANNEL MAINTENANCE MANAGEMENT PLAN

5-744.7-LWT
LOST ISLAND PLACEMENT SITE

LEGEND

Pipeline Access ——--——-

Barge Unloading Access — — — —

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5-744.0-RMP	Weaver Bottoms	MN/Wabasha/Weaver	Federal Government
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5.30, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 30 September 1985 (Lower Pool 5/Weaver Rehab.). GREAT recommended use of 76 acres of Type 4 and 5 wetlands for placement of material from cuts 1-4. The RRF endorsed the Lower Pool 5 Channel Maintenance Plan/Weaver Bottoms Rehabilitation Plan on 30 September 1985 (Plan D was the selected alternative). This plan identified a total of 108 acres to be impacted by creating islands and modifying side channels. Phase I construction is complete and Phase II construction has been deferred until all data from monitoring has been evaluated and a final report is written.

SITE CHARACTERISTICS: All completed islands and side channel closures have been capped with fine sediments to encourage revegetation, or rock for stabilization. More information can be found in the Pool 5/Weaver Bottoms Rehabilitation report.

SITE DIMENSIONS: Area = 56 acres of side channel habitat and 52 acres of backwater habitat modified. Pre-Fill Elevation = 655.0. Maximum Fill Elevation = 672.0. LCP Elevation = 659.8. Estimated Capacity = 1,659,500 cubic yards.

BENEFICIAL USE: The beneficial use in this area is for environmental enhancement. The habitat value in the backwater has improved. Approximately 1,367,000 cubic yards of material were removed from the two historic placement sites. These sites were Above Fisher Island (site 5-754.8-RMT with 782,000 cubic yards removed) and Lost Island (site 5-744.7-LWT with 585,000 cubic yards removed).

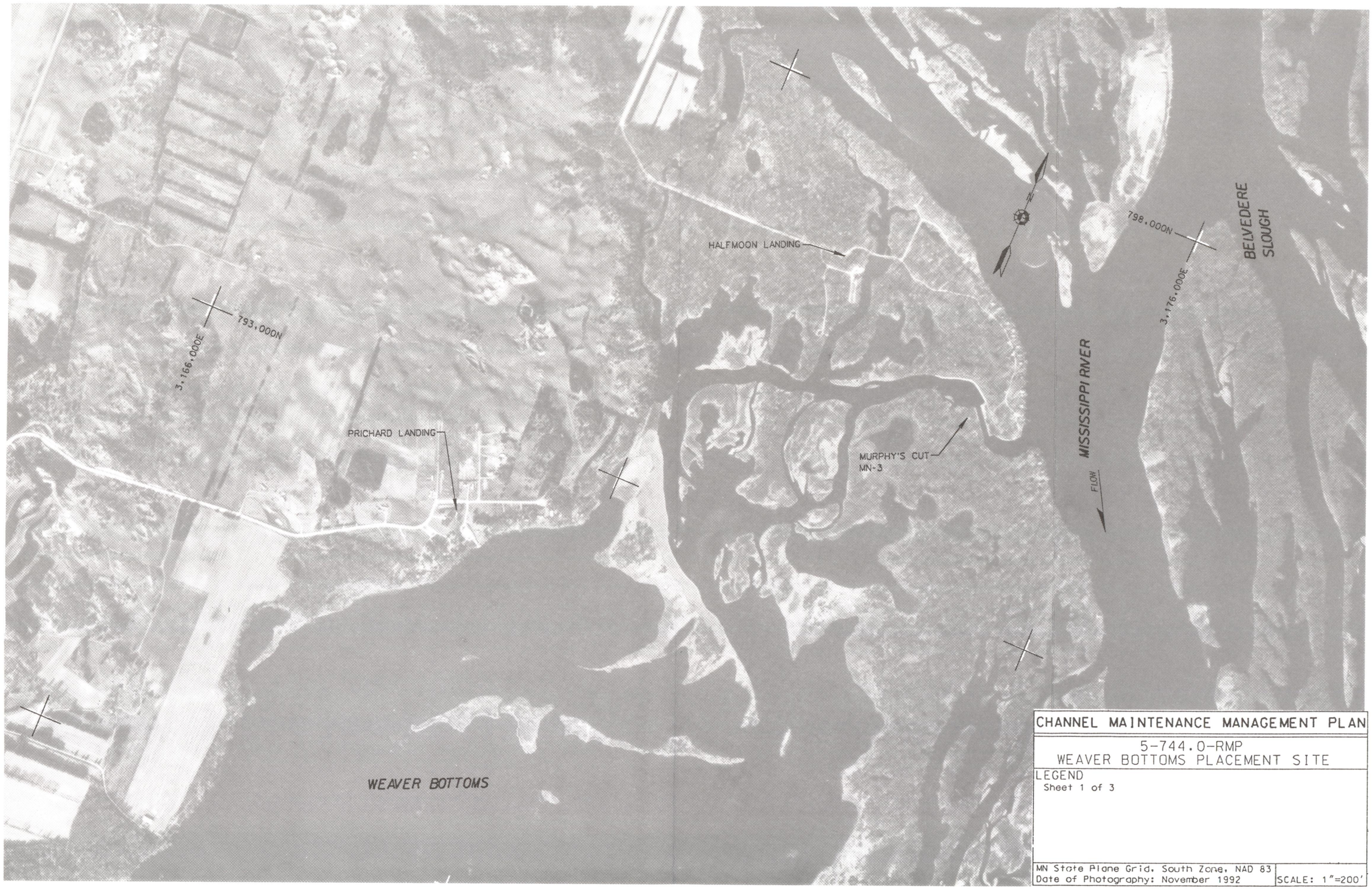
EQUIPMENT REQUIREMENTS/LIMITATIONS: The entire backwater area is shallow (less than 6.0 feet) and requires equipment that can operate in shallow water.

SPECIAL CONDITIONS/RESTRICTIONS: Work will be coordinated with natural resource agencies to reduce the interference with the wildlife species using the Weaver Bottoms area. The Corps will apply out of comity, for a MDNR Protected Waters permit if additional work is proposed in MN waters.

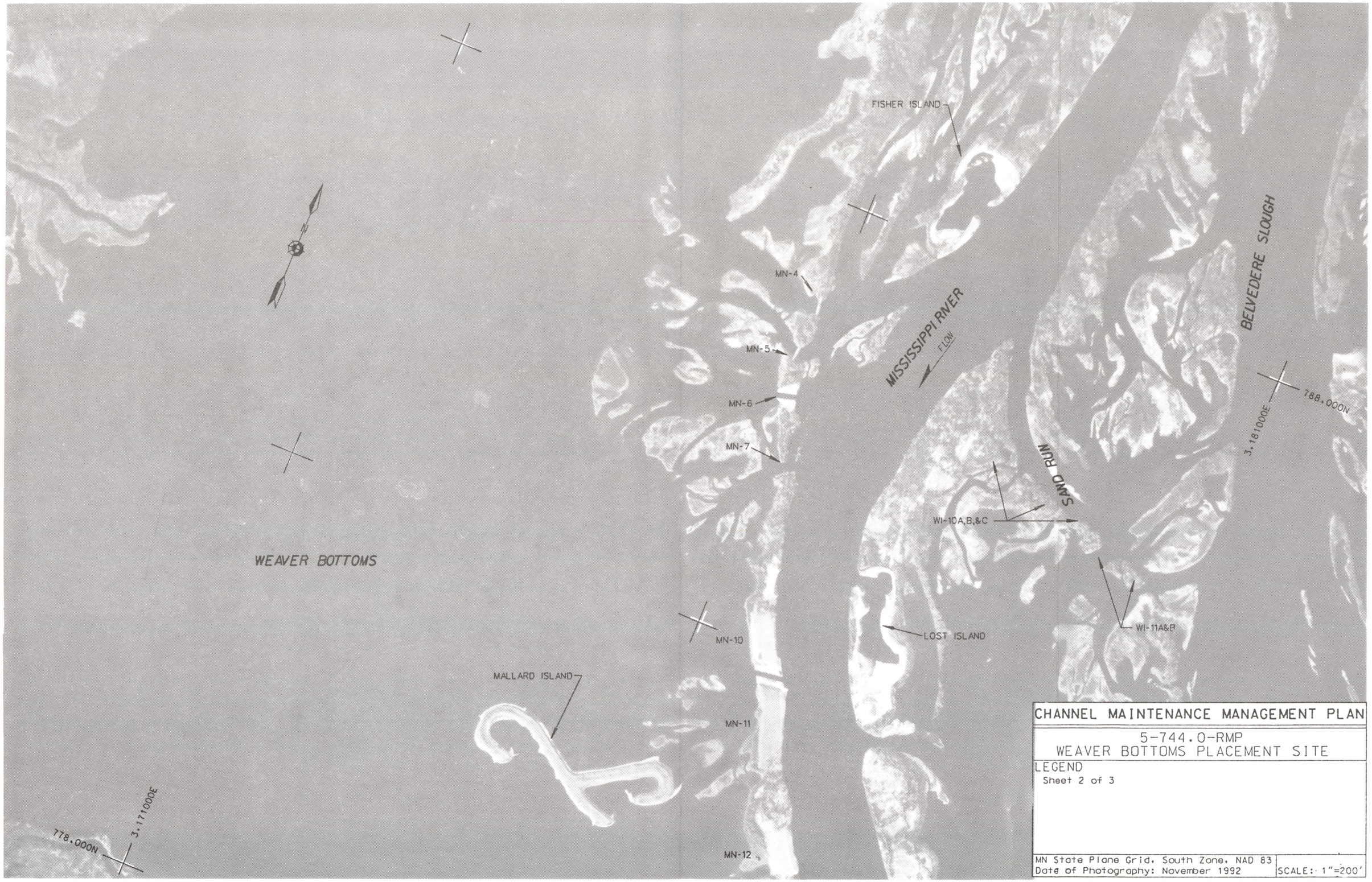
FUTURE PLANS: Continue to construct the islands until the proposed work has been completed or a new plan is developed and endorsed by the RRF.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	General permits with MDNR, WDNR, & MPCA
X	404(b)(1) Evaluation	Long-term 404(b) completed (exp. 2025)
	Other:	

Potential Dredge Cuts		Dredge		Pipeline Distance		
Name	Mile	Type	Water	Land	Total	Lift
Fisher Island	Varies	H,M	Varies	Varies	Varies	Varies
Lower Zumbro	Varies	H,M	Varies	Varies	Varies	Varies
Sommerfield Island	Varies	H,M	Varies	Varies	Varies	Varies
Historic Placement Sites	Varies	H,M	Varies	Varies	Varies	Varies



CHANNEL MAINTENANCE MANAGEMENT PLAN	
5-744.0-RMP WEAVER BOTTOMS PLACEMENT SITE	
LEGEND Sheet 1 of 3	
MN State Plane Grid, South Zone, NAD 83 Date of Photography: November 1992	SCALE: 1"=200'



CHANNEL MAINTENANCE MANAGEMENT PLAN

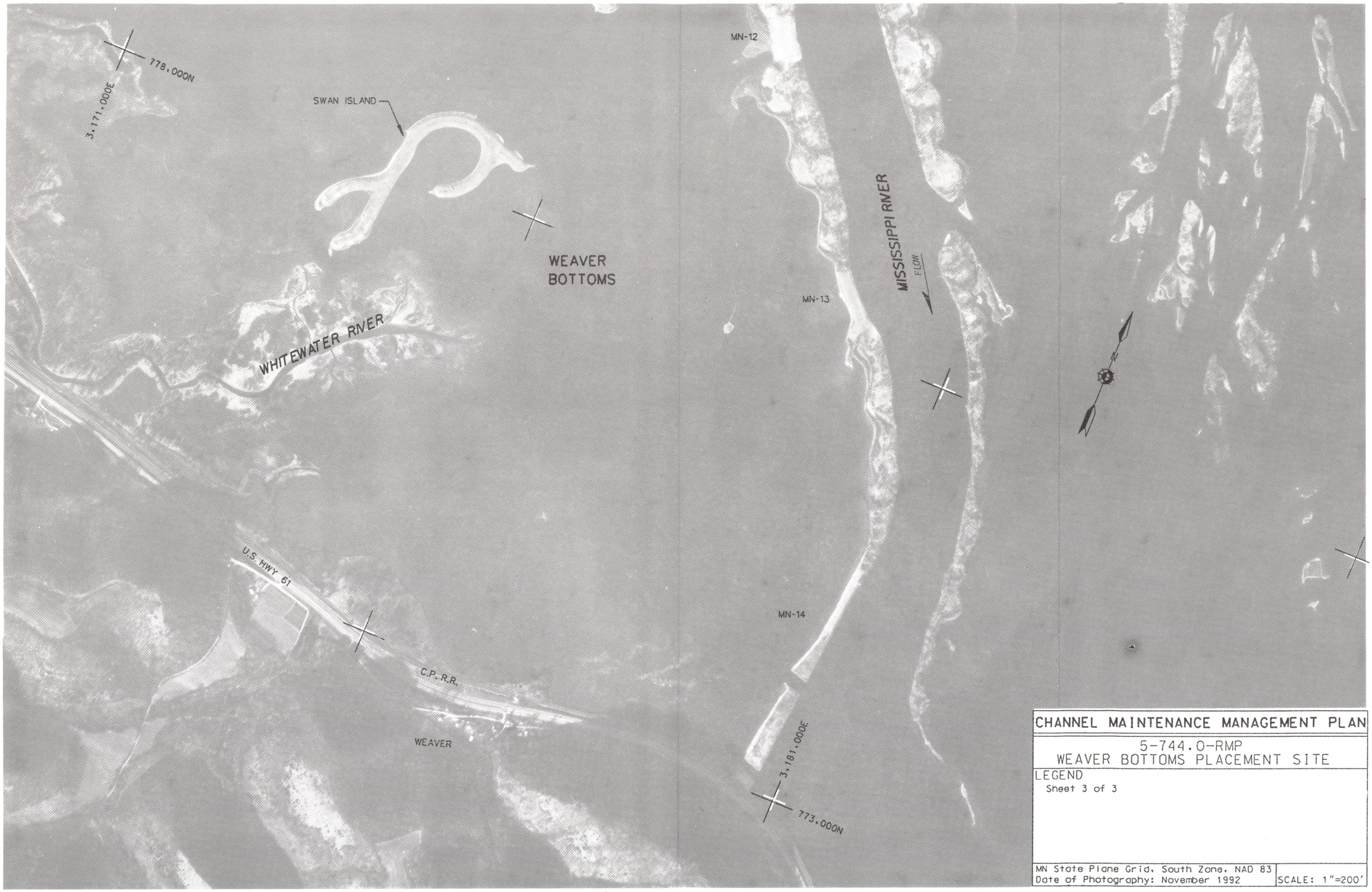
5-744.0-RMP
WEAVER BOTTOMS PLACEMENT SITE

LEGEND

Sheet 2 of 3

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'



CHANNEL MAINTENANCE MANAGEMENT PLAN	
5-744.0-RMP WEAVER BOTTOMS PLACEMENT SITE	
LEGEND Sheet 3 of 3	
MN State Plane Grid, South Zone, NAD 83 Date of Photography: November 1992	SCALE: 1"=200'

TAB 16

Placement Site Information Sheets and Operational Maps

POOLS 5A & 6

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5A-738.2-RMP	L/D 5 Site	MN/Winona/Whitman	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5A.36, Reference GREAT I Vol. 8-Part IV). There was no RRF endorsement prior to the CMMP. This site was endorsed by the RRF on 20 October 1983 (Pool 5A Recon. Alt. A1). GREAT selected use of 2 acres (1 ea. wetland & upland) for permanent placement of material from cut 5. The RRF endorsed the Pool 5A Recon. on 20 October 1983 with conditions: 1) This site would be used to test beneficial use before the Bass Camp site (5A-737.5-RMP) is used; 2) Any beneficial use demand will be considered to prolong development of the Fountain City 2 site (5A-731.8-LWP).

SITE CHARACTERISTICS: The site is adjacent to the Lock and Dam #5 lower guidewalls. An unloading ramp has been constructed at the site and an area has been set aside for a beneficial use stockpile area. Placement of material will be 100% upland.

SITE DIMENSIONS: Area = 2 acres. The area is 600 feet by 130 feet. Pre-Fill Elevation = 657.0. Maximum Fill Elevation = 682.0. LCP Elevation = 651.0. Estimated Capacity = 35,000 cubic yards.

BENEFICIAL USE: A beneficial use stockpile will be developed and removal is expected from Winona County and the MN DOT. Road access has been improved and is good.

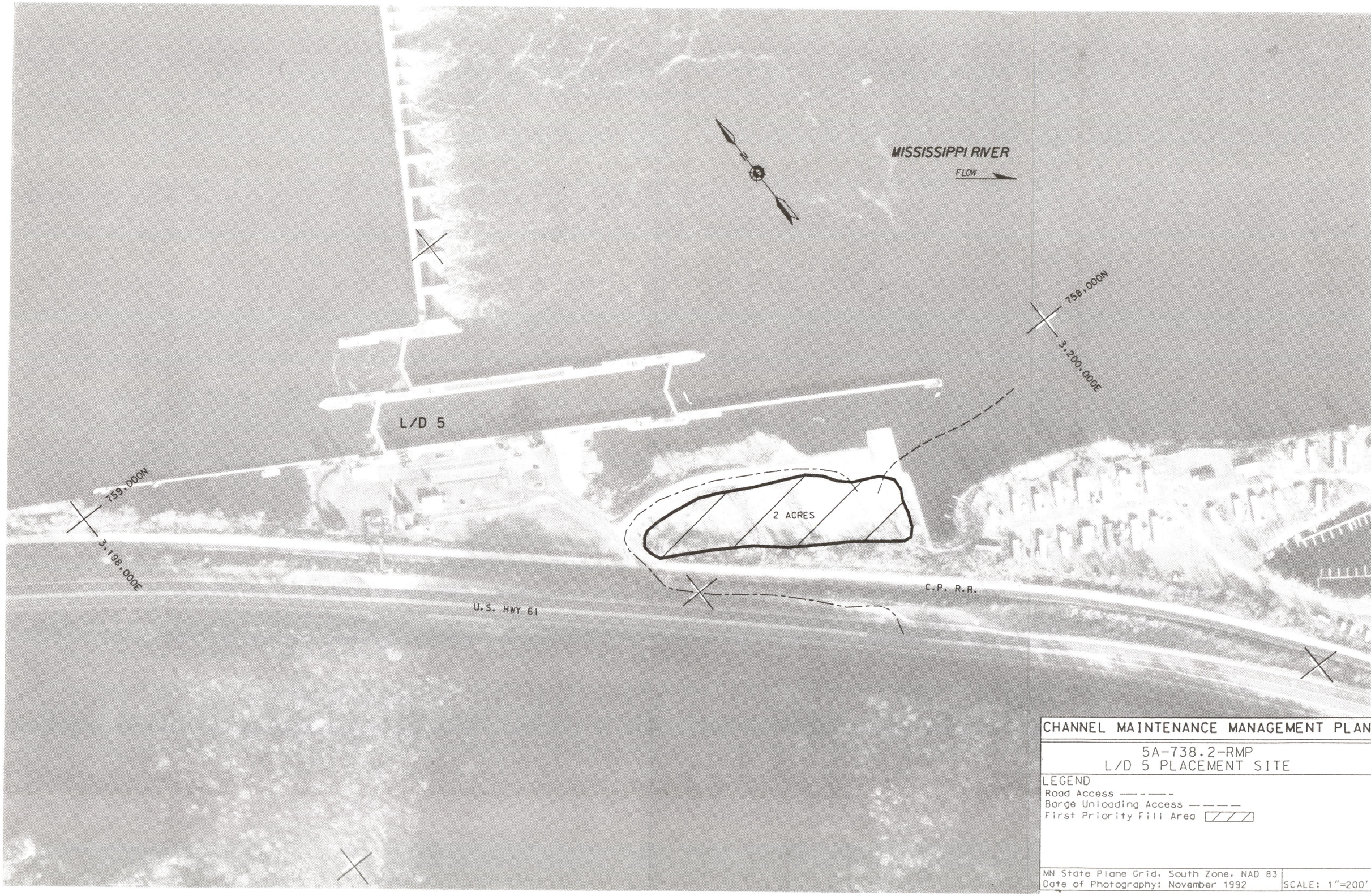
EQUIPMENT REQUIREMENTS/LIMITATIONS: Use of a conveyor may be required to stockpile material to maximum capacity. There may be restrictions on the removal of material.

SPECIAL CONDITIONS/RESTRICTIONS: Maximum capacity of the stockpile will be no more than 35,000 cubic yards. Removal of material will probably be limited to state and county unless supply exceeds demand.

FUTURE PLANS: Promote beneficial use of material when placed at this site.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	FONSI completed on 04/17/85
X	Real Estate	Owned by the federal government
X	State	General permits with MDNR and MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Island 58	734.0-735.2	M	19000	50-500	19050-19500	6-31
Lower Appch. L/D 5	737.0-738.1	M	2000	50-500	2050-2500	6-31



CHANNEL MAINTENANCE MANAGEMENT PLAN

5A-738.2-RMP
L/D 5 PLACEMENT SITE

LEGEND
Road Access ——-——-
Barge Unloading Access ———
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5A-734.5-LWE	Island 58	WI/Buffalo/Fountain City	Federal Gov't. & WDNR
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5A.14T, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 4 December 1986 (Letter Report dated. Nov. 1986). GREAT selected use of 32 acres at this site for temporary placement of material from cuts 4-5. The RRF endorsed the Pool 5A Recon. (Alt. A1) on 20 October 1983 and identified this site as temporary/emergency, but did not identify acres impacted. On 4 December 1986, the RRF endorsed a letter report from the Corps (dated. Nov. 1986) which outlined plans (Alt. 2) for the Fountain City Service Base (FCSB) expansion and temporary/emergency placement sites for cuts 4-5. According to the letter report, approximately 70,000 cubic yards will be excavated from 3 acres at this site for expansion at FCSB, with routine dredging of cuts 4-5 placed back into this site. The Corps will excavate this site to provide fill for the FCSB and to prepare for use as an emergency placement site.

SITE CHARACTERISTICS: Past dredge material placement has provided over 2,400 linear feet of sand beach for recreational use. Adjacent land use is Mississippi River and WI State Park land. Located in the floodplain and floodway, the containment area created would impact 3 acres of sparsely revegetated old dredged material.

SITE DIMENSIONS: Area = 3 acres. The area is 480 feet by 275 feet. Excavate site to elev. 636.0 (15' below LCP). Pre-Fill Elevation = 666.0. Maximum Fill Elevation = 666.0. LCP Elevation = 651.0. Estimated Capacity = 70,000 cubic yards.

BENEFICIAL USE: There would be no direct beneficial use at this site unless material was placed for beach improvement. Material will be removed from this site and used beneficially as landfill for expansion of the Fountain City Service Base.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Material will be excavated from this site mechanically.

