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STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
101 SOUTH WEBSTER STREET, BOX 7921
MADISON, WISCONSIN 53707

FINAL ENVIRONMENTAL IMPACT STATEMENT

LONG-TERM CHANNEL MAINTENANCE PLAN FOR THE FEDERAL COMMERCIAL HARBOR AND A PERMIT APPLICATION TO CONSTRUCT AND EXPAND BARGE TERMINAL FACILITIES IN THE EAST CHANNEL OF THE UPPER MISSISSIPPI RIVER AT PRAIRIE DU CHIEN, WISCONSIN

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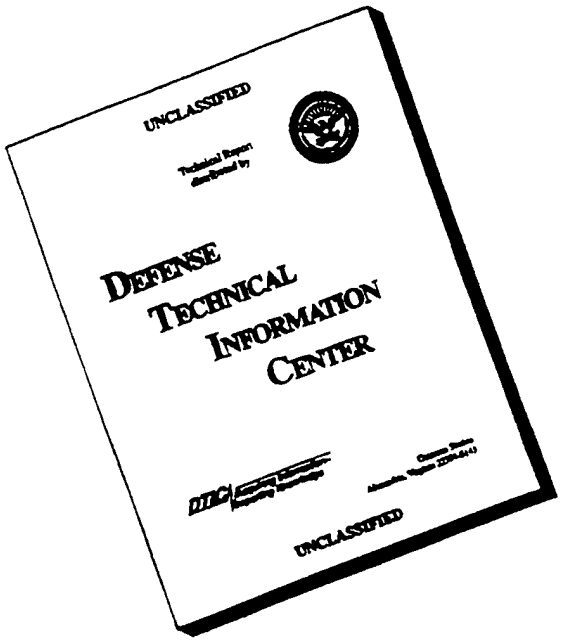
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St. Feriole Island

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The purpose of this document is to analyze the environmental impacts of a proposed permit action to upgrade and expand an existing barge transloading facility at St. Feriole Island for Prairie Sand and Gravel Inc., and the Corps of Engineers proposed Long-Term Channel Maintenance Plan for the federal commercial harbor in the East Channel of the Mississippi River at Prairie du Chien. The purpose of the proposed actions is to provide for environmentally sustainable public and/or private commercial navigation, including harbor and terminal facilities, in the East Channel of the Mississippi River at Prairie du Chien to meet the need for continued growth and development. A variety of alternatives were developed and evaluated, four of which are evaluated in detail. The following significant resources would be affected by the proposed activities: 1. Freshwater mussels; 2. Federal and state-listed threatened and endangered mussel species; 3. cultural resources; 4. Mississippi River nine-foot channel project; 5. Upper Mississippi River Wildlife and Fish Refuge and 6. Wisconsin and Southern Railraod (W&SRR).

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BEFORE THE
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

RECORD OF DECISION
WISCONSIN ENVIRONMENTAL POLICY ACT (WEPA) COMPLIANCE
FOR THE PERMIT APPLICATIONS TO CONSTRUCT AND EXPAND
BARGE TERMINAL FACILITIES IN THE
EAST CHANNEL OF THE UPPER MISSISSIPPI RIVER
AT PRAIRIE DU CHIEN, WISCONSIN

FINDINGS OF FACT

1. Prairie Sand and Gravel, Inc. (PS&G) has submitted to the Department an application for permits under ch. 30, Wis. Stats., for a proposed expansion to an existing barge tansloading facility located in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin.

2. The Department determined that an Environmental Impact Statement (EIS) under s. 1.11, Wis. Stats., was needed for its actions related to the harbor proposal and so notified the applicant.

3. The Department and the U.S. Army Corps of Engineers (COE) prepared the Draft EIS as joint lead agencies pursuant to a Cooperative Agency Agreement. The COE has received an application for federal permits required for the proposed harbor expansion and determined that an EIS was needed under the National Environmental Policy Act and agency regulations.

4. The Draft EIS was prepared and released for public and agency review on August 2, 1993. A public informational meeting on the Draft EIS was held on August 11, 1993, to receive comments.

5. The Department and the COE prepared a Final EIS which was released for public and agency review on January 16, 1996. A public hearing on the Final EIS was held on February 20, 1996 and written comments were solicited through March 6, 1996.

6. The Department of Natural Resources has complied with the requirements of ch. NR 150, Wisconsin Administrative Code, and s. 1.11, Stats., by:

   a. Participating in public scoping meetings in Prairie du Chien on April 20, 1992 in which interested parties were provided an opportunity to express their views and concerns about the potential permit actions.

   b. Preparing a Draft EIS which identified major issues, included a description of the purpose of the proposal and need for it, a description of the proposal

and affected environment, an evaluation of the probable environmental impacts of the proposal, and an evaluation of reasonable alternatives and their impacts.

c. Distributing the Draft EIS on August 2, 1993 for public and agency review.

d. Holding a public meeting on the Draft EIS in Prairie du Chien on August 11, 1993, to receive comment on the document.

e. Preparing a Final EIS which addressed the comments received on the Draft EIS and incorporated additional analysis of previously unresolved issues.

f. Distributing the Final EIS on January 16, 1996 for public and agency review.

g. Publishing a Hearing Notice announcing the public hearing on the Final EIS in the January 17,1996 edition of the Prairie du Chien newspaper, *The Courier-Press*.

h. Holding a public hearing on February 20,1996, to receive public comments on the Final EIS.

i. Receiving and considering comments on the Final EIS up to the present date.

7. The proposed harbor expansion project is expected to result in adverse impacts to freshwater mussels including threatened and endangered species. The degree of impact would be less than for any of the reasonable alternatives evaluated throughout the EIS process and less than what is presently occuring with the operation of two commercial harbors on St. Feriole Island.

CONCLUSION OF LAW

The Department of Natural Resources, under ch. NR 150, Wisconsin Administrative Code, and s. 1.11, Stats., has the responsibility to comply with WEPA, and the authority to determine its compliance with that Act.

DECISION

The Department has complied with the requirements of WEPA, s. 1.11, Stats., and ch. NR 150, Wisconsin Administrative Code, for its permit actions related to the proposed barge terminal expansion. The Department has considered the Final EIS, public and agency comments on the EIS, and the associated record to this point in the decision-making process. This compliance with WEPA applies to all subsequent Department decisions whose impacts are considered in the EIS. The Department's decisions on the permits will be made at a later date. The Final EIS and associated record will be entered into and become a part of the permit decisions.

APPEAL RIGHTS

If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30 day period for filing a petition for judicial review.

This notice is provided pursuant to s. 227.48(2) Wis. Stats.

Dated at Madison, Wisconsin, this 13th day of March, 1996.

STATE OF WISCONSIN
Department of Natural Resources
For the Secretary

By George Albright

George Albright, Chief
Environmental Analysis/Project Management Section
Bureau of Environmental Analysis and Review

RECORD OF DECISION

ENVIRONMENTAL IMPACT STATEMENT LONG-TERM CHANNEL MAINTENANCE PLAN FOR THE FEDERAL COMMERCIAL HARBOR AND A PERMIT APPLICATION TO CONSTRUCT AND EXPAND BARGE TERMINAL FACILITIES IN THE EAST CHANNEL OF THE UPPER MISSISSIPPI RIVER AT PRAIRIE DU CHIEN, WISCONSIN

I have reviewed the proposed Long-Term Channel Maintenance Plan (LTCMP) for the Federal Harbor in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin, and a Section 404 (Clean Water Act)/Section 10 (Rivers and Harbors Act of 1899) permit application filed by Prairie Sand and Gravel, Inc. of Prairie du Chien, Wisconsin, to expand a private harbor facility in the East Channel of the Upper Mississippi River at Prairie du Chien. A final Environmental Impact Statement (EIS) addressing the environmental impacts of the proposed permit action and the LTCMP for the East Channel was completed in January 1996.

The lead agencies responsible for preparation of the EIS were the U.S. Army Corps of Engineers, St. Paul District and the Wisconsin Department of Natural Resources. The U.S. Fish and Wildlife Service and the Wisconsin Department of Transportation participated as cooperating agencies. A separate Record of Decision will be prepared and signed by the Secretary of the Wisconsin Department of Natural Resources.

A variety of alternatives were developed and evaluated, four of which were evaluated in detail. One of the alternatives considered in detail was the no action alternative of maintaining historical levels of navigation through permit denial and not implementing the LTCMP. The other alternatives considered in detail involved expansion of barge transloading facilities through permit approval and partial implementation of the LTCMP. The following significant resources in the Prairie du Chien/East Channel area would be affected by the proposed activities: (1) Freshwater Mussels, (2) Federally and State Listed Threatened and Endangered Mussel Species, (3) Cultural Resources, (4) Mississippi River Nine-Foot Channel Project, (5) Upper Mississippi River Wildlife and Fish Refuge, and (6) Wisconsin and Calumet Railroad (Short Line). All of the expansion alternatives considered would have minor to significant beneficial effects (compared to the no action alternative) on transportation, community and regional growth and development, property values, tax revenues, public services and facilities, employment, business activity, food supply, commercial navigation, and energy resources. All of the expansion alternatives considered would have minor to significant adverse effects (compared to the no action alternative) on aesthetic values, recreational opportunities, controversy, aquatic habitat, fish and wildlife, freshwater mussels, Federal and State threatened and endangered species (especially the Federal and State listed mussel species, *Lampsilis higginsi*), and historical architectural values.

It is my decision that Alternative D best meets the purpose of providing environmentally sustainable public and/or private commercial navigation, including harbor and terminal

facilities, in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin, to meet the need for continued growth and development. Under Alternative D, a permit would be granted to Prairie Sand and Gravel, Inc. to expand harbor operations in the East Channel and the LTCMP would be partially implemented. However, maintenance of the Federal commercial harbor located at the City Dock would be deferred. Future use of the Federal commercial harbor would be limited to historic levels of usage (approximately 15 barges per year). Permit conditions to avoid and minimize adverse environmental impacts will include: prohibiting the loading or unloading of hazardous commodities at the facility, requiring the preparation of a spill contingency plan for the facility, restricting navigational access to the site to the northern east channel, and requiring the permittee to contribute financially to a mussel monitoring program for the East Channel mussel beds. Additionally, the permittee must meet any requirements identified in the Memorandum of Agreement for protection of cultural resources and the U.S. Fish and Wildlife Service's biological opinion for minimization of effects to threatened and endangered species.

I find that this alternative, in conjunction with the permit conditions, best meets the purposes and needs of the permit applicant and the Federal interest in maintaining a commercial harbor at Prairie du Chien; offers the best combination of economic, engineering and environmental considerations; is acceptable to local interests and concerned agencies; and complies with applicable laws and regulations. Accordingly, it is my decision that the best interests of the public would be served by implementation of this alternative.

Date: 2 Apr 96

J. M. Wonsik
Colonel, Corps of Engineers
District Engineer

FINAL ENVIRONMENTAL IMPACT STATEMENT LONG-TERM CHANNEL MAINTENANCE PLAN FOR THE FEDERAL COMMERCIAL HARBOR AND A PERMIT APPLICATION TO CONSTRUCT AND EXPAND BARGE TERMINAL FACILITIES IN THE EAST CHANNEL OF THE UPPER MISSISSIPPI RIVER AT PRAIRIE DU CHIEN, WISCONSIN

Abstract - The responsible lead agencies are the U.S. Army Corps of Engineers, St. Paul District and the Wisconsin Department of Natural Resources. The U.S. Fish and Wildlife Service and the Wisconsin Department of Transportation are cooperating agencies. The purpose of this document is to analyze the environmental impacts of: 1) a proposed permit action by Prairie Sand and Gravel, Inc. (PS&G) of Prairie du Chien, Wisconsin, to upgrade and expand an existing barge transloading facility on St. Feriole Island and the adjacent mainland; and 2) the Corps of Engineers (COE) proposed Long-Term Channel Maintenance Plan (LTCMP) for the Federal commercial harbor in the East Channel of the Mississippi River at Prairie du Chien.

The purpose of the proposed actions is to provide for environmentally sustainable public and/or private commercial navigation, including harbor and terminal facilities, in the East Channel of the Mississippi River at Prairie du Chien to meet the need for continued growth and development. A variety of alternatives were developed and evaluated, four of which were evaluated in detail. One of the alternatives considered in detail was the no action alternative of maintaining historical levels of navigation and not implementing the LTCMP. The other alternatives considered in detail involved expansion of barge transloading facilities and partial implementation of the LTCMP. The following significant resources in the Prairie du Chien/East Channel area would be affected by the proposed activities: (1) Freshwater Mussels (2) Federally and State listed Threatened and Endangered mussel species (3) Cultural Resources (4) Mississippi River Nine-Foot Channel Project (5) Upper Mississippi River Wildlife and Fish Refuge (6) Wisconsin and Southern Railroad (W&SRR). All of the expansion alternatives considered would have minor to significant beneficial effects (compared to the no action alternative) on transportation, community and regional growth and development, property values, tax revenues, public services and facilities, employment, business activity, food supply, commercial navigation, and energy resources. All of the expansion alternatives considered would have minor to significant adverse effects (compared to the no action alternative) on aesthetic values, recreational opportunities, controversy, aquatic habitat, fish and wildlife, freshwater mussels, Federal and State threatened and endangered species (especially the Federal and State listed mussel species, *Lampsilis higginsi*), and historical architectural values (cultural resources).

For further information on this final EIS, please contact:

Mr. Dennis Anderson
190 5th Street East
St. Paul, Minnesota 55101-1638
Telephone: (612) 290-5272

GLOSSARY

CFR - Code of Federal Regulations

City Dock - Federal commercial harbor at Prairie du Chien, Wisconsin

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

Consultation - a formal process between a Federal agency, a State Historic Preservation Officer and the Advisory Council on Historic Preservation to consider adverse effects of a Federal undertaking on a property listed on or determined eligible for the National Register.

CR - Crawford County, Wisconsin

Cultural Resources - a broad term used to group prehistoric or historic sites, districts, buildings, structures, artifacts, or objects that fall within the disciplines of prehistoric and historic archeology, history, and architectural history.

EIS - Environmental Impact Statement

EPA - Environmental Protection Agency

HD - House Document

Historic Preservation - the identification, evaluation, recordation, documentation, curation, acquisition, protection, management, rehabilitation, restoration, stabilization, maintenance, and reconstruction of historic properties, or any combination of the foregoing activities, as defined by Title III of the National Historic Preservation Act.

Historic Properties - any prehistoric or historic district, site, building, structure, or object included in, or eligible for, the National Register of Historic Places. The term includes artifacts, records, and remains related to such a district, site, building, structure, or object.

L. higginsi - ***Lampsilis higginsi,*** the Higgins' eye pearly mussel

LTCMP - Long-Term Channel Maintenance Plan

NEPA - National Environmental Policy Act of 1969

National Historic Landmark (NHL) - a district, site, building, structure or object that the Secretary of the Interior has determined possesses exceptional value in commemorating or illustrating the history of the United States and which has been so designated under the authority of the Historic Sites Act of 1935.

NR - Natural Resources

National Register (NRHP) - the list of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering and culture maintained by the Secretary of the Interior and fully titled the "National Register of Historic Places."

PS&G - Prairie Sand and Gravel, Inc. of Prairie du Chien, Wisconsin

W&SRR - Wisconsin and Southern Railroad

State Historic Preservation Officer (SHPO) - The official appointed or designated pursuant to Section 101(b)(1) of the National Historic Preservation Act of 1966 to administer the State Historic Preservation Program.

UMR - Upper Mississippi River

UMTA - Urban Mass Transportation Administration

USFWS - U.S. Fish and Wildlife Service

WDNR - Wisconsin Department of Natural Resources

WDOT - Wisconsin Department of Transportation

WEPA - Wisconsin Environmental Policy Act

CONVERSION FACTORS, NON-SI TO SI UNITS OF MEASUREMENT

Non-SI units of measurement used in this report can be converted to SI units as follows:

Multiply	By	To Obtain
feet	0.3048	meters
square feet	0.092903	square meters
cubic yards	0.76455	cubic meters
acres	4,047	square meters
miles	1.609	kilometers

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1.0 SUMMARY

The St. Paul District, U.S. Army Corps of Engineers (COE) and the Wisconsin Department of Natural Resources (WDNR) have each received applications for permits from Prairie Sand and Gravel, Inc. (PS&G) to expand an existing barge transloading facility located in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin. The need for an Environmental Impact Statement (EIS) was precipitated by the potential for significant effects on the outstanding mussel populations of the East Channel, on the largest known population of the State and Federally listed endangered Higgins' eye pearly mussel (*Lampsilis higginsi*) and other State listed threatened and endangered freshwater mussels, on numerous historic and archeological sites (cultural resources) of State and Federal significance and on socioeconomic resources. The complexity of and longstanding controversy over port facilities in the East Channel, the precedent-setting nature of a permit decision under these circumstances, and the need for an informed decision concerning environmentally sustainable development in the East Channel area underscore the need for an EIS which not only addresses the pending permit action, but also evaluates continued operation/maintenance of the Federal commercial harbor (City Dock) and the navigation lanes to the harbor. Because the COE and WDNR each have regulatory authority over activities in the East Channel, a jointly prepared EIS best serves the needs of the agencies and the public.

1.1 Proposed Action

1.1.1 Prairie Sand and Gravel, Inc. Permit Proposal

PS&G proposes to expand its existing barge transloading facility located at the north end of St. Feriole Island (Figure 1). The proposal includes split-location harbor use both on the island and at an adjacent area on the mainland known as the Swingle site. In the past, approximately 230 loaded barges have left the existing facility each year. The permit applicant estimates approximately 500 barges per year would be handled, within several years, if the proposed expansion is approved. In the next 10 to 25 years, up to 800 barges per year could be required to move projected increases in demands for commodities shipped through Prairie du Chien (Glaze and Krikelas 1990). The additional barges needed for commodity transport could be accommodated by further expansion of the PS&G facility or by increased shipping from the City Dock in the Federal commercial harbor.

1.1.2 Corps of Engineers Maintenance of East Channel

The Rivers and Harbors Act of 1950 (House Document (HD) 71-81-1) authorized construction of the Federal commercial harbor at Prairie du Chien, Wisconsin. Construction of the Federal commercial harbor was completed in 1958. In authorizing the commercial harbor, the House Document implies access to the harbor is available and will be maintained through the East Channel. Thus, the purpose for maintaining the East Channel is to provide access to the Federal commercial harbor.

The COE has formulated a Long-Term Channel Maintenance Plan (LTCMP) for the East Channel that would ensure access to the Federal commercial harbor (City Dock). The plan provides for a 100-foot-wide navigation channel between the northern end of the East Channel and the Federal commercial harbor. In order to maintain this channel, two dredge cuts were proposed. Cut 1, located at the north end of the East Channel, is projected to require dredging once during the 40-year period covered under the LTCMP. Approximately 2,500 cubic yards would be dredged from cut 1. Cut 2, located immediately in front of the City Dock in the Federal commercial harbor, was projected to require dredging two times during the 40-year period of the LTCMP; however, in its Biological Opinion of June 28, 1993, the U.S. Fish and Wildlife Service (USFWS) opposed dredging cut 2. Therefore, dredging cut 2 would be deferred (the dredge cut would be monitored and if dredging was determined necessary to maintain navigation, Federal Threatened and Endangered Species Section 7 consultation would be re-initiated and appropriate environmental documentation prepared and coordinated) and was not considered in the alternatives evaluated in further detail in the EIS (see Section 1.2 and Appendix C). As identified in the LTCMP (see Appendix B), the preferred placement site for materials dredged from cut 1 is site A. Site A is located just downstream from the Highway 18 bridge in Prairie du Chien.

1.2 Major Findings and Conclusions

In preparing the draft and final EIS, the COE and the WDNR consulted with various Federal, State and local governmental entities, as well as private citizens and other interested parties. The COE and WDNR have carefully scrutinized and analyzed information provided by outside sources and accept information, as presented in this document, as accurate and reasonable.

Through public meetings and consultation with State and Federal agencies, the following resources in the Prairie du Chien/East Channel area were identified as significant: (1) Freshwater Mussels, (2) Federally and State Listed Threatened and Endangered Mussel Species, (3) Cultural Resources, (4) Mississippi River Nine-Foot Channel Project, (5) Upper Mississippi River Wildlife and Fish Refuge, and (6) Wisconsin and Southern Railroad (W&SRR). These natural, cultural and socioeconomic resources would all be affected by the proposed harbor development project and implementation of the LTCMP.

In August 1992, the USFWS requested the COE to initiate consultation pursuant to Section 7 of the Endangered Species Act regarding the channel maintenance actions proposed by the COE and the harbor development project proposed by PS&G. The COE prepared and provided to the USFWS a biological assessment of the impacts of the proposed actions on 17 Federally listed threatened or endangered species that occur or could occur in the East Channel area (see Appendix D). The consultation between the COE and USFWS was concluded on June 28, 1993, when the USFWS issued a Biological Opinion on the proposed actions (see Appendix C). Based on an evaluation of the direct, indirect and cumulative effects of the proposed actions, the USFWS determined that unrestricted shipping and channel maintenance activities would likely jeopardize the continued existence of *L. higginsi*. The

USFWS provided three reasonable and prudent alternatives which, if adopted, would avoid the likelihood of jeopardizing *L. higginsi*. The reasonable and prudent alternatives included:

1) Suspension of channel maintenance dredging in the East Channel between the Highway 18 bridge and the barge turning basin area of the East Channel (i.e., suspension of dredging in cut 2).

2) Inclusion of requirements for hazardous material spill prevention and response planning in any Army permit granted to PS&G.

3) Monitoring of shipping from the City Dock; re-initiation of formal Section 7 (Endangered Species Act of 1973) consultation with the USFWS if shipping (barges departing from the City Dock) exceeds 135 permitted and 15 incidental barges per year.

Four alternatives that would meet the various combinations of regulatory permit and Federal harbor operation and maintenance options were evaluated in detail.

1.2.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Implementation of Alternative A (no action) would require denial of the permit for the harbor expansion proposed by PS&G. In addition, the COE would not maintain a navigation channel in the East Channel; however, the Federal commercial harbor (City Dock) would not be deauthorized. The COE would defer implementation of the LTCMP by placing maintenance of the Federal commercial harbor in an "inactive" status. Under Alternative A, barge traffic to the City Dock and PS&G would return to historic levels. At the City Dock, historic levels equate to approximately 15 barges per year, while historic levels at PS&G equate to approximately 230 barges per year. Minor adverse effects on natural resources, including freshwater mussels and State and Federal threatened and endangered species, would continue at historic levels. Adverse affects to historic resources on St. Feriole Island and visual impacts to Effigy Mounds National Monument, while not eliminated, would return to pre-1988 levels. Adverse effects on recreational resources caused by harbor activities at the PS&G and City Dock sites would continue at historic levels under this alternative. Substantial adverse effects on transportation and regional growth, and minor adverse effects on community cohesion, community growth and development, and commercial navigation, would be attenuated under Alternative A.

1.2.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Implementation of Alternative C1 would require denial of the permit for harbor expansion proposed by PS&G, continued use of facilities at the City Dock at recent levels of barge traffic, and continued maintenance of cut 1 in the East Channel by the COE according to the LTCMP. The maximum use of the City Dock would be limited to 135 permitted and 15

unregulated barges per year. Approximately 230 barges per year would continue to use the PS&G harbor. When compared to the no action alternative, the impacts of dredging and navigation traffic under Alternative C1 would have minor adverse impacts on aquatic habitats and fish and wildlife, substantial adverse impacts on freshwater mussels, and significant adverse impacts on threatened and endangered species (both State and Federally listed). Impacts to historic resources on St. Feriole Island would be minimized by keeping expansion south of these resources. Impacts associated with the operations at PS&G would continue at historic levels. Positive benefits on transportation, community growth and development, property values, tax revenues, public facilities and services, regional growth, employment, business activity, commercial navigation, and energy needs and resources would be realized. Effects on recreation under this alternative would be similar to those of Alternative A with the exception of increased commercial navigation in the East Channel and increased truck and rail traffic through historic and park areas.

The USFWS, COE and WDNR share concerns about the potential long-term impacts to significant aquatic resources as a result of barge transloading operations at the City Dock. Use of the City Dock for commercial barge transloading remains an unacceptable risk to the WDNR.

1.2.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Implementation of Alternative D would require approval of the permit for harbor expansion proposed by PS&G. Projected dredging of cut 1 would be completed as outlined in the LTCMP. In addition, PS&G would connect its existing gravel quarry to Sawmill Slough by dredging an area identified as cut 3 on Figure 1. Alternative D would have minor adverse impacts on aquatic habitats and fish and wildlife. Increased barge traffic and dredging of cut 1 would have a substantial adverse impact on freshwater mussels including Federal and State threatened and endangered species. This alternative would have significant adverse impacts to historic resources on St. Feriole Island; however, these impacts would be substantially minimized through implementation of the Memorandum of Agreement included as Appendix F of this final EIS. Visual impacts to Effigy Mounds National Monument would increase over the no action alternative and Alternative C1 because the PS&G/Swingle site is more visible from the monument than the City Dock. Substantial benefits to transportation, community growth and development, tax revenues, public facilities and services, regional growth, employment, business activity and commercial navigation would be realized if the permit for harbor expansion were granted. Additional commercial navigation maneuvering created by adding the Swingle site would have adverse effects on recreational boaters due to the site's proximity to local marinas. Also, public health and safety could be adversely affected by increased truck traffic through residential areas.

1.2.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Implementation of Alternative F1 would require issuance of the requested permit. Dredging/excavation of cuts 1 and 3 would be completed as specified in the LTCMP and in the permit application, respectively. Alternative F1 would combine the impacts of Alternatives C1 and D. The impacts of Alternative F1 on aquatic habitats and fish and wildlife would be substantial. The impacts of Alternative F1 on freshwater mussels and Federal and State threatened and endangered species would be significant. This alternative would have significant adverse impacts on historic resources on St. Feriole Island; however, these impacts would be substantially minimized through implementation of the Memorandum of Agreement included as Appendix F of this final EIS. Visual impacts to Effigy Mounds National Monument would increase significantly as a result of development at the PS&G site. Impacts resulting from increased traffic at the City Dock would be less than those from development at PS&G. Alternative F1 would likely optimize socioeconomic benefits. Substantial benefits on transportation, community growth and development, tax revenues, public facilities and services, regional growth, employment, business activity and commercial navigation would be realized if the permit for harbor expansion were granted. Adverse recreational effects would be the greatest under this alternative. This alternative would combine the effects of the PS&G/Swingle harbor proposal with those of expanded use of the City Dock. Implementation of Alternative F1 would elicit significant controversy between environmental protection groups and economic interests.

As discussed under Alternative C1, use of the City Dock for barge transloading operations remains an unacceptable risk to the WDNR.

1.3 Controversy

In the past 15 years, the regulation of port facility development by the COE and WDNR, and channel maintenance activities conducted by the COE, have generated considerable controversy. Concerns about State and Federally listed endangered freshwater mussel species, including *L. higginsi*, the significant cultural resources found in the area, and economic development have resulted in a great deal of debate for many years. The public meetings held in conjunction with the development of this EIS confirmed that the proposed actions remain highly controversial.

Within the last 3 years, however, there has been a concerted, coordinated State and local effort to find a mutually acceptable resolution to harbor-related controversies. The pending PS&G permit application for expansion of the present dock facilities on the north end of St. Feriole Island and new port facilities on the Swingle site is consistent with the direction of these recent initiatives. As this final EIS is being prepared, extensive negotiations between the permit applicant, the city of Prairie du Chien, the township of Prairie du Chien and Didion, Inc. are ongoing. The intent of these negotiations is to provide a consolidated, modern port facility that serves both governmental and business entities. Should the

negotiations prove successful, there would be municipal (both city and township) and State involvement in the operations and funding, respectively, of portions of the permit applicant's proposal (see selected letters regarding this subject in Appendix H).

1.4 Unresolved Issues

Cultural Resources

During preparation of the draft EIS, several issues concerning cultural resources remained unresolved. The primary issue was one of vibration impacts from increasing train traffic on the historic resources on St. Feriole Island, especially those National Historic Landmarks, the Dousman Hotel, the Brisbois House, the Astor Fur Warehouse, and Villa Louis. Another unresolved issue at the time of the draft EIS was the visual impact of harbor development and expansion on historic resources located on the island and on Effigy Mounds National Monument located across the Mississippi River in Iowa. These issues have been resolved between a number of interested parties, and the specifics of the resolution have been incorporated into a Memorandum of Agreement. This Memorandum of Agreement is included in Appendix F of this document.

2.0 PURPOSE AND NEED

2.1 Background

2.1.1 Corps of Engineers Regulatory Permit History

Port facilities have existed at the north end of St. Feriole Island since the turn of the century and at the City Dock since at least 1958. PS&G began operations on St. Feriole Island in 1963, and Didion, Inc. began barge loading operations at the City Dock in 1988. Figure 1 shows the location of these facilities. Modifications to both of these facilities in recent years have resulted in the need for numerous Department of the Army permits.

Subsequent to the discovery of the Federally listed endangered species, the Higgins' eye pearly mussel (*L. higginsi*), in the East Channel of the Mississippi River, permit proposals related to commercial navigation have been very controversial. In 1990, Didion, Inc. applied for a permit for: 1) loading an indefinite number of barges on a continuing basis as long as a monitoring program does not detect an unacceptable level of adverse impact, and 2) loading an additional 90 barges through June 21, 1991. In compliance with Section 7 of the Endangered Species Act of 1973, the COE formally consulted with the USFWS on the permit application. The USFWS issued a Biological Opinion on the unrestricted shipping proposal in March 1991 stating unlimited barge shipping from the City Dock would jeopardize the continued existence of *L. higginsi*. The USFWS identified two reasonable and prudent alternatives for avoiding jeopardy: 1) relocation of shipping outside the East Channel, and 2) limitation of traffic to 135 barges per year. From 1990 to 1993, Didion, Inc. operated under a permit which authorized the loading/unloading of 135 barges per year from the City Dock. In 1994 and again in 1995, Didion, Inc. operated under a 1-year permit authorizing the loading/unloading of 135 barges per year.

At present, PS&G is operating existing grain and coal docks without any restrictions imposed by the Department of the Army. The Department of the Army permit (91-548-15) previously granted to PS&G to place a spud barge in front of an existing barge loading dock required road access to the facility be relocated to the east to lessen impacts to historic resources.

2.1.2 Operation and Maintenance History

The Rivers and Harbors Act of 1930 (House Document (HD) 290-71-2 and HD 137-72-1) authorized a 9-foot channel project on the Mississippi River, but did not specify an East and West Channel at Prairie du Chien. This lack of specification is true for the entire project. Throughout the system, the actual location of the navigation channel is left undetermined in the authorizing documents. The Rivers and Harbors Act of 1950 (HD 71-81-1) authorized the construction of the commercial and small-boat harbors at Prairie du Chien. In authorizing the commercial harbor, the House Document implies access is available and will be maintained through the East Channel, but the West Channel "is considered the main waterway and has

been continuously maintained." The purpose for maintaining the East Channel is to provide access to the Federal commercial harbor.

Construction of the commercial harbor was completed in 1958. Under project authorization for the commercial harbor, the city of Prairie du Chien was required to: a) furnish without cost to the United States all lands, easements, and rights-of-way necessary for construction and maintenance of the harbor, b) protect the upstream corner of the fill at the commercial harbor with revetment, or furnish funds for this work if accomplished by the United States, and c) provide and maintain at local expense adequate public terminal and transfer facilities, in connection with the commercial harbor, open to all on equal terms. The city of Prairie du Chien operates the facilities at the City Dock in the Federal commercial harbor.

Records do not indicate how much dredging was accomplished for original construction of the commercial harbor. No maintenance dredging has been required since construction was completed. The East Channel was last dredged in 1976. A total of 105,000 cubic yards of material was removed from two cuts upstream of the barge turning basin (Figure 1). Dredging was accomplished to a depth of 13 feet below low control pool elevation. Records show dredging was also accomplished in the vicinity of the East Channel in 1935, but there is no indication of the location or the quantity. Channel maintenance activities in the East Channel have also been highly controversial. In 1976, large numbers of freshwater mussels including the Federally endangered *L. higginsi* were destroyed as a result of dredging. In 1981, the COE proposed dredging in the East Channel in conjunction with emergency repairs to the Highway 18 bridge. However, the USFWS determined the proposed dredging was likely to jeopardize the continued existence of *L. higginsi*, and the dredging portion of the project was not completed.

2.1.3 State of Wisconsin Regulatory History

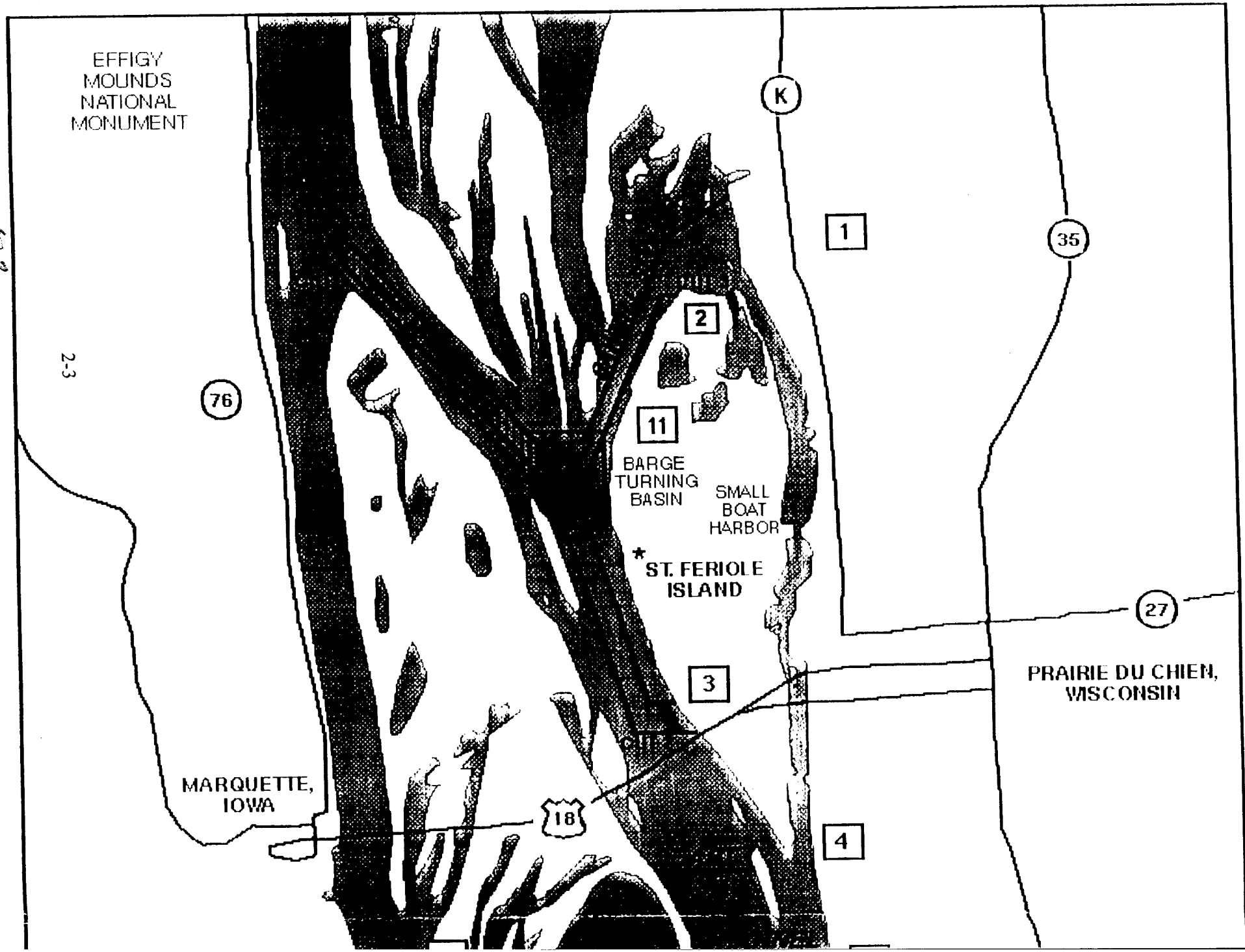
The use of the north end of St. Feriole Island for sand and gravel extraction and for commercial barge transloading operations has been under State regulatory permitting since the late 1970's. State water regulatory permits have been issued to PS&G related to dredging enlargements to Sawmill Slough for the primary purposes of gravel extraction and deepening for harbor use (1979 and 1988) [expired; extension requested]; single dock and associated pile cluster placement for grain loading operations (1981); shoreline grading and riprap placement (1992); and temporary dock (1992). In addition, there has been a pending application since 1983 for use of a portion of Sawmill Slough for barge fleeting. A State air pollution control permit associated with the grain transfer operation was granted after-the-fact in 1985.

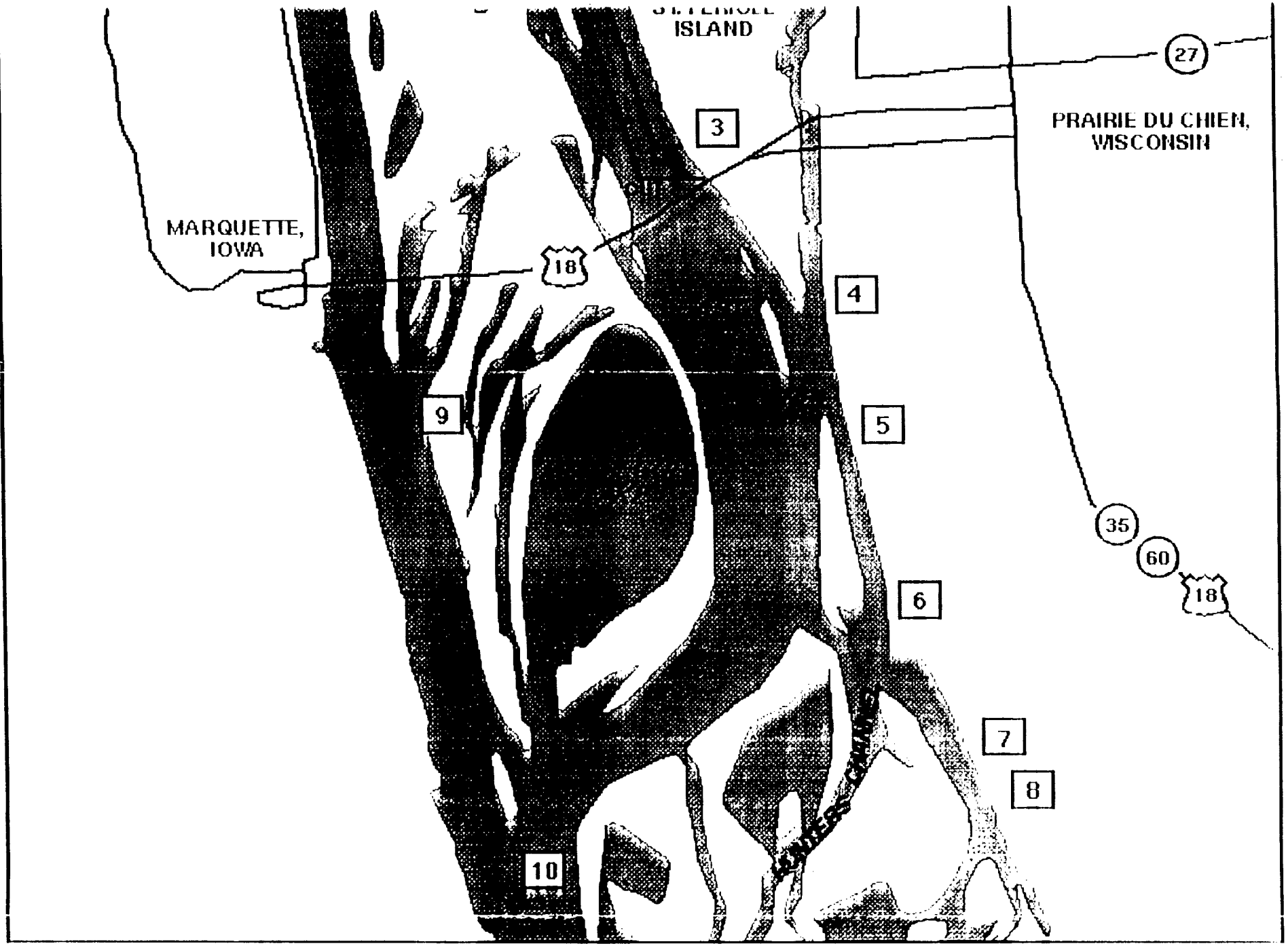
2.1.4 Proposed Actions

2.1.4.1 Prairie Sand and Gravel, Inc. Permit Proposal

The current permit application is a variation of others proposed in the past by the applicant, although all proposals have been premised on the desire of the applicant, and others, to

FIGURE 1. LOCATION MAP, EAST CHANNEL UPPER MISSISSIPPI RIVER AT PRAIRIE DU CHIEN, WI




ISLAND
27
PRAIRIE DU CHIEN,
WISCONSIN
3
MARQUETTE,
IOWA
18
4
9
5
35
60
18
6
7
8
10
HARBOR ALTERNATIVES
1 SWINGLE SITE
– HISTORIC DREDGE CUTS



HARBOR ALTERNATIVES

1. SWINGLE SITE
2. PRAIRIE SAND AND GRAVEL
3. CITY DOCK
4. DEPOT
5. FS
6. SEWER PLANT
7. PRAIRIE CAMPGROUND
8. BLOYER
9. MCGREGOR ISLE
10. INDIAN ISLE
11. NATIONAL DECORATIVE METALS

▥ – HISTORIC DREDGE CUTS

▬ – PROPOSED DREDGE CUTS

★ St. Feriole Island: National Register of Historic Places - Archeological and Historic District. Includes Villa Louis, Dousman Hotel, Brisbois House, and Astor Fur Warehouse - National Historic Landmarks.

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MILES

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expand barge transloading facilities on the Wisconsin side of the Mississippi River in the Prairie du Chien area. In 1982, the applicant proposed to develop the Swingle site (part of this proposal) as an alternate harbor location to the present island facility. A City-sponsored harbor siting study concluded the previous year had identified the Swingle site as a top prospect for future harbor development. PS&G's proposal included three docks on the Swingle site (one grain, one coal and one maintenance), a commodity conveyance system from the rail-head on the island across St. Feriole Slough to the mainland Swingle site, and a phase-out of the island harbor operations in favor of more recreational based uses. The City was initially included as a co-applicant in this proposal, but later dropped out due to a voter referendum that was not supportive of City participation at the Swingle location. The applicant abandoned this development proposal in 1984 when performance conditions attached to the proffered permits related to monitoring environmental impacts were not acceptable to him. The applicant provided partial financial support for environmental monitoring conducted by the State and Federal Government over the next 2 years to answer some of the environmental concerns raised in the review of this proposal.

In 1989, a first version of the present proposal was submitted by the applicant. This proposal differed from the 1982 proposal in that harbor development was still slated solely for the Swingle site, but the conveyor system across St. Feriole Slough was replaced with a rail and truck bridge. The combined use of the PS&G and Swingle sites is described in Public Notice (91-1040-15) issued September 6, 1991 by the Regulatory Branch, COE (see Appendix A). Subsequent to publication of the public notice and after consultation with the WDNR, Wisconsin Department of Transportation (WDOT), and COE on the probable infeasibility of such a bridge, the proposal was amended in 1992 to its present appearance. Figures 2, 3, and 4 show the revised plans. The proposal now calls for split-location harbor use both on the island (rail transported commodities) and on the Swingle site (truck transported commodities via a new truck route to State Highway 35 which is not shown on Figure 2). Other modifications to the proposal include elimination of a fleeting area proposed at the north end of St. Feriole Island and construction of a channel between Sawmill Slough and the existing borrow pit located on the east side of PS&G. This borrow pit would be used for fleeting barges and would also be the site of two proposed grain loading docks. These docks would be located on the western side of the pit, adjacent to the existing railroad tracks.

The modified plan also includes the following activities at the existing PS&G site: (1) Construction of one new grain loading dock on Sawmill Slough. (2) An addition to the existing grain loading dock. (3) Rebuilding the existing coal unloading dock. (4) Construction of 27 mooring dolphins, each a 10-foot-diameter circular steel bin filled with granular fill and topped with a concrete cap. Each dolphin would extend approximately 10 feet above low water elevation. (5) Riprap on all unprotected shoreline. (6) Upland development including regrading, commodity storage pads for seasonal storage, loading-unloading equipment, and utilities.

The following activities are proposed for the Swingle site under the modified plan: (1) Construction of a commodity unloading dock. (2) Construction of a cleaning and

maintenance dock. (3) Construction of 23 mooring dolphins. (4) Upland development including regrading, commodity storage pads, buildings, water treatment ponds, and other utilities. (5) Construction of a truck access road to State Trunk Highway 35.

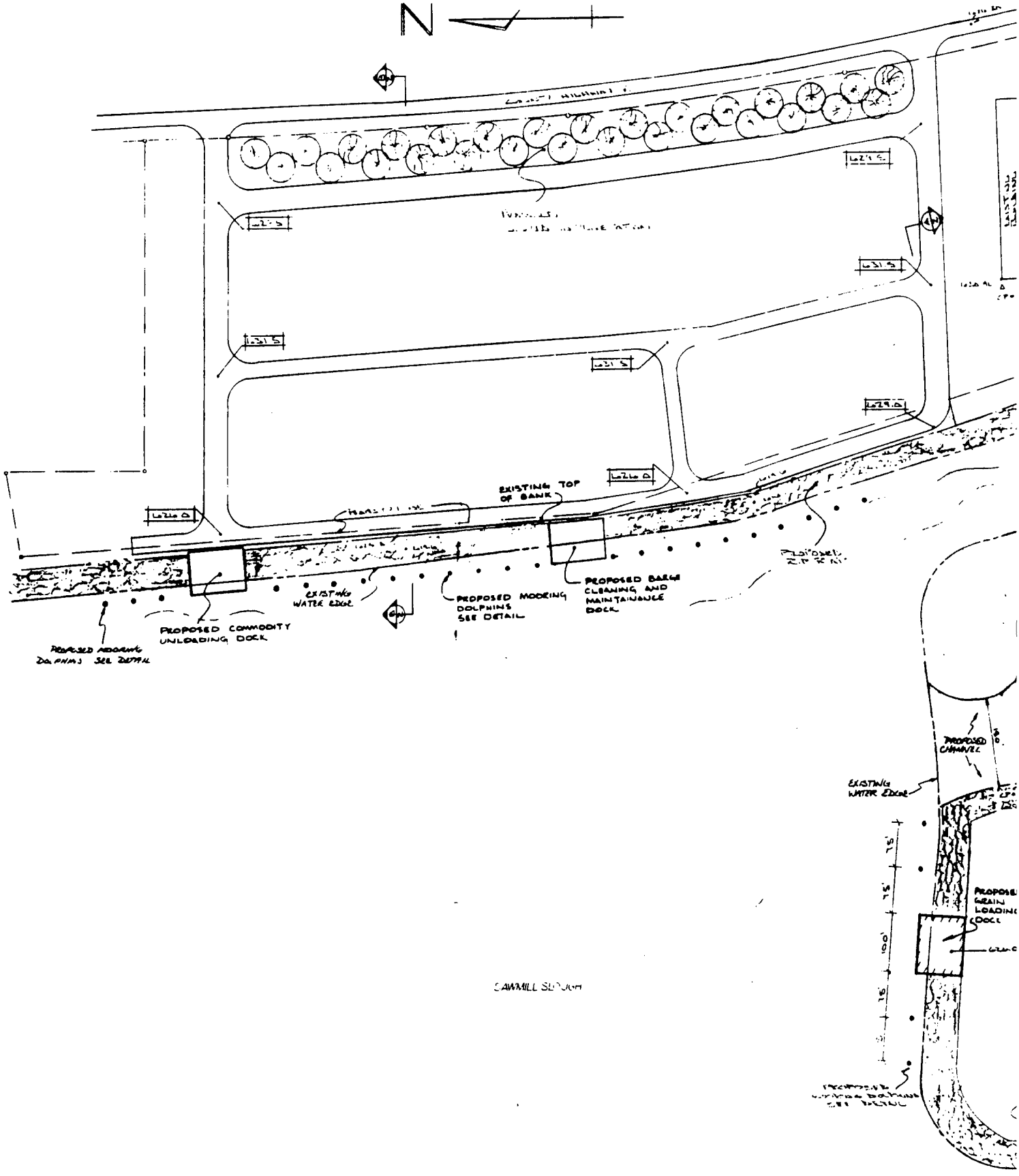
The existing PS&G facility has approximately 1,400 feet of water frontage. To accommodate another grain merchandiser, the applicant proposes to expand 800 to 1,000 feet on the east side of the existing facility. The 1,200 feet of frontage at the Swingle site would be used for barge cleaning operations and off-loading of salt and fertilizer. Figure 5 shows yearly totals of the actual number of loaded barges departing from the harbors at Prairie du Chien. In 1991, 230 loaded barges used facilities at PS&G. The owner of PS&G estimates that approximately 500 barges per year would be loaded if the permit was granted.

2.1.4.2 Corps of Engineers Maintenance of East Channel

The East Channel is used primarily as an access channel to the City Dock and the PS&G terminal. Both small and large recreational craft, including the steamboat *Mississippi Queen*, also use the East Channel. Full-size tows do not normally enter the East Channel. Barges are fleeted in the main channel and shuttled to the City Dock or PS&G by workboats. Workboats usually move one or two loaded or unloaded barges at a time. Total annual traffic is limited to several hundred barges (Figure 5). The criteria used for maintenance of the main stem navigation channel are not justified in the East Channel due to the comparatively low level of use the East Channel receives. Therefore, a minimum 100-foot-wide navigation channel at least 9 feet deep should be maintained in the East Channel to assure access is available to the Federal commercial harbor. The COE would conduct periodic surveys of the East Channel at intervals of approximately 3 years or upon request of project users. If surveys indicated channel widths less than 200 feet between the 9-foot contours or shoals restricting use at the City Dock, a closer review and evaluation would be initiated to determine if dredging would be necessary.

A review of the available historic channel survey information reveals that, with the exception of the 1976 survey, at least a 200-foot-wide channel has always been present between the 9-foot contours. The 1976 survey indicated shoals across the channel on the upstream entrance to the East Channel and a small shoal restricting the channel approximately 4,500 feet downstream of the upstream entrance. The most recent survey (1992) indicated a minimum width of 250 feet between the 9-foot contours and generally greater than 300-foot widths available throughout the East Channel. For most areas of the East Channel, it is believed a 200-foot channel is self-maintaining between the 9-foot contours. Because of these natural conditions and the level and type of navigation traffic using the East Channel, dredging requirements are expected to be low.

The COE has formulated a Long-Term Channel Maintenance Plan (LTCMP) that would ensure access to the Federal commercial harbor according to the channel criteria described above (see Appendix B). An accurate projection of future dredging requirements is not possible; however, for planning and evaluation purposes, a prediction of the most probable



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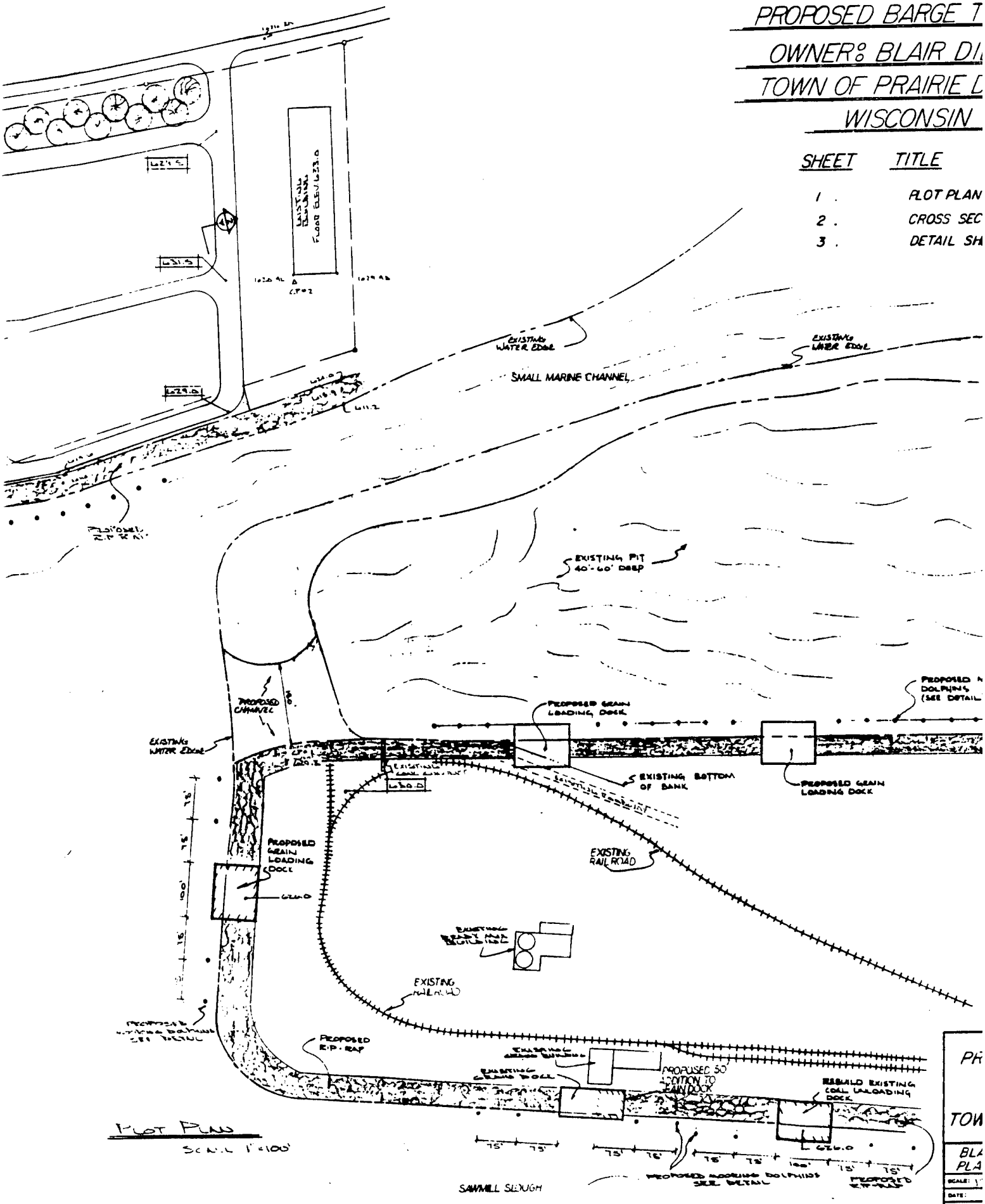
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TOWN OF PRAIRIE D

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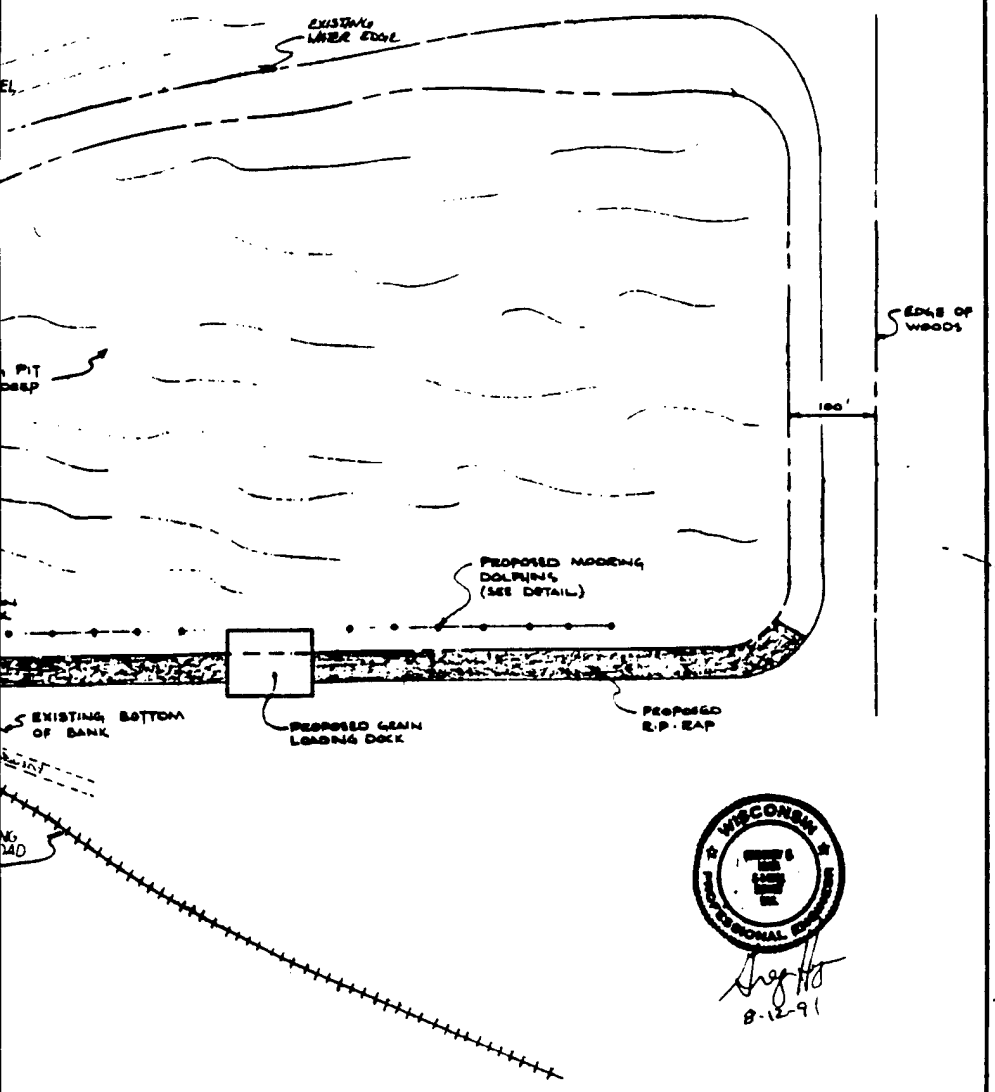
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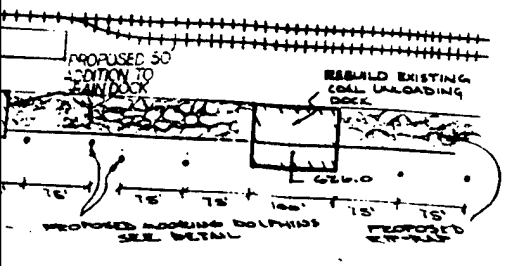
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PROPOSED BARGE TERMINAL
OWNER: BLAIR DILLMAN
TOWN OF PRAIRIE DU CHIEN
WISCONSIN

SHEET	TITLE
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2.	CROSS SECTIONS
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WISCONSIN PROFESSIONAL ENGINEER

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Figure 2:

PROPOSED BARGE TERMINAL
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TOWN OF PRAIRIE DU CHIEN, WI

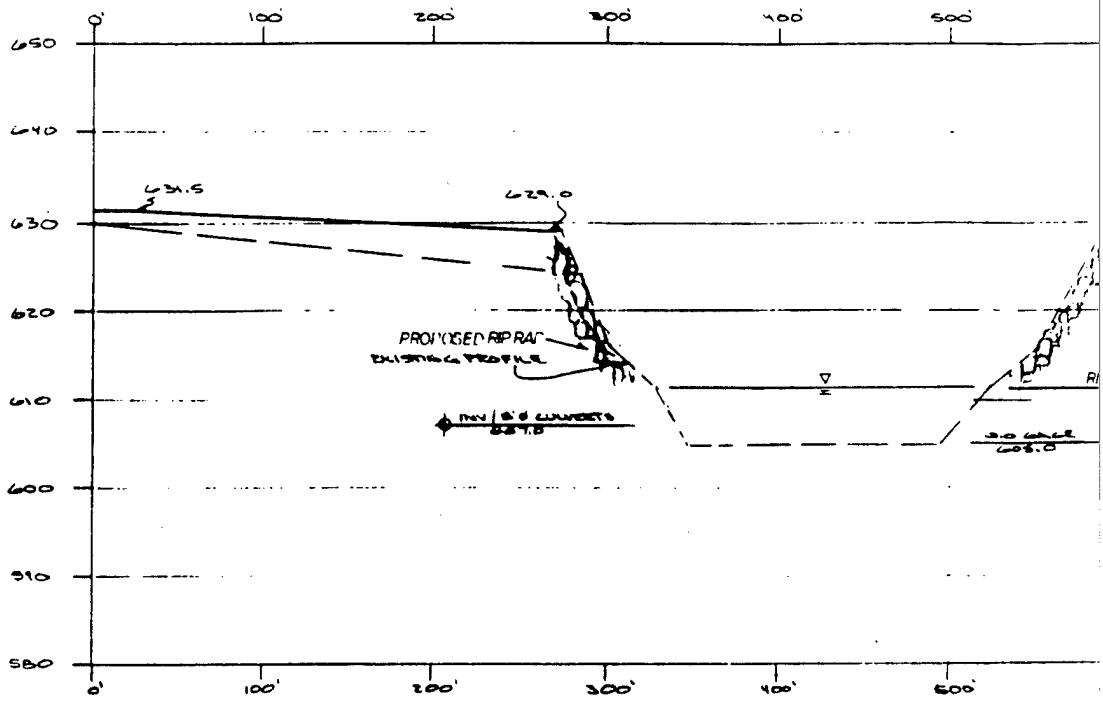
BLACKHAWK ENGINEERING LTD.
PLATTEVILLE, WISCONSIN