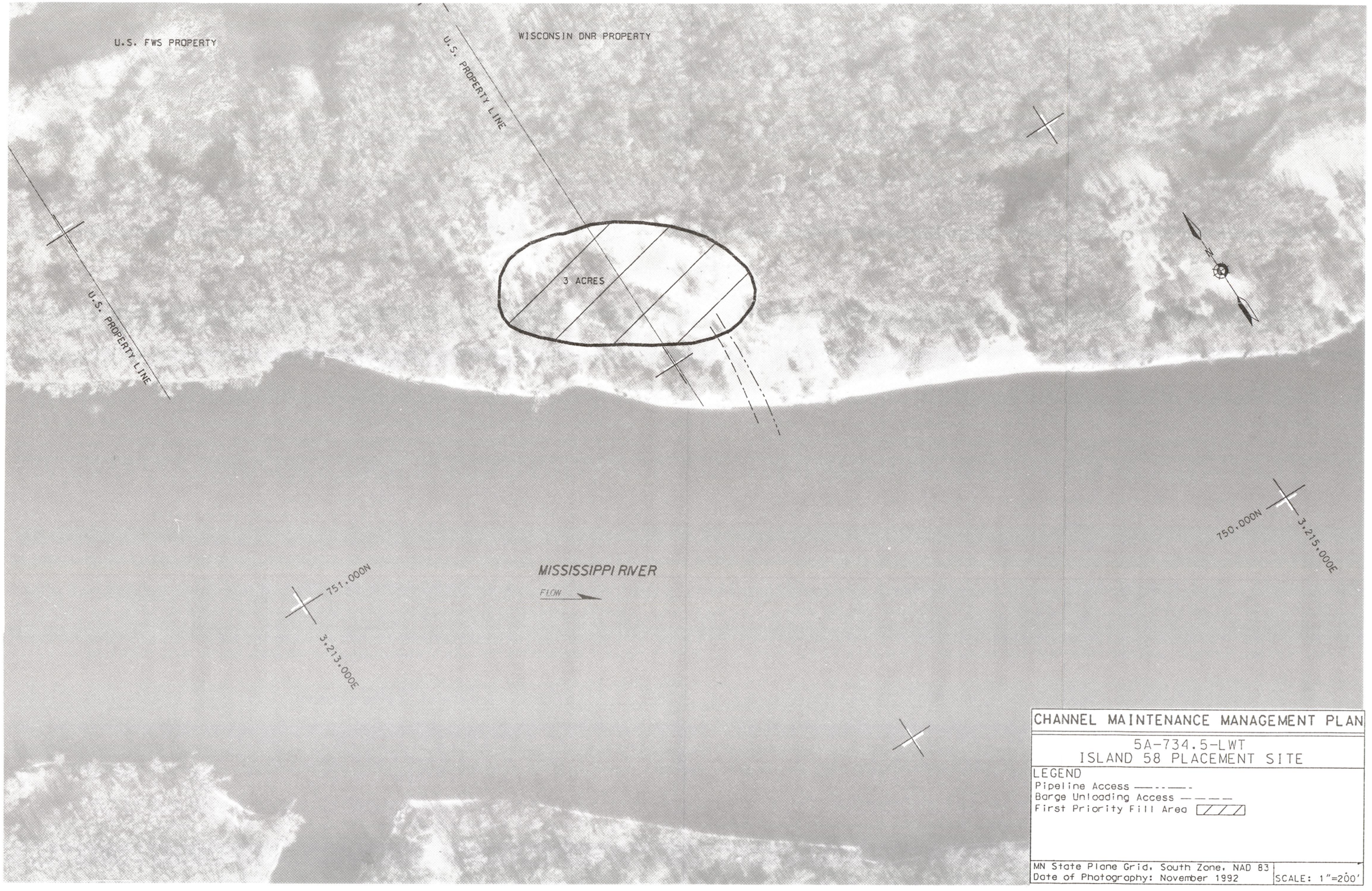
SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies. A condition for RRF endorsement is that the Corps consider suggestions for environmental enhancement at this site.

FUTURE PLANS: Proposed development of the site would involve removing the existing material and constructing a 3 acre diked containment area for emergency hydraulic placement. Landscape plantings will be used near the containment dike to reduce visual impacts. The OSIT will review the site and recommend site boundaries. The site map will be changed accordingly.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WNDR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Fountain City	733.3-733.8	H	4000	50-700	4050-4700	9-19
Island 58	734.0-735.2	H	4000	50-700	4050-4700	9-19

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

5A-734.5-LWT
ISLAND 58 PLACEMENT SITE

LEGEND

Pipeline Access ——--——-

Barge Unloading Access — — — —

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83

Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5A-733.5-LWP	Ft. City Service Base	WI/Buffalo/Fountain City	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 5A.34). On 4 December 1986, the RRF endorsed a letter report from the Corps (dated. Nov. 1986) which outlined the plan (Alt. 2) for the Fountain City Service Base (FCSB) expansion and temporary/emergency placement sites for cuts 4-5. Approximately 70,000 cubic yards will be excavated from site 5A-734.5-LWE (Island 58) and used to fill approximately 2 acres of open water for expansion of the FCSB. The plan also includes a loading dock, mooring cells, and riprapping the new embankment. Installation of the mooring cells along the shoreline of the island opposite the FCSB and the loading dock have been completed.

SITE CHARACTERISTICS: The area to be filled is all open water. Adjacent land use is the FCSB, railroad, and the Mississippi River.

SITE DIMENSIONS: Area = 2 acres. The area is 750 feet by 100 feet. Pre-Fill Elevation = 647.0. Maximum Fill Elevation = 664.0. LCP Elevation = 650.9 Estimated Capacity = 70,000 cubic yards.

BENEFICIAL USE: The material would be used beneficially as landfill for the expansion of the FCSB facilities.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Material from site 5A-734.5-LWE (Island 58) will be mechanically excavated & placed at this location.

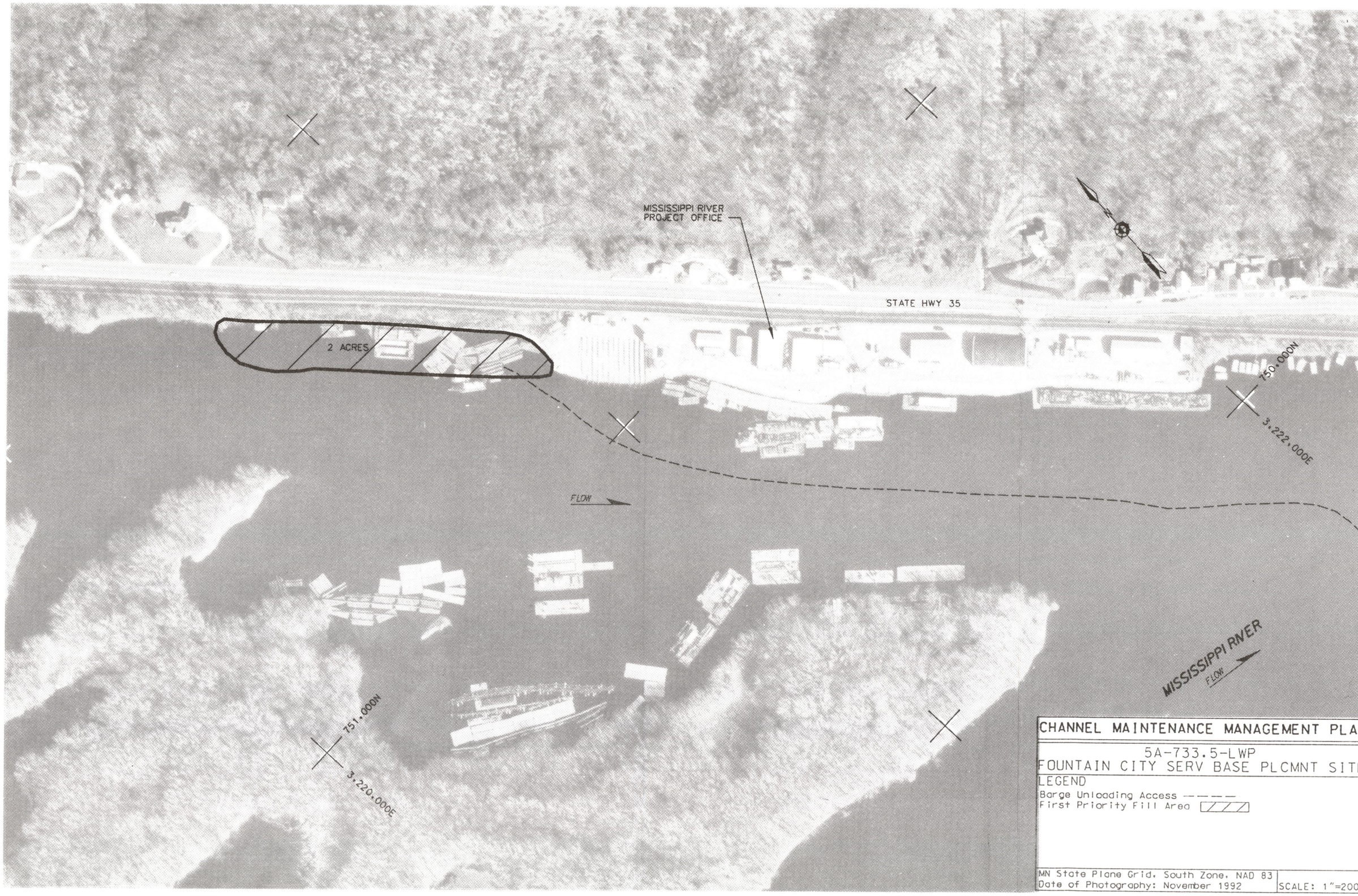
SPECIAL CONDITIONS/RESTRICTIONS: The proposed area including the riprap can only be filled by using material from a channel maintenance project. Riprap is necessary to prevent erosion of the filled area. Areas at or near the FCSB are being tested for PCB contamination. If sediment PCB results are below the level of concern at or near the proposed placement site, implementation can proceed as approved in this plan.

FUTURE PLANS: This site is a one time fill area for constructing an expansion to the District's FCSB, which is required because of additional equipment necessary to meet the Channel Maintenance Management Plan requirements.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	404(b) will be completed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Island 58 site	5A-734.5-LWE	M	7000	0	7000	0-13

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLA

5A-733.5-LWP
FOUNTAIN CITY SERV BASE PLCMNT SIT

LEGEND
Barge Unloading Access — — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5A-731.9-LWP	Fountain City 1	WI/Buffalo/Fountain City	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5A.25, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 20 October 1983 (Pool 5A Recon. Alt. A1). GREAT selected 6 acres to be used as a secondary site for permanent placement from cuts 1-2 and as a primary site for cut 4. The Pool 5A Recon. was endorsed with the condition that any beneficial use demand will be considered to prolong development of the Fountain City 2 site (5A-731.8-LWP). The Recon. identified 4 acres. The Corps purchased approx. 6 acres (Jan 1988) and currently has stockpiles for dredged material (3 acres) and rock (1 acre) at this site.

SITE CHARACTERISTICS: This is an active beneficial use stockpile site. It is a triangular shaped parcel bordered by the Mississippi River, railroad track, and a stockpile site for rock used by the Corps.

SITE DIMENSIONS: Area = 6 acres. The area is 1300 feet by 200 feet. Stockpile area approximately 3 acres (750'X175'). Pre-Fill Elevation = 660.0. Maximum Fill Elevation = 690.0. LCP Elevation = 650.4. Estimated Capacity = 90,000 cubic yards.

BENEFICIAL USE: This site has been very active as a beneficial use stockpile site. From 1975 to 1995 approximately 279,000 cubic yards were placed at the site and as of 1995 it has all been removed or spoken for. Removal average is approximately 13,300 cubic yards/year.

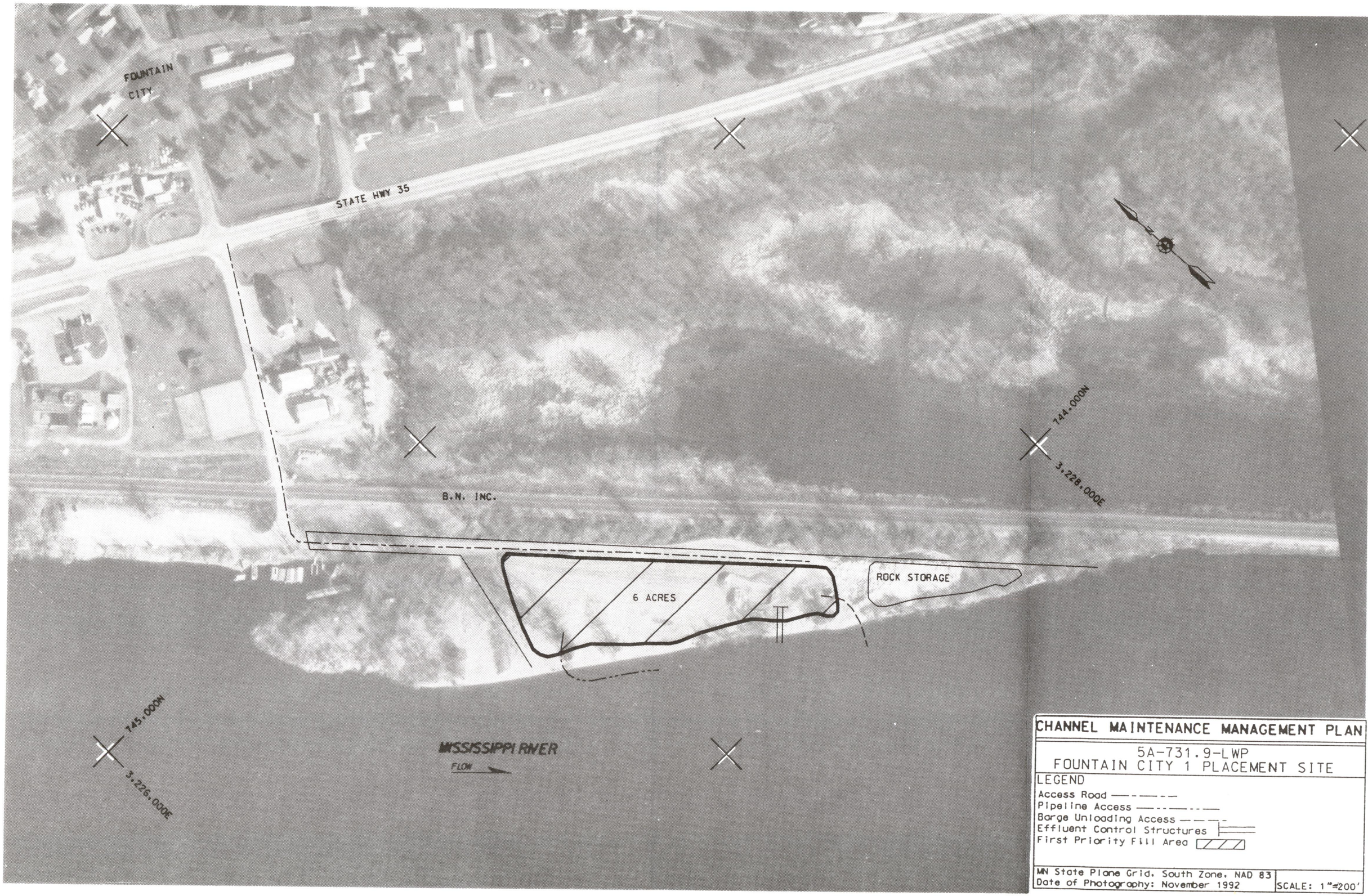
EQUIPMENT REQUIREMENTS/LIMITATIONS: Due to the demand for the material from City, County, and State agencies as well as private contractors, the area will be sectioned off for various uses.

SPECIAL CONDITIONS/RESTRICTIONS: Beneficial use removal must continue to maintain capacity at the site. The downstream end will be a stockpile area for rock, and the upstream end will be maintained as a beneficial use stockpile site.

FUTURE PLANS: Vegetation from the center of the site was removed for increased capacity and vegetation will be planted along the shoreline for screening and for erosion. The access road will be improved.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Fountain City	733.3-733.8	M	8000	50-300	8050-8300	10-40
Betsy Slough	731.0-732.0	H,M	3000	50-300	3050-3300	10-40
Wilds Bend	730.2-730.7	M	7000	50-300	7050-7300	10-40
Upper Appch. L/D 5A	728.5-729.5	M	13700	50-300	13750-14000	10-40



CHANNEL MAINTENANCE MANAGEMENT PLAN

5A-731.9-LWP
FOUNTAIN CITY 1 PLACEMENT SITE

LEGEND

Access Road

Pipeline Access

Barge Unloading Access

Effluent Control Structures

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5A-731.8-LWP	Fountain City 2	WI/Buffalo/Fountain City	City of Fountain City
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5A.32, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 20 October 1983 (Pool 5A Recon. Alt. A1). GREAT selected 34 acres to be used for permanent placement of material from cuts 1-3. The Pool 5A Recon. was endorsed with the condition that any beneficial use demand will be considered to prolong the development of this site. The Pool 5A Recon. identified 22 acres of wetland to be used for permanent placement of material from cuts 2-4. This site has not been used to date.

SITE CHARACTERISTICS: This site lies between the Burlington Northern Railroad tracks and State Hwy. 35. This area is 100% wetland, consisting mostly of floodplain forest, shallow emergent marsh, and shallow aquatic areas. The entire site is no more than 3 feet above LCP and is flooded by high waters almost every spring.

SITE DIMENSIONS: Area = 22 acres. The area is 1340 feet by 715 feet. Pre-Fill Elevation = 650.0. Maximum Fill Elevation = 675.0. LCP Elevation = 650.4. Estimated Capacity = 764,500 cubic yards.

BENEFICIAL USE: The Recon. identified active beneficial use at either this site or the Fountain City 1 site (5A-731.9-LWP) to be 380,000 cubic yards. Since the Fountain City 1 site (5A-731.9-LWP) is a proven active beneficial use location, this site would be used as a passive beneficial use site for excess material.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Because of this sites location, the only practical method of dredged material placement is hydraulic. Cuts 2-3 will be by direct hydraulic placement and cut 4 will be mechanical to the Fountain City 1 site (5A-731.9-LWP) with hydraulic or mechanical rehandling.

SPECIAL CONDITIONS/RESTRICTIONS: If any substantial filling is required near the railroad embankment, the area will be evaluated for stability in regard to any possible lateral movement or settlement of the embankment.

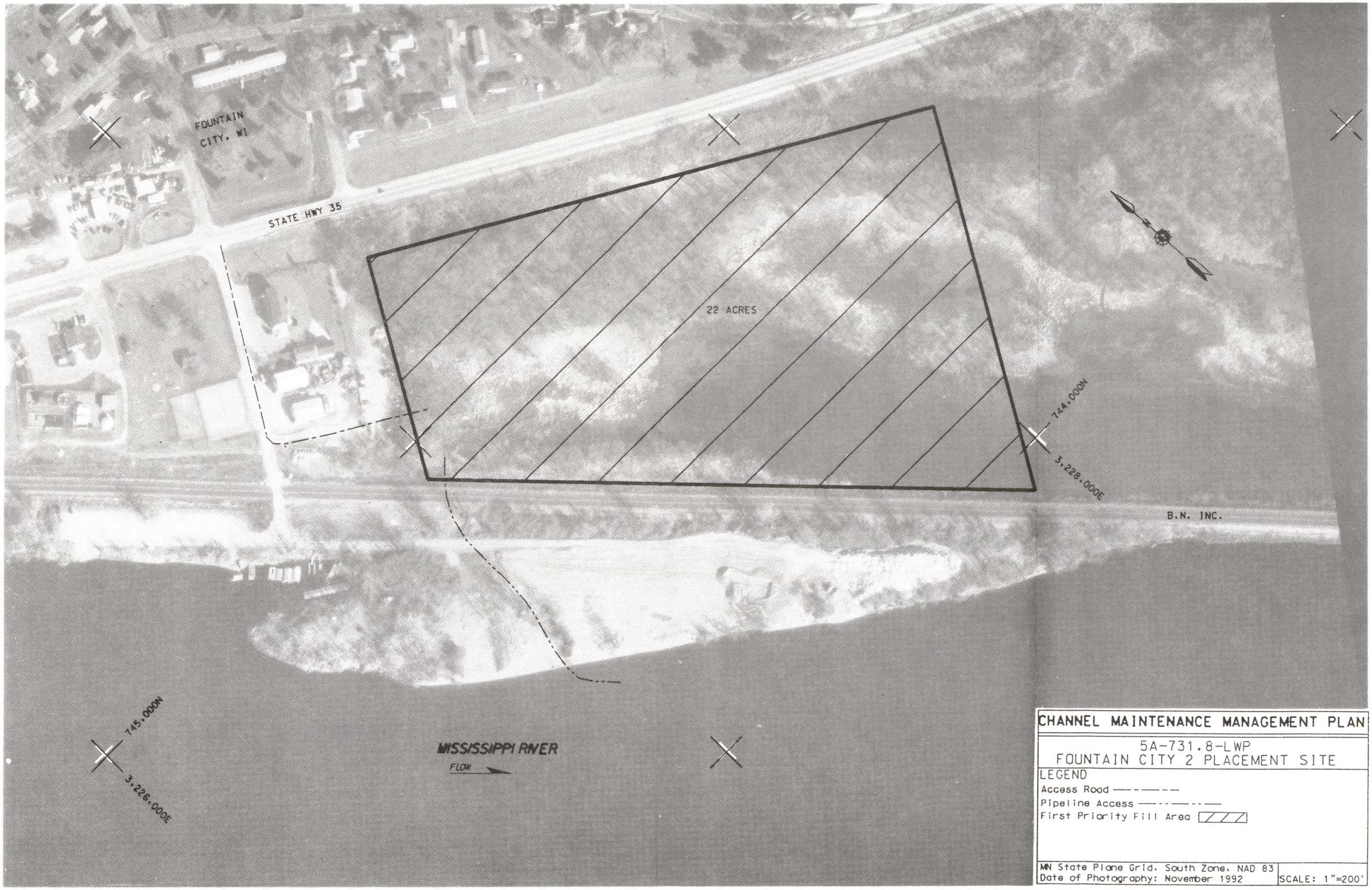
FUTURE PLANS: The Corps will actively pursue all other options to filling this placement site because of the high wetland values within the fill area. Should no options be available, filling at this site will occur in phases to preserve as much of the wetland habitat as possible. A phased expansion plan will be developed through coordination with the OSIT. Preparation of this site will only occur after all other reasonable placement options have been exhausted. Preparation of this site would include; riprapping the dry run, constructing a containment dike, clearing vegetation, and jacking a pipe under the railroad embankment for pipeline access.

PERMITS/APPROVAL CHECKLIST:

	Remarks
Cultural Resources	Survey required
Endangered Species	Coordinate analysis with FWS
Floodplain Impact Analysis	Impacts will be analyzed
NEPA	Covered by O&M, EIS
Real Estate	Agreement required from landowner
State	Water quality certification required from WDNR
404(b)(1) Evaluation	Long-term 404(b) proposed
Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Wilds Bend	730.2-730.7	H	7000	200-1800	7200-8800	0-25
Betsy Slough	731.0-732.0	H	3000	200-1800	3200-4800	0-25
Fountain City	733.3-733.8	M&H	8000	200-1800	8200-9800	0-25

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

5A-731.8-LWP
FOUNTAIN CITY 2 PLACEMENT SITE

LEGEND

Access Road ——— - ———

Pipeline Access ——— -- ——— -- ———

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

5A-730.5-LWT	Wilds Bend	WI/Buffalo/Fountain City	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 5A.08T, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 6 March 1984 (proposed by Corps at RRF meeting). GREAT selected use of 9 acres at this site for temporary placement of material from cut 2. The RRF endorsed the Pool 5A Recon. (Alt. A1) on 10/20/83 and identified this site as temporary, but did not identify acres impacted. The endorsement also noted that any beneficial use demand will be considered to prolong use of the Fountain City 2 site (5A-731.8-LWP). On 6 March 1984, the RRF endorsed a proposal to excavate 300,000 cubic yards from this site for beneficial use in Winona, MN. The Corps would then use this site rather than the Fountain City 2 site (5A-731.8-LWP) for future maintenance up to the quantity removed with no time limit.