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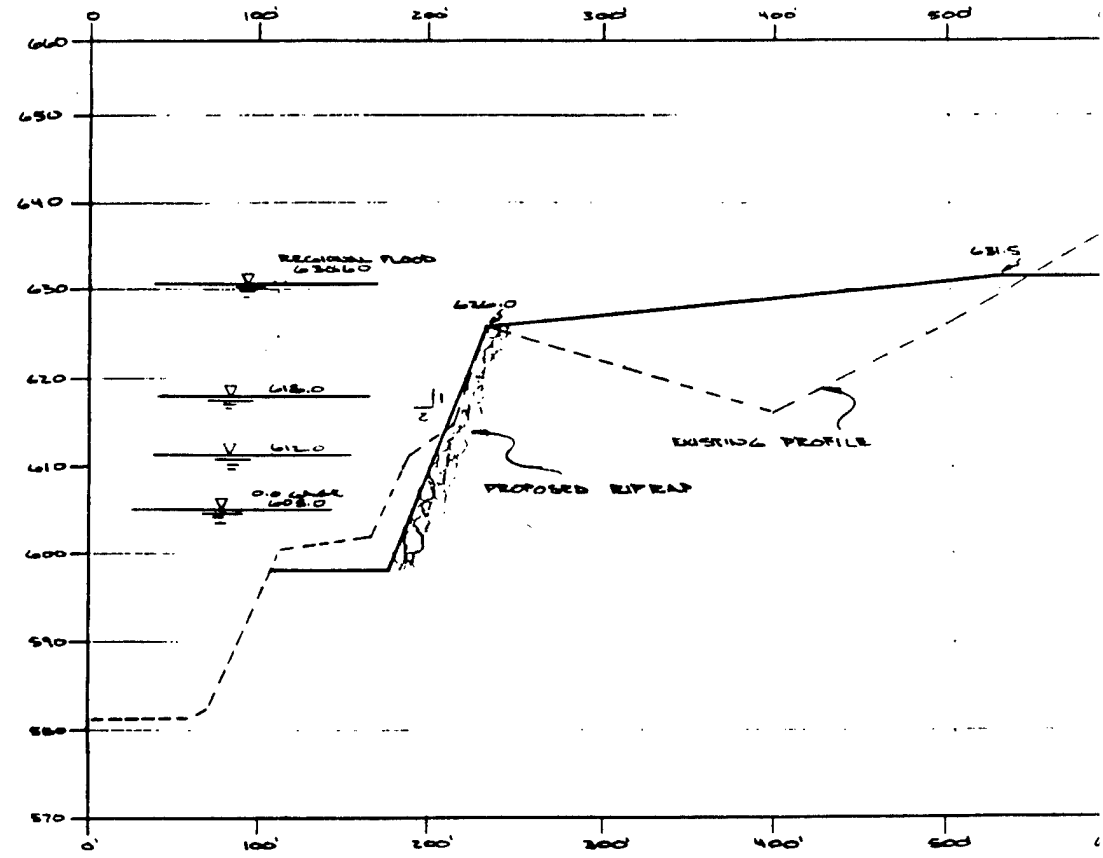
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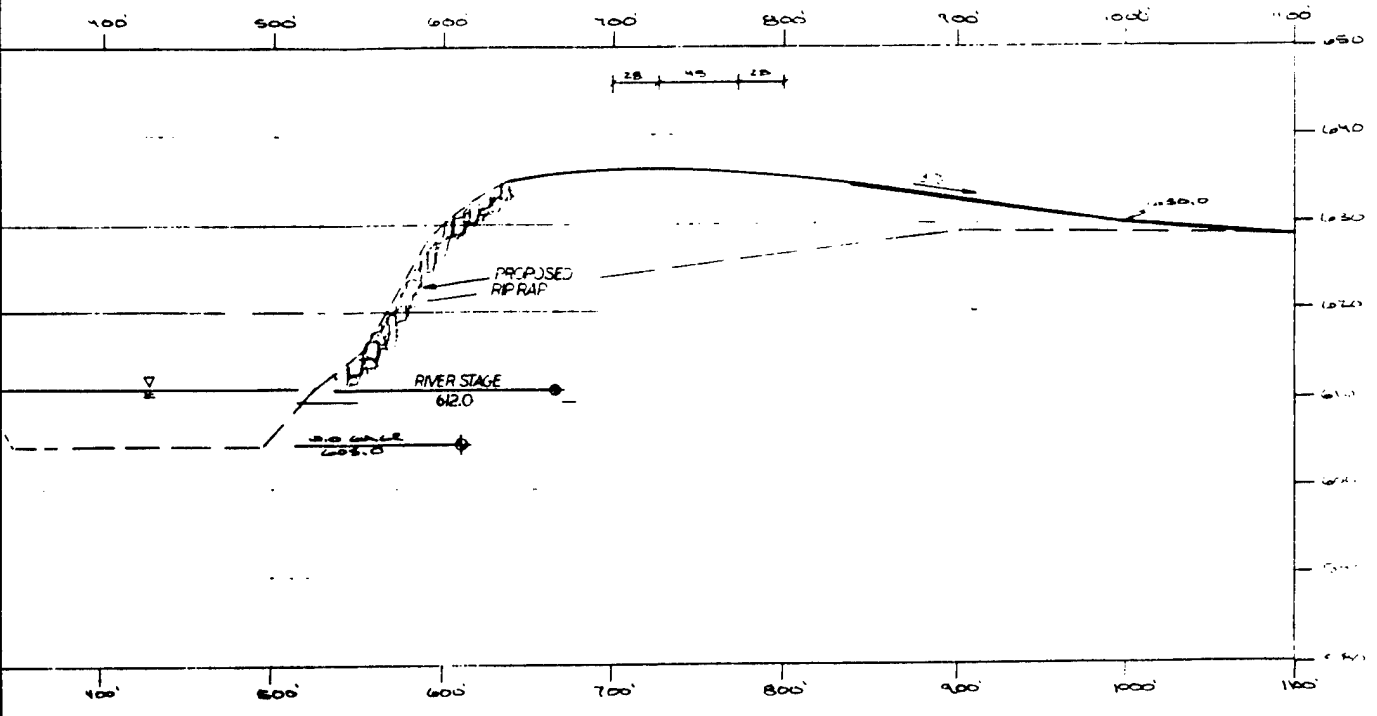


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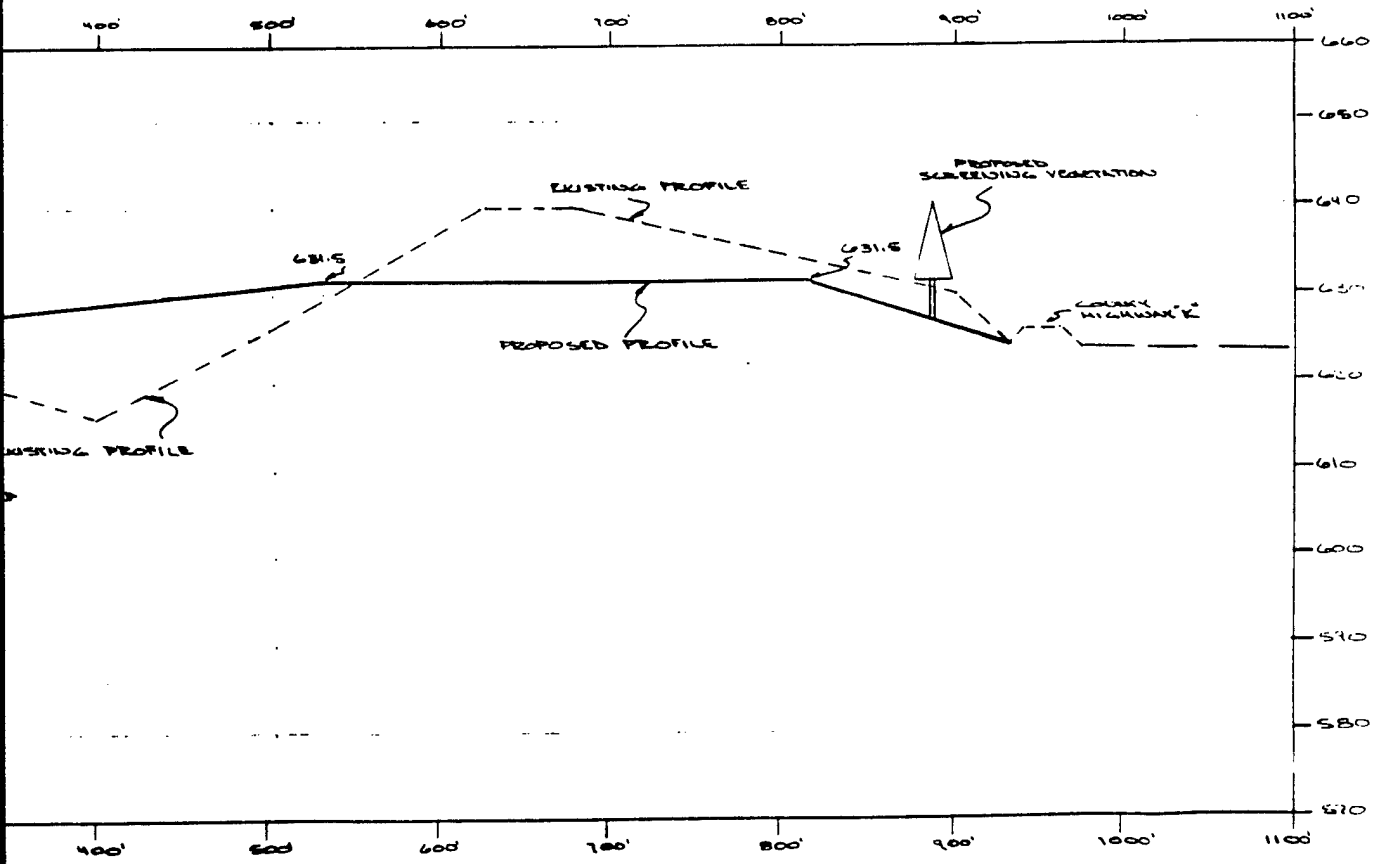
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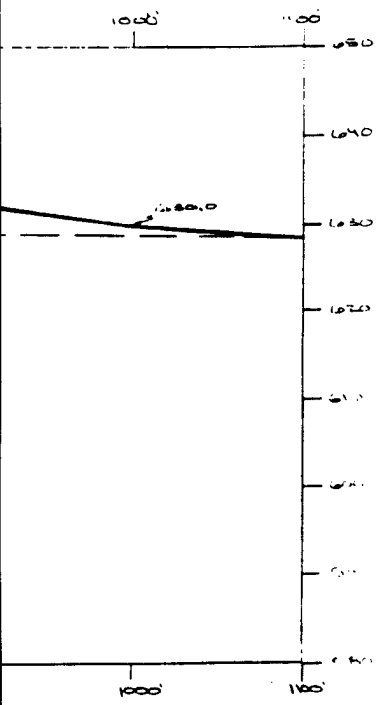
BRIDGE CROSS SECTION A-2

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TYPICAL CROSS SECTION B-2

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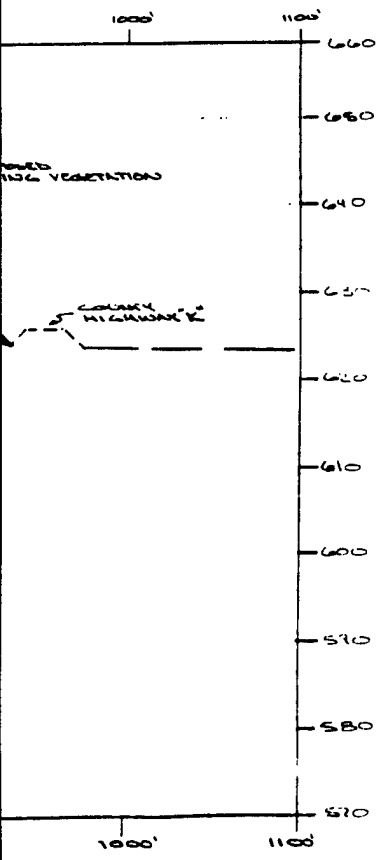


Figure 3:

PROPOSED BARGE TERMINAL
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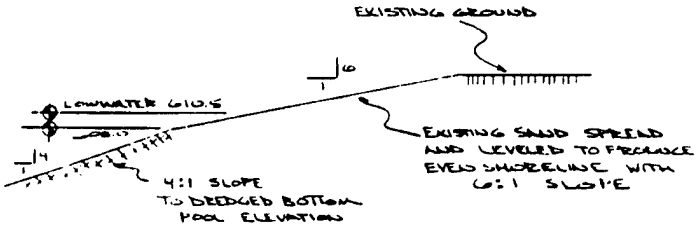
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SEATTLE, WASH.

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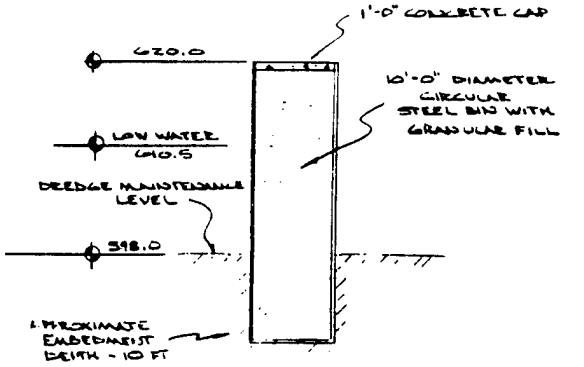
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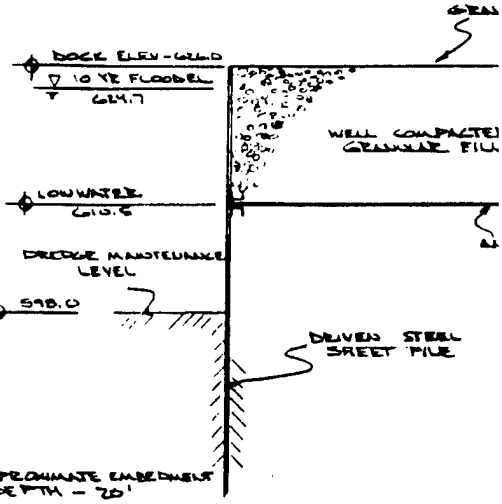
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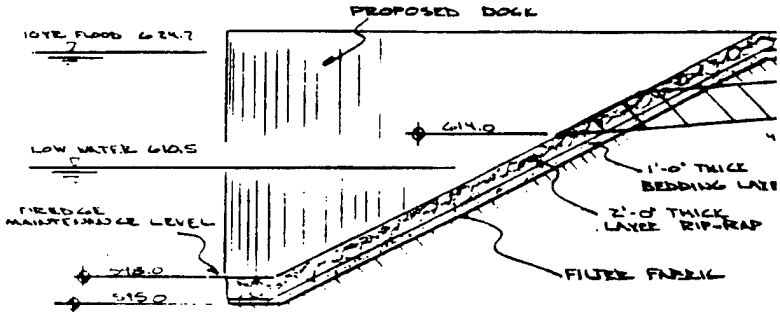
PROPOSED MOORING DOLPHIN

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PROPOSED MAINTENANCE, GRAIN LOADING AND COAL LOADIN

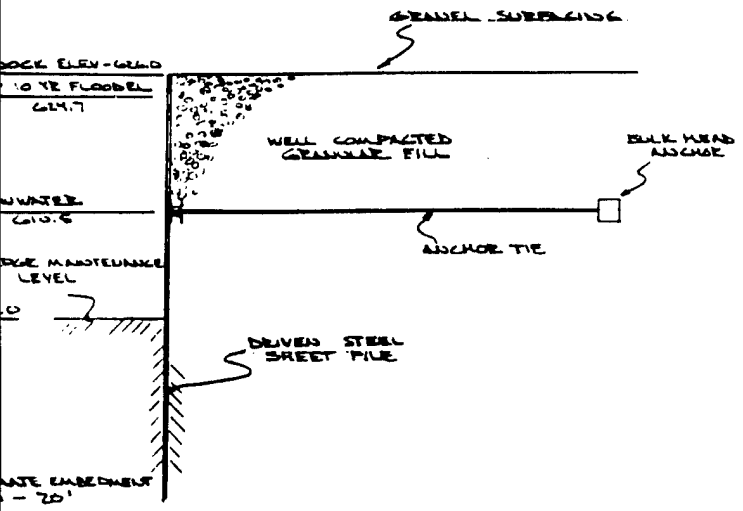
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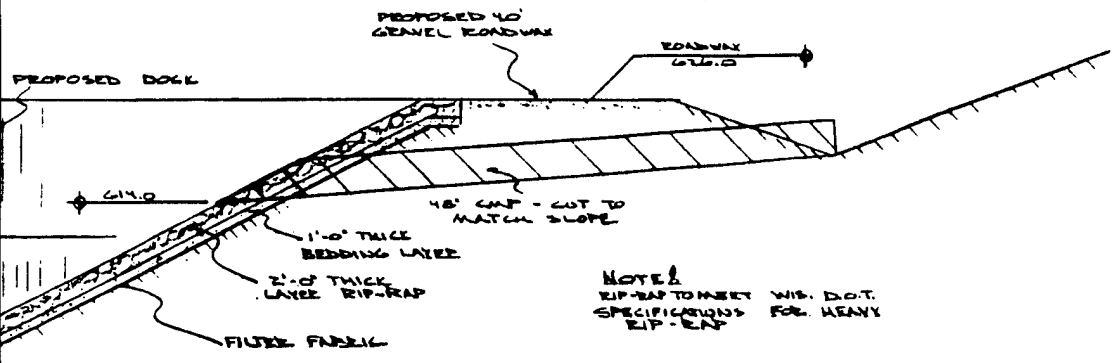
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MAINTENANCE, GRAIN LOADING AND COAL LOADING DOCK

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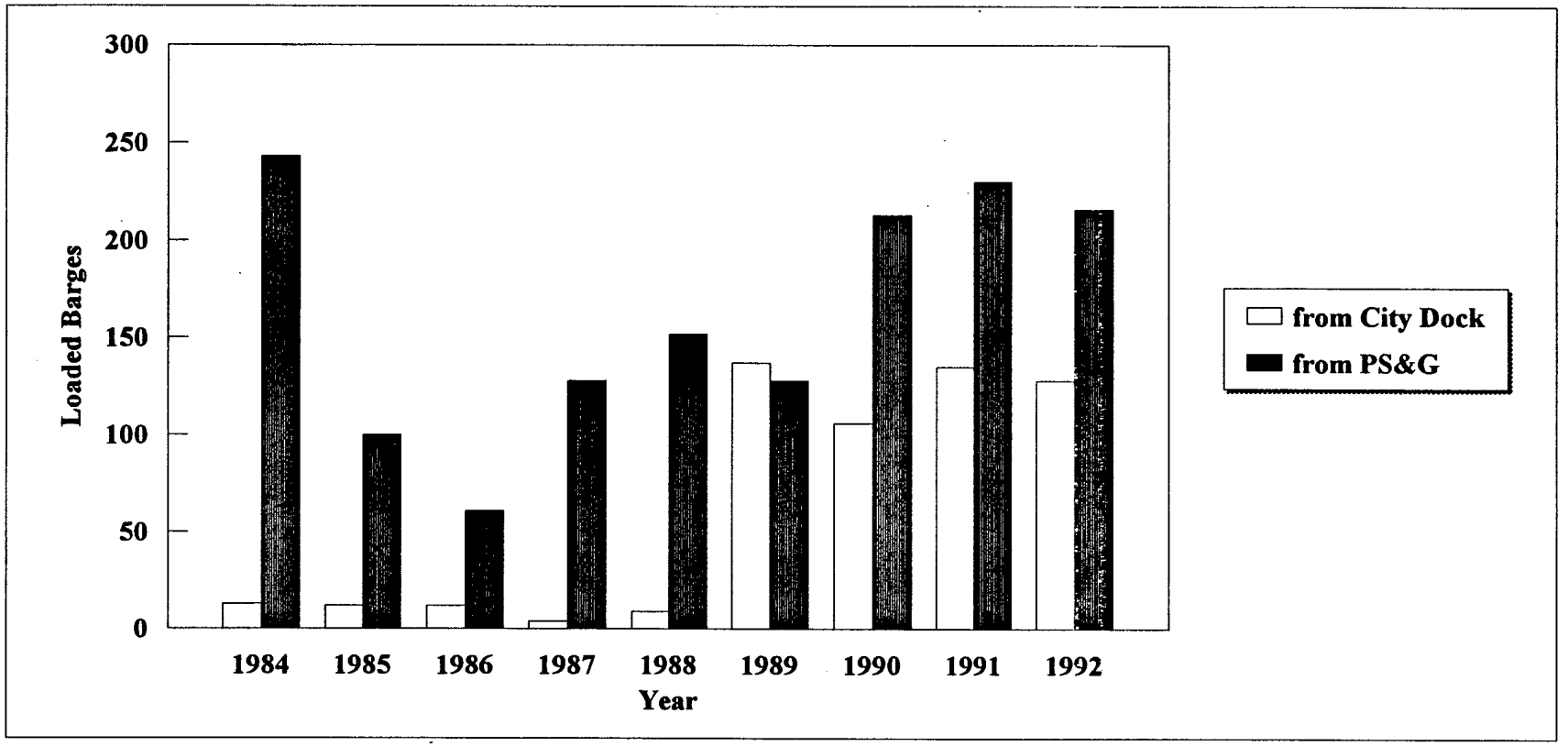
PROPOSED RIP-RAP PROTECTED SHORELINE

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Figure 4:

PROPOSED BARGE TERMINAL
PRAIRIE SAND & GRAVEL
TOWN OF PRAIRIE DU CHIEN
BLACKHAWK ENGINEERING LTD. PLATTEVILLE WISCONSIN
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Figure 5. Loaded barges shipped from Prairie du Chien harbors, 1984 - 1992.



Source: Didion, Inc. and Prairie Sand and Gravel, Inc. records.

future is provided. The projections given are based on previous dredging experience, hydrographic surveys between 1976 and 1992, consideration of navigation requirements and review by Hydraulics and Hydrology Branch, Engineering and Planning Division, COE. Future dredging is projected for two areas under the LTCMP (identified as cut 1 and cut 2 on Figure 1). Cut 1 is located at the northern (upstream) entrance of the East Channel and would be dredged once in the 40-year period of the LTCMP (2.5-percent frequency). An estimated 2,500 cubic yards of material would be removed from an area 100 feet wide, 450 feet long, and having a 1.5-foot average face (11.0 feet deep).

Cut 2 is located immediately in front of the City Dock in the Federal commercial harbor. Dredging was projected to be required two times in the next 40 years (5-percent frequency) to provide access to the Federal commercial harbor. The area that would have been dredged is 100 feet wide, 350 feet long and has a 1.5-foot average face (11.0 feet deep). Approximately 1,900 cubic yards of dredged material would have been removed during each dredging event; however, in its Biological Opinion of June 28, 1993, the USFWS opposed dredging cut 2. Therefore, dredging of cut 2 was not proposed under any of the alternatives considered in detail (see Section 2.1.4.3)

2.1.4.3 Restrictions on Proposed Actions

In August 1992, the USFWS requested the COE initiate consultation pursuant to Section 7 of the Endangered Species Act regarding the channel maintenance actions proposed by the COE and the harbor development project proposed by PS&G. The COE prepared and provided to the USFWS a biological assessment of the impacts of the proposed actions on 17 Federally listed threatened or endangered species that occur or could occur in the East Channel area (see Appendix D). The COE's assessment concluded that none of the species listed, except the Higgins' eye pearly mussel (*L. higginsi*), would be affected by the proposed channel maintenance and harbor development projects. The USFWS concurred with this assessment.

The consultation between the COE and USFWS was concluded on June 28, 1993, when the USFWS issued a Biological Opinion on the proposed actions (see Appendix C). Based on an evaluation of the direct, indirect and cumulative effects of the proposed actions, the USFWS determined that unrestricted shipping and channel maintenance activities were likely to jeopardize the continued existence of *L. higginsi*. However, the USFWS provided three reasonable and prudent alternatives which, if adopted, would avoid the likelihood of jeopardizing *L. higginsi*. The reasonable and prudent alternatives included:

1) Suspension of channel maintenance dredging in the East Channel between the Highway 18 bridge and the barge turning basin area of the East Channel (i.e., suspension of dredging in cut 2).

2) Inclusion of requirements for hazardous material spill prevention and response planning in any Army permit granted to PS&G.

3) Monitoring of shipping from the City Dock; re-initiation of formal Section 7 (Endangered Species Act of 1973) consultation with the USFWS if shipping (barges departing from the City Dock) exceeds 135 permitted and 15 incidental barges per year.

These reasonable and prudent alternatives are binding. The alternatives considered in further detail in this final EIS include implementation of these reasonable and prudent alternatives. Alternatives that would increase the number of barges using the City Dock beyond 135 permitted and 15 incidental barges per year or that included dredging of cut 2 were eliminated from further consideration.

2.1.5 Other Ongoing Studies

The St. Paul District, COE initiated a Section 107 study to investigate the feasibility of relocating the existing Federal commercial harbor in 1993. However, the study was suspended indefinitely pending a determination on the harbor expansion permit this EIS addresses.

2.1.6 Need for an Environmental Impact Statement

Section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA) requires that an Environmental Impact Statement (EIS) be prepared for major Federal actions significantly affecting the quality of the human environment. The Wisconsin Environmental Policy Act (WEPA) contains analogous provisions for State of Wisconsin actions [Sec. 1.11, stats.].

The primary determination to be made on the need for an EIS is if there would be significant effects on significant resources.

Resources are identified as significant based on institutional, public, or technical recognition. The following resources in the Prairie du Chien/East Channel area are recognized as significant: (1) Freshwater Mussels - The East Channel supports the most diverse and abundant freshwater mussel assemblage in the Mississippi River including the commercially harvested washboard and three-ridge. (2) Federally and State Listed Threatened and Endangered Species - The East Channel supports the largest known population of the endangered species *L. higginsi*, plus significant populations of seven State listed mussels. (3) Cultural Resources - St. Feriole Island has been determined eligible for the National Register of Historic Places as an Archeological and Historic District. Prior to this determination, the Astor Fur Warehouse, the Michael Brisbois House, the Dousman Hotel, the Rolette House, and the Villa Louis were listed individually on the National Register. All of the properties, except the Rolette House, are also National Historic Landmarks. Across the Mississippi River channel to the north is the Effigy Mounds National Monument. In addition to those properties currently listed on or determined eligible for the National Register, numerous archeological sites exist in the vicinity of Prairie du Chien. Most of these sites have not been evaluated for individual significance to the National Register, but many would appear to qualify, if evaluated. In addition to those sites listed on or determined eligible for the

National Register, there is an abundance of burial sites in the vicinity of Prairie du Chien, and several prehistoric burial mounds exist on St. Feriole Island and mainland Prairie du Chien. All human burials within Wisconsin are protected under State law. (4) Mississippi River Nine-Foot Channel Project - The existence of the Federal project allows commercial navigation and its economic benefits to occur. (5) Upper Mississippi River Wildlife and Fish Refuge - The Refuge provides habitat for many fish and wildlife species, including nationally significant populations of migratory birds. (6) Wisconsin and Southern Railroad (W&SRR) - The W&SRR is the sole rail carrier of grain from southern Wisconsin to the Port of Prairie du Chien.

Significant effects, as defined by NEPA and WEPA, require consideration of both context and intensity impacts. Context means the significance of an action must be analyzed in several contexts, such as: society as a whole, the affected region, the affected interests, and the locality. Intensity refers to the severity of impact.

Impacts from individual projects, as well as cumulative impacts of port facility development, barge fleeting, dredging, and navigation activities could result in significant impacts to the identified significant resources in the East Channel/Prairie du Chien area. Irreversible and irretrievable commitment of resources could occur through permit actions or maintenance activities, limiting environmentally sustainable development in the area.

2.2 Project Authority

2.2.1 Corps of Engineers

Regulatory Authority

The COE has been involved in regulating certain activities in waters of the United States since 1899. Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any navigable water of the United States. The construction of any structure in or over any navigable water of the United States, the excavating from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters is unlawful unless the work has been authorized by the COE. Pursuant to Section 404 of the Clean Water Act, the COE regulates the discharge of dredged or fill material into waters of the United States, including wetlands.

Operation and Maintenance Authority

The Rivers and Harbors Act of 1930 (see HD 290-71-2 and HD 137-72-1) authorized a 9-foot channel project on the Mississippi River, but did not specify an East and West Channel at Prairie du Chien. This lack of specificity is true for the entire project. Throughout the system, the actual location of the navigation channel is left undefined in the authorizing documents. A channel width of 300 feet is specified. The Rivers and Harbors Act of 1950 (see HD 71-81-1) authorized the commercial and small-boat harbors at Prairie du Chien. HD

71-81-1 indicates the 9-foot channel project "is located in both channels at Prairie du Chien but the West Channel is considered the main waterway and has been continuously maintained." In authorizing the commercial harbor, the House Document implies access is available and will be maintained in the East Channel.

2.2.2 Wisconsin Authority

The current proposal would require a number of new permits and approvals. State water regulatory permits would be required for structures and deposits in State navigable waters (s. 30.12, stats.) [for dock faces, pile clusters, riprap]; enlargement and protection of waterways (s. 30.19, stats.) [for connecting non-connected gravel pits to Sawmill Slough and for bank grading and stabilization]; removal of material from beds of navigable waters (s. 30.20, stat.) [for dredging]; and barge fleeting (NR 327, Wi. Adm. Code). Ancillary improvements on the island portion of the harbor, such as storage facilities and access improvements, would have to be in compliance with county and State floodplain regulations (Crawford County, and NR 116, Wi. Adm. Code) [the Swingle site was found to be in compliance with county/State floodplain regulations in 1982]. A State air pollution control permit would be required for commodity transfer and conveyance facilities that are direct sources of dust and other significant air emissions (chapter 144, stats., NR 400, Wi. Adm. Code). Also, discharge permits may be required for storm water runoff from commodity storage areas and contact water (Chapter 147, stats.).

2.3 Purpose and Need

The purpose is to provide for environmentally sustainable public and/or private commercial navigation, including harbor and terminal facilities, in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin, to meet the need for continued growth and development.

3.0 ALTERNATIVES

The scope of alternatives the COE and State must consider is set forth in the Council on Environmental Quality regulations found at 40 CFR Parts 1500-1508 which implements the procedural provisions of the National Environmental Policy Act (42 U.S.C. 4371 et. seq.). Additional procedures for implementing COE NEPA requirements for Federal water resource development projects and regulatory activities are found at 33 CFR Parts 230 and 325.

In addition, the COE and the U.S. Environmental Protection Agency (EPA) have promulgated regulations, found at 33 CFR Parts 320-330 and 40 CFR Part 230, respectively, that set forth procedures for evaluating applications for Department of the Army permits. These procedures include evaluating all practicable alternatives. Practicable alternatives are those that are available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose. Further, if it is otherwise a practicable alternative, an area not presently owned by a permit applicant which could be reasonably obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.

The Wisconsin Environmental Policy Act (WEPA) closely follows NEPA. WEPA and WDNR regulations NR 150 set forth procedures, similar to the Federal procedures, which the WDNR must comply with in evaluating water resource development projects and regulatory activities.

Alternatives upon which decisions can be based are defined by a combination of regulatory and operation and maintenance alternatives. Regulatory alternatives include denial of the permit, denial of the permit and revocation of existing permits, or issuance of the permit, with or without conditions. Alternatives for operation and maintenance of the Federal harbor include continuation of operation and maintenance according to the LTCMP, or deauthorization of the Federal harbor with no further maintenance dredging of the East Channel. A combined decision regarding the State and Federal regulatory permit actions and the COE's operation and maintenance activities will be made.

For the permit application by PS&G, a combination of factors were considered in determining reasonable and practicable alternatives for detailed study. The primary sources of information for this determination included a previous harbor siting study conducted by the Mississippi River Regional Planning Commission (1990) for the City of Prairie du Chien, and a Draft Environmental Impact Statement prepared by the Wisconsin Department of Natural Resources (1990).

The Mississippi River Regional Planning Commission study identified 11 potential harbor sites with a total of 22 options for possible alternative development of a new municipal port facility. This study developed an economic and environmental analysis and ranking system to compare alternatives and eliminated from consideration for recommendation those sites having unacceptable environmental and infrastructure cost impacts. Factors considered in the

economic analysis included road, rail, conveyor, and harbor costs, as well as electric utility and floodproofing costs. The environmental analysis was habitat based and ranked six major environmental factors, including: endangered mussels, water quality, nongame species, fish and mussels, wildlife, and air quality. Impacts to cultural resources and social impacts were also considered in the evaluation; however, they were not formally graded or ranked.

The WDNR EIS focused on the need for a single consolidated harbor in Prairie du Chien, recognizing the desirability of minimizing negative impacts to aquatic resources and recreational and historic uses of the East Channel and vicinity. A single harbor would consolidate land use and residential disruptions in and around the city. The WDNR EIS relied on the study previously done by the Planning Commission in selecting for further study those sites that would meet its objective of establishing a single harbor in Prairie du Chien.

In addition to the barge transloading facilities at Prairie du Chien, facilities exist in the general area at Clayton and Marquette, Iowa, which could possibly be expanded to account for the increased demand for shipping. However, much of the demand for increased barge shipping comes from central Wisconsin, via the recently upgraded Middleton-Prairie du Chien ("short-line") rail line. The significant reciprocal relationship between the railroad and barge terminals in the Prairie du Chien area is identified in the Harbor Siting Plan when the Mississippi River Regional Planning Commission (1990) states "The traffic generated by the barge terminal(s) is essential to the continued operation of the Middleton-Prairie du Chien line, and some would say, the entire railroad, and the success of the terminal as a competitive enterprise is dependent upon rail access." This intimate tie between the barge terminal facilities and the rail link limits practicable harbor alternatives to the Prairie du Chien area served by the railroad and accessible by river barges as well as vehicles.

The current joint-action EIS being prepared by the COE and the WDNR selected for detailed study alternatives that meet the defined purpose and need and that are practicable and reasonable in terms of applicable regulations and authorities.

The alternatives evaluation began with reexamination of the previous evaluations of sites identified by the Planning Commission and WDNR. Reasonable and practicable alternative locations for the permit applicant to expand existing operations, including the facilities proposed for the Swingle site and existing PS&G terminal, were identified. This evaluation recognized that PS&G is an existing operation and that denial of the requested permit would not include foreclosing operation of that facility.

Factors considered in determining reasonable alternatives warranting detailed study included: availability of rail and truck access to the site; feasibility of barge access, including initial and maintenance dredging requirements; potential impacts on freshwater mussels, including the Federally listed endangered species, *Lampsilis higginsi*; potential effects on cultural resources; and overall economic cost.

The presence of an exceptional population of *L. higginsi* in the East Channel was known prior to the 1976 dredging in the upper East Channel. At that time, there was a consensus among the resource agencies that the lower East Channel provided habitat of the same or greater quality for this species than the area to be dredged between the barge turning basin and the main channel. The COE, WDNR and USFWS agreed to limit dredging to the area upstream of the Highway 18 bridge in order to protect mussel resources in the lower East Channel.

This factor (i.e., limiting dredging and to some extent commercial navigation to the upper East Channel) was considered in the identification of the alternatives to be considered in the present evaluation. However, limiting commercial navigation to the area north of the Highway 18 bridge has also resulted in concerns, including: impacts to the mussel population throughout the entire East Channel if a chemical or petroleum spill should occur; impacts to the mussel populations as a result of commercial navigation traffic and dredging; and continued impacts to cultural or archeological and historic resources on St. Feriole Island if commercial harbors continue to exist on the island. In addition, the actual extent of the *L. higginsi* population south of the Highway 18 bridge is not well characterized. Recent survey data indicate the best mussel habitat and most viable populations may exist in the area between the City Dock and the barge turning basin.

This information emphasized the need to identify and evaluate all reasonable alternatives, including those in the lower East Channel, that would provide access to the Federal commercial harbor and meet the permit applicant's objectives. Alternatives not meeting these objectives were eliminated from further consideration.

3.1 Alternatives Eliminated From Further Consideration

Several alternatives, including some identified in earlier harbor siting studies, e.g., Mississippi River Regional Planning Commission, 1990, were eliminated from detailed study in this EIS. Factors considered in eliminating alternatives included: proximity to Prairie du Chien; site acquisition and development costs; impacts to cultural resources; and impacts to significant natural resources, including endangered species, and wetlands. The locations of all sites considered under this EIS, including those eliminated from further consideration, are shown on Figure 1.

3.1.1 FS Harbor (Alternative E)

FS is the site of a former fertilizer factory located in Prairie du Chien, on the mainland, at Upper Mississippi River (UMR) mile 634.0 in the lower East Channel. Road access is available via Wells Street from Main Street. Rail access is provided by the W&SRR.

The site is owned by the permit applicant, PS&G. In a letter to the COE, the permit applicant has stated that the FS site is not a feasible site for its harbor operation because the number of usable acres and the amount of water frontage are insufficient for barge shipping operations. The site is approximately 2.5 acres in size and has 650 feet of water frontage. Thus, PS&G would also have to continue operating at its existing location in order to meet its

space needs. In effect, this alternative would result in expansion of commercial navigation to another area of the East Channel beyond those areas currently in use.

The entire site is developed and contains buildings and storage areas. No undeveloped habitat remains on the site. The riverbank and shoreline areas contain a few trees and shrubs and provide marginal habitat for small mammals and songbirds.

In order to develop the site, PS&G would have to dredge extensively in either the southern East Channel or Hunter's Channel to provide adequate barge access to the site. The most viable option for providing barge access to the site would involve dredging a 100-foot-wide and 9-foot-deep navigation channel through Hunter's Channel. Based on 1992 depth soundings, the COE estimates approximately 70,000 cubic yards of material would have to be removed to construct a channel of these dimensions. The estimated cost would be $350,000.

Problems with this alternative include conflicts with the Refuge and lack of an identified dredged material disposal site. Also, there is very little information available regarding mussel populations and other habitat values in Hunter's Channel and Slough. Both Federal and State permits would be required before this site could be developed as a barge terminal.

The impacts of barge shipping through the aquatic habitats in Hunter's Slough, an undisturbed tertiary channel (Wilcox 1993), and the continued impact of barge traffic navigating the northern one-third of the East Channel and Sawmill Slough to the PS&G facility would be substantial. Wetland areas adjacent to Hunter's Channel would be affected by barge traffic through this area.

The Hunter's Slough area is rich in fish and wildlife species. The extensive dredging required in Hunter's Slough to provide access to the FS site and the levels of commercial traffic which would navigate the slough would cause substantial disturbance to aquatic resources and minor disturbance to wetlands, areas important to fish and wildlife.

Reducing navigation traffic and channel maintenance activities in the northern portion of the East Channel would have a minor beneficial impact on freshwater mussels. However, the mussel resources in Hunter's Slough are unknown at this time. No quantified data on mussel populations exists for Hunter's Channel; therefore, it is impossible to predict a quantitative take for this alternative. Use of this site would require dredging of a navigation channel in Hunter's Channel. This action could possibly have substantial adverse effects on mussel populations, including *L. higginsi*, in this channel. It is likely additional mussel survey data would be required if the present permit application by PS&G were denied and a permit to develop a barge terminal at this site were applied for.

Dredging and commercial navigation in Hunter's Channel would have an adverse effect on the Hunter's Channel Archeological District, a series of prehistoric archeological sites that have been determined eligible for the National Register of Historic Places.

Two archeological sites are recorded for the FS site, the site of the former Trade Silver Mound (47 CR 62) and a small site that has not been assigned an official site number (Wisconsin Archeological Site Inventory, ASI #9506). The Trade Silver Mound no longer exists at this location. While the FS site has been disturbed by development over the years, it is possible that deeply buried archeological deposits could exist at this location, and expansion of harbor facilities here could adversely affect these remains.

In addition to the archeological sites at the FS site, dredging and navigation in Hunter's Channel, required to get barges to the FS site, would have an adverse effect on at least four sites located in Hunter's Channel (47 CR 312-313, 47 CR 360, and 47 CR 461). Three of the four sites are part of the Hunter's Channel Archeological District and have been determined to be eligible for the National Register. Selection of this alternative would have a positive effect upon the historic resources on St. Feriole Island by reducing or eliminating vibration impacts. The location of the FS site to the south would have a beneficial effect on Effigy Mounds National Monument because visual impacts would be significantly reduced.

No further work was required of the applicant for archeological sites associated with this alternative, as the applicant stated that the FS site was too small for commercial harbor development and the impacts to the Refuge would likely preclude development.

Effects on recreational activities caused by development at the FS site would be nominal and would depend on barge routing. If commercial access is routed through Hunter's Channel, conflicts with recreational boaters using the Lockwood Street Ramp and fishing in Hunter's Slough can be anticipated. Effects caused by rail and vehicular traffic would be minimal due to the site's location. Although the shoreline along the FS site shows signs of revegetation, it has been highly disturbed in the past, and development would not have significant impacts.

3.1.2 Depot

The Depot site is located south of the Highway 18 bridge in the city of Prairie du Chien. It is on the mainland at UMR mile 634.5 in the lower East Channel. Access is available via South Main Street and the W&SRR. The Depot site is under private ownership and would need to be purchased by the permit applicant. River access could be provided via the East Channel or would need to be developed from the southwest, via Hunter's Channel. As with the FS site, the most viable means of providing barge access would involve dredging Hunter's Channel.

A large portion of this site lies west of the railroad tracks and consists of floodplain forest wetland. It provides habitat for small mammals, furbearing mammals, and songbirds. The shoreline is undeveloped and provides additional habitat for ducks and wading birds.

The Depot site was not considered in detail for several reasons. If selected as the site for a new barge terminal, the Depot site would require total site development of upland ancillary facilities, as well as riverfront development for the barge loading/unloading facilities. The *Port of Prairie du Chien Harbor Siting Study* prepared in 1990 by the Mississippi River

Regional Planning Commission for the City of Prairie du Chien estimated total site development costs of between $4.3 and $4.5 million.

As with the FS site, dredging and commercial navigation in Hunter's Channel would have an adverse effect on the Hunter's Channel Archeological District, a property determined eligible for the National Register of Historic Places. While implementation of this alternative would adversely affect the Hunter's Channel Archeological District, a trade-off in cultural resources impacts would occur, as those significant impacts affecting the historic resources on the island would be reduced or eliminated. Additional benefits to selection of the Depot site would be the reduction of visual impacts to Effigy Mounds National Monument.

A major portion of the Depot site is comprised of wetland, and considerable wetland filling would be necessary to develop the site. Dredging of an access channel through Hunter's Channel would have substantial adverse effects on aquatic resources as discussed in Section 3.1.1.

3.1.3 Sewer Plant

This site is located in Prairie du Chien adjacent to the city sewer plant on the mainland at UMR mile 633.7 on a side channel of the lower East Channel. Road access is via Lockwood Street. Rail access would require construction of a spur from the W&SRR. River access could be provided via the East Channel or would need to be developed from the southwest, via Hunter's Channel.

The Sewer Plant site was eliminated from detailed evaluation for a variety of reasons. Although this site was addressed in previous harbor studies, a defined area has not been identified at this location. The sewer plant is located south of Lockwood Street, and the area to the north is occupied by private residences. Acquisition of these properties would be required if this site were to be selected and developed as a barge terminal. The *Port of Prairie du Chien Harbor Siting Study* prepared in 1990 by the Mississippi River Regional Planning Commission for the City of Prairie du Chien estimated total site development costs of between $2.6 and $2.8 million.

River access via the East Channel could be avoided by dredging a new channel in the vicinity of Hunter's Channel. A new channel in this location would encroach on the Refuge and would require the permission of, or a change in land ownership with, the USFWS. As with the FS site, dredging in Hunter's Channel would have substantial adverse effects on aquatic resources (see Section 3.1.1).

An alternative access route has been proposed by Mr. William Hubbard, a local citizen and landowner. He suggests that a channel be dredged from the east side of the West Channel in a northeasterly direction through Indian Isle and Hunter's Lake to the sewer plant site. He indicated he owns the land through which this channel would pass, thereby eliminating the need to acquire an easement or ownership of USFWS land. This alternative was eliminated from consideration because of unacceptable wetland impacts.

Similarly rejected because of unacceptable impacts to wetlands and aquatic habitats was Mr. Hubbard's suggestion that Hunter's Island be dredged and Hunter's Lake be used for the commercial harbor. He proposed access could be provided by construction of a conveyor system or a roadway from Hunter's Island to the mainland.

As a result of a project to expand the city of Prairie du Chien's existing sewage treatment facilities, an archeological survey located a prehistoric archeological site with a significant historic component. Historic artifacts found at this site place it within the time frame and reported location of the "Pig's Eye" or French Fort of 1755. It has been speculated (Salkin 1993) that this site could be one of the encampments that were known to be located outside the fort. This site and the site of the French Fort are extremely significant to understanding the early French history of Prairie du Chien, and their existence here would severely limit harbor development at this location. As with the Depot site, selection of the Sewer Plant site would be a trade-off in impacts between cultural resources in the Prairie du Chien area. Selection of this alternative would greatly reduce or eliminate those adverse impacts to historic resources located on St. Feriole Island. The location of the Sewer Plant site to the south would have a beneficial effect on Effigy Mounds National Monument where visual impacts would be significantly reduced.

Development of this site would displace all recreational activities at the Lockwood Street boat ramp, which is located adjacent to the site. Commercial navigation activities would be increased through Hunter's Channel, decreasing boater safety and fishing in the area.

3.1.4 Prairie (currently Big River) Campground

This site is located south of Prairie du Chien at UMR mile 633.0 on an unnamed slough with access to the upper end of Hunter's Channel and Garnet Lake. An improved truck access road would have to be constructed to serve this site. Rail access would be available from the W&SRR, but would require construction of a spur line. River access would require that a dedicated barge channel be dredged about one and one-quarter miles in length to the main channel through Garnet Lake or Hunter's Channel.

The Prairie Campground site was eliminated from further consideration for several reasons. Dredging and navigation in Hunter's Channel would have an effect on the Hunter's Channel Archeological District. In addition, the site is located adjacent to the Refuge, and development would adversely affect that resource. Also, the permit applicant does not presently own the site and would have to acquire it. The *Port of Prairie du Chien Harbor Siting Study* prepared in 1990 by the Mississippi River Regional Planning Commission for the City of Prairie du Chien estimated total site development costs of $4.1 million.

The Olson 1 Prehistoric Site (47 CR 92) would be affected by harbor development at the Prairie Campground alternative. This Middle Woodland campsite has not been evaluated for eligibility for the National Register of Historic Places. In addition to this prehistoric site, this area is the reported location of Pig's Eye Fort (47 CR 253). While the exact location of this

site is unknown, a historic archeological site was recently discovered in Prairie du Chien which may have been associated with the fort (Salkin 1993). This site is discussed in Section 3.1.3 (Sewer Plant Site), above. Selection of the Prairie Campground alternative would have a beneficial impact upon those historic resources of St. Feriole Island and on the vista of Effigy Mounds National Monument.

Most of this site is currently being used as a popular private campground and boat ramp. Development would displace these recreational activities. Commercial navigation would also decrease boater safety and fishing in the area.

3.1.5 Bloyer Site

This site is located at UMR mile 632.5 immediately south of the Prairie Campground site. The site is primarily upland agricultural fields. Like the Campground site, this site would require extensive dredging in Hunter's Channel or Garnet Lake. Rail and road access would need to be developed.

The Bloyer site was eliminated from further consideration for several reasons. The permit applicant does not presently own the site and would have to acquire it. The *Port of Prairie du Chien Harbor Siting Study* prepared in 1990 by the Mississippi River Regional Planning Commission for the City of Prairie du Chien estimated total site development costs of $4.3 million.

Dredging to provide river access would have unacceptable impacts to the Refuge and aquatic resources. In addition, the entire river frontage at this site is floodplain forest wetland approximately 100 to 150 feet wide. Development of the site would result in the loss of this wetland.

Five archeological sites were located or relocated in the vicinity of the Bloyer site during a 1990 survey of the southern end of the Prairie du Chien terrace. At least two of these sites (47 CR 193 and 47 CR 339) would be directly affected by harbor developments at this location. None of the sites have been evaluated for their eligibility to the National Register of Historic Places. While further testing of these sites could indicate that these sites are significant archeological resources, selection of this alternative would trade off an adverse impact to these resources for the beneficial impact of reducing or eliminating impacts to historic resources on St. Feriole Island. Additional benefits to selection of the Bloyer site would be the reduction of visual impacts to Effigy Mounds National Monument.

3.1.6 Indian Isle

Indian Isle is located on Bergman Island in the Mississippi River main channel at UMR mile 632.5. There is no land access by railroad or highway. A conveyor system would be required to transport commodities from the site to the mainland. A rail and truck loading terminal in the Bloyer/Campground vicinity would be required, with the conveyor passing

over wetlands and islands to the site. This site is the location of an existing barge fleeting site. It is privately owned.

This island site was eliminated from further consideration for several reasons. The site is not located on the East Channel and would require the construction of extensive and costly conveyor systems to the mainland at Prairie du Chien in order to have rail access. In addition, mainland ancillary facilities would be required at the conveyor terminus. The *Port of Prairie du Chien Harbor Siting Study* prepared in 1990 by the Mississippi River Regional Planning Commission for the City of Prairie du Chien estimated total site development costs of between $5.9 and $7.4 million.

The Indian Isle West Side Prehistoric Site (47 CR 368) would be adversely affected by harbor developments at this location. This site was located during a 1989 survey of the Mississippi River floodplain by the University of Wisconsin-Madison (Boszhardt 1982). Depending upon the location of the conveyor system needed to make this alternative functional, additional archeological sites could be affected by the Indian Isle harbor site. Further survey for archeological sites and further testing to evaluate known sites against the criteria of the National Register would be necessary prior to implementing this alternative. However, the adverse effects of this alternative on known, and as yet undiscovered, archeological resources would be ameliorated through the reduction or elimination of impacts to the historic resources on St. Feriole Island. The location of the Indian Isle site to the south would have a beneficial effect on Effigy Mounds National Monument where visual impacts would be significantly reduced.

3.1.7 McGregor Lake

This site is located on Island 112 in the main channel at UMR mile 634.5. The island is located within the Refuge and is managed by the USFWS. There is no rail or highway access. Highway access would require a new road south from U.S. Highway 18 on the island. Like Indian Isle, a conveyor system to the mainland, as well as ancillary facilities, would be required to obtain rail access. All rail and truck bulk handling could be restricted to the mainland, with conveyor access to a barge loading facility on Island 112.

The site is not located on the East Channel and would require the construction of extensive and costly conveyor systems to the mainland at Prairie du Chien in order to have rail access. In addition, mainland ancillary facilities would be required at the conveyor terminus. The *Port of Prairie du Chien Harbor Siting Study* prepared in 1990 by the Mississippi River Regional Planning Commission for the City of Prairie du Chien estimated total site development costs of between $4.0 and $4.8 million.

This alternative could have an adverse impact upon the Bloody Run prehistoric archeological site (47 CR 449). This site was located during a 1988 survey of the Mississippi River by the University of Wisconsin-Madison (Wahls 1990). No evaluation of this site has been done to determine the site's eligibility to the National Register of Historic Places. It is possible that

additional unrecorded archeological sites could be affected by construction of road access and conveyor access to this site. Further survey for archeological sites and further testing to evaluate known sites against the criteria of the National Register would be necessary prior to implementing this alternative. However, the adverse effects of this alternative on known, and as yet undiscovered, archeological resources would be ameliorated through the reduction or elimination of impacts to the historic resources on St. Feriole Island. The location of the McGregor Lake site along the main channel of the Mississippi River to the south of Effigy Mounds National Monument would reduce visual impact to the monument.

3.1.8 Picatee Creek

This site is located on the Mississippi River main channel about 7 miles north of Prairie du Chien. It is about 0.5 mile west of State Trunk Highway 35 via an unpaved road. The Burlington Northern Railroad is approximately three-fourths mile from the site.

The lack of rail access to the site is a major drawback. Harbor development would require either extension of the railroad tracks from Prairie du Chien or use of the Burlington Northern track. Alternatively, a conveyor system could be constructed between the rail line and harbor site. The *Port of Prairie du Chien Harbor Siting Study* prepared in 1990 by the Mississippi River Regional Planning Commission for the City of Prairie du Chien estimated total site development costs of about $5.5 million.

This low-lying site has a zone of wetlands about 2,000 feet in width that separates the river from the low upland on the west side of the railroad at the site. Harbor development would require wetland filling for access roads, rail corridors, and other facilities. In addition, the site is remote from existing barge fleeting areas in pool 10, and another barge fleeting site would have to be developed within about 3 miles of the site to accommodate barge movement.

Two prehistoric archeological sites are in the vicinity of the Picatee Creek harbor site. The High Bank campsite (47 CR 44) would likely be affected by the proposed development at this location. This site was recorded in a 1927 archeological survey. While additional work was done at this site, and reported on in 1963 (Baerreis 1963), this site has not been formally evaluated for its eligibility to the National Register of Historic Places. The Picatee Creek archeological site (47 CR 454) was recorded by the University of Wisconsin-Madison in a 1988 survey of this area (Wahls 1990). Although the archeological site is located south of Picatee Creek, erosion at this site would be increased if a harbor were constructed at this location. The Picatee Creek site has never been evaluated against the criteria of the National Register of Historic Places. Selection of the Picatee Creek alternative would have a beneficial impact upon the historic sites located on St. Feriole Island by reducing or eliminating the impacts to these resources. Selection of this alternative would have a greater impact upon the vista to Effigy Mounds National Monument by adding a modern obstruction to the more natural setting looking north from the monument.

3.1.9 Swingle Site (Without Prairie Sand and Gravel, Inc.)

This alternative was not considered in detail because it would not be economically feasible for the permit applicant to develop this site without retaining its existing facility. This site is not served by the W&SRR which ends at the existing PS&G facility. In addition, the water frontage available at this site, approximately 1,200 feet, is substantially less than the 3,700 feet the applicant proposes for expansion.

3.1.10 Prairie Sand and Gravel, Inc. and National Decorative Metals Harbor

The National Decorative Metals site is located in Prairie du Chien at the north end of St. Feriole Island. The site is located at UMR mile 635.8 on the East Channel, immediately south of PS&G. The same road and rail routes that provide access to the PS&G site serve the National Decorative Metals site.

This site is closer than the PS&G site to the Villa Louis and other historic properties and, if developed, could cause substantial conflict with uses of these properties. In addition, the location of the National Decorative Metals site corresponds with the location of some of the first French plats of St. Feriole Island. While portions of this site have been disturbed, remains of structures associated with the early French habitation of the island may still exist in this area. No archeological work has ever been done to confirm their presence; however, discovery of any undisturbed remains would no doubt meet the eligibility criteria for the National Register. Selection of this site would not reduce the vibration impacts to historic resources on St. Feriole Island. Use of the National Decorative Metals site would focus rail traffic and the visual impacts associated with harbor development closer to the island's historic resources. The location of this site so close to the northern end of St. Feriole Island would have significant visual impacts on Effigy Mounds National Monument.

The site is in private ownership and was formerly a metal plating and engraving factory. The foundation of the building is all that remains on the site. Because of this past use, it is likely that the site would have to be surveyed for hazardous and toxic substances. In addition, the site would have to be surveyed for historic and archeological resources.

The site has no wetlands and does not provide any habitat value for wildlife, other than species normally associated with developed areas, such as common songbirds and common small mammals.

The City of Prairie du Chien had expressed a desire to relocate the city harbor to this site. On January 5, 1993, the Common Council for the City of Prairie du Chien passed a resolution that the city purchase this property for development of a city harbor. However, the property owner has expressed no interest to sell, and the city is unwilling to pursue condemnation. For the same reasons, use of this site as an alternative to the proposed expansion would be infeasible.

3.1.11 No Harbor Alternative (Alternative B)

The following actions would be required to implement Alternative B:

1) deauthorization of the Federal commercial harbor,

2) denial of the current permit application for harbor expansion at the PS&G/Swingle site, and

3) revocation of all existing State and Federal regulatory permits.

If these actions were taken, both public and private commercial harbor facilities would be eliminated from Prairie du Chien. Use of the East Channel by commercial shippers would be eliminated, thus obviating the need for continued maintenance dredging.

The following is a summary of the effects of the no harbor alternative.

Vessel-induced disturbances (i.e., turbulence, altered velocity, suspended sediments, waves and wave wash, drawdown) would be virtually eliminated in the East Channel. Direct physical disturbance of aquatic habitats and other effects (i.e., sediment and pollutant resuspension) associated with dredging would be eliminated from secondary navigation channel and channel border areas of the East Channel. No need for dredged material disposal would exist; therefore, no impacts as a result of this activity would occur. Aquatic resources, fish and wildlife and freshwater mussel species, including State and Federally listed endangered species, would benefit from the elimination of navigation traffic and dredging activities.

Elimination of commercial navigation traffic and cessation of channel maintenance activities in the East Channel would have a significant beneficial effect on the archeological and historic resources of the area. Audible and visual impacts and impacts associated with vibration and safety on St. Feriole Island would be eliminated. Impacts to archeological sites from harbor expansion activities and from dredged material disposal would also be eliminated. Reuse of St. Feriole Island could then focus on the economic and interpretive development of historic resources on the island that now conflict with operation of the two existing harbors.

Termination of all commercial navigation activities in the East Channel would have a positive effect on recreational activities. Boaters would no longer encounter the risk of barge traffic, and access to the marinas in Marais de St. Feriole would be improved. The historic and park areas on St. Feriole Island would benefit from the elimination of truck and rail traffic through the island. Air and water quality would improve, and noise pollution would decrease. Land use in the current harbor areas could be changed to functions more compatible with recreational activities. Shorelines could be redeveloped for recreational uses and better visual quality from the water.

Eliminating port facilities in the East Channel could result in increased levels of shipping from and facilities expansion at other Wisconsin and Iowa ports. Therefore, some of the positive impacts on natural, cultural, and recreational resources identified with termination of port facilities in the East Channel might be offset by adverse impacts associated with expansion at other Wisconsin and Iowa ports.

The no harbor alternative, however, could have substantial adverse effects on transportation, community growth and development, and would likely generate a great deal of controversy. Permit denial and port closure would result in the loss of investment in the Wisconsin railway system route from central Wisconsin to Prairie du Chien. The reciprocal relationship between the railroad and barge terminals is captured in the Harbor Siting Plan when they argue that "The traffic generated by the barge terminal(s) is essential to the continued operation of the Middleton-Prairie du Chien line, and some would say, the entire railroad, and the success of the terminal as a competitive enterprise is dependent upon rail access" (Mississippi River Regional Planning Commission 1990). Transportation cost savings would also be lost. A portion of these savings would be represented by the difference in cost "made possible by rail shipment from McFarland to Prairie du Chien, than the difference between trucking from McFarland to LaSalle-Peru, Illinois..." (Mississippi River Regional Planning Commission 1990).

The no harbor alternative would simply foreclose on the opportunity for community growth and development in the transportation sector of the Prairie du Chien economy. At public meetings held in Prairie du Chien, representatives from the business community and city argued that the "no harbor" alternative "was not an alternative." Economic issues and related concerns were the topics most often discussed at the public meetings. Many statements focused on the ideas of "more jobs" and "must have it to survive." Moreover, permit denial and port closure would result in controversy whereby a substantial political chasm between the city, State and Federal government would likely be created. On the other hand, the environmental community and historic preservation proponents would likely embrace and support this alternative. Discussions regarding environmental issues, especially preservation of *L. higginsi* and mussels in general, occurred often and were second in frequency only to economic issues. In addition, discussions regarding historic site tourism potential were often cast within the purview of community economic development.

The no harbor alternative could have substantial adverse effects on tax revenues, public facilities, local employment and business activity, and commercial navigation and farmland-food supply. Permit denial and revocation of existing permits would reduce the value of barge terminal operations in Prairie du Chien and thereby remove substantial portions of existing transportation business and related activities from tax rolls. The city would also forego approximately $25,000 in revenue obtained from the City Dock. The loss of employment in the transportation sector would only exacerbate an already high local unemployment rate. Local transportation business activity would certainly feel a substantial impact, and support services could also anticipate a negative effect on their revenues. The ports in Prairie du Chien account for approximately 25 to 30 percent of all barge tonnage

coming into and going out of Wisconsin via the Mississippi River. Loss of these facilities could have a substantial adverse effect on local commercial navigation activities while possibly having a more positive effect on other Wisconsin and Iowa ports through reduced competition. Reduction in competition, however, could raise transportation costs, and those costs could eventually affect costs associated with food supply (Glaze and Krikelas 1990; Mississippi River Regional Planning Commission 1990).

It is often argued that commodity movement by barge is more energy efficient than other transportation modes. Loss of port facilities in Prairie du Chien could result in the use of less energy-efficient modes and therefore greater depletion of non-renewable natural resources (Mississippi River Regional Planning Commission 1990).

The no harbor alternative would have substantial beneficial effects on the Villa Louis historic site and adjacent area. Representatives of the historic site argue a major asset to the area "has been the quiet, backwater river ambience with unfettered views of the River and a quality of time having altered little of the Island or its relationship to the River," (memorandum to the Corps, Dec. 13, 1993). Although the aesthetic quality is difficult to quantify, site personnel "believe that this quality is seriously threatened by the proposed harbor development which will create noise, visual intrusions, increased rail traffic between the Site and the River, and increased semi-tractor trailer traffic through the heart of the historic Villa grounds" (memorandum to the Corps, Dec. 13, 1993). Combined, these effects would have a negative impact on the volume of visitors and the quality of the visitor experience. Additionally, economic losses associated with the termination of commercial navigation possibly could be partially offset through historic site tourism and future development of tourism in the area.

In summary, the no harbor alternative would have positive effects on natural, cultural and recreational resources. This alternative, however, would not meet the economic needs defined in the purposes and needs statement, and socioeconomic resources would be significantly adversely affected. Therefore, the no harbor alternative was eliminated from further consideration.

3.1.12 Alternative C - City Dock in Federal Commercial Harbor (Expanded) and Prairie Sand and Gravel Harbor (Historic)

As a result of the Biological Opinion issued by the USFWS on June 28, 1993, Alternatives C and F were eliminated from further consideration. In the Biological Opinion, the USFWS stated that because of the adverse impacts of increased barge traffic on the endangered mussel species *L. higginsi*, use of the City Dock could not exceed the present level of 135 permitted and 15 unregulated barges per year. Additionally, no channel maintenance activities could be conducted between the Highway 18 bridge and the barge turning basin. This opinion is consistent with past jeopardy determinations by the USFWS for permit actions at the City Dock.

Implementation of Alternative C would require denial of the permit for harbor expansion proposed by PS&G, expansion of facilities at the City Dock and continued maintenance of the East Channel by the COE according to the LTCMP. Commercial navigation levels to both the City Dock and the existing PS&G harbor would be unrestricted. The maximum estimated use of the City Dock is 500 barges per year. Approximately 230 barges per year would continue to use the PS&G harbor (assuming the PS&G facility has historically operated at maximum capacity). In contrast, Alternative C1 would limit barge traffic at the City Dock to 150 barges per year.

The primary reason for eliminating Alternative C from further consideration was the unacceptable impacts to endangered species. Increased commercial navigation in the East Channel, in particular from the barge turning basin to the City Dock, would cause significant adverse impacts to the endangered species *L. higginsi*. Over the 40-year term of the LTCMP, approximately 10,500 *L. higginsi* would be lost from existing populations as a result of increased navigation traffic and dredging of cuts 1 and 2. It should be noted that in the Biological Opinion (Appendix C) a population loss of 10,900 *L. higginsi* was estimated to occur as a result of Alternative C. However, new survey information in Sawmill Slough and the northern end of the East Channel, collected after publication of the draft EIS, has resulted in a revised estimated population loss of 10,500 *L. higginsi*.

Other impacts associated with Alternative C would be similar to those discussed under Alternative C1 (see Section 3.2.2).

3.1.13 Alternative F - City Dock in Federal Commercial Harbor (Expanded) and Prairie Sand and Gravel/Swingle Site Harbor (Expanded)

Issuance of the requested permit and continued channel maintenance according to the LTCMP would result in the continued existence of these two commercial terminals, with both operating at unrestricted levels. Dredging of cuts 1, 2, and 3 would be required.

The dredging and increased navigation under Alternative F would result in the loss of approximately 1,860,000 mussels, including an estimated 11,400 *L. higginsi*, from mussel populations in the East Channel north of the Highway 18 bridge (see Appendix D). The Biological Opinion issued by the USFWS evaluated Alternative F. In summary, the USFWS determined that Alternative F would jeopardize the continued existence of *L. higginsi* (see Appendix C). As stated above, it should be noted that in the Biological Opinion (Appendix C) a population loss of 14,000 *L. higginsi* was estimated to occur under Alternative F. However, new survey information in Sawmill Slough and the northern end of the East Channel, collected after publication of the draft EIS, has resulted in revision of the estimated population loss to 11,400 *L. higginsi*.

Other impacts associated with Alternative F would be similar to those discussed under Alternative F1 (see Section 3.2.4).

3.2 Alternatives Considered in Detail

Included in this section are discussions of the practicable sites or combinations of sites, including the necessary level of channel maintenance, that would meet the various combinations of regulatory permit and Federal harbor operation and maintenance alternatives. Table 1 presents the alternatives considered in detail and the necessary decisions which would need to be made to implement alternatives.

3.2.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Implementation of Alternative A (no action) would require denial of the permit for the harbor expansion proposed by PS&G. In addition, the COE would not maintain a navigation channel in the East Channel; however, the Federal commercial harbor would not be deauthorized. The COE would defer implementation of the LTCMP by placing maintenance of the Federal commercial harbor in an "inactive" status. If future channel conditions restricted navigational access in the East Channel, the COE would evaluate the environmental consequences of alternatives to maintaining the channel at that time. Additional NEPA documentation and Endangered Species Act coordination would be required at that time.

For the purposes of this EIS, the no action alternative is defined as the baseline for comparison of all other alternatives. Under Alternative A, barge traffic to the City Dock and PS&G would return to historic levels. Historic levels of barge traffic are defined as pre-1988 levels. At the City Dock, historic levels equate to approximately 15 barges per year, while historic levels at PS&G equate to approximately 230 barges per year.

PS&G is located in Prairie du Chien, at the north end of St. Feriole Island (Figure 1). It is at the mouth of Sawmill Slough at UMR mile 636.0 and water access is via the upper end of the East Channel. Land access is provided by road (city streets) and rail (short-line) owned by the Wisconsin and Southern Railroad (W&SRR). Both rail and former street access locations are adjacent to significant historical resources and conflict with uses of these facilities. Mining of sand and gravel from the northern end of St. Feriole Island began in the early 1890's. Much of Sawmill Slough, as well as upland on the north end of St. Feriole Island, has been mined for these materials. In 1960, PS&G began handling barged commodities for intermodal transfer. Agricultural commodities, primarily corn, have been the dominant commodity shipped from the terminal. Road salt and coal have also been shipped to Prairie du Chien and unloaded at this facility. Historically, approximately 230 barges per year have been loaded at this harbor.

The Federal commercial harbor was constructed by the COE in 1958 as part of navigation improvements authorized by the 1950 River and Harbor Act. The improvements provided a terminal frontage of about 1,000 feet and an access channel to the East Channel dredged to a depth of 10 feet. The City of Prairie du Chien constructed the existing dock and other ancillary facilities. The City Dock is located in Prairie du Chien (Figure 1) on St. Feriole

Table 1. Alternatives considered in detail.

Alternative Descriptions				Decision options required to implement alternatives	
EIS #	Description	Traffic Levels	Dredging	Federal Harbor O&M	Permit*
A	No action - Commercial Harbor at City Dock, with continued operation at PS&G.	Historic/Historic	No Dredging	Placed in "inactive" status	Denial
C1	Continuation of recent levels at City Dock (150 barges/year), with continued operation at PS&G.	Recent/Historic	Federal Maintenance of cuts 1 and 2**	Continue O&M - LTCMP	Denial
D	Commercial Harbor at City Dock, with expansion at permit applicant proposed sites - PS&G and Swingle sites.	Historic/Expansion	Federal Maintenance of cuts 1 and 2** and private dredging of cut 3	Continue O&M - LTCMP	Grant
F1	Continuation of recent levels at City Dock (150 barges/year) and expansion at permit applicant proposed sites - PS&G and Swingle sites.	Recent/Expansion	Federal Maintenance of cuts 1 and 2** and private dredging of cut 3	Continue O&M - LTCMP	Grant

* Functional Alternatives or permit conditions are considered later and only on the Corps and WDNR proposed alternative.

** Maintenance of cut 2 would be deferred in accordance with USFWS's Biological Opinion, cut 1 maintenance contingent on conditions in cut 2.

Island at UMR mile 635.0 on the East Channel. Road access is via Second Street. The W&SRR provides rail service to the site.

Since 1988, Didion, Inc., has been the major lessee of the facility from the city of Prairie du Chien. The loading/unloading of barges at this site, and the associated barge traffic navigating the channel reach between the City Dock and the barge turning basin, has been very controversial because of potential impacts to the endangered mussel *L. higginsi*. Since 1988, grain has been loaded by Didion, Inc. at the City Dock; however, permit restrictions imposed by the COE and WDNR in 1990 allowed a maximum of 135 barges per year to be loaded at this facility. The WDNR permit has been extended under an interlocutory agreement for 1993, and single year permits in 1994 and 1995. COE permits have likewise been extended through 1995. Under Alternative A, no new permits would be issued for use of the City Dock. Use of this facility would return to historic levels. Before 1988, an average of 15 barges per year were loaded and unloaded at the City Dock. Salt and fertilizer were the main commodities handled.

Under Alternative A, barge traffic in the East Channel would be reduced from current levels (approximately 380 barges per year; 15 unregulated from City Dock + 135 regulated from City Dock + 230 from PS&G, Inc.) to historic levels (approximately 245 barges per year; 15 from City Dock + 230 from PS&G, Inc.). With this reduction in barge traffic, recent adverse effects on natural resources including aquatic habitats, fish and wildlife, freshwater mussels and State and Federal threatened and endangered species would be reduced. However, Alternative A is defined as the baseline for comparison of alternatives. Implementation of Alternative A would result in continuation of minor adverse effects on natural resources.

Adverse impacts to historic resources on St. Feriole Island and visual impacts to Effigy Mounds National Monument would continue at pre-1988 traffic levels.

Permit denial could have substantial adverse effects on Prairie du Chien commercial ports, and community growth and development would also be adversely affected. Controversy between harbor proponents and environmental and historic preservation proponents would also likely continue (Glaze and Krikelas 1990; Mississippi River Regional Planning Commission 1990).

Minor adverse recreational effects caused by historic harbor activities at the PS&G and City Dock sites would continue under this alternative. These include commercial navigation maneuvering around heavily used recreational boating areas, truck and rail traffic through historic and park areas, and increased water, air and noise pollution. Visual quality from both land and water is adversely affected in both areas.

3.2.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Implementation of Alternative C1 would require denial of the permit for harbor expansion proposed by PS&G, continued use of facilities at the City Dock at recent levels of barge

traffic and continued maintenance of cut 1 in the East Channel by the COE according to the LTCMP. The maximum use of the City Dock would be limited to 135 permitted and 15 unregulated barges per year. Approximately 230 barges per year would continue to use the PS&G harbor.

Dredging of cuts 1 and 2 was projected under the LTCMP; however, suspending dredging in cut 2 was identified in the USFWS's Biological Opinion of June 28, 1993, as a reasonable and prudent alternative to avoid jeopardizing the continued existence of the endangered mussel species *L. higginsi*. Therefore, under Alternative C1, the LTCMP would be only partially implemented, with dredging of cut 2 deferred. Over the 40-year project span, dredging of cut 1 would result in the take of approximately 540 freshwater mussels. Additionally, substantial adverse effects on mussels and significant adverse effects on *L. higginsi* would result from barge traffic (150 barges per year) using the channel reach between the City Dock and the barge turning basin. The specific take of mussels and *L. higginsi* under Alternative C1 could not be quantified; however, the COE, WDNR and USFWS believe between 5 and 20 percent of mussel populations within navigation lanes between the City Dock and main channel would be destroyed over the 40-year planning period. Depending on the selected level of estimated navigation take (5, 10 or 15 percent; see Section 5.0), the impacts of Alternative C1 would be comparable to or greater than those identified for Alternative D.

When compared to the No Action Alternative, dredging and navigation traffic under Alternative C1 would have minor adverse impacts on aquatic habitats and fish and wildlife, substantial adverse impacts on freshwater mussels, and significant adverse impacts on threatened and endangered species (both State and Federally listed).

While this alternative would allow for limited expansion of traffic at Prairie du Chien, impacts to historic resources on St. Feriole Island would be minimized by keeping expansion south of these resources. Adverse impacts associated with the operations at PS&G would continue at historic levels. Expansion at the City Dock would also diminish visual impacts to Effigy Mounds National Monument due to increased distance between this facility and the monument.

Limited expansion of operations at the City Dock combined with historic level operations at PS&G would have beneficial effects on transportation and community and regional growth and development. Revenues to Prairie du Chien, associated with shipping from the City Dock, would have positive effects on local employment and business activity. Minor positive effects on the cost of food supply and energy resources would also be realized. However, limited increased shipping from the City Dock would likely engender opposition from the environmental community.

Effects on recreation under this alternative would be similar to those of Alternative A with the exception that increased commercial navigation in the East Channel, and increased truck and

rail traffic through historic and park areas, would increase impacts on recreational opportunities.

It must be noted that use of the City Dock has been severely limited by the concerns of the WDNR, by the COE, by legal objections to State permit actions by environmental groups and individuals, and by the Wisconsin Public Intervenor's Office. Notwithstanding the conclusions of the USFWS's Biological Opinion related to acceptable barge use levels at the City Dock, the WDNR, the COE and parties in contest to permit actions at the City Dock continue to be concerned about potential long-term impacts to the significant aquatic resources in the central portion of the East Channel caused by commercial navigation use levels to the City Dock. The WDNR, while they actively participated in review of the technical methods used and deliberations leading to the COE's Biological Assessment (see Appendix D) and the USFWS's Biological Opinion (see Appendix C), make note that the sensitivity analysis of these exercises indicates a large margin of error is possible in the results. Chronic impacts to mussel resources caused by commercial navigation, especially under low water conditions, are still a concern and are practically very difficult to measure. Therefore, expanded use of the City Dock for commercial barge transloading remains an unacceptable risk to the WDNR and parties to pending litigation over State-regulated uses at the City Dock. The WDNR has indicated they would not approve future permits for continued shipping from the City Dock.

3.2.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Implementation of Alternative D would require approval of the permit for harbor expansion proposed by PS&G. Projected dredging of cut 1 would be completed as outlined in the LTCMP. In addition, PS&G would connect its existing gravel quarry to Sawmill Slough by dredging an area identified as cut 3 on Figure 1. Dredging of cut 2 would be deferred in compliance with the reasonable and prudent alternatives identified in the USFWS's Biological Opinion on the permit application.

Compared to the no action alternative, Alternative D would have minor adverse impacts on aquatic habitats and fish and wildlife. Increased barge traffic and dredging of cut 1 would have a substantial adverse impact on freshwater mussels including Federal and State threatened and endangered species. Over the 40-year planning period, as many as 541,000 freshwater mussels would be lost from existing populations as a result of dredging cut 1 and increased navigation traffic in the channel reach between PS&G and the main channel. This includes an estimated incidental take (population reduction from current levels) of approximately 3,400 *L. higginsi* (see Section 5.0).

The adverse impact to historic resources on St. Feriole Island would increase if this alternative were implemented. With harbor development at the north end of the island, increased train traffic would pass in front of these historic structures. Visual impacts to Effigy Mounds National Monument would increase over the no action alternative and Alternative C1 because harbor development would move closer to the monument.

The potential for farmers in Wisconsin to receive better prices could be increased if the permit was approved. The improved railway system and added grain storage facilities could have substantial positive effects on regional growth, community growth and development, tax revenues, local employment and business activity. In contrast, the reduction in operations at the City Dock would erode competition, and revenues derived by Prairie du Chien from City Dock operations would be lost. Controversy between the lessee of the City Dock, the city and the permit applicant could be stimulated. Also, an increase in truck traffic and associated noise attributable to the proposed Swingle site expansion could adversely affect public health and safety.

Additional commercial navigation maneuvering created by adding the Swingle site would have the most adverse effect on recreational boaters due to the site's proximity to local marinas. Most recreational traffic would have to pass the Swingle site to access the East and main channels. Adverse effects on air and water quality would also be increased due to the site's location.

3.2.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Implementation of Alternative F1 would require issuance of the requested permit. Dredging/excavation of cuts 1 and 3 would be completed as projected in the LTCMP and as outlined in the permit application, respectively.

Alternative F1 would combine the impacts of Alternatives C1 and D. The dredging and increased navigation identified under Alternative F1 would result in the incidental take (population reduction from current levels) of significant numbers of freshwater mussels including *L. higginsi*. The specific take of mussels and *L. higginsi* under Alternative F1 could not be quantified; however, the COE, WDNR and USFWS believe between 5 and 20 percent of mussel populations within navigation lanes between the City Dock and main channel would be destroyed over the 40-year planning period. Depending on the selected level of estimated navigation take (5, 10 or 15 percent; see Section 5.0), the impacts of Alternative F1 on freshwater mussels would be significant. The impacts of Alternative F1 on aquatic habitats and fish and wildlife would be substantial. The impacts of Alternative F1 on freshwater mussels and Federal and State threatened and endangered species would be significant and would be greater than the impacts of Alternatives C1 or D.

The adverse impact to St. Feriole Island historic resources and visual impact to Effigy Mounds National Monument would increase as a result of development at the PS&G site. Impacts resulting from increased traffic at the City Dock would be less than those from development at PS&G.

Alternative F1 would most likely maximize socioeconomic benefits. Permit approval and limited expansion of shipping activities at the City Dock would have substantial benefits on transportation, community growth and development, tax revenues, public facilities and

services, commercial navigation, regional growth, employment, and business activity. However, significant controversy between environmental preservation groups and economic interests would likely be generated. Additionally, negative effects on public health and safety could be attenuated as a result of increased truck traffic through the city.

Adverse recreational effects would be the most prevalent under this alternative, because the alternative would combine the effects of the PS&G/Swingle harbor proposal with those of expanded use of the City Dock. Substantial adverse effects on recreational opportunities would be realized under Alternative F1.

As noted under Section 3.2.2, the WDNR is concerned about the potential long-term impacts to significant aquatic resources as a result of barge transloading operations at the City Dock. Use of the City Dock for commercial barge transloading remains an unacceptable risk to the WDNR.

Table 2 summarizes and compares the environmental consequences resulting under the four alternatives evaluated in detail. A thorough discussion of the environmental consequences and comparison of these alternatives is found in Section 5.0 Environmental Consequences.

3.3 Proposed Alternatives

COE regulations implementing NEPA require the COE be neither an opponent nor a proponent of a permit applicant's proposal. An important combination of alternatives that is a plausible outcome of several years of negotiation is a consolidation of operations at the present City Dock at portions of the PS&G property on the north end of St. Feriole Island (see Section 1.3). The present application of PS&G, in fact, has been amended from that originally submitted in 1991 specifically to accommodate City and City-lessee inclusion. Alternatives D and F1 would allow for development as proposed under the permit application and are consistent with the harbor consolidation possibility (see Section 2.1.4.1). In the event agreement to consolidate all industrial port functions is successful, the State has agreed to work with the municipal government toward achieving relocation of the existing Federal harbor to the consolidated site.

Because the COE has current, mandated responsibilities to provide channel maintenance to the designated Federal commercial harbor (City Dock), this EIS must address alternatives that provide continuing service to this facility. The channel maintenance activities proposed by the COE in the LTCMP would ensure that the COE meets its obligation of maintaining an authorized Federal harbor at Prairie du Chien and providing continued access to this harbor. Alternatives C1, D, and F1 would partially meet this objective. As a result of the USFWS Biological Opinion, dredging of cut 2 would be deferred in order to comply with the reasonable and prudent alternatives identified by the USFWS (see Section 2.1.4.2). If future channel conditions in cut 2 restricted navigational access to the Federal commercial harbor, the COE would evaluate the environmental consequences of alternatives to maintaining the channel at that time. Additional NEPA documentation and Endangered Species Act

Table 2. Environmental impact assessment matrix, East Channel of UMR at Prairie du Chien, WI.

Name of Parameter	Alternatives A	C1	D	F1
A. Social Effects				
1. Noise Levels	0	0	0	0
2. Aesthetic Values	0	-1	-1	-1
3. Recreational Opportunities	-1	-1	-2	-2
4. Transportation	-2	+1	+2	+2
5. Public Health and Safety	0	0	-1	-1
6. Community Cohesion (Sense of Unity)	-1	-1	+1	+1
7. Community Growth & Development	-1	+1	+2	+2
8. Business and Home Relocations	0	0	0	0
9. Existing/Potential Land Use	0	+1	+1	+1
10. Controversy	-1	-1	-1	-3
B. Economic Effects				
1. Property Values	0	+1	+1	+1
2. Tax Revenues	0	+1	+2	+2
3. Public Facilities and Services	0	+1	+2	+2
4. Regional Growth	-2	+1	+2	+2
5. Employment	0	+1	+2	+2
6. Business Activity	0	+1	+2	+2
7. Farmland/Food Supply	0	+1	+2	+2
8. Commercial Navigation	-1	+1	+2	+2
9. Flooding Effects	0	0	0	0
10. Energy Needs and Resources	0	+1	+1	+1
C. Natural Resource Effects				
1. Aquatic Habitats	0	-1	-1	-2
2. Wetlands	0	0	0	0
3. Terrestrial Habitats	0	0	0	0
4. Fish and Wildlife	0	-1	-1	-2
5. Freshwater Mussels	-1	-2	-2	-3
6. Fed. Threatened and Endangered Species	-1	-3	-2	-3
7. State Threatened and Endangered Species	-1	-3	-2	-3
D. Cultural Effects				
1. Historic Architectural Values*	-1	-2	-1	-1
2. Pre-Hist & Historic Archeological Values	0	0	0	0

+3 - significant beneficial +2 - substantial beneficial +1 - minor beneficial 0 - no effect
-3 - significant adverse -2 - substantial adverse -1 - minor adverse

* Historic architectural values for Alternatives D and F1 have been reduced to the current level based on the mitigation of resources as outlined in the signed Memorandum of Agreement included in Appendix F. It is assumed the mitigation reduces the adverse impacts to a minor level but does not eliminate these impacts completely, as would alternatives that remove the harbor site from St. Feriole Island completely.

See Section 5.0 of FEIS for further discussion of environmental consequences.

coordination would be required at that time. Also, the COE would have to closely examine its legal responsibilities, under existing authorities, for maintaining cut 1 if and when maintenance dredging is required. The COE's responsibilities would be related to channel depths at the Federal harbor (cut 2). If shoals in cut 2 were restricting access to the harbor, the COE would not have authority to dredge cut 1. However, as long as depths at the Federal harbor continued to allow 9-foot navigation, the COE would continue to partially implement the LTCMP for the East Channel.

All alternatives examined in depth in the following sections of the EIS include level-of-use scenarios for the present City Dock. As a joint author of this EIS, the WDNR acknowledges the channel maintenance responsibilities of the COE, but requests that the reader understand the State does not have similar responsibilities. The applicable WDNR standard for governing uses in navigable waters is a broad public interest test (Chapter 30, stats.). It must be noted that both State and Federal environmental law determinations have placed significant limitations on use of the City Dock. These limitations are incorporated into the COE's LTCMP for the East Channel and in the use levels analyzed in this EIS.

3.4 Mitigation Measures

Mitigation measures include functional alternatives that can be incorporated into the preferred alternative, or included as permit conditions, that avoid, minimize, rectify or compensate potential adverse effects. These alternatives are generic and could be adapted to any site.

Mitigation measures have been considered and proposed as part of the LTCMP (Appendix B).

In addition, the USFWS Biological Opinion (Appendix C) issued on June 28, 1993, contained reasonable and prudent alternatives and conservation recommendations intended as protective measures to reduce the likelihood of jeopardizing the continued existence of *L. higginsi*. The reasonable and prudent alternatives to the project are required to be implemented to avoid jeopardy. Implementation of the conservation recommendations is discretionary because these actions would help minimize or avoid adverse effects on the listed endangered species beyond the level necessary to avoid the likelihood of jeopardy.

3.4.1 Restrictions on Commodities Shipped and/or Stored

Although grain is the primary commodity shipped to or from Prairie du Chien, coal, salt, and fertilizer are also handled. Between 1982 and 1988, grain comprised 71 percent of the total tonnage, coal 17 percent, salt 9 percent, and fertilizer 3 percent.

Large spills of salt or fertilizer could result in significant effects on water quality and aquatic species. Of special concern are impacts to the lower East Channel from spills upriver. Limitations on the types and/or amounts of commodities shipped or stored at any time could be required to reduce potential impacts. For example, according to State regulations on storage in a floodway, salt and fertilizer may be stored only on the Swingle site.

The USFWS Biological Opinion (Appendix C) requires that, if a permit is issued, the permit applicant or subsequent or additional users of the facility would not be allowed to load or unload hazardous commodities and would be required to have a spill contingency plan approved by the USFWS and WDNR.

3.4.2 Restrictions on the Number of Barges

Concern exists that barge tow navigation in the East Channel causes acute and chronic impacts to mussels, particularly threatened or endangered mussel species. Therefore, the number of barges allowed to use a commercial harbor could be restricted. Both the COE and the WDNR have put this type of restriction on previous permits in the East Channel. Since 1988, Didion, Inc., has shipped grain from the City Dock under a lease agreement with the City. The COE and WDNR have restricted the number of barges allowed to use the City Dock each year.

Alternatives C1 and F1 reflect these concerns. As a result of the USFWS Biological Opinion, Alternatives C and F, both of which included unlimited barge traffic at the City Dock, were eliminated from consideration, and were replaced by Alternatives C1 and F1, which both limit barge traffic at the City Dock to 150 barges per year (135 permitted, 15 unregulated).

3.4.3 Restrictions on Sailing Lines

The sailing line or approach a tow must take to reach a terminal facility could be restricted as a means to limit traffic in certain areas. Implementing limitations on sailing lines would require the approval and cooperation of the U.S. Coast Guard. The Coast Guard, in cooperation with the COE and WDNR, has previously restricted sailing lines in the central East Channel by the placement of additional navigation buoys.

As an example, access to the proposed PS&G/Swingle harbor could be limited to a northern entrance. This could be accomplished by specifying permissible sailing lines in any permit issued for barge terminal expansion or construction. As a practical matter, this could be accomplished by the COE not maintaining a navigable channel in selected locations.

3.4.4 Restrictions on Barge Equipment

The size and type of tow used to move barges in the East Channel could be restricted to reduce tow induced impacts such as increased turbulence, altered current velocity, changed flow pattern, increased wave and wave wash, and drawdown. At present, a workboat (switchboat) is used to transport one or two barges from the fleeting area on the main channel to either the City Dock or PS&G harbor and back to the fleeting area.

3.4.5 Restrictions to Protect Cultural Resources

Within the draft EIS, this section described several measures to mitigate adverse impacts to archeological and historic resources affected as a result of proposed expansion of harbor facilities in the Prairie du Chien area. Since June 1994, the COE has been working with the Advisory Council on Historic Preservation, the Wisconsin and Iowa SHPOs, the Wisconsin State Historical Society, the Wisconsin DOT, the National Park Service at Effigy Mounds National Monument, the Railroad, the city of Prairie du Chien, and the applicant PS&G to develop appropriate measures to mitigate the adverse impacts to historic resources.

The Memorandum of Agreement, signed by the participants in the Section 106 consultation undertaken under the National Historic Preservation Act of 1966, is included in Appendix F to this EIS. The Memorandum of Agreement provides for the following measures:

- Retrofitting of the tracks adjacent to historic structures with rubberized vibration mats.
- Development of a yard at the north end of St. Feriole Island to remove traffic and switching away from the historic structures.
- Designation of tracks to be used adjacent to historic structures.
- Development of visitor safety measures such as operating schedules and speed limits.
- Identification of visitor flow adjacent to the tracks and coordination of visitor events between the State Historical Society, the Railroad and the applicant.
- Relocation of the harbor access road away from Villa Louis.
- Reduction of visual impacts to Effigy Mounds National Monument and properties of the State Historical Society of Wisconsin on St. Feriole Island.

4.0 AFFECTED ENVIRONMENT

An analysis of the potential environmental impacts of public and private commercial navigation, including port facility development, in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin, necessitates an understanding of the current status of that environment. To facilitate this understanding, a review of current conditions has been conducted to address various environmental resources or disciplines. Together these topics encompass the social, economic, and natural settings which are part of the "affected environment" for this analysis. The material described has been guided by public issues identified through the scoping process and interdisciplinary field analysis.

4.1 Natural Resources

At approximately UMR mile 636.5, near Prairie du Chien, Wisconsin, the Mississippi River divides into two navigable channels. The easternmost channel, referred to as the East Channel, is about 3.5 miles long and passes by the City of Prairie du Chien, rejoining the main channel at approximately UMR mile 633.0. Descriptions of the varied and unique natural resources of the East Channel area between UMR mile 637.0 and UMR mile 633.0 are presented below.

4.1.1 Aquatic Habitats

Tertiary deep-running channels, shallow backwater lakes, navigated channel and channel border areas, and broad secondary channels form a dynamic mosaic of aquatic habitat in the project vicinity. The East Channel is essentially a secondary channel of the Mississippi River (Wilcox 1993). From approximately the City Dock northward to its juncture with the main channel, the East Channel is characteristic of navigation channel and channel border aquatic areas: navigated by commercial traffic, 2.7-meter minimum depths in the navigation channel, sand/silty-sand substrates, continuous currents, channel training structures and lack of rooted aquatic vegetation. The northern portion of the East Channel was dredged in 1976. Bathymetric surveys conducted by the COE in 1976, 1981, 1988 and 1992 indicate depths of 3.0 to 4.5 meters at normal pool elevation (612.7 feet mean sea level at Prairie du Chien) are found in the navigated portion of the central East Channel. Current velocities normally do not exceed 0.6 meter per second along the bottom of the channel and 0.9 meter per second in the upper one-third of the water column (Holland-Bartels et al. 1987).

The predominant sediment type throughout the East Channel is relatively contaminant free, medium- to fine-grained sand with minor components of silt (COE 1985). Scattered areas of gravel are also present. In areas where mussel beds are located, live shells and shell fragments make up a sizable fraction of the bottom sediment. Low concentrations of aliphatic and polynuclear hydrocarbon contaminants have been detected in sediment samples from the East Channel (COE 1985).

Most of the barge traffic navigating the East Channel passes from the main channel to the PS&G dock on the north end of St. Feriole Island via a secondary channel known as Sawmill Slough. Depths generally exceed 3.0 meters in the navigated portion of Sawmill Slough. A man-made lake (Wilcox 1993) lies north of the PS&G operation and east of the Swingle site (Figure 1). This lake has been extensively mined for sand and gravel by the PS&G operation, and conditions in the lake reflect this disturbance. Depths exceed 12 meters in some locations.

Very limited commercial navigation activity occurs in the East Channel from approximately the City Dock southward to the confluence with the main channel. Current velocities and substrate types are similar to those found in the navigated portion of the East Channel. Depths generally range from 1.5 to 4.5 meters, with extensive "flats" 2.1 to 3.0 meters deep. Conditions in this portion of the East Channel are characteristic of secondary channel habitats, containing both sandbar and channel border areas.

The combination of depths, sediment types and current velocities makes the East Channel an outstanding habitat for freshwater mussels.

Backwater lakes and ponds (McGregor Lake) and tertiary channels (Hunter's Slough) in the project area support submerged and floating macrophytes such as pondweeds, wild celery, and American lotus providing habitat for many fish and wildlife species. Because of the mid-pool location, littoral zone development between UMR mile 630.0 and UMR mile 637.0 provides typically richer habitat than upper or lower pool reaches.

4.1.2 Wetlands

Three general types of wetlands are found in the project vicinity: marsh/sedge meadow, wooded swamp and floodplain forest.

Marsh/sedge meadows include low-lying flat, wet areas, covered either partially or entirely with water and subject to annual flooding. Marsh habitats represent the transition zone between aquatic and terrestrial habitats and therefore have an interspersion of aquatic, semi-aquatic and terrestrial species. Dominant plants are reed canary grass (*Phalaris arundinacea*), sedges (*Carex spp.*), bluejoint grass (*Calamagrostis canadensis*) and a variety of broad-leaved species including swamp milkweed (*Asclepias incarnata*), Joe-pye weed (*Eupatorium maculatum*) and boneset (*Eupatorium perfoliatum*). An overstory layer of tall shrub species, like red osier dogwood (*Cornus stolonifera*), button bush (*Cephalanthus occidentalis*) and Indigo bush (*Amorpha fruticosa*), are present. The marsh/sedge meadow habitat component is rare in Pool 10, covering only about 6 percent of the total area of 18,600 acres of land (calculated from land between the railroad tracks that run along the first terraces, Cawley 1973).

In the vicinity of Prairie du Chien, extensive forested floodplains provide habitat for many fish and wildlife species. A characteristic feature of floodplain forests is the alluvial soil

constantly deposited in some areas but eroded in others. Alluvial soils are inundated during flood events, but are usually well-drained for much of the growing season (Shaw and Fredine 1956). The area floodplain forest is classified as the southern wet-mesic forest type (Curtis 1959) and is dominated by American elm (*Ulmus americana*), silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), and basswood (*Tilia americana*). Other tree species include river birch (*Betula nigra*), eastern cottonwood (*Populus deltoides*), black ash (*Fraxinus nigra*), swamp white oak (*Quercus bicolor*), red oak (*Quercus rubra*), white oak (*Quercus alba*) and black willow (*Salix nigra*). The herbaceous groundlayer is commonly composed of jewelweed (*Impatiens spp.*), wood nettle (*Laportea canadensis*), poison ivy (*Rhus radicans*), wild grape (*Vitis riparia*), cutgrass (*Leersia spp.*), and woodbine (*Parthenocissus inserta*).

Unlike floodplain forests, wooded swamps have soils saturated during much of the growing season, often inundated by as much as a foot of standing water (Shaw and Fredine 1956). Dominant trees include black ash, red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), and silver maple (Eggers and Reed 1987). The ground layer often contains skunk cabbage (*Symplocarpus foetidus*), marsh marigold (*Caltha palustris*) and sedges.

4.1.3 Terrestrial Habitats

The soils of the Prairie du Chien area have been classified and described previously (Slota and Garvey 1961, Cawley 1973 and references therein). Generally, siting alternatives identified in this report are located on bottomland soils of alluvial origin. Alluvial bottomlands have soils made up of layers or lenses of sand, clays and silts deposited following periodic flooding. In areas of annual flooding, there is little soil development since humus material is removed or covered annually. A gley layer (Wilde 1940) of sticky fine clay with blue-green mottling from reduced iron is present in all bottomland soils. It indicates poor internal drainage and anaerobic soil conditions. Generally, alluvial soils have been in place long enough for trees and other plants to grow, but are located in frequently flooded areas and are subject to change.

Higher lands on natural levees or outwash terraces have sandy loam soils which developed under prairie vegetation. The soil type found on much of St. Feriole Island is classified in the Dakota Series of soils. These soils have a surface layer of black to very dark brown sandy loam which overlies sandy substratum containing some gravel. The Dakota soils found on St. Feriole Island are well drained, with slopes of 0 to 3 percent and are more susceptible to erosion by wind than by water, although the hazard of erosion is slight.

Uplands - The original upland vegetation on both the Iowa and Wisconsin sides of the river was primarily tall-grass prairie. Agriculture has replaced much of the upland prairie, and the terraces have become sites for towns, such as Prairie du Chien; however, extensive stands of relatively undisturbed dry "goat prairies" can still be found on the south- and west-facing bluff slopes. The steep north- and east-facing bluff slopes have well-developed stands of maple-basswood forest grading into oak-hickory on drier sites.

Developed Areas - Developed areas are normally unvegetated or marginally vegetated due to human activities. Parks, agricultural land and residential areas are included in this description. Within the City of Prairie du Chien and on St. Feriole Island, several developed upland areas have been proposed as alternative harbor locations. These areas have been previously disturbed by industrial development and are marginally vegetated. Generally, these areas have minor to moderate habitat value to wildlife species.

4.1.4 Fish and Wildlife

The terrestrial, wetland and aquatic habitats of the East Channel support a wide variety of fish, mammal, bird, reptile and amphibian species. The species of importance and their uses of the East Channel area are summarized below.

The East Channel supports an important sport fishery. Northern pike (*Esox lucius*), bluegill (*Lepomis macrochirus*), white crappie (*Pomoxis annularis*), black crappie (*P. nigromaculatus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), walleye (*Stizostedion vitreum*) and sauger (*S. canadense*) are important gamefish species found in the East Channel (Rasmussen 1979). Studies by the WDNR indicate the East Channel is an important overwintering habitat for channel catfish (*Ictalurus punctatus*), a species important to both commercial and recreational fishermen.

Other commercially harvested species include smallmouth buffalo (*Ictiobus bubalus*), carp (*Cyprinus carpio*) and freshwater drum (*Aplodinotus grunniens*).

Paddlefish (*Polyodon spathula*), shovelnose sturgeon (*Scaphirhynchus platorynchus*), carp, drum and suckers (*Catostomus spp.*) are known for using main channel habitat, while walleye, sauger, northern pike, white bass (*Morone chrysops*) and channel catfish are typically found in channel border and side channel habitats. Backwater lake habitats are more suited to bass, bullhead (*Ictalurus spp.*) and bluegill.

Certain species of fish are necessary as hosts for the parasitic glochidial stage of freshwater mussels. Walleye, largemouth bass (WDNR 1990), smallmouth bass, yellow perch (*Perca flavescens*) (Holland-Bartels and Waller 1988), sauger and freshwater drum (Stern et al. 1982 and references therein) have all been implicated as suitable host species for the glochidia of the Federal/State endangered freshwater mussel species *Lampsilis higginsi.*

Floodplain forest areas in the project vicinity contain a rich assortment of mammalian species, particularly those species associated with and dependent on water. Raccoon (*Procyon lotor*), muskrat (*Ondatra zibethica*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*) and mink (*Mustela vison*) are common inhabitants frequenting woodlands, marsh/sedge meadow areas and aquatic habitats alike. White-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes fulva*), gray fox (*Vulpes cinereoargenteus*), opossum (*Didelphis virginianus*), striped skunk (*Mephitis mephitis*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), Eastern

cottontail rabbit (*Sylvilagus floridanus*) and various smaller rodent species are also found in bottomland habitats, most generally in woodland and/or marsh/sedge meadow areas.

The river bottomlands serve as breeding areas for many species of marsh dwelling birds. Extensive wood duck (*Aix sponsa*) nesting and brood-rearing habitat is available. Hooded mergansers (*Lophodytes cucullatus*), mallards (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), Canada geese (*Branta canadensis*), whistling swans (*Olor columbianus*), and herons, shorebirds and marsh passerines (e.g., red-winged blackbird (*Agelaius phoeniceus*), yellow-throated blackbird (*Xanthocephalus xanthocephalus*)) and marsh wrens use floodplain forest and marsh areas for nesting and brood-rearing.

Historically, wild celery (*Vallisneria americana*) beds in McGregor Lake (UMR mile 634.0) attracted canvasback ducks. Current canvasback use is reduced due to declining wild celery and other submerged vegetation beds. The Lower Bottoms (UMR miles 631.0-633.0) also provide good waterfowl habitat. Dabbling ducks use shallow backwater areas, feeding on submerged pondweeds and the seeds of emergents. Diving ducks use more open water areas, feeding on submerged pondweeds, wild celery, mollusks and invertebrates. Many species of waterfowl use the Mississippi River strictly for roosting, feeding primarily in adjacent upland areas (i.e., cornfields, grain fields).

Backwaters in the project area provide feeding habitat for wading birds from rookeries both upstream and downstream. An active nesting colony of great blue heron, double-crested cormorant, and great egret exists at approximately UMR mile 639.6, on the Wisconsin side, in an area known locally as Voth Lake. Garnet Lake between UMR mile 631.0 and UMR mile 633.0 is heavily used by wading birds feeding on fish species. Historically, Garnet Lake had heron rookeries nearby, and today it supports a black tern nesting colony. Marsh and shorebird species, passerines, aquatic furbearers, and reptiles also favor many of the same habitats. Turtle, muskrat, and beaver are commonly trapped in the biologically rich Lower Bottoms.

Information on reptilian and amphibian species that inhabit the East Channel area is limited. Species of turtles, water snakes, mud puppies, salamanders, frogs and toads are all commonly found in marsh/sedge meadow areas and aquatic habitats. Turtles make use of sandbar areas as nesting habitat, while all life stages of mud puppies, salamanders, frogs and toads use backwater sloughs and marshes.

4.1.5 Freshwater Mussels

The notable characteristics of the East Channel -- moderate to high flow, stable substrates, the presence of aquatic vegetation and high water quality -- make this area excellent habitat for freshwater mussels (Miller and Payne 1990b, WDNR 1990). The East Channel, particularly its main channel, main channel border and side channel areas, provides habitat for one of the richest populations of mussels in the Upper Mississippi River (Duncan and Thiel 1983, Havlik and Marking 1980, Holland-Bartels and Waller 1988, Miller and Payne 1986, Stern et al.

1982, Thiel 1981). Historically, 44 species of freshwater mussels have been identified from the Prairie du Chien area (Havlik and Stansbery 1977 and references therein). Recent studies indicate about 31 species of freshwater mussels exist in the East Channel (Table 3, WDNR 1990). Due to the quality of the mussel resource in the East Channel, this area has been chosen for long-term research on the effects of commercial navigation traffic on freshwater mussels. A moderate volume of information exists on the mussel resources of the East Channel and the effects of commercial navigation on freshwater mussels.

Estimates of mussel densities in the East Channel vary with location. Duncan and Thiel (1983) estimated an average density of 31.89 mussels/m^2. Miller et al. (1984) sampled five sites in the East Channel and reported mussel densities between 22.4 mussels/m^2 and 167.2 mussels/m^2. Density estimates derived from the results of a survey conducted in the lower end of Sawmill Slough (Harris 1993) indicated an average density of 14.3 mussels/m^2. For comparative purposes, mussel densities reported by Duncan and Thiel (1983) from other areas of Pool 10 ranged from 25.8 mussels/m^2 in the West Channel to 7.1 mussels/m^2 in the lower end of Pool 10.

To assess the effects of commercial navigation traffic on freshwater mussel populations, Miller and Payne (1992a) and Clarke (1991) have monitored mussel populations in the East Channel since 1984 and 1989, respectively. Miller and Payne (1992a) have studied mussel populations in the turning basin area of the East Channel and at a reference site relatively unaffected by vessel movement about 0.8 kilometer downriver. From 1984 to 1991, mean mussel densities in the reference site area ranged from 68.5 to 149.2 mussels/m^2 while mean densities in the turning basin area ranged from 22.0 to 48.6 mussels/m^2. The lower mussel densities observed in the turning basin area were caused by channel maintenance operations (dredging) conducted by the COE in 1976. After approximately 8 years of monitoring, Miller and Payne (1992a,b) have observed no changes in mussel densities which can be related to navigation traffic. Clarke (1991) sampled four sites, three transversed by commercial barges and one similar area not transversed by barges, in the East Channel in 1990 and 1991. He reported densities between 9.5 mussels/m^2 and 52.0 mussels/m^2 in the areas transversed by barges and densities between 34.9 mussels/m^2 and 53.2 mussels/m^2 in the control area. Since release of the draft EIS, Clarke has sampled his East Channel sites three additional times, in 1992, 1993 and 1994. Clarke and Loter (1994) reported densities between 7.3 mussels/m^2 and 67.0 mussels/m^2 in the areas transversed by barges and densities between 28.8 mussels/m^2 and 59.5 mussels/m^2 in the control area.

A survey of the lower portions of Sawmill Slough was completed in October 1993 by Harris (1993). Sixty-five quarter-meter-squared quadrats were collected across 13 transects. In total, 233 live freshwater mussels were sampled. Density estimates derived from the results of this survey indicate an average density of 14.3 mussels/m^2.

A skimmer dredge survey using techniques described in Miller et al. (1989) of the upper portions of Sawmill Slough immediately adjacent to the Swingle/PS&G site was completed by

Table 3. Mussel species collected from the East Channel of the UMR at Prairie du Chien, WI.

Common Name	Scientific Name	Source		
		Duncan and Thiel, 1983	Clarke, 1991	Miller and Payne, 1992
Threeridge	*Amblema plicata*	X	X	X
Washboard	*Megalonaias gigantea*	X	X	X
Deertoe	*Truncilla truncata*	X	X	X
Fragile Papershell	*Leptodea fragilis*	X	X	X
Fawnfoot	*Truncilla donaciformis*	X	X	X
Pimpleback	*Quadrula pustulosa*	X	X	X
Pigtoe	*Fusconaia flava*	X	X	X
Pink Heelsplitter	*Proptera alata*	X	X	X
Spike	*Elliptio dilatata*	X	X	X
Threehorn	*Obliquaria reflexa*	X	X	X
Mapleleaf	*Quadrula quadrula*	X	X	X
Paper Floater	*Anodonta imbecillis*	X	X	
Pocketbook	*Lampsilis ovata ventricosa*	X	X	X
Wartyback	*Quadrula nodulata*	X	X	X
Hickory Nut	*Obovaria olivaria*	X	X	X
Giant Floater	*Anodonta grandis*	X	X	X
Black Sandshell	*Ligumia recta*	X	X	X
Fat Mucket	*Lampsilis radiata siliquoidea*	X	X	
Strange Floater	*Strophitus undulatus*	X	X	X
Rockshell	*Arcidens confragosus*	X	X	X
Higgins' Eye	*Lampsilis higginsi*	X	X	X
Monkeyface	*Quadrula metanevra*	X	X	X
White Heelsplitter	*Lasmigona complanata*	X	X	X
Pink Papershell	*Proptera laevissima*	X	X	X
Butterfly	*Ellipsaria lineolata*	X	X	X
Lilliput	*Carunculina parva*	X	X	X
Yellow Sandshell	*Lampsilis teres*	X		X
Ohio River Pigtoe	*Pleurobema sintoxia*	X		X
Ellipse	*Actinonaias ellipsiformis*		X	
Mucket	*Actinonaias carinata*		X	
Buckhorn	*Tritogonia verrucosa*	X		
Total Species	31	29	28	26

the COE and USFWS in June 1993. An estimated mean density of 0.15 mussel/m^2 was calculated from the results of this survey.

In the northern portion of the East Channel, where dredging was conducted by the COE in 1976, the number of species is low, the density of mussels is lower and individuals are smaller than in other undisturbed areas (Miller et al. 1990, Miller and Payne 1986). Harris and Hay (1993) surveyed three sites in the northern East Channel: site 1 located at the extreme north end of the East Channel; site 2 located immediately north of the barge turning basin and site 3 located north of site 2. Harris and Hay (1993) reported densities of 0.13 mussel/m^2, 7.58 mussels/m^2, and 0.67 mussel/m^2, respectively, at sites 1, 2, and 3. Although mussel densities are lower in dredged portions of the northern East Channel, Miller and Payne (1992b) conclude recruitment of *Amblema plicata* is proceeding at similar rates in dredged and undisturbed areas of the East Channel.

The dominant mussel species in the East Channel beds is *Amblema plicata*. *A. plicata* normally comprises about 50 percent of the total number of mussels collected during surveys of the East Channel (Duncan and Thiel 1983, Miller et al. 1984, Clarke 1991, Miller and Payne 1992a,b). Densities of *A. plicata* as high as 77.6 mussels/m^2 have been reported in the East Channel (Miller et al. 1984). Three other species, *Megalonaias gigantea, Truncilla truncata, and Leptodea fragilis*, are relatively common, each comprising 4 to 9 percent of the East Channel mussel population and found in densities of greater than 2.0 mussels/m^2 (Duncan and Thiel 1983, Miller et al. 1984, Clarke 1991, Miller and Payne 1992a,b). Because of the extreme dominance of *A. plicata* in the East Channel, estimates of species diversity are low (Clarke 1991, Miller and Payne 1992a,b).

4.1.6 Federal and State Threatened and Endangered Species

One species of freshwater mussel and two bird species listed by the USFWS as Federally endangered are known to occur in the East Channel study area. The Prairie du Chien area is within the historic range of several other Federally listed threatened and endangered species; however, these species have not recently been documented in the project vicinity and their presence in the project vicinity is unlikely. In addition to the Federally listed species, several species listed by Wisconsin as threatened or endangered are known to inhabit the East Channel study area.

4.1.6.1 Freshwater Mussels

The presence of the Federally endangered freshwater mussel species *Lampsilis higginsi* in the East Channel is well documented (Havlik and Stansbery 1977, Kindschi 1980, Thiel 1981, Havlik 1980, Stern et al. 1982, Duncan and Thiel 1983, Holland-Bartels and Waller 1988). Duncan and Thiel (1983), Miller et al. (1984), Holland-Bartels and Waller (1988) and Clarke (1991) have gathered quantitative survey data assessing the relative abundance and density of *L. higginsi* populations in the East Channel. Of 1,142 mussel specimens collected by Miller et al. (1984) in the East Channel, seven or 0.61 percent were *L. higginsi* individuals. Clarke

(1991) reported, of 762 mussel specimens collected in 1990, seven (0.92 percent) were *L. higginsi* individuals, while in 1991, 0.80 percent (11 of 1,389) were *L. higginsi*. Since 1984, *L. higginsi* has comprised on average about 0.75 percent of the mussels collected from Miller and Payne's reference site near the City Dock (Miller and Payne 1992a).

While *L. higginsi* was never known to be abundant in its historic range, the relative density of *L. higginsi* in the East Channel is high compared to other habitats. Duncan and Thiel (1983) reported an *L. higginsi* density of 0.172 mussel/m^2 while Holland-Bartels and Waller (1988) reported a density of 0.4 mussel/m^2. Clarke (1991) sampled four transects in the East Channel and reported *L. higginsi* densities of between 0.133 mussel/m^2 and 0.667 mussel/m^2. In comparison, the *L. higginsi* density reported from a 3-mile portion of the main channel in the Prairie du Chien area was 0.086 mussel/m^2 while densities in all of Pool 10 were 0.054 mussel/m^2 (Duncan and Thiel 1983). The populations of *L. higginsi* in the East Channel are the largest known remaining populations of this species in the Mississippi River (Stern et al. 1983, WDNR 1990). Based on this fact, the *Lampsilis higginsi* Recovery Team has recommended the East Channel and a large segment of the main channel from UMR mile 637.0 to approximately UMR mile 633.4 be classified as "essential habitat" for *L. higginsi* (Stern et al. 1983).

Based on recent surveys of the East Channel discussed in detail in the Biological Assessment for this project (Appendix D), densities for *L. higginsi* populations north of the barge turning basin, in Sawmill Slough, and between the City Dock and the barge turning basin were estimated at 0.16 mussel/m^2, 0.373 mussel/m^2 and 0.579 mussel/m^2, respectively. However, no live *L. higginsi* were collected in a survey conducted by Harris (1993) in Sawmill Slough in October 1993. Five dead specimens were collected, indicating that *L. higginsi* probably exist in the area. Therefore, a revised estimate of *L. higginsi* densities in Sawmill Slough was formulated by multiplying the average total density of mussels (14.3 mussels/m^2) collected by Harris (1993) by an averaged percent composition (0.75 percent; Miller and Payne 1992a,b) of *L. higginsi* in other locations in the East Channel. This yields an estimated *L. higginsi* density of 0.107 mussel/m^2, lower than the density estimate of 0.373 mussel/m^2 used in the Biological Assessment (Appendix D). Additionally, surveys of the northern East Channel, completed by Harris and Hay (1993) in October 1993 collected live *L. higginsi* from two sites (sites 2 and 3) north of the barge turning basin. This information was used to calculate a revised *L. higginsi* density of 0.15 mussel/m^2 for that portion of the East Channel north of the barge turning basin. Although this new information has resulted in revision of density estimates provided in the Biological Assessment for this project, the conclusions of the Biological Assessment remain as originally stated.

4.1.6.2 Other Federally Listed Species

The East Channel area provides potential breeding habitat for the Federally listed threatened bald eagle (*Haliaeetus leucocephalus*) and the Federally listed endangered peregrine falcon (*Falco peregrinus*). Bald eagle nest sites are known to exist several miles upstream of the

East Channel area and a few miles downstream of the area; however, no nest sites for either the bald eagle or the peregrine falcon are known to exist in the immediate East Channel area.

The East Channel also provides suitable wintering habitat for bald eagles. Eagles are often observed roosting in streamside trees, floating on ice floes during spring thaw and soaring overhead in the East Channel area.

The following species Federally listed as endangered (E) or threatened (T) could also occur in the general area: gray bat (*Myotis grisescens*) (E), Indiana bat (*Myotis sodalis*) (E), piping plover (*Charadrius melodus*) (E), least tern (*Sterna antillarum*) (E), Iowa Pleistocene snail (*Discus macclintocki*) (E), Minnesota trout lily (*Erythronium propullans*) (E), Karner blue butterfly (*Lycaeides melissa samuelis*) (E), northern wild monkshood (*Aconitum noveboracense*) (T), Mead's milkweed (*Asclepias meadii*) (T), dwarf lake iris (*Iris lacustris*) (T), prairie bush-clover (*Lespedeza leptostachya*) (T), Fassett's locoweed (*Oxytropis campestris var. chartacea*) (T), eastern prairie fringed orchid (*Platanthera leucophaea*) (T), and western prairie fringed orchid (*Platanthera praeclara*) (T). However, no documentation exists of the current presence of these species in the East Channel area, and habitat conditions are generally unsuitable for these species.

4.1.6.3 State Threatened and Endangered Species

A Wisconsin endangered species is defined as any species whose continued existence as a viable component of the State's wild animals or wild plants is determined by the WDNR to be in jeopardy on the basis of scientific evidence. A threatened species is defined as any species of wild animals or wild plants which appears likely, within the foreseeable future, on the basis of scientific evidence, to become endangered.

There are eleven and seven species of mussels on the Wisconsin endangered and threatened species lists, respectively. The following seven species of mussels, three endangered and four threatened, are known to occur in the Prairie du Chien area (Duncan and Thiel 1983).

ENDANGERED		Density (#/m^2)
Butterfly	*Ellipsaria lineolata*	0.01
Higgins' Eye Pearly	*Lampsilis higginsi*	0.172
Yellow/Slough Sandshell	*Lampsilis teres*	0.011
THREATENED		
Rock Pocketbook	*Arcidens confragosus*	0.108
Monkeyface	*Quadrula metanevra*	0.086
Wartyback	*Quadrula nodulata*	0.237
Buckhorn	*Tritogonia verrucosa*	0.011

A number of State listed endangered and threatened fish species also are known to occur in the Prairie du Chien area. A list of these protected species and the general location of their known occurrence follows (from documented records in the Wisconsin Natural Heritage and Fish Distribution databases).

ENDANGERED

Skipjack Herring (*Alosa chrysochloris*) - 1984, T7N R7W
Goldeye (*Hiodon alosoides*) - > 25-year-old record, T7N R7W
Pallid Shiner (*Notropis amnis*) - 1976, south of Prairie du Chien

THREATENED

Black Buffalo (*Ictiobus niger*) - > 25-year-old record, T7N R7W
Speckled Chub (*Hybopsis aestivalis*) - 1976, north of Prairie du Chien; older records at and south of Prairie du Chien

4.2 Upper Mississippi River National Wildlife and Fish Refuge

The following is summarized from information provided by the USFWS.

4.2.1 General

The Upper Mississippi River National Wildlife and Fish Refuge (Refuge), established under the Upper Mississippi River Wildlife and Fish Refuge Act, is the longest refuge in the lower 48 States, extending 261 miles from the Chippewa River in Wisconsin to Rock Island, Illinois. Authorized in 1924, the Refuge protects approximately 194,000 acres of bottomland habitat in parts of Minnesota, Wisconsin, Iowa, and Illinois. It provides one of the largest areas of contiguous wildlife habitat remaining in the central United States. More than half of the Refuge land is owned by the COE, but is managed by the USFWS under a cooperative agreement.

The 1934 Fish and Wildlife Coordination Act and subsequent amendments provide the authority for the USFWS to enter into cooperative agreement with the COE for the transfer of lands suitable for migratory bird programs into the Refuge, and to develop general plans with the COE and States for management of the transferred lands. The Act also requires agencies involved in water projects to give full consideration to the effects of such projects on wildlife.

The Refuge has a great deal of ecological diversity due to its location in a sheltered river floodplain and its north-south expanse. In many places, it is possible to locate the Refuge boundary by noting where the natural vegetation stops and development begins. It is apparent that the presence of the Refuge has preserved in a more natural state a large portion of the river floodplain.

4.2.2 Refuge Description

Most of the islands, side channels, backwater lakes and ponds in the project vicinity are included in the Refuge. These areas provide a diversity of habitat types and support a variety of fish and wildlife species. Sections 4.1.1 through 4.1.6 describe these resources.

4.3 Cultural Resources

4.3.1 Prehistory

The area surrounding Prairie du Chien is one of the best known archeological areas along the Upper Mississippi River within the St. Paul District. Hundreds of prehistoric archeological sites are located on the floodplain and along the terraces and adjacent uplands of the Mississippi River.

Archeological work began in the late 1800's with the identification of numerous burial mounds that were located in this area of the Mississippi River Valley (Thomas 1894). Burial mound archeology, especially that associated with the distinctive effigy mounds found in this area, predominated until the 1970's (Halsey 1972). Much of the modern archeological work that resulted in the identification of a large number of habitation sites has come since the late 1970's as a result of both Federal projects (Kennington 1993; Oerichbauer 1976; Overstreet 1984, 1993; Wahls 1990) and the interest in the Prairie du Chien area by the Anthropology Department of the University of Wisconsin-Madison (Boszhardt 1982, 1986; Stoltman 1982a; Theler 1983). While the scientific recording of archeological sites has been a recent phenomenon, many of these same sites have been known and collected for years by local people interested in the archeology of this area. Some of these local collections are very large, consisting of thousands of prehistoric artifacts.

While archeological sites from the river terraces and upland areas fall across most of the spectrum of prehistoric periods, knowledge of floodplain sites has focused primarily on sites of the Late Archaic and Woodland Periods. The preponderance of sites from these periods can be attributed to two primary factors, geomorphology of the riverine environment and sampling biases from past surveys.

Geomorphological studies of the river near Prairie du Chien have suggested, while the location of the river in this area has not changed greatly over the past 10,000 years, the nature of the floodplain has changed considerably (Church 1985). Since glacial downcutting, accretion has gradually filled the river with alluvial sediment. In addition to this vertical rise in the overall elevation of the floodplain, the floodplain islands have also undergone significant development. Most of the islands in the Prairie du Chien area have been accreting laterally for thousands of years. Since the floodplain environment has played a significant role in the nature of past human habitation, understanding floodplain development is critical to the successful identification of these past habitation areas.

Most of the recent, large-scale, archeological surveys have concentrated on the shorelines along the islands and mainlands of the Mississippi River. This survey bias, combined with the geomorphological development of the floodplain, has tended to focus archeological efforts on land surfaces that are more geologically recent. Older, interior island locations and past surfaces that are now deeply buried have received little archeological attention over the years.

Archeologists have only seen glimpses of the potential for deeply buried sites and sites on island interiors over the past decade. In the early 1980's, very limited deep-testing and the use of ground penetrating radar identified sites nearly 5 meters deep on islands south of Prairie du Chien (Overstreet 1984). Other sites were found deeply buried on glacial terraces now covered with floodplain sediments. More recently, archeologists from the University of Wisconsin-Madison have located significant, deeply stratified sites in island interiors (Wahls 1990).

While a great deal of work has been accomplished at archeological sites over the past decade, much of the archeological potential of the Prairie du Chien area has yet to be realized. The floodplain and terraces, which are of primary concern with respect to harbor development at Prairie du Chien, offer a significant opportunity for the study of prehistoric use of this area. In addition to the numerous archeological surveys that have focused on the Prairie du Chien area in general, archeological information has been gathered specifically for Prairie du Chien harbor development. Eleven potential harbor sites were evaluated as a result of the study conducted by the Mississippi River Regional Planning Commission. These potential harbor sites and the impacts to archeological and historic resources were discussed in the Commission's report: *Port of Prairie du Chien Harbor Siting Plan - 1990.* Each of the 11 potential harbor sites contained one or more archeological sites that could be affected as a result of development.

4.3.2 History

While Marquette and Joliet were the first Europeans to see the Mississippi River, upon entering it from the Wisconsin River in June 1673, there is no firm evidence that they set foot upon the terrace at Prairie du Chien. Less than a decade later, La Salle writes of establishing a settlement at the Prairie, where he hunted buffalo, but it was not until 1685 when Nicholas Perrot established Fort St. Nicholas that the first European occupation of Prairie du Chien can be verified.

The military occupation of Prairie du Chien, beginning at this time, has an interesting history. While the French maintained military control of the Prairie du Chien terrace, using the area as an early fur trade center, French control of the area was lost in 1763. At this time, the British took control of the Northwest Territories. By 1805, the United States established a presence in Prairie du Chien - building Fort Shelby on St. Feriole Island some 9 years later. However, only months after construction, the fort was captured by the British in a battle of the War of 1812. The British renamed it Fort McKay, and occupied it until the war's end in 1816, when it was abandoned and burned. The Americans again regained control of the area and

constructed another fort on the island, naming it Fort Crawford. Because of flooding, the fort was relocated to the mainland in 1828.

While the date of earliest settlement for Prairie du Chien has been debated, the first permanent settlement of the area came in 1779 when a small community was established on St. Feriole Island. However, the first record of private land claims was not established until 1820, followed by the incorporation of the borough of Prairie du Chien a year later.

During the 1830's, Prairie du Chien grew rapidly, and with the influx of immigrants looking to settle the area, land speculation grew to a fevered pitch. By the 1840's, the economy of the city nearly collapsed when the fur trade, upon which it had become so dependent, also collapsed. By the end of the decade, Fort Crawford's garrison had been transferred, and the fort was abandoned.

In 1852, it was announced Prairie du Chien had been selected as the western terminus for the railroad. With the coming of the railroad in 1857, new prosperity was brought to the city as its importance as a transshipment point increased (Zeitlin n.d.). Goods arriving by railroad were loaded to riverboats for travel to the north and south of Prairie du Chien. Transshipment from rail to steamboat was a time-consuming process and tended to keep the city bustling with people and the hotels filled. By 1860, steamboat traffic at Prairie du Chien ranged between 70 and 80 vessels a week. Because of low water problems for steamboats, the mainland railroad terminal was moved to the island in 1864. With the move came new developments to the island including construction of a five-story grain elevator, the Diamond Jo Warehouse and the Railway House Hotel (later renamed the Dousman Hotel).

Prairie du Chien's importance as a transshipment point began its decline in 1874, when John Lawler opened his pontoon bridge to railroad traffic between Prairie du Chien and McGregor, Iowa. While this occurrence reduced handling of east-west transshipments, north-south handling was still necessary. However, within a decade of the opening of the pontoon bridge, north-south rail linkages began to further decrease Prairie du Chien's importance as a rail and river junction point. With the national economic depression of the 1890's, the heyday of Prairie du Chien's importance as a transshipment and trade center had vanished.