SITE CHARACTERISTICS: This site is considered a transfer site. A containment dike was constructed in 1978. In 1984 when the site was excavated, the perimeter was left as a dike for future placement. The existing diked area covers approximately 8 acres. Adjacent land is bottomland hardwoods and the main channel.

SITE DIMENSIONS: Area = 8 acres. The area is 850 feet by 385 feet. Excavated 300,000 cubic yards to reach Pre-Fill Elev. Pre-Fill Elevation = 640.0. Maximum Fill Elevation = 690.0. LCP Elevation = 650.3. Estimated Capacity = 300,000 cubic yards.

BENEFICIAL USE: The material will be used beneficially at a later date if the site is excavated. Material in the area is primarily a medium grade sand.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Some material will be placed mechanically, however, most will be placed hydraulically.

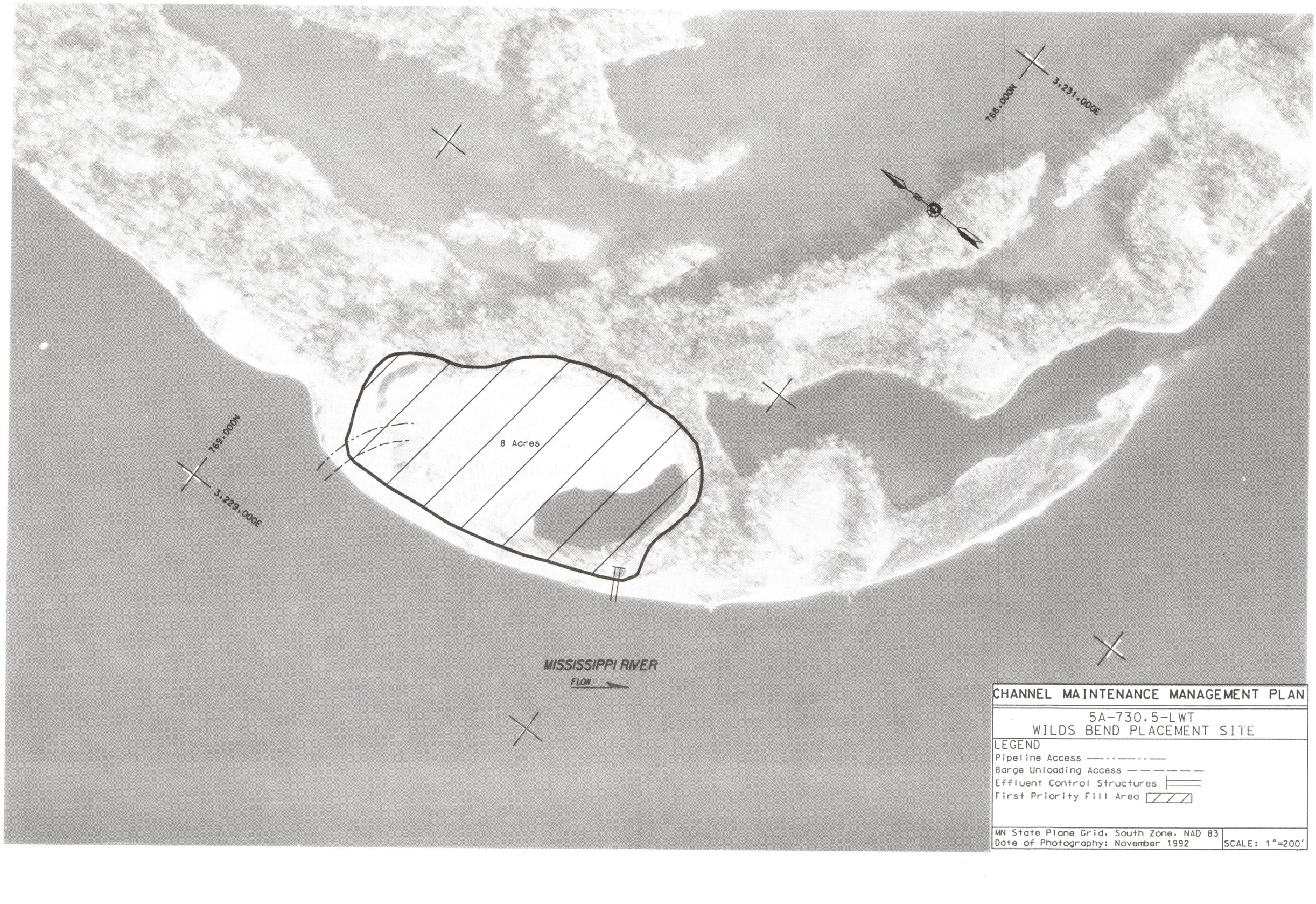
SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed when it is economical or when capacity has been reached. It will be transferred to a permanent site. The Fountain City 1 (first priority) and Fountain City 2 (second priority) sites have been designated as the permanent sites for material transferred from this site. The Corps will consider other locations while planning the excavation.

FUTURE PLANS: When the site is filled to capacity it will be excavated and placed in a permanent site. If this site is utilized and beneficial use removal of the Fountain City 1 site keeps up with the supply, it will prolong the need to develop site 5A-731.8-LWP (Fountain City 2).

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	Review occasionally
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
X	404(b)(1) Evaluation	404(b) is good until 300,000 cy
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Wilds Bend	730.2-730.7	H	100	50-300	150-400	10-40
Betsy Slough	731.0-732.0	H	5200	50-300	5250-5500	10-40

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

5A-730.5-LWT
WILDS BEND PLACEMENT SITE

LEGEND

Pipeline Access ——--——--——

Barge Unloading Access — — — — —

Effluent Control Structures

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

6-726.3-RMP	Winona Commerc. Harbor	MN/Winona/Winona	Winona Port Authority
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. There was no RRF endorsement prior to the CMMP. GREAT selected use of 21 acres at the Winona Industrial Park site (6-723.3-RMP) for cuts 1-4, 11 acres at the Homer site (6-720.5-RMP) for cut 1, 2.5 acres at GREAT site 6.19 (6-724.5-RMP), and 2.5 acres at GREAT site 6.20 (6-724.6-RMP), for cut 4, and 0.5 acres at the Winona Harbor site (6-726.0-LMP) for cuts 5 and 6. All of the GREAT selected sites are permanent sites. No further studies have been completed in Pool 6 because the Corps has determined that the GREAT plans are justified. This site was established in 1989 at the request of the City of Winona. It's a good beneficial use site and is permitted on a yearly basis. The Corps will use this site for cuts 3-6 to prolong use of the GREAT recommended sites for those cuts.

SITE CHARACTERISTICS: This is an upland site located in a commercial harbor area. The surrounding land uses include a harbor access, a bottomland hardwood area, a grain facility, and a paved street on the Winona flood control dike.

SITE DIMENSIONS: Area = 6 acres. The area is 650 feet by 400 feet. Pre-Fill Elevation = 655.0. Maximum Fill Elevation = 675.0. LCP Elevation = 645.5. Estimated Capacity = 150,000 cubic yards.

BENEFICIAL USE: Material stockpiled at the site will belong to the Winona Port Authority. They plan to use the material beneficially or provide the material to other agencies or contractors for beneficial use.

EQUIPMENT REQUIREMENTS/LIMITATIONS: There is no containment dike for hydraulic placement. A barge unloading ramp was constructed in 1989 to allow for future mechanical placement

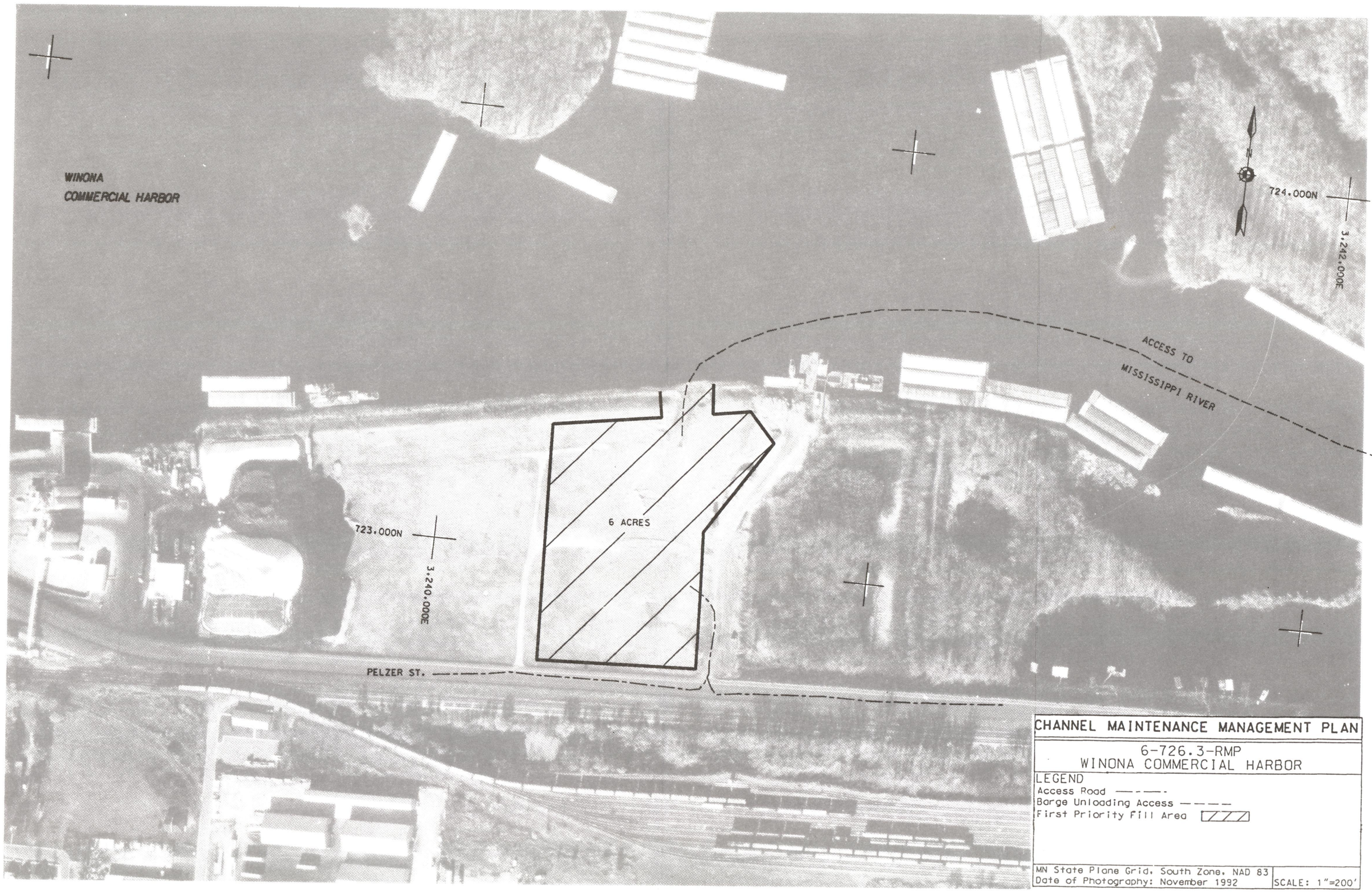
SPECIAL CONDITIONS/RESTRICTIONS: Unloading of barges must not interfere with commercial harbor activities.

FUTURE PLANS: Implementation of a long-term beneficial use stockpile site is desired. The unloading ramp should be maintained. The Corps has pursued a long-term real estate agreement but the Winona Port Authority does not want to commit to a long-term agreement at this time. The Corps will continue to pursue a long-term agreement.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
	Real Estate	Long-term lease proposed
X	State	General permits with MDNR and MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Winona SBH	726.1	M	3000	50-400	3050-3400	9-29
Winona Commercial Harbor	726.3	M	100	50-400	150-500	9-29
Below Winona RR Bridge	723.4-723.8	M	16000	50-400	16050-16400	9-29

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

6-726.3-RMP
WINONA COMMERCIAL HARBOR

LEGEND
Access Road ——·——·
Barge Unloading Access — — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

6-726.0-LMP	Winona Harbor	MN/Winona/Winona	City of Winona
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 6.27, Reference GREAT I Vol. 8-Part IV). There was no RRF endorsement prior to the CMMP. GREAT selected use of .5 acres at this site for permanent placement of material from cuts 5-6. No further studies have been completed in Pool 6 because the Corps has determined that the GREAT plans are justified. This site has been used in the past, but not since the development of the Commercial Harbor site (6-726.3-RMP). This site is permitted by the city of Winona and will continue to be used as needed.

SITE CHARACTERISTICS: This is a previously used beneficial use site located adjacent to the Winona Small Boat Harbor. It consists of old dredged material and bottomland hardwood surroundings.

SITE DIMENSIONS: Area = 1 acres. The area is 180 feet by 130 feet. Pre-Fill Elevation = 650.0. Maximum Fill Elevation = 665.0. LCP Elevation = 645.5. Estimated Capacity = 9,000 cubic yards.

BENEFICIAL USE: Material placed at this site is removed by the city and used beneficially.

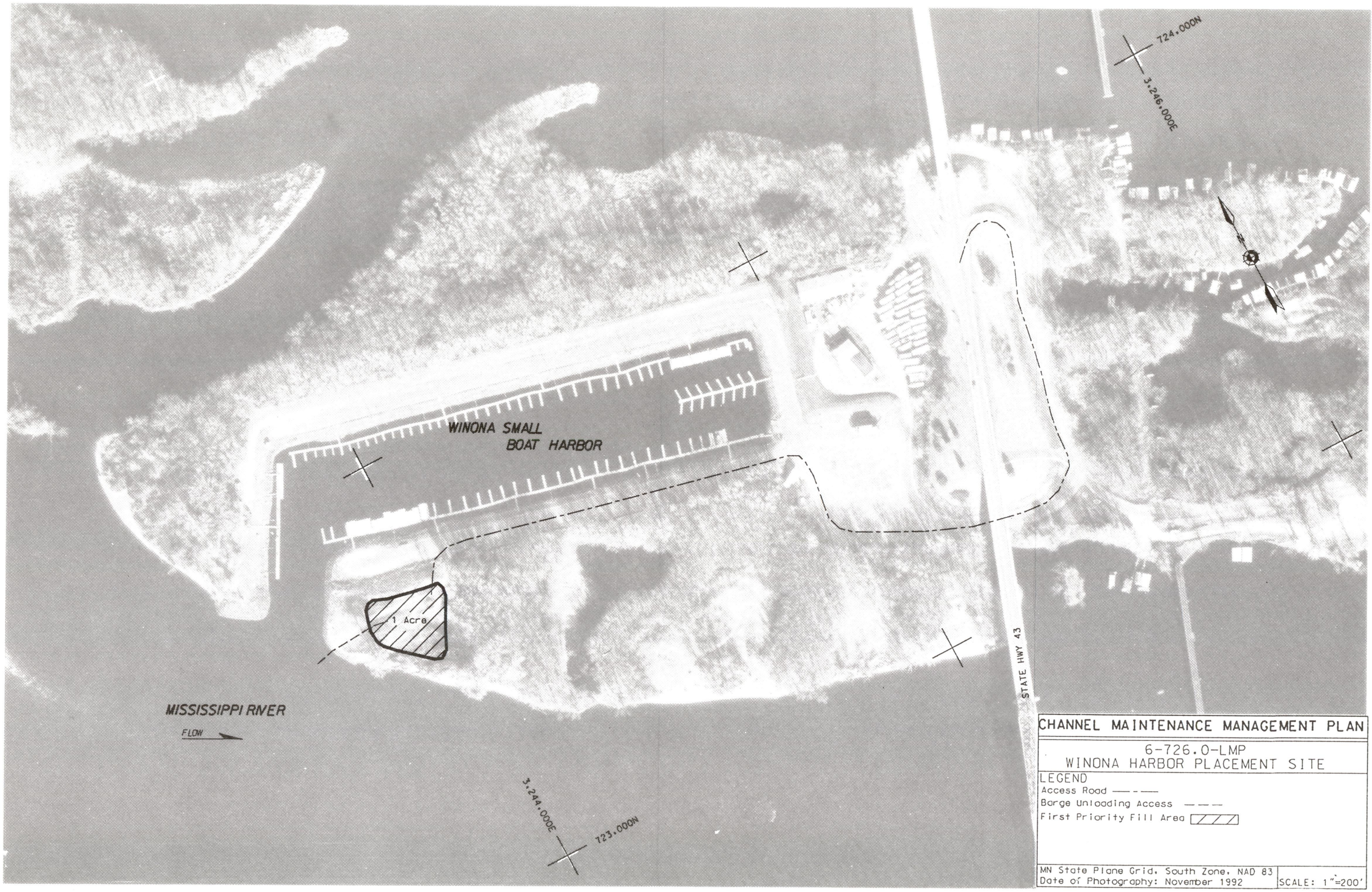
EQUIPMENT REQUIREMENTS/LIMITATIONS: The site can only be used with mechanical equipment because of its limited space.

SPECIAL CONDITIONS/RESTRICTIONS: Unknown.

FUTURE PLANS: Use of this site may not be required once the Winona Commercial Harbor site is fully developed and a long-term real estate agreement is obtained. Until that time, operations will continue as they have in the past.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires a permit from the landowner
X	State	General permits with MDNR and MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Winona SBH	726.1	M	50	50-300	100-350	4-19
L/D 5A Lock Chamber	728.3	M	13700	50-300	13750-14000	4-19
Lower Appch. L/D 5A	727.1-728.1	M	13700	50-300	13750-14000	4-19
Island 71	726.0-726.5	M	300	50-300	350-600	4-19



CHANNEL MAINTENANCE MANAGEMENT PLAN

6-726.0-LMP
WINONA HARBOR PLACEMENT SITE

LEGEND
Access Road ——-——
Borge Unloading Access ———
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

6-720.5-RMP	Homer	MN/Winona/Homer	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 6.11, Reference GREAT I Vol. 8-Part IV). There was no RRF endorsement prior to the CMMP. GREAT selected use of 11 acres as a secondary placement site for cut 1. The primary site for cut one is the Winona Industrial Park (6-723.3-RMP) which the city of Winona plans to fill with material dredged from Lake Winona. The site has not been developed because of the limited dredging in the area. No further studies have been completed in Pool 6 because the Corps has determined that the GREAT plans are justified. The 11 acres calculated by GREAT has been adjusted to 10 acres. This provides a minimum buffer of 50 feet around the entire pile.

SITE CHARACTERISTICS: The site is in the floodplain and the floodway. It is primarily bottomland hardwood with approximately 2 acres of bare sand and a 1 acre pond. Adjacent land use is the main river channel and the CP Rail railroad tracks.

SITE DIMENSIONS: Area = 10 acres. The area is 1400 feet by 310 feet. Pre-Fill Elevation = 649.0. Maximum Fill Elevation = 664.0. LCP Elevation = 644.8. Estimated Capacity = 150,000 cubic yards.

BENEFICIAL USE: The material would be placed beneficially as landfill and has been placed at the site in the past to benefit recreational beach use. The current landowner wants the material to use in his ready-mix concrete operations and there is potential to develop a stockpile.

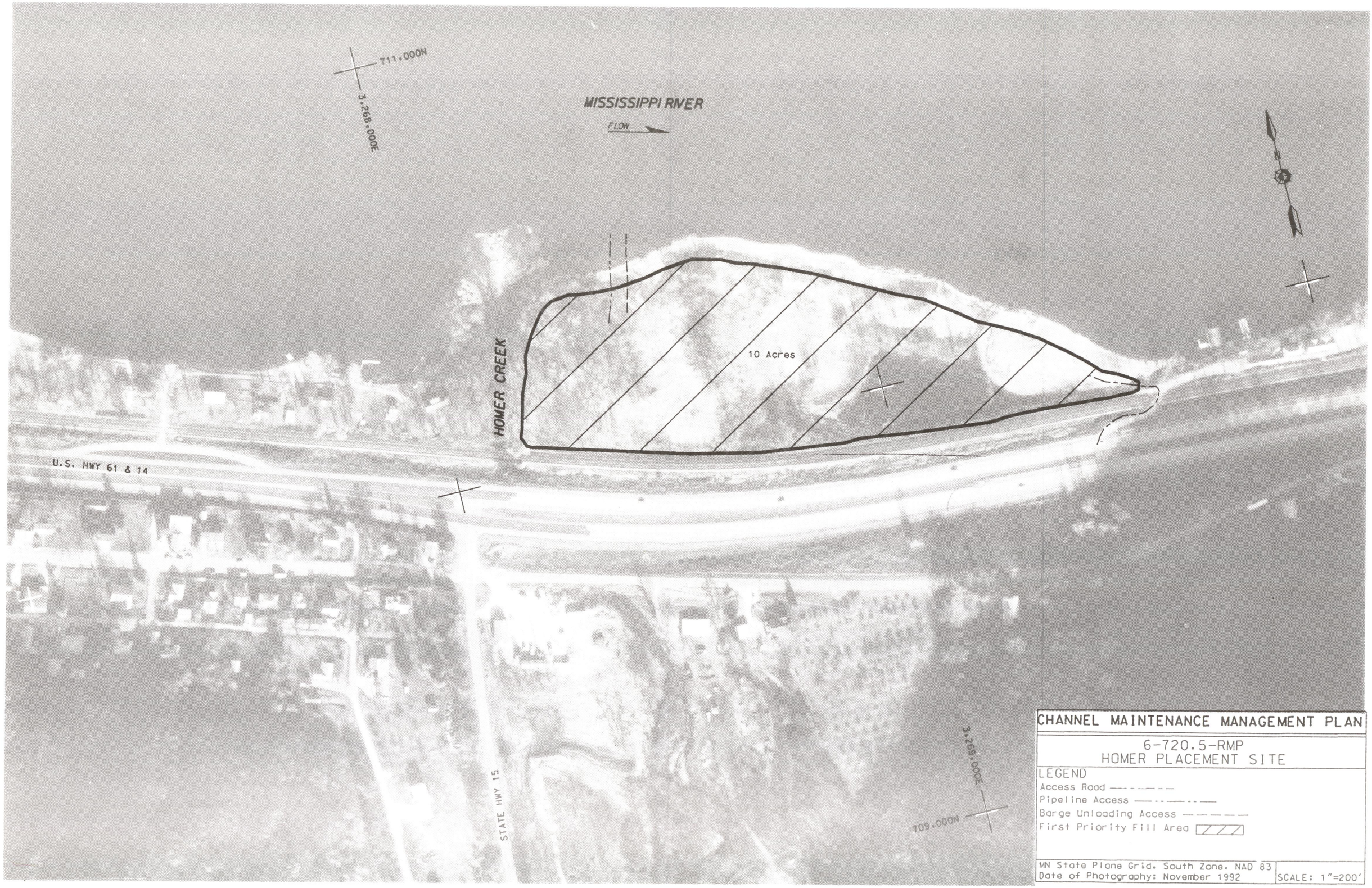
EQUIPMENT REQUIREMENTS/LIMITATIONS: The site is accessible to both mechanical and hydraulic dredged material placement.

SPECIAL CONDITIONS/RESTRICTIONS: Additional coordination with landowner and the On Site Inspection Team is required for the development of this site.

FUTURE PLANS: Acquisition of the site should be initiated if the owner is willing to sell. Access road improvements are needed. Removal of material and developing a beneficial use stockpile site will be discussed with the landowner.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	Impacts will be analyzed
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Requires a permit from the landowner
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Homer	720.4-721.1	H,M	200	30-400	230-600	4-19



CHANNEL MAINTENANCE MANAGEMENT PLAN

6-720.5-RMP
HOMER PLACEMENT SITE

LEGEND

Access Road — - - - - —

Pipeline Access — - - — - - —

Barge Unloading Access — — — — —

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 17 - POOL 7

TAB 17

Placement Site Information Sheets and Operational Maps

POOL 7

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

7-714.1-LWP	Trempealeau	WI/Trempealeau/Trempealeau	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 7.06, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 6 March 1984 (Pool 7 Recon. Alt. F). GREAT selected use of 21 acres (all wetland) at this site for permanent placement of material from cuts 2-5 and 7. The endorsed Pool 7 Recon. (Alt. F) recommended the use of 5 acres at this site for cuts 4-7. Acres at this site were reduced because active beneficial use was increased from 216,000 cubic yards to 800,000 cubic yards. Because of increased beneficial use removal with large trucks, increased use of the boat launching facilities, and development of a marina, the entrance road to L/D 6 was widened to improve access.

SITE CHARACTERISTICS: This site is within a contained area bound by the L/D 6 entrance road, dam dike, and railroad embankment. A circulation culvert is located on the south boundary and connects the site with the river. The 5 acre placement site is previously filled wetland.

SITE DIMENSIONS: Area = 5 acres. The area is 900 feet by 240 feet. Pre-Fill Elevation = 640.0. Maximum Fill Elevation = 655.0. LCP Elevation = 638.5. Estimated Capacity = 99,000 cubic yards.

BENEFICIAL USE: This is a permanent beneficial use stockpile site. There is a high demand for material in the area. Most removal has been from Trempealeau and LaCrosse County Highway Departments. Beneficial use removal is estimated to be 800,000 cubic yards.

EQUIPMENT REQUIREMENTS/LIMITATIONS: A concrete crossing has been constructed to facilitate the transportation of dredge material across the entrance road. If placement is hydraulic, the pipe must be covered to form a bridge where it crosses the entrance road.

SPECIAL CONDITIONS/RESTRICTIONS: Signs must be in place to caution visitors of dredging operations when conditions exist. Need to develop signs to caution visitors of trucks hauling from the stockpile.

FUTURE PLANS: Berming and vegetative plantings will be used around the site to reduce aesthetic impacts and blowing sand. Because of the high public use at this location, an informational kiosk should be constructed to explain using this site to place dredged material.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
X	404(b)(1) Evaluation	404(b) expires 2024; supplement in 1990
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Winters Landing	707.4-709.3	M	30000	300-1000	30300-31000	16-36
Below Queen's Bluff	710.3-710.7	M	19000	300-1000	19300-20000	16-36
Richmond Island	711.4-712.3	M	11600	300-1000	11900-12900	16-36
Lower Appch. L/D 6	714.0-714.3	H,M	300	300-1000	600-1300	16-36

TREMPEALEAU, WI

704.000N

3,300,000E

B.N. INC.

5 ACRES

L/D 6

MISSISSIPPI RIVER

FLOW

3,298,000E

703,000N

CHANNEL MAINTENANCE MANAGEMENT PLAN

7-714.1-LWP
TREMPEALEAU PLACEMENT SITE

LEGEND

Access Road

Pipeline Access

Pipeline Access

Effluent Control Structures

Fence

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

7-713.1-RMP	Hot Fish Shop	MN/Winona/Donehoven	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 7.05, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 6 March 1984 (Pool 7 Recon. Alt. F). GREAT selected use of 12 acres (all wetland) at this site for permanent placement of material from cut 6. The endorsed Pool 7 Recon. (Alt. F) recommended the use of 2 acres at this site. There are 3 acres of upland available which has been used in the past for dredged material placement. Since the landowner has been making the 3 acres are available for stockpiling, the Corps will plan on using the entire area. Alternative F shows placement of 400,000 cubic yards at this site over the 40-year planning period with beneficial use of the entire amount.

SITE CHARACTERISTICS: Three acres of previously disturbed upland area from past dredged material placement exists. The site is bordered by the Mississippi River main channel and ponds used for holding fish for commercial use.

SITE DIMENSIONS: Area = 3 acres. The area is 650 feet by 195 feet. Pre-Fill Elevation = 643.0. Maximum Fill Elevation = 663.0. LCP Elevation = 638.5. Estimated Capacity = 60,000 cubic yards.

BENEFICIAL USE: This is a permanent beneficial use stockpile site. There is a high demand for material in this area. Most removal has been from private construction contractors in Winona, MN. Beneficial use removal is estimated to be 400,000 cubic yards.

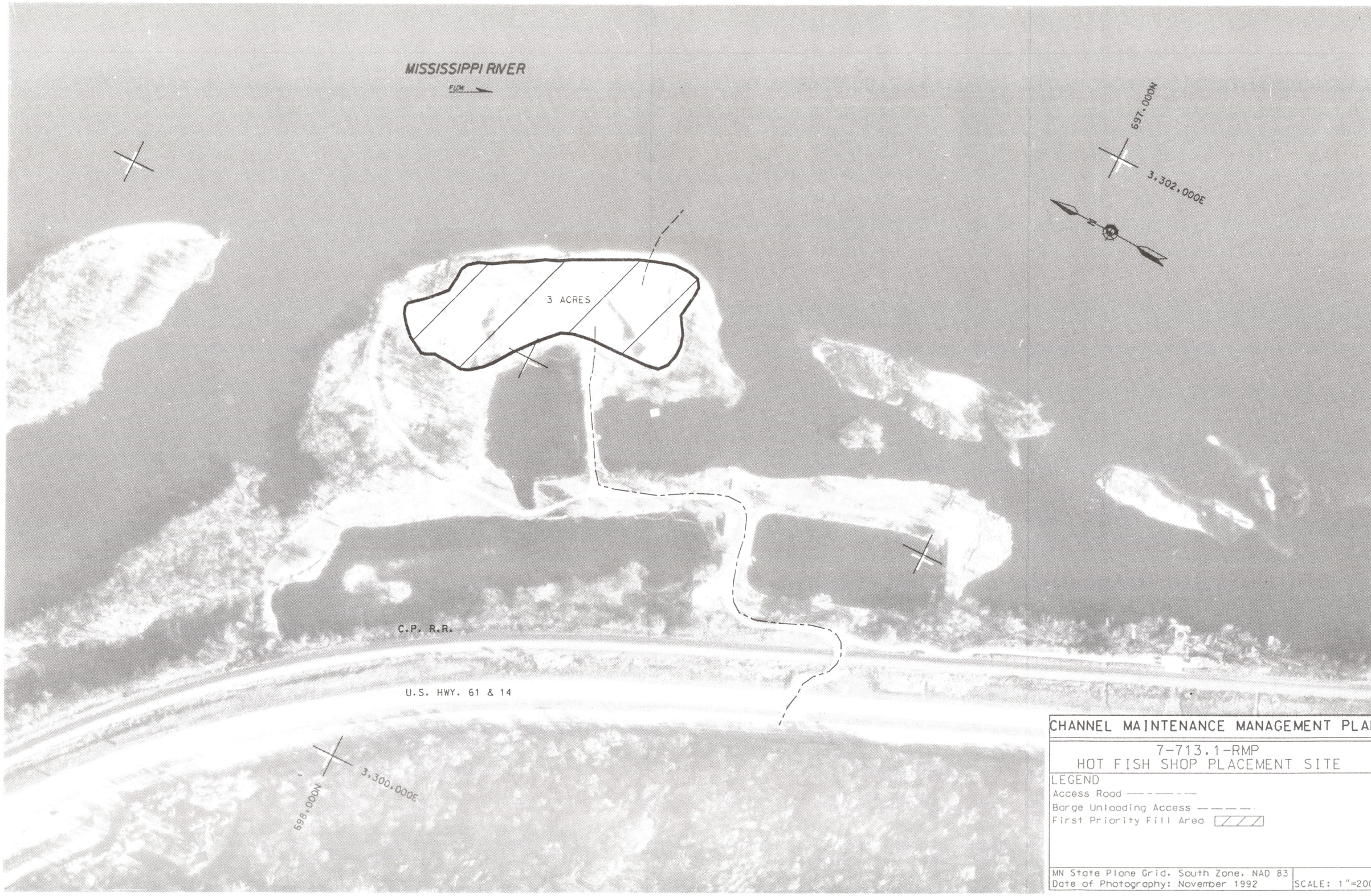
EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

SPECIAL CONDITIONS/RESTRICTIONS: This site is privately owned and any removal must be done with the landowners permission. In the past, the Railroad has required the use of one of their flagmen during removal operations by truck because there are no crossing guards where the access road crosses the tracks.

FUTURE PLANS: Continue to pursue long-term real estate agreement for use of this site.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires a permit from the landowner
X	State	General permit with MDNR and MPCA
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Richmond Island	711.4-712.3	M	6300	20-500	6320-6800	5-25
Winters Landing	707.4-709.3	M	24800	20-500	24820-25200	5-25
Dakota	706.1-706.6	M	35400	20-500	35420-35900	5-25
Head of Dresbach	704.0-705.3	M	44400	20-500	44420-44900	5-25



CHANNEL MAINTENANCE MANAGEMENT PLA

7-713.1-RMP
HOT FISH SHOP PLACEMENT SITE

LEGEND
Access Road
Barge Unloading Access
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

7-708.7-LWE	**Winters Landing**	WI/LaCrosse/Onalaska	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 7.11T, Reference GREAT I Vol. 8-Part IV). There was no RRF endorsement prior to the CMMP. GREAT selected use of 1.5 acres at this site for temporary placement of material from cut 4. The RRF endorsed the Pool 7 Recon. (Alt. F) on 6 March 1984 which identified this site as temporary, but did not identify acres impacted. This site will be used as an emergency site. Development of containment dikes at this site will be coordinated with the OSIT. The Winters Landing Channel Realignment Project constructed in 1988-89 may reduce the need for this site. However, advanced preparation would reduce impacts to the environment in the event of an emergency.

SITE CHARACTERISTICS: This 100% upland site is within the floodplain and within the floodway. It is an old dredged material placement site. Sand covered areas with very little vegetation. A dike may be constructed following OSIT review to protect the backwater.

SITE DIMENSIONS: Area = 2 acres. The area is 380 feet by 175 feet. GREAT pile height of 15' changed to 25' to reach capacity. Pre-fill Elevation = 644.0. Maximum Fill Elevation = 669.0. LCP Elevation =638.5. Estimated Capacity = 40,000 cubic yards.

BENEFICIAL USE: In the past material has been placed at this site for recreational beach enhancement.

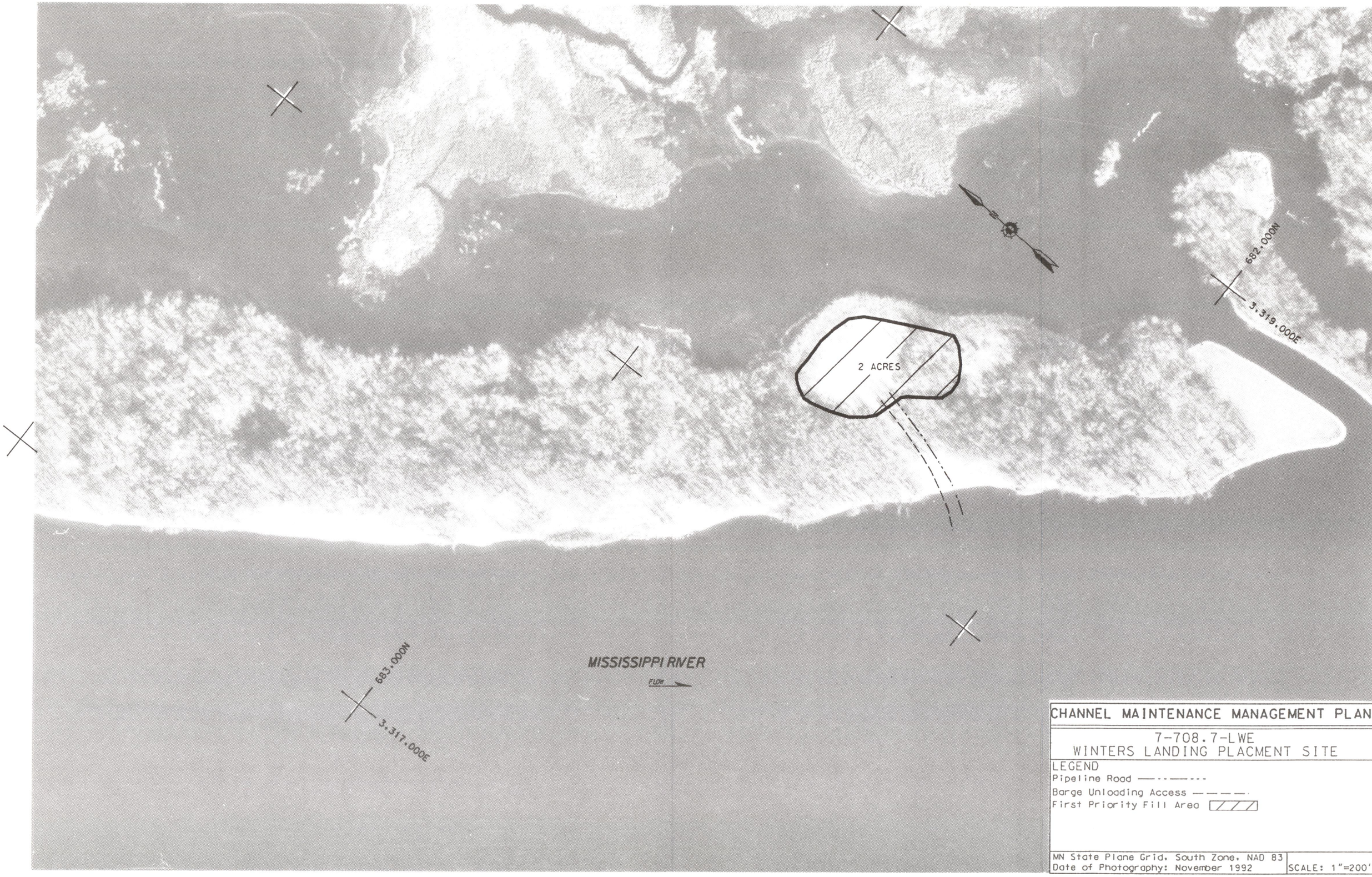
EQUIPMENT REQUIREMENTS/LIMITATIONS: Dredged material placement will be by mechanical, or hydraulic methods.

SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies. Care should be taken to avoid disturbing the oak trees planted around the back of the site.

FUTURE PLANS: Evaluate the Winter's Landing Channel Relocation to determine its effectiveness. Investigate site with the OSIT and develop a plan for constructing a containment dike in advance of this site being used.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	Impacts will be analyzed
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Winter's Landing	707.4-709.3	H,M	3000	50-450	3050-3450	5-15



CHANNEL MAINTENANCE MANAGEMENT PLAN

7-708.7-LWE
WINTERS LANDING PLACMENT SITE

LEGEND
Pipeline Road —--—---
Barge Unloading Access — — — —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

7-707.3-RMP	**Dakota Boat Ramp**	MN/Winona/Dakota	MN Dept. of Nat'l. Res.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 7.25A). This site was endorsed by the RRF on 6 March 1984 (Pool 7 Recon. Alt. F). GREAT selected the use of 21 acres at the Trempealeau site (7-714.1-LWP) for permanent placement of material from cut 3. The endorsed Pool 7 Recon. (Alt. F) recommended the use of 5 acres at this site for permanent placement of 156,100 cubic yards from cut 3 (remaining 217,900 cubic yards from cut 3 going to the L/D 7 site (7-702.5-RMP)). Endorsement came with a condition that the report indicate potential for a boat ramp and active beneficial use from this site. On 23 June 1986, the RRF endorsed a Corps proposal to excavate 150,000 cubic yards from the Dakota Island site (7-706.5-RMT) to this site for development of a boat ramp and stockpile site. The Dakota Island site (7-706.5-RMT) would then be used for placement of material from routine channel maintenance. All material from Lower Pool 7 will be placed at this site because the L/D 7 site (7-702.5-RMP) is not implementable.

SITE CHARACTERISTICS: This is a heavily wooded area in the floodplain of Dakota Creek. It is located in Dakota, MN between the frontage road and US Hwy. 14 & 61. The other boundaries are the Dakota Creek and a private residence.

SITE DIMENSIONS: Area = 5 acres. The area is 490 feet by 450 feet. Two acres will be filled to elevation 645.0 for a parking lot. Pre-Fill Elevation = 643.0. Maximum Fill Elevation = 665.0. LCP Elevation = 638.5. Estimated Capacity = 90,000 cubic yards.

BENEFICIAL USE: This site will be developed as a boat ramp and a beneficial use stockpile site. The beneficial uses would be for landfill to develop the area and also for continued beneficial use removal.

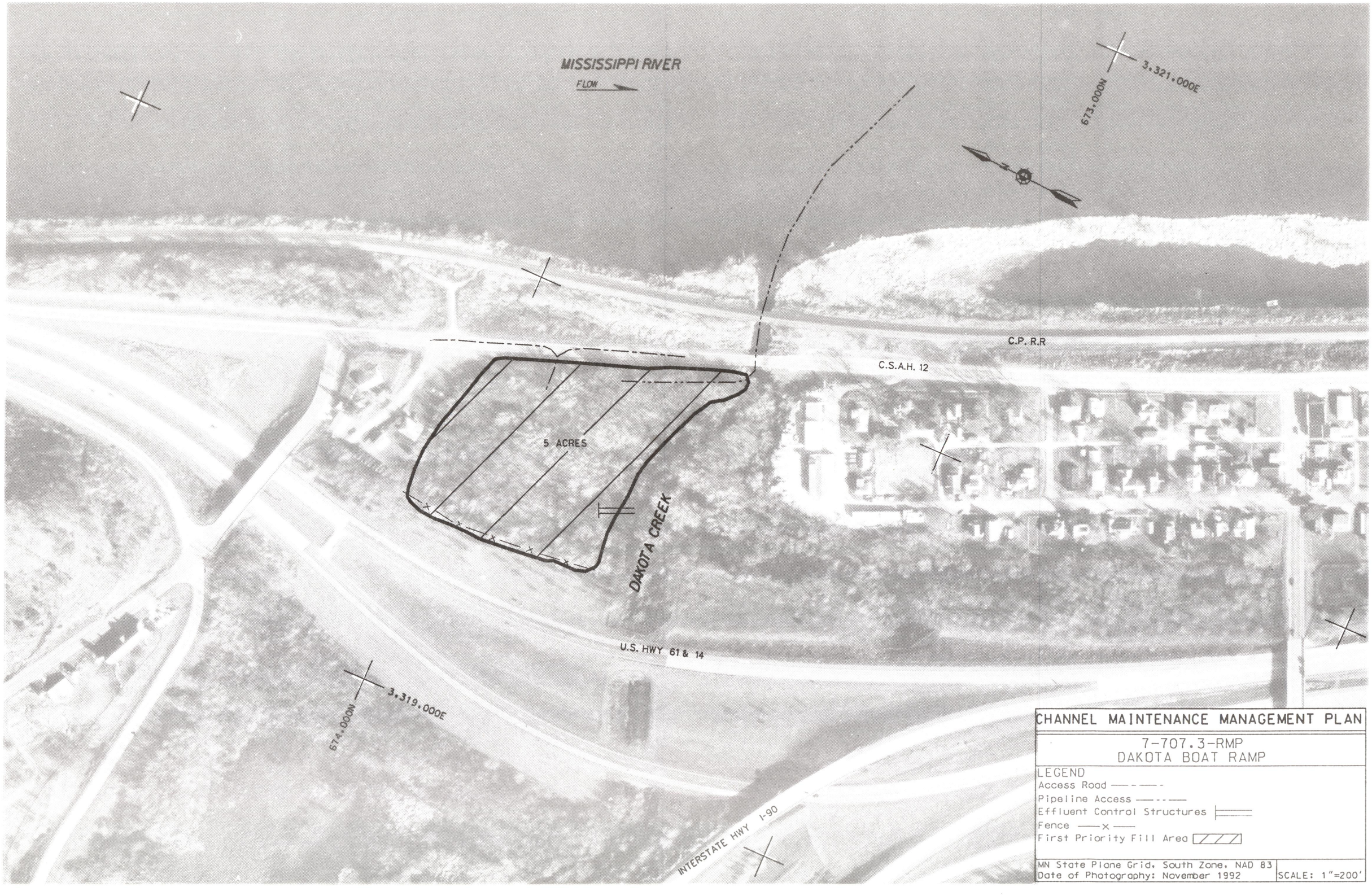
EQUIPMENT REQUIREMENTS/LIMITATIONS: Access to the site with dredging equipment limits the methods to hydraulic placement only. A pipeline would access the site through the existing Railroad and county bridges.

SPECIAL CONDITIONS/RESTRICTIONS: This site will be used to relocate material from the Dakota Island placement site (7-706.5-RMT).

FUTURE PLANS: Most of the trees will have to be removed for site preparation. A landscaping plan including screening has been developed. Implementation will begin with construction of the boat ramp and parking, diking, and preparation of the stockpile area.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
	Real Estate	Long-term agreement with MDNR proposed
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Dakota	706.1-706.6	H	4000	25-800	4025-4800	4-33
Dakota Island site	7-706.5-RMT	H	4000	25-800	4025-4800	4-33



CHANNEL MAINTENANCE MANAGEMENT PLAN

7-707.3-RMP
DAKOTA BOAT RAMP

LEGEND
Access Road — - — -
Pipeline Access — - - —
Effluent Control Structures
Fence — × —
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

7-706.5-RMT	Dakota Island	MN/Winona/Dakota	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 7.12T, Reference GREAT I Vol. 8-Part IV). This site was endorsed by the RRF on 23 June 1986 (proposed by Corps). GREAT selected use of 6.4 acres at this site for temporary placement of material from cut 3. The RRF endorsed the Pool 7 Recon. (Alt. F) on 6 March 1984 which identified this site as temporary but, did not identify acres impacted. On 23 June 1986, the RRF endorsed a Corps proposal to excavate 150,000 cubic yards from this site to the Dakota Boat Ramp site (7-707.3-RMP) for development of a boat ramp and stockpile site. This site would then be used for placement of material from routine channel maintenance. A containment dike covering 8 acres was constructed in 1979 to accommodate hydraulic placement.

SITE CHARACTERISTICS: This is a transfer site. The island itself was created with dredged material. It is 100% upland and within both the floodplain and the floodway.

SITE DIMENSIONS: Area = 8 acres. The area is 1000 feet by 350 feet. Pre-Fill Elevation = 640.0. Maximum Fill Elevation = 655.0. LCP Elevation = 638.5. Estimated Capacity = 160,000 cubic yards.