4.3.3 Significant Resources

Because of the high density of prehistoric archeological sites and the long history of European settlement in the area, Prairie du Chien has a large number of significant resources. Archeologists and historians have evaluated many of these resources, especially those associated with the historic period, against the criteria of the National Register of Historic Places. Some of the resources have also been designated as National Historic Landmarks.

Within the past decade, a large number of prehistoric sites have been located within the Prairie du Chien vicinity, but unlike the historic resources, many of these have yet to be evaluated for the National Register. Underwater archeological resources abandoned in the

waters of the Upper Mississippi River have only recently come to the attention of archeologists. These resources remain the least investigated category of historic archeological resources in most States. Underwater resources, as well as their on-land counterparts, must be considered potentially eligible for the National Register of Historic Places until the evaluation process is completed.

4.3.3.1 Historic Resources of St. Feriole Island

In 1979, as a result of the COE Flood Control Project at Prairie du Chien, the COE and the Wisconsin State Historic Preservation Officer (SHPO) determined that St. Feriole Island was eligible for the National Register of Historic Places (NRHP) as an archeological and historic district. Within this district, a number of historic resources existed which had been previously nominated individually for the National Register. Some of these had also been designated as National Historic Landmarks (NHL).

Astor Fur Warehouse	NRHP/NHL
Brisbois House	NRHP/NHL
Dousman Hotel	NRHP/NHL
Villa Louis	NRHP/NHL
Rolette House	NRHP

In addition to these pre-existing National Register properties, three historic properties were identified as part of the historic district for the Prairie du Chien Flood Control Project and were recommended for in-place preservation by the Historic American Buildings Survey of the National Park Service (Hoagland and Frandsen 1978). In accordance with the 1980 Memorandum of Agreement with the Wisconsin State Historic Preservation Office and the Advisory Council on Historic Preservation, these three buildings were retained for use by the City of Prairie du Chien.

House (2 Story Log, ca. 1860)	113 Villa Louis Road
House (1 Story Log, no date)	419 5th Street
House (early brick, pre-1850)	210 Villa Louis Road

4.3.3.2 Archeological Resources of St. Feriole Island

Twenty prehistoric archeological sites have been recorded in the State Archeological Site Files as existing on St. Feriole Island.

47 CR 7	Mound
47 CR 29	Mounds
47 CR 57	Fort Crawford - Prehistoric
47 CR 65	Mound
47 CR 131	Campsite/Cemetery
47 CR 160	Mound

47 CR 161	Mounds
47 CR 167	Rolette House
47 CR 245	Campsite
47 CR 246	Mounds
47 CR 248	Cemetery
47 CR 249	Historic Fort Shelby/McKay/Crawford
47 CR 254	Euro-American Military
47 CR 255	Euro-American
47 CR 436	Old Copper
47 CR 444	Worksite
47 CR 445	Worksite
47 CR 469	Campsite/Burials
47 CR 487	Undiagnostic Prehistoric
47 CR 501	Undiagnostic Prehistoric

Some of these sites were reported at the turn of the century; these tend to be prehistoric burials, some of which were individual burials (3) and many of which existed in the form of burial mounds and mound groups (6). Many of these mounds can still be seen on the island today, and some of these mounds were the building sites for historic buildings, such as Villa Louis (47 CR 7), where human remains were reportedly found during the construction of the basement.

Many of the prehistoric resources reported for St. Feriole Island have been destroyed by historic development. For example, 47 CR 131 has been totally destroyed by gravel operations at the north end of the island, and portions of 47 CR 248 have also been destroyed by gravel operations. Site 47 CR 501 was discovered in 1990 as a result of surveys required of Didion, Inc. for a Department of the Army permit. The site was located adjacent to the City Dock below 3.0 meters of fill placed in this area as a result of construction of the Federal commercial harbor in the late 1950's. The extent and condition of this site have never been determined. With the present barge limitation on the City Dock, it is economically infeasible for major developments to occur here that would adversely affect site 47 CR 501. Removal of barge shipping limitations and increased development at this site would likely require a new permit and new coordination for NEPA and historic resources compliance.

Within the St. Feriole Island Archeological and Historic District, few of the prehistoric habitation sites recorded for St. Feriole Island actually have been intensively tested. However, limited archeological work suggests that many of the deposits on the island may extend from surface remains to more deeply buried components. At the Rolette House site (47 CR 167), prehistoric deposits were found to depths of at least 2 meters.

4.3.3.3 Historic Resources of Mainland Prairie du Chien

Five historic structures listed on the National Register of Historic Places are located on the mainland within the City of Prairie du Chien. These properties are the Crawford County

Courthouse, the W.H.C. Folsom House, the Fort Crawford Military Hospital, the Old Rock School, and the Strange Powers House.

In addition to these National Register properties, the French Town and Calvary Cemeteries are located just north of the Prairie du Chien city limits.

4.3.3.4 Archeological Resources of the Prairie du Chien Terrace

4.3.3.4.1 North Terrace Sites

At the northern end of the Prairie du Chien terrace (north of the corporate limits), five archeological sites are reported in the site files of the State Archeologist. Three of the five sites are mound groups (47 CR 22, 47 CR 50, and 47 CR 53). The other two sites are prehistoric habitation sites (47 CR 374 and 47 CR 127). One of these, the Pedretti III Site (47 CR 127), is listed on the National Register of Historic Places.

4.3.3.4.2 South Terrace Sites (Southwest of Highway 18)

Over 30 archeological sites exist on the southern Prairie du Chien terrace to the south and west of Highway 18. Half of these sites were recorded during a 1990 survey by the Anthropology Department of the University of Wisconsin-Madison. None of the sites in this area have been evaluated for the National Register of Historic Places except the Prairie du Chien Water Treatment Plant Site (47 CR 552) which was only recently completed (Salkin 1993). This site, with its historic components possibly related to the Pig's Eye French Fort, has been found to meet the criteria of the National Register.

The best known mound located on the south terrace in the Prairie du Chien area was excavated by Thomas in 1894. This mound, the Trade Silver Mound (47 CR 62), was 70 feet in diameter and 10 feet high. Named after the silver artifacts that Thomas took from the mound, including a silver locket, 6 silver brooches, 10 silver bracelets and a silver cross, the mound has been totally destroyed in the intervening years.

4.3.3.5 Archeological Resources of the Floodplain

The archeological sites described here lie adjacent to the Prairie du Chien terrace from the head of Scrogum Island on the north, south to the head of Snake Island. This area encompassed Roseau, East and Hunter Channels on the Wisconsin side of the river. The shorelines of Roseau Channel, the East Channel, a portion of Hunter Channel and McGregor Lake, and most of the main channel of the Mississippi River were surveyed for archeological sites in 1988 by the Department of Anthropology, University of Wisconsin-Madison (Wahls 1990). Within this area are 35 known archeological sites. The majority of these sites are Woodland period campsites and shell midden sites. However, one burial site, the Alfred Reed Mound Group (47 CR 311), is located in the floodplain. This mound group is listed on the National Register of Historic Places.

Eleven prehistoric archeological sites located on Marais Lake, and called the Marais Lake Archeological District, were determined to be eligible for the National Register of Historic Places (Stoltman 1980). These 11 sites (47 CR 18, 47 CR 185, 47 CR 187, 47 CR 340, 47 CR 348, 47 CR 352-353, 47 CR 356-358, and 47 CR 370) are a series of village/shell midden sites dating primarily from the Middle through Late Woodland; however, several of the sites also have Archaic components.

Another group of three archeological sites located on Hunter Channel has been determined eligible for the National Register of Historic Places (Stoltman 1980). These three sites (47 CR 312, 47 CR 314, and 46 CR 360) are a series of habitation areas dating primarily to the Woodland Period.

The only other sites within this area that have been systematically tested are the Atlantis site (47 CR 451) and the Tillmont site (47 CR 460). The Atlantis site is a campsite that dates from Early through Late Woodland and the Tilimont site, a stratified habitation site, dates from the Archaic through the Late Woodland Period. Both of these sites were evaluated for the National Register of Historic Places during the summer of 1995 by Dr. James Stoltman of the Department of Anthropology at the University of Wisconsin-Madison. During the 1995 fieldwork, Stoltman found the Tillmont archeological site to be one of the most significant sites located to date on the floodplain of the Mississippi River. While the Tillmont site definitely meets the criteria of eligibility for the National Register, work at the Atlantis site did not recover significant archeological information, and it does not meet the National Register criteria.

4.3.3.6 Effigy Mounds National Monument

Effigy Mounds National Monument was created by Presidential proclamation on October 25, 1949. The North Unit of the monument is to the northwest of Prairie du Chien, in Allamakee and Clayton Counties, Iowa. The detached Sny Magill Unit is located 15 miles to the south of the North Unit on the floodplain of the Mississippi River.

Within the 1,204 acres of the North Unit of the monument are 191 known prehistoric mounds. Twenty-nine of these mounds are in the form of bird and bear effigy, while the rest are conical or linear mounds. The mounds in the monument can be traced from the Red Ocher Culture (around 2,500 years ago), through the Hopewell Culture (100 B.C. to A.D. 600), to those effigy figures built by the Effigy Mound Culture (around A.D. 1300). An additional 99 mounds were added to the monument in 1961 when the 263-acre Sny Magill Unit was transferred to the National Park Service.

Four scenic overlooks make up part of the trail system of the North Unit. Many miles of the Upper Mississippi River are visible from these overlooks, including the City of Prairie du Chien. Fire Point, on the south, is the closest overlook to the city, while Hanging Rock, on the north, is the farthest. Effigy Mounds National Monument attracts many visitors during the

year. The busiest time is the fall when the overlooks of the monument offer a panoramic and colorful vista of the fall foliage.

4.3.3.7 Cultural Resources Studies Undertaken for the EIS

Three archeological studies have been undertaken for this EIS. Two of these studies, an underwater archeological survey and an upland archeological survey, were conducted by the COE as part of data collection for dredging and dredged material disposal. The underwater archeological survey was conducted to identify resources in the East Channel potentially affected by dredging (Kennington 1993). The upland survey was conducted to identify land-based archeological and historic resources potentially affected by disposal of material associated with dredging (Overstreet 1993).

Underwater Archeological Survey. The underwater archeological survey included target identification and assessment in the portion of the East Channel from the downstream end of a 1976 dredge cut to just below the existing City Dock. This area was suspected to contain remains of a vessel that divers in the area had previously located. There had been several reports of artifacts associated with a sunken vessel just downstream of Sawmill Slough. Remote sensing of this portion of the study area identified nine targets. Diver reconnaissance at each of these targets found that none of them were associated with marine archeological sites. All were revealed to be modern debris, and no further work was recommended for this portion of the East Channel. A southern survey, from the City Dock to the lower end of the East Channel, was also conducted. Here, remote sensing identified five additional targets; however, no assessment was conducted on any of these targets since alternatives for harbor access through the southern portion of the East Channel had been subsequently dropped.

Upland Archeological Surveys. The archeological survey of the four proposed disposal areas identified one prehistoric shell midden site at one of the disposal areas on Island 172. This site is located 1.4 meters below the present surface of the island. No other sites were found at any of the other proposed disposal areas for maintenance dredging in the East Channel.

The permit applicant, PS&G, has also conducted an archeological survey of lands adjacent to the Swingle Site in order to identify any archeological sites that may be located in areas of harbor development, including access roads between the Swingle site and State Highway 35 to the east. The results of this survey were negative, and the State Historical Society of Wisconsin concluded that there are no archeological resources eligible for inclusion on the National Register of Historic Places within the areas surveyed.

No archeological survey was required in the area of cut 3 (Figure 1). This area consists of previously dredged material, and has been open water in the past. Were any archeological resources located here in the past, they have been destroyed as a result of the sand and gravel mining operations at the north end of St. Feriole Island. Previous surveys required of the applicant at the north end of St. Feriole Island have been unsuccessful in locating either archeological sites or original ground surfaces capable of containing archeological sites.

Gravel mining operations at the north end of the island have effectively destroyed any archeological sites that may have existed there.

Vibration Testing. The COE required the applicant to conduct vibration testing to assess the potential impacts of rail traffic on the Rolette House, the Dousman Hotel, the Brisbois House, the Astor Fur Warehouse, and the Villa Louis. This work was conducted by Twin Cities Testing Corporation of St. Paul, Minnesota, in late November and early December 1993. The work included a condition survey of the buildings (Dousman Hotel, Rolette House, Brisbois House, Astor Fur Warehouse, and Villa Louis) and vibration monitoring of train movement near the buildings. Vibration monitoring was done with five seismographs located inside the structures. Results of eight train runs by each structure were recorded in peak particle velocity (PPV). While the report of these investigations concluded that the recorded PPV were well below levels necessary to induce cracking in modern structures, they were within unacceptable international levels set for historic structures.

Because of the significance of vibrations on historic structures, the COE conducted further literature review on the issue of vibration standards at historic structures. In a letter dated February 10, 1995, the COE presented a number of conclusions to the Advisory Council on Historic Preservation on the results of the literature review:

- The literature on vibration impacts as they relate to historic buildings has been sporadic and is often contradictory in establishing appropriate peak particle velocity acceptable for historic buildings. Appropriate levels of peak particle velocity may be related to specific construction techniques used in any given building and the nature, condition, and significance of its architectural features.

- Vibration impacts from traffic, because of their continual nature, must include consideration of building fatigue; however, fatigue on historic building materials in not well understood.

- Building deterioration is a very complex problem and may include many environmental factors unrelated to vibration.

- Vibration impacts should be looked at as both architectural and structural. Structural impacts are those that jeopardize the ability of the affected building to remain standing, and architectural impacts are those that cause cosmetic impacts in plaster and other architectural components that do not jeopardize a building's structural integrity.

- Building condition assessments may not be able to specifically relate building deterioration to vibration impacts; however, they provide the basis for future monitoring efforts to detect and correct adverse impacts.

- The first line of defense against building deterioration from vibration impacts is good building maintenance.

These conclusions formed the basis for negotiations during the April 25-26, 1995 meeting at Prairie du Chien in which interested parties discussed mitigation measures which would be included in the Memorandum of Agreement for historic resources. Because of the difficulty in relating vibration damage to specific causes, such as train traffic, the meeting participants agreed that measures to mitigate vibration at the source were a more effective way to deal with potential vibration damage. The measures to retrofit the tracks in front of the historic structures, which is a part of the Memorandum of Agreement (Appendix F), were a direct outcome of the Prairie du Chien negotiations.

Visual Impact Assessment: A visual impact assessment of Effigy Mounds National Monument was conducted by the COE in 1995. The COE concluded visual impacts to Effigy Mounds National Monument from development and expansion of harbor facilities at the north end of St. Feriole Island would not be significant. Subsequently, the COE met on-site with the National Park Service and the Advisory Council during an April 25-26, 1995 meeting. The COE revised its opinion of the severity of the impacts to the viewshed based on a visitor's ability to readily see a salt storage building recently constructed by PS&G at the Swingle site. Measures to mitigate these visual impacts were discussed in the April 25-26 meeting and were incorporated into the Memorandum of Agreement.

4.4 Socioeconomic Resources

4.4.1 Existing Condition

Prairie du Chien is a small urban community of 5,658 people. Located 100 miles west of Madison and 60 miles south of La Crosse on State Highway 35, Prairie du Chien is the county seat of Crawford County.

In the city, there are an elementary school, a junior high school, and a high school. Six State and private colleges are located within 60 miles. According to the 1990 U.S. Census, 43 percent of the city residents have a high school degree, 6 percent have an associate's degree, 11 percent have attended college but have no degree, 11 percent have a bachelor's degree, and 3 percent have a graduate or professional degree.

The primary industries in town are manufacturing, which employs 27 percent of all persons 16 years or older, retail trade, which employs 23 percent, and educational services, which employs 10 percent (U.S. Census 1990). The major employers in the community are 3M, Design Homes, McGregor Loudspeakers, Wolf Machine, Walmart, Memorial Hospital, Miniature Precision Component, and Crawford County. In 1990, the unemployment rate was 5.5 percent for Prairie du Chien and 4.6 percent for the Nation. The per capita income was $10,375 for the city and $14,420 for the Nation in 1990; the city's per capita income was only 72 percent of the national figure (U.S. Census 1990).

An abundance of recreational opportunities in and around Prairie du Chien includes visitor sites, parks, and scenic overlooks along the Mississippi River. The region is ideal for picnicking, camping, hiking, swimming, boating, and other recreational activities due to its location upstream of the Wisconsin River, a tributary of the Mississippi River. Nearby State parks include Wyalusing in Wisconsin and Pikes Peak in Iowa.

Situated on the Mississippi River, Prairie du Chien is well known as a shipping port for agricultural products from northeastern Iowa and southwestern Wisconsin. There are three shipping terminals in and near the city which transport grain (corn, soybeans, winter wheat), coal, road salt, and fertilizer to various ports downstream. These terminals are PS&G, Peavey Grain, and Didion Incorporated. It is estimated that 897,000 tons of grain, coal, road salt, and fertilizer moved through all terminals at Prairie du Chien in 1990 (pages 3-9, *Port of Prairie du Chien Harbor Siting Plan 1990*). Throughout the 1980's, shipping levels for these commodities ranged from 210,000 tons to 680,000 tons.

The port of Prairie du Chien is important to the city and the farming regions of Wisconsin and Iowa. The region served or potentially served by the port includes the Wisconsin counties of Crawford, Grant, Iowa, Vernon, Columbia, Dane, Dodge, Green, Jefferson, and Rock and the Iowa counties of Clayton, Allamakee, Fayette, and Winneshiek as defined by the Wisconsin Department of Agriculture, Trade, and Consumer Protection (pages 3-9, *Port of Prairie du Chien Harbor Siting Plan 1990*). Due to the location of Prairie du Chien on the Mississippi River, special focus is on Crawford County, Wisconsin, and Clayton County, Iowa.

The existing condition regional economic area for the port of Prairie du Chien is a 50-mile-radius area, including four counties of Iowa. Some of the 22 million bushels of grain shipped out of Prairie du Chien comes by railway from farther into Wisconsin, but the majority comes by truck within the 50-mile radius. The current shipping market in the area has four large shipping terminals to which the region's surplus grain can be hauled. A review of the activity at the existing shipping facilities and the plans for future expansion shows that the margins are large enough to support the existing companies, while competition provides fair prices for farmers.

4.4.2 Population Trends

Wisconsin - The 1990 U.S. Population Census shows a decrease of 3.4 percent or 200 people since 1980 for the city of Prairie du Chien. The current population is 5,659. Crawford County shows a decrease of 616 people, for a total population of 15,940. This is a decrease of 3.7 percent from the 1980 census. The State of Wisconsin shows an increase of 186,127 (3.8 percent) since 1980, for a total population of 4,891,769.

Iowa - Two population centers in Clayton County along the Mississippi River, Marquette and McGregor, have 1990 populations of 479 and 797, respectively. Clayton County has a population of 19,054. This is a decrease of 2,044 people or 9.7 percent since 1980. The

State of Iowa has a 1990 population of 2,776,755, down from the 1980 census of 2,913,808. The State experienced a decrease in population of 137,053 since 1980.

4.4.3 Per Capita Income

Wisconsin - The 1989 per capita income for the State of Wisconsin is $16,454, which is significantly greater than Crawford County's, $11,698.

Iowa - The 1989 per capita income for the State of Iowa, at $15,664, is also significantly higher than that for Clayton County, which is $13,118.

Per capita income data is from information provided by the Bureau of Economic Analysis, 1989.

4.4.4 Employment

Wisconsin - The 1988 County Business Patterns showed a total of 2,283,049 employed persons in the State of Wisconsin. The three most significant industries for the State are manufacturing (23.3 percent of employed persons), trades (21.9 percent), and services (20.7 percent). For Crawford County, there were 6,359 employed persons in 1988. The three most significant industries are agriculture services (24.3 percent of employed persons), trades (20.6 percent), and services (18.0 percent).

Iowa - For the State of Iowa in 1988, there were 1,281,757 employed persons. The three most significant industries were trades (22.4 percent of employed persons), services (19.3 percent), and government (17.3 percent). For Clayton County, there were 7,693 employed persons. The three most significant industries were agriculture services (34.4 percent of employed persons), manufacturing (18.6 percent), and government (17.8 percent).

Data for employment is derived from Bureau of the Census, Enhanced County Business Patterns, 1988.

4.4.5 9-Foot Channel

Prairie du Chien is located just east of the Mississippi River in Wisconsin between Lock 9 at Lynxville, Wisconsin, and Lock 10 at Guttenberg, Iowa.

Barges and tows require certain minimum channel widths and depths. The standard minimum depth maintained on the Upper Mississippi River system is 9 feet, necessary to accommodate a 1,700-ton load moved in a standard size barge. The standard barge width is 35 feet. To maintain the required depth on various sections of the river, periodic dredging is necessary.

Barges are ferried in small numbers (1 to 3) to and from Prairie du Chien docks to fleeting sites on the main (west) channel, where they are grouped into standard tows of 15 barges. Standard tows of 15 barges do not use the East Channel.

4.4.6 Rail Line

The W&SRR serves the interior of Wisconsin and has the potential to bring the bulk of the commodities to Prairie du Chien that are to be shipped on the Mississippi River. A complete description of the railroad is found on pages 4-2 to 4-3 in the *Port of Prairie du Chien Harbor Siting Plan 1990.* This report was prepared for the City of Prairie du Chien Harbor Commission by the Mississippi River Regional Planning Commission.

4.4.7 Future Condition

The future condition economics become complex as more variables enter the equation. The State of Wisconsin is currently rehabilitating the rail lines to the port of Prairie du Chien, thus creating future potential for a larger region to competitively purchase grain and making Prairie du Chien a more competitive and desirable location for marketing grain out of Wisconsin. The permit applicant, PS&G, has also added a 75,000-bushel grain storage bin to increase capacity at the port of Prairie du Chien. Permit applications for expansion of barge loading in the ports adjacent to the port of Prairie du Chien also show that regional demand to ship grain from the Prairie du Chien area is high. With these variables added into the equation, the future regionality will be determined, to some degree, by whether or not the permits are granted for the port of Prairie du Chien.

4.4.8 Summary

In summary, the current grain shipping region served by Prairie du Chien is largely in Iowa. The majority of grain comes by truck traffic to the port. The commitments of the State of Wisconsin, Didion Inc., and PS&G show the market is being expanded and the region served by Prairie du Chien can extend into south-central Wisconsin with the use of the railroads and improved port facilities.

4.5 Recreational Resources

The Mississippi River is the major recreation attribute in the Prairie du Chien region, providing recreational boating, fishing, swimming and camping. Access to the water may be gained from the eight boat ramps and four marinas in the study area. The Lawler Park Ramp and the North Water Street Ramp are on the west side of St. Feriole Island with direct access to the East Channel. On the east side of the island in Marais de Saint Feriole are two marinas, each having boat ramps with access to the East Channel. Downriver from Prairie du Chien on the Wisconsin mainland are the Lockwood Street Ramp, located at the upper end of Hunter Channel, and a ramp at the Big River Campground. On the Iowa side, the towns of Marquette and McGregor both have local marinas with ramps.

Many of the islands in the Mississippi River are part of the Upper Mississippi River National Wildlife and Fish Refuge. Although the islands are managed predominantly for wildlife rather than for human use, they do offer opportunities for wildlife related recreation activities. The southwest tip of Island 169 located at the northern entrance to the East Channel has been designated by the USFWS as a Low Density Recreation Area. There are no developed facilities, and recreation use is expected to be non-intensive and dispersed, although more intensive than in Wildlife Management Areas. Activities in this area could include hiking, hunting, fishing, primitive camping, photography and bird watching.

There are a number of parks in the area. Effigy Mounds National Monument offers visitors hiking trails on top of the bluffs and interpretation of historic features in the area. Pikes Peak State Park in Iowa and Wyalusing State Park in Wisconsin have hiking trails, picnic facilities and campgrounds. The Clayton County Roadside Park provides opportunities for picnicking and fishing along the riverbank. Within Prairie du Chien, Lawler Park is located on the west side of St. Feriole Island and is the location for tour boat docking. The Historic District of St. Feriole Island, with the Villa Louis and a park-like setting, provides recreation and tourism for the town.

The moderate to steep slopes of the Mississippi River valley provide visual variety and interest to the flat agricultural lands that surround it. The wooded bluffs, wetlands and wildlife combine to produce visual qualities that attract visitors to this area. Effigy Mounds National Monument on the Iowa side offers visitors extensive views of the river valley, although the natural character of this viewshed is gradually being marred by development. Wyalusing State Park and Pikes Peak State Park also offer visitors a sweeping view of the river valley. The viewsheds of Wyalusing and Pikes Peak remain relatively unaffected by development due to their distance south of Prairie du Chien. The natural shorelines of the many channels and sloughs are visible from opposing banks and from the water, adding another important visual quality to the recreational user's experience.

5.0 ENVIRONMENTAL CONSEQUENCES

The impacts of the various alternatives on the natural, cultural, socioeconomic and recreational resources of the East Channel study area range from minor to significant. The following sections discuss these impacts and provide a basis for identifying the most acceptable alternative.

5.1 Natural Resources Effects

The impacts of the various alternatives on the natural environment may be short- or long-term. The primary adverse environmental consequences result from increased navigation, dredging, dredged material placement/disposal, and site development and operation. Adverse consequences include disturbance and destruction of in-stream and on-shore aquatic and wildlife organisms and habitat.

The baseline to which alternatives are compared is defined by the no action alternative. Under the no action alternative, levels of commercial traffic in the East Channel would return to historic levels (i.e., about 15 barges per year at the City Dock and 230 barges per year at PS&G; Figure 5) at the expiration of existing Federal and State permits for use of the City Dock.

It must be noted that Didion, Inc. has operated at the City Dock since 1988, handling between 60 and 135 barges per year (Figure 5). Studies (Clarke 1991, 1992, 1993 and 1994; Miller and Payne 1992a,b) have attempted to delineate the level of impact commercial traffic has on freshwater mussels in the East Channel. To date, these studies have not detected significant acute impacts to mussel populations attributable to commercial navigation at present levels. From a long-term assessment perspective, these studies have provided inconclusive evidence of the chronic impacts of present levels of navigation on mussel populations. However, other study results and theoretical logic suggest barge traffic in environments like the East Channel can produce a variety of harmful effects on mussels.

5.1.1 Aquatic Habitats

The physical disturbances to aquatic habitats caused by movement of commercial and recreational craft include increased turbulence, altered current velocity, changed flow pattern, increased waves and wave wash, and drawdown (Bhowmik et al. 1990a,b). Vessel-induced changes in magnitude and direction of flow can negatively affect aquatic habitats by scouring substrates and resuspending fine sediments. Periods of elevated suspended solids and turbidity can stress pelagic fish eggs and larvae and bottom dwelling organisms such as mussels, aquatic insects, worms, and crustaceans. Commercial vessel traffic can also cause long-term impacts on aquatic habitats by eroding natural banks. These effects can bring about sustained physical changes to the navigation channel, channel borders, backwater areas and natural banks that are part of the riparian zone.

Full-size tows do not normally enter the East Channel. Barges are moored in the main channel at designated fleeting areas and shuttled to loading facilities by workboats. Workboats usually move one or two loaded or unloaded barges at a time. Minor changes in magnitude and direction of flow caused by a workboat pushing a single loaded barge in the East Channel have been monitored (Miller and Payne 1992a,b). In studies in the East Channel, vessel passage caused ambient velocity to approximately double for 80 to 100 seconds and caused slight alterations in the direction of flow. While directly caused by vessel passage, the physical disturbances observed were brief and considered minor in comparison to naturally occurring variations in current velocity.

Results from recent studies of the effects of navigation on the Upper Mississippi River indicate tow-induced elevated suspended solids during normal pool levels are small compared with ambient levels during flood stage (Bhowmik et al. 1990a). Normally, vessel-caused increases in turbidity are short-term with ambient levels of turbidity returning within 5 minutes of tow passage (Miller and Payne 1990a). Bhowmik et al. (1990a) cautions, "the most prominent feature of all field studies of navigation-induced resuspension of sediments is the large variation within or among studies. Simple generalizations about tow-induced resuspension of sediments do not always realistically portray the complex results of field observations." The dominant sediment types in the East Channel are fine- to medium-grained sands, which are not subject to significant resuspension and downstream displacement.

Additional impacts to aquatic habitats would result from dredging and construction of ancillary facilities for a barge terminal, including docks and riprap. Removal of bottom materials and improvement of hydraulic characteristics expose new sterile substrates to which benthic organisms cannot readily adapt (COE 1974). The direct physical disturbance of aquatic habitats and the organisms using these habitats is the most easily recognized and probably the most significant impact dredging has on aquatic resources. Dredging directly destroys benthic organisms and their habitats. During dredging operations, bottom sediments are resuspended by hydraulic or mechanical removal of bottom substrate from the dredge cut. Suspended sediments can cover benthic organisms; affect respiration, feeding and reproduction in fish; interfere with nutrient uptake, photosynthesis and dissolved gas exchange in macrophytes and phytoplankton; flocculate planktonic algae; decrease food availability of aquatic organisms; deplete oxygen resources; and release noxious materials into the water column. Turbidity clouds the water, reducing light penetration and thus limiting photosynthesis in macrophytes and phytoplankton (Met. Council 1978). While these effects in sum could result in substantial impacts on aquatic resources, numerous studies on the effects of dredging have shown increases in turbidity and suspended solids are generally local and of short duration, resulting in only minor impacts to aquatic resources (Anderson et al. 1981, Hayes et al. 1984, Barnard 1978). The sediments in the East Channel are relatively coarse sands and silty sands. These materials tend to settle out of the water column rapidly, reducing the exposure time to aquatic resources.

Dredging creates immediate oxygen demands, both biological and chemical, which generally result in localized short-term deficiencies of dissolved oxygen. However, soon after initial

disturbance, dilution and aeration will return the oxygen content of the water column to ambient conditions (Lee et al. 1975). The effects of reduced dissolved oxygen levels on the aquatic environment as a result of dredging are short-term and localized, generally resulting in only minor impacts to aquatic resources.

Dredging can affect water quality through resuspension of pollutants during the dredging process. Normally, only very small quantities of toxic metals are released into solution during dredging and disposal operations (Blom et al. 1976, Chen et al. 1976, Lee et al. 1975). Only rarely have water quality standards for metals been exceeded as a result of dredging activities (Met. Council 1978). Chen et al. (1976) demonstrated that dredging of clay-type sediments generally resulted in the release of more nitrogenous and phosphorus-containing compounds than dredging of sand and silt-type sediments, such as those found in the East Channel. Under normal conditions, neither nitrogen nor phosphorus is released at levels significant enough to cause ecological damage (Met. Council 1978). It is unlikely that major releases of toxic metals or nutrients would occur as a result of dredging in the East Channel; however, some localized minor negative impacts on water quality could result.

Pollutants exposed during the dredging process can reenter the water column in the return effluent resulting from placement of dredged material in disposal areas. Sediments and pollutants can also be resuspended by prop wash during dredging operations. However, the limited scope and type of dredging proposed in the East Channel would result in essentially no effluent return from placement/disposal sites and little sediment resuspension as a result of prop wash. Placement/disposal of dredged materials would have minor or no effect on aquatic resources in the East Channel.

5.1.1.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Alternative A would have negligible effects on aquatic habitats. At the expiration of Federal and State permits for use of the City Dock by Didion, Inc., the number of commercial barges using the City Dock would revert to historic levels (approximately 15 barges per year). Use of the PS&G facilities would continue at historic levels (approximately 230 barges per year). Because of low traffic levels, maintenance dredging of the East Channel would be deferred (i.e., placed in an "inactive status"); no dredging would be conducted. In the future, if shoaling occurred and dredging were required, additional evaluation of alternatives and environmental documentation of effects would be necessary.

5.1.1.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Continued use of the City Dock at current traffic levels would result in minor adverse impacts on aquatic habitats. The impacts associated with navigation traffic -- turbulence, waves and wave wash, resuspension of sediments and changed velocity patterns -- would not increase

over current levels in the East Channel. Use of the PS&G facilities would continue at historic levels. No additional disturbance of aquatic habitats in Sawmill Slough would occur.

Dredging requirements and activities, as outlined in the LTCMP (Appendix B), would be only partially implemented. Both cuts 1 and 2 were projected to require dredging within the 40-year life of the project. However, the USFWS's Biological Opinion (Appendix C) of June 28, 1993 determined that dredging in cut 2 and unrestricted barge traffic to the City Dock would likely jeopardize the continued existence of the endangered mussel species *L. higginsi*. Therefore, only cut 1 would be dredged under the LTCMP. Dredging of cut 2 would be deferred as a reasonable and prudent alternative for avoiding jeopardy. The area affected in cut 1 would be relatively small (approximately 4,180 m^2). Direct physical removal and disturbance of channel bottom substrates in cut 1 would have minor, short-term adverse impacts on aquatic habitats in the East Channel.

As discussed in the LTCMP (Appendix B), dredged materials would be placed at site A. Use of this site would have no additional effect on the aquatic habitats of the East Channel area.

5.1.1.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Alternative D would have minor adverse impacts on aquatic habitats. In 1991, a total of 230 loaded barges left the PS&G facility. PS&G estimates 500 barges would be loaded each year if the permit for harbor expansion was granted. Commercial navigation traffic would be reduced in the channel reach between the barge turning basin and the City Dock; however, levels of navigation traffic in Sawmill Slough and the northern portion of the East Channel would increase, resulting in increased impacts to aquatic habitats in these areas. The navigation lane from the PS&G facility to the main channel is approximately 2,130 meters long and 61 meters wide. Increased impacts associated with commercial navigation traffic would be imparted on approximately 129,930 m^2 of aquatic habitat.

Dredging requirements and activities, as outlined in the LTCMP (Appendix B), would only be partially implemented. Dredging of cut 1 would be completed as projected. Dredging of cut 2 would be deferred. Dredging/excavation of cut 3 would be completed as proposed under the permit application.

The direct physical removal and disturbance of channel bottom substrates in cut 1 would have minor, short-term adverse impacts on aquatic habitats. The consequences of using site A for dredged material placement would be the same as those discussed under Alternative C1 (no effect on aquatic habitats).

Dredging/excavation of cut 3 would connect waters in Sawmill Slough with a deep-water pit previously excavated by PS&G. Most of the materials to be removed from cut 3 are above the waterline and thus removal of these materials would have no effect on aquatic habitats;

however, some dredging to deepen adjacent shoreline areas would also be necessary. The impacts of excavating/dredging cut 3 on aquatic habitats would be negligible.

The applicant has two areas available for disposal of dredged materials: site E (Swingle site) and site A (the COE's proposed disposal site downstream of the Highway 18 bridge). Materials dredged from cut 3 would probably be disposed of at site E. Site E has been cleared of vegetation and has received dredged material from the PS&G operation in the past. The landowner has filled the site above the 100-year flood elevation as part of the proposed harbor expansion project. The impacts of disposal of dredged materials at this site are discussed in the LTCMP (Appendix B). Use of this site would have no appreciable impact on aquatic habitats in the East Channel.

Overall, the impacts of Alternative D on aquatic habitats would be minor, resulting in degradation of approximately 129,930 m^2 of aquatic habitat in the northern one-third of the East Channel and in Sawmill Slough.

5.1.1.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Alternative F1 would have substantial adverse impacts on aquatic habitats in the East Channel. Commercial barge traffic would increase substantially over historic levels in all navigable sections of the East Channel, resulting in increased disturbance to aquatic habitats. The impacts identified under Alternatives C1 and D would essentially be combined under Alternative F1. The 61-meter-wide navigation lanes in the East Channel north of the Highway 18 bridge are in total approximately 3,105 meters long. Increased impacts associated with commercial navigation traffic would be imparted on approximately 189,405 m^2 of aquatic habitat.

Dredging was projected to be required in cuts 1 and 2; however, as discussed under Alternatives C1 and D, dredging of cut 2 would be deferred. Dredging of cut 3 would be completed as proposed under the harbor development/expansion permit. Dredging of cut 1 would cause some minor, short-term additional disturbance to aquatic habitats, while dredging of cut 3 would have little additional impact on aquatic habitats. Placement of dredged materials at either site A or E would have no effect on aquatic habitats.

5.1.2 Wetlands

No wetlands exist on or adjacent to the City Dock, PS&G or Swingle site. Navigation and channel maintenance activities generally affect navigation channel areas. The impacts of navigation, channel maintenance and harbor development on wetland resources in the East Channel area are therefore limited to those impacts resulting from placement/disposal of dredged materials directly into wetlands.

5.1.2.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

No dredging operations would be conducted under Alternative A. No placement/disposal of dredged materials would be necessary; therefore, Alternative A would have no effect on wetlands.

5.1.2.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Dredged materials from cut 1 would be placed at site A, the COE's proposed dredged material placement site. Site A is surrounded on the south and east by floodplain forest, bounded on the west by the Chicago, Milwaukee, St. Paul and Pacific Railroad (CMSPP) trackage and bounded on the north by the embankment for the Highway 18 bridge. Placement of dredged materials at this site would not encroach upon adjacent floodplain forest areas; however, a path for front-end loaders would need to be cleared through a bottomland forest area about 400 feet downstream of the Highway 18 bridge. Use of site A would have a minor adverse impact on wetlands at the placement site location; however, the overall impact on wetlands in the East Channel area would be negligible.

5.1.2.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

No wetlands exist on either the PS&G or Swingle sites. Development at the PS&G and Swingle sites would have no appreciable effect on wetlands. The Swingle site has been used as a disposal site for dredged material in the past, and the floodplain forest habitat that was present on the site has been filled. Disposal of materials dredged from cut 3 at the Swingle site (site E) would have no effect on wetlands. As discussed under Alternative C1, use of site A for placement of dredged materials would have negligible impacts on wetlands in the East Channel area.

5.1.2.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Use of site A for placement of materials dredged from cut 1 would have a minor adverse impact on wetlands in the placement site vicinity; however, the overall impact of alternative F1 on wetland resources in the East Channel area would be negligible. Disposal of materials dredged from cut 3 at site E would have no effect on wetlands. Overall, Alternative F1 would have no effect on wetland resources in the East Channel area.

5.1.3 Terrestrial Habitats

The impacts of harbor expansion, navigation, and channel maintenance activities on terrestrial habitats in the East Channel area are limited to those impacts resulting directly from

construction of facilities and from placement/disposal of dredged materials. The general impacts of barge terminal expansion on terrestrial resources would consist of the conversion of upland habitat areas into ancillary facilities for the terminal, including roads, parking lots, and buildings. Placement/disposal of dredged materials on upland sites can cover important terrestrial habitats. Regardless of the alternative, navigation and dredging would occur in navigation channel areas of the East Channel and would have no impact on terrestrial resources.

5.1.3.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Both the City Dock and PS&G are developed, highly disturbed sites. Continued use of these sites at historic levels of commodity loading and shipping would have no impact on terrestrial habitats.

No dredging operations would be conducted under Alternative A; therefore, no impacts as a result of dredged material disposal would be anticipated.

5.1.3.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Both the City Dock and PS&G are developed, disturbed sites. Use of these sites at historic or current levels of commodity loading and shipping would have no impact on terrestrial habitats.

The LTCMP would be partially implemented under Alternative C1. Maintenance of cut 1 would be completed as projected. Maintenance of cut 2 would be deferred. The COE's proposed disposal site (site A) is an upland area previously disturbed by placement of materials dredged from the East Channel. Materials were also placed here during construction of the Highway 18 bridge. Vegetation on the site consists of grasses and a few small trees. Placement of dredged materials at this site would result in the loss of this vegetative cover; however, the impact of this action on the terrestrial habitats of the East Channel area would be negligible.

5.1.3.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

The PS&G site is highly developed. Those areas not actively used at present have been disturbed in the past. Continued and expanded use of this site would have no appreciable effect on terrestrial habitats.

The Swingle site has received dredged material from the PS&G operation in the past. Most of the 28.9-acre site has been filled. Some vegetation consisting mainly of small willows and

cottonwoods exists on the site. Continued filling and development of this site would result in no appreciable impacts to terrestrial habitats.

The applicant's proposed dredged material disposal site, the Swingle site, has received dredged material from the PS&G operation in the past. The landowner plans to fill the site to the 100-year flood elevation as part of the proposed harbor expansion project. Approximately half of the site has been filled. An additional 200,000 cubic yards of material is needed to complete filling this site. Placement of materials dredged from cut 3 at the Swingle site would have no effect on terrestrial habitats.

Dredging would be completed in cut 1 as projected in the LTCMP. Placement of materials dredged from cut 1 at site A would have no effect on terrestrial habitats.

The applicant's proposed truck access route to connect the Swingle site with State Trunk Highway 35 would pass through an agricultural field on the northern outskirts of Prairie du Chien. Construction of the access road would affect terrestrial habitat which has been previously disturbed by agricultural practices. The resulting impacts on this habitat would be negligible.

5.1.3.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

The City Dock, PS&G and Swingle sites are developed or in the process of being developed. Construction/expansion of barge terminal facilities at these sites would have no appreciable effect on terrestrial habitats.

Under Alternative F1, dredging of cut 3 would be completed by the permit applicant with dredged materials being placed at the Swingle site. The Swingle site has been extensively filled in the past, and the placement of dredged materials at this site would have little impact on terrestrial habitats.

Dredging of cut 1 would be completed as outlined in the LTCMP with dredged materials placed at site A. Use of site A for dredged material placement would have no effect on terrestrial habitats.

As discussed under alternative D, construction of the permit applicant's proposed truck access route would have a negligible impact on previously disturbed terrestrial habitat.

5.1.4 Fish and Wildlife

Studies investigating the direct effects of commercial traffic on fishes and their environments have been reviewed by Pearson et al. (1989). These studies note that adult and juvenile fishes are usually capable of detecting or withstanding most of the environmental effects directly associated with increased commercial traffic; i.e., hull and propeller impact, turbulence, wave

action, drawdown, resuspension of sediments, and bank erosion. Larval fishes, being less capable of avoidance movements, are more susceptible to environmental perturbations and can be adversely affected by increases in barge traffic. It is generally agreed the first few weeks of life, including the egg stage, is usually the period of maximum mortality and of great significance in determining subsequent densities. Any action or disturbance that alters mortality rates during this period may have a long-term effect on the adult population. Most riverine species grow quickly through the larval stage, with the period of greatest vulnerability usually in late spring and early summer (Holland and Sylvester 1983).

Holland and Sylvester (1983) found that main channel and channel border areas contained slightly more larval fish than backwater areas. Therefore, significant increases in barge traffic could be expected to directly affect survival of larvae in the navigation channel and channel border areas of the East Channel. However, studies are inconclusive as to the extent of impacts. While investigating the effects of turbulence, shear forces, and currents, Morgan et al. (1987) found surface tow net samples taken before and after barge passages on the Upper Mississippi River actually collected more fish larvae after passage than before, and the ratio of dead-to-live larvae was higher before the barge passed. This occurred because both live and dead larvae were being swept up from the bottom into the water column by the propeller wash of the tow. Live larvae may have been able to return to the bottom before drifting down to the sampling area, while dead larvae continued to drift, thus accounting for the higher dead/live ratios obtained in front of the next tow.

The effects of suspended sediments on aquatic systems have been reviewed extensively (Pearson et al. 1989). Increases in suspended sediment concentrations above ambient levels have been attributed to barge propellers (Sparks et al. 1980, Bhowmik et al. 1981). Propellers generate powerful currents that scour the bed of the channel and raise a plume of suspended sediments. The actual increase is variable, and is dependent on the size, speed, loading, and heading of the tow; position on the sailing line depth/draft ratio; sediment character; and channel morphology and hydrology. The currents associated with drawdowns and the waves produced by tows can resuspend sediments. Wave action can also erode existing banks, adding sediment to the water column.

Effects on larval fish of increased suspended solids include abrasion, disorientation through loss of visibility, disruption of schooling and other behaviors, increased respiration rates, reduced ability to see and capture prey, reduced predator avoidance behavior, exposure to contaminants released from resuspended sediments, and reduced food availability due to reductions in primary production and production of zooplankton and benthos (Pearson et al. 1989).

Some studies have found that moderate levels of suspended solids may provide benefits to larval fish (Pearson et al. 1989). The growth of food organisms may be enhanced by resuspension of organic particles. Although a reduction in visibility inhibits the ability of larval fish to see prey, it likewise aids in avoiding predators.

Although effects on adult stages are not as great as on egg and larval stages, barge tow passage does also affect adult fish. Pelagic species such as gizzard shad, freshwater drum, white bass and paddlefish could suffer direct mortality from towboat propellers. Bottom dwelling species such as sauger, bullhead, smallmouth bass, flathead catfish and walleye would be disturbed and displaced by towboat activity. Catfish use the East Channel during winter as a refuge, becoming inactive during cold water conditions. Towboat movements late in the navigation season could disturb catfish, causing an additional energy expenditure in avoiding the disturbance.

Indirect effects of barge traffic can also affect fish species. Pearson et al. (1989) suggest fish eggs and larvae would be affected by releases of fuel, oils, exhaust gases, and other wastes associated with the operation of each tow. Also, there is greater risk of catastrophic spills of toxic materials as more materials are moved on, stored along, and processed adjacent to the river.

Impacts to wildlife would occur primarily as a direct result of habitat destruction associated with development of a barge terminal site. Losses and degradation of both terrestrial and wetland habitats could result.

Impacts to fish and wildlife can result from both the dredging operation itself and from the disposal of dredged materials. Generally, dredging operations tend to have greater impacts on aquatic species, while dredged material disposal activities tend to affect terrestrial species.

While dredging primarily affects navigation channel areas, the effects of dredging can extend to channel border, side channel and tertiary channel areas, some of the more important breeding, nursery and feeding areas for both fish and wildlife. Dredging has a direct impact on benthic organisms through removal of these species from dredge cut areas. During hydraulic dredging operations, fish can be entrained along with bottom sediments in the suction pipeline, resulting in death. However, most adult fish are capable of detecting and avoiding dredging operations.

Invertebrates, especially filter feeders, can be adversely affected by turbidity, resuspended pollutants, reduced oxygen levels and settling sediments produced during the dredging operation. Suspended solids and sedimentation caused by dredging can cause clogging and abrasion of gills and other respiratory surfaces in fish, can affect reproduction through coverage of eggs, can increase susceptibility to disease, can increase uptake of pollutants and can change predator/prey relationships through reduced visibility (Met. Council, 1978).

Generally, the effects of dredging on fish and wildlife species are localized, primarily encompassing the immediate dredging location and the area influenced by the downstream turbidity plume. With the exception of freshwater mussel species, it is believed the effects of limited dredging on fish and wildlife species in the East Channel would be relatively minor.

5.1.4.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Alternative A would have negligible effects on fish and wildlife species in the East Channel area. Historically, low levels of barge traffic in the East Channel probably caused little disturbance to aquatic and terrestrial habitats. Dredging would be deferred under Alternative A; therefore, no disturbance of aquatic habitats as a result of dredging would occur. Also, disturbance of terrestrial habitats as a result of dredged material placement would not occur.

5.1.4.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Alternative C1 would have a minor adverse impact on fish and wildlife species in the East Channel area. Barge traffic in the East Channel, particularly in the channel reach between the City Dock and the barge turning basin, would continue to disturb aquatic habitats and species.

Dredging of cut 1 would have localized, short-term impacts on fish species. Approximately 4,180 m^2 of bottom substrate would be disturbed in cut 1. The disturbance of aquatic habitats as a result of dredging would have no more than minor long-term consequences.

Dredged materials would be disposed of at site A, downstream of the Highway 18 bridge. Site A has been used for dredged material placement in the past and is in various stages of revegetation. The site provides marginal habitat for birds and small mammals. Construction of a path for front-end loaders through a bottomland forest area about 400 feet downstream of the Highway 18 bridge would result in minor disturbance to wildlife habitat. Use of site A would disturb the vegetation that currently exists on site, reducing use of this area by wildlife species. However, current wildlife use of the site is limited due to previous disturbance. The impacts of dredged material placement at site A on fish and wildlife species in the East Channel area would be negligible.

5.1.4.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Minor adverse impacts to fish species in the northern one-third of the East Channel and in Sawmill Slough would occur as a result of increased barge navigation to and from the proposed harbor site. The channel segment between the PS&G/Swingle site and the main channel is approximately 2,130 meters long and by definition 61 meters wide. Increased levels of commercial navigation in this channel segment would affect approximately 129,930 m^2 of secondary channel and channel border aquatic habitat, areas frequently used by adult and larval fish.

The direct impacts on fish and wildlife species from dredging cut 1 would be minor and short-term; however, the disturbance of aquatic habitat could have long-term impacts.

Excavation/dredging of cut 3 would have little impact on fish and wildlife resources. Much of the material to be removed from cut 3 is above the waterline and is in an area highly disturbed by industrial development.

The applicant's proposed dredged material disposal site, the Swingle site, has little value as wildlife habitat. Some bird and mammal species make use of the site for feeding and nesting; however, use of this site for dredged material disposal would have no appreciable impacts on wildlife species.

Use of site A for placement of materials dredged from cut 1 would have minor impacts on wildlife species.

5.1.4.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Alternative F1 would have a substantial adverse impact on fish and wildlife in the East Channel. Commercial barge traffic would increase substantially over historic levels in all currently navigated sections of the East Channel, resulting in increased disturbance to aquatic habitats and species. Approximately 189,405 m^2 of secondary channel and channel border aquatic habitat within the navigation lanes in the East Channel would be affected by increased commercial navigation activities. Fish species using these habitat types would be adversely affected by increased commercial traffic.

Dredging/excavation would occur in cuts 1 and 3 in accordance with the LTCMP and permit proposal, respectively. The impacts of dredging would be identical to those described under Alternative D.

Some minor disturbance of terrestrial habitats through dredged material placement activities at site A and the Swingle site would occur. However, these sites currently receive only limited use by avian, reptilian and mammalian species. Use of these sites for dredged material placement would have negligible or minor impacts to wildlife.

5.1.5 Freshwater Mussels

Resource agencies and malacological experts have identified various potential adverse impacts to mussel communities as a result of commercial traffic. Tow-induced increases in turbidity, turbulence, and water velocities can physiologically stress mussels, negatively affecting mussel feeding, metabolism, growth rates, and reproduction. Aldridge et al. (1987) reported that chronic perturbation and physiological stress produced by cyclic increases in water velocity and turbulence, at a level and frequency similar to routine navigation traffic, led to reduced feeding rates in mussels and increased reliance on endogenous and nonproteinaceous energy reserves; continuous or near-continuous disruption of water velocity and turbulence, such as might be associated with barge fleeting activities, led to virtually complete reliance on endogenous energy reserves. Physical harm to mussels may occur from direct contact with

barges and barge tow propellers, especially during low water conditions. Host fish species may avoid areas heavily transversed by commercial traffic, reducing the likelihood of recolonization in these areas. A large spill of a hazardous or toxic substance could threaten mussel populations in large portions of the East Channel. Adverse impacts from increased navigation negatively affect the growth and survival of the vulnerable juvenile mussels, resulting in long-term negative population impacts to the mussel community. Increased mortality rates as a result of environmental stress can be manifested by increased navigation levels.

The effects of increased navigation traffic would be most readily imparted on freshwater mussels within an area extending outward from the middle of the main navigation lane. Impacts of increased navigation activities (i.e., suspended solids, current reversals, etc.) would extend to areas outside the main navigation routes; however, the most significant impacts would be imparted on organisms within the 61-meter (200-foot) wide navigation lanes.

Dredging can be especially destructive to mussel populations, particularly when dredge cuts are made through rich mussel beds, such as those found in the East Channel. Dredging results in the direct physical removal and destruction of mussel beds located within the dredge cuts. Havlik and Marking (1980) examined dredged materials deposited on an upland site during the COE's dredging operations in the East Channel in 1976. They documented the presence of an extremely rich assemblage of freshwater mussel species in the area which had been destroyed by dredging. In addition to direct physical removal from bottom substrates, freshwater mussels can be affected by turbidity, intakes of resuspended pollutants, reduced oxygen levels and direct coverage by settling sediments during the dredging process.

Following dredging, bottom substrates in the dredge cuts are often unstable or shifting, providing poor habitat for recolonization of these areas by juvenile mussels (Burky 1983). Particle sizes of bottom substrates exposed by dredging may not be immediately favorable for mussels, especially juveniles. Additionally, fish hosts must be attracted to the area before recolonization can occur. For these reasons, combined with the slow growth rate of mussels, it may be years before a lost population returns to dredged areas (Yokley 1976). Miller, Payne and Hartfield (1984) collected qualitative and quantitative samples to assess mussel community characteristics and size demography of *Amblema plicata* populations in dredged and undredged portions of the East Channel. They concluded that, although dredged areas had to some extent recolonized, the species composition and density of mussel populations in the dredged portions of the East Channel had not nearly returned to pre-dredging levels.

Dredging and increased navigation activity in the East Channel could have significant acute and chronic impacts on mussel populations. Acute impacts are primarily those which occur to individuals over the short-term. Chronic impacts are primarily defined by long-term reductions in productivity and thus population size. In the following discussion, "take" is used to define the number of individuals lost as a result of a specific action; for example, dredging. The phrases "population reduction" or "loss from existing populations" are used to define the number of individuals lost from the existing population as a result of the combined

effects of several actions over the long term. Population reduction factors in or offsets the "take" of individuals with population increases attributed to the reproductive capability of the population.

5.1.5.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Historic levels of shipping are those levels occurring prior to 1988 (i.e., about 15 barges per year at the City Dock and approximately 230 barges per year at PS&G). At historic levels of barge traffic, acute and long-term chronic losses of mussels probably have occurred, and would continue to occur, in the channel reach between PS&G and the main channel. However, it is believed mussel populations have stabilized, at somewhat lower densities, under historic barge traffic levels. Therefore, when considered in the context of the East Channel as a whole, continuation of historic levels of barge traffic would have negligible or minor additional effect on freshwater mussels in the East Channel. Channel maintenance activities would be deferred under Alternative A; therefore, no impacts on freshwater mussels as a result of dredging and dredged material placement would occur.

5.1.5.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

When compared to the no action alternative, long-term limited expansion of navigation traffic to the City Dock would adversely affect freshwater mussel species, particularly in the navigation lane between the City Dock and the barge turning basin -- the area currently supporting the highest densities of mussels in the East Channel. Based on mussel density data collected by Miller and Payne (1992b) and Harris and Hay (1993), mean mussel density in the barge turning basin has averaged 25 mussels/m^2 since 1984. The mean density in the channel reach between the Highway 18 bridge and the barge turning basin has averaged 95.7 mussels/m^2 (Miller and Payne 1992b, Clarke 1991). Based on these density estimates, approximately 7.8 million freshwater mussels may exist in the 60-meter-wide by 2,435-meter-long navigation channel between the Highway 18 bridge and the main or west channel of the Mississippi River. Recent studies of the long-term effects of current barge traffic levels on mussel populations in the East Channel are inconclusive to date. However, resource agencies continue to be concerned that shipping activities from the City Dock at recent levels would result in long-term reductions in mussel productivity and survival.

Dredging cut 1 would affect approximately 4,180 m^2 (45,000 ft^2) of bottom substrate. However, a survey of the proposed dredge cut location (Harris and Hay 1993) indicated low mussel densities (0.13 mussel/m^2) exist in this location. Dredging cut 1 would destroy (take) approximately 540 mussels. However, mussel surveys conducted in portions of the barge turning basin where dredging was conducted in 1976 (Miller et al. 1984) indicate mussel recolonization of dredge cut areas has occurred. Assuming recolonization of cut 1 occurs following dredging, the long-term effect of dredging cut 1 on mussel resources would be minor.

The East Channel north of the Highway 18 bridge including the navigated portions of Sawmill Slough may support in excess of 41 million freshwater mussels. The direct destruction of mussels associated with channel maintenance activities under Alternative C1 would be minor, affecting less than 0.01 percent (540/41,000,000) of the mussels in the East Channel; however, the long-term chronic impacts of navigation traffic in the channel segment between the City Dock and the barge turning basin could result in substantial adverse effects on the outstanding mussel resources in this area. As stated previously, approximately 7.8 million (about 19 percent of the estimated population of 41 million) freshwater mussels may exist in the navigation lanes between the Highway 18 bridge and the main channel, the area of primary impact under Alternative C1.

When increased barge shipping operations have been proposed at the City Dock, the USFWS has issued "jeopardy" determinations for unrestricted use of this facility. In its most recent Biological Opinion (June 28, 1993), the USFWS effectively limited the number of permitted barges that could use the City Dock to 135 per year (Alternative C1). The USFWS did not identify a level of incidental take associated with this level of commercial shipping at the City Dock. Therefore, specific quantification of impacts to *L. higginsi* and the larger East Channel mussel populations for this level of traffic was not possible. However, in response to comments on the draft EIS received from the U.S. Environmental Protection Agency (Appendix I) requesting quantification of the impacts of Alternative C1 on freshwater mussels, further coordination with the USFWS was initiated to determine if a level of incidental take associated with continued shipping of 150 barges/year from the City Dock could be estimated. The USFWS queried several malacological resource experts familiar with the East Channel. While the resource experts agreed that unlimited shipping could reasonably be expected to result in a take of 20 percent of the existing populations in navigation lanes in the East Channel, based on presently available information they could not identify the level of take resulting from shipping from the City Dock at recent levels (150 barges/year). Although monitoring has detected no significant changes in mussel populations in the East Channel at current levels of barge traffic from the City Dock, the COE, WDNR and USFWS believe sustained shipping activities from the City Dock at greater than historic levels would result in significant long-term reductions in mussel productivity and survival. The take would be greater than zero but less than the 20 percent estimated for unlimited navigation. Therefore, for comparative purposes, Table 4 provides estimates of the number of mussels that would be lost from existing populations under Alternatives C1 and F1 at 5, 10 and 15 percent levels of navigation take. Table 4 also provides estimates of the number of mussels lost from existing populations under unlimited shipping levels (20 percent navigation take) as identified under Alternative D, and Alternatives C and F (which were eliminated from further consideration because of unacceptable impacts on *L. higginsi*; see Section 3.0). As Table 4 illustrates, depending on the level of estimated navigation take, the impacts of Alternative C1 would be comparable to or greater than those identified for Alternative D.

Table 4. Estimated losses of Lampsilis higginsi and all freshwater mussels under various alternatives and various levels of navigation take.

Level of Navigation Take	Alternative					
	A	C1	C**	D	F1***	F**
5%		2400 (391,000)*			5100 (826,000)*	
10%		4700 (781,000)*			6900 (1,111,000)*	
15%		7100 (1,172,000)*			8600 (1,395,000)*	
20%			10,500 (1,743,000)*	3400 (541,000)*		11,400 (1,860,000)*

* Figures in ( ) are estimated losses of all freshwater mussels.

** Alternatives C and F were eliminated from further consideration due to adverse impacts to an endangered species. Alternatives C and F are included here for comparison only.

*** Includes an estimated 20% take as defined under Alternative D and an unknown/undefined take under Alternative C1.

5.1.5.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

The channel reaches between the barge turning basin and the main channel and between the barge turning basin and the PS&G/Swingle site (Sawmill Slough) do not support mussel beds as dense as those in the reach between the City Dock and the barge turning basin. Based on mussel density data collected by Miller and Payne (1992b) and Harris and Hay (1993), mean mussel density in the barge turning basin has averaged 25 mussels/m^2 since 1984. Density estimates derived from the results of a survey conducted in the lower end of Sawmill Slough (Harris 1993) indicate an average density of 14.3 mussels/m^2 exists in Sawmill Slough. Alternative D would result in increased levels of navigation traffic in navigation lanes between the barge turning basin and the main channel and between the barge turning basin and the proposed PS&G/Swingle harbor. An estimated 2.7 million (about 6.6 percent of the estimated population of 41 million) freshwater mussels may exist in the navigation lanes in these areas. Increased navigation traffic in these areas would adversely affect mussel resources.

In its Biological Opinion, the USFWS estimated a 20-percent reduction in the population size of *L. higginsi* in the navigation lanes between the main channel and the barge turning basin and the barge turning basin and the PS&G/Swingle site as a result of unrestricted barge shipping activities. This same 20-percent reduction can be applied to the larger mussel populations in these navigation lanes.

As discussed under Alternative C1, dredging cut 1 would destroy (take) approximately 540 freshwater mussels. However, over the 40-year project planning period, some recolonization of cut 1 would occur, offsetting the impacts of dredging. Dredging of cut 3 would be completed as part of the proposed harbor expansion project at the PS&G/Swingle site. Excavation/dredging cut 3 would connect waters in Sawmill Slough with a deep-water pit excavated by PS&G. Most of the materials to be removed from cut 3 are above the waterline, and thus removal of these materials would have no effect on freshwater mussels.

The combination of dredging and increased barge traffic would result in the loss of approximately 541,000 (Table 4) freshwater mussels from existing populations in the East Channel over the project planning period. When compared to the no action alternative, the adverse impacts of increased navigation and dredging on mussel resources would be substantial.

5.1.5.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Increased barge traffic throughout the East Channel and dredging cut 1 would have significant adverse impacts on freshwater mussels. Alternative F1 would combine the effects of Alternatives C1 and D. Approximately 8.4 million (about 20.5 percent of the estimated population of 41 million) freshwater mussels may exist in the navigation lanes between the

Highway 18 bridge and the barge turning basin, the PS&G/Swingle site and the barge turning basin and the barge turning basin and the main channel of the Mississippi River.

As discussed under Alternative D, the USFWS, in its Biological Opinion of June 28, 1993, stated unrestricted levels of shipping from the PS&G/Swingle site would result in a 20-percent reduction in *L. higginsi* populations. This 20-percent reduction can be applied to the entire mussel population in the navigation lanes between the PS&G/Swingle site and the main channel.