BENEFICIAL USE: Placement of material on the island has created recreational beaches for boaters. If the Dakota Boat Ramp site (7-707.3-RMP) is developed, material will be excavated from this site and used beneficially for stockpile replenishment and boat ramp and parking lot development.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

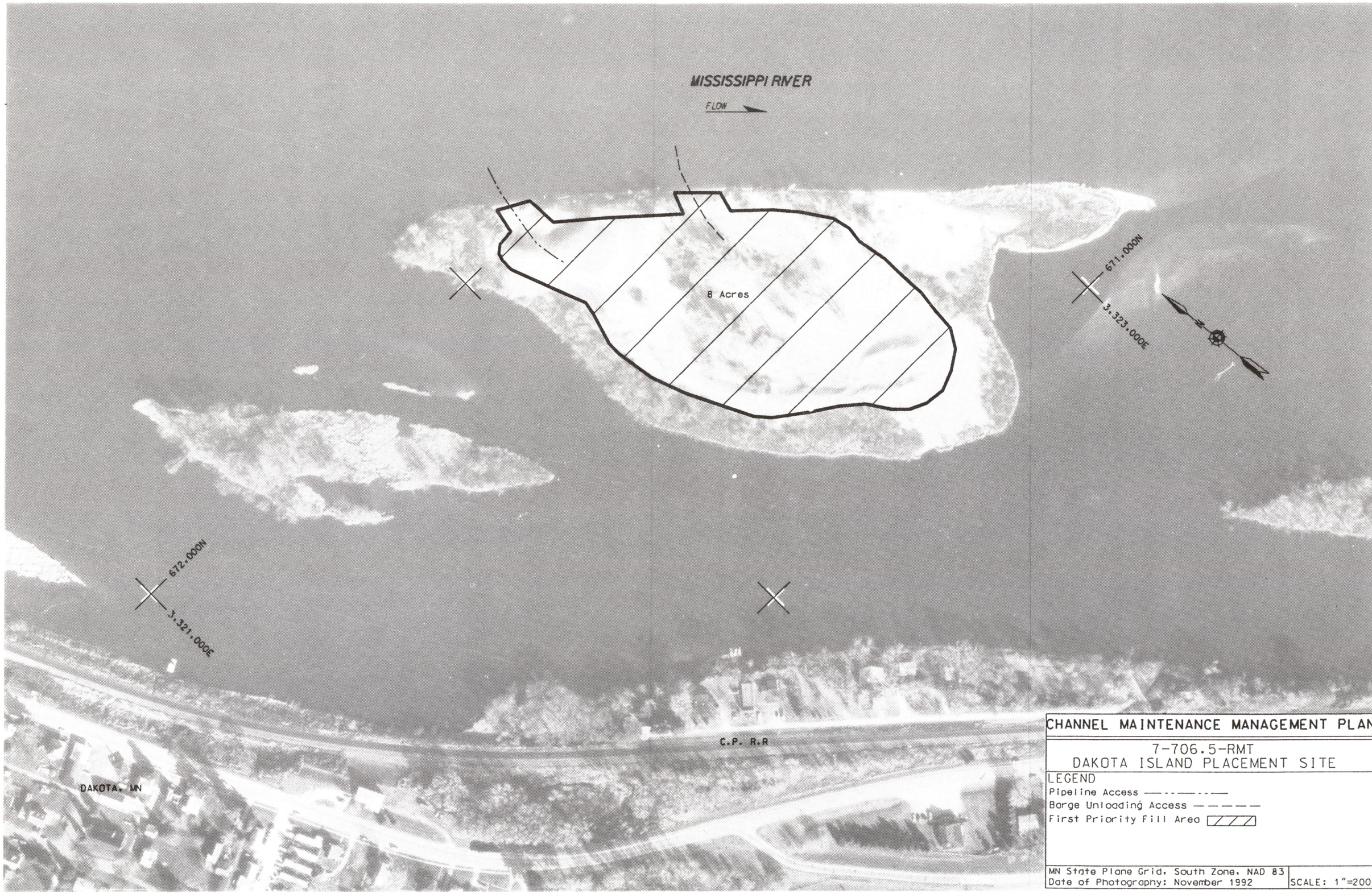
SPECIAL CONDITIONS/RESTRICTIONS: Material must be protected against erosion and will be removed when it is economical or when capacity has been reached. It will be transferred to the permanent Dakota Boat Ramp site (7-707.3-RMP).

FUTURE PLANS: Excavate the site for development of the Dakota Boat Ramp site and continue to use it for routine and emergency placement. Use as a transfer site and excavate material to replenish the Dakota Boat Ramp site as necessary.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	General permit with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Dakota	706.1-706.6	H,M	500	10-300	210-800	5-16

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

7-706.5-RMT
DAKOTA ISLAND PLACEMENT SITE

LEGEND
Pipeline Access
Barge Unloading Access
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

TAB 18

Placement Site Information Sheets
and
Operational Maps

POOL 8

TAB 18 - POOL 8

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

8-695.7-LWP	Isle La Plume	WI/LaCrosse/LaCrosse	City of LaCrosse
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 8.06, Reference GREAT I Vol. 8-Part V). This site was endorsed by the RRF on 20 October 1983 (Upper Pool 8 Recon. Alt. A), and on 23 June 1986 (Upper Pool 9 Recon. Alt. D). GREAT selected use of 44 acres (upland) at this site for permanent placement of material from cut 2 in Pool 7, cuts, 6-10 in Pool 8, and cuts, 4, 5, and 7-10 in Pool 9. The endorsed Upper Pool 8 Recon. (Alt. A) and the Upper Pool 9 Recon. (Alt. D) recommended use of 4 acres for placement of material from Pool 8 cuts 6-10 and Pool 9 cuts 4-5 and 8-9. Acres of use have been changed to 8 based on the real estate agreement with the city of LaCrosse, WI. Only material from the Pool 8 cuts has gone into this site in the past.

SITE CHARACTERISTICS: This site is an upland site located out of the floodplain and used to stockpile dredged material for mutual benefit from the city of LaCrosse and the Government. It was previously used as a landfill for the city.

SITE DIMENSIONS: Area = 9 acres. The area is 1200 feet by 315 feet. Pre-Fill Elevation = 646.6. Maximum Fill Elevation = 671.6. LCP Elevation = 631.0. Estimated Capacity = 250,000 cubic yards.

BENEFICIAL USE: GREAT projected beneficial use demand at this site to be 2,082,500 cubic yards. The Upper Pool 8 Recon. indicates that the entire 40 year projection from cuts 6-10 (1,680,500cy) will be removed from this site. Once placed on-site, material belongs to the City.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Use of the loading/uploading ramp and mooring facility is permitted so long as the use does not interfere with fleeting operations. Placement at this site is restricted to mechanical methods only.

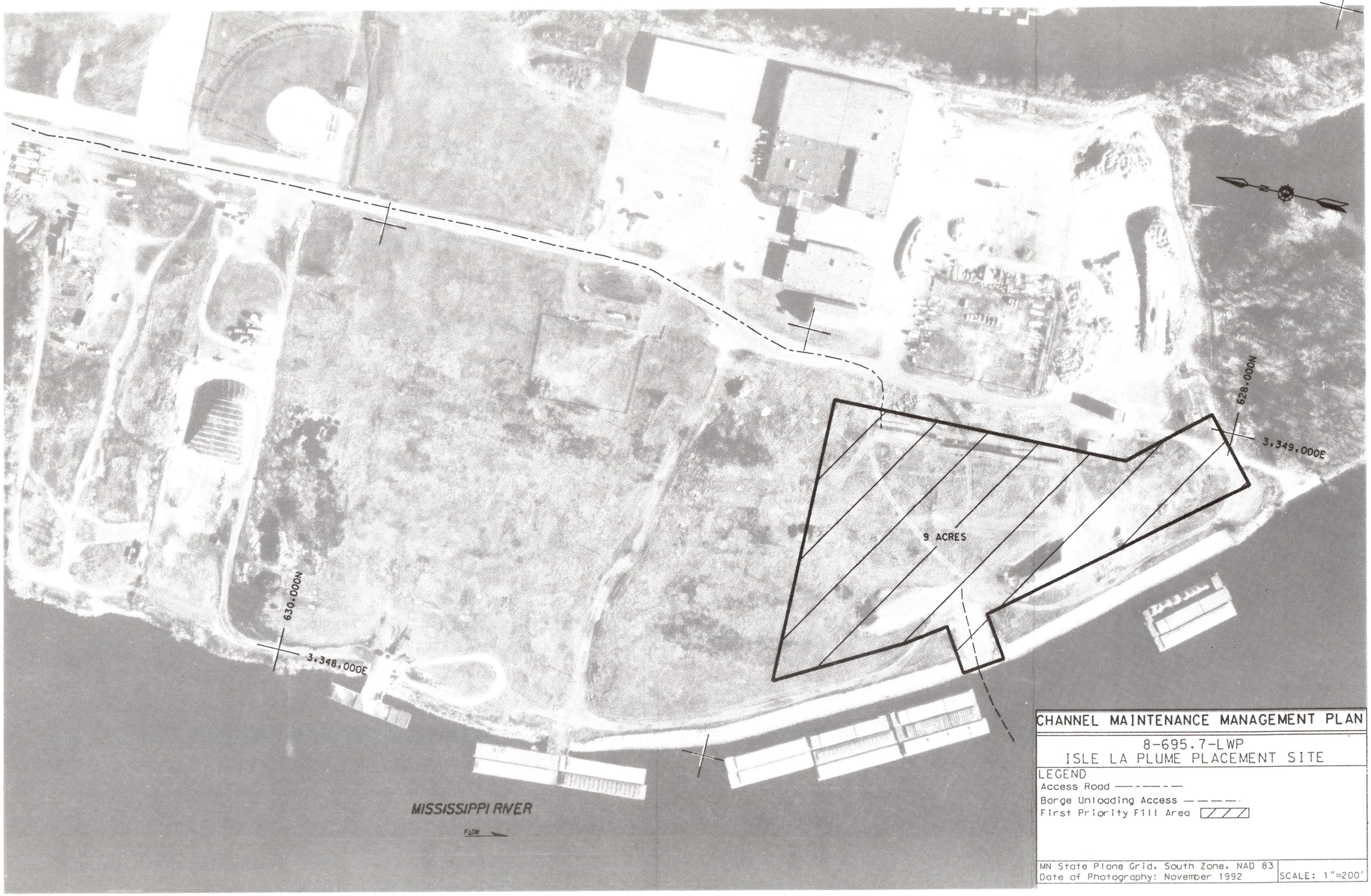
SPECIAL CONDITIONS/RESTRICTIONS: In the event of non-use by the Government. for a consecutive period of four years, the city of LaCrosse may terminate the lease by giving a 90-day written notice. With the city's consent, material may be temporarily stockpiled for use by the Government at other projects.

FUTURE PLANS: Continue to use this site as a beneficial use stockpile for the city of LaCrosse. Landscaping and vegetative screening may be accomplished as jointly determined necessary by the Corps and the City.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	06/12/86 Lease until 06/30/96
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Above Brownsville	689.9-690.8	M	28000	25-600	28025-28600	16-41
Picayune Island	691.4-692.4	M	21000	25-600	21025-21600	16-41
Sand Slough	694.3-695.0	M	6300	25-600	6325-6900	16-41
Abv. & Blw. LaCrosse RR	699.8-700.4	M	19500	25-600	19525-20100	16-41

April 2, 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

8-695.7-LWP
ISLE LA PLUME PLACEMENT SITE

LEGEND

Access Road ——- - ——- - ——

Barge Unloading Access —— - - ——

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

8-690.4-LWT	**Above Brownsville**	WI/Vernon/Brownsville	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 8.17T, Reference GREAT I Vol. 8-Part V). There was no RRF endorsement prior to the CMMP. GREAT selected an area of 8.5 acres as a temporary site for cut 6. The RRF endorsed the Upper Pool 8 Recon. (Alt. A) on 20 October 1983, which identified this site as temporary and indicated that 14 acres were available within the existing dike. The District has taken an approach that involves excavating large quantities from temporary to permanent sites cost effectively, which restores capacity at the temporary sites. The Corps future program for the GREAT I recommended Action Item 8 (supported by the RRF) is stated in the GREAT I Implementation Status Report and Future Program (dated. 05/92). This will be used as a transfer site with material removed to the permanent Isle La Plume site (8-695.7-LWP).

SITE CHARACTERISTICS: This is an upland site created by previously placed dredged material. Vegetation is sparse and patchy with most of the area open sand. Material from the Above Brownsville site is predominately medium to fine sand.

SITE DIMENSIONS: Area =14 acres. The area is 1510 feet by 410 feet. Pre-Fill Elevation = 653.6. Maximum Fill Elevation = 670.6. LCP Elevation = 630.6. Estimated Capacity = 325,000 cubic yards.

BENEFICIAL USE: There is no beneficial use of the material when it is placed in the containment site. However, the material will be removed when capacity is reached and would likely be used beneficially at that time.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Placement may be accomplished by mechanical or hydraulic methods.

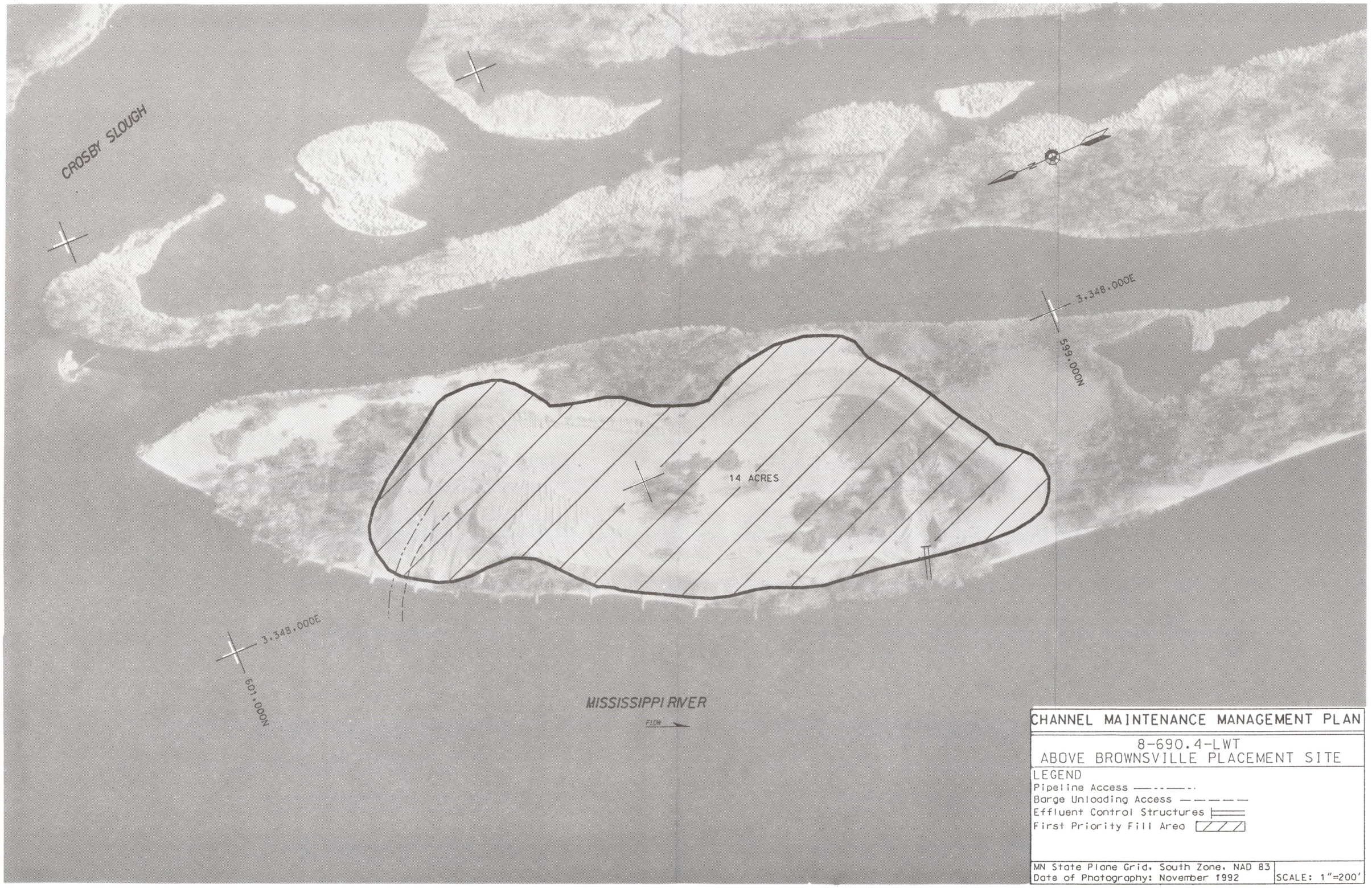
SPECIAL CONDITIONS/RESTRICTIONS: The containment berms must be properly maintained. This site may be used when barging the material to Isle La Plume is deemed impractical. Material must be protected against erosion and will be removed when it is economical or when capacity is reached. It will be transferred to a the permanent Isle La Plume site (8-695.7-LWP).

FUTURE PLANS: Continue to use as a transfer site until capacity is reached. When filled to capacity the site will be excavated to restore capacity.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
X	404(b)(1) Evaluation	07/30/86- 404(b) until capacity reached
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Above Brownsville	689.9-690.8	H	5500	100-700	5600-6200	23-40

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

8-690.4-LWT
ABOVE BROWNSVILLE PLACEMENT SITE

LEGEND

Pipeline Access ——--——··

Barge Unloading Access — — — — —

Effluent Control Structures ⊢═══⊣

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

8-688.7-RMP	**Brownsville Containment**	MN/Houston/Brownsville	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 8.30, Reference GREAT I Vol. 8-Part V). This site was endorsed by the RRF on 6 March 1984 (Lower Pool 8 Recon. Alt. A). GREAT selected use of 55 acres (33 wetland/22 upland) at this site for permanent placement of material from cuts 3-5. The Lower Pool 8 Recon. (Alt. A) was endorsed with the following conditions: 1) comments in the hydraulic appendix concerning wing dam modifications and Corps intentions be noted in the main body; 2) report should discuss planned incremental development of this site and potential for providing fill to GREAT site 8.50. The Recon. recommended using 36 acres (17 wetland/19 upland) for cuts 3-5. A dike, currently covering 13 acres, contains stockpiled material.

SITE CHARACTERISTICS: A Marina and a residential development are located adjacent to the north end of the site, the east and west sides of the site are formed by the River and Railroad, and the south side is Wildcat Park. Habitat types include old dredged material, bottomland forest, emergent marsh, and shallow aquatic.

SITE DIMENSIONS: Area = 36 acres. The area is 1550 feet by 1010 feet. Current area filled is 13 acres (1300'X440'). Pre-Fill Elevation = 632.0. Maximum Fill Elevation = 662.0. LCP Elevation =630.6 Estimated Capacity = 1,266,500 cubic yards.

BENEFICIAL USE: The Lower Pool 8 Recon. projected active beneficial use of 645,000 cubic yards from this site. It is open to the general public and has been used heavily by contractors and the city of Brownsville. Material was borrowed for construction of Pool 8 EMP islands.

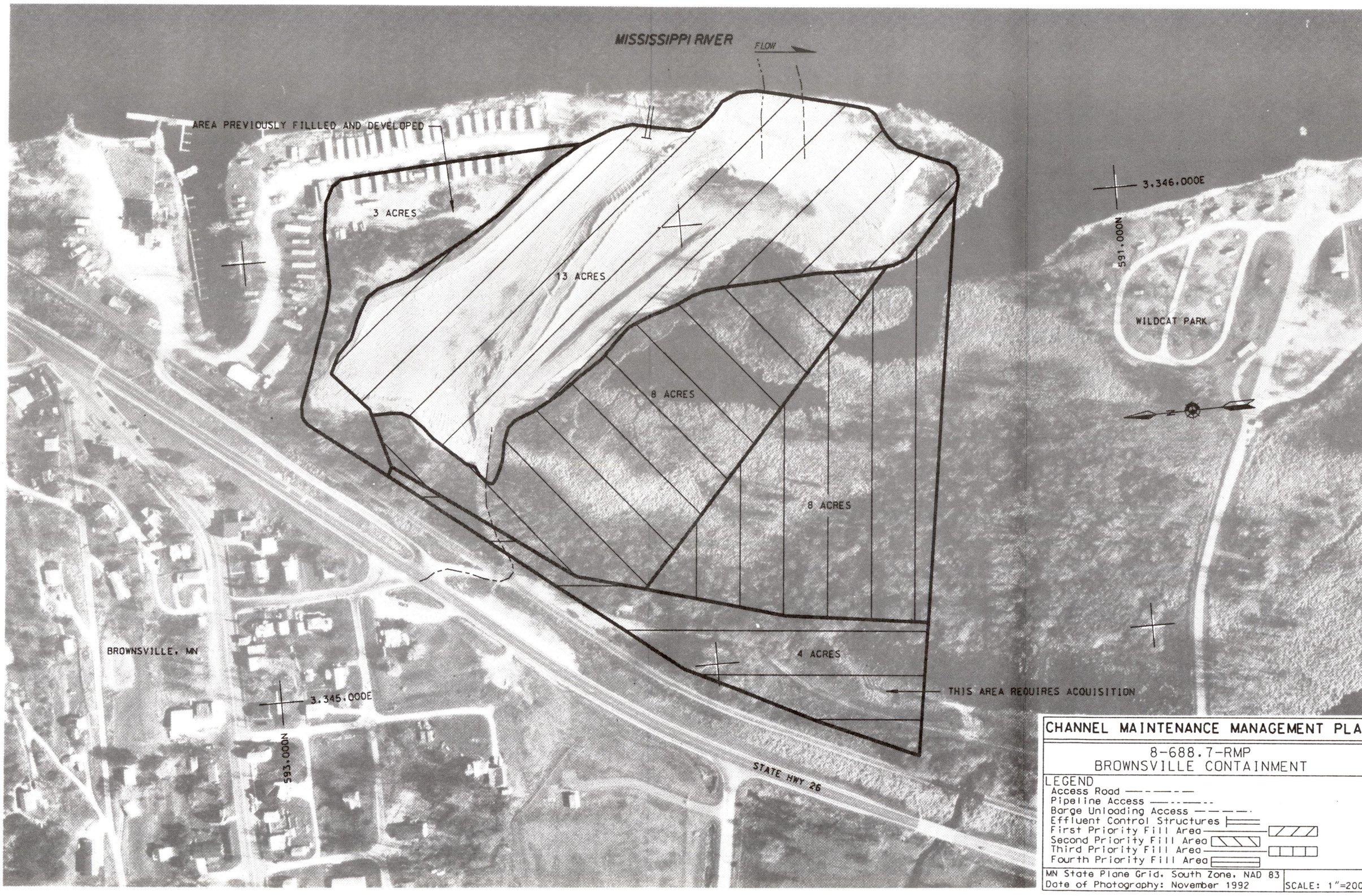
EQUIPMENT REQUIREMENTS/LIMITATIONS: Placement of material at the site may be both mechanical and hydraulic. However, the most practical means of placing material from Deadman's Slough is mechanically due to the distance from the placement site.

SPECIAL CONDITIONS/RESTRICTIONS: Maintain berms for hydraulic placement of material. Seeding and planting is required to stabilize and screen the site, and to minimize aesthetic impacts. This area will be filled according to the priority of fill areas identified on the site map. Priority areas 1, 2, 3, 4, and 5 are 13, 8, 8, 4, and 3 acres respectively. The fourth priority area requires acquisition prior to use and the fifth area shown has been developed and is not available.

FUTURE PLANS: Because of the high demand for the dredged material it will continue to be used as a beneficial use stockpile. If removal remains high, expansion into the wetland areas will be delayed. Improvements to the access road and railroad crossing will be considered.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
X	State	General permits with MDNR and MPCA
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Brownsville	688.7-689.4	H,M	4000	50-1500	4050-5500	1.31
Head of Raft Channel	687.5-688.7	H,M	6000	50-1500	6050-7500	1-31
Deadmans Slough	686.5-687.5	M	10560	50-1500	10610-12060	1-31



CHANNEL MAINTENANCE MANAGEMENT PLA

8-688.7-RMP
BROWNSVILLE CONTAINMENT

LEGEND
Access Road
Pipeline Access
Barge Unloading Access
Effluent Control Structures
First Priority Fill Area
Second Priority Fill Area
Third Priority Fill Area
Fourth Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200

TAB 19

Placement Site Information Sheets
and
Operational Maps

POOL 9

TAB 19 - POOL 9

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

9-677.7-LWP	**Genoa Power Plant**	WI/Vernon/Genoa	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 9.15, Reference GREAT I Vol. 8-Part V). This site was endorsed by the RRF on 23 June 1986 (Upper Pool 9 Recon. Alt. D). GREAT selected use of 1 acre at this site for permanent placement of material from cuts 7-10. The endorsed Upper Pool 9 Recon. (Alt. D) recommended use of 2 acres for placement of 12,000 cubic yards from cut 7, 299,000 cubic yards from cut 8, and 93,500 cubic yards from cut 10 (all of which would be removed for beneficial use). This area was changed extensively by the landowner since it was recommended as a site. The OSIT will visit this site to recommend changes to the plan if necessary.

SITE CHARACTERISTICS: The site is located downstream from the Genoa Power Plant, near a public boat ramp.

SITE DIMENSIONS: Area = 2 acres. The area is 400 feet by 220 feet. Pre-Fill Elevation = 630.0. Maximum Fill Elevation = 650.0. LCP Elevation = 620.0. Estimated Capacity = 45,000 cubic yards.

BENEFICIAL USE: The Upper Pool 9 Recon. projected active beneficial use of 404,500 cubic yards from this site.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Mechanical placement only, due to location and small size of the site.

SPECIAL CONDITIONS/RESTRICTIONS: Identification of the exact stockpile area will be coordinated with RRF agencies. There may be special conditions placed on removal of material.

FUTURE PLANS: The Corps will try to implement the GREAT designated site, but extensive changes by the landowner may require designating another acceptable location. Develop as a beneficial use stockpile site and promote use.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Will be analyzed if necessary
	NEPA	
	Real Estate	Requires a permit from the landowner
X	State	Exhibit A of WDNR's MOU
X	404(b)(1) Evaluation	None required if no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Below Twin Island	675.4-675.9	M	7392	50-300	7442-7692	10-30
Twin Island	676.0-676.6	M	10560	50-300	10610-10860	10-30
Lower Appch. L/D 8	678.7-679.2	M	12144	50-300	12194-12444	10-30

April 3, 1996

STATE HWY 35

B.N. INC.

543,000N

3,359,000E

GENOA
POWER PLANT

2 ACRES

BOAT
RAMP

3,358,000E

541,000N

TO MAIN CHANNEL

THIEF SLOUGH

FLOW

CHANNEL MAINTENANCE MANAGEMENT PLAN

9-677.7-LWP
GENOA POWER PLANT PLACEMENT SITE

LEGEND

Access Road — - — - —

Barge Unloading Access — — — —

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

9-670.5-LWP	**Blackhawk Park**	WI/Vernon/Victory	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 9.55). This site was endorsed by the RRF on 23 June 1986 (Upper Pool 9 Recon. Alt. D). GREAT selected the use of 13 acres at DeSoto (9-667.5-LWP), 44 acres at Isle La Plume (8-695.7-LWP), 5 acres at Gantenbein (9-671.8-LWP), and 13 acres at GREAT site 9.33 (9-671.3-LWP) for permanent placement of material from cuts 4 and 6. The endorsed Upper Pool 9 Recon. (Alt. D) recommended use of 68.5 acres at this site for permanent placement of 860,000 cubic yards from cuts 4 and 6 in lieu of the GREAT sites. Endorsement was subject to additions agreed upon between the FWS and Corps at the 17 December 1985, Blackhawk Park meeting briefly discussed in SPECIAL CONDITIONS/RESTRICTIONS section. Park development will occur in phases (1-8). Material may be brought from the Indian Camp Light site (9-665.8-RIE) to implement phases if necessary.

SITE CHARACTERISTICS: This is a recreation area with campsites, beach, picnic areas, and boat ramps. Habitat impacts include 36 acres bottomland forest, 2 acres marsh, 3 acres open water, 7 acres old dredged material, and 21 acres disturbed terrestrial. A private trailer park borders the north end of the site.

SITE DIMENSIONS: Approx. Area: 68.5 acres - 8 areas to be completed in phases. A 3 acre stockpile will have a Fill Elev. of 650.0. Pre-Fill Elevation = 625.0. Maximum Fill Elevation = 629.0. LCP Elevation = 620.0. Estimated Capacity = 400,000 cubic yards.

BENEFICIAL USE: Of the projected 860,000 cubic yards placed at this site, 400,000 cubic yards would remain on-site to upgrade the park facilities and 460,000 would be removed for beneficial use off-site. A stockpile will be developed for beneficial use removal.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Hydraulic placement requires dike construction with effluent directed back to the main channel. Mechanical placement may require haul distances greater than 900 feet from the unloading area.

SPECIAL CONDITIONS/RESTRICTIONS: Actual placement of dredged material will be in phases as required for Park development. Prior to any filling of areas 7 and 8, the Corps will evaluate (in cooperation with other resource agencies) recreational needs at Blackhawk Park to determine if additional recreational development is justified. The evaluation will also consider alternative placement sites, should placement in areas 7 and 8 be unnecessary for recreational development. At the same time, the Corps will evaluate the beneficial use demand for material in the area.

FUTURE PLANS: Development of the Park should continue according to the phases indicated in the Upper Pool 9 Recon. Report and the site management plan. Further evaluation and coordination with State and Federal agencies is required before areas 7 and 8 are developed as previously outlined. The Corps will pursue purchase of the trailer park area to develop a beneficial use stockpile.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Battle Island	671.0-672.6	H,M	4800	100-1000	4900-5800	5-30
Indian Camp Light	665.0-665.8	M	26000	100-2000	26100-28000	5-30
DeSoto	667.4-668.5	M	15840	100-2000	15940-17840	5-30

April 1996

STATE HWY. 35

B.N. INC.

GREEN LAKE

10 ACRES

PROPOSED STOCK PILE

PARK OFFICE

TO STATE HWY 35

3 ACRES

9.1 ACRES

8.9 ACRES

8.0 ACRES

7.8 ACRES

17.1 ACRES

4.0 ACRES

3.6 ACRES

WISCONSIN

BATTLE SLOUGH

BATTLE ISLAND

670

671

MISSISSIPPI RIVER

FLOW

IOWA

CHANNEL MAINTENANCE MANAGEMENT PLAN

9-670.5-LWP
BLACKHAWK PARK PLACEMENT SITE

LEGEND

- Access Road
- Barge Unloading Access
- Transport Material By Truck
- First Priority Fill Area
- Second Priority Fill Area
- Third Priority Fill Area
- Fourth Priority Fill Area
- Fifth Priority Fill Area
- Sixth Priority Fill Area
- Seventh Priority Fill Area
- Eighth Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1" = 500'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

9-665.8-RIE	**Indian Camp Light**	IA/Allamakee/Lansing	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 9.18T, Reference GREAT I Vol. 8-Part V). There was no RRF endorsement prior to the CMMP. GREAT selected use of 2.7 acres at this site for temporary placement of material from cut 4. A containment dike covering 3 acres exists and the Corps will continue to use this area for emergency placement. To aid the sequential development of the Blackhawk Park site (9-670.5-LWP), the Corps may take material from this site (creating a bathtub) and haul it to the park. Instead of waiting for more fill, an area could be developed and stabilized.

SITE CHARACTERISTICS: The site is within the floodway and the floodplain. The area selected for placement will be on top of old dredged material. The surrounding area is primarily bottomland forest.

SITE DIMENSIONS: Area = 3 acres. The area is 360 feet by 330 feet. Pre-Fill Elevation = 630.0. Maximum Fill Elevation = 645.0. LCP Elevation = 620.0. Estimated Capacity = 50,000 cubic yards.

BENEFICIAL USE: Recreational beach enhancement if material is placed along the shoreline. There will be passive beneficial use if material is excavated and hauled to Blackhawk Park for development of that site for recreation.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Dredged material placement will be by mechanical or hydraulic methods.

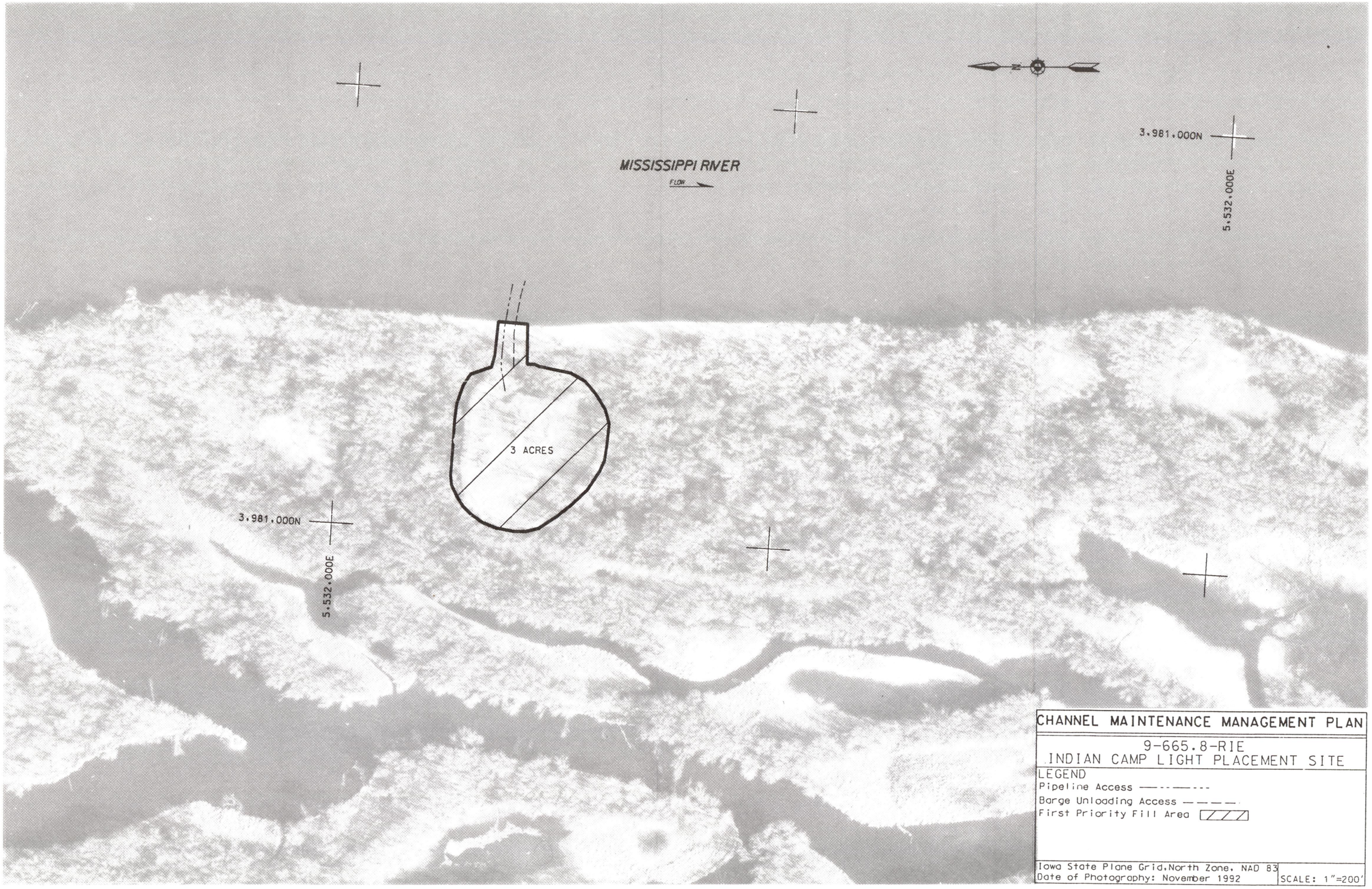
SPECIAL CONDITIONS/RESTRICTIONS: Placement must be contained to the area within the berms unless otherwise agreed upon by an OSIT. Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies.

FUTURE PLANS: Maintain the berms to assure use if an emergency situation arises. Evaluate the need for creating a bathtub by excavating material and hauling it to Blackhawk Park (9-670.5-LWP).

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
	Endangered Species	Eagle nesting probable
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
	State	404(t) required if effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Indian Camp Light	665.0-665.8	H	4000	50-500	4050-4500	10-25

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

9-665.8-RIE
INDIAN CAMP LIGHT PLACEMENT SITE

LEGEND
Pipeline Access
Barge Unloading Access
First Priority Fill Area

Iowa State Plane Grid, North Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

9-664.3-RIT	Lansing	IA/Allamakee/Lansing	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 9.17T, Reference GREAT I Vol. 8-Part V). This site was endorsed by the RRF on 25 September 1986 (proposed by Corps at RRF meeting). GREAT selected the use of 4 acres at this site for temporary placement of material from cut 3. On 20 October 1983, the RRF deferred endorsement of the Lower Pool 9 Recon. report which identified this site as a temporary site but did not identify areas impacted. On 25 September 1986, the RRF endorsed a Corps proposal to excavate 150,000 cubic yards from this site for a landfill in Lansing, with subsequent dredging jobs placed at this site if they are large hydraulic jobs or at the Lansing Highway Bridge site (9-663.5-LWP) if they are small mechanical jobs, up to the amount excavated. In 1987-1988, 208,000 cubic yards were removed. This will be the capacity rather than 150,000.

SITE CHARACTERISTICS: This site is a 9 acre diked containment site. The containment dike was constructed in the late 1970's. A small bay was created in the interior of the site when it was excavated, but the bay has since been filled. Adjacent land is bottomland forest and Mississippi River main channel.

SITE DIMENSIONS: Area = 9 acres. The area is 850 feet by 460 feet. Excavated 208,000 cubic yards to reach Pre-Fill Elevation. Pre-Fill Elevation = 610.0. Maximum Fill Elevation = 650.0. LCP Elevation = 620.0. Estimated Capacity = 208,000 cubic yards.

BENEFICIAL USE: This site has been excavated and the material used beneficially for development in Lansing, IA and at Blackhawk Park recreation area. Material placed at this site will not be considered beneficial until it is removed for a beneficial project.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Dredged material placement will be by mechanical or hydraulic methods.

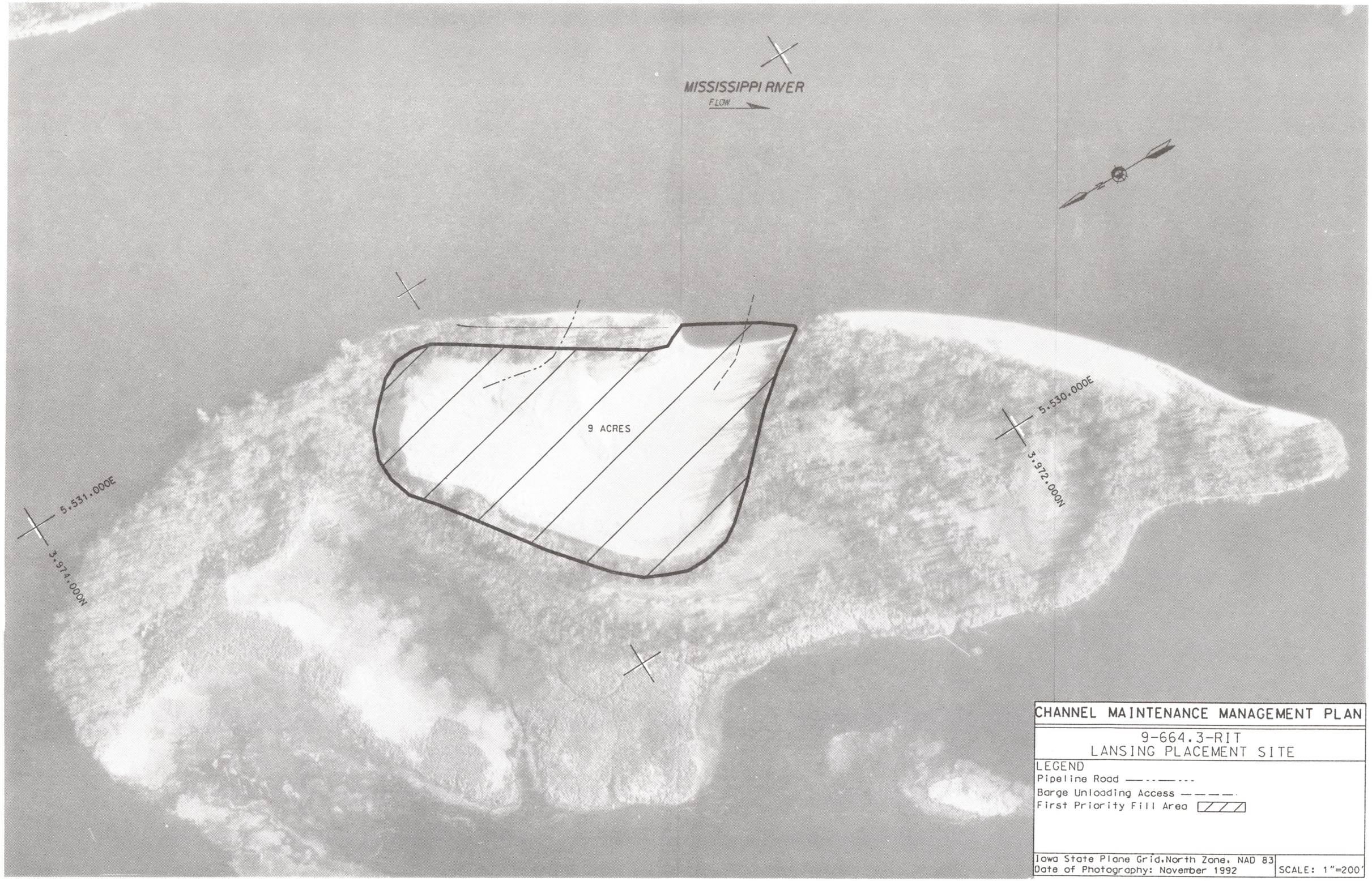
SPECIAL CONDITIONS/RESTRICTIONS: Existing vegetation on the outside of the containment area dike and adjacent wetland shall not be adversely impacted during operations. Material must be protected against erosion and material will be removed to a permanent site when economical or when capacity is reached. It will be transferred to the permanent Lansing Highway Bridge site (9-663.5-LWP).

FUTURE PLANS: Maintain the berms at the site and continue to use as a transfer site and excavate material for beneficial projects when capacity is reached. Work on making the outside slope of the dike more gradual and stabilize. Use for emergencies or if the Lansing Highway Bridge site (9-663.5-LWP) has no capacity.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
	State	404(t) required if effluent
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Lansing Upper Light	663.8-664.9	H	500	25-1000	525-1500	0-30
Indian Camp Light	665.0-665.8	H	7000	25-1000	7025-8000	0-30

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

9-664.3-RIT
LANSING PLACEMENT SITE

LEGEND

Pipeline Road ——·——·——

Barge Unloading Access — — — —

First Priority Fill Area

Iowa State Plane Grid, North Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

9-663.5-LWP	**Lansing Hwy. Bridge**	WI/Crawford/Lansing	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 9.50T). GREAT selected the use of 22 acres at GREAT site 9.26 (9-663.5-RIP), 1 acre at GREAT site 9.47 (9-660.0-RIP), and 4.1 acres at GREAT site 9.03 (9-663.0-RIP) for permanent placement of material from cut 3. On 30 March 1983 the RRF endorsed use of this site to test beneficial use, provide fill for the FWS parking lot, and create a staging area for the Lansing wingdam project. On 20 October 1983 the RRF deferred endorsement of the Lower Pool 9 Reconnaissance Report (Alt. B1), which recommended using 7 acres at this site for all material from cut 3, pending beneficial use effectiveness. On 8 December 1992, the RRF endorsed a Corps proposal to use 5 acres (see conditions in SPECIAL CONDITIONS/RESTRICTIONS section) for all material from cut 3.

SITE CHARACTERISTICS: The entire site was a bottomland forest wetland. It is located adjacent to the State Highway 82 bridge at Lansing, IA. A FWS boat landing and parking area are located on the upstream end of the site. The site is within the floodplain. One acre has remained disturbed since 1984 to test beneficial use.

SITE DIMENSIONS: Area = 5 acres. The area is 520 feet by 420 feet. Initial area will be 3.2 acres (250'X550'). Pre-Fill Elevation = 622.0. Maximum Fill Elevation = 642.0. LCP Elevation = 620.0. Estimated Capacity = 129,000 cubic yards.

BENEFICIAL USE: The Lower Pool 9 Recon. projected beneficial use of 7,500 cubic yards per year from this site. From 1984 to 1992, the site demonstrated beneficial use removal of 66,988 cubic yards or 8,374 cubic yards per year, but the site sat empty much of the time.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Following construction of a dike, this site will be used hydraulically for dredging at cut 3 whenever possible. Mechanical placement will also be acceptable.

SPECIAL CONDITIONS/RESTRICTIONS: RRF Endorsement in 1992 had the following conditions: 1) Corps and FWS resolve mitigation issue; 2) endorse 5 acres but develop 3.2 as proposed and do not expand unless necessary. Coordinate the placement area configuration with the FWS to minimize conflicts with existing boat ramp use.

FUTURE PLANS: Construct containment dike around the initial fill area (3.2 acres) and develop an access road along the toe of the Highway 82 bridge. Expand the site as needed to a maximum area of 5 acres.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
X	Real Estate	Owned by federal government
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Lansing Upper Light	663.8-664.9	M	5000	20-650	5020-5650	2-22
Indian Camp Light	665.0-665.8	M	11000	20-650	11050-11650	2-22

6000 FT
TO MILE
664.8

STATE HWY 82

BOAT RAMP PARKING LOT

3,968,000N

5,531,000E

1.8 ACRES

3.2 ACRES

3,970,000N

5,529,000E

MISSISSIPPI RIVER
FLOW

CHANNEL MAINTENANCE MANAGEMENT PLAN

9-663.5-LWP
LANSING HIGHWAY BRIDGE PLACEMENT SITE

LEGEND

Access Road ——-——-

Pipeline Access ——--——-

Barge Unloading Access ——— —

Effluent Control Structures

First Priority Fill Area

Second Priority Fill Area

Iowa State Plane Grid.North Zone. NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

TAB 20

Placement Site Information Sheets
and
Operational Maps

POOL 10

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-647.1-LWP	Varo Property	WI/Crawford/Lynxville	Private & WDNR
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 10.17, Reference GREAT I Vol. 8-Part V). This site was endorsed (see SPECIAL CONDITIONS/RESTRICTIONS section) by the RRF on 30 September 1985 (Pool 10 Recon. Alt. D*). GREAT selected use of 3.5 acres at this site for permanent placement of material from cut 10. The endorsed Pool 10 Recon. (Alt. D*) recommended the use of 4 acres for placement of 272,500 cubic yards from cut 9. The entire amount would be removed from this site for beneficial use. Dredging in cut 9 has not been required since the site was endorsed and it has not been developed.

SITE CHARACTERISTICS: This is a low lying wooded area within the floodplain. There are 2 acres of bottomland forest and 2 acres of disturbed terrestrial habitat. Adjacent land use includes, highway, residential, railroad, boat ramp, and navigation channel.