The USFWS did not identify a level of incidental take associated with current levels of commercial traffic in the navigation lane between the City Dock and the barge turning basin (see Section 5.1.5.2); however, it is believed a substantial long-term reduction in productivity and survival of mussels would occur in this channel segment as a result of long-term limited expansion of barge shipping activities. Table 4 provides estimates of the number of mussels lost under various levels of navigation take. Dredging impacts would be as described for Alternative D.

The combined effects of increased navigation traffic and dredging would result in a substantial long-term reduction in mussel productivity in the navigation lanes as a result of long-term expansion of barge shipping activities. When compared to the no action alternative, the effects of Alternative F1 on freshwater mussels would be significant, combining the substantial impacts identified under Alternatives D and C1. About 20.5 percent of the mussel population in the East Channel would be affected under Alternative F1, although the specific level of impact remains unquantified (Table 4).

5.1.6 Federal and State Threatened and Endangered Species

The impacts of channel maintenance activities on bald eagle and peregrine falcon individuals in the East Channel area are limited to those minor impacts resulting from placement/disposal of dredged materials. Dredging operations would be conducted in main channel areas of the East Channel and would essentially have no effect on bald eagles or peregrine falcons which could be found in the East Channel area.

The impacts of operation and maintenance activities on freshwater mussels in the East Channel have been discussed previously in this document. Those same impacts would also apply to the Federally endangered freshwater mussel species *L. higginsi*, which is known to inhabit the East Channel, and the seven other freshwater mussel species identified by the State of Wisconsin as threatened or endangered.

Dredging results in the direct physical removal of freshwater mussel species from dredge cut locations, normally resulting in death. In addition, increased turbidity levels, intakes of resuspended pollutants, reduced oxygen levels and direct coverage by settling sediments produced during the dredging process can adversely affect freshwater mussel species in the immediate vicinity of the dredge cut.

Following dredging, bottom substrates in the dredge cuts are often unstable or shifting, providing poor habitat for recolonization of these areas by mussels (Burky 1983). The habitat conditions existing after dredging may also be unsuitable for use by fish host species, further delaying recolonization efforts.

L. higginsi populations have been affected by dredging in the East Channel in the past. Havlik and Marking (1980) examined dredge spoil piles deposited on an upland site during the COE's dredging operations in the East Channel in 1976. They documented the presence of an extremely rich freshwater mussel assemblage, including 175 specimens of *L. higginsi*, which had been destroyed by the Corps dredging operations.

The U.S. Fish and Wildlife Service has recognized that the impacts of dredging on endangered mussel species can be significant. Three times since 1976, the USFWS has determined that dredging and unrestricted navigation traffic in the East Channel could jeopardize the continued existence of *L. higginsi*. The effects of barge terminal expansion on species listed as Federally threatened or endangered are discussed in the Biological Opinion and Biological Assessment prepared for the permit proposal this EIS addresses (Appendixes C and D). The only Federally listed species that would be affected by the proposed actions is the Higgins' eye pearly mussel (*L. higginsi*). Included in the Biological Opinion and Biological Assessment are the estimated numbers of *L. higginsi* taken (killed) under the proposed alternatives. The estimated takes are based on proposed dredging and on anticipated increases in the number of barges using Prairie du Chien terminals. To quantify the potential impacts on *L. higginsi*, a panel of interagency mussel experts was convened to review existing data, establish the evaluation method to be used, and where adequate data did not exist, agree upon the assumptions necessary to allow quantification of the impacts. Many assumptions were made in quantifying the potential impacts on *L. higginsi*. The final determinations of take and population effects are very sensitive to these assumptions. Detailed descriptions of the evaluations conducted are contained in the Biological Opinion and Biological Assessment (Appendices C and D).

Impacts to State listed fish species known to occur in the Prairie du Chien area (the most recent record in 1984) are expected to be very limited. Unlike sessile mussels, adult fish are very mobile and are able to evade dredging and navigation activities. It is possible some larval State listed endangered or threatened fish species (which are limited in mobility) could be killed by hydraulic dredging or barge navigation activities. However, because of the large amount of aquatic habitat available in the Mississippi River and backwaters, the low density occurrence of State listed fish species and the temporal nature of navigation activities in time and place, it is expected the loss of individuals of State listed fish species by these channel maintenance and harbor development activities would be unmeasurable and insignificant.

5.1.6.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

As discussed in Section 5.1.5.1, mussel populations, including *L. higginsi* populations, were probably adversely affected by historic levels of commercial traffic in the East Channel. However, it is believed mussel populations have stabilized, albeit at somewhat lower densities, under historic levels of impact.

Under Alternative A, barge traffic in the East Channel would revert to historic levels at the expiration of Federal and State permits for the use of the City Dock. Some localized acute losses and long-term chronic impacts would continue to occur in the channel reach between PS&G and the main channel as a result of navigation traffic; however, when considered in the context of the East Channel as a whole, the impact on *L. higginsi* populations would be minor.

Channel maintenance activities would be deferred under Alternative A; therefore, no impacts on threatened and endangered freshwater mussels, resulting from dredging and dredged material placement, would occur.

5.1.6.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

When compared to the no action alternative, long-term limited expansion of commercial shipping activities at the City Dock would cause significant adverse impacts to the endangered species *L. higginsi*. An estimated 251,000 *L. higginsi* may exist in the East Channel north of the Highway 18 bridge including navigated portions of Sawmill Slough. Approximately 19 percent, or 47,000 *L. higginsi*, of this estimated population could be affected under Alternative C1 (i.e., about 47,000 *L. higginsi* are estimated to inhabit the navigation lanes between the Highway 18 bridge and the main channel).

As stated in the Biological Opinion prepared for this EIS, over the 40-year term of the LTCMP, approximately 700 *L. higginsi* would be destroyed as a result of dredging cut 1 (Appendices C and D). However, surveys of the proposed dredge cut location by Harris and Hay (1993) in October 1993 found few freshwater mussels (density = 0.13 mussel/m^2) and no *L. higginsi*. Based on this survey information, the impacts of dredging cut 1 on *L. higginsi* populations would be negligible. Additionally, as discussed in Section 5.1.5.2, it is believed cut 1 would be recolonized by freshwater mussels, including *L. higginsi*, in 8 to 12 years, reducing the long-term impacts of dredging.

When increased barge shipping operations have been proposed at the City Dock, the USFWS has issued "jeopardy" determinations for unrestricted use of this facility. In its most recent Biological Opinion (June 28, 1993), the USFWS estimated a population loss of 10,900 *L. higginsi* (navigation induced 20 percent reduction) would occur if unrestricted use of the City Dock were permitted (Appendix D). Based on new data collected by Harris and Hay (1993)

and Harris (1993), this estimated loss would be revised downward to 10,500 (Table 4). Because of this high level of estimated impact, the USFWS effectively limited the number of permitted barges that could use the City Dock to 150 per year (Alternative C1). The USFWS did not identify a level of incidental take associated with this level of commercial shipping at the City Dock. Therefore, specific quantification of impacts to *L. higginsi* for this level of traffic was not possible. However, in response to comments received from the U.S. Environmental Protection Agency (Appendix I) requesting quantification of the impacts of Alternative C1 on freshwater mussels, further coordination with the USFWS was initiated to determine if a level of incidental take associated with continued shipping of 150 barges/year from the City Dock could be estimated. The USFWS queried several malacological resource experts familiar with the East Channel. While the resource experts agreed that unlimited shipping could reasonably be expected to result in a take of 20 percent of the existing populations in navigation lanes in the East Channel, based on presently available information they could not identify the level of take resulting from shipping from the City Dock at recent levels (150 barges/year). Although monitoring has detected no significant changes in *L. higginsi* numbers in the East Channel at current levels of barge traffic from the City Dock, the COE, WDNR and USFWS believe sustained shipping activities from the City Dock at higher than historic levels would result in significant long-term reductions in *L. higginsi* productivity and survival. The take would be greater than zero but less than the 20 percent estimated for unlimited navigation. Therefore, for comparative purposes, Table 4 provides estimates of the number of *L. higginsi* lost from existing populations under Alternatives C1 and F1 at 5, 10 and 15 percent levels of navigation take. Table 4 also provides estimates of the number of *L. higginsi* lost from existing populations under unlimited shipping levels (20 percent navigation take) as identified under Alternative D, and Alternatives C and F (which were eliminated from further consideration because of unacceptable impacts on *L. higginsi*; see Section 3.0). Depending on the level of estimated navigation take, the impacts of C1 would be comparable to or greater than those identified for Alternative D.

The COE's proposed placement site has been used for dredged material placement and fill material stockpiling in the past and is relatively disturbed. It is unlikely that bald eagles or peregrine falcons make use of this area. No appreciable impacts to these species, or any other State or Federally listed threatened or endangered species including *L. higginsi*, are anticipated if this area is used for dredged material placement. The USFWS concurs with this assessment.

5.1.6.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

When compared to the no action alternative, increased barge traffic in the northern one-third of the East Channel and in Sawmill Slough and dredging in cuts 1 and 3 would have significant adverse impacts on *L. higginsi* populations. An estimated 17,000 *L. higginsi*, or 6.8 percent of the estimated total population of *L. higginsi*, may exist in the navigation lanes between PS&G/Swingle site and the main channel.

Based on recent surveys of the East Channel discussed in detail in the Biological Assessment for this project (Appendix D), densities for *L. higginsi* populations north of the barge turning basin, in Sawmill Slough, and between the City Dock and the barge turning basin were estimated at 0.166 mussel/m^2, 0.373 mussel/m^2 and 0.579 mussel/m^2, respectively. However, Harris and Hay (1993) collected mussel density information from an area immediately north of the barge turning basin and in the northern end of the East Channel in October 1993. A revised estimate of 0.15 mussel/m^2 was calculated for *L. higginsi* populations north of the barge turning basin by averaging density information collected by Miller and Payne (1992b) and Harris and Hay (1993).

Also, no live *L. higginsi* were collected in a survey conducted by Harris (1993) in Sawmill Slough in October 1993. Five dead specimens were collected, indicating that *L. higginsi* probably exist in the area. Therefore, a revised estimate of *L. higginsi* densities in Sawmill Slough was formulated by multiplying the average total density of mussels (14.3 mussels/m^2) collected by Harris (1993) by an averaged percent composition (0.75 percent) of *L. higginsi* in other locations in the East Channel. This yields an estimated *L. higginsi* density of 0.107 mussel/m^2, lower than the density estimate of 0.373 mussel/m^2 used in the biological assessment (Appendix D). However, this does not change the conclusions of the biological assessment.

In the draft EIS, the estimated incidental take of *L. higginsi* under Alternative D was 6,000; however, in light of the new survey results in the northern end of the East Channel and in Sawmill Slough, this estimate has been revised downward to 3,400 (Table 4; i.e. the population of *L. higginsi* would be reduced by 3,400 individuals over the 40-year project planning period).

In its Biological Opinion, the USFWS stated this level of "incidental take" would be exempt from the prohibitions of Section 9 of the Endangered Species Act, provided certain reasonable and prudent measures are implemented to minimize the take (Appendix C).

The permit applicant's proposed disposal site has been used as a dredged material placement site in the past and is relatively disturbed. It is unlikely bald eagles or peregrine falcons currently make use of this area. No appreciable impacts to these species, or any other State or Federally listed threatened or endangered species, are anticipated if this area is used for dredged material placement. The USFWS concurs with this opinion.

5.1.6.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Alternative F1 would result in increased navigation traffic sometime during the life of the project throughout the East Channel north of the Highway 18 bridge and dredging in cuts 1 and 3. Approximately 20.5 percent, or 51,500 *L. higginsi*, of the estimated population of *L. higginsi* in the East Channel north of the Highway 18 bridge could be affected under

Alternative F1. Alternative F1 essentially combines the significant impacts of Alternatives C1 and D.

As stated under Alternative D, new survey results in Sawmill Slough indicate a much lower density of *L. higginsi* than estimated in the draft EIS. Additionally, the COE, WDNR and USFWS believe continued limited shipping from the City Dock (150 barges/year) would reduce the existing *L. higginsi* population over the next 40 years. No level of incidental take was identified in the draft EIS for Alternative F1; however, in response to comments received from the EPA and in further coordination with the USFWS, Table 4 quantifies the number of *L. higginsi* lost from existing populations under various levels of navigation take.

Long-term expansion of commercial navigation would result in long-term reductions in productivity and survival of the *L. higginsi* population in the East Channel. When compared to the no action alternative, the impacts of Alternative F1 on *L. higginsi* would be significant, combining the impacts of Alternatives C1 and D. Of the alternatives considered in detail, Alternative F1 would have the greatest impact on threatened and endangered mussel species; however, the continued existence of *L. higginsi* would not be jeopardized (Appendix C).

5.1.7 Upper Mississippi River Wildlife and Fish Refuge (Refuge)

None of the proposed alternatives would directly affect the Refuge. Increased barge traffic in the East Channel and vicinity would have minor impacts on the natural resources of the Refuge.

5.1.7.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Barge traffic in the East Channel would return to historic levels at the expiration of State and Federal permits at the City Dock. Alternative A would have no effect on the Refuge.

5.1.7.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Continued use of the City Dock at current levels of traffic would have a minor adverse effect on the Refuge. Barges using East Channel areas adjacent to the Refuge would disturb the resources of the Refuge; however, these disturbances would be minor.

5.1.7.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Development and expansion of a barge terminal facility as proposed by PS&G would have no appreciable effect on the Refuge; however, increased barge traffic in areas adjacent to the Refuge would have a minor adverse impact.

5.1.7.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Increased barge traffic in the East Channel would have a minor impact on the natural resources of the Refuge.

5.2 Cultural Resources Effects

5.2.1 Nature of Impacts to Cultural Resources

Effects to significant archeological and historic resources at Prairie du Chien fall primarily into four categories: physical, audible-visual, safety, and burial. These four categories are discussed below.

Physical Impacts to Resources - The Wisconsin State Historic Preservation Officer and the Advisory Council on Historic Preservation are concerned that harbor development may adversely affect archeological and historic resources located on the island. These impacts may vary from the short-range impacts upon archeological sites damaged as a result of construction to the long-range impacts that increased train traffic may have on National Register and National Landmark properties, some of which are located no more than 30 feet from the existing track.

Audible-Visual Impacts to Resources - Early in the permit process, one of the primary audible-visual impacts that concerned the State Historical Society of Wisconsin was the access road to PS&G at the north end of St. Feriole Island. The applicant's trucks pass directly in front of Villa Louis, a property owned and operated by the State Historical Society of Wisconsin. Truck traffic was out of character with the site of Villa Louis, detracting significantly from the historic experience of visitors to this site. This access road has subsequently been relocated to the east side of St. Feriole Island as a result of conditions placed on the applicant by the COE under another permit. As a result, this visual impact has been removed.

Concern has also been expressed by the State Historical Society of Wisconsin that the increased train traffic resulting from expanded harbor facilities will have an adverse effect upon the redevelopment of the Dousman Hotel. The concern is that a potential threefold increase in train traffic would lessen the possibility for redevelopment of the hotel, although within the last year, Mr. Blair Dillman of PS&G has purchased the Dousman Hotel for redevelopment. In an effort to make the redevelopment feasible and more attractive to developers, the Wisconsin State Legislature passed special legislation to allow for the development of the hotel and railroad depot as a "spark" for the completion of other key components of the St. Feriole Island Reuse Plan. This concern was also expressed by residents of Prairie du Chien during the public meeting of April 20, 1992. The central issue identified during the meeting concerned reuse of the historic structures, especially the Dousman Hotel, as a means to economically revitalize the island. Effective reuse of the

island depends in large part upon economic stimulation of this area. The reuse plan focuses on recreation and interpretation of the archeological and historic resources of the island. Features of the plan include reconstructed Indian villages, Old French Town, jogging and ski trails, a camping area, a park shelter, a swimming pool, and a large public events area. All of these proposed developments are consistent with the previously implemented flood control project at Prairie du Chien.

The National Park Service at Effigy Mounds National Monument has expressed concerns that the development of larger, more extensive harbor facilities at Prairie du Chien will have an adverse effect upon the viewshed. St. Feriole Island and the existing harbor facilities can be seen from all of the scenic overlooks within the monument.

Safety - The State Historical Society of Wisconsin, as an operator of a major historic site, is concerned for the safety of visitors to their historic properties on the island. They operate the Villa Louis, the Astor Fur Warehouse, the Brisbois House and the Rolette House. In addition to these historic properties, they also operate an adjacent visitor center. Truck traffic had been a major concern with visitor safety, but this concern will be eliminated with the relocation of the access road to the PS&G operation on the north end of the island.

The railroad also presents a safety problem. The present tracks pass no more than 30 to 50 feet from the Astor Fur Warehouse, the Brisbois House, the Rolette House, and the Dousman Hotel. The State Historical Society of Wisconsin has informed the COE of several instances where visitor safety has been threatened as a result of trains moving along the tracks in front of their properties.

Burials - While the issue of burials has not been raised by the State Historical Society of Wisconsin, discovery of human remains during the development of harbor facilities would require added coordination with the State Historical Society and others as a result of Wisconsin Statutes that protect human remains and burial sites. Impacts to burials are not discussed in the alternatives described below since no known sites with burials are associated with archeological sites at these locations. However, from a brief review of the site types of archeological resources located on St. Feriole Island (see Affected Environment), it is possible that burials could be located at any of the harbor facilities presently under consideration.

5.2.1.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

This alternative would include denial of the permit to PS&G for any further expansion at the north end of St. Feriole Island and for development at the Swingle site. It would also include a reduction of traffic to the City Dock to pre-1988 levels.

This alternative would limit the potential for impact to archeological resources, since the level of activity associated with the harbor would be returned to pre-1988 levels. It is unlikely that future on-land development, such as expansion of docking and loading facilities, would take

place as a result of these restrictions. No impacts to known or unknown archeological resources would result.

Impacts from vibration to historic structures on St. Feriole Island would continue at existing levels for PS&G, or they could be increased slightly if the reduction in barge traffic from current to historic levels at the City Dock is shifted to PS&G at the north end of St. Feriole Island.

Some increased visual effects to Effigy Mounds National Monument could be expected at the Swingle site even without further harbor development in the Prairie du Chien area.

5.2.1.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Expansion of harbor facilities at the City Dock, the existing Federal harbor, would not have an appreciable effect on archeological resources. The only archeological site located in this area is 47 CR 501. This prehistoric site is located under 3.0 meters of fill placed at the City Dock when the harbor was dredged during its construction in 1958. Any construction associated with harbor development would be unlikely to extend to a depth where adverse effects to this site would be significant.

Use of the City Dock as the focus for limited harbor expansion would have a beneficial effect on the historic structures located along the rail line. It would limit increases in harbor related traffic to an area south of the historic structures. Under this alternative, impacts to the historic structures from vibration would continue at existing levels as a result of continued use of the PS&G facility at current levels (see Alternative D below for a more detailed discussion of vibration impacts to historic structures).

Visual and audible impacts from truck traffic under proposed expansion at the City Dock would be increased over the present route used by PS&G. Access off and onto St. Feriole Island would conflict with visitors to the island. Use of the Blackhawk Avenue bridge for truck traffic would require that visitors and truck traffic travel the same route. The Blackhawk Avenue bridge is currently the most used access to the island for visitors because it ties directly to downtown Prairie du Chien. Use of the Washington Street bridge would require that truck traffic cross the Blackhawk Avenue route at some point and then wind through the park-like setting of St. Feriole Island to get to the Washington Street bridge.

Visual impacts to Effigy Mounds National Monument would likely be reduced somewhat. While this alternative would put an additional mile between proposed harbor development and the monument, it would not reduce the present visual impacts resulting from the PS&G facility.

Dredging the East Channel of the Mississippi River would not have an effect on any known submerged archeological resources. Areas associated with dredging from the turning basin

north to the main channel were dredged in 1976. Any resources in this area would have been destroyed at that time. Areas associated with dredging from the City Dock north to the main channel that have not been previously disturbed by the dredging activities of 1976 were included in the archeological remote sensing survey conducted by the COE in 1992 (Kennington 1993). No significant resources were located in these areas as a result of the survey; however, it is possible that a wood-fastened wooden vessel could have gone undetected as a result of the remote sensing survey.

Dredged material associated with this alternative would be placed at the downstream bridge stockpile area. Much of this site is an existing stockpile area that was previously disturbed by placement of materials dredged from the East Channel and from materials disposed during construction of the Highway 18 bridge. The undisturbed portions of this site were surveyed for archeological resources with negative results (Overstreet 1993).

5.2.1.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

In 1982 (Stoltman 1982b), the Swingle tract was surveyed by the Department of Anthropology at the University of Wisconsin-Madison for archeological and historic resources when the applicant (PS&G) proposed a similar development there. As a result of the survey required by the COE, two areas of historic debris were recorded and identified as the Swingle archeological site (47 CR 374). Two pieces of prehistoric lithic debris were also found in the survey area. The 1982 survey included excavation of six shovel test pits in the areas of historic material to assess the potential of locating undisturbed subsurface archeological deposits. None of these shovel tests indicated the presence of archeological remains below the plow zone. Also, there were no surface indications that any kind of structures were located at the Swingle tract (Stoltman 1982b).

Because of poor visibility in the cultivated field in which this site was found during the 1982 survey, the area was resurveyed in 1983 (Stoltman 1983) by the University of Wisconsin. Controlled surface collection verified the two artifact concentrations in the field. Excavation of five additional shovel tests led Stoltman (1983) to conclude, "if any historic buildings were once present, the only direct evidence surviving to the present is likely to be in the form of subsurface pits that will escape detection until the plow zone (Ap soil horizon) is stripped from the surface over the full area of the two [artifact] clusters." Analysis of artifacts from this site suggests the historic occupation dates between 1855 and 1870. In making recommendations for further evaluation of 47 CR 374, Stoltman suggests stripping the surface of the site with heavy machinery to search for buried structural features, as controlled excavations "would be extremely time consuming and costly, with there being a low probability that it would yield any new information not known already or would be learned more efficiently by feature excavation following upon plow zone stripping."

No further archeological evaluation of this site was conducted prior to the applicant filling the Swingle tract. At the present time, the COE estimates that about 5 feet of fill covers 47 CR

374. Based on the PS&G proposal for development of the Swingle site, both of the historic areas that make up 47 CR 374 would be located under a roadway. Considering this development would take place on the existing fill, over 5 feet of fill deposits would separate the road from the surface of the old field, and undisturbed deposits, if they exist, would be below the plow zone, there is little chance that the Swingle archeological site would be adversely affected by the proposed work.

The COE has required the applicant, under the present permit, to conduct further archeological studies associated with development of the Swingle site not yet affected by past fill activities. This included the construction of access roads connecting County Trunk Highway "K" with State Trunk Highway 35. This survey was conducted in May 1993, and included surface survey, shovel testing and coring. No archeological sites were located within the proposed road access route.

This alternative allows the applicant to develop facilities at the Swingle site, and the existing facilities at PS&G on the north end of the island. Since the Swingle site does not have rail access, all commodities shipped from the Swingle site would be by truck. Commodities presently shipped by rail would continue to use the PS&G facilities.

Development of the Swingle site would reduce the amount of truck traffic on St. Feriole Island. While truck traffic was originally a concern to the State Historical Society of Wisconsin in its operations of the Villa Louis historic site, required relocation of the PS&G access farther to the east has reduced the Society's previous objections. Any further reduction in truck traffic on the island would have a long-term positive benefit on future development of the island by Prairie du Chien. Reductions in truck traffic would significantly reduce competing historical and commercial uses of the island. This would also reduce the visual and audible effects of truck traffic which are now out of character with interpretation of the historic resources on St. Feriole Island.

The proposed development at the existing PS&G operation at the north end of St. Feriole Island, including dock construction, fleeting areas, shoreline riprap, and associated upland construction, is not anticipated to have an effect on any archeological or historic resources. Three archeological sites are recorded for this area. One site, 47 CR 131, was located at the extreme northern end of the island, but gravel operation destroyed this site years ago. Site 47 CR 245, located along the shoreline of the East Channel on St. Feriole Island, is south of the project area and would not be affected by shoreline riprap construction. Site 47 CR 248 is located just south of the PS&G property and would not be affected by the proposed development.

The PS&G property is extremely disturbed by the existing use of the facility; therefore, construction of commodity storage pads, buildings, and other upland development associated with the applicant's proposal would not have an effect on any previously undiscovered archeological resources that might be in the area.

The primary impacts resulting from development of the PS&G alternative relate to the railroad access to and from the north end of St. Feriole Island. Over the past several years, the State Historical Society of Wisconsin has been concerned with the use of the railroad adjacent to their historical properties and the impacts that vibration from rail use may be having on these structures.

Historically, train traffic has been using the present route since as early as 1864 when the rail line was extended from Lower Town (mainland) to the southern part of the island. As a result of the development of the Pontoon Bridge by John Lawler, a 1.75-mile-long loop of track was constructed from the flour mill on the southern end of the island northward along the river, past Villa Louis and the old Fort Crawford, where it looped south to enter the pontoon bridge. This loop was constructed in 1874. The pontoon bridge was said to have a capacity of 1,000 cars a day, but 300 cars was the average use.
While rail traffic has traveled past these historic structures for more than 125 years, and at significantly higher levels than today, two factors must be considered in assessing impacts to historic structures. The most significant factor is, at the height of the railroad's use of the island, motive power of trains was less than it is today. Locomotive size did not begin to reach the level of today's engines until the beginning of the century; therefore, carloads would have been smaller and lighter, and would have had less impact to adjacent structures.
Another factor is, during the 1870's and 1880's, the historic buildings were significantly newer and were likely more capable of withstanding damages from trains than these structures are today.

In February 1990, the COE discussed impacts to historic structures from rail traffic with the Urban Mass Transportation Administration (UMTA). In studies conducted by the UMTA, impacts to historic structures were found to be associated with rail traffic. A number of factors were found by the UMTA to be important in the cause of these rail impacts: gross weight of the cars passing near historic structures, distance separating the tracks and the structures, properties of the soil through which the vibrations would pass, and speed of the traffic. Speed of traffic should not be a factor in Prairie du Chien since the UMTA only found a correlation to adverse effects when traffic exceeded 30 miles per hour. The Memorandum of Agreement for harbor development at Prairie du Chien limits train traffic on the island to speeds below 10 miles per hour.

In discussing Prairie du Chien, the UMTA felt that impacts to historic structures would be likely to any structures when these structures were located within 100 feet of the tracks and there would certainly be impacts to structures within 50 feet of the tracks. While the impacts may only be cosmetic, such as hairline cracks to plaster, the UMTA cautioned against attempting to extrapolate their data to Prairie du Chien. The UMTA believes that the only effective way to consider the cumulative impacts of all of these factors is to measure them by conducting physical studies of traffic on the specific historical structures in question. The COE required the applicant to conduct vibration impact studies, which was done in late November and early December 1993 by Twin Cities Testing Corporation of St. Paul, Minnesota. Their work included a condition survey of the buildings (Dousman Hotel, Rolette

House, Brisbois House, Astor Fur Warehouse, and Villa Louis) and vibration monitoring of train movement near the buildings. Vibration monitoring was done with five seismographs located inside the structures. Results of eight train runs by each structure were recorded in peak particle velocity (PPV). While the report of these investigations concluded that the recorded PPV were well below levels necessary to induce cracking in modern structures, they were within unacceptable international levels set for historic structures. The Memorandum of Agreement (Appendix F) which was negotiated between concerned parties addresses the issue of vibration through the retrofitting of the tracks adjacent to the historic structures on St. Feriole Island.

Development of the proposed harbor facilities at PS&G, and the concomitant increases in rail traffic associated with this alternative, has also been a concern of the State Historic Preservation Office and the general public as it relates to the reuse of the Dousman Hotel. Both the State Historic Preservation Office and the public are interested in seeing a private developer restore the hotel. Adaptive reuse of the hotel would not only allow for appropriate restoration of a building that is now deteriorating, but it would provide an infusion of capital and energy into greater reuse of St. Feriole Island itself. The great concern from both the Wisconsin State Historic Preservation Office and the public is that any increases in visual and audible impacts from increases in rail traffic would limit the redevelopment potential of the hotel. Without redevelopment of the hotel, it is likely this National Historic Landmark would continue to deteriorate and ultimately be lost. However, within the past year, Mr. Blair Dillman of PS&G has purchased the Dousman Hotel and is in the process of restoring it for redevelopment. Presently, the most deteriorated elements, such as the roof of the hotel, have been stabilized, and other non-historic elements have been removed from the original hotel structure. With renovation of the hotel and retrofitting of the track, adverse effects from train traffic vibrations will continue to be less of a problem for this structure.

In addition to visual impacts from harbor development on historic resources of St. Feriole Island, there would be increased visual impacts to Effigy Mounds National Monument. Currently, the existing harbor facilities are visible from all four overlooks in the monument. While summer vegetation obscures many of the facilities at PS&G, large stockpiles of commodities are still visible from the monument as well as the recently constructed salt storage building located at the Swingle site. Increased development could increase the number and size of commodities stockpiled at both the Swingle site and at PS&G, and this would have a greater impact upon the viewshed of the monument, detracting from the overall visitor experience. In addition to increases in stored commodities from the expansion of harbor facilities at the Swingle site and PS&G, deauthorization of the Federal harbor would shift commodities presently stored at the City Dock to the north end of the island. Visual impacts to the monument are greatest for the northernmost, and closest, alternatives under consideration. Concerns over the visual impacts of harbor development and expansion were discussed in detail at the April 25-26, 1995 meeting at Prairie du Chien, and these discussions led to the development of mitigative measures which would greatly reduce visual impacts. These mitigative measures have been made part of the Memorandum of Agreement (Appendix F).

Dredging associated with this alternative would be similar to Alternative C1. Archeological surveys of the downstream bridge disposal area were negative (Overstreet 1993); therefore, disposal here would not affect any archeological sites.

5.2.1.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

The impacts from this alternative are similar to those discussed above. A detailed discussion of impacts to historic properties resulting from vibration can be found in Section 5.2.1.3 (Alternative D) above, along with impacts resulting from development of the Swingle site. A detailed discussion of impacts from use of the City Dock at a level capped at 135 permitted and 15 incidental barges per year can be found in Section 5.2.1.2 (Alternative C1).

The combination of these plans in this alternative would allow for expansion of harbor facilities at PS&G which would have adverse impacts on historic structures on St. Feriole Island. However, in combination with limited expansion at the City Dock harbor (up to 150 barges per year), these impacts could be reduced somewhat by taking this limited traffic away from PS&G. Similarly, visual impacts to Effigy Mounds National Monument could be reduced by dividing stockpiled materials between the two sites. Truck traffic at the City Dock would be increased. This would result in conflicting use between the City Dock and visitors to the island as discussed in Section 5.2.1.2 (Alternative C1) above.

Dredging requirements for this alternative would not have a significant impact to any known submerged resources, although there is a potential that wooden vessels may be located in the channel which were not detected by remote sensing surveys conducted by the COE in 1992. None of the disposal areas that would be used during dredging would have an effect on any known archeological or historic properties.

5.3 Socioeconomic Resources Effects

5.3.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Permit denial could have substantial adverse effects on transportation and regional growth. Although the effects of this alternative would not be as great as those resulting from the no harbor alternative, permit denial could still have a substantial effect on the railroad and impede community and regional growth in the rail and commercial navigation transportation sector. Outcomes associated with this alternative would likely generate controversy between city, State and Federal officials. Controversy between economic growth proponents and environmental preservation proponents would also likely continue.

5.3.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Limited expanded operations at the City Dock combined with historic level operations at PS&G would likely result in some beneficial outcomes for the transportation industry. Spill-over effects on community and regional growth and development could also be positive. This alternative could enhance the relationship between the railroad and the barge fleeting industry, resulting in greater revenues for the city and thereby producing positive effects on local employment and business activity. Farmers would also likely receive better prices for their crops. Minor positive effects on the cost of food supply could also be realized, and using more efficient modes of transportation would have a positive effect on energy resources.

Two potential sources of conflict and controversy are associated with this alternative. One may be the permit applicant, while the other may stem from environmental concerns. This alternative would involve denial of the applicant's permit for expansion and the granting of a permit to the City for loading 150 barges per year. Permit denial and restricting the City Dock to 150 barges per year would encroach upon the port's ability to meet local and regional shipping demand. Any increased barge activity at the City Dock would likely engender opposition from the environmental community.

5.3.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

The potential for farmers in Wisconsin to receive better prices could be increased if the permit was approved. Assuming rational economic behavior, i.e., profit maximization, Prairie du Chien could become more competitive in the grain market. The improved railway system and added grain storage facilities in Prairie du Chien could be viewed as indicators of regional economic expansion with potential for even more growth. These factors, in turn, could have substantial positive effects on community growth and development, tax revenues, local employment and business activity.

These positive effects could be attenuated through the reduction in operations at the City Dock. Reduction in City Dock operations could erode competition, and the revenue the city derives from the operation would be lost. The reduction could have minor negative effects on local employment and business activity and could stimulate some controversy between the lessee of the City Dock, the City, and the permit applicant. However, those entities are currently undergoing discussions and negotiations regarding use by the City of the permit applicant's harbor if the permit is granted. The environmental community would most likely support the closure of the City Dock.

An increase in truck traffic and associated noise attributable to the proposed Swingle site expansion could create public health and safety concerns for nearby residents. However, the applicant proposes to construct a truck access road through an agricultural field on the northern outskirts of Prairie du Chien. The proposed road would connect the Swingle site

with State Trunk Highway 35 and would effectively route traffic away from residential areas in Prairie du Chien. The adverse impacts of increased noise directly resulting from the proposed Swingle site expansion would be minimized.

5.3.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

This alternative would most likely maximize socioeconomic benefits. It would also likely generate controversy. While this alternative would probably garner a great deal of support from economic development proponents, it would also come under critical scrutiny from the environmental community.

As discussed under Alternative D, increased truck traffic and associated noise attributable to the proposed Swingle site expansion could create public health and safety concerns for nearby residents. However, these adverse impacts would be minimized by routing of traffic to the applicant's proposed truck access route on the northern outskirts of Prairie du Chien.

5.4 Recreational Resources Effects

Any proposed port facility expansion and development would increase the possibility for adverse effects on future recreation activities. Although the possibility for conflicts between commercial and recreational boaters in the East Channel would increase, these could be minimized if the majority of barge shipping occurred during periods of reduced recreational boating (i.e., weekdays). Increases in vehicular and railroad traffic through and around recreational and historic areas would adversely affect their serenity and quality. Any proposed development would have negative effects on local air, water and noise, and on the area's visual resources.

5.4.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

The harbor activities of the PS&G and City Dock sites have adverse effects on recreation activities and visual quality on and around St. Feriole Island. Commercial navigation maneuvers in the East Channel conflict with recreational boaters. PS&G's proximity to the north entrance to Marais de St. Feriole endangers recreational boaters using the Prairie du Chien marina. Railroad and truck traffic, with the associated noise, fumes, and visual disturbances, interferes with recreation activities in historic and park areas on St. Feriole Island. Scheduling railroad and truck traffic during non-peak recreational use periods would help to alleviate this interference. Although visual quality around both these sites is adversely affected by the highly disturbed character of the sites, the continuance of harbor activities at these sites would not alter the current condition.

5.4.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Long-term limited expanded commercial use of the City Dock would cause an increase in commercial vehicular traffic across Blackhawk Avenue bridge and through St. Feriole Island. Since railroad access to the island is from the south, effects from railroad traffic to this location would be limited to areas south of the park and historic districts. Careful routing and scheduling of vehicular traffic could lessen the effect on public areas. Adverse effects on recreational boaters in the East Channel would increase, although effects would be less at this site than at others due to its greater distance from Sawmill Slough and the Prairie du Chien marina entrance. Adverse visual quality effects caused by any increase in activity at the City Dock would be minimal due to the site's current state of high disturbance.

Adverse effects from harbor activities at PS&G would remain at historic levels.

5.4.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

Harbor activities at a combined PS&G/Swingle site would cause the most interference with recreational boaters using the Prairie du Chien marina due to its proximity. The permit applicant has eliminated plans for a loading dock on the south end of the Swingle site to help assure recreational boat passage. However, because of low clearances through the south channel, all boaters using the marina must use the northern access. The marina owner has expressed long-term plans to double the number of slips to accommodate the larger boats and sailboats which are making greater use of the marina. Larger craft and sailboats are typically slower and less maneuverable than smaller recreational craft and pose a greater possibility for conflicts with commercial river traffic. Vehicular traffic across the Blackhawk Avenue bridge and through park and historic areas of St. Feriole Island would increase, as would rail traffic along the western edge of the island. Commercial truck and rail access to the Swingle site would have nominal effects on recreation due to its mainland location. The effects on air and water quality would be increased due to the site's proximity to the marina and the historic district of St. Feriole Island. The current permit proposal of using both the Swingle and PS&G sites would combine the problems of both, including barge maneuvering activities between the two sites.

Adverse effects from the City Dock site would remain at historic levels.

5.4.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

An increase in commercial activities at these sites would have the greatest adverse effects on recreation activities. Effects for this alternative would combine the effects of Alternatives C1 and D.

5.5 Energy Requirements and Conservation Potential

Energy-consuming requirements resulting from maintaining a commercial navigation channel and port facility operation arise from construction and maintenance of the port facilities, from maintenance dredging and from tow/barge operation. However, tow and barge transportation has been found to be the most energy efficient mode of transporting commodities. The Minnesota Department of Transportation (1988) found that fossil fuel consumption for transportation of bulk commodities ranges from 2.5 to 9 times less per hour per mile for barge transport over ground transport; i.e., truck and rail.

5.5.1 Alternative A - No Action Alternative - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel Harbor (Historic)

Energy consumption under this alternative would be reduced from present consumption because annual barge traffic levels in the East Channel would be reduced from approximately 380 barges per year to approximately 245 barges per year.

5.5.2 Alternative C1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel Harbor (Historic)

Approximately 380 barges per year would use East Channel harbor facilities under this alternative. Additional energy would be required for the projected dredging of cut 1.

5.5.3 Alternative D - City Dock in Federal Commercial Harbor (Historic) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

This alternative would require expending fossil fuels to accomplish the proposed expansion of the PS&G facility and the Swingle site, including the dredging of cut 3. It is estimated that cut 1 would need to be dredged once over the next 40 years. Approximately 500 barges would use this facility each year. The energy use required for these activities would not be significant.

5.5.4 Alternative F1 - City Dock in Federal Commercial Harbor (Expanded up to 150 Barges/Year) and Prairie Sand and Gravel/Swingle Harbor (Expanded)

This alternative would result in the greatest energy consumption. In addition to the 150 barges per year using the City Dock, barge traffic at the proposed PS&G/Swingle harbor would increase to approximately 500 barges per year. Additional energy would be required for dredging cuts 1 and 3.

5.6 Irreversible and Irretrievable Commitments of Resources

This section discusses irrevocable uses of resources, changes in land use, destruction of archeological or historic sites, unalterable disruptions in the ecosystem and other adverse

environmental effects that could result from implementation of the barge terminal expansion alternatives and associated dredging/channel maintenance requirements.

Raw materials used in any of the barge terminal expansion alternatives would be committed, but would not be wholly irreversible or irretrievable because it would be possible to retrieve and reuse components to an extent. Economic resources committed by the permit applicant would include those for original construction, as well as long-term maintenance. In addition, if the permit was denied for the applicant's proposed project, there could be land acquisition costs associated with development of another alternative site. There would be varying types and degrees of commitments of land use resulting from conversions of land use necessary to develop barge terminal facilities at the different alternative locations.

Two archeological resources have been located within areas covered by alternatives considered in detail in this EIS. One of these is the Swingle historic archeological site (47 CR 374) and the other is prehistoric archeological site 47 CR 501, located at the City Dock. Both of these sites have been buried by historic fill activities in the Prairie du Chien area for a decade or more. It is unlikely that either of these sites would be significantly affected by activities associated with the harbor developments. However, while these sites may not be directly affected by the projects, development at these sites would make it increasingly difficult to conduct intensive excavations here in the future.

Without implementation of the mitigative measures identified in the Memorandum of Agreement, continued use of the rail line on St. Feriole Island would increase deterioration of the historic resources. While these properties may not be irrevocably lost, accelerated deterioration could add significant costs to maintaining these structures in the future. Visual impacts to Effigy Mounds National Monument are not considered irretrievable, as future abandonment of harbor facilities, however unlikely, would restore the monument's viewshed.

Maintenance of a navigation channel in the East Channel of the Mississippi River at Prairie du Chien would require a commitment of Federal economic resources by the COE. The assurance of the continued existence of a navigation channel would also result in the commitment of resources by the local government as well as by the private sector to maintain and increase the shipping of commodities from the city. The amounts of these investments and the parties involved would depend upon which alternative was ultimately implemented.

Dredging to maintain navigation in the East Channel would also require an irretrievable commitment of fossil fuels. However, reductions in fossil fuel consumption for transportation of commodities would be realized because of the more energy efficient mode of transportation.

Commercial navigation and maintenance of the East Channel would cause irretrievable losses of freshwater mussels including the Federally listed endangered species *L. higginsi*. All alternatives except the no action alternative would result in population reductions. The actual loss would depend upon the alternative that is ultimately selected and implemented.

5.7 Means to Mitigate Adverse Environmental Impacts

Means to mitigate the adverse environmental effects from the proposed expansion of the PS&G barge terminal could include functional alternatives (see Section 3.4). These measures could be implemented through imposing conditions on any permit granted that would be related to barge traffic at the facility. Conditions could include restrictions on the types of commodities shipped; the number of barges allowed in a specified time period; restrictions on the type of barge equipment, e.g., barge engine horsepower limitations; and restrictions on sailing lines used to access and leave the terminal.

Mitigative measures to reduce the environmental effects of channel maintenance activities were considered and are part of the LTCMP (Appendix B). Mitigative measures investigated in the LTCMP included: minimizing dredging requirements by reducing channel widths and depths, using mechanical versus hydraulic dredging and using previously disturbed upland sites for dredged material disposal.

Permit conditions restricting the number of barges allowed per year have been imposed on other permittees in Prairie du Chien. Didion, Inc., was issued permits by the COE and the State of Wisconsin related to use of the City Dock for grain shipment which restricted barge numbers to 135 per year. As a result of the USFWS Biological Opinion, this condition would continue for the City Dock under two of the alternatives being considered. However, if no restrictions were deemed necessary at the time a permit was granted, the District Engineer and the State of Wisconsin have the authority to modify or revoke the permit(s), including imposing additional permit conditions, if future circumstances would warrant such action.

Similarly, permit conditions could be imposed on the permittee as a means to mitigate adverse impacts on cultural resources. If the permit for harbor development and expansion is granted, implementation of the Memorandum of Agreement for historic resources will be made a condition of the permit.

Furthermore, a standard condition of all permits issued by the Department of the Army requires that the District Engineer be notified if previously unknown historic or archeological remains are discovered while accomplishing work authorized by the permit. The COE then initiates required Federal and State coordination to determine if the site is eligible for listing on the National Register of Historic Places or if the remains warrant a recovery effort.

5.8 Cumulative Impacts

5.8.1 Natural Resources

As discussed in Sections 5.1.1 to 5.1.7, the natural resources most likely to be affected by the cumulative effects of the various alternatives include aquatic resources, fish and wildlife, and freshwater mussels, including the Federally listed endangered mussel species *L. higginsi*.

To accurately predict the effects of proposed actions on these natural resources, consideration must be given to the cumulative effect of different actions, both natural and human-induced, on the resource. The impacts of navigation and channel maintenance activities on aquatic habitats, fish and freshwater mussels are relatively easy to identify. However, these are not the only impacts that would affect these resources in the East Channel. Natural mortality, commercial clamming/fishing, recreational fishing, additional development activities, the impending zebra mussel infestation, and recreational traffic could also impose some degree of impact on aquatic resources, fish and freshwater mussels. Additionally, one of the largest floods on record occurred in 1993 with many unknown effects on aquatic, floodplain and wetland habitats. These impacts would remain regardless of whether channel maintenance operations were conducted or navigation activity increased in the East Channel. For this assessment, it is assumed these impacts would not increase substantially in the future and are already reflected in current population levels. The following sections discuss these factors and the cumulative impact they could have on natural resources.

Natural mortality can take several forms. Death from old age, predation, disease, or accident reduces the number of viable individuals in a population. The flood of 1993 resulted in many changes to aquatic habitats. Normally, mortality is offset by recruitment in healthy populations, and no net reduction in population numbers or densities results. As discussed in the Biological Opinion included as Appendix C, it is assumed the population of *L. higginsi* in the East Channel is stable under existing conditions (i.e., recruitment equals mortality). This assumption probably also holds true for the larger mussel population in the East Channel.

Fish populations are also affected by natural mortality. However, again, it is assumed that fish populations in the East Channel are stable.

Since 1986, the gross commercial harvest of washboard and three-ridge mussels (measured in pounds of shell) has remained fairly constant (Brecka and Marron 1992). While the harvest of washboard mussel shells has declined over this time period, the harvest of three-ridge shells has increased. The harvest of three-ridge and washboard mussels from the East Channel is estimated to be around 90,000 mussels annually. To obtain 90,000 legal-sized three-ridge and washboard mussels, approximately 520,000 mussels in total need to be collected from the East Channel, handled, and sorted.

Two methods of harvesting freshwater mussels are generally employed, brailing and diving. The first method, brailing, is relatively non-selective for both species and size. A "crows-foot" wire device is dragged across the bottom substrate, and mussels contract around the tines of the "crows-foot." The second method, diving, can be somewhat more selective for both species and size, depending on the experience and abilities of the diver. However, divers must still remove mussels from their positions in the substrate to assess their size and species, resulting in disturbance and displacement of the mussel.

Based on professional judgment, 10 percent of the mussels collected, but returned to the water during clamming operations, perish. No studies have been conducted to document the

specific mortality associated with the return of non-commercial or sub-legal mussels by commercial clammers. The figure used here (10 percent) is very speculative and should not be taken as the standard mortality rate of mussels replaced by commercial mussel harvest divers. However, if this figure is applied to the estimated number of mussels handled (520,000) minus the actual number harvested (90,000), an additional 43,000 mussels would be destroyed as a result of commercial harvest. These additional mortalities would be of various species and sizes. Included in this incidental mortality are 390 *L. higginsi* per year.

Commercial fishing on the Mississippi River is targeted mainly at species considered undesirable by sport fishermen (i.e., "rough fish"). Included in the commercial harvest are carp, buffalo, and to a lesser degree catfish. Netting is the preferred method of harvest, and invariably some "game" species (i.e., walleye, bass, panfish) are captured in nets and perish. Commercial harvest data indicates approximately 377,098 pounds and 379,060 pounds of fish were harvested in 1991 and 1992, respectively, from pool 10.

Sport fishing is one of the primary recreational interests the Mississippi River supports. The primary species of interest in the Prairie du Chien area include walleye, sauger, largemouth bass, smallmouth bass, northern pike and panfish (crappie, bluegill). Sport fishermen can have a significant impact on gamefish species. Largemouth bass, for example, are susceptible to overharvest. Fishermen can easily remove the majority of reproducing largemouth bass individuals from a particular area, adversely affecting the area's abilities to sustain harvestable numbers. However, it is assumed current limits on recreational harvest of fish species, as set by State conservation agencies, are adequate for protecting the long-term sustainable harvest of fish species from the Mississippi River.

Recreational craft using the East Channel could potentially affect aquatic resources through habitat disturbance. Recreational traffic can cause bank erosion and elevated suspended sediment levels through increased wave action. Many of the impacts associated with commercial navigation traffic can be extrapolated, to a lesser degree, to recreational traffic. Large cruisers can produce waves as high as those produced by commercial tows; however, recreational craft normally draft far less water than commercial craft. It is difficult to assess to what degree recreational traffic would affect aquatic habitats in the East Channel. It is assumed the impacts would be minor or non-detectable in relation to the other, more significant impacts imposed by navigation traffic, although it is possible that impacts from recreational traffic may increase stress on fish and mussel species, making them more susceptible to impacts from the more significant perturbations.

Additional construction of ports or marinas and the associated increase in navigation traffic would have an incremental impact on natural resources. Future water-associated development activities would require a permit(s) from the COE. The cumulative impacts of any additional projects would need to be addressed before a permit(s) could be issued.

In 1991, the first observance of zebra mussels (*Dreissena polymorpha*) in the Upper Mississippi River was reported in pool 8 near La Crosse, Wisconsin. Since then, zebra

mussels have been observed at Locks and Dams Upper St. Anthony Falls (USAF), 1, 2, 3, 4, 5, 5A, 6, 8, 9 and 10. In October 1992, zebra mussels were observed attached to native freshwater mussels near Clayton, Iowa, just downstream of the East Channel in pool 10. The first reports of zebra mussels in the East Channel also occurred in October 1992. These reports indicated zebra mussels were observed attached to native mussels harvested from the East Channel by commercial clammers. Zebra mussels were also observed attached to wing dams in the East Channel.

Zebra mussels colonize new areas through natural dispersal of veligers on river currents or through adult migration on movable substrates, such as barge hulls. Zebra mussels can affect native mussel populations in two ways: through direct competition for food resources and by colonization on native mussel shells, resulting in suffocation and eventual death. In Lakes Erie and St. Clair, where zebra mussels have existed for several years, the native mussel populations have been devastated, and in some areas of both lakes, eradicated (Macke et al. 1992; Gillis and Mackie, 1992). However, the extent of infestation in a riverine environment and the resultant impacts in the Upper Mississippi River are unknown at this time. Potentially, a heavy zebra mussel infestation in the East Channel could significantly reduce the mussel resources of the East Channel, making the impacts of dredging and navigation seem moot. However, if the impacts of zebra mussels were moderate, the increased stress on mussel resources could increase the significance of the impacts of dredging and increased navigation activity. Without more information, it is impossible to assess the impacts of zebra mussels on mussel populations in the East Channel at this time.

Freshwater drum are known to feed on zebra mussels. Zebra mussels could colonize important rock structures used by gamefish species as spawning habitat. In Lake Erie, where zebra mussels have existed since the late 1980's, zebra mussels have colonized important walleye spawning reefs. Although no adverse impacts on walleye reproduction have been recorded to date, it is believed that zebra mussels would affect the physical and chemical characteristics of spawning substrates, thus adversely affecting reproduction.

The direct impact of harbor construction on natural resources is minimal. Some riprapping of shorelines and minor dredging activities could affect fish and mussel individuals; however, the likelihood of this is low and the overall impact of harbor construction is probably minimal.

Increased navigation activity would disturb aquatic habitats and stress fish and mussel populations through increased turbidity, turbulence, current changes, and increased water velocities. Negative effects on feeding, metabolism, growth rates, and reproduction can result from these impacts. Turbulence produced by barge traffic can adversely affect fish larvae through entrainment. It is estimated that, within the navigation routes, the chronic effects associated with increased navigation would have substantial adverse impacts on existing mussel populations and significant adverse effects on the Federally listed endangered mussel species *L. higginsi*. The impacts of increased barge traffic on fish species would not be as significant. Fish are mobile and can generally avoid undesirable conditions. Some increased fish mortality as a result of navigation could occur.

Dredging would result in an immediate, acute impact on aquatic habitats and benthic organisms. Dredging would also destroy or disturb habitat, making conditions unfavorable for recolonization. After dredging, increased navigation traffic would further inhibit recolonization efforts. As discussed in Sections 5.1.5 and 5.1.6, dredging would have minor impacts on freshwater mussels including *L. higginsi* (Appendix C). Some minor disturbance to fish species would occur during the dredging process; however, the areas proposed for dredging are in navigation channel locations probably not heavily used by fish species. Dredging would have only minor impacts on fish species in the East Channel.

A spill of hazardous materials, although remote and unlikely, could impose disastrous effects on natural resources, particularly mussel populations in the East Channel. Adult fish are generally able to avoid contamination as a result of a spill by swimming out of the spill area; however, some fishes or life stages could be adversely affected by a spill of highly toxic chemicals. Mussels, on the other hand, are unable to rapidly move away from a spill source. Depending on the specific gravity of the material spilled (i.e., does it float or sink), a large spill of chemicals, salt or fertilizer could potentially destroy large numbers of mussels. This, in combination with impacts associated with navigation and dredging, could have a significant impact on mussel populations. If the permit is approved, restrictions on the commodities that can be shipped may be included in the permit to reduce or eliminate the potential for unacceptable spills.

The cumulative impacts of dredging, increased navigation, commercial clamming, and recreational traffic on freshwater mussels could result in long-term reductions in productivity. There would be only minor cumulative effects on aquatic habitats and fish.

5.8.2 Cultural Resources

Cumulative impacts to archeological and historic resources are difficult to assess because of the nature of the resource. Unlike many biological resources, archeological and historic resources are nonrenewable. Once sites or portions of sites have been destroyed, information from those resources cannot be reconstructed. Within the Prairie du Chien area, a finite number of archeological sites make up the resource base of the area. While loss of a single site may not appear to have a great effect on the total number of resources available for the area, each site lost reduces the future prospect for understanding the larger nature of prehistoric cultural development in the area.

Unfortunately, development and expansion in the Prairie du Chien area are having, and would continue to have, a significant effect upon archeological resources. Archeological sites on the Prairie du Chien terrace, such as the sites located around the proposed Swingle harbor, if not affected by harbor development, would likely be adversely affected by future private development in the Prairie du Chien area. While archeological site losses, as a result of Federal or Federally assisted or permitted projects, are taken into consideration under Section 106 of the National Historic Preservation Act, these losses are usually preceded by some form

of mitigation. Sites lost as a result of private development, where no Federal action is involved, are rarely mitigated prior to destruction of the resource.

Burials, mounds and cemetery sites are now protected under Wisconsin State statute, and present and future impacts to these areas would be considered and mitigated under these statutes. However, a significant number of these sites have been lost in the past as a result of development, looting, and past archeological excavation.

Historic resources on St. Feriole Island, while preserved for public interpretation, are presently affected by vibration from train traffic on the island and also by flooding. While these houses and buildings have withstood numerous flood events over the course of their existence, these impacts incrementally damage the properties and burden their owners with the added costs for cleanup and maintenance.

Considerable areas exist on the terrace to the north and south of Prairie du Chien and on the blufftops to the east of the city for future expansion and development. Visual impacts to island resources, and especially to the Effigy Mounds National Monument, would continue to increase in the future as long as Prairie du Chien continues to grow as an urban center.

5.8.3 Socioeconomic Resources

Additional construction of ports or marinas and the associated increase in navigation traffic would have an incremental impact on socioeconomic resources. Expansion activities would likely result in positive effects on most economic parameters. Expansion activities would also likely exacerbate relations between economic growth proponents and environmental preservation proponents. A probable scenario could be the greater the expansion activities, the greater the disparity between the two groups.

5.8.4 Recreational Resources

Clayton County Roadside Park is located at the northern inlet to the East Channel and is currently the site of a barge staging area. Any future development at the northern sites could increase staging in this area, increasing long-term negative impacts to recreational users of this park. The number of barges allowed to fleet in this area would be dependent on Iowa regulations governing barge fleeting.

Part of the recreational experience and the attraction of this area is its natural shoreline when viewed from the water. Any increase in development along the river would have a negative impact on the enjoyment of this important characteristic, with some sites having more impact than others. The Swingle, PS&G and City Dock sites have already been severely disturbed, and future development would not affect the natural river shoreline and visual qualities.

The most dramatic views of the river valley are from the Iowa side, particularly Effigy Mounds National Monument and Pikes Peak State Park. Representatives from the national

monument are concerned not only with the visibility of the proposed facility, but also with the visibility of an increase in barge maneuvering and staging areas. Development at any of the northern sites would have the greatest negative impact on the viewshed from the national monument. Sites south of Prairie du Chien are less visible from this vantage point and their impacts would be minimal. Because of Pikes Peak State Park's southern location, sites on or near St. Feriole Island would have little or no impact from its overlooks. Any negative impacts from the sites south of St. Feriole Island would be caused primarily by additional barge maneuvering and staging.

5.9 Compliance with Other Laws and Statutes

Table 5 lists the applicable environmental protection statutes and executive orders affecting the LTCMP and regulatory permit action. In the draft EIS, the status of compliance for several acts/orders was listed as only partial. Full compliance with these acts/orders has been or will be achieved at the signing of the Record of Decision on the permit application.

Archeological and Historic Preservation Act: Full compliance has been achieved through resolution of the vibration impacts, subsequent coordination of the study results with appropriate agencies, and completion of the Memorandum of Agreement (Appendix F).

Clean Water Act: Included as Appendix E of this document is a draft Section 404(b)(1) evaluation for placement of fill materials in waters or wetlands of the United States. The 404(b)(1) evaluation documents the expected impacts of riprap placement for shoreline protection proposed under the permit applicant's harbor development plan. The 404(b)(1) evaluation was prepared in compliance with the Clean Water Act. Full compliance with the Clean Water Act would be achieved upon completion of the public review process and issuance of water quality certification by the WDNR.

Fish and Wildlife Coordination Act: The USFWS has participated in preparation of this final EIS. Submittal of a Fish and Wildlife Coordination Act letter by the USFWS will achieve full compliance.

Floodplain Management (Executive Order 11988): It is simply not practical to develop a barge terminal loading facility outside the floodplain because of existing technological constraints. Expansion of operations at PS&G would have limited effects on characteristics of the floodplain, and the proposed activities are fairly harmonious with existing conditions. The proposed expansion would take place within a disturbed area, and other alternatives, for the most part, would require disturbing natural characteristics of the floodplain. The proposed development calls for the construction of fixed, water-related terminal and dock facilities, but not habitable structures. These structures would not modify flow characteristics or water surface profiles. The degree of hazard and degree of threat to human health and safety would be minimal.

Table 5. Status of compliance with other environmental requirements.

Federal Statutes	Status
Archeological and Historic Preservation Act	Full
Clean Air Act, as amended	Full
Clean Water Act, as amended	Partial*
Coastal Zone Management Act, as amended	N/A
Endangered Species Act of 1973, as amended	Full
Estuary Protection Act	N/A
Federal Water Project Recreation Act, as amended	Full
Fish and Wildlife Coordination Act, as amended	Full
Land and Water Conservation Fund Act, as amended	Full
Marine Protection, Research and Sanctuaries Act	N/A
National Environmental Policy Act of 1969, as amended	Full
National Historic Preservation Act of 1966, as amended	Full
National Wildlife Refuge Administration Act of 1966	Full
Watershed Protection and Flood Prevention Act	Full
Wild and Scenic Rivers Act, as amended	Full
Farmland Policy Protection Act of 1981	Full
Federal Executive Orders (E.O.), Memoranda	
Floodplain Management (E.O. 11988)	Full
Protection of Wetlands (E.O. 11990)	Full
Environmental Effects Abroad of Federal Actions (E.O. 12114)	Full
Analysis of Impacts on Prime and Unique Farmland CEQ Memorandum 30 August 1976	Full

The compliance categories used in this table were assigned according to the following definitions:

Full - All requirements of the statute, E.O., or other policy and related regulations have been met for the current stage of planning.

Partial - Some requirements of the statute, E.O., or other policy and related regulations remain to be met for the current stage of planning.

Noncompliance - Violation of a requirement of the statute, E.O., or other policy and related regulations

Not Applicable (N/A) - Statute, E.O., or other policy and related regulations not applicable for the current stage of planning.

* State water quality certification is required before full compliance with the Clean Water Act can be achieved. If the permit is granted the WDNR would provide water quality certification.

5.10 Conflicts between Alternatives and Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

5.10.1 Upper Mississippi River Land Use Allocation Plan

The permit applicant's proposed barge terminal expansion and the COE proposed channel maintenance plan conform with the Upper Mississippi River Land Use Allocation Plan.

5.10.2 USFWS Refuge Master Plan

While the Upper Mississippi River Wildlife and Fish Refuge Act specifically prohibits activities that adversely affect Refuge flora and fauna, further protection was included under the National Wildlife Refuge Administration Act of 1966. This latter Act required a compatibility determination for use of refuge lands. This means that proposed uses or projects must be shown to be compatible with the major purposes for which the refuge was established, the goals of the National Wildlife Refuge System and the objectives of the Refuge. In addition, Refuge lands taken or degraded by a project must be replaced with lands of equal or greater wildlife and monetary value.

Procedurally, this means:

1. A regional analysis must demonstrate a need that cannot be satisfied except at the subject location.

2. Compatibility must be shown as described above if an activity is to be allowed on Refuge lands.

3. Any kind of land exchange would require replacement with property of equal or greater wildlife and monetary value.

4. The USFWS would recommend, in keeping with regulations and policy, that a "no net loss" compensation requirement must be met in addition, which would involve creation or restoration of habitat elements, not simply purchase and transfer of existing habitats.

The proposed expansion of the PS&G/Swingle harbor and implementation of the COE LTCMP would not conflict with the Refuge Master Plan.

5.10.3 Effigy Mounds National Monument General Management Plan

The National Park Service operates Effigy Mounds National Monument as a public interpretive facility with the primary goal of interpreting the burial mounds and the effigy mound culture that created them. Secondary goals are to manage the natural habitat of the monument in a manner that restores the ecological conditions that existed at the time the mounds were constructed. Within the main unit of the monument are several overlooks that

provide vistas of the Mississippi River. Since the National Park Service does not control lands adjacent to the monument, which are subject to developments inconsistent with their management objectives, the National Park Service relies on cooperation with other Federal, State, and local government agencies, private organizations and individuals to ensure compatible land and water uses in areas surrounding the monument.

The National Park Service would recommend that encroaching development be limited to reduce or eliminate those developments that have an impact upon the viewshed from the monument. However, the National Park Service realizes the difficulty in controlling all development outside its boundaries; therefore, the agency seeks cooperative efforts aimed at minimizing impacts to the viewshed.

The Memorandum of Agreement for historic resources implements measures to reduce visual impacts from the proposed expansion of the PS&G/Swingle harbor and implementation of the COE LTCMP in a manner that would not conflict with the General Management Plan.

5.10.4 Local

As of the publication of this final EIS, it is believed the proposed expansion of the PS&G barge terminal and the COE LTCMP for the East Channel of the Mississippi River are not in conflict with any local zoning or land use plans.

5.10.5 Regional Planning Commission

As of the publication of this final EIS, it is believed the proposed barge terminal expansion and COE channel maintenance activities are not in conflict with any regional land use plans.

6.0 LIST OF PREPARERS

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Dennis Anderson (EIS Team Leader, Chief, Operation and Maintenance Unit, Environmental Resources Section) - Masters degree in Aquatic Biology, 17 years experience in environmental impact assessment and documentation.

David Ballman (Ecologist, Regulatory Branch) - 18 years experience as project manager Section 404 and Section 10 permit processing.

David Berwick (Archeologist, Chief, Cultural Resources Unit, Environmental Resources Section) - Masters degree in Archeology, 18 years experience in cultural resources management and impact assessment.

Kevin Bluhm (Economist/Public Involvement Specialist, Planning and Evaluation Section) - 8 years experience in economic analysis and public involvement.

Jon Hendrickson (Hydraulic Engineer, Hydraulic Section, Hydraulics and Hydrology Branch) - 10 years experience in hydraulic and sediment transport engineering.

Greg Johnson (Landscape Architect, Planning and Evaluation Section) - 3 years experience in recreational use planning and impact assessment.

Gary Nelson (Sociologist, Chief, Budget, Manpower, and Management Analysis Branch) - Doctor of Philosophy in Sociology, 13 years experience in social analysis and impact assessment.

Steve Tapp (Chief Maintenance Coordinator, Waterways Section, Mississippi River Project Office) - 8 years experience in managing, planning, designing and scheduling channel and harbor maintenance.

Robert Whiting (Chief, Environmental Resources Section) - Masters degree in Aquatic Biology, 25 years experience in environmental impact assessment and documentation, leader *Lampsilis higginsi* recovery team.

Tim Yager (Fishery Biologist, Environmental Resources Section) - Masters degree in Water Resources, 4 years experience in water quality monitoring and analysis, 4 years experience in environmental impact assessment and documentation.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Robert Read (Environmental Review Specialist) - 18 years experience in project analysis and development (mines, highways, harbors, wetlands). Mr. Read passed away shortly after release of the draft EIS. His knowledge of harbor development issues and natural resources in the Prairie du Chien area contributed significantly to completion of that document and this final EIS.

George Albright (Chief, Environmental Analysis Section) - Bachelors degree in Fisheries, 22 years experience in environmental impact assessment and documentation.

U.S. FISH AND WILDLIFE SERVICE

Chuck Kjos (Endangered Species Listing and Recovery Coordinator) - Masters degree in Zoology, 24 years experience in project review, 9 years experience in endangered species coordination.

7.0 PUBLIC INVOLVEMENT AND COORDINATION

7.1 Scoping

Community and public agency involvement was an integral part of the development and assessment of alternatives pertaining to COE maintenance of the East Channel and the PS&G barge terminal expansion proposal. In addition to the meetings and newsletters discussed below, the COE, prior to the decision to prepare an EIS, published a Public Notice, dated September 6, 1991, which described the PS&G proposed expansion (Appendix A).

7.1.1 Public Meetings

Public meetings were held during the EIS process to inform local citizens and public officials, as well as other interested parties, of the need for an EIS, and to solicit their comments, suggestions, and concerns. The first meetings were held on April 20, 1992, in Prairie du Chien. An afternoon meeting was conducted to inform business and city leaders of the need for an EIS, while an evening meeting was open to the general public. The results of these meetings are summarized in Appendix G.

A public meeting to receive comments on the draft EIS was conducted on August 11, 1993, shortly after the draft EIS was published and released for public comment.

7.1.2 Newsletters

In conjunction with the public meetings, newsletters were sent to interested parties to inform them of the status of the EIS. The first newsletter was sent in April 1992 and summarized the EIS process and why an EIS was needed for the proposed actions. This newsletter gave notice of the first public meetings held on April 20, 1992 (see Section 7.1.1 above).

A second newsletter was sent in April 1993. This newsletter summarized the results of the first public meetings and identified the alternatives that would be considered in the draft EIS.

7.2 Required Coordination

7.2.1 Fish and Wildlife Coordination

The USFWS participated in preparation of this final EIS as a cooperating agency. The USFWS has been coordinated with throughout the scoping and preparation of the draft and final EIS.

7.2.2 Cultural Resources Coordination

In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, the permit applicant's proposed project has been coordinated with the Wisconsin and Iowa State Historic Preservation Offices and the Advisory Council on Historic Preservation. On October 15, 1991, the COE met in Prairie du Chien with the Wisconsin State Historic Preservation Office, the Advisory Council on Historic Preservation, the applicant, the National Park Service (Effigy Mounds National Monument), the City of Prairie du Chien, and several other interested parties for preliminary discussions about the proposed permit and Section 106 compliance issues.

As a result of the significance of the National Historic Landmarks and the impacts to these structures resulting from harbor expansion, the Advisory Council on Historic Preservation, on May 11, 1994, requested the National Park Service prepare a report pursuant to Section 213 of the National Historic Preservation Act. This report, dated August 26, 1994, discussed the significance of the National Historic Landmarks and Effigy Mounds National Monument, the effects harbor expansion would have on these resources, and recommendations. The National Park Service recommended no increased harbor and rail activity at Prairie du Chien and further study to understand the effects of present rail activity on the National Historic Landmarks.

On April 25-26, 1995, the COE again met in Prairie du Chien to discuss the impacts to historic resources as a result of the applicant's project and to identify specific mitigation measures which would reduce these impacts. In advance of this meeting, the COE prepared and distributed a preliminary Memorandum of Agreement for review. Agencies and individuals represented at this meeting included the COE, the Advisory Council on Historic Preservation, the WDNR, the WDOT, the Wisconsin Department of Development, the applicant (PS&G), the City of Prairie du Chien, the Prairie du Chien Island Reuse Committee, the Prairie du Chien Harbor Commission, the Wisconsin and Southern Railroad, the Wisconsin River Rail Transit Commission, the National Park Service at Effigy Mounds National Monument, the State Historical Society of Wisconsin, and the Wisconsin and Iowa State Historic Preservation Offices.

The April 1995 meeting at Prairie du Chien resulted in more than 10 revisions and recoordination of the preliminary Memorandum of Agreement between April and October of 1995. A final Memorandum of Agreement (Appendix F) was circulated for review on August 2, 1995, and the signature process and acceptance of the Memorandum of Agreement was concluded by the Advisory Council on Historic Preservation on December 5, 1995.

The draft EIS has been coordinated with the Wisconsin and Iowa State Historic Preservation Offices, and the Advisory Council on Historic Preservation, as well as other interested agencies and parties, as noted above. The EIS represents the COE's compliance with NEPA regulations and the regulations of the Advisory Council on Historic Preservation, 36 CFR Part 800. The draft EIS represented the COE's request for comments from the Advisory Council,

and it formed the basis for consultation between the COE, the Wisconsin and Iowa State Historic Preservation Offices and the Advisory Council and subsequent development of the Memorandum of Agreement for historic resources.

7.2.3 Environmental Impact Statement Review

This final EIS has been sent to the agencies, organizations and individuals listed in Section 8.0 for official review. Additionally, notices of the availability of the final EIS have been sent to other interested parties informing them of whom to contact to receive a copy of the final EIS.

8.0 AGENCIES, ORGANIZATIONS AND PERSONS RECEIVING COPIES OF THE EIS

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9.0 REFERENCES

Adams, J.R. and E. Delisio. 1990. Temporal and lateral distributions of resuspended sediment following barge tow passage on the Illinois River. Proceedings of the 1990 National Conference. Hydraulic Engineering 2:1-6.

Adams, J.R. and E. Delisio. 1991. Ambient suspended sediment concentration and turbidity levels. Proceedings of the 1991 National Conference. Hydraulic Engineering pp. 865-869.

Adams, J.R., N.G. Bhowmik, and E. Delisio. 1989. Measuring resuspension of sediment by barge tows. Proceedings of the International Symposium, Sediment Transport Modeling pp. 765-770.

Aldridge, D., B.S. Payne, and A.C. Miller. 1987. The effects of intermittent exposure to suspended solids and turbulence on three species of freshwater mussels. Environmental Pollution 45:17-28.

Anderson, D.D., R.J. Whiting and B. Jackson. 1981. An assessment of water quality impacts of maintenance dredging on the Upper Mississippi River in 1978. Department of the Army, St. Paul District, Corps of Engineers, St. Paul, Minnesota 55101. 125 pp. + appendices.

Baerreis, D. 1963. "The Bookshelf: The High Bank Site, Crawford County, Wisconsin," in: The Wisconsin Archeologist, Vol. 44, No. 3, pp. 186-190.

Barnard, W.D. 1978. Prediction and control of dredged material dispersion around dredging and open-water pipeline disposal operation. Technical Report DS-78-13, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Bhowmik, N.G, A.C. Miller and B.S. Payne. 1990a. Techniques for studying the physical effects of commercial navigation traffic on aquatic habitats. Technical Report EL-90-10, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Bhowmik, N.G., T.W. Soong, W. Reichelt, and W.C. Bogner. 1990b. Waves generated by recreational traffic on the Upper Mississippi River System. Proceedings of the 1990 National Conference. Hydraulic Engineering 1:855-860.

Bhowmik, N.G., J.R. Adams, A.P. Bonini, C.Y. Guo, D.J. Kisser and M.A. Sexton. 1981. Resuspension and lateral movement of sediment by tow traffic on the Upper Mississippi and Illinois Rivers. Illinois State Water Survey Contract Report 269, Champaign, Illinois.

Bhowmik, N.G. 1989. Resuspension and lateral movement of sediment due to commercial navigation in the Mississippi River System. Fourth International Symposium on River Sedimentation pp. 953-959.

Blom, B.D., T.F. Jenkins, D.C. Leggett and R.P. Murrmann. 1976. Effect of sediment organic matter on migration of various chemical constituents during disposal of dredged material. For: Environmental Effects Laboratory, U.S. Army Engineer Waterways Experiment Station, Dredged Material Research Program, Contract Report D-76-F.

Boszhardt, R.F. 1982. "Archaeological Investigations in the Lowland Floodplain of Navigation Pool 10 Near Prairie du Chien, Crawford County, Wisconsin," MA Thesis, University of Wisconsin, Madison, Wisconsin.

Boszhardt, R.F. 1986. "Upper Mississippi Floodplain Archaeology: A comparison of the Trempealeau, La Crosse, Prairie du Chien, Dubuque, and Quad Cities Areas," in: The Wisconsin Archeologist, Vol. 67, No. 1, pp. 1-19.

Brecka, B. and M. Marron. 1992. Mississippi River commercial fishing statistics for 1992. Wisconsin Department of Natural Resources, Bureau of Fisheries Management, Alma, Wisconsin 54610. 28 pp.

Burky, A.J. 1983. Physiological ecology of freshwater bivalves. in: The Mollusca, Vol. 6, Ecology. K.M. Wilbur, ed. Academic Press, New York.

Cawley, E.T. 1973. Final Report, Environmental Impact Assessment Study, Pool 10 of the Northern Section of the Upper Mississippi River. North Star Research Institute, Minneapolis, Minnesota. Prepared for the St. Paul District, U.S. Army Corps of Engineers.

Chen, K.Y., S.K. Gupta, A.Z. Sycip, J.S.C. Lu, M. Knezevic and W.W. Choi. 1976. Research study on the effect of dispersion, settling, and resedimentation on migration of chemical constituents during open water disposal of dredged materials. For: Environmental Effects Laboratory, U.S. Army Engineer Waterways Experiment Station, Dredged Material Research Program, Contract Report D-76-1.

Church, P.E. 1985. "The Archaeological Potential of Pool No. 10, Upper Mississippi River: A Geomorphological Perspective," in: The Wisconsin Archeologist, Vol. 66, No. 3, pp. 197-242.

Clarke, A.H. 1991. Results of the nineteen ninety-one mussel monitoring program in the Mississippi River at Prairie du Chien, Wisconsin. A report prepared for Didion, Inc., McFarland, Wisconsin, by A.H. Clarke, EcoSearch Inc., Portland, Texas. 44 pp.

Clarke, A.H. and J.C. Loter. 1992. Results of the nineteen ninety-two mussel monitoring program in the Mississippi River at Prairie du Chien, Wisconsin. A report prepared for DeWitt, Porter & Company of Madison, Wisconsin and Didion, Inc. of Johnson Creek, Wisconsin by A.H. Clarke and J.C. Loter, Ecosearch Inc., Portland, Texas. 52 pp. + appendixes.

Clarke, A.H. and J.C. Loter. 1993. Results of the nineteen ninety-three mussel monitoring program in the Mississippi River at Prairie du Chien, Wisconsin. A report prepared for DeWitt, Porter & Company of Madison, Wisconsin and Didion, Inc. of Johnson Creek, Wisconsin by A.H. Clarke and J.C. Loter, Ecosearch Inc., Portland, Texas. 63 pp. + appendixes.

Clarke, A.H. and J.C. Loter. 1994. Results of the nineteen ninety-four mussel monitoring program in the Mississippi River at Prairie du Chien, Wisconsin. A report prepared for DeWitt, Porter & Company of Madison, Wisconsin and Didion, Inc. of Johnson Creek, Wisconsin by A.H. Clarke and J.C. Loter, Ecosearch Inc., Portland, Texas.

Coon, T.G., J.W. Eckblad and P.M. Trygstad. 1977. Relative abundance and growth of mussels (Mollusca: Eulamellibranchia) in pools 8, 9 and 10 of the Mississippi River. Freshwater Biology 7:279-285.

Curtis, J.T. 1959. The Vegetation of Wisconsin. University of Wisconsin Press, Madison, Wisconsin. 658 pp.

Downing, J.A. and W.L. Downing. 1992. Spatial aggregation, precision and power in surveys of freshwater mussel populations. Canadian Journal of Fisheries and Aquatic Sciences 49:985-991.

Duncan, R.E. and P.A. Thiel. 1983. A survey of the mussel densities in Pool 10 of the Upper Mississippi River. Technical Bulletin No. 139, Department of Natural Resources, P.O. Box 7921, Madison, Wisconsin 53707. 14 pp.

Eggers, S.D. and D.M. Reed. 1987. Wetland plants and plant communities of Minnesota and Wisconsin. St. Paul District, Army Corps of Engineers, St. Paul, Minnesota 55101. 201 pp.

Fuller, S.L.H. 1978. Fresh-water mussels (Mollusca: Bivalvia: Unionidae) of the Upper Mississippi River: observations at selected sites within the 9-foot navigation channel project on behalf of the United States Corps of Engineers. Final Report.

Fuller, S.L.H. 1980. Freshwater mussels (Mollusca: Bivalvia: Unionidae) of the Upper Mississippi River: observations at selected sites within the 9-foot navigation channel project for the St. Paul District, United States Army Corps of Engineers, 1977-1979. Volume I: Text. Academy of Natural Sciences of Philadelphia Division of Limnology and Ecology.

Gillis, P. and G.L. Mackie. 1992. Impacts of the exotic zebra mussel, *Dreissena polymorpha*, (Bivalvia:Dreissenidae) on native unionidae in Lake St. Clair. in: Biology and Impact of Zebra Mussels in Lake St. Clair and Lake Erie. Mackie, G.L., D. Pathy, P. Gillis and E. Dobson, eds. pp. 59-93, Final Report to the Ministry of the Environment, Project 443G. 116 pg.

Glaze, J. and A. Krikelas. 1990. An evaluation of the economic benefits associated with shipping through the ports of Prairie du Chien. Wisconsin Department of Transportation, Division of Planning and Budget, Bureau of Policy Planning and Analysis. 43 pp.

Graves, J. 1993. "A Phase I Archaeological Survey of the Land Associated with the Proposed St. Feriole Island Access Road Project, in Prairie du Chien Township, Crawford County, Wisconsin," unpublished report.

Halsey, J.R. 1972. "The Crawford County, Wisconsin Archeological and Historical Site Survey (1971)," unpublished report of the State Historical Society of Wisconsin, Madison, Wisconsin.

Harris, R. 1993. Threatened and endangered mollusk species survey (Mollusca:Unionidae) of Sawmill Slough, Mississippi River. Report of survey completed by Marine Specialties of Winona, Winona, Minnesota for Wisconsin Department of Natural Resources.

Harris, R and R. Hay. 1993. Mussel surveys in the East Channe, Mississippi River at Prairie du Chien, Wisconsin. Final report to the United States Fish and Wildlife Service for amendment no. 32-discretionary funding.

Havlik, M.E. and D.H. Stansbery. 1977. The naiad mollusks of the Mississippi River in the vicinity of Prairie du Chien, Wisconsin. Bulletin of the American Malacological Union for 1977:9-12.

Havlik, M.E. 1980. The historic and present distribution of the endangered naiad mollusk *Lampsilis higginsi* (Lea, 1857). Bulletin of the American Malacological Union for 1980:19-22.

Havlik, M.E., S.M. Briggs and M.M. Larson. Documentation of available data: *Lampsilis higginsi* (Lea, 1857), Prairie du Chien, WI, area, Mississippi River Mile 628 to 646, 1972-1990. Computerized printout prepared for the U.S. Fish and Wildlife Service, Office of Endangered Species, Twin Cities, MN by Malacological Consultants, La Crosse, Wisconsin.

Havlik, M.E. and L.L. Marking. 1980. A quantitative analysis of naiad mollusks from the Prairie du Chien, Wisconsin, dredge material site on the Mississippi River. Bulletin of the American Malacological Union for 1980:30-34.

Havlik, M.E. and C.B. Stein. 1992. Effects of commercial navigation on unionid mollusks near the City Dock, East Channel, Mississippi River, Prairie du Chien, WI, October 1990. Proceedings of the Mississippi River Research Consortium, Inc. 24:23-

Hayes, D.F., G.L. Raymond and T.N. McLellan. 1984. Sediment resuspension from dredging activities. pages 72-82 in: Dredging and Dredged Material Disposal, Volume 1: Proceedings of the Conference Dredging 1984. R.L. Montgomery and J.W. Leach, eds. American Society of Civil Engineers, 345 East 47th Street, New York, New York 10017.

Herbich, J.B. and S.B. Brahme. 1984. Turbidity generated by a model cutterhead dredge. pages 47-56 in: Dredging and Dredged Material Disposal, Volume 1: Proceedings of the Conference Dredging 1984. R.L. Montgomery and J.W. Leach, eds. American Society of Civil Engineers, 345 East 47th Street, New York, New York 10017.

Herricks, E.E., L.L. Osborne, H. Cairns, C. Gantzer, D. Himelick and L. Schmitt. 1981. Final Report: Effects of barge passage on physical, chemical, and biological conditions in the navigation reach of the Kaskaskia River. Department of Civil Engineering, University of Illinois, Urbana, Illinois 61801. 60 pp.

Hoagland, A.K. and B.T. Frandsen. 1978. "Prairie du Chien: Historical and Architectural Resources," unpublished report of the Historic American Buildings Survey, National Park Service, Washington, DC.

Holland, L.E. 1986. Effects of barge traffic on distribution and survival of ichthyoplankton and small fishes in the Upper Mississippi River. Transactions of the American Fisheries Society 115:162-165.

Holland, L.E. and D.L. Waller. 1986. Endangered Species Progress Report: *Lampsilis higginsi*. U.S. Fish and Wildlife Service, National Fisheries Research Center, P.O. Box 818, La Crosse, Wisconsin 54602. 23 pp.

Holland, L.E. and J.R. Sylvester. 1983. Distribution of larval fishes related to potential navigation impacts on the Upper Mississippi River, Pool 7. Transactions of the American Fisheries Society 112:293-301.

Holland-Bartels, L.E. and D.L. Waller. 1988. Aspects of the life history of the endangered Higgins' Eye Pearly Mussel *Lampsilis higginsi* (Lea, 1857). U.S. Fish and Wildlife Service, National Fisheries Research Center, P.O. Box 818, La Crosse, Wisconsin 54602. 187 pp.

Holland-Bartels, L.E., M.R. Dewey and E.W. Chilton, II. 1987. Current velocity and direction survey of the Mississippi River at Prairie du Chien, Wisconsin. Submitted to St. Paul District, Army Corps of Engineers, by the National Fisheries Research Center, P.O. Box 818, La Crosse, Wisconsin 54602.

Imlay, M.J. 1972. Greater adaptability of freshwater mussels to natural rather than to artificial displacement. The Nautilus 86:76-79.

Karaki, S. and J. vanHoften. 1975. Resuspension of bed material and wave effects on the Illinois and Upper Mississippi Rivers caused by boat traffic. Prepared for U.S. Army Engineer District, St. Louis, by the Engineering Research Center, Colorado State University, Fort Collins, Colorado. 31 pp.

Kennington, J. 1993. "A Phase I Magnetic and Acoustic Remote Sensing and Target Assessment Investigation for the East Channel of the Mississippi River at Prairie du Chien, Wisconsin," unpublished report, Tidewater Atlantic Research, Washington, North Carolina.

Killgore, K.J., A.C. Miller and K.C. Conley. 1987. Effects of turbulence on yolk-sac larvae of paddlefish. Transactions of the American Fisheries Society 116:670-673.

Kindschi, G.A., ed. 1980. A compendium of mollusk (naiad) surveys taken from the upper Mississippi River and major tributaries. United States Department of the Interior, Fish and Wildlife Service, Office of Endangered Species, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111.

Lee, G.F., M.D. Piwoni, J.M. Lopez, G.M. Mariani, J.S. Richardson, D.H. Homer and F. Saleh. 1975. Research study for the development of dredged material disposal criteria. For: Environmental Effects Laboratory, U.S. Army Engineer Waterways Experiment Station, Dredged Material Research Program, Contract Report D-75-4.

Mackie, G.L., D. Pathy, P. Gillis and E. Dobson, eds. Biology and Impact of Zebra Mussels in Lake St. Clair and Lake Erie. Final Report to the Ministry of the Environment, Project 443G. 116 pg.

Marking, L.L. and T.D. Bills. 1977. Acute effects of silt and sand sedimentation on freshwater mussels. Completion Report, U.S. Fish and Wildlife Service, Fish Control Laboratory, La Crosse, Wisconsin 13 pp.

Marron, M. 1991. Mississippi River commercial fishing statistics for 1991. Wisconsin Department of Natural Resources, Bureau of Fisheries Management, La Crosse, Wisconsin 54601. 26 pp.

Mathiak, H.A. 1979. A river survey of the unionid mussels of Wisconsin 1973-1977. Sand Shell Press, P.O. Box 44, Horicon, Wisconsin 53032.

McNaughton, S.J. and L.L. Wolf. 1973. General Ecology. Holt, Rinehart and Winston, Inc., New York. 710 pp.

Metropolitan Council. 1978. Assessment of water pollution from river dredging activities. Metropolitan Council, 300 Metro Square Building, St. Paul, Minnesota 55101.

Miller, A.C. and B.S. Payne. 1976. An assessment of mussel community and population structure at a dredged site in the Upper Mississippi River. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C. and B.S. Payne. 1986. Community characteristics and demography of bivalves in the Mississippi River near Prairie du Chien, Wisconsin, 1984-85. U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Mississippi 39180. 27 pp. + figures.

Miller, A.C. and B.S. Payne. 1988. The need for quantitative sampling to characterize size demography and density of freshwater mussel communities. Bulletin of the American Malacological Union for 1988 6:49-54.

Miller, A.C. and B.S. Payne. 1988. A workshop to investigate techniques to analyze physical and biological effects of commercial navigation traffic. Miscellaneous Paper EL-89-4. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C. and B.S. Payne. 1990a. Comments on: Environmental impact statement on a proposal to increase barge shipment from the city dock in Crawford County, Wisconsin, and an analysis of alternative commercial harbor sites in the Prairie du Chien area, Prepared by the Wisconsin Department of Natural Resources, 31 Aug 1990. Unpublished report.

Miller, A.C. and B.S. Payne. 1990b. The effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: 1990 studies. Technical Report EL-91, U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, P.O Box 631, Vicksburg, Mississippi 39180. 51 pp + appendices.

Miller, A.C. and B.S. Payne. 1992a. A summary of studies on freshwater molluscs in the East Channel of the Upper Mississippi River conducted by the U.S. Army Engineer Waterways Experiment Station, 1984-1990. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C. and B.S. Payne. 1992b. Effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: 1992 studies. Technical Report EL-93-, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C., B.S. Payne, D.J. Hornbach, and D.V. Ragland. 1990. Physical effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: phase I studies. Technical Report EL-90-3, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C., B.S. Payne, and D.V. Ragland. 1990. Studies on the physical effects of commercial navigation traffic in the Upper Mississippi River. Proceedings of the 1990 Hydraulic Engineering National Conference, pp. 861-866.

Miller, A.C., B.S. Payne, and C.M. Way. 1989. Phase I studies: impacts of commercial navigation traffic on freshwater mussels - a review. Miscellaneous Paper EL-89-11, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C. and T.S. Siemsen. 1987. Physical effects of commercial navigation traffic in large waterways: summary of a workshop held in Louisville, Kentucky, 4 March 1986. Miscellaneous Paper EL-87-8, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C., K.J. Killgore, B.S. Payne, and D. Buckley. 1987. Bibliography of effects of commercial navigation activities in large waterways. Miscellaneous Paper E-87-1, U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Mississippi 39180.

Miller, A.C., B.S. Payne, and P.D. Hartfield. 1984. A mussel study at Prairie du Chien, Wisconsin, 1-4 October 1984. U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Mississippi 39180. 13 pp + appendices.

Mississippi River Regional Planning Commission. 1990. Port of Prairie du Chien Harbor Siting Plan 1990. Prepared for the City of Prairie du Chien Harbor Commission.

Morgan, R.P., K.J. Killgore and A.C. Miller. 1987. Effects of barge traffic resuspension of organisms in the Upper Mississippi River. unpublished report, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Nakai, O. 1978. Turbidity generated by dredging projects. in: Management of Bottom Sediments Containing Toxic Substances, Proceedings of the 3rd U.S./Japanese Experts Meeting, EPA-600/13-78-084.

Nelson, D.A. and A.C. Miller, compilers. 1987. Proceedings of the workshop on the environmental effects of navigation traffic. Internal Working Document E-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Oerichbauer, E.S. 1976. "Prairie du Chien: A Historical Study," unpublished report of the State Historical Society of Wisconsin, Madison, Wisconsin.

Overstreet, D.F. 1984. "Archaeological Reconnaissance Survey of Pool 10, Upper Mississippi River, Grant and Crawford Counties, Wisconsin, and Allamakee and Clayton Counties, Iowa," unpublished Reports of Investigations No. 139, Great Lakes Archaeological Research Center, Waukesha, Wisconsin.

Overstreet, D.F. 1993. "Archaeological and Geomorphological Investigations at Four (4) Proposed Dredge Disposal Sites, Navigation Pool 10, Crawford County, Wisconsin," unpublished Reports of Investigations No. 314, Great Lakes Archaeological Research Center, Milwaukee, Wisconsin.

Payne, B.S. and A.C. Miller. 1987. Quantitative sampling to characterize freshwater mussel communities and populations. in: R.J. Neves (ed.), Proceedings of the Workshop on Die-offs of Freshwater Mussels in the United States, pp 55-65. U.S. Fish and Wildlife Service and Upper Mississippi River Conservation Committee.

Payne, B.S. and A.C. Miller. 1988. Effects of current velocity on the freshwater bivalve *Fusconaia ebena.* American Malacological Bulletin 5:177-179.

Payne, B.S. and A.C. Miller. 1989. Growth and survival of recent recruits to a population of *Fusconaia ebena* (Bivalvia: Unionidae) in the lower Ohio River. American Midland Naturalist 121:99-104.

Payne, B.S., K.J. Killgore, and A.C. Miller. 1990. Effects of current velocity on paddlefish yolk-sac larvae. Mississippi Academy of Sciences.

Pearson, W.D., K.J. Killgore, B.S. Payne, and A.C. Miller. 1989. Environmental effects of navigation traffic: studies on fish eggs and larvae. Technical Report EL-89-15, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Rasmussen, J.L. 1979. Distribution and relative abundance of Upper Mississippi River fishes. Pages 30-40 in: A Compendium of Fishery Information on the Upper Mississippi River. J.L. Rasmussen, ed. Upper Mississippi River Conservation Committee, Second Edition - 1979.

Salkin, P.H. 1993. "A Program of Archaeological Testing at the Prairie du Chien Water Treatment Plant Site (47CR552) in Prairie du Chien, Wisconsin," unpublished, Report of Investigations No. 792, Archaeological Consulting and Services, Verona, Wisconsin.

Shaw, S.P. and C.G. Fredine. 1956. Wetlands of the United States. U.S. Fish and Wildlife Service, Circular 39. 67 pp.

Slota, R.W. and G.D. Garvey. 1961. Soil Survey of Crawford County, Wisconsin. United States Department of Agriculture, Natural Resources Conservation Service. 85 pp. + maps.

Soong, T.W., W.C. Bogner, and W.F. Reichelt. 1990. Data acquisition for determining physical impacts of navigation. Proceedings of the 1990 National Conference. Hydraulic Engineering 1:616-621.

Sparks, R.E., R.C. Thomas and D.J. Schaeffer. 1980. The effects of barge traffic on suspended sediment and turbidity in the Illinois River. Completion report to the U.S. Fish and Wildlife Service, Rock Island, Illinois.

Stefan, H.G. and M.J. Riley. 1985. Mixing of a stratified river by barge tows. Water Resources Research 21(8):1085-1094.

Stern, H., W. Emanuel, H.F. Kroch, J. Mick, D. Nelson, D. Roosa, M. Vanderford, and R. Whiting. 1983. Higgins' Eye Mussel Recovery Plan. Fish and Wildlife Reference Service, 1776 E. Jefferson Street, 4th Floor, Rockville, Maryland 20852.

Sternberg, R.B. 1972. Upper Mississippi River Habitat Classification Survey. Upper Mississippi River Conservation Committee (UMRCC), Fish Technical Section Report.

Stoltman, J.B. 1980. A report of the 1979-1980 archaeological survey activities conducted in the Upper Mississippi River Wildlife and Fish Refuge, Pool 10, Crawford County, Wisconsin. unpublished report of the Department of Anthropology, University of Wisconsin, Madison, Wisconsin.

Stoltman, J.B. 1982a. Archaeological survey and testing in the Prairie du Chien region: the 1980 season. unpublished report of the Department of Anthropology, University of Wisconsin, Madison, Wisconsin.

Stoltman, J.B. 1982b. A report of archaeological survey on the Swingle tract, the site of proposed commercial harbor development north of Prairie du Chien, Wisconsin. unpublished report of the Department of Anthropology, University of Wisconsin, Madison, Wisconsin.

Stoltman, J.B. 1983. Follow-up surface survey of the Swingle tract during the summer of 1983. unpublished report of the Department of Anthropology, University of Wisconsin, Madison, Wisconsin.

St. Paul District, Corps of Engineers (COE). 1974. Final environmental impact statement, operation and maintenance, 9-foot navigation channel, Upper Mississippi River, head of navigation to Guttenberg, Iowa. U.S. Army Corps of Engineers, St. Paul, Minnesota 55101.

St. Paul District, Corps of Engineers (COE). 1983. Upper Mississippi River Land Use Allocation Plan, Master Plan for Public Use Development and Resource Management Part I and II. Public Use Planning Section, St. Paul District, Corps of Engineers, St. Paul, Minnesota 55101.

St. Paul District, Corps of Engineers (COE). 1985. Substrate survey and analyses for metals and organics in sediments, East Channel of the Upper Mississippi River, Prairie du Chien, WI.

St. Paul District, Corps of Engineers (COE). 1988. Bathymetric survey maps of the East Channel, Upper Mississippi River at Prairie du Chien, Wisconsin.

St. Paul District, Corps of Engineers (COE). 1992. Environmental Impact Statement, 9-foot Navigation Channel Project: Channel Maintenance Management Plan, Upper Mississippi River, Head of Navigation to Guttenberg, Iowa. St. Paul District, Corps of Engineers, St. Paul, Minnesota 55101.

St. Paul District, Corps of Engineers (COE). 1995. Visual Impact Assessment, Effigy Mounds National Monument. St. Paul District, Corps of Engineers, 190 Fifth Street East, St. Paul, Minnesota 55101.

Theler, J.L. 1983. Woodland Tradition Economic Strategies: Animal Resource Utilization in Southwestern Wisconsin and Northeastern Iowa, PhD Thesis, University of Wisconsin, Madison, Wisconsin.

Thiel, P.A. 1981. A survey of unionid mussels in the Upper Mississippi River (Pools 3 through 11). Technical Bulletin No. 124, Department of Natural Resources, Madison, Wisconsin. 24 pp.

Thomas, C. 1894. "Report on the Mound Explorations of the Bureau of Ethnology," Twelfth Annual Report of the Bureau of Ethnology, Smithsonian Institution, Washington, DC.

van der Schalie, H. and A. van der Schalie. 1950. The mussels of the Mississippi River. The American Midland Naturalist 44(2):448-466.

Wahls, R.R. 1990. "Phase I Archaeological and Historical Survey of the Shoreline of Pool No. 10, Upper Mississippi River - 1988," unpublished report of the Department of Anthropology, University of Wisconsin, Madison, Wisconsin.

Wilcox, D.B. 1993. An aquatic habitat classification for the Upper Mississippi River system. St. Paul District, U.S. Army Corps of Engineers, St. Paul, Minnesota 55101.

Wilde, S.A. 1940. Classification of gley soils for the purpose of forest management and reforestation. Ecology 21:34-44.

Williams, J.D., M.L. Warren, K.S. Cummings, J.L. Harris and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18(9):6-22.

Wisconsin Department of Natural Resources. 1990. Environmental impact statement on a proposal to increase barge shipment from the city dock in Crawford County, Wisconsin, and an analysis of alternative commercial harbor sites in the Prairie du Chien area. Wisconsin Department of Natural Resources, Bureau of Environmental Analysis and Review, Box 7921, 101 South Webster Street, Madison, Wisconsin 53707. 61 pp.

Wright, T.D. 1978. Aquatic dredged material disposal impacts. U.S. Army Engineer Waterways Experiment Station, Dredged Material Research Program, Technical Report DS-78-1.

Wright, T.D. 1982. Potential biological impacts of navigation traffic. Miscellaneous Paper E-82-2, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Yokley, P., Jr. 1976. The effect of gravel dredging on mussel production. Bulletin of the American Malacological Union for 1976:20-22.

Zeitlin, R.H. n.d. "Prairie du Chien: Uran Consolidation and Decline - 1858-1930," unpublished report of the U.S. Army Corps of Engineers, St. Paul, Minnesota.

10.1 APPENDIX A

PUBLIC NOTICE

PRAIRIE SAND & GRAVEL, INC.

PERMIT APPLICATION

SEPTEMBER 6, 1991

US Army Corps of Engineers
St Paul District

APPLICANT: Prairie Sand and Gravel

REFER TO: CENCS-CO-R (91-1040-15)

Public Notice
ISSUED: September 6, 1991
EXPIRES: October 7, 1991

SECTION: 404 - Clean Water Act
10 - Rivers and Harbors Act of 1899

1. APPLICATION FOR PERMIT TO expand the existing barge terminal by constructing four barge loading/unloading docks, a maintenance dock, mooring cells, and associated upland facilities.

2. SPECIFIC INFORMATION.

APPLICANT'S ADDRESS: Prairie Sand and Gravel
800 North Villa Louis Road
P.O. Box 210
Prairie du Chien, Wisconsin 53821

PHONE NUMBER: (608) 326-6471

PROJECT LOCATION: Two sites are proposed for development in Sawmill Slough, a backwater of the Mississippi River, in Section 24, Township 7 North, Range 7 West, Crawford County, Wisconsin. One site is located at the north end of St. Feriole Island at the existing Prairie Sand and Gravel facility and the other is at a nearby area locally known as the Swingle site.

DESCRIPTION OF PROJECT: The applicant proposes to construct the following features:

a. Three 100-foot-long sheet pile docks would be constructed along 1,500 feet of the shoreline of the Swingle site. The northern-most dock would be used for grain loading, the center dock would be used for maintenance work, and the southern-most dock would used for unloading coal. In conjunction with those docks, nineteen 10-foot-diameter mooring cells would be constructed of sheetpile, filled with granular material and capped with concrete.

b. A 100-foot-long sheet pile dock for the unloading of coal would be constructed at the north end of St. Feriole Island with four 10-foot-diameter mooring cells.

c. A 100-foot-long sheet pile dock for the unloading of coal would be constructed at the northwest end of St. Feriole Island, just south of the existing Prairie Sand and Gravel grain dock. This facility would include the construction of four 10-foot-diameter mooring cells.

d. A 50-foot-long sheet pile extension would be added to the south end of the existing grain dock.

e. The applicant also proposes to establish a fleeting area at the north end of St. Feriole Island with a maximum capacity of 30 barges. The fleeting area would occupy

an area 525 feet along the shoreline and 400 feet wide. This fleeting site would require the construction of off-shore mooring structures.

f. The applicant proposes to place rock riprap along the shoreline of the Swingle site and the remaining un-protected shoreline at the Prairie Sand and Gravel facility.

g. The barge terminal at the Swingle site would also require extensive upland development, including re-grading, commodity storage pads, buildings, water treatment ponds and other utilities.

The applicant has abandoned the previous plans to construct a bridge/roadway over the St. Feriole Slough channel area, which is used by recreational boaters to gain access to a local marina.

3. REPLIES/COMMENTS.

Interested parties are invited to submit to this office written facts, arguments, or objections within 30 days of the date of this notice. These statements should bear upon the suitability of the location and the adequacy of the project and should, if appropriate, suggest any changes believed to be desirable. Comments received may be forwarded to the applicant.

Replies may be addressed to the District Engineer, St. Paul District, Corps of Engineers, La Crosse Field Office, P.O. Box 1445, La Crosse, Wisconsin 54602-1445.

Or, IF YOU HAVE QUESTIONS ABOUT THE PROJECT, call Bruce Norton at the La Crosse Field Office, (608) 784-8236.

4. THREATENED OR ENDANGERED WILDLIFE OR PLANTS OR THEIR CRITICAL HABITAT.
The East Channel of the Mississippi River at Prairie du Chien contains the largest known concentration of the federally endangered species Lampsilis higginsi. The barge traffic utilizing the proposed site would use the northern end of the East Channel for access. In addition, Crawford County is within the known or historic range of the following threatened (T) and/or endangered (E) species:

Species	Habitat
Peregrine falcon (E)	Potential breeding
Bald eagle (T)	Breeding

This application is being coordinated with the U.S. Fish and Wildlife Service. Any comments they may have concerning endangered or threatened wildlife or plants or their critical habitat will be considered in our final assessment of the described work.

5. JURISDICTION. This project comes under the regulatory jurisdiction of the Corps of Engineers because the Mississippi River is a navigable water of the United States.

REGULATORY AUTHORITY: The application will be reviewed according to the provisions of Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act. Therefore, our public interest review will consider the guidelines set forth under Section 404(b) of the Clean Water Act (40 Code of Federal Regulations 230).

THE APPLICANT HAS STATED THAT THE FOLLOWING STATE PERMIT HAS BEEN APPLIED FOR: Wisconsin Department of Natural Resources.

6. WATER QUALITY CERTIFICATION.

This Public Notice has been sent to the Wisconsin Department of Natural Resources and is considered by the District Engineer to constitute valid notification to that agency for water quality certification.

A permit will not be granted until the Wisconsin Department of Natural Resources has issued or waived Section 401 certification.

7. HISTORICAL/ARCHAEOLOGICAL.

The project site is within the St. Feriole Island Historic and Archaeological District, which is listed on the National Register of Historic Places. This public notice is being sent to the National Park Service, the State Archaeologist, and the State Historic Preservation Officer for appropriate coordination under the requirements of Section 106 of the National Historic Preservation Act.

8. PUBLIC HEARING REQUESTS.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, in detail, the reasons for holding a public hearing. A request may be denied if substantive reasons for holding a hearing are not provided or if there is otherwise no valid interest to be served.

9. PUBLIC INTEREST REVIEW.

The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production and, in general, the needs and welfare of the people. Environmental and other documents will be available for review in the St. Paul District Office.

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are

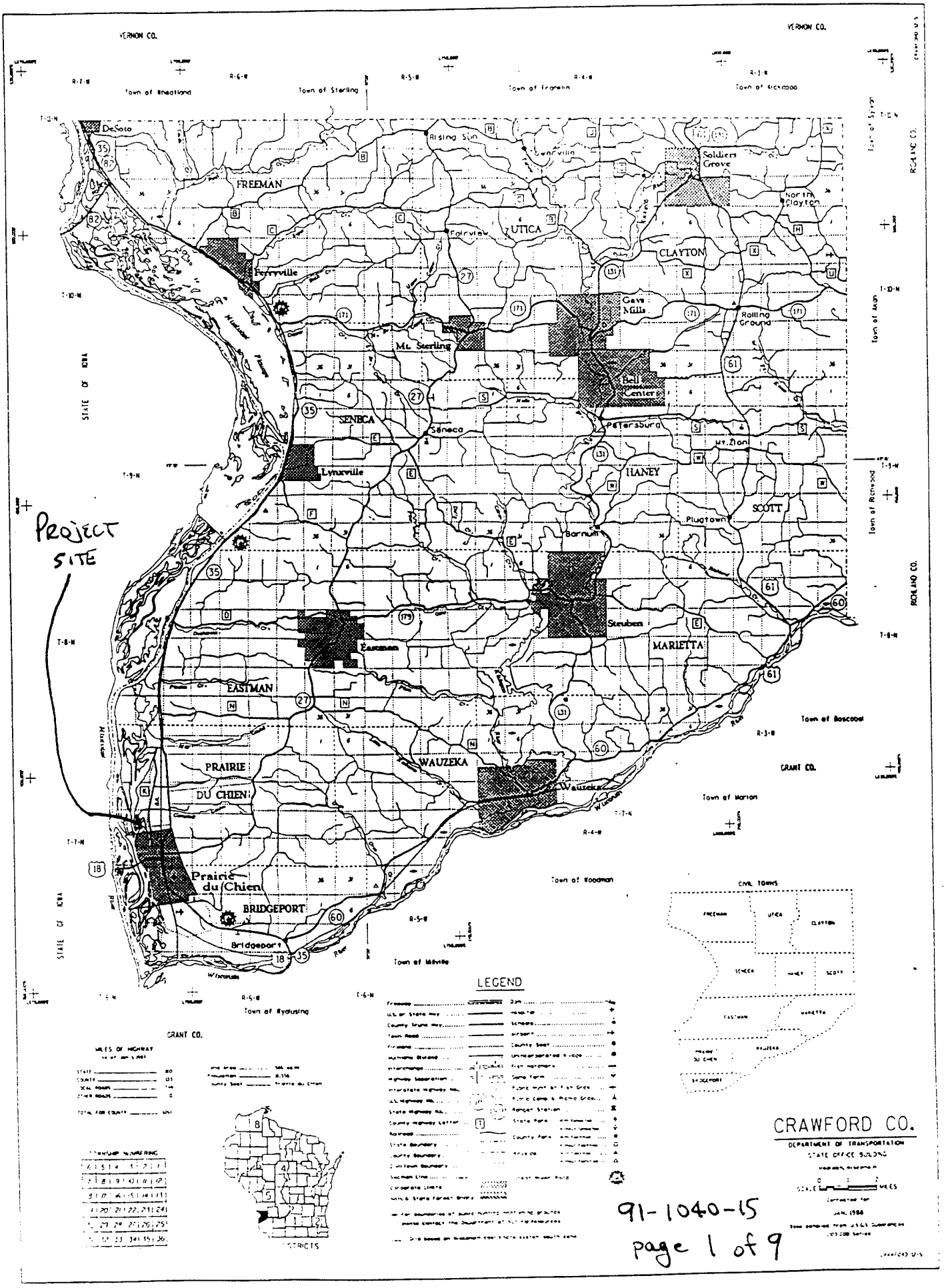
September 6, 1991

used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

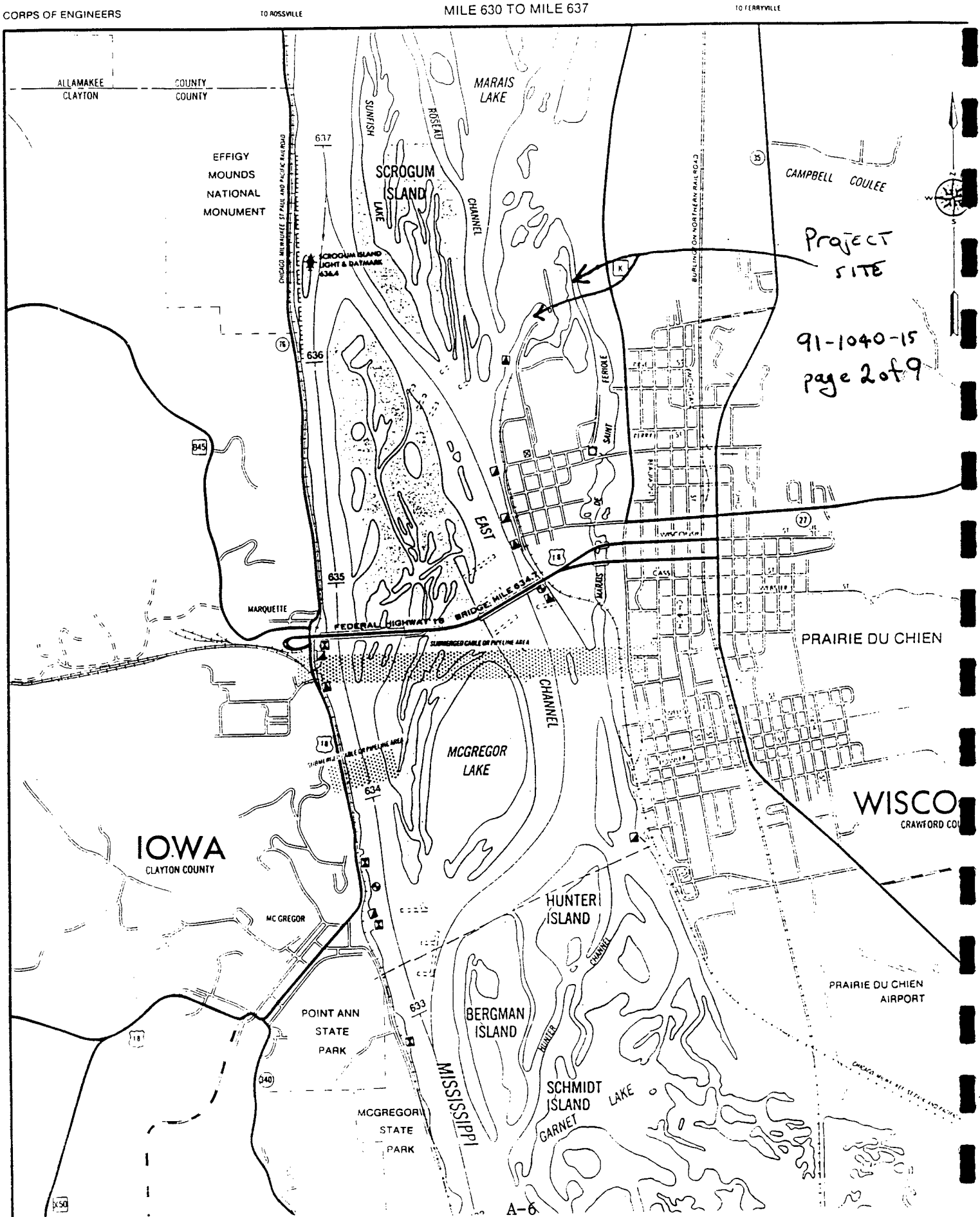
FOR THE DISTRICT ENGINEER:

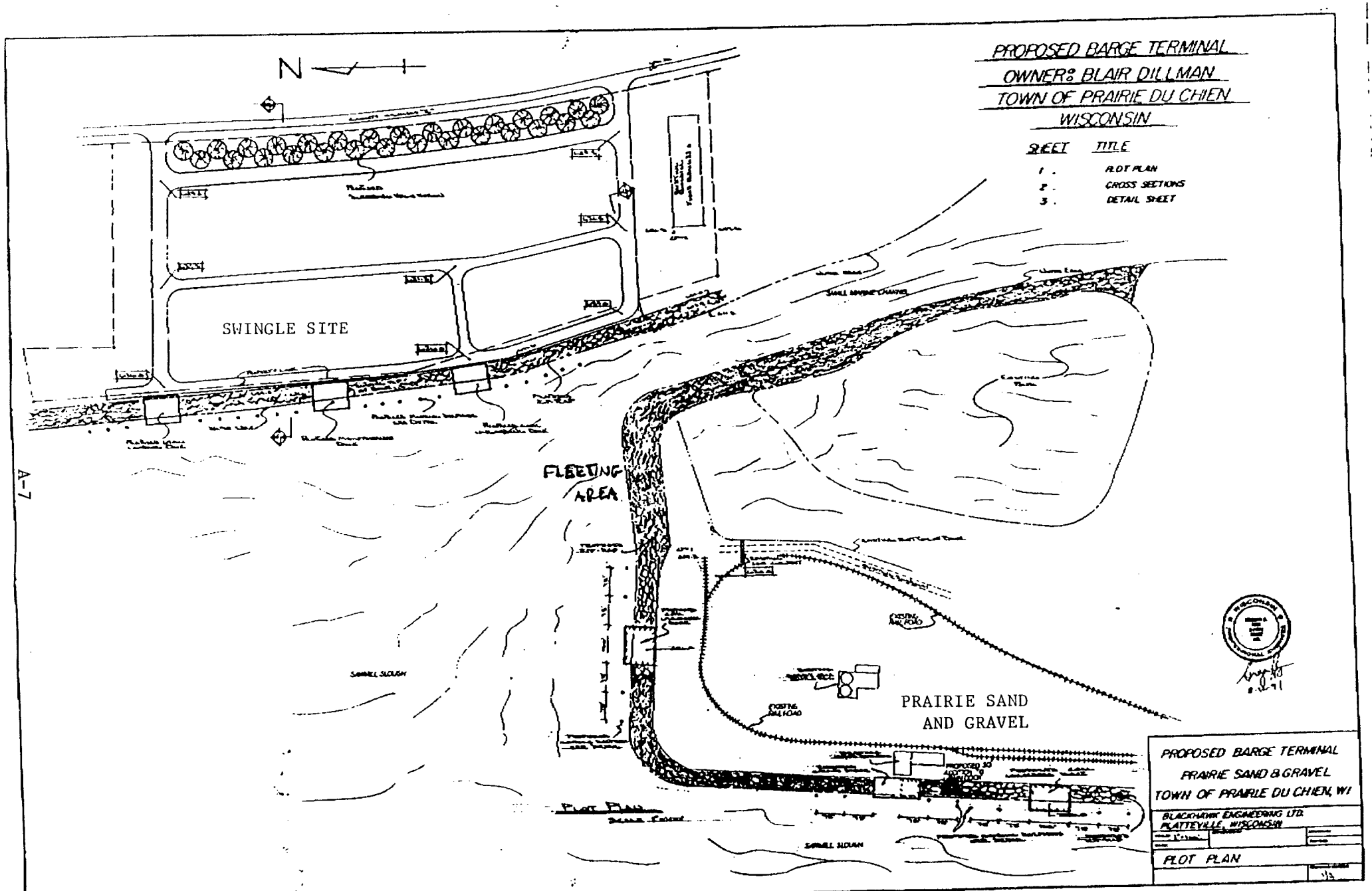
Enclosure(s)

for JAMES E. NICHOLSON
Chief, Construction-Operations Division

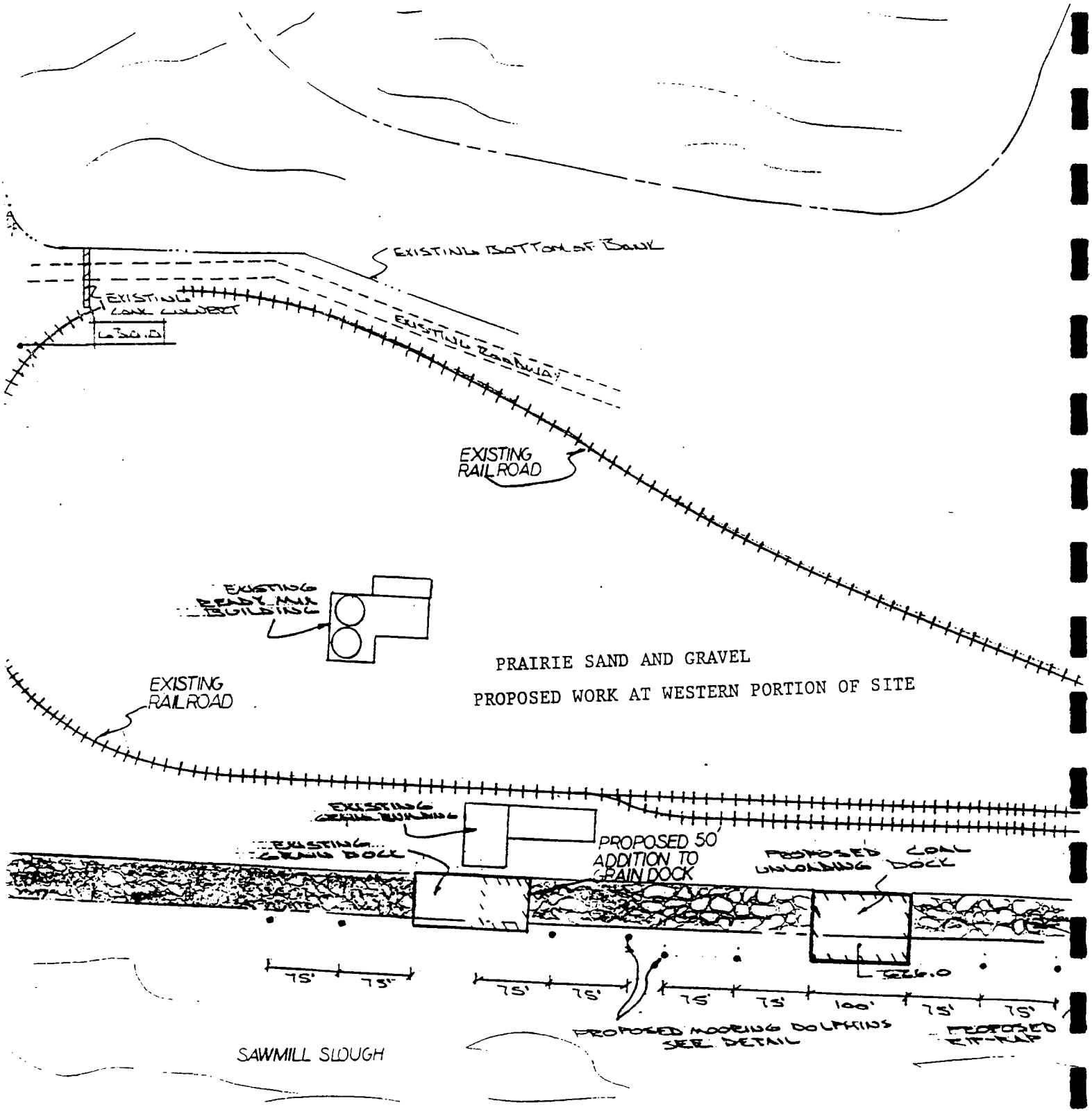


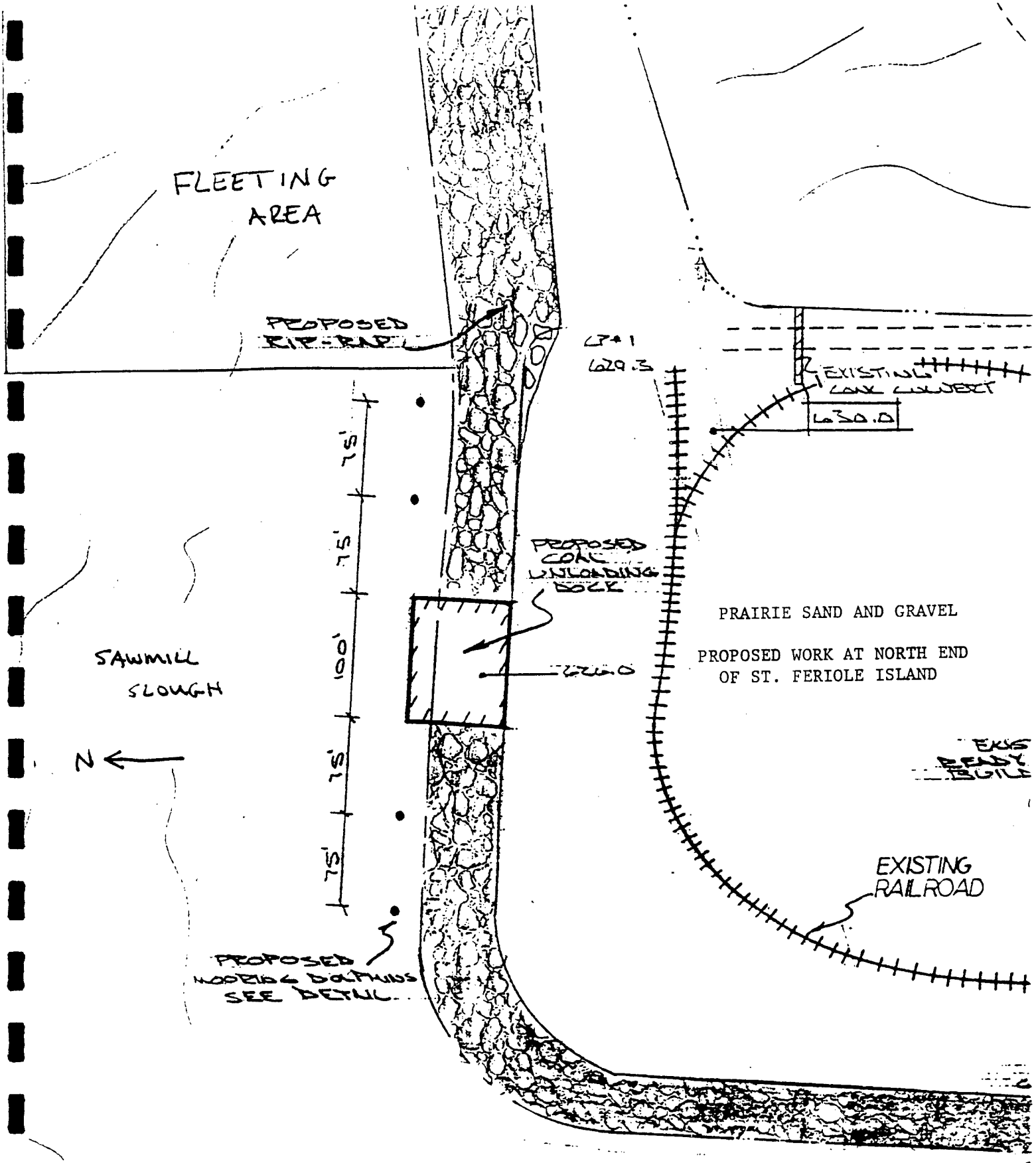
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page 1 of 9


CORPS OF ENGINEERS
TO ROSSVILLE
MILE 630 TO MILE 637
TO FERRYVILLE
ALLAMAKEE COUNTY
CLAYTON COUNTY
EFFIGY MOUNDS NATIONAL MONUMENT
MARAIS LAKE
SUNFISH
ROSEAU
SCROGUM ISLAND
LAKE
CHANNEL
637
636
635
634
633
SCROGUM ISLAND LIGHT & DAYMARK 634.4
CHICAGO, MILWAUKEE, ST PAUL AND PACIFIC RAILROAD
BURLINGTON NORTHERN RAILROAD
CAMPBELL COULEE
Project SITE
91-1040-15
page 2 of 9
FERRIOLE
SAINT
EAST
MARAIS
CASS
MARQUETTE
FEDERAL HIGHWAY 18 BRIDGE, MILE 634.7
SUBMERGED CABLE OR PIPELINE AREA
PRAIRIE DU CHIEN
CHANNEL
MCGREGOR LAKE
WISCO
CRAWFORD CO
IOWA
CLAYTON COUNTY
MC GREGOR
HUNTER ISLAND
HUNTER CHANNEL
PRAIRIE DU CHIEN AIRPORT
POINT ANN STATE PARK
BERGMAN ISLAND
MISSISSIPPI
SCHMIDT ISLAND
GARNET LAKE
MCGREGOR STATE PARK
TO MINONA


PROPOSED BARGE TERMINAL
OWNER: BLAIR DILLMAN
TOWN OF PRAIRIE DU CHIEN
WISCONSIN
SHEET TITLE
1. PLOT PLAN
2. CROSS SECTIONS
3. DETAIL SHEET
N
SWINGLE SITE
FLEETING AREA
PRAIRIE SAND AND GRAVEL
PROPOSED BARGE TERMINAL
PRAIRIE SAND & GRAVEL
TOWN OF PRAIRIE DU CHIEN, WI
BLACKHAWK ENGINEERING LTD.
PLATTEVILLE, WISCONSIN
PLOT PLAN

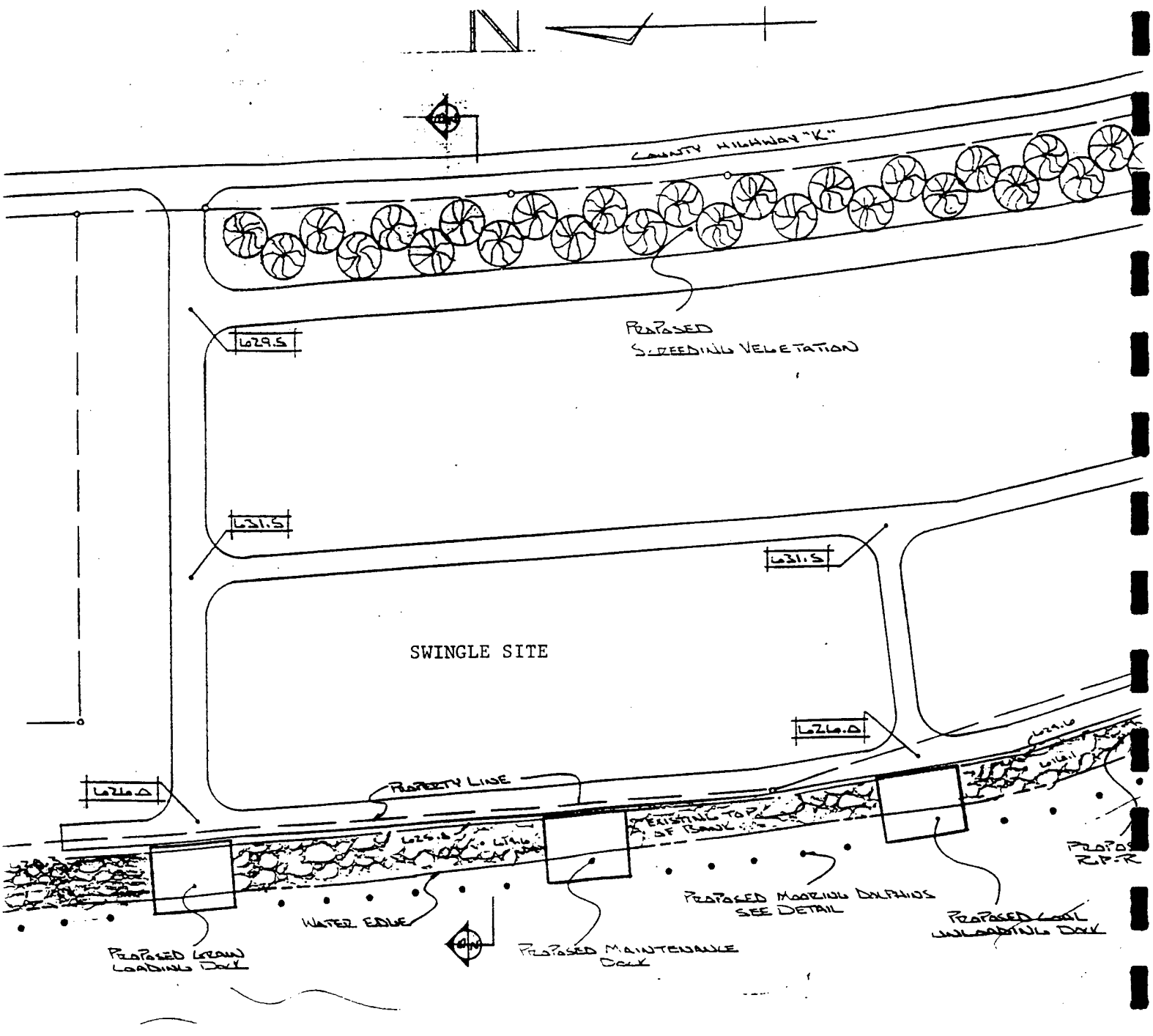
A-7


EXISTING BOTTOM OF BANK
EXISTING RAILROAD
EXISTING
RAILROAD
PRAIRIE SAND AND GRAVEL
PROPOSED WORK AT WESTERN PORTION OF SITE
EXISTING
RAILROAD
PROPOSED 50'
ADDITION TO
GRAIN DOCK
PROPOSED COAL
UNLOADING DOCK
75'
75'
75'
75'
75'
75'
100'
75'
75'
PROPOSED MOORING DOLPHINS
SEE DETAIL
SAWMILL SLOUGH
N

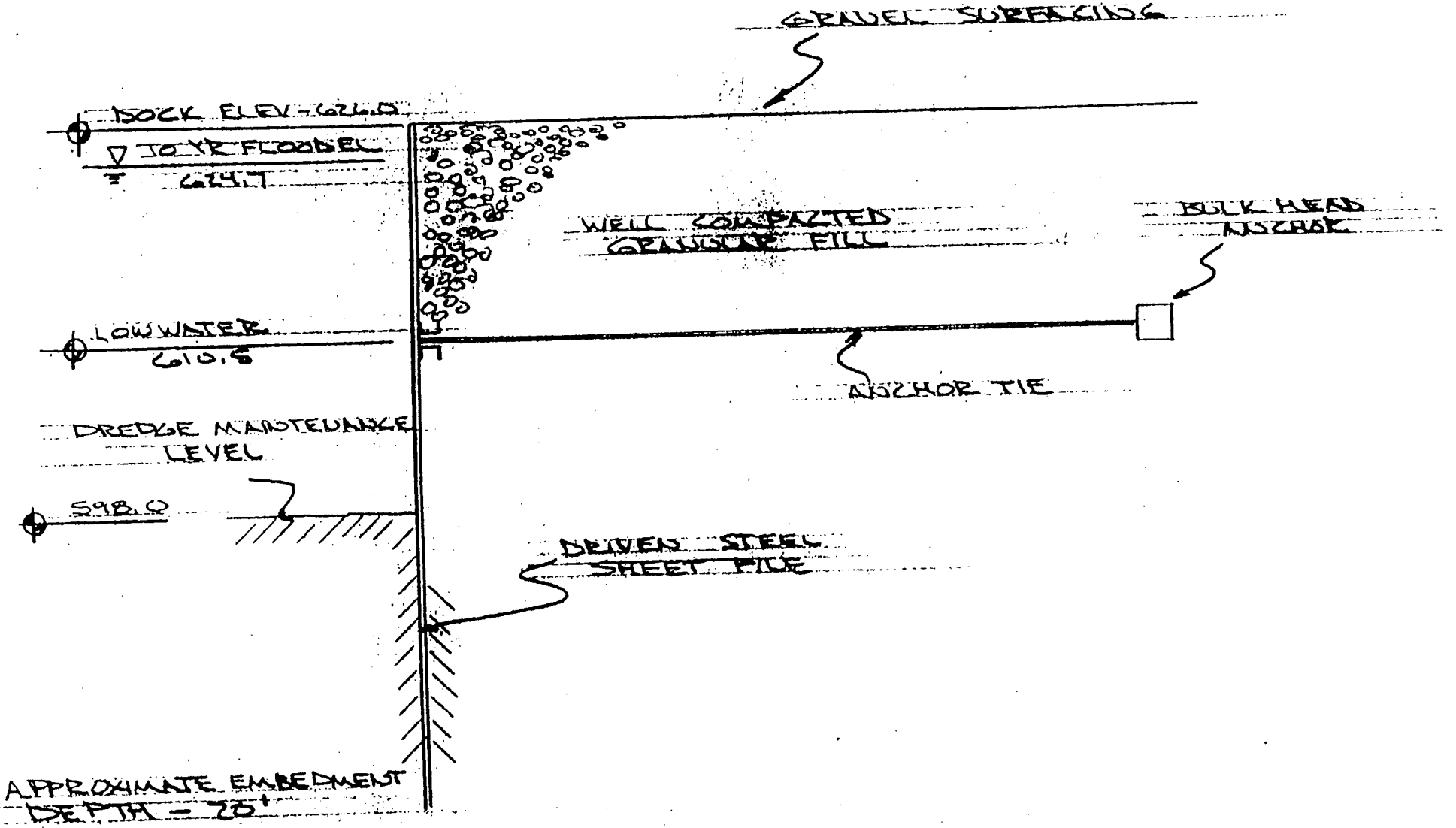


PLOT PLAN

SCALE: 1"=100'



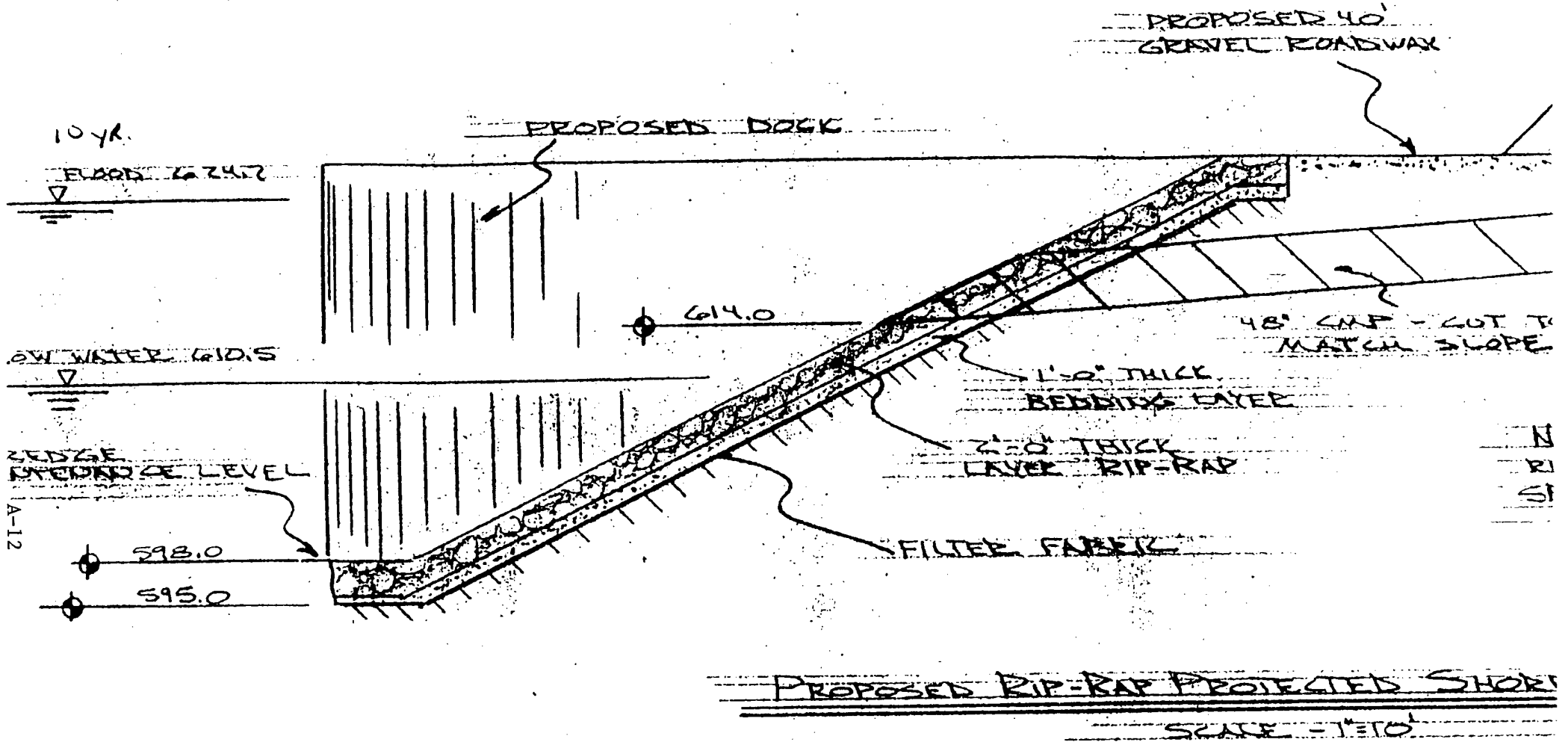
SAWMILL SLOUGH



PROPOSED MAINTENANCE, GRAIN LOADING AND COAL LOADING DOCK

SCALE - 1"=10'

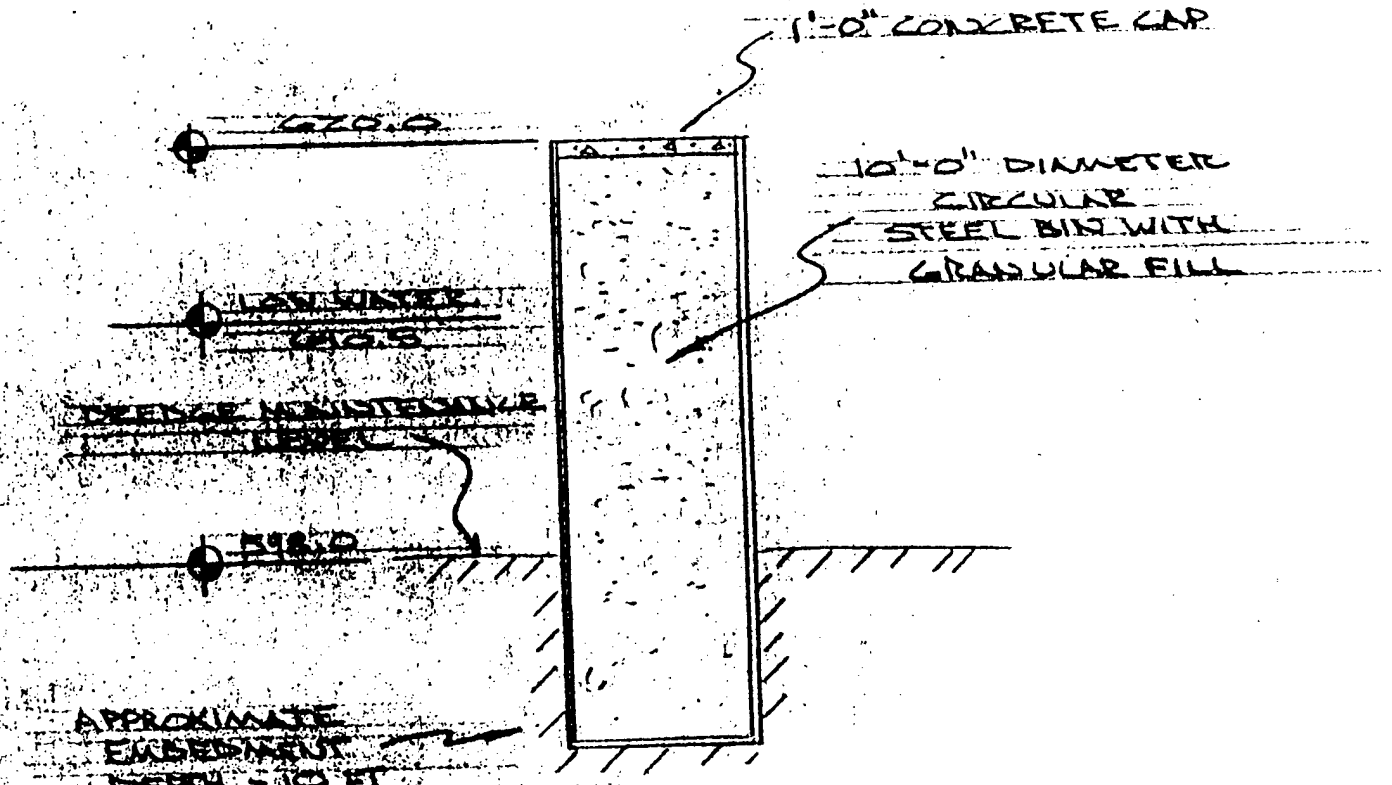
A-11



PROPOSED RIP-RAP PROTECTED SHORE

SCALE - 1"=10'

A-12



PROPOSED MOORING DOLPHIN

SCALE- 1" = 10'

A-13

10.2 APPENDIX B

LONG TERM CHANNEL MAINTENANCE PLAN FOR THE EAST CHANNEL AT PRAIRIE DU CHIEN, WISCONSIN

PROJECT LOCATION

Prairie du Chien, Wisconsin
East Channel UMR mile 633.0 - 636.5
Commercial Harbor UMR mile 634.7 (East Channel)
Small Boat Harbor UMR mile 635.5 (Marais de St. Feriole)

PROJECT AUTHORITY

The Rivers and Harbor Act of 1930 (see HD 290-71-2 and HD 137-72-1) authorizes a nine-foot channel project on the Mississippi River, but does not specify an East and West Channel at Prairie du Chien. This lack of specification is true for the entire project. Throughout the system, the actual location of the navigation channel is left undetermined in the authorizing documents. The Rivers and Harbor Act of 1950 (see HD 71-81-1) authorized the commercial and small boat harbors at Prairie du Chien but the West Channel "is considered the main waterway and has been continuously maintained." In authorizing the commercial harbor, the house document implies that access is available and will be maintained through the East Channel. The purpose for maintaining the East Channel is to provide access to the Federally authorized commercial harbor located at the City Dock.

LOCAL COOPERATION REQUIREMENTS

Under project authorization for the commercial harbor, local interests (City of Prairie du Chien) are required to: (a) furnish without cost to the United States all lands, easements, and rights-of-way necessary for construction and maintenance of each of the harbor improvements, when and as required; (b) protect the upstream corner of the fill at the freight harbor with revetment, or furnish funds for this work if accomplished by the United States, and maintain the fills at both harbors without cost to the United States; (c) provide and maintain at local expense adequate public terminal and transfer facilities, in connection with the commercial freight harbor, open to all on equal terms; and (d) provide and maintain at the small-boat harbor, without cost to the United States, adequate mooring facilities and utilities, including a public landing with suitable supply facilities, open to all on equal terms. For the small-boat harbor only, the City by resolution agreed to accomplish maintenance dredging in the access channel and the basin, and to place adequate navigation marking for the access channel if necessary. Because the objective of maintaining a channel in the East Channel is to assure access to the harbors item (a) above applies also to maintenance dredging in the East Channel.

PREVIOUS MAINTENANCE EXPERIENCE

The commercial and small boat harbors were constructed in 1958 and 1960 respectively. Records do not indicate how much dredging was accomplished for original construction and there has been no maintenance dredging required for either of the harbors. The East Channel was last dredged in 1976. A total of 105,000 cubic yards was removed with the Dredge WILLIAM A. THOMPSON from two cuts upstream of the highway bridge. Dredging was

accomplished to a depth of 13 feet below low control pool elevation. Material from the upper cut was pumped to the lower cut and rehandled. All material was placed on-land, upstream of the highway bridge approach, on property owned by the City of Prairie du Chien. Records show that dredging was also accomplished in the vicinity of the East Channel in 1935 but there is no indication of the location or the quantity.

ANALYSIS OF HYDROGRAPHIC SURVEYS

A review of the available historic survey information reveals that, with the exception of the 1976 survey, at least a 200 foot channel has always been present between the 9 foot contours. The 1976 survey indicated shoaling across the channel on the upstream entrance to the East Channel and a small shoal restricting the 9 foot channel to 100 feet wide approximately 4500 feet downstream from the entrance. The most recent survey conducted in 1992 indicates a minimum of 250 feet between the 9 foot contours and generally ≥300 feet available throughout the East Channel. For most areas of the East Channel, it is believed that a 200 foot channel is self maintaining between the 9 foot contours. Because of these natural channel conditions and the fact that the level and type of navigation is not the same as in the main channel, dredging requirements are expected to be low.

DISCUSSION OF NAVIGATION REQUIREMENTS

The East Channel is primarily used as an access channel to the municipal dock and the PS&G terminal. It is used by smaller harbor boats pushing several barges in a tow. Total annual traffic is limited to several hundred barges. The criteria used for maintenance of the main stem navigation channel is not justified in the East Channel due to the level of use it receives. Therefore, a minimum 100 foot wide navigation channel at least nine feet deep should be maintained in the East Channel to assure that access is available to the harbor. This is comparable to the authorized channel dimensions on the Minnesota River which has significantly higher levels of traffic than the East Channel. The COE will conduct periodic surveys of the East Channel at intervals of approximately three years or upon request of project users. If surveys indicate that the channel width is less than 200 feet between the 9 foot contours or shoaling is restricting use at the commercial harbor, a closer review and evaluation will be initiated to determine if dredging might be necessary at the harbor or to assure a 100 foot channel for access.

PROJECTION OF FUTURE DREDGING REQUIREMENTS

An accurate projection of future dredging requirements is not possible. However, it is understood that for planning and evaluation purposes a prediction of the most probable future is needed. The information provided is based on previous dredging experience, hydrographic surveys between 1976 and 1992, consideration of navigation requirements, and review by Hydraulics Branch, Engineering Division, COE.

To maintain the channel criteria described above, it is predicted that dredging will be required one time in the next 40 years (2.5% frequency), at the upstream entrance to the channel as shown on Figures 1 and 2. Assuming a cut width of 100 feet wide by 450 feet long and an average dredging face of 1.5 feet (11 feet below low control pool elevation), an estimated quantity of 2,500 cubic yards can be generated for planning purposes.

To provide the nine foot controlling depth at the commercial harbor it is predicted that dredging will be required two times in the next 40 years (7.5% frequency). The dredging would take place within a 100 foot by 350 foot cut as identified on Figure 3. Dredging to 11 feet below low control pool elevation would be accomplished and based on the 17 January 1990 survey, it is estimated that 1,900 cubic yards will be dredged during each event. Total dredging quantities projected for the 40 year planning period are 3,800 cubic yards.

ALTERNATIVE PLACEMENT SITE EVALUATION

There were no sites selected for placement of dredged material from the East Channel cut during the GREAT I Study. Rationale given was the cut's low dredging frequency, small total volume, limited traffic volume, and presence of large clam beds containing endangered species in the channel. Dredging and placement methods were major factors in evaluating the placement sites. For the following reasons, only sites where dredged material could be placed mechanically were evaluated: (a) When dredging hydraulically, a great deal of time is necessary to set up the pipeline and prepare dikes to contain the dredged material. With such small dredging quantities anticipated, the cost to complete site preparations make hydraulic operations much more expensive than mechanical operations; (b) Developing a site within reach of a hydraulic dredging operation for the cut at the upstream end of the East Channel would involve significant impacts on a heavily vegetated wetland area and the material would not be used for beneficial purposes. For the purpose of the Prairie du Chien - East Channel EIS, five sites were investigated as potential placement sites. Characteristics of the sites are described in the following paragraphs.

As discussed in the projection of future dredging requirements section, it is anticipated that the upstream end of the East Channel will require dredging once (2,500 cubic yards)and the commercial harbor will require dredging two times (1,900 cubic yards per event) during the 40 year planning period. In the event that both cuts would be dredged during the same year, dredged material placement sites evaluated needed to have capacity for at least 4,400 cubic yards. If material could be removed from the sites for beneficial use elsewhere, a minimum capacity of 4,400 cubic yards was required and if all material would remain at the site, a minimum capacity of 6,300 cubic yards was required.

Site Descriptions

Site A - Bridge Stockpile (Downstream)

Location: This site is located adjacent to and on the south side of the new highway 18 bridge in Prairie du Chien, WI.

Landowner: City of Prairie du Chien

Site Characteristics: This area has been previously disturbed by material dredged from the East Channel. Material was placed there during the construction of the highway 18 bridge. It was spread out and is in a three to four foot pile. The site is surrounded on the south and east sides by a wetland forest area. The northern boundary is the embankment for the highway 18 bridge. The western boundary is the C.M. ST. P. & P. Railroad. Vegetation on the site consists of grasses and a few small trees.

Dimensions: An area of 3.1 acres is available for placement of material if necessary. However, since material will be removed beneficially, approximately 0.6 acre would be required to stockpile the estimated 4,400 cubic yards (most projected for a given year). Stockpile height would be five feet.

Distance From Channel Cut: 9,400' water & 150'-360' land
Harbor Cut: 500' water & 150'-360' land

Lift: 12 to 17 feet with a pile height of 5 feet.

Method of Placement: The area is too small to be considered as a hydraulic placement site. Material will have to be brought to the site mechanically. Most of the shoreline adjacent to the site is steep and approximately 12 feet above LCP. There is an area 400 feet downstream of the highway 18 bridge where the shoreline slope is gradual and access by barge is possible. Approximately six to twelve trees, three to eight inches in diameter will need to be cleared. Front end loaders could be used to unload barges and transport the material across the railroad tracks to the site. Depending on the frequency of use of the tracks, there could be a problem with crossing them. From talking to the locals, it sounds like its use is approximately 2 to 3 trains per day.

Berming: Berming would not be required if material is placed mechanically, unless the material had a high concentration of silt.

Special Conditions/Restrictions: An island re-use committee has designated the south end of St. Feriole Island as a natural area for wildlife preservation. Highway 18 is elevated adjacent to the site which will make pile height an important consideration for aesthetics.

Beneficial Use: Access to the site is very good and beneficial use removal of all the material is expected. The city would be the primary user with removal also expected from local contractors.

Site B - Bridge Stockpile (Upstream)

Location: This site is located adjacent to and north of the new highway 18 bridge in Prairie du Chien, WI.

Landowner: City of Prairie du Chien.

Site Characteristics: This area has been previously disturbed by material dredged from the East Channel. Approximately 105,000 cubic yards of material were placed there during maintenance dredging in 1976. Most of it has been removed. The remaining material has been spread out and a pile with an average height of six feet remains. With the exception of a few trees and some grasses, the site has not revegetated very well. The site is bordered by the highway 18 bridge embankment on the south, a parking and turnaround area for trucks at the city operated dock on the west, a bottomland forest area on the east, and a park area and road on the north.

Dimensions: An area of 4.4 acres is available for placement of material if necessary. However, since material will be removed beneficially, approximately 0.6 acre would be required to stockpile the estimated 4,400 cubic yards (most projected for a given year). Stockpile height would be five feet.

Distance From Channel Cut: 8,600' water & 400'-800' land
Harbor Cut: 30' water & 400'-800' land

Lift: 12 to 17 feet with a pile height of 5 feet.

Method of Placement: The construction of an unloading ramp will be necessary for mechanical placement methods. This would require reshaping the shoreline slope and adding rock protection. Material would be transported from the unloading ramp, across an access road to the City Dock, and across the C.M. ST. P. & P. Railroad tracks.

Berming: Berming would not be required if material is placed mechanically, unless the material had a high concentration of silt.

Special Conditions/Restrictions: Highway 18 is elevated adjacent to the site which will make pile height an important consideration for aesthetics. Depending on the frequency of use of the tracks, there could be a problem with crossing them. From talking to the locals, it sounds like its use is approximately 2 to 3 trains per day.

Beneficial Use: Access to the site is very good and beneficial use removal of all the material is expected. The city would be the primary user with removal also expected from local contractors.

Site C - Island #171

Location: This site is located on island #171 on the Mississippi River at mile 636. It is the island located between the east and the west channels at Prairie du Chien, WI.

Landowner: United States Government (USFWS)

Site Characteristics: This site is a heavily vegetated wetland area adjacent to the dredge cut. It is an island site located between the east and west channels.

Dimensions: The entire point of the island (approx. 100 acres) is available for placement of material if necessary. However, approximately 0.9 acre would be required to stockpile the estimated 6,300 cubic yards of material. Stockpile height would be five feet.

Distance From Channel Cut: 700' water & 50'-350' land
Harbor Cut: 6,000' water & 50'-350' land

Lift: Due to lack of survey information on the island, lift is estimated to be 1 to 6 feet with a pile height of 5 feet.

Method of Placement: For the reasons described above, mechanical placement will be the preferred method. A location along the shoreline with water depths adequate for barge access will be selected.

Berming: Berming would not be required if material is placed mechanically, unless the material had a high concentration of silt.

Special Conditions/Restrictions: Some of the area would have to be cleared of vegetation to provide room for equipment to maneuver.

Beneficial Use: There would be no beneficial use from this site unless material was placed to form a beach or removed for a beneficial use at a later date.

Site D - Prairie Sand and Gravel Site

Location: This site is located on the north end of St. Feriole Island in Prairie du Chien, WI.

Landowner: Private (Blair Dillman)

Site Characteristics: This area is a previously excavated pit with water depths of 40 to 60 feet. It is presently contained by berms, but the landowner has plans to open the area up to the river and use it for fleeting operations. Use of this site would be dependant upon the landowner opening the area to the river. PS&G is still mining this area but has indicated that the deep water areas of the pit could be filled. If the area was used, at least a 20 foot water depth (above LCP) would have to remain. The site is bordered by the PS&G operation and the Marais De Saint Feriole Channel.

Dimensions: An area of 27.3 acres is available for placement of material if necessary. However, approximately 0.5 acre would be required to place the estimated 6,300 cubic yards of material.

Distance From Channel Cut: 8,600' water & 0' land
Harbor Cut: 8,000' water & 0' land

Lift: N/A

Method of Placement: Placement of material into the deep water areas of this site mechanically will depend on whether the landowner gets permission to open the area up to access from the river. The current plan is to use the area to fleet barges. With access from the river, bottom dump scow barges could be used to unload material.

Berming: Placement would be in open water and berms would not be required.

Special Conditions/Restrictions: Placement must be confined to the deep water areas only. No material may be placed above elevation
591 (20 feet below LCP elevation).

Beneficial Use: There would be no beneficial use of the material. The landowner plans to leave the material in place.

Site E - Swingle Site

Location: The site is located on the north end of Prairie du Chien, WI along north Main Street. It lies along the east side of Marais De Saint Feriole Channel upstream form the northern point of St. Feriole Island.

Landowner: Private (Blair Dillman)

Site Characteristics: The site has been cleared of vegetation and has received dredged material from the PS&G operation. The landowner plans to fill the site to the 100 year flood elevation. Half of the site has been filled. A berm has been constructed around the entire site to contain effluent from current hydraulic placement operations.

Dimensions: An area of 28.9 acres is available for placement of material if necessary. However, approximately 0.5 acre would be required to stockpile the estimated 6,300 cubic yards of material. Material would be piled to the 100 year flood elevation (630.2).

Distance From Channel Cut: 9,700' water & 50'-700' land
Harbor Cut: 8,200' water & 50'-700' land

Lift: Since the area would be bermed to the 100 year flood elevation (630.2) and leveled at that height, a lift of 19.2 feet would be required.

Method of Placement: Mechanical placement would involve the use of a crane the landowner plans on having at the site. When filled to the 100 year flood elevation, the bank would be too high and steep for unloading barges with front end loaders.

Berming: The site is currently surrounded by berms for the ongoing hydraulic placement at the site. However, they would not be required for mechanical placement.

Special Conditions/Restrictions: When the entire Swingle site is filled, material can be transferred across the road on the east side of the site. This area has been zoned for industrial development and is owned by the same landowner as the Swingle site. Capacity for the site across the road is estimated at 500,000 cubic yards.

Beneficial Use: The material will be used as landfill on site for industrial development in Prairie du Chien, WI.

Beneficial Use

Placing material at locations where it could be used beneficially was a major objective in selecting alternative placement sites. Beneficial use of dredged material is divided into two basic categories: active, which is removed from the site, and passive, which is left permanently for potential site development or enhancement. If material is stockpiled at sites A and B, it will be available for removal. The city of Prairie du Chien has projects already identified to use 85,000 cubic yards of material. They have also indicated the need for approximately 6,000 cubic yards annually for other projects. Estimates of annual use from stockpiles at sites A and B by other construction companies add up to approximately 4,000 cubic yards. No beneficial use is associated with site C because of the lack of direct land vehicle access. No beneficial use is associated with site D because material would fill in deep water areas of a previously excavated pit and remain on site. Dredged material placed at site E would remain on site as landfill for industrial development.

Alternative Development

Based on the sites discussed previously and evaluations of only mechanical dredging and placement operations, five alternative channel maintenance plans were developed for the estimated dredging requirements in the East Channel at Prairie du Chien. Descriptions and basic economic, environmental and recreational reviews are provided in the following paragraphs. Estimated dredging costs for the alternative plans can be found in Table 1.

Alternative A

Description. This alternative involves the use of site A as the primary placement site with all dredged material placed at this site. Of the estimated 6,300 cubic yards of material, all would be removed for active beneficial use. An area of 0.6 acre would be filled to a depth of 5 feet. Material would be dredged mechanically and placed directly at the site.

Economic. Alternative A is the same cost as alternatives D and E and is the least expensive alternative with a total cost of $31,500. The lower cost of this alternative can be attributed to the fact that all material would be placed by direct mechanical dredging methods and there would be no site preparations necessary.

Environmental. Mechanical placement of dredged materials at this disturbed, upland site would have minor impacts on the natural resources of the site. The site has been used for dredged material placement in the past and is in various stages of revegetation providing minimal habitat for birds and small mammals. Placement of materials on site would have minor adverse impacts on terrestrial vegetation and fish and wildlife use of the area. Clearing of 6 to 12 trees to provide access to the site would have a minor adverse impact on a small amount of floodplain forest. With mechanical placement of materials, no return effluent would be expected resulting in no appreciable impact on aquatic resources. Use of this site would have no appreciable impacts on wetlands, freshwater mussels and threatened and endangered species.

Recreational. Use of site A would have no effect on recreational boating or fishing other than a temporary disturbance during the dredging operation. Vehicular access to the stockpile would increase truck traffic on St. Feriole Island and could have minimal adverse effects on the park and historic districts. Vehicular routing on the island could be planned to minimize this problem. Shoreline alterations necessary for material placement would have minimal negative visual impact.

Alternative B

Description. This alternative involves the use of site B as the primary placement site with all dredged material placed at this site. Of the estimated 6,300 cubic yards of material, all would be removed for active beneficial use. An area of 0.6 acre would be filled to a depth of 5 feet. Material would be dredged mechanically and placed directly at the site.

Economic. Alternative B is the most expensive alternative with a total cost of $55,750 or $24,250 (43%) more than the least expensive alternatives (alternatives A, D, E). The higher cost can be attributed to the need to construct an unloading ramp for dredged material placement.

Environmental. Mechanical placement of dredged materials at this disturbed, upland site would have minor adverse impacts on the natural resources of the area. Placement of dredged materials at this site would result in the loss of the existing ground vegetation, however, the impact of this action on the terrestrial resources and fish and wildlife use of the site would be minor.

Construction of an unloading ramp, including shoreline reshaping and addition of rock protection, would have minor adverse impacts on a small amount of floodplain forest. Placement of dredged materials at this upland site would have no appreciable impact on freshwater mussel species and threatened or endangered species.

Recreational. Effects on recreational resources resulting from use of site B would be similar to those caused by use of site A, with the possibility of increased vehicular activity closer to the park and historic districts due to site B's closer proximity to these areas.

Alternative C

Description. This alternative involves the use of site C as the primary placement site with all dredged material placed at this site. Of the 6,300 cubic yards of material, all would remain permanently on site with no beneficial use removal. An area of 0.9 acre would be filled to a depth of 5 feet. Material would be placed by direct mechanical dredging methods. Light clearing an grubbing would be necessary for site preparations.

Economic. Alternative C is the second least expensive alternative with a total cost of $33,300 or $1,800 (5%) more than the least expensive alternatives (alternatives A, D, E). This alternative is more costly because the site requires light clearing and grubbing of 0.9 acres to prepare the site.

Environmental. Site C is an undisturbed, heavily vegetated floodplain forest/wetland complex adjacent to the proposed dredge cut in the north end of the East Channel. The actual disposal of materials at this site would have no appreciable impact on aquatic and terrestrial resources and freshwater mussel species (including threatened and endangered species) in the area, however, light clearing of floodplain forest vegetation would be required to provide a disposal area and access to this site. Disposal of dredged materials at this site would result in the permanent loss of approximately 0.9 acre of floodplain forest habitat and degradation of adjacent wetlands, areas valuable to bird, mammal, reptile and amphibian species. Use of site C would have a substantial adverse impact on wetland resources and fish and wildlife in the area.

Site C could provide suitable nesting and/or roosting habitat for bald eagles and peregrine falcons. It is unknown whether these threatened and endangered species, respectively, are currently making use of this area. The impacts of using this area for dredged material disposal on threatened or endangered species are unknown at this time.

Recreational. Site C is located directly across the East Channel from a Low Density Recreation Area on Island 169. Recreational activities at and around this area would be temporarily affected during dredging operations. Vegetation clearing for vehicular access would have minimal adverse visual impact. Disposal of dredged material on the site to form a beach would improve recreational access to the island and increase the area's recreation potential.

Alternative D

Description. This alternative involves the use of site D as the primary placement site with all dredged material placed at this site. Of the 6,300 cubic yards of material, all would remain permanently on site with no beneficial use. An open water area of 0.5 acre would be used for placement. The area is located in a
previously excavated gravel pit with depths of 60 feet. The area of placement would be in the deep holes and would not be higher than an elevation 20 feet below Low Control Pool elevation. Material would dredged mechanically and placed at the site using bottom dump scow material barges.

Economic. Alternative D is the same cost as alternatives A and E and is the least expensive alternative with a total cost of $31,500. The lower cost of this alternative can be attributed to the fact that all material would be placed by direct mechanical dredging methods and there would be no site preparations necessary.

Environmental. PS&G, Inc. has mined gravel in this location for several years and has excavated a pit 40 to 60 feet deep which is filled with water. PS&G, Inc. has indicated the pit will continue to be mined for sand and gravel. The impact on aquatic resources of dredged material disposal at site D would be minor; deeper portions of a river lake would be filled and minor localized impacts on water quality could occur.

Disposal of materials at this site would have no appreciable impacts on wetlands, terrestrial resources, threatened and endangered species, and wildlife, however, minor adverse impacts to fish species could occur, although it is unclear what species of fish, if any, inhabit this river lake. It is unknown whether species of freshwater mussels are present in this pit, although the continued removal of sand and gravel from the bottom of this pit makes their presence there extremely unlikely. Disposal of dredged materials in this pit would cover any mussels present with a deep layer of dredged material. Because of the unlikely presence of freshwater mussels at this site, no appreciable impacts, including impacts to threatened or endangered mussel species, would occur if this site were used for dredged material disposal.

Recreational. Site D is located at the main access point to the marinas in Marais de St. Feriole and therefore disposal operations at this site could have temporary adverse effects on recreation boaters in this area. The site is not a beneficial use placement site. No impacts to recreational resources would occur as a result of beneficial use removal.

Alternative E

Description. This alternative involves the use of site E as the primary placement site with all dredged material placed at this site. Of the 6,300 cubic yards of material, all would remain permanently on site as passive beneficial use with no removal. An area of 0.5 acre would be filled to a depth of 5 feet. Material would be placed at site E by direct mechanical dredging methods.

Economic. Alternative E is the same cost as alternatives A and D and is the least expensive alternative with a total cost of $31,500. The lower cost of this alternative can be attributed to the fact that all material would be placed by direct mechanical dredging methods and there would be no site preparations necessary.

Environmental. Site E has been cleared of vegetation and has received dredged material from the PS&G, Inc., operation in the past. The landowner plans to fill the site to the 100-year flood elevation as part of the proposed harbor expansion project. Use of site E would have no appreciable impact on aquatic resources, wetlands, terrestrial resources, freshwater mussel species and threatened and endangered species in the area. The area does receive limited use by wildlife species, however, placement of dredged materials at site E would have only a minor adverse impact on fish and wildlife species.

Recreational. Use of site E as a stockpile location would have similar effects on recreational boaters as the PS&G Site. Materials would not be removed from site E for beneficial uses, thus, no long-terms impacts on recreation as a result of this activity would occur.

Discussion

A dredged material placement evaluation matrix developed during the Upper Mississippi River Basin Commission Study was used (with some modifications) to compare the economic differences for the five alternative plans. This economic evaluation included comparisons of site availability, dredging costs, and benefits from the dredging. The matrix evaluation also included an assessment of the impacts of the alternatives on environmental, cultural, and socioeconomic factors.

Based on economics, the matrix scores indicate alternative A is the best dredged material placement plan. Alternatives B, E, D, and C ranked 2, 3, 4, and 5, respectively. Alternative A was the same cost as alternatives D and E but ranked better because all material would be stockpiled at a public site and actively removed for beneficial use elsewhere. Since the City of Prairie du Chien has the responsibility to provide the placement sites for dredging in the East Channel, site availability for alternatives A and B would not be a problem. Site availability for alternative C would also be no problem because the site is government owned. Alternatives D and E have sites that are privately owned. A binding document with the landowner would be required to assure use for the entire planning period.

Alternatives A, B, D, and E would have similar minor levels of impact on natural and recreational resources. Alternative C would have a substantial adverse impact on wetlands and fish and wildlife resources but a minor beneficial impact on recreational resources.

Table 1. Estimated dredging costs for alternative channel maintenance plans, Prairie du Chien, East Channel.

Alternative/ Component	Dredging/Placement Method	Unit Cost	Rehandling Method	Unit Cost	Total Unit Cost	Quantity	Component Cost
A. Downstream Bridge							
1. Cut 1 to A	Mechanical Direct	$5.00	-	-	$5.00	2,500 CY	$12,500
2. Comm. Harbor to A	Mechanical Direct	5.00	-	-	5.00	3,800 CY	19,000
							$31,500
B. Upstream Bridge							
1. Cut 1 to B	Mechanical Direct	$5.00	-	-	$5.00	2,500 CY	$12,500
2. Comm. Harbor to B	Mechanical Direct	5.00	-	-	5.00	3,800 CY	19,000
3. Unloading Ramp Construction					24,250.00	1 JOB	24,250
							$36,750
C. Island 171							
1. Cut 1 to C	Mechanical Direct	$5.00	-	-	$5.00	2,500 CY	$12,500
2. Comm. Harbor to C	Mechanical Direct	5.00	-	-	5.00	3,800 CY	19,000
3. Light clearing and grubbing					2000.00	0.9 AC	1,800
							$33,300
D. Dillman Pit							
1. Cut 1 to D	Mechanical Direct	$5.00	-	-	$5.00	2,500 CY	$12,500
2. Comm. Harbor to D	Mechanical Direct	5.00	-	-	5.00	3,800 CY	19,000
							$31,500
E. Swingle Site							
1. Cut 1 to E	Mechanical Direct	$5.00	-	-	$5.00	2,500 CY	$12,500
2. Comm. Harbor to E	Mechanical Direct	5.00	-	-	5.00	3,800 CY	19,000
							$31,500

Explanation of dredging costs
Mechanical direct if under 4 mile haul = $5.00/CY

10.3 APPENDIX C

U.S. FISH AND WILDLIFE SERVICE'S

BIOLOGICAL OPINION

JUNE 28, 1993

United States Department of the Interior

TAKE PRIDE IN AMERICA

FISH AND WILDLIFE SERVICE
Bishop Henry Whipple Federal Building
1 Federal Drive
Fort Snelling, MN 55111-4056

Log No. 93-R3-TCFO-0001

IN REPLY REFER TO:

FWS/AES-TE

June 28, 1993

Colonel Richard W. Craig
District Engineer
Department of the Army
Corps of Engineers,
St. Paul District
Room 1421
180 Kellogg Boulevard
St. Paul, Minnesota 55101

Dear Colonel Craig:

Enclosed is the U.S. Fish and Wildlife Service's (Service) Biological Opinion on the effects of Corps of Engineers (Corps) navigation channel maintenance and permit activities on federally listed endangered species in the affected area. The project area is the East Channel of the Mississippi River in the vicinity of Prairie du Chien, Crawford County, Wisconsin, and the proposed activities are described in your Biological Assessment of January 1993. This Biological Opinion has been prepared pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act), and complies with appropriate regulations and guidance.

Based on our review of information provided by your agency on the proposed activities and on other information on the biology and ecology of federally listed species in the project area, we have made the following determination: The project, a combined permit and navigation channel maintenance action, is likely to jeopardize the continued existence of the Higgins' eye pearly mussel (*Lampsilis higginsi*). The enclosed document also includes conservation recommendations to benefit the species.

The Service believes that the Corps can plan activities associated with its Prairie du Chien activities to avoid the likelihood of jeopardizing the continued existence of the Higgins' eye pearly mussel. Our Biological Opinion contains reasonable and prudent alternatives which, if adopted, will avoid the likelihood of jeopardizing the continued existence of this species.

We believe that implementation of protective measures should:

- Suspend navigation channel maintenance dredging in the East Channel between the Highway 18 bridge and the turning basin.

- Include hazardous material spill prevention and response conditions in any Army permit granted to Prairie Sand and Gravel.

- Monitor the shipping from City Dock; reinitiate formal section 7 consultation with the Service if shipping (barges leaving City Dock) exceeds 135 permitted and 15 incidental barges per year.

JUL 06 1993

If you wish, the Service is available to help the Corps implement these alternatives. Regardless, we request notification of whether your agency will implement these reasonable and prudent alternatives.

Because the proposed action is likely to have adverse effects on a listed species, we have included an incidental take statement pursuant to section 7(b)(4) of the Act. This incidental take statement provides your agency with an exception to the takings prohibitions of section 9 of the Act as long as your agency complies with the terms and conditions contained in the incidental take statement. You should take note of the terms and conditions of this incidental take statement, and you should be aware that any failure to comply with these terms and conditions voids your exemption to the takings prohibitions of section 9 of the Act.

Finally, we have included conservation measures in our Biological Opinion to help your agency comply with section 7(a)(1) of the Act. These conservation measures are discretionary on the part of your agency, but would contribute greatly to the conservation of the Higgins' eye pearly mussel. We would also like to be informed of any of these conservation measures your agency chooses to implement.

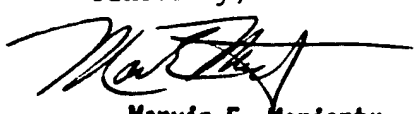
This concludes formal consultation for the actions at Prairie du Chien. Consultation should be reinitiated if there are subsequent modifications to the proposed action, if a species or critical habitat that occurs in the area affected by your project is listed in the future, or if new information changes conclusions reached in this Biological Opinion.

The Biological Assessment indicated no date for the commencement of the Corps navigation maintenance dredging element of the project because channel conditions are dynamic and uncertain. A year or more may pass before dredging becomes necessary. As a consequence of that delay, we anticipate that changes in the environmental baseline, including the status of *L. higginsi*, will occur; that additional information on *L. higginsi*, and other pertinent channel features, will be published; and that changes in project specifications will occur. We, therefore, earnestly suggest that the Corps contact the Service before commencing maintenance dredging in the East Channel, if more than one year transpires between the date of this Biological Opinion and the intended commencement of dredging. The Service will then review the environmental baseline, published reports, and the latest Corps dredging plans to determine with the Corps if formal section 7 consultation needs to be reinitiated.

We look forward to future cooperation with your agency to conserve our Nation's threatened and endangered species.

If you have further questions, please contact Ms. Lynn Lewis, Field Supervisor, Twin Cities Ecological Services Field Office, at 612/725-3548.

Sincerely,



Marvin E. Moriarty
Acting Regional Director

Enclosure

Endangered Species Act

Section 7 Consultation - Biological Opinion

Action Agency: U.S. Army Corps of Engineers, St. Paul District (Corps)

Action Considered During Consultation: Corps combined consideration of (1) Permit application by Prairie Sand and Gravel (PS&G) to expand the PS&G barge loading facility at the north end of St. Feriole Island and at the nearby Swingle site, both at Prairie du Chien, Wisconsin, and (2) operation and maintenance of the East Channel of the Mississippi River in the vicinity of Prairie du Chien.

Consultation By: Region 3, U.S. Fish and Wildlife Service (Service), Twin Cities Field Office, Bloomington, Minnesota

Date of Issuance: June 28, 1993.

Consultation History

On September 6, 1991, The Corps issued Public Notice CENCS-CO-R (91-1040-15) describing PS&G's application for a permit to develop a split-location harbor at the Swingle site and on the north end of St. Feriole Island, both at the north end of Sawmill Slough. Subsequent to issuance of the Public Notice, the applicant modified the project as described in the Description of the Proposed Action section of this Biological Opinion. Modifications included elimination of the fleeting area at the north end of St. Feriole Island and the addition of a channel to be dredged from Sawmill Slough to the existing borrow pit on the east side of PS&G. The borrow pit would be used for barge fleeting and would be the site of two grain loading docks. The docks would be located on the west side of the pit, adjacent to the existing railroad tracks.

On April 3, 1992, the Service sent a letter to the Corps describing its participation as a Cooperating Agency under the National Environmental Policy Act of 1969, as amended, in the Corps' preparation of the Environmental Impact Statement (EIS) for the project. In addition to involving the Service in developing the EIS, this cooperation involved the Service with the Wisconsin Department of Natural Rescources (DNR), the Corps, and with various other mussel experts in developing the Corps Biological Assessment (BA).

On June 16 and 17, 1992, Service and Corps personnel visited the project area in the East Channel and Sawmill Slough. Corps and Service personnel also met and conferred with Wisconsin DNR personnel and with Mr. Blair Dillman, president of PS&G and permit applicant for this project. Mr. Dillman updated Wisconsin DNR, Corps, and Service personnel on his latest plans and conducted a site visit to his present and proposed operations areas.

On August 8, 1992, the Service provided the Corps the Service review of a Corps preliminary draft EIS for the project. In the review, the Service requested additional information from the Corps and further coordinated

Service and Corps biological and project information and resource concerns for the Corps BA and for this formal endangered species consultation.

On October 6, 1992, Service and Wisconsin DNR personnel met with Corps project biologists at the Corps office and with mussel experts Dr. Pam Thiel, of the Environmental Management Technical Center, Onalaska, Wisconsin; Dr. Diane Waller, National Fishery Research Center, La Crosse, Wisconsin; and Dr. Andrew Miller, Waterways Experiment Station, Vicksburg, Mississippi. The purpose of the meeting was to get expert advice and reach agency agreement regarding available *L. higginsi* and other mussel data, appropriate use of the data, appropriate assumptions to be used in project impact analysis, and analysis methodology. Advice provided at this meeting and the assumption and analysis method decisions are reflected in the Corps' BA and in this Biological Opinion.

On February 5, 1993, the Service received the Corps letter of February 3, 1993, describing project changes, transmitting the final (January 1993) BA, and requesting Endangered Species Act of 1973, as amended (Act) section 7 consultation.

On March 22, 1993, the Service acknowledged receipt of the Corps final BA and initiated formal section 7 consultation effective February 5, 1993.

On April 13, 1993, the Service received the Corps letter of April 12, 1993, transmitting a preliminary review draft EIS (PRDEIS) for the project. The PRDEIS provided further details of alternatives and of Corps and PS&G preferred alternatives.

On June 1, 1993, Corps, Wisconsin DNR, and Service project biologists met to discuss the project and to coordinate agency review activities. Corps and Service personnel conducted a field survey of mussels and mussel habitat in the PS&G proposal area.

Species Considered in this Biological Opinion

The Higgins' eye pearly mussel, *Lampsilis higginsi* (Lea, 1857), is the only federally listed endangered species in the area of the proposed action. No critical habitat has been designated in the area of the proposed action.

Lampsilis higginsi is generally considered a large river species that was once widely distributed. According to the *Higgins' Eye Mussel Recovery Plan* (U.S. Fish and Wildlife Service 1983), the historical distribution of the species is not known with certainty, but it probably inhabited the Mississippi River from just north of St. Louis, Missouri, to Minneapolis-St. Paul, Minnesota. The species also occurred in the lower portions of several tributaries of the Mississippi River -- the Minnesota River in Minnesota, the St. Croix River between Wisconsin and Minnesota, the Wapsipinicon, Cedar, and Iowa Rivers in Iowa, and the Illinois and Sangamon Rivers in Illinois. It may have occurred in the lower (Illinois-Kentucky) portion of the Ohio River. The species is now found only in the Upper Mississippi River above Canton, Missouri, in the St. Croix River between Minnesota and Wisconsin, and in the lower Rock River in Illinois. The

southernmost viable reproductive population of the species is believed to be in Sylvan Slough, near Moline, Illinois, in the Iowa-Illinois Quad Cities area.

Lampsilis higginsi was probably never abundant despite its relatively wide distribution (Baker 1905, Coker 1919, van der Schalie 1950). Miller *et al.* 1991) found that *L. higginsi* represented 0.54 percent of the total number of mollusks found at Prairie du Chien, Wisconsin. Similarly, *L. higginsi* represented from 0.01 to 0.5 percent of the total number of mollusks found in mussel beds located elsewhere in the Mississippi River (Cawley 1984, Duncan and Thiel 1983, Thiel 1981).

The general alteration of the Upper Mississippi River from a free-flowing riverine system to an impounded river system appears to have contributed to the decline of *L. higginsi*. The decline in water quality associated with municipal, industrial, and agricultural effluent also contributed to the species' decline. More recently, channel dredging for project construction and maintenance has been identified as a problem (Havlik and Marking 1980, Havlik and Stansbery 1977). These authors identify increased turbidity, smothering, and removal of mussels from substrate as impacts of channel maintenance activities.

Pollution and physical alteration activities have continued in the Upper Mississippi River in recent years and, in some instances, have further jeopardized the continued existence of *L. higginsi*. In 1983, the Service concluded that opening the East Channel for unlimited navigation during the West Channel Highway 18 bridge repair at Prairie du Chien was likely to jeopardize *L. higginsi*. In 1988, the Service concluded that increased river traffic resulting from major rehabilitation of Mississippi River locks and dams 2-22 and the Illinois Waterway from LaGrange to Lockport would adversely affect *L. higginsi*, but was not likely to jeopardize its continued existence. In 1991, the Service concluded that construction of barge loading facilities and increased barge traffic from City Dock at Prairie du Chien, Wisconsin, was likely to jeopardize *L. higginsi*, while at Prescott, Wisconsin, an effort to relocate *L. higginsi* in connection with bridge construction over the St. Croix River resulted in significant mussel mortality.

Recent information from the National Fisheries Research Laboratory, LaCrosse, Wisconsin, suggests that the suitability of the environment for mussels in the Upper Mississippi River may be deteriorating. Naimo (personal communication, 1993) indicated that studies of one group of mussels, the fingernail clams (mostly *Musculium transversum*), have revealed major population declines in the past two decades in the Upper Mississippi River from St. Paul, Minnesota, to Keokuk, Iowa, which is a 700-km segment of river that spans the entire Mississippi River range of *L. higginsi*. The causes of the decline are unknown at present, but fingernail clams are sensitive to sediment quality and water quality. Because of their sensitivity, fingernail clams are good leading indicators of environmental conditions. The conditions that caused this sensitive species' population declines may also threaten *L. higginsi* populations.

In the past 2 years, the exotic zebra mussel (*Dreissena polymorpha*) has posed new threats to *L. higginsi*. Zebra mussels have been found in native mussel beds throughout the range of *L. higginsi* in the Mississippi and St. Croix River drainages (O'Neill and MacNeill 1991, U.S. Fish and Wildlife Service 1992). This exotic species has extirpated several native unionid species in Lake St. Clair, in Michigan, and in the Detroit River in Ontario, Canada (O'Neill and MacNeill 1991). Zebra mussels have been found on mussels, including *L. higginsi*, in the East Channel of the Mississippi River at Prairie du Chien.

Ecology of *Lampsilis higginsi*

Physical variables in the aquatic environment exert a strong influence on the distribution of mussels of the family Unionidae, of which *L. higginsi* is a member. Unionids are most successful in stable, coarse sand, or sand-gravel mixtures and are generally absent from substrates with heavy silt loads (Cooper 1984, Salmon and Green 1983, Stern 1983). Unionids are also most successful where water velocities are low enough to assure stable sediments, but high enough to prevent excessive siltation (Salmon and Green 1983, Stern 1983, Way *et al.* 1990). Most unionids also occur in water less than 4-10 meters deep (Machena and Kautsky 1988, Salmon and Green 1983, Way *et al.* 1990).

Like most native unionids, *L. higginsi* live in large, stable aquatic habitats where they are generally buffered from periodic catastrophic population reductions (McMahon 1991). The species is most frequently found in medium to large rivers with high current velocities (0.5 to 1.5 ft/sec) and in depths ranging from 3 to 20 feet. *Lampsilis higginsi* appears to prefer water with dissolved oxygen greater than 5 ppm and calcium carbonate levels greater than 50 ppm. The species is usually associated with well-graded sand-mud-gravel substrates. It is usually found in large, stable mussel beds with relatively high species and age diversity.

The reproductive cycle of *L. higginsi* is similar to that of most unionid species as is its pronounced sexual dimorphism. Males produce sperm that is discharged into the surrounding water; females obtain the sperm as they siphon water for food and respiration. Egg fertilization occurs within the gills of the female and the fertilized eggs are retained within the marsupial gills of the female until they mature into glochidia.

A female *L. higginsi* may brood and release several hundred thousand glochidia each year, but few glochidia reach maturity (McMahon 1991). Female *L. higginsi* have an unusual adaption to attract host fish species for their glochidia: they have mantle flaps that resemble a small, swimming fish. When a fish attacks these mantle flap lures, the female *L. higginsi* expels her glochidia in the presence of the nearby attacking fish, thereby improving the likelihood of her glochidia contacting the fish, which will then serve as the host fish for the glochidia (Kat 1984).

After expulsion from female *L. higginsi*, glochidia try to attach themselves to the gills of host fish, where they live as they develop further. If successful in attaching to a host fish, the young *L. higginsi* mature and

excyst from the gills of the host fish as juvenile bivalves, settle to the substrate, and become sedentary in the substrate, if it is suitable.

Two fish species are known hosts for *L. higginsi* -- the sauger (*Stizostedion canadense*) and the freshwater drum (*Aplodinotus grunniens*) (Waller and Holland 1987).

Description of the Proposed Action

The proposed action is composed of two parts. The first part is maintenance of the Federal navigation channel and harbor at Prairie du Chien. The second part is a Corps permit application by PS&G to expand its barge loading and unloading facilities near Prairie du Chien. The Corps has developed a long-term operation and maintenance plan for the East Channel. It has identified a navigation corridor in the East Channel that would be maintained for unrestricted navigation and shipping; this navigation channel consists of that segment of the East Channel extending from the main channel of the Mississippi River at the north end of the East Channel south to the Prairie du Chien City Dock. The Corps does not include the East Channel south of the Highway 18 bridge (just south of City Dock) in this proposed action.

The Corps proposes to maintain, for unlimited shipping, a navigation channel 30.5-meters (100-feet) wide and 2.7-meters (9-feet) deep from the north end of the East Channel to the City Dock. Based on its hydrographic analysis, the Corps believes that most areas of the East Channel are self-maintaining between the 2.7-meter (9-foot) depth contours. Because of this natural channel condition and because of the level and type of navigation, the Corps expects dredging requirements to be low.

A 137-meter (449-foot) portion at the north end of the East Channel (identified by the Corps as Cut 1) and a 107-meter (351-foot) portion directly in front of City Dock (identified by the Corps as Cut 2) may need dredging at an estimated frequency of once in 40 years and twice in 40 years respectively. Prairie Sand and Gravel indicated that a short cut through the north end of St. Feriole Island to the lagoon on its property will be needed for barge access, but that no dredging is needed for its project in the Sawmill Slough channel.

The Corps estimates that 1,922 m^3 (2,500 cubic yards) would be dredged from the 100 m X 137 m (328 ft X 449 ft) cut at the north end of the East Channel; an estimated 1,450 m^3 (1,900 cubic yards) would be dredged from the 100 m X 107 m (328 ft X 351 ft) cut at City Dock. The dredged material from both cuts would be placed at an upland site immediately south of the Highway 18 bridge.

The Corps anticipates the dredging frequency as indicated above, but cannot predict when dredging will next be needed; shoaling is not presently, nor imminently, a factor limiting commercial barge traffic in the East Channel. The proposed dredging will not increase the navigation capacity of the East Channel, but the Corps considers the proposed dredging sufficient to provide unrestricted shipping in the East Channel north of the turning basin and from the turning basin to City Dock. Barge traffic in Sawmill Slough and in the

East Channel north of the turning basin would increase, should the PS&G permit application be granted.

The PS&G proposal is described in the Corps' 1991 Public Notice of permit application and subsequent modifications to that permit application. Prairie Sand and Gravel proposes to develop a split-location harbor at the Swingle site and on the north end of St. Feriole Island, both at the north end of Sawmill Slough. The modifications eliminated a barge fleeting area at the north end of St. Feriole Island and added a channel to be dredged from Sawmill Slough to the existing borrow pit on the east side of PS&G. The borrow pit would be used for barge fleeting and would be the site of two grain loading docks on the west side of the pit, adjacent to the existing railroad tracks. The application also includes: (1) construction of a new grain loading dock on Sawmill Slough; (2) addition to the existing grain loading dock; (3) rebuilding the existing coal unloading dock; (4) construction of 27 mooring dolphins; and (5) riprap of unprotected shoreline.

Swingle site work includes (1) construction of a commodity unloading dock, (2) construction of a cleaning and maintenance dock, (3) construction of 23 mooring dolphins, and (4) upland development to include regrading, commodity storage pads, buildings, water treatment ponds, and other utilities.

Environmental Baseline

The East Channel of the Mississippi River at Prairie du Chien, Wisconsin, is a portion of the Federal Mississippi River Nine-Foot Channel Project. The Corps is responsible for maintaining navigable depths in the East Channel through operation and maintenance activities (dredging). Authority for continued operation and maintenance of the Mississippi River Nine-Foot Channel Project is provided by the River and Harbor Act of July 3, 1930, and the River and Harbor Act of February 24, 1932.

At approximately Upper Mississippi River (UMR) mile 636.5, near Prairie du Chien, the Mississippi River divides into two navigable channels. The easternmost channel, referred to as the East Channel, is about 5,633 meters (18,480 feet) long. It passes by the City of Prairie du Chien and rejoins the main channel at approximately UMR mile 633.0.

The Corps' proposed dredged material disposal site is on the south side of the Highway 18 bridge in Prairie du Chien. The disposal site is bordered on the north by the Highway 18 bridge embankment, on the west by railroad tracks, on the south and east by a bottomland forest area. The area, which has been disturbed by previous activities, is approximately 12,340 m^2 (3.1 acres) in size. Access to the site is good, and beneficial use removal of all dredged material placed on site is expected. The City and local contractors are the presumed users.

Mr. Blair Dillman, president of PS&G, owns the disposal site for material dredged through his land for his project. The site is located just north of the City of Prairie Du Chien, in the Town of Prairie du Chien, along north

Main Street. Known locally as the Swingle site, the site lies along the west side of Marais de St. Feriole Island upstream from the northern point of St. Feriole Island. About half of the site has been cleared of vegetation and has received dredged material from past PS&G operations. Small willows and grasses exist on the uncleared portion of the site. Dredged materials placed at the Swingle site would be used as landfill for industrial development. No beneficial use removal of deposited materials is expected.

Private interests, the City of Prairie du Chien, and the State of Wisconsin support port facility expansion and construction in the vicinity of Prairie du Chien. Port facilities have existed at the north end of St. Feriole Island since the turn of the century and at the City Dock for many years. PS&G began operations at the north end of St. Feriole Island in 1963, and Didion, Inc., began barge loading operations at the City Dock in 1988.

Modifications to both of these facilities in recent years have resulted in the need for numerous Department of the Army permits. The Service entered formal consultation with the Corps under section 7 of the Act and issued a Biological Opinion on one of the permit applications. In that instance, the Service issued a Biological Opinion on March 1, 1991, finding jeopardy to *L. higginsi* for a barge loading conveyor permit application by Didion, Inc., that would have permitted an unrestricted increase in barge shipping in the East Channel. That Biological Opinion determined that unrestricted shipping from City Dock constituted jeopardy to *L. higginsi*, but that 135 barges per year from Didion, Inc., added to City Dock's annual average of 15 non-Didion vessels per year (a total of 150 vessels shipped per year from City Dock), would not jeopardize the species. Shipping at or below the 150 vessels per year from the City Dock to the turning basin of the East Channel would not constitute jeopardy to *L. higginsi*.

Several characteristics of the East Channel -- moderate to high flow, stable substrates, the presence of aquatic vegetation and high water quality -- make it excellent habitat for mussels (Miller and Payne 1990a, Wisconsin DNR 1990). the East Channel border and side channels provide habitat for one of the richest populations of mussels in the Upper Mississippi River (Duncan and Thiel 1983, Havlik and Marking 1980, Holland-Bartels and Waller 1988, Miller and Payne 1986, U.S. Fish and Wildlife Service 1983, Thiel 1981). Historically, 44 species of mussels have been identified from the Prairie du Chien area (Havlik and Stansbery 1977, and references therein). More recent studies indicate that about 32 species of mussels, including the federally listed endangered mussel *L. higginsi*, exist in the East Channel (Wisconsin DNR 1990).

Estimates of mussel densities in the East Channel vary with location. Duncan and Thiel (1983) estimated the average density of mussels in the East Channel to be 31.89 mussels/m^2 (2.96 mussels/ft^2). Miller, Payne, and Hartfield (1984) sampled five sites in the East Channel and reported mussel densities of between 22.4 mussels/m^2 (2.08 mussels/ft^2) and 167.2 mussels/m^2 (15.53 mussels/ft^2). In comparison, mussel densities reported by Duncan and Thiel (1983) for other areas of Pool 10 ranged from 25.8 mussels/m^2 (2.40

mussels/ft^2) in the West Channel to 7.1 mussels/m^2 (0.66 mussels/ft^2) in the lower end of Pool 10.

The East Channel north of the turning basin and the turning basin were dredged by the Corps 1976. In that segment of the East Channel, the number of mussel species is lower, mussel density is lower, and the mussels are smaller than in undredged areas (Miller, Payne, Hornbach, and Ragland 1990, Miller and Payne 1986).

The presence of the federally listed endangered mussel species *L. higginsi* in the East Channel is well documented (Havlik and Stansbery 1977, Kindschi 1980, Thiel 1981, Havlik 1980, U.S. Fish and Wildlife Service 1983, Duncan and Thiel 1983, Holland-Bartels and Waller 1988, and Miller and Payne 1992). Using information gathered from personal observations, published records, and unpublished field notes, Havlik (1991) prepared a map for the Service delineating locations in the East Channel where *L. higginsi* specimens have been collected.

Duncan and Thiel (1983), Miller, Payne, and Hartfield (1984), Holland-Bartels and Waller (1988), Clarke (1991), and Miller and Payne (1992) have gathered quantitative survey data assessing the relative abundance and density of *L. higginsi* populations in the East Channel. Of 1,142 mussels collected by Miller, Payne, and Hartfield (1984) in the East Channel, seven, or 0.61 percent, were *L. higginsi*. Clarke (1991) reported that, of 762 mussels collected in 1990, seven, or 0.92 percent, were *L. higginsi*, while in 1991, 0.80 percent (11 of 1,389) were *L. higginsi*. Miller and Payne (1992) reported that the relative abundance of *L. higginsi* in the turning basin area of the East Channel ranged from 0.00 percent to 1.21 percent from 1984 to 1990, while at a reference site area about 0.8 km downstream of the turning basin, the relative abundance of *L. higginsi* ranged from 0.00 percent to 1.44 percent.

While *L. higginsi* was never reported abundant in its historic range, the relative density of *L. higginsi* in the East Channel is higher than its known density elsewhere. Duncan and Thiel (1983) reported *L. higginsi* densities of 0.172 mussel/m^2 (0.016 mussel/ft^2) while Holland-Bartels and Waller (1988) reported densities of 0.4 mussel/m^2 (0.037 mussel/ft^2). Clarke (1991) sampled four transects in the East Channel and reported *L. higginsi* densities of between 0.133 mussel/m^2 (0.012 mussel/ft^2) and 0.667 mussel/m^2 (0.062 mussel/ft^2). Miller and Payne (1992) monitored mussel populations in the turning basin area of the East Channel and at a reference site about 0.8 km downriver since 1984. Their data indicates that densities of *L. higginsi* in the reference site area as high as 1.4 mussels/m^2 (0.13 mussel/ft^2), with densities of *L. higginsi* in the turning basin area can be as high as 0.6 mussel/m^2 (0.06 mussel/ft^2). The lower turning basin densities may be the result of dredging performed by the Corps in 1976.

In comparison, *L. higginsi* densities reported from a 3-mile portion of the main (west) channel in the Prairie du Chien area were 0.086 mussel/m^2 (0.008 mussel/ft^2), while densities reported in all of Pool 10 were 0.054 mussel/m^2 (0.005 mussel/ft^2) (Duncan and Thiel 1983). The *L. higginsi* of the East Channel comprise the largest known remaining population of this species in

the Mississippi River (U.S. Fish and Wildlife Service 1983). Consequently, the East Channel and a large segment of the main (west) channel from river mile 637.0 to approximately river mile 633.4 are considered essential for the survival and recovery of the *L. higginsi* (U.S. Fish and Wildlife Service 1983).

Using site specific information collected by Clarke (1991), Miller and Payne (1992), and Heath (personal communication 1992), the Corps estimated a mean density of 0.360 *L. higginsi*/m^2 (0.033 mussel/ft^2) for the East Channel north of the Highway 18 bridge, including Sawmill Slough to the southern end of the PS&G operation. The estimated surface area of the portion of this segment of the East Channel greater than 0.9 meter (3 feet) deep is 771,977 m^2 (190 acres). Based on the above information, an estimated 278,200 *L. higginsi* exist below the 3-foot depth contours in the East Channel north of the Highway 18 bridge, including the designated area in Sawmill Slough.

The Corps considers the navigation lanes of the East Channel and Sawmill Slough to be 61 meters (200 feet) wide. Based on density estimates reported in Clarke (1991) and Miller and Payne (1992), 14,784 *L. higginsi* may exist in the 1,460-meter (4,800-foot) navigation lane extending from the main channel to the barge turning basin; 15,245 may exist in the 670-meter (2,200-foot) navigation lane from the barge turning basin to the PS&G's Swingle site; and 34,436 may exist in the 975-meter (3,200-foot) navigation lane between the barge turning basin and the City Dock. The *L. higginsi* densities of these three lanes are estimated to be 0.166 *L. higginsi*/m^2 in the East Channel north of the turning basin, 0.373/m^2 in Sawmill Slough, and 0.579/m^2 in the East Channel between City Dock and the turning basin. The City Dock to turning basin segment is extraordinarily rich in *L. higginsi*; it is the most viable and vital part of the East Channel bed, which is the best *L. higginsi* bed known.

On June 1, 1993, Corps biologists conducted a skimmer dredge and bathymetry survey of the upper end of Sawmill Slough to evaluate the likelihood that PS&G's proposed activities would affect *L. higginsi*. The Corps' report (Corps of Engineers 1993b) indicated that habitat conditions (previous disturbance by past dredging, ongoing barge loading operations, sluggish current, and unfavorable substrate of silt and cobble) were unfavorable for *L. higginsi*. The skimmer dredge results revealed a relatively impoverished mussel community in the PS&G permit site (few individuals of few species). *Lampsilis higginsi* typically occur in habitats occupied by relatively large numbers and high diversity of mussel species. Together, the habitat and mussel survey information indicate that the areas affected by the PS&G permit are unlikely to support *L. higginsi*.

Commercial Harvests of Mussels

Mussels are commercially harvested in the East Channel and the two main methods of commercial mussel harvest are brailing and diving. Diving is by far the most-used method in the East Channel (Heath, personnel communication, 1993). Brailing is relatively non-selective for species and size; a "crows-foot" device of numerous wire hooks or tines is dragged across the bottom substrate, and mussels contract around the tines of the crows-foot. Diving

can be more selective for both species and size, depending on the experience and abilities of the divers. However, divers must remove mussels from their positions in the substrate to assess their size and species, which results in disturbance and displacement of the mussel. In the following analysis, it is assumed that mussels harvested from the East Channel are initially collected (lifted from the substrate) by divers in a nonselective manner for both species and size.

Since 1986, commercial mussel harvest data for the Upper Mississippi River has been collected by the Wisconsin DNR (Welke 1992a). This information indicates that the gross commercial harvest (in pounds of shell) of washboard mussels (*Megalonaias gigantea* = *M. nervosa*) and threeridge mussels (*Amblema plicata*) remained fairly constant between 1986 and 1991. While the harvest of washboard mussel shells has declined over this time period, the harvest of threeridge shells has increased. Since 1986, the mean combined poundage of threeridge and washboard shells harvested had been approximately 970,000 pounds annually. In 1986 approximately 970,000 pounds of mussel shells were harvested, a number representative of the harvest since 1986.

An estimated 450,000 mussels (threeridge and washboard) were harvested from Pool 10 of the Upper Mississippi River in 1986. Experts believe that the harvest in pool 10 has declined since 1986 (Welke 1992b), therefore, the 450,000 mussel estimate may overstate the present long-term harvest from Pool 10. Estimates of mussels harvested from the East Channel are as high as 20 percent of the Pool 10 total, or 90,000 mussels. Of this total, approximately 29 percent, or 26,000 mussels, are threeridge mussels, while the remainder are mostly washboard mussels. Population estimates of threeridge mussels in the East Channel indicate that about 1 in 10 is of legally harvestable size (66.7 mm or 2 5/8 inches) (Welke 1992a). Therefore, approximately 260,000 threeridge would need to be handled to obtain a legal harvest of 26,000 mussels.

The community composition of mussels in the East Channel, as sampled by Miller and Payne (1992) since 1984, indicates that threeridge mussels comprise about 50 percent of the mussels in the East Channel. Thus, to handle the 260,000 threeridge mussels necessary for the 26,000 threeridge harvest, approximately 520,000 mussels of all species would need to be collected and checked from the East Channel. *Lampsilis higginsi* comprises about 0.75 percent of the total population of mussels in the East Channel (Miller and Payne 1992). Therefore, of the estimated 520,000 mussels handled, about 3,900 would be *L. higginsi*. It is illegal to harvest *Lampsilis higginsi*, so specimens collected during commercial clamming operations must be returned, unharmed, to the water.

Data from mussel relocation studies suggests that mussel relocation generally results in high mortality. Imlay (1972) states, "It would appear that regulations for commercial clammers to toss back undersized mussels or mussels that are protected as endangered species may accomplish little because the mussels in question have been artificially displaced and are not expected to necessarily regain a viable posture in the substrate." Imlay's conclusion was based mainly on observations of commercial harvest by

brailing. Brailing is only moderately size-selective and removes mussels from the bottom substrate.

Diving is the principle method of commercial mussel harvest in the East Channel. Although divers remove mussels that are too small from the substrate, they can generally estimate whether the size of the mussels they are collecting is legal before bringing the mussels to the surface. Therefore, most mussels that too small and are removed from the substrate are left on the bottom, which probably increases the survival of the unharvested mussels.

Using this rationale, the Corps assumed that 10 percent of the mussels that are collected during commercial clamming operations perish even if they are promptly returned to the substrate (U.S. Army Corps of Engineers 1993a). No studies have reported the mortality associated with the return of non-commercial or sub-legal mussels by commercial clammers, so the 10 percent figure is speculative. If the 10 percent figure is applied to the estimated number of *L. higginsi* that are annually handled by commercial clammers and returned to the river bed, an estimated 390 of the 3,900 sub-legal *L. higginsi* handled and replaced would perish each year in the East Channel. Over a 40-year period, an estimated 15,600 *L. higginsi* would be destroyed in the East Channel in the course of commercial mussel harvest.

Zebra Mussels

In 1991, the first zebra mussels (*Dreissena polymorpha*) in the Upper Mississippi River were reported in Pool 8 near La Crosse, Wisconsin. Since then, zebra mussels have been observed at Locks and Dams Nos. 2, 3, 4, 5, 5A, 6, 8, 9 and 10, and at the Upper St. Anthony Falls Dam. In October 1992, zebra mussels were observed attached to native mussels in Pool 10, near Clayton, Iowa, just downstream of the East Channel. The first reports of zebra mussels in the East Channel also occurred in October 1992. Zebra mussels were observed attached to native mussels harvested from the East Channel by commercial clammers. Zebra mussels were also observed attached to wing dams in the East Channel.

Zebra mussels spread via passive drift of immatures (called "veligers") on river currents and through the transport of adults on movable substrates, such as boat hulls. Zebra mussels affect other mussels by competing for food and by attaching to the other mussels in such numbers that the infested mussel cannot travel or burrow, nor can it open or close properly. Zebra mussels can build up on a native mussel in such numbers that, even if the infested mussel does bury naturally, wave and current action may pull on the exposed zebra mussels and pull the attached native mussel out of the bottom. Any of these impacts or combination of impacts can lead to the death of the infested mussel.

In Lakes Erie and St. Clair, where zebra mussels have existed for several years, native mussel populations have been devastated, and in some areas of both lakes, eradicated (Masteller and Schloesser 1991, Gillis and Mackie 1991). However, the extent of infestation in a riverine environment and the impacts of zebra mussels on native mussels in the Upper Mississippi River are

unknown at this time. Conceivably, a heavy zebra mussel infestation in the East Channel could devastate the mussel resources of the East Channel, mooting the impacts of dredging and navigation. However, if the impacts of zebra mussels are moderate, the increased stress on mussel resources could be added to the impacts of dredging and increased navigation activity. It is impossible to assess the impacts of zebra mussels on mussel populations in the East Channel at this time.

Previous Federal Activities in the Action Area

Lampsilis higginsi populations have been affected by dredging in the East Channel in the past. Havlik and Marking (1980) examined dredged material deposited on an upland site after Corps dredging in the East Channel in 1976. They documented the presence of an extremely rich mussel assemblage, including 175 *L. higginsi*, that had been destroyed by Corps' dredging. However, they did not calculate a total number of *L. higginsi* that had been adversely affected by this dredging operation.

Twice since 1976, the Service has determined that dredging or unlimited navigation in the East Channel was likely to jeopardize the continued existence of *L. higginsi*. To avoid the likelihood of jeopardy, shipping from the City Dock is effectively limited to 150 barges per year (the pre-Didion, Inc., average of 15 barges per year plus the 135 barges per year allowed by the March 1, 1991, Service Biological Opinion on a Corps permit issued to Didion, Inc.).

The proposed disposal site for materials dredged from Cuts 1 and 2 is an upland area; use of this area for dredged material disposal would have no affect on *L. higginsi*. The Swingle site is also an upland area that has received fill materials in the past. Use of this site for dredged material disposal would likewise have no affect on *L. higginsi*.

Effects of the Proposed Action

Despite many studies of the mussel fauna of the East Channel of the Mississippi River at Prairie du Chien, Wisconsin, specific information on the distribution, relative abundance, status, and trends of *L. higginsi* is still limited. During the course of the interagency coordination on this proposed action, the Service had to make several assumptions to compensate for this limited information. In all instances, these assumptions are based on the best scientific and commercial data available. The assumptions are:

1. The mean density of *L. higginsi* reported in the barge turning basin area is representative of *L. higginsi* densities in that portion of the East Channel north of the barge turning basin to the main channel.

2. *L. higginsi* densities of between 0.133 mussel/m^2 (0.012 mussel/ft^2) and 1.4 mussels/m^2 (0.13 mussel/ft^2) have been reported for the river bottom in the immediate vicinity of the City Dock (Clarke 1991, Miller and Payne 1992). If Clarke's (1991) and Miller and Payne's (1992) estimates of *L. higginsi* densities in this portion of the East Channel are averaged, a mean density estimate of 0.579 *L. higginsi*/m^2 (0.054

mussel/ft^2) results. Several site-specific density estimates are included in the mean density estimate. The Service is using this mean density to estimate *L. higginsi* densities in the East Channel north of the Highway 18 bridge to the barge turning basin.

3. The navigation traffic level in Sawmill Slough is similar to levels in the East Channel north of the barge turning basin. Observations by David Heath (personal communication 1992) indicate that habitat conditions in Sawmill Slough are intermediate between conditions in the East Channel north of the barge turning basin and conditions in the East Channel between the City Dock and the barge turning basin. To reflect the lower quality of these environmental conditions, the Service assumes that mussel densities in Sawmill Slough are intermediate between densities found in the East Channel north of the barge turning basin (0.166 mussel/m^2 which was obtained by averaging density estimates from existing databases) and densities found in the East Channel between the City Dock and the barge turning basin (0.579 mussel/m^2). The mean of these two densities is 0.373 mussel/m^2.

4. Research by Downing and Downing (1992) on spatial aggregation of freshwater mussels indicates that many mussel populations are not significantly aggregated within their habitat. The research shows that unionid mussel populations are aggregated less frequently than other benthic taxa. Only 53 percent of the mussel populations observed were significantly aggregated. Also, for mussel populations occurring at higher spatial densities, the frequency of aggregation was much greater than for populations occurring at lower densities. Compared to densities of other mussels in the East Channel, densities of *L. higginsi* are low. The Service assumes that *L. higginsi* individuals are not significantly aggregated in the East Channel, but that their distribution is random. Accordingly, the Service assumes that site specific density estimates of *L. higginsi* in habitat types in the East Channel can be applied to, and are representative of, larger sections of similar habitat type in the East Channel.

5. The area of the East Channel that is greater than 0.9 meter (3 feet) in depth will be considered the area of suitable *L. higginsi* habitat.

6. Below a minimum density, mussel populations are unable to sustain themselves. Populations of mussels are normally not observed below densities of 0.02 mussel/m^2 (0.002 mussel/ft^2) (Miller 1992). In high quality habitats (including the East Channel) where density estimates have been calculated for *L. higginsi*, reported densities range between 0.2 mussel/m^2 (0.019 mussel/ft^2) and 0.6 mussel/m^2 (0.056 mussel/ft^2) (Duncan and Thiel 1983, Cawley 1984, Miller and Payne 1992). A conservative estimate of the minimum density necessary for *L. higginsi* populations to remain viable would be the lower end of this range, or 0.2 mussel/m^2 (0.019 mussel/ft^2). Therefore, the Service assumes that a density of 0.2 mussel/m^2 represents the minimum density criterion of a high quality *L. higginsi* population. The overall *L. higginsi* density

of the East Channel exceeds the minimum density criterion indicative of a high quality population and a minimum density of 0.2 mussel/m^2 should be maintained to ensure that a viable, self-sustaining population remains in the East Channel.

7. Based on past dredging events and current levels of navigation, the East Channel north of the Highway 18 bridge can be divided into three distinct sections: (1) the section between the Highway 18 bridge and the barge turning basin. This section has not been dredged since construction of the City Dock in the 1950s and barge traffic in this portion of the East Channel is lower than in portions of the East Channel north of the barge turning basin; (2) the section between the barge turning basin and the main channel that was dredged extensively in 1976. Barge traffic in this portion of the channel is 3 to 5 times higher than in the section from the City Dock to the barge turning basin; and (3) the upper portion of the section between the barge turning basin and the PS&G's Swingle site that has been extensively dredged for sand and gravel in the past. Barge traffic in this section of the East Channel is similar to that from the barge turning basin to the main channel, about 3 to 5 times higher than from the City Dock to the barge turning basin.

8. The Service assumes that newly-dredged areas will provide mussel habitats similar to those of the areas dredged by the Corps in 1976. Therefore, based on Miller and Payne's (1992) observations, the Service assumes that, following dredging, dredge cut areas will be recolonized by *L. higginsi* in 8 to 12 years. The recolonized areas will support *L. higginsi* densities of approximately 0.166 mussel/m^2 (mean density reported in the barge turning basin since 1984).

9. Density estimates of *L. higginsi* have been collected at sites in each of these sections of the East Channel. The estimates vary substantially for each section of the East Channel. Based on assumption 1, site specific estimates of densities of *L. higginsi* in habitat types in the East Channel can be applied to larger sections of the East Channel.

10. Using site specific information collected by Clarke (1991) and Miller and Payne (1992) and general observations made by Heath (personal communication to Corps 1992), an estimated mean *L. higginsi* density of 0.360 mussels/m^2 (0.033 mussel/ft^2) is calculated for the East Channel area north of the Highway 18 bridge, including Sawmill Slough to the southern end of the PS&G operation. The estimated surface area of this segment of the East Channel which is deeper than 0.9 meter (3 feet) is 771,977 m^2 (190 acres).

11. The assessment of impacts to mussels, including *L. higginsi*, will be limited to the portion of the East Channel north of the Highway 18 bridge, including Sawmill Slough, because (1) little information is available concerning mussel resources south of the Highway 18 bridge, and few mussel density estimates are available, and (2) it is anticipated that project activity and major impacts to mussel resources

will occur in the portion of the East Channel north of the Highway 18 bridge.

12. A population of 278,200 *L. higginsi* is estimated to exist in the East Channel north of the Highway 18 bridge, including the designated area in Sawmill Slough.

13. To date, no studies have reported a general decline in numbers of *L. higginsi* in the East Channel. Nevertheless, the East Channel surveys do not report enough immature *L. higginsi* to sustain the population. The low numbers of immature *L. higginsi* could indicate impending population decline or it could be consistent with a pattern common in surveys of other mussel species that appeared to have insufficient numbers of immature mussels to sustain populations, even in populations where the adult population level has been stable for years. When asked about the effects of low numbers of immature mussels in the *L. higginsi* of the East Channel, Miller, personal communication, 1993; Thiel, personal communication, 1993, and Waller, personal communication, 1993; stated that present survey techniques tend to miss the smaller immature mussels and, therefore, reports of insufficient immatures do not indicate impending population decline. In the absence of other evidence of *L. higginsi* decline in the East Channel, the Service assumes that the *L. higginsi* population of the East Channel is stable.

Direct Effects

The Endangered Species Act of 1973, as amended, provides that, in assessing the "reasonably foreseeable" effects of proposed actions, a conservative approach be taken. For this analysis, overall mean densities and mean population sizes were estimated based on recent site-specific density measurements. The use of mean densities rather than maximum densities for estimating take and population size is a more conservative approach. "Take" as defined by the Act, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." With maximum densities, the "take" of individuals is much larger, but the effect appears to be smaller because use of the maximum density results in a larger estimate of population size. Large populations are generally more resilient (*i.e.*, better able to absorb and recover from losses) than small populations. The use of mean densities results in a lower overall "take" estimate, but the projected effect on the estimated population is greater because of the smaller, less resilient, estimated population size.

The Service assumes that newly-dredged areas will have habitat characteristics similar to those of the areas dredged by the Corps in 1976. Therefore, based on Miller and Payne's (1992) observations, after dredging the dredge cut areas will be recolonized by *L. higginsi* to densities of approximately 0.166 mussel/m^2 (mean density reported in the barge turning basin since 1984) in 8 to 12 years. The Service also assumes that the estimated *L. higginsi* density of 0.166/m^2 in Cut 1 will be regained in 8 to 12 years following dredging.

Dredging is likely to affect *L. higginsi* in several ways -- the physical trauma of being dredged will kill some individual mussels, being cast up on shore will kill others, and being buried or suffocated under disturbed sediment as a consequence of the dredging will kill more.

Past dredging in the East Channel is discussed in the Environmental Baseline section. One of the East Channel segments that may need dredging is Cut 1, which is at the north end of the East Channel. Dredging Cut 1 would remove approximately 30.5 m X 137 m, or 4,180 m^2 (44,980 ft^2) of substrate. Applying the estimated mean density of 0.166 *L. higginsi*/m^2 (from assumption No. 3), a one-time dredging could destroy 694 (0.166 mussel/m^2 X 4,180 m^2) *L. higginsi*.

The second channel segment that may need dredging is Cut 2, in the East Channel at the City Dock. Dredging Cut 2 would remove approximately 30.5 m X 107 m, or 3,264 m^2 (35,128 ft^2) of bottom substrate. Applying the estimated mean density of 0.579 *L. higginsi*/m^2, approximately 1,810 *L. higginsi* (0.579 mussel/m^2 X 3,264 m^2) could be destroyed by one dredging of Cut 2, with a second take of 542 (0.166 *L. higginsi*/m^2 X 3,264 m^2) *L. higginsi* occurring when the second anticipated dredging of Cut 2 is performed. The *L. higginsi* population of Cut 2, if the species repopulates the cut to 0.166/m^2 following dredging, will be 0.166/m^2 X 3,264 m^2, or 542 individuals, an effective reduction of 1,348 *L. higginsi* from the pre-dredging estimate of 1,890 *L. higginsi* individuals in Cut 2. The effective reduction in *L. higginsi* constitutes a reduction of approximately 3.9 percent of the estimated *L. higginsi* population in the City Dock to turning basin navigation lane.

No channel dredging is proposed for Sawmill Slough in connection with the PS&G permit application because present Sawmill Slough channel depths are sufficient for the anticipated barge traffic. The proposed dredging for barge access is through an upland area for barge access. Prairie Sand and Gravel's proposed dock construction and bank protection would occur in areas of unsuitable *L. higginsi* habitat, and no direct effects to *L. higginsi* have been identified.

For the 40-year term of the channel maintenance plan, Corps dredging could result in an effective take of approximately 1,348 of the estimated 278,200 *L. higginsi* in Sawmill Slough and in the East Channel north of the City Dock.

The proposed disposal site for material that would be dredged from Cuts 1 and 2 and from the PS&G permit are upland areas (described in the above Environmental Baseline section); placement of dredged material on these sites would have no impact on *L. higginsi* numbers.

Indirect Effects

Commercial barge traffic is projected to increase in Sawmill Slough and between the turning basin and the north end of the East Channel as an indirect (post-construction activity) effect of the proposed action. Increased navigation traffic would impose stresses on mussels within the slough and channel. Potential adverse effects to mussels as a result of

commercial traffic include physiological stress from increased turbidity (including possible resuspension of contaminants in the sediment), turbulence, current changes, increased water velocities, and from physical injury caused by contact with moving barge hulls and with towboat propellers. A spill of a hazardous or toxic substance could threaten the entire mussel fauna in large portions of the East Channel.

Fish species that serve as mussels' glochidial hosts may avoid areas heavily traversed by commercial traffic, and thereby reduce the likelihood of recolonization in these areas. Any adverse effects from increased navigation would negatively affect the growth and survival of the vulnerable juvenile mussels, resulting in long-term negative population impacts to the mussel community.

The Service expects navigation and chronic exposure to barge traffic to decrease the life expectancy, reproductive success, nutrition, growth, and general health of *L. higginsi* in the action area. These effects are expected to result from repeated interruption and suspension of the mussels' feeding, repeated exposure of the mussels' gills and feeding structures to polluted or unpolluted sediments stirred up by barge passage, and repeated dislocation of mussels from the sediment by the wash of towboat propellers. For example, Payne, *et al.* (1985) found that cyclic increases in water velocity and turbulence at a level and frequency that can be caused by routine navigation traffic led to reduced feeding rates and slightly increased reliance on endogenous and nonproteinaceous energy reserves; continuous or near-continuous disruption, such as might be associated with barge fleeting activities, caused virtually complete reliance on endogenous energy reserves. Sparks and Blodgett (1988) reported that growth rates of most river mussel species they studied were lower in barge fleeting areas than in areas where barges were not fleeted. Additional adverse effects could occur if substances harmful to the mussels, such as barge fuel or harmful cargo, entered the project area water from the shore facilities or from the barges.

The adverse effects of navigation would be greatest on mussels in an area extending outward from the middle of the main navigation lane. The effects of increased navigation activities (*e.g.*, increased exposure to suspended solids and to current reversals) would extend to areas outside the main navigation routes; however, the Service believes that the most significant adverse effects would be on organisms within the 61-meter (200-foot) navigation lane. Based on density estimates reported in Clarke (1991) and Miller and Payne (1992), 14,784 *L. higginsi* may exist in the 1,460-meter (4,800-foot) navigation lane that extends from the main channel to the turning basin, 15,245 in the 670-meter (2,200-foot) navigation lane from the turning basin to the PS&G/Swingle site, and 34,436 in the 975-meter (3,200-foot) navigation lane between the turning basin and the City Dock.

The potential effects of navigation traffic on mussels have been described, but the actual effects of navigation traffic on mussel populations have not been clearly documented, in part because no long-term, chronic effects studies have been published. Anecdotal information exists, however. For example, much more traffic traverses the West Channel of the Mississippi River than traverses the East Channel. *Lampsilis higginsi* densities in the

West Channel are about half of those reported in the East Channel (Duncan and Thiel 1983). Habitat differences between the East and West Channels may account for much of the difference in mussel densities, but differing levels of navigation traffic may also be a causal factor. It is likely that increased navigation in the East Channel would negatively affect mussel populations, although the extent of this effect is unclear. Increased navigation traffic in the East Channel might not reduce mussel densities to those found in the West Channel (a 50-percent reduction) because of the better habitat quality in the East Channel, but the effect of increased navigation traffic in the East Channel would not be negligible.

Miller and Payne (1992) and Clarke (1991) have monitored mussel populations in the East Channel for several years to assess the effects of commercial navigation traffic on mussel populations. Since 1984, Miller and Payne (1992) have monitored mussel populations in the turning basin area of the East Channel and at a reference site relatively unaffected by vessel movement (barges going to and from the Didion, Inc., operation at the City Dock have passed over this site since 1988) about 0.8 km (0.5 mile) downriver. They report that from 1984 to 1991, mean mussel densities in the reference area ranged from 68.5 mussels/m^2 (6.36 mussels/ft^2) to 149.1 mussels/m^2 (13.85 mussels/ft^2) while mean densities in the turning basin area ranged from 22.0 mussels/m^2 (2.04 mussels/ft^2) to 48.6 mussels/m^2 (4.52 mussels/ft^2). The lower mussel densities observed in the turning basin area are believed to have been caused by channel maintenance operations (dredging) conducted by the Corps in 1976. From 20 to 50 percent of the mussels observed in the turning basin area showed evidence of physical damage from waterborne traffic. However, after approximately 8 years of monitoring, Miller and Payne (1992b) reported no changes in mussel densities that they related to the particular traffic levels that existed during their study.

Clarke (1991) sampled four of the East Channel sites in 1990 and 1991; three traversed by commercial barges and one similar area not traversed by barges. He reported densities of 9.5 mussels/m^2 (0.88 mussel/ft^2) to 52.0 mussels/m^2 (4.83 mussels/ft^2) in the control area and densities of 34.9 mussels/m^2 (3.24 mussels/ft^2) to 53.2 mussels/m^2 (4.94 mussels/ft^2) in the three areas traversed by barges. Clarke (1991) examined mussels in front of the City Dock and in navigation lanes to the City Dock. He reported that 1.1 percent of the mussel shells collected in these areas were chipped, cracked, or scraped. He concluded that barge traffic in the areas he examined in the East Channel caused little physical damage to the shells of live mussels. He proposed that brailing activities, rather than commercial navigation traffic, was possibly responsible for more physical damage to mussels.

In contrast, Miller and Payne (1992b) reported that 20 to 50 percent of the mussels in the barge turning basin showed evidence of physical damage. However, water depths are shallower and traffic levels are greater in the barge turning basin than in front of the City Dock. Barges in the barge turning basin are more likely to scrape the bottom and cause damage to mussel shells. Vessel-caused shell damage is typically not uniformly distributed throughout the channel, but is a localized, site-specific phenomenon where vessels operate in relatively confined parts of waterways, shallow areas, near-shore areas, or areas where vessels are maneuvering sharply with periods

of full, or near-full, power. Clarke (1991), based on 2 years of studies in the East Channel, reported no acute (as opposed to chronic) navigation affects on mussel densities at the levels of traffic that occurred during his study.

The Wisconsin DNR prepared a draft Environmental Impact Statement (State EIS) on a proposal by Didion, Inc., to increase barge shipments from the City Dock. The State EIS contains the State's analysis of effects associated with movement of an unlimited number of barges from the City Dock through the East Channel. The State EIS provides a thorough review of the potential impacts of navigation traffic on mussels. Expansion of the PS&G facility would increase navigation through only the northern one-third of the East Channel, but adverse effects to mussels in this reach would be similar to those described in the State EIS. The State EIS warns of chronic adverse effects to mussels in the East Channel as a result of increased barge traffic; however, it does not estimate effects on *L. higginsi* populations. Similarly, the Service, in its March 1, 1991, Biological Opinion on the Didion, Inc., permit application, determined that unlimited navigation was likely to jeopardize the *L. higginsi* population in the project area and stipulated a limit of 135 barges per year from City Dock above City Dock's average level of 15 vessels departing per year as a reasonable and prudent alternative to avoid the likelihood of jeopardy.

The proposed action is likely to result in increased barge traffic in Sawmill Slough and in the East Channel north of the turning basin. It would also result in increased near shore barge traffic at the proposed PS&G permit sites (St. Feriole Island and Swingle site) in Sawmill Slough. In 1991, 230 loaded barges left the PS&G facility, while 131 loaded barges departed from City Dock. In 1991, 511,984 tons of grain were shipped from the ports at Prairie du Chien (Lester 1992). The Wisconsin Department of Transportation (DOT), using information from industry sources, indicated that if improvements were made in harbor loading facilities, if increased loading sites were provided, and if temporary storage sites were provided, the tonnage of grain passing through Prairie du Chien could easily double in the next few years. For shipments of salt, fertilizer, and coal, Wisconsin DOT (Glaze and Krikelas 1990) estimated an annual growth rate of 0.4, 1.5, and 1.0 percent, respectively. Using these data, an estimated 1.2 million tons of commodities could be shipped yearly through Prairie du Chien for the next 10 to 25 years. A loaded barge can hold about 1,500 tons of material; therefore, nearly 800 loaded barges would be required per year to move the estimated tonnage of commodities from Prairie du Chien, a 220-percent increase in loaded barge traffic.

Studies by Clarke (1991) and Miller and Payne (1992) reported no detected *acute* effects to mussel resources at current levels of barge traffic. The Corps has concluded, and the Service concurs, that an increase of up to 220 percent in barge traffic in the East Channel would have a negative *chronic* effect on mussels, including the federally listed endangered *L. higginsi*. The adverse effects of increased navigation traffic, except effects associated with spills of hazardous materials, which are covered elsewhere in this Biological Opinion, would primarily affect mussels in and adjacent to the navigation lanes.

Three distinct navigation lanes exist in the East Channel: (1) main channel to the barge turning basin; (2) turning basin to the City Dock; and (3) the turning basin to the PS&G/Swingle site. With the proposed action, project-related traffic increase would pass to and from the main channel to the turning basin to the PS&G/Swingle site, a distance of about 2,100 meters (7,000 feet). The proposed action would not increase traffic between the turning basin and City Dock because traffic from the PS&G site would be in Sawmill Slough and in the East Channel north of the turning basin.

The Corps' January 1993 BA for this project identified 30.5-meter (100-foot) wide cuts that would be dredged within the 61-meter (200-foot) wide navigation lanes and estimated that within the East Channel and Sawmill Slough navigation lanes, a 220-percent increase in barge traffic would result in up to a 20-percent reduction in the number of *L. higginsi* as a result of chronic perturbations over a 40-year period. This would result in a chronic depression of approximately 6,001 *L. higginsi* from the combined population of Sawmill Slough and from the East Channel north of the turning basin (15,245 *L. higginsi* in Sawmill Slough + 14,800 *L. higginsi* from the turning basin to north end of the East Channel = 30,045 *L. higginsi*. Twenty percent of 30,045 = 6,009 *L. higginsi*).

Cumulative Effects of the Proposed Action

Cumulative effects include the effects of future State, local, or private actions that will not be subject to endangered species consultation in the area being considered the Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section if they would require a separate consultation pursuant to section 7 of the Act. Relevant future actions in the present project area are primarily associated with commercial navigation traffic.

Present channel conditions (depth and width), do not limit traffic between City Dock and the turning basin (nor between the turning basin and the PS&G sites). The proposed Corps dredging is to maintain unrestricted navigation from the north end of the East Channel to the City Dock, and present Corps' authorities for operating and maintaining Federal harbors and navigation channels (as distinct from Corps permit authority) does not limit traffic in those facilities. As discussed in the Environmental Baseline section, the federally permitted shipping level from City Dock is effectively capped at 150 barges per year (135 of the 150 being permitted to Didion, Inc.) in accordance with the jeopardy Biological Opinion issued by the Service for the Didion, Inc. permit.

The present Corps proposal would allow unlimited shipping in the critical segment of the East Channel from the City Dock to the turning basin, and a significant shipping increase there could result. The Service's Biological Opinion of March 1, 1991, on the permit application of Didion, Inc., determined that unlimited barge shipping from City Dock was likely to jeopardize the continued existence of *L. higginsi*. That Biological Opinion also concluded that 135 barges per year shipped by Didion, Inc., from City Dock was not likely to jeopardize the continued existence of the *L. higginsi*.

This determination implicitly recognized that other large vessel traffic that did not require a Corps permit was also taking place from City Dock at a level of approximately 15 barges (or equivalent vessels) per year, which, when added to Didion Inc's. 135 barges per year, totaled 150 per year. The present nonjeopardy level of approximately 150 barges per year from City Dock is largely utilized by Didion, Inc., in its permit to ship 135 barges per year. The proposed project would provide for the continuation of current traffic levels between City Dock and the turning basin, and it would facilitate and allow an increase in commercial traffic to occur between City Dock and the turning basin. The Service must assume, given that shipping might increase by 220 percent, that the current nonjeopardy level of shipping between City Dock and the turning basin might be exceeded, with no mechanism available to prevent resulting impacts and jeopardy to *L. higginsi*. In evaluating the likelihood of jeopardy posed by the project, the Service recognizes that an increase in unregulated shipping may also occur between the turning basin and the PS&G permit areas in Sawmill Slough.

A spill of hazardous materials could have disastrous effects on mussel populations in the East Channel. A large spill of salt or fertilizer could destroy a large number of mussels. The number of *L. higginsi* that could be lost as a consequence of a spill cannot be predicted, but would depend on such unquantifiable factors as where in the East Channel the spill occurred, the amount and substance spilled, the effectiveness of any spill containment and cleanup effort, river stage, and on additional unquantifiable factors. The Service will propose restrictions on the commodities that can be shipped, spill prevention measures, and spill response measures to reduce or eliminate the potential for spills.

Biological Opinion

Based on an evaluation of the direct, indirect, and cumulative effects of the proposed action on *L. higginsi* in the action area, the Service concludes that the action is likely to adversely affect this mussel. The adverse effects would be the consequence of: (1) dredging Cuts 1 and 2; (2) the identified navigation increase in Sawmill Slough and in the East Channel north of the turning basin; and (3) continued and potentially increased, unrestricted navigation between the turning basin and City Dock.

The Service believes that the proposed action is likely to jeopardize the continued existence of *L. higginsi*. This conclusion is based on the Service's assessment of the project in light of information on *L. higginsi's* East Channel and rangewide population size, distribution, and status. The project would reduce the *L. higginsi* population in the East Channel north of the Highway 18 bridge, including Sawmill Slough. That reduction would occur preponderantly and disproportionally in the navigation lane between City Dock and the turning basin, the segment that contains the highest estimated density of *L. higginsi* in the East Channel. The turning basin to the City Dock segment is the vital premier core of the larger East Channel *L. higginsi* bed, which is the largest and healthiest of the known remaining *L. higginsi* beds. The threat of unrestricted increased shipping over the

L. higginsi between City Dock and the turning basin constituted jeopardy for Didion, Inc., and it is the basis for the jeopardy determination for the present project.

In view of evidence that mussel populations and conditions in the Upper Mississippi River may be generally declining and in view of the possibility that sparsely occupied *L. higginsi* sites rangewide may slip below maintenance densities, the Service considers it imperative for the security of the species and for its recovery that the vital core remnant of the bed between City Dock and the turning basin not be further degraded, compromised, or threatened. The project's proposed Cut 2 dredging and likely increased shipping between City Dock and the turning basin would degrade and threaten the most vital part of the East Channel *L. higginsi* population. Accordingly, the Service believes that the proposed action reduces the likelihood of *L. higginsi* survival and recovery.

Reasonable and Prudent Alternatives

Section 7(b)(3)(A) of the Act requires the Service to include reasonable and prudent alternatives that avoid the likelihood of jeopardy, if any are available, whenever the Service issues a jeopardy Biological Opinion. Accordingly, the Service believes that a reasonable and prudent alternative to the project as proposed would be to:

- Suspend navigation channel maintenance dredging in proposed dredge Cut 2.

- Include hazardous material spill prevention and response conditions as specified below in any Army permit granted to PS&G.

- Monitor the shipping from the Federal harbor at City Dock; reinitiate formal Endangered Species Act of 1973 (as amended) section 7 consultation with the Service if shipping exceeds 135 permitted and 15 incidental barges per year.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to carry out conservation programs that benefit endangered or threatened species. Conservation measures are actions that can minimize or avoid adverse effects on listed species or critical habitat beyond the level necessary to avoid the likelihood of jeopardy. To help the Corps meet this responsibility, the Service recommends the following conservation measures:

1. Deauthorize the present Federal harbor at City Dock and the Federal navigation channel between the turning basin and City Dock.

2. Reactivate and pursue the Prairie du Chien 107 harbor study to find an alternative to City Dock that meets local needs in the Prairie du Chien area.

3. Fund further laboratory investigations into both acute and chronic (long-term) effects of commercial navigation on *L. higginsi*.

4. Fund searches for five viable reproductive populations (the first delisting criterion in the Recovery Plan) and fund the monitoring of three other "Essential Habitat" mussel populations as part of the Upper Mississippi River-Illinois Waterway System Navigation Study, which is being initiated by the St. Louis, Rock Island, and St. Paul Districts of the Corps.

Incidental Take Statement

Section 9 of the Act prohibits any taking of listed species without special exemption. Sections 7(b)(4) and 7(o)(2) exempt taking that is incidental to, but not an intended part of, an agency's action from the prohibitions of section 9, as long as that taking complies with this Incidental Take Statement. The measures described below are nondiscretionary and must be implemented by the action agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the section 7(o)(2) exemption to apply.

A. Level of Incidental Take

The reasonable and prudent alternative is likely to result in incidental take from increased barge traffic in Sawmill Slough and in the East Channel north of the turning basin and from dredging Cut 1. The incidental take can be expressed as the anticipated decrease in the *L. higginsi* population that will result from the dredging and from the navigation increase.

The Service expects that during a 40-year project life, the *L. higginsi* population of the East Channel turning basin to the main channel segment would be reduced from the present estimated population of 61,300 to an estimated 58,348. This is an anticipated *L. higginsi* density reduction from $0.166/m^2$ to $0.133/m^2$ in the navigation lane, from $0.166.m^2$ to $0.158/m^2$ for the entire segment. This impact would result from dredging Cut 1 and from the barge traffic increase in the 61 m X 1,460 m navigation lane.

The Service expects that during a 40-year project life, the *L. higginsi* population of Sawmill Slough between the turning basin and the permit sites will be reduced from the present estimated population of 29,450 to 26,401 due to increased navigation impacts. This is an anticipated *L. higginsi* density reduction of $0.373/m^2$ to $0.298/m^2$ in the navigation lane, from $0.373/m^2$ to $0.344/m^2$ for the entire segment. This impact would result from the barge traffic increase in the 61 m X 670 m navigation lane.

The Service expects the total 40-year project life impact on *L. higginsi* in Sawmill Slough and in the East Channel north of the turning basin to be a population reduction from the estimated current population of 278,200 to an estimated 272,200 due to the effects of dredging Cut 1 and increased barge traffic in 2,160 m of 61-meter wide navigation lane.

The anticipated take of *L. higginsi*, or of any other federally listed threatened or endangered species, that would occur at an alternate Prairie du Chien Federal harbor location will be determined when the site is selected, the project described, and the biological studies completed.

B. Reasonable and Prudent Measures to Avoid or Minimize Take.

The Service believes the following reasonable and prudent measures are necessary to minimize the take of *L. higginsi*:

1. Monitor *L. higginsi* densities in Sawmill Slough and in the East Channel north of the turning basin for 10 years after the PS&G permit is issued, if permit is issued, and between City Dock and the turning basin until alternative Prairie du Chien Federal harbor is constructed and commissioned.

2. No hazardous commodities are to be loaded or unloaded at the Corps-permitted PS&G facility or by subsequent or additional users of the permitted facility. The permittee will be required to have a spill prevention and contingency plan approved by the Service and the Wisconsin DNR.

3. Determine the annual level of shipping from City Dock each year, in barges loaded and unloaded at City Dock. Reinitiate consultation with the Service if shipping to and from City Dock exceeds 135 permitted and 15 incidental barges per year.

C. Terms and Conditions to Minimize Impacts of the Incidental Taking.

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures outlined above:

1. Determine at 2-year intervals for 10 years after the PS&G permit is issued the *L. higginsi* densities in the navigation lanes and in the areas beside the navigation lanes within the 3-foot depth contours in Sawmill Slough and in the East Channel north of the turning basin. Sample sites and transects should be selected, insofar as possible, to repeat previous mussel surveys. Results of the surveys should be provided to the Service within 90 days of survey completion.

   Provide the results of *L. higginsi* density surveys for the duration of the Federal channel and harbor between City Dock and the turning basin. The density surveys are to be conducted at 2-year intervals in the East Channel within the navigation lane and beside the navigation lane within the 3-foot contours and from the turning basin to City Dock.

   Results of the surveys should be provided to the Service within 90 days of survey completion.

2. Include as a condition in any PS&G permit that only coal, fertilizer, grains, salt, sand, gravel, and inert materials may be loaded and

unloaded. The permittee will be required to have a spill prevention and contingency plan approved by the Service and the Wisconsin DNR.

3. Provide the Service by March 30 of each year a report of the number of barges departing Prairie du Chien City Dock in the preceding navigation season.

D. Reinitiation of Consultation

If traffic from the City Dock to the turning basin exceeds 135 permitted and 15 incidental barges per year, the Corps must reinitiate consultation with the Service. If surveys reveal a statistically significant decline in *L. higginsi* densities in the navigation lanes of Sawmill Slough or the East Channel north of the turning basin below Corps-projected post projected densities (*i.e.*, below 0.133 *L. higginsi*/m^2 in the navigation lane of the East Channel north of the turning basin, below 0.298/m^2 in the navigation lane of Sawmill Slough, or below 0.466/m^2 in the navigation lane between City Dock and the turning basin), the Corps must reinitiate consultation with the Service to avoid violating section 9 of the Act.

If there is a spill in the project area, the Corps must notify the Service within 24 hours after it receives notice of the spill, and must request that consultation be reinitiated.

As part of the information to reinitiate consultation, the Corps should provide an explanation of the circumstances and cause(s) of the take, if known.

If any of the above stipulated contingencies occur, the Corps must contact the Service to determine if actions associated with the action must be stopped and to determine if formal consultation must be reinitiated. The Service will evaluate the effects of the action on listed species or critical habitat and may provide a new incidental take statement. As part of the information package to reinitiate consultation, the Corps should provide an explanation of the causes of the taking.

Opportunities for Further Consultation

This concludes formal consultation on your proposed navigation and permit activities in the East Channel of the Mississippi River in the vicinity of Prairie du Chien, Wisconsin. The Corps is required to reinitiate formal consultation with the Service if: (1) new information reveals effects on listed species or critical habitat that were not considered in this Biological Opinion; (2) the action is modified in a manner that affects listed species or critical habitat that were not considered in this Biological Opinion; or (3) a new species is listed or if critical habitat is designated that may be affected by the action.

The BA indicated no date for the commencement of the Corps navigation maintenance dredging element of the project because channel conditions are dynamic and uncertain. A year or more may pass before dredging becomes necessary. As a consequence of that delay, we anticipate that changes in the

environmental baseline, including *L. higginsi*, will occur; that additional information on *L. higginsi*, and other pertinent channel features, will be published; and that changes in project specifications will occur. We, therefore, earnestly suggest that the Corps contact the Service before commencing any maintenance dredging in the East Channel if more than 1 year transpires between the date of this Biological Opinion and the intended commencement of dredging. The Service will then review the environmental baseline, published reports, and the latest Corps dredging plans to determine with the Corps if formal section 7 consultation needs to be reinitiated.

Literature Cited

Baker, F.C. 1905. The molluscan fauna of McGregor, Iowa. Transactions of the St. Louis Academy of Science 15:249-256.

Burky, A.J. 1983. Physiological ecology of freshwater bivalves. *In*: The Mollusca, Vol. 6, Ecology. K.M. Wilbur, ed. Academic Press; New York.

Cawley, E.T. 1984. Report of mussel survey of high quality beds, pools 17, 18, 19 UMR. Endangered Species Research - Higgins' Eye Pearly Mussel, Environmental Research Center, Loras College; Dubuque, Iowa.

Clarke, A.H. 1991. Results of the nineteen ninety-one mussel monitoring program in the Mississippi River at Prairie du Chien, Wisconsin. A report prepared for Didion, Inc., McFarland, Wisconsin, by A.H. Clarke, EcoSearch, Inc.; Portland, Texas. 44 pp.

Coker, R.E. 1919. Freshwater mussels and mussel industries of the United States. Bulletin of the Bureau of Fisheries 36:13-89.

Cooper, C.M. 1984. The freshwater bivalves of Lake Chicot, an oxbow of the Mississippi in Arkansas. Nautilus 98:142-145.

Downing, J.A. and W.L. Downing. 1992. Spatial aggregation, precision, and power in surveys of freshwater mussel populations. Canadian Journal of Fisheries and Aquatic Sciences 49:985-991.

Duncan, R.E. and P.A. Thiel. 1983. A survey of the mussel densities in pool 10 of the Upper Mississippi River. Technical Bulletin No. 139, Department of Natural Resources, P.O. Box 7921, Madison, Wisconsin 53707. 14 pp.

Gillis, P.L. and G.L. Mackie. 1991. The effect of the exotic zebra mussel (*Dreissena polymorpha*) on native bivalves (Unionidae) in Lake St. Clair. Presented at the 1991 Electric Utility Zebra Mussel Control Technology Conference.

Glaze, J. and A. Krikelas. 1990. An evaluation of the economic benefits associated with shipping through the port of Prairie du Chien. Wisconsin Department of Transportation, Bureau of Policy Planning and Analysis. 43 pp.

Havlik, M.E. 1980. The historic and present distribution of the endangered naiad mollusk *Lampsilis higginsi* (Lea, 1857). Bulletin of the American Malacological Union for 1980:19-22.

_____. 1991. Documentation of available data: *Lampsilis higginsi* (Lea, 1857), Prairie du Chien, Crawford County, Wisconsin, Area, Mississippi River, River Mile 628 to 646, 1972-1990. Prepared for the U.S. Fish and Wildlife Service, Region 3. Malacological Consultants, 1603 Mississippi Street, La Crosse, Wisconsin 54601.

_____ and D.H. Stansbery. 1977. The naiad mollusks of the Mississippi River in the vicinity of Prairie du Chien, Wisconsin. Bulletin of the American Malacological Union for 1977:9-12.

_____ and L.L. Marking. 1980. A quantitative analysis of naiad mollusks from the Prairie du Chien, Wisconsin, dredge material site on the Mississippi River. Bulletin of the American Malacological Union for 1980:30-34.

Holland-Bartels, L.E. and D.L. Waller. 1988. Aspects of the life history of the endangered Higgins' Eye Pearly Mussel, *Lampsilis higginsi* (Lea, 1857). U.S. Fish and Wildlife Service, National Fisheries Research Center, P.O. Box 818, La Crosse, Wisconsin 54602. 187 pp.

Heath, D. 1992. Personal communication to Corps.

_____. 1993. Personal communication by telephone to Mr. Charles G. Kjos, U.S. Fish and Wildlife Service, May 5, 1993.

Kat, P.W. 1984. Parasitism and the Unionacea (Bivalva). Biological Review 59:189-207.

Kindschi, G.A., ed. 1980. A compendium of mollusk (naiad) surveys taken from the Upper Mississippi River and major tributaries. United States Department of the Interior, Fish and Wildlife Service, Office of Endangered Species, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111.

Lester, M.J. 1992. Personal communication (letter) to Mr. Bluhm, PD-ES, Army Corps of Engineers, April 15, 1992.

Machena, C. and N. Katusky. 1988. A quantitative diving survey of benthic vegetation and fauna in Lake Kariba, a tropical man-made lake. Freshwater Biology 19:1-14.

McMahon, R.F. 1991. Mollusca: bivalva. Pp. 315-399. *In* J.H. Thorp and A.P. Covich (eds.). Ecology and classification of North American freshwater invertebrates. Academic Press, Inc.; New York, New York.

Masteller, E.C. and D.W. Schloesser. 1991. Infestation and impact of zebra mussels on the native unionid population at Presque Isle State Park, Erie, PA. Presented at the 1991 Electric Utility Zebra Mussel Control Technology Conference.

Miller, A.C. 1992. Personal communication to Corps.

_____. 1993. Personal communication by telephone to Mr. Charles G. Kjos, U.S. Fish and Wildlife Service, February 10, 1993.

_____ and B.S. Payne. 1976. An assessment of mussel community and population structure at a dredged site in the Upper Mississippi River. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

_____ and _____. 1986. Community characteristics and demography of bivalves in the Mississippi River near Prairie du Chien, Wisconsin, 1984-85. U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Mississippi 39180. 27 pp. + figures.

_____ and _____. 1990a. *Comments on*: Environmental impact statement on a proposal to increase barge shipment from the city dock in Crawford County, Wisconsin, and an analysis of alternative commercial harbor sites in the Prairie du Chien area. Prepared by the Wisconsin Department of Natural Resources, 31 August 1990. Unpublished report.

_____ and _____. 1990b. The effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: 1990 studies. Technical Report EL 91, U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, P.O. Box 631, Vicksburg, Mississippi 39180. 51 pp. + appendices.

_____ and _____. 1991. Effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: 1989 studies. Technical Report EL-91-3. U.S. Army Engineer Waterways Experiment Station; Vicksburg, Mississippi.

_____ and _____. 1992. A summary of studies on freshwater mollusks in the the East Channel of the Upper Mississippi River conducted by the U.S. Army Engineer Waterways Experiment Station, 1984-1990. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

_____, _____, and P.D. Hartfield. 1984. A mussel study at Prairie du Chien, Wisconsin, 1-4 October 1984. U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Mississippi. 13 pp. + appendices.

_____, _____, D.J. Hornbach, and D.V. Ragland. 1990. Physical effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: phase I studies. Technical Report EL-90-3, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Naimo, T.J. 1993. Personal communication to Mr. Charles G. Kjos, U.S. Fish and Wildlife Service, April 9, 1993.

O'Neill, C.R., Jr. and D.B. MacNeill. 1991. The zebra mussel (*Dreissena polymorpha*): an unwelcome North American invader. New York Sea Grant, Cornell Cooperative Extension; Brockport, New York.

Payne, B.S., Aldridge, D.W., and Miller, A.C. 1985. The effects of cyclic exposure to turbulence and suspended solids on three species of freshwater Unionacean clams. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Salmon A. and R.H. Green. 1983. Environmental determinants of unionid clam distribution in the Middle Thames River, Ontario. Canadian Journal of Zoology 61:832-838.

Sparks, B.S. and Blodgett, K.D. 1988. Effects of fleeting on mussels. PL 88-309, Project No. 1-5-39667. Illinois Natural History Survey; Havana, Illinois.

Stern, E.M. 1983. Depth distribution and density of freshwater mussels (Unionidae) collected with scuba from the lower Wisconsin and St. Croix Rivers. Nautilus 97:36-42.

Thiel, P.A. 1981. A survey of unionid mussels in the Upper Mississippi River (pools 3 through 11). Technical Bulletin No. 124, Department of Natural Resources, Madison, Wisconsin. 24 pp.

_____. 1993. Personal communication by telephone to Mr. Charles G. Kjos, U.S. Fish and Wildlife Service, February 3, 1993.

U.S. Army Corps of Engineers. 1993a. Biological Assessment of the Impacts on federally Listed Threatened and Endangered Species from Channel Maintenance Activities and a Permit application the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin. Environmental Resources Branch, U.S. Army Engineer District, St. Paul, Minnesota. ii + 25 pp.

_____. 1993b. Mussel Survey, Prairie Sand and Gravel, Inc./Swingle Site, East channel at Prairie du Chien, Wisconsin. Environmental Resources Branch, U.S. Army Engineer District, St. Paul, Minnesota. 7 pp.

U.S. Fish and Wildlife Service. 1983. Higgins' Eye Mussel Recovery Plan. Fish and Wildlife Reference Service, 1776 E. Jefferson St., 4th Floor, Rockville, Maryland 20852. ix + 98 pp.

_____. 1992. Special report of the Fishery Management Program: zebra mussel response plan. Unpublished report prepared by the Fishery Resources Office; Winona, Minnesota.

Waller, D.L. 1993. Personal communication by telephone to Mr. Charles G. Kjos, U.S. Fish and Wildlife Service, February 9, 1993.

_____ and L.E. Holland. 1987. Fish hosts for glochidia of the endangered freshwater mussel, *Lampsilis higginsi* (Pelecypoda: Unionidae). Unpublished paper prepared for the National Fisheries Research Center, U.S. Fish and Wildlife Service; LaCrosse Wisconsin.

Way, C.M., A.C. Miller, and B.S. Payne. 1990. The influence of physical factors on the distribution and abundance of freshwater mussels. (Bivalva: Unionacea) in the lower Tennessee River. Nautilus 103: 96-98.

Welke, K. 1992a. A 10-year re-evaluation of mussel densities and populations in pool 10, Upper Mississippi River. Wisconsin Department of Natural Resources, Prairie du Chien, Wisconsin.

_____. 1992b. Personal communication to Corps.

Wisconsin Department of Natural Resources. 1990. Environmental impact statement on a proposal to increase barge shipment from the city dock in Crawford County, Wisconsin, and an analysis of alternative commercial harbor sites in the Prairie du Chien area. Wisconsin Department of Natural Resources, Bureau of Environmental Analysis and Review, Box 7921, 101 South Webster Street, Madison, Wisconsin 53707. 61 pp.

10.4 APPENDIX D

U.S. ARMY CORPS OF ENGINEER'S

BIOLOGICAL ASSESSMENT

JANUARY 1993

BIOLOGICAL ASSESSMENT OF THE IMPACTS ON FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES FROM CHANNEL MAINTENANCE ACTIVITIES AND A PERMIT APPLICATION TO CONSTRUCT AND EXPAND BARGE TERMINAL FACILITIES IN THE EAST CHANNEL OF THE UPPER MISSISSIPPI RIVER AT PRAIRIE DU CHIEN, WISCONSIN

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CONVERSION FACTORS, NON-SI TO SI UNITS OF MEASUREMENT

Non-SI units of measurement used in this report can be converted to SI units as follows:

Multiply	By	To Obtain
feet	0.3048	meters
square feet	0.092903	square meters
cubic yards	0.76455	cubic meters
acres	4,047	square meters
miles	1.609	kilometers

Biological Assessment of the Impacts on Federally Listed Threatened and Endangered Species From Channel Maintenance Activities and a Permit Application to Construct and Expand Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin

I. INTRODUCTION

In August, 1992, the U.S. Fish and Wildlife Service requested that the U.S. Army Corps of Engineers, St. Paul District, initiate consultation pursuant to Section 7 of the Endangered Species Act regarding the following proposed actions in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin: 1) channel maintenance activities (dredging) and 2) construction/expansion of a barge loading facility. Consultation includes preparing a biological assessment of the impacts of the proposed actions on threatened or endangered species.

The Higgins' eye pearly mussel (Lampsilis higginsi) and the bald eagle (Haliaeetus leucocephalus), species listed by the Federal Government as endangered and threatened, respectively, occur in the East Channel area. The following species listed as threatened or endangered could also occur in the general area: gray bat (Myotis grisescens), Indiana bat (Myotis sodalis), American peregrine falcon (Falco peregrinus), piping plover (Charadrius melodus), least tern (Sterna antillarum), Iowa Pleistocene snail (Discus macclintocki), Karner blue butterfly (Lycaeides melissa samuelis), northern wild monkshood (Aconitum noveboracense), Mead's milkweed (Asclepias meadii), Minnesota trout lily (Erythronium propullans), dwarf lake iris (Iris lacustris), prairie bush-clover (Lespedeza leptostachya), Fassett's locoweed (Oxytropis campestris var. chartacea), eastern prairie fringed orchid (Platanthera leucophaea) and western prairie fringed orchid (Platanthera praeclara).

This document evaluates the potential impacts of channel maintenance activities and harbor construction/expansion on these species. In the Corps of Engineers' opinion none of the species listed above, except L. higginsi, would be affected by the proposed projects.

II. BACKGROUND

The East Channel of the Mississippi River at Prairie du Chien, Wisconsin, is a portion of the Mississippi River Nine-Foot Channel Project (figure 1). The Corps of Engineers is responsible for maintaining navigable depths in the East Channel through operation and maintenance