SITE DIMENSIONS: Area = 4 acres. The area is 500 feet by 350 feet. Pre-Fill Elevation = 621.0. Maximum Fill Elevation = 631.0. LCP Elevation = 611.0. Estimated Capacity = 56,000 cubic yards.

BENEFICIAL USE: GREAT projected a total active beneficial use demand of 362,000 cubic yards from cuts 2, 3, and 7-9. This was later revised (1982 marketing study) to 1,085,500 cubic yards. All material from cut 9 placed at this site (projected 272,500) will be removed for beneficial use.

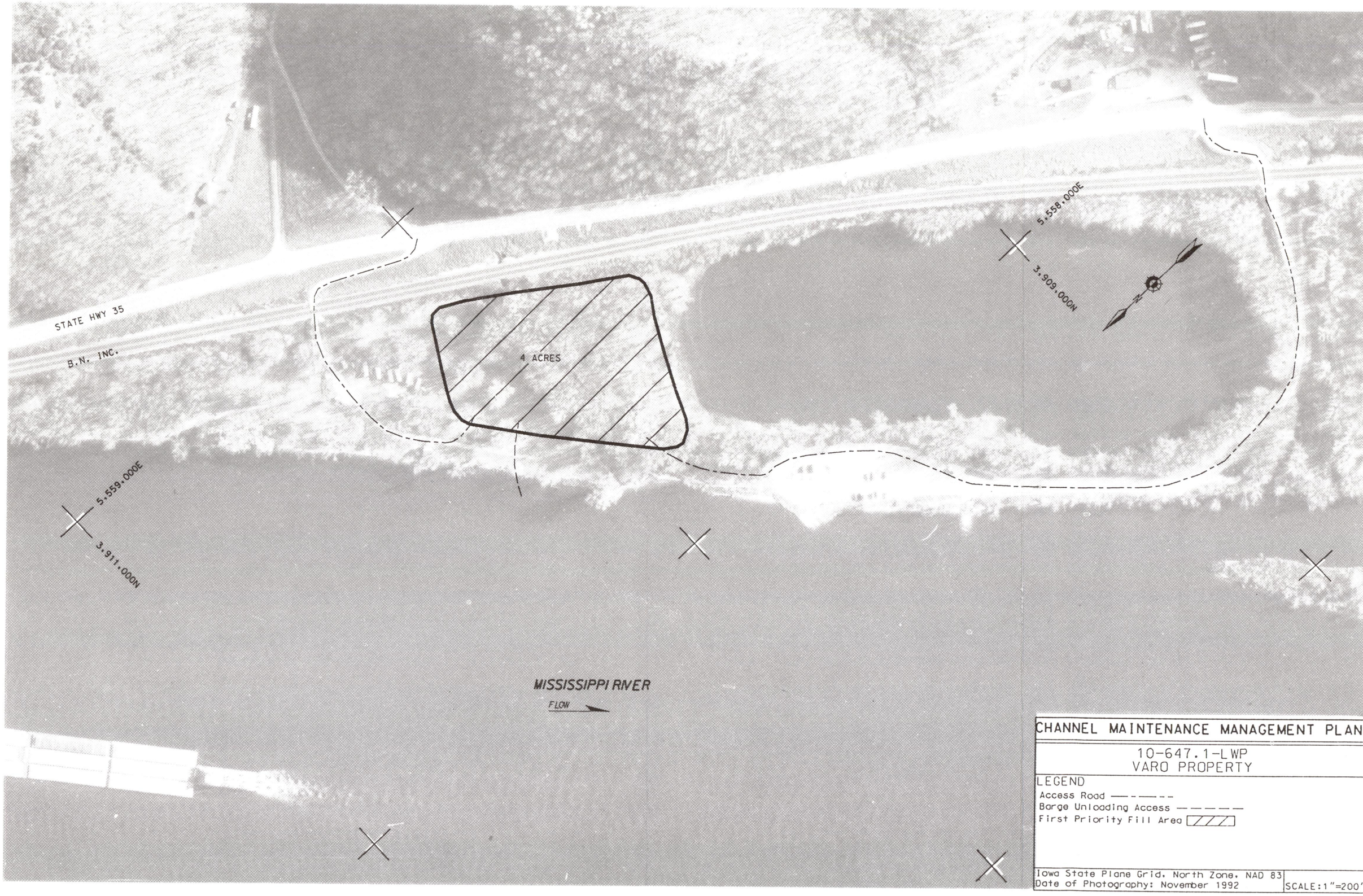
EQUIPMENT REQUIREMENTS/LIMITATIONS: Material will be placed using direct hydraulic dredging methods. Mechanical placement may also be used.

SPECIAL CONDITIONS/RESTRICTIONS: The RRF endorsed this site with the condition that cost for site protection is too low and should be revised.

FUTURE PLANS: Construct a containment dike around the site and riprap or establish vegetation on the outside slope where necessary to protect against erosion.

	PERMITS/APPROVAL CHECKLIST:	Remarks
	Cultural Resources	Cultural resources survey required
X	Endangered Species	No impacts on endangered/threatened
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Requires permit from the landowner
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Hay Point	646.0-646.6	H, M	4200	80-500	4280-4700	10-20



CHANNEL MAINTENANCE MANAGEMENT PLAN

10-647.1-LWP
VARO PROPERTY

LEGEND
Access Road ——- ——-
Barge Unloading Access — — — —
First Priority Fill Area

Iowa State Plane Grid, North Zone, NAD 83
Date of Photography: November 1992

SCALE:1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-644.5-RIE	Jackson Island	IA/Allamakee/Harpers Ferry	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 10.22T, Reference GREAT I Vol. 8-Part V). There was no RRF endorsement prior to the CMMP. GREAT selected use of 3 acres at this site for temporary placement of material from cut 8. The RRF endorsed the Pool 10 Recon. (Alt. D*) on 30 September 1985 which identified this site as temporary but did not identify acres impacted. This site was last used in 1975 for dredged material placement. In 1984, fine material was spread on top of this site and it was seeded as part of a revegetation study. The site has revegetated and the seeded species is very well established.

SITE CHARACTERISTICS: This site is on an island, adjacent to the main channel. It is 100% upland but is within the floodplain and the floodway. It is a revegetated historic placement site.

SITE DIMENSIONS: Area = 3 acres. The area is 500 feet by 265 feet. Pre-Fill Elevation = 620.0. Maximum Fill Elevation = 630.0. LCP Elevation = 611.0. Estimated Capacity = 40,000 cubic yards.

BENEFICIAL USE: Since this is an island site, there will be no direct beneficial use of material expected at the site. When material is removed from the site it may have beneficial uses.

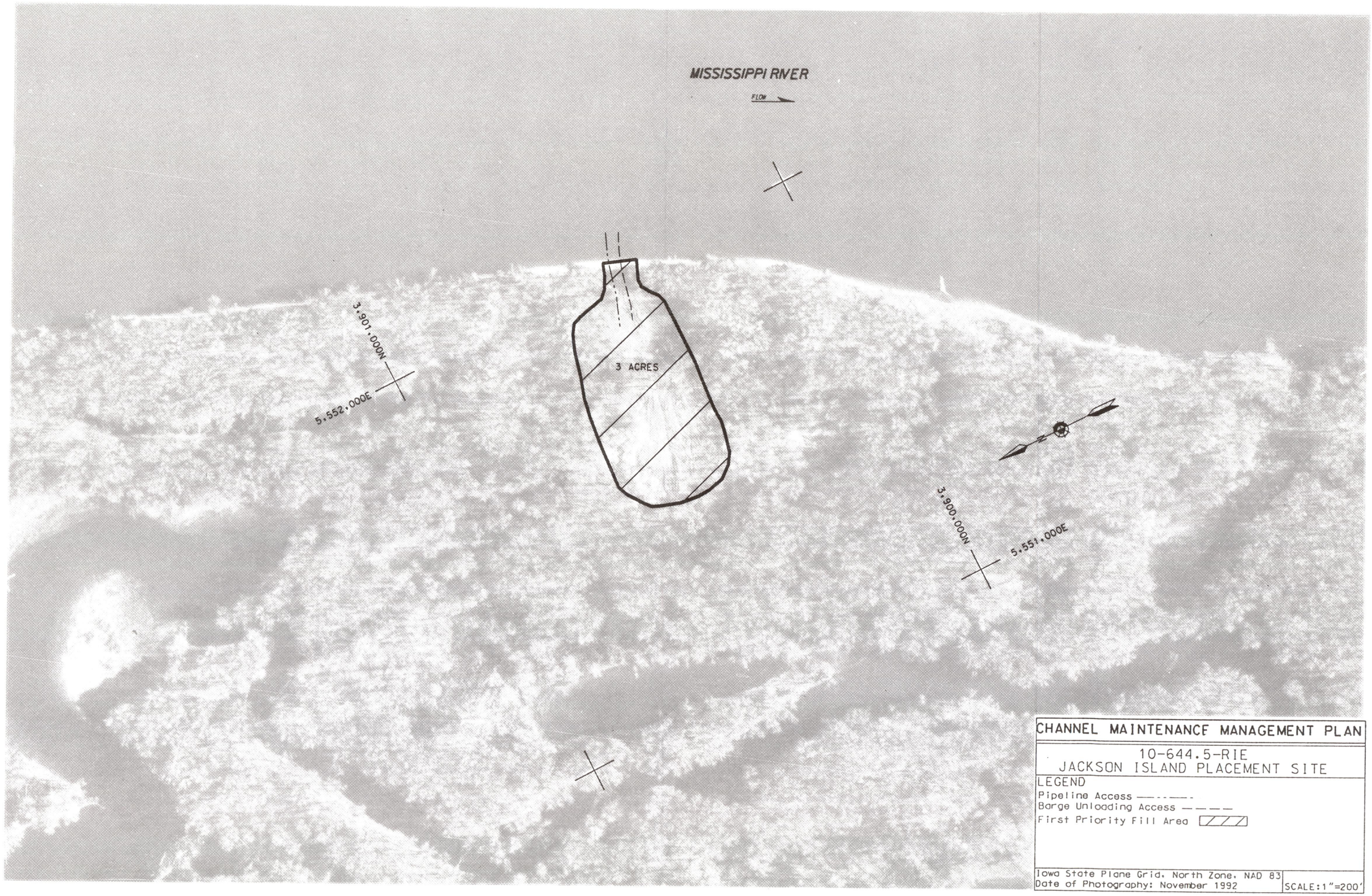
EQUIPMENT REQUIREMENTS/LIMITATIONS: Material will be placed using direct hydraulic or direct mechanical dredging methods.

SPECIAL CONDITIONS/RESTRICTIONS: Maintain containment dike when this site is used and avoid disturbing the areas beyond the dike. Material must be protected against erosion and will be removed and transferred to a permanent site by the following spring high water or as soon as possible under time and/or equipment limitations but not to exceed two years from the time of emergency placement and before the placement of any additional material, unless another mutually agreeable plan of action is reached with the appropriate regulatory agencies.

FUTURE PLANS: At this time, there are no plans to use this site except for emergency purposes.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
X	Real Estate	Owned by federal government
	State	404(t) required if effluent
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Jackson Island	643.7-644.7	H	200	50-400	250-600	9-19



CHANNEL MAINTENANCE MANAGEMENT PLAN

10-644.5-RIE
JACKSON ISLAND PLACEMENT SITE

LEGEND

Pipeline Access ——·——·—

Barge Unloading Access — — — —

First Priority Fill Area

Iowa State Plane Grid, North Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-643.5-LWI	Jackson Rehandle	WI/Crawford/Prairie Du Chien	N/A
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. This site was endorsed by the RRF on 30 September 1985 (Pool 10 Recon. Alt. D*). The endorsed plan calls for hydraulic dredging of cut 8 with placement at this rehandling site before it is hydraulically dredged again and placed at the permanent Mississippi Gardens site (10-642.4-LWP).

SITE CHARACTERISTICS: This site is an in-water rehandling site. A hydrographic and environmental survey will be completed prior to selecting an acceptable area. Ideally, the selected area would have a sand bottom to minimize changes in substrate type, water depths would be less than 10 to 12 feet, there would not be any high value fishery habitat in the area such as wing dams, submerged riprap, and deep holes, and it would be located to minimize the erosive force of current as much as possible.

SITE DIMENSIONS: Area = 3 acres (approximately). The actual size of the in-water rehandling site will depend on the size of the job from cut 8, river conditions, and depth of the water at the site. Exact area will be determined after coordination with the OSIT.

BENEFICIAL USE: There would be no beneficial use associated with this site. Material would be removed to a permanent stockpile site.

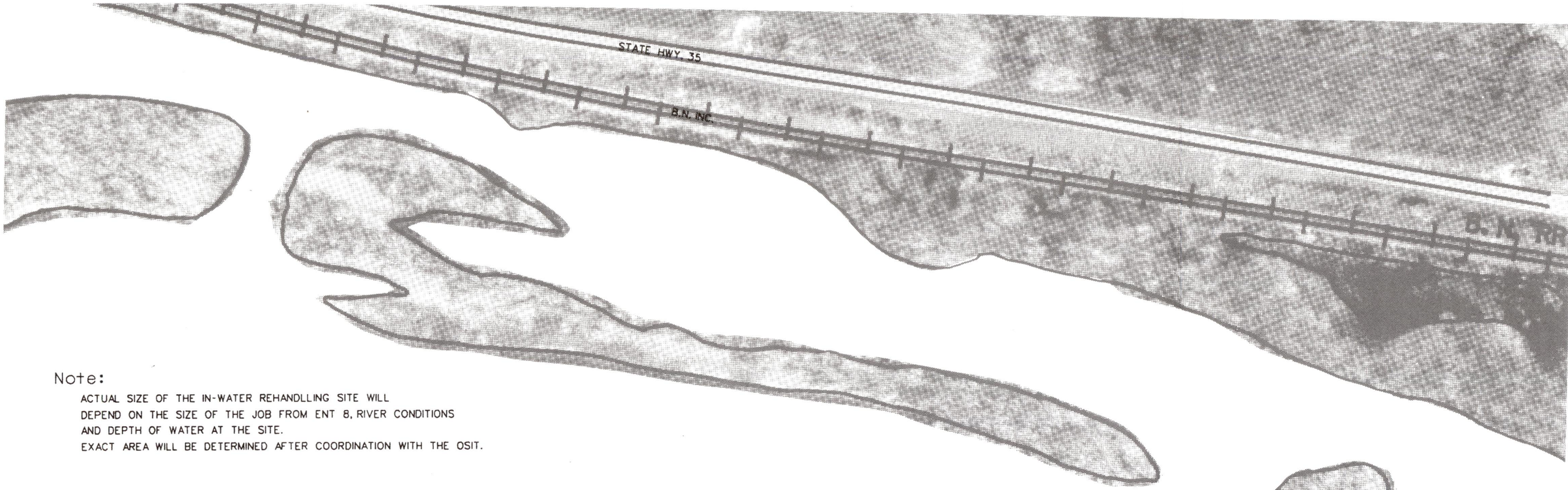
EQUIPMENT REQUIREMENTS/LIMITATIONS: Given the location of cut 8 and currently available floating pipeline, the site would have to be located between Mile 643.8 and 643.2.

SPECIAL CONDITIONS/RESTRICTIONS: Unknown

FUTURE PLANS: Given the desired site characteristics and the equipment limitations, it appears that Mile 643.5 in the left main channel border would be the most suitable location. If use of this site is necessary, the area will be inspected by the OSIT prior to use.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
	Endangered Species	Mussel survey required
X	Floodplain Impact Analysis	No action required
	NEPA	
X	Real Estate	N/A
	State	Requires amending Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Jackson Island	643.7-644.7	H	3700	0	3700	0



Note:

ACTUAL SIZE OF THE IN-WATER REHANDLLING SITE WILL
DEPEND ON THE SIZE OF THE JOB FROM ENT 8, RIVER CONDITIONS
AND DEPTH OF WATER AT THE SITE.
EXACT AREA WILL BE DETERMINED AFTER COORDINATION WITH THE OSIT.

643.4

CHANNEL MAINTENANCE MANAGEMENT PLA

10-643.5-LWI
JACKSON REHANDLE

LEGEND

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=20

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-642.4-LWP	**Mississippi Gardens**	WI/Crawford/Prairie Du Chien	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 10.40, Reference GREAT I Vol. 8-Part V). This site was endorsed (see SPECIAL CONDITIONS/RESTRICTIONS section) by the RRF on 30 September 1985 (Pool 10 Recon. Alt. D*). GREAT selected use of 25.8 acres (upland) at this site for permanent placement of material from cuts 7-10. The endorsed Pool 10 Recon. (Alt. D*) recommended the use of 4 acres for placement of 640,000 cubic yards from cuts 7-8. The entire amount would be removed from this site for beneficial use. The endorsed plan calls for hydraulic dredging of both cuts with cut 7 placed directly and cut 8 requiring in-water rehandling. Rehandling will be between Miles 643.2 and 643.8 using criteria set forth in the 1985 Pool 10 Recon. (page B-6). Placement site 10-643.5-LWI (Jackson Rehandle) is designated as the rehandling site but the exact location could change following OSIT review. A permanent rehandling site approximately 1 acre in size has been identified for mechanical rehandling if necessary. Mechanical dredging of cut 8 with mechanical rehandling will be considered and would be preferred by the resource agencies.

SITE CHARACTERISTICS: This site is part of an agricultural field. It is in the floodplain but out of the floodway. It is 100% upland. Surrounding land use is railroad, State Highway, and floodplain forest. Use of the mechanical rehandling site will result in the disturbance of 1 acre of riparian habitat.

SITE DIMENSIONS: Area = 4 acres - The stockpile area is 4 acres (550'X320'). The mechanical rehandling area is approximately 1 acre (320'X100'). Pre-Fill Elevation = 626.0 Fill Elevation = 651.0 LCP Elevation = 611.0. Estimated Capacity = 110,000 cubic yards.

BENEFICIAL USE: A beneficial use stockpile will be developed and removal of all material placed at this site is projected.

EQUIPMENT REQUIREMENTS/LIMITATIONS: The Mississippi Gardens cut would be placed by direct hydraulic pumping. The Jackson Island cut would require hydraulic double pumping. A permanent rehandling site has been identified for mechanical rehandling if necessary.

SPECIAL CONDITIONS/RESTRICTIONS: The RRF endorsed this site with the condition to add a sentence on page B-6 of the 1985 Pool 10 Recon. referencing a mussel survey.

FUTURE PLANS: The Corps will pursue a long-term agreement or acquisition of this site and construct a containment dike. The Recon. recommended directing effluent overland into the adjacent bottomland forest and willow habitats due to the distance of the site from the river. The Corps will evaluate directing effluent via pipeline back to the river.

PERMITS/APPROVAL CHECKLIST:		Remarks
	Cultural Resources	Survey required for more information
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by O&M, EIS
	Real Estate	Requires acquisition or extended lease
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Mississippi Gardens	642.7-643.4	H	3000	1800-2200	4800-5200	14-40
Jackson Island	643.7-644.7	H	10600	1800-2200	12400-12800	14-40

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

10-642.4-LWP
MISSISSIPPI GARDENS PLACEMENT SITE

LEGEND
Access Road ——-——-
Pipeline Access ——--——-
Barge Unloading Access ——-——
Transport Material By Truck ——----
First Priority Fill Area

Iowa State Plane Grid, North Zone, NAD 83
Date of Photography: November 1992

SCALE:1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-635.0-LWP	**Prairie Municipal Dock**	WI/Crawford/Prairie du Chien	City of Prairie du Chien
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 10.43). This site was endorsed by the RRF on 27 April 1982 (Proposed by Wisconsin DNR). Due to low volume and frequency, limited barge traffic, and presence of endangered species, dredging in the East Channel (cut 6) was not evaluated in GREAT or in the Recon. Report for Pool 10. The RRF endorsed this site with the following conditions: 1) conduct an archeological investigation; 2) no placement until all necessary permits are obtained; 3) remove any material placed at this site before the next spring high water.

SITE CHARACTERISTICS: This area has been previously disturbed by placement of material from dredging in the East Channel (cut 6). Most material was removed but the remainder has been spread out with an average height of 6 feet. The site has not revegetated well. It is bordered by the Highway 18 Bridge embankment, the city dock, bottomland forest habitat, and a park.

SITE DIMENSIONS: Area = 5 acres. Based on description in the minutes of the 27 April 1982 RRF meeting. Pre-Fill Elevation = 623.0. Maximum Fill Elevation = 628.0. LCP Elevation = 611.0. Estimated Capacity = 30,000 cubic yards.

BENEFICIAL USE: Access to the site is good and beneficial use of all the material is expected. The city of Prairie du Chien would be the primary user with removal also expected from local contractors.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

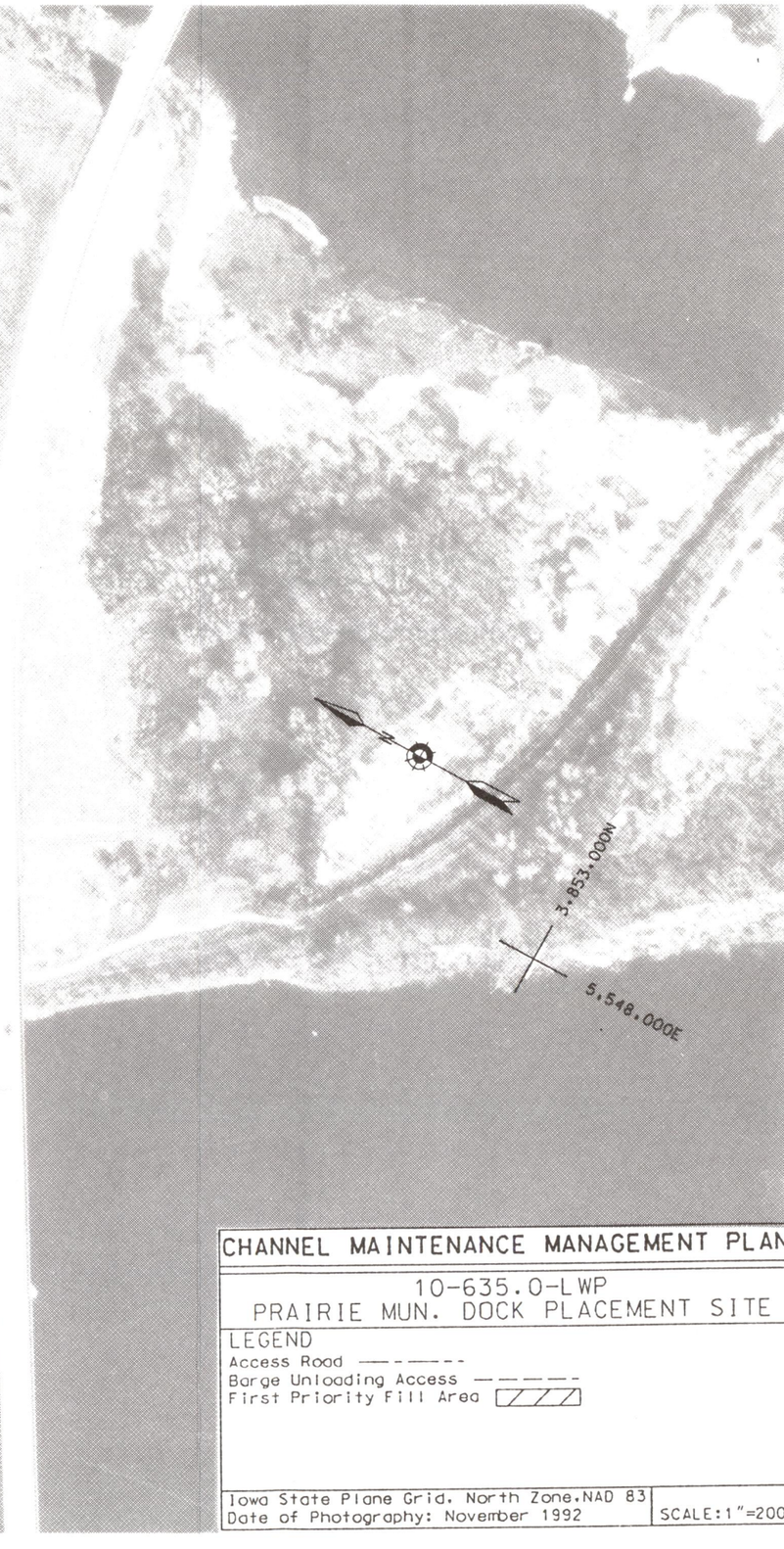
SPECIAL CONDITIONS/RESTRICTIONS: Unknown.

FUTURE PLANS: Dredging in the East Channel (cut 6) and development of this site is not anticipated, but if required in the future, site boundaries and details for use will be established though the OSIT process.

PERMITS/APPROVAL CHECKLIST:		Remarks
	Cultural Resources	Survey may be required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	
X	NEPA	East Channel EIS
	Real Estate	Permit required from the landowner
X	State	Exhibit A of WDNR's MOU
X	404(b)(1) Evaluation	None required if there is no effluent return
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
East Channel	633.0-636.5	M	8000	400-800	8400-8800	12-17
Prairie Comm. Harbor	634.7	M	100	400-800	500-900	12-17





CHANNEL MAINTENANCE MANAGEMENT PLAN

10-635.0-LWP
PRAIRIE MUN. DOCK PLACEMENT SITE

LEGEND

Access Road ——————

Barge Unloading Access — — — —

First Priority Fill Area

Iowa State Plane Grid. North Zone. NAD 83

Date of Photography: November 1992

SCALE: 1"=200

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-628.0-LWP	Wyalusing Pit	WI/Grant/Wyalusing	State of WI & B.N. R.R.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was selected by GREAT I (Site No. 10.01, Reference GREAT I Vol. 8-Part V). This site was endorsed by the RRF on 30 September 1985 (Pool 10 Recon. Alt. D*). GREAT selected use of 8.2 acres at this site for permanent placement of material from cuts 3-4. The endorsed Pool 10 Recon. (Alt. D*) recommended use of 6 acres for placement of 123,000 cubic yards from cut 3. The entire amount would be removed for beneficial use. An attempt would be made to obtain a long-term agreement or acquisition of the site. It would be operated as a beneficial use stockpile site.

SITE CHARACTERISTICS: This site is an inactive limestone quarry located just upstream from Wyalusing, WI. It is sparsely vegetated and has received dredged material in the past.

SITE DIMENSIONS: Area = 6 acres. Pre-Fill Elevation = 625.0. Maximum Fill Elevation = 645.0. LCP Elevation = 611.0. Estimated Capacity = 123,000 cubic yards.

BENEFICIAL USE: The site would be developed as a beneficial use site. Although this site has capacity to permanently accommodate material, it is estimated that all material placed here will be removed for beneficial use.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Lack of adequate drainage requires the installation of pumps for dewatering during dredging.

SPECIAL CONDITIONS/RESTRICTIONS: Effluent from hydraulic placement must be entirely contained within the quarry to permit seepage, or the water returned to the river shall not contain higher quantities of pollutants than presently existing in the Mississippi.

FUTURE PLANS: Dredging in Cut 3 has been re-evaluated and may not be required during the planning period. If future dredging requires use of this site, boundaries and details for use will be established through the OSIT process.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
X	Endangered Species	None found at this site
X	Floodplain Impact Analysis	No further analysis necessary
X	NEPA	Covered by the GREAT and O&M, EIS
	Real Estate	Permit from landowners
X	State	Exhibit A of WNDR's MOU
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other: Shorepipe Access	Permission from landowners required

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Wyalusing	627.3-628.0	H	4000	1200-1800	5200-5800	10-20



MISSISSIPPI RIVER

FLOW

CHANNEL MAINTENANCE MANAGEMENT PLAN

10-628.0-LWP
WYALUSING PIT

LEGEND
Access Road ——--
Pipeline Access ——--—
First Priority Fill Area ////

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-627.8-LWP	Wyalusing Beach	WI/Grant/Wyalusing	Grant County
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 10.24). This site was endorsed by the RRF on 30 September 1985 (Pool 10 Recon. Alt. D*). The RRF endorsed the Pool 10 Recon. (Alt. D*) with the condition to add this site into the plan with the condition that material has to be removed, deleted (OSIT would recommend when to use the site). Other than location on the GREAT I map, no information could be found documenting the size of the area. An area of 2 acres will be used as scaled off recent aerial photography.

SITE CHARACTERISTICS: This is a popular beach site located on the left descending bank of the Mississippi River. It is all sand and is within the floodplain and the floodway.

SITE DIMENSIONS: Area = 2 acres. Pre-Fill Elevation = 614.0. Maximum Fill Elevation = 617.0. LCP Elevation = 611.0. Estimated Capacity = 10,000 cubic yards.

BENEFICIAL USE: Material placed at this site will be used beneficially for beach nourishment to provide for recreation.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Unknown.

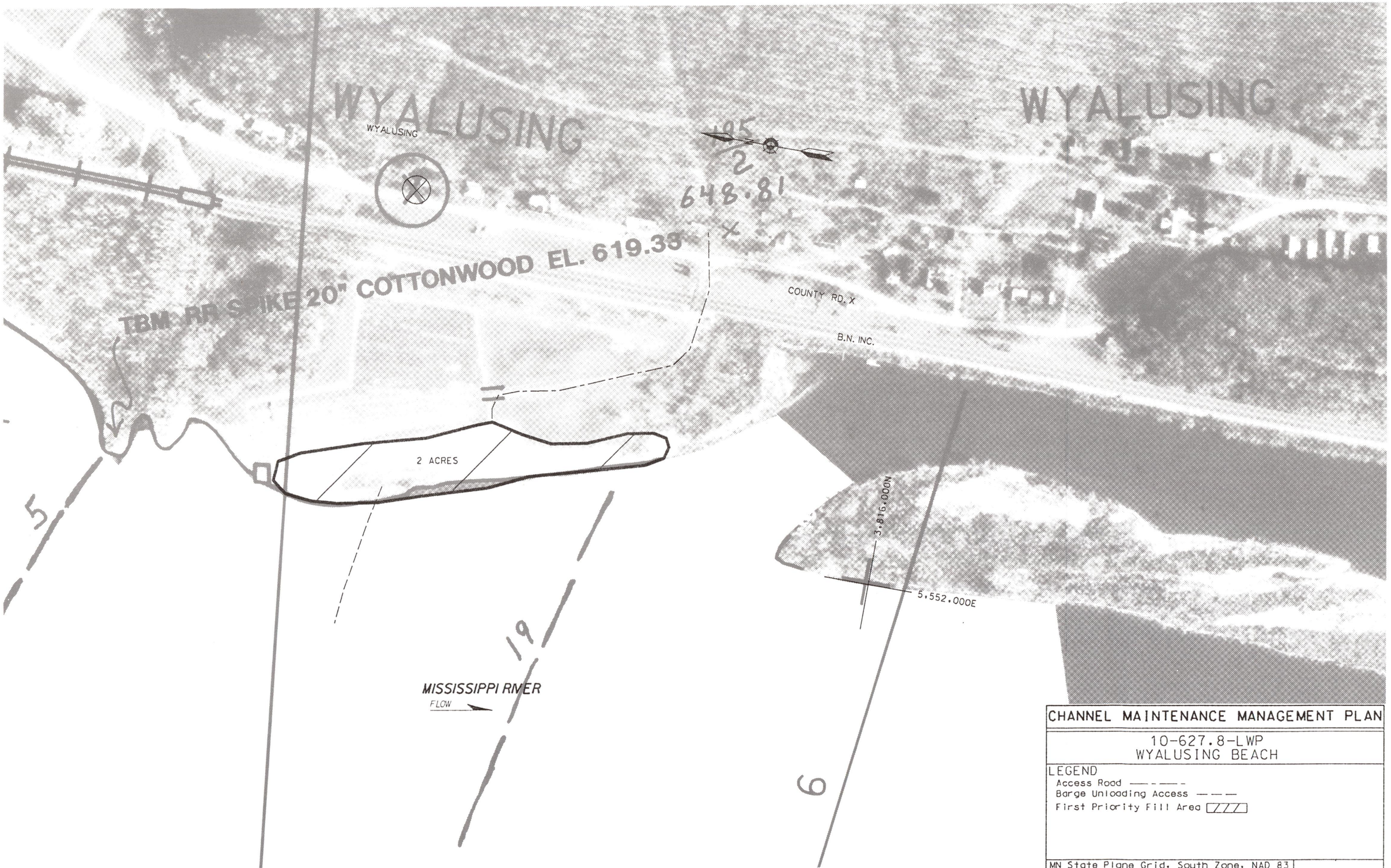
SPECIAL CONDITIONS/RESTRICTIONS: Any placement of material for beach nurishment must not reduce water depths near the boat launching facility.

FUTURE PLANS: If future dredging requires use of this site, boundaries and details for use will be established through the OSIT process.

PERMITS/APPROVAL CHECKLIST:		Remarks
X	Cultural Resources	No action required
	Endangered Species	
	Floodplain Impact Analysis	
	NEPA	
	Real Estate	
X	State	Exhibit A of WDNR's MOU
	404(b)(1) Evaluation	
	Other:	

	Potential Dredge Cuts	Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
Wyalusing	627.3-628.0	M	4000	0-50	4000-4050	0-5

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

10-627.8-LWP
WYALUSING BEACH

LEGEND
Access Road ——-——-
Barge Unloading Access ———
First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83
Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-618.7-RIT	McMillan Island	IA/Clayton/Guttenberg	Federal Gov't.
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I (Site No. 10.18). GREAT selected use of 8.2 acres at site 10.04 for permanent placement of material from cut 2. The RRF endorsed the Pool 10 Recon. (Alt. D*) on 30 September 1985, which recommended use of 7 acres at site 10.04. Site 10.04 was used several times but no long-term real estate agreement was reached and the landowner association does not want any more material. The RRF endorsed the August 1995 Lower Pool 10 Recon. (Alt. B) on 6 September 1995, which recommends using 5 acres at this transfer site with removal when capacity is reached to the permanent Buck Creek site (10-618.0-RIP).

SITE CHARACTERISTICS: This is an island site used in the past for placement of dredged material. Habitat impacts include 1.6 acres sand, 1. 2 acres old dredged material, 1.6 acres bottomland forest, and 0.6 acres marsh.

SITE DIMENSIONS: Area = 5 acres. The area is 600 feet by 365 feet. Estimated capacity includes excavation to 30' below LCP. Pre-Fill Elevation = 620.0. Maximum Fill Elevation = 650.0. LCP Elevation = 610.4. Estimated Capacity = 267,500 cubic yards.

BENEFICIAL USE: GREAT identified active beneficial use of 362,000 cubic yards from Pool 10. This was increased to 1,085,500 in the 1985 Recon. but that was for the entire pool. The 1995 Recon. adjusted the projection to 175,000 cubic yards for the Lower Pool 10 reach on the Iowa side.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Dredged material will be placed at this site either hydraulically or mechanically. Preferred method is hydraulic, which would require effluent control structures and may not be efficient once the site is close to capacity.

SPECIAL CONDITIONS/RESTRICTIONS: Dike construction with effluent control structures is required to contain the material and direct effluent back to the main channel. Excavation is expected to take place on 2 separate occasions to a depth of 10 feet below LCP or greater (a greater depth would be preferred to provide longevity).

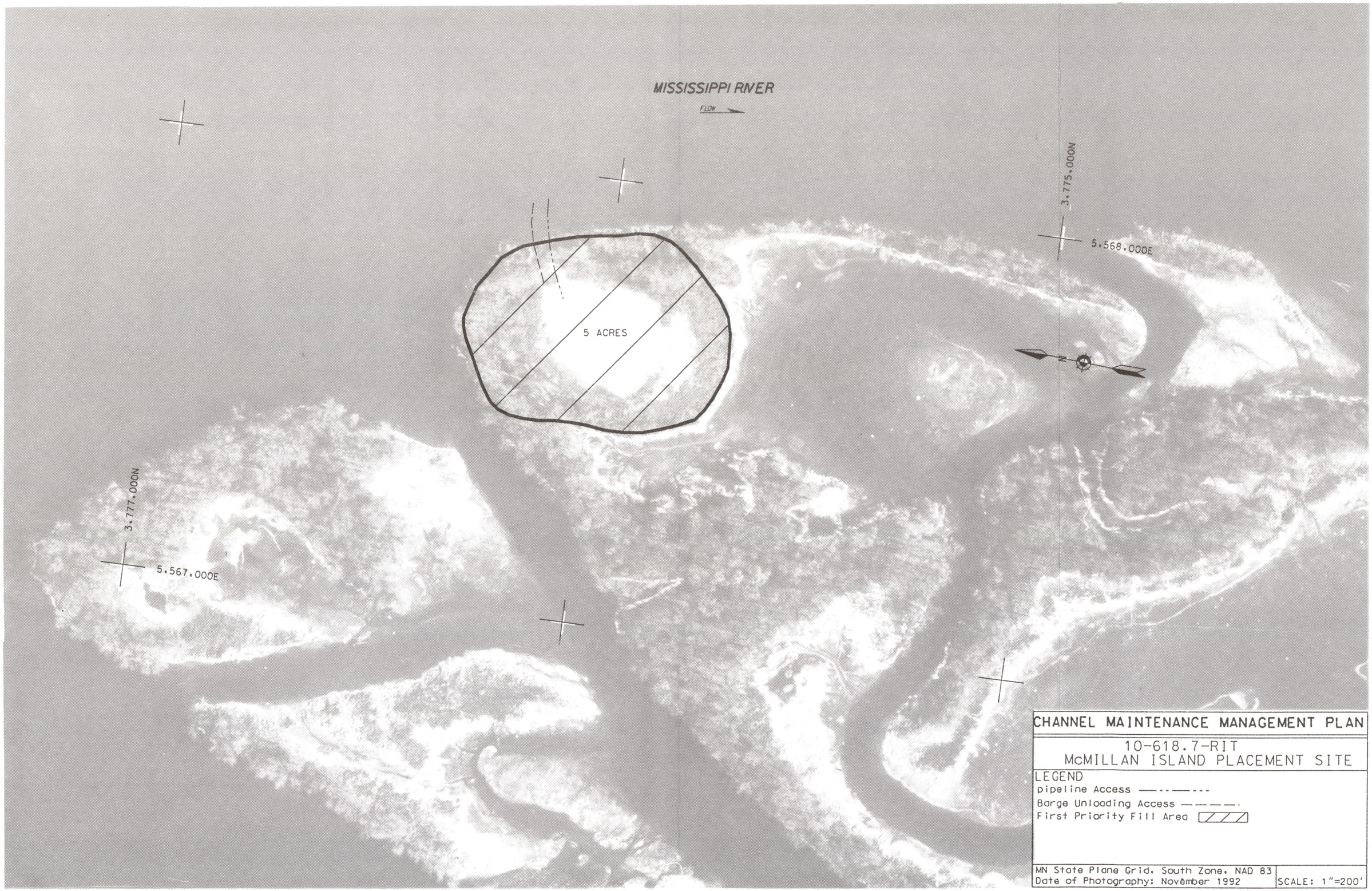
FUTURE PLANS: Once this site is filled to capacity, material will be excavated to the permanent site at Buck Creek (10-618.0-RIP). This will require setting a pipeline through a wetland to reach the site, which will be coordinated with the OSIT.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	Surveyed, no further action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	May require further analysis
	NEPA	
X	Real Estate	Owned by federal government
	State	404(t) required if there is an effluent return
	404(b)(1) Evaluation	Long-term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
McMillan Island	618.4-619.6	H,M	8000	30-400	8030-8400	10-40

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

10-618.7-RIT
McMILLAN ISLAND PLACEMENT SITE

LEGEND

pipeline Access —--—---

Barge Unloading Access — — — —·

First Priority Fill Area

MN State Plane Grid, South Zone, NAD 83

Date of Photography: November 1992

SCALE: 1"=200'

DREDGED MATERIAL PLACEMENT SITE INFORMATION SHEET

10-618.0-RIP	Buck Creek	IA/Clayton/Guttenberg	Private
Site Identification	Site Name	State/County/Municipality	Landowner

BACKGROUND: This site was not selected by GREAT I. GREAT selected the use of 8.2 acres at Esmann Island (10-618.8-RIP) for permanent placement of material from cut 2. The RRF endorsed the Pool 10 Recon. (Alt. D*) on 30 September 1985, which recommended the use of 7 acres at Esmann Island. The Esmann Island site was used several times but no long-term real estate agreement was reached and the landowner assocciation does not want any more material. The RRF endorsed the August 1995 Lower Pool 10 Recon. (Alt. B) on 6 September 1995, which recommends using 5 acres at the McMillan Island transfer site (10-618.7-RIT) for placement of material from cut 2 with removal when capacity is reached to 10 acres at this site.

SITE CHARACTERISTICS: This site is currently an agricultural field surrounded by reed canary grass, willows, and cottonwood. It has good land access for beneficial use removal. An area of 10 acres has been identified for use. However, only 8 of those acres will be impacted directly with fill. The remainder will serve as buffer.

SITE DIMENSIONS: Area = 10 acres. The area is 725 feet by 600 feet. Only 8 acres of habitat will be filled (680'X510'). The remaining 2 acres will serve as a buffer around the site with minimal disturbance. Pre-Fill Elevation = 630.0. Maximum Fill Elevation = 655.0. LCP Elevation = 610.3. Estimated Capacity = 360,000 cubic yards.

BENEFICIAL USE: GREAT identified active beneficial use of 362,000 cubic yards from Pool 10. This was increased to 1,085,500 cubic yards in the 1985 Recon. but that was for the entire pool. The 1995 Recon. adjusted the projection to 175,000 cubic yards for the Lower Pool 10 reach on the Iowa side.

EQUIPMENT REQUIREMENTS/LIMITATIONS: Dredged material will be excavated from the transfer site at McMillan Island and placed at this site by hydraulic methods. Special equipment may be required for placement of the pipeline across wetland areas for access to this site.

SPECIAL CONDITIONS/RESTRICTIONS: Dike construction with effluent control structures is required to contain the material and direct effluent into Buck Creek . Landscapping and a vegetative cover would be established on the site where beneficial use is not taking place. Maintain a buffer around the site.

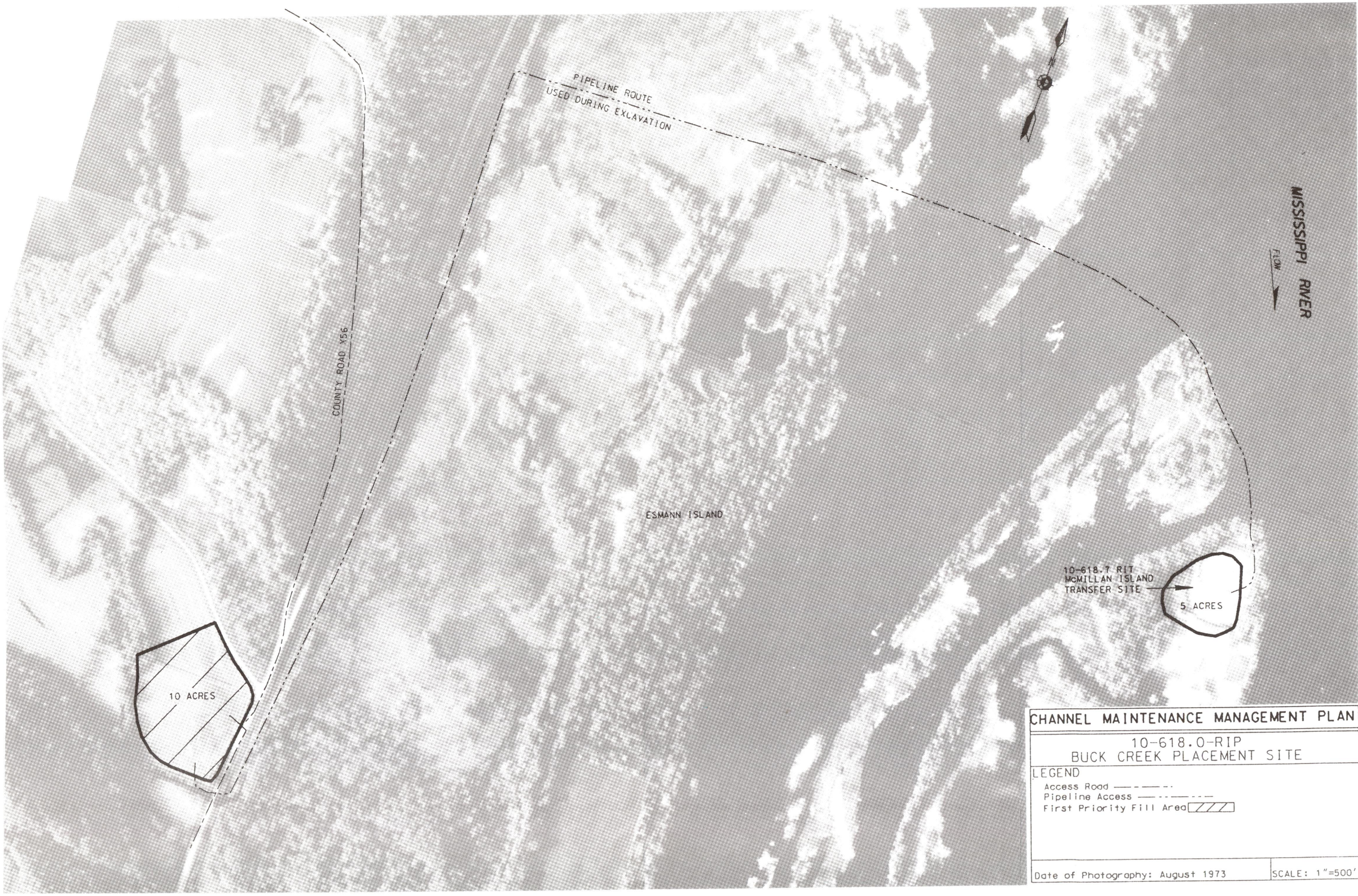
FUTURE PLANS: Acquisition of this site will be pursued, followed by construction of containment dikes. Acquisition will also include all real estate agreements necessary for long-term pipeline access to the site.

PERMITS/APPROVAL CHECKLIST:

		Remarks
X	Cultural Resources	Surveyed, no further action required
X	Endangered Species	None found at this site
	Floodplain Impact Analysis	Further analysis required
	NEPA	
	Real Estate	Corps will pursue acquisition
	State	404(t) required if effluent
	404(b)(1) Evaluation	Long term 404(b) proposed
	Other:	

Potential Dredge Cuts		Dredge	Pipeline Distance			
Name	Mile	Type	Water	Land	Total	Lift
McMillan Island site	10-618.7-RIT	H	6200	2800-3500	9000-9700	20-45

April 1996



CHANNEL MAINTENANCE MANAGEMENT PLAN

10-618.0-RIP
BUCK CREEK PLACEMENT SITE

LEGEND

Access Road

Pipeline Access

First Priority Fill Area

Date of Photography: August 1973

SCALE: 1"=500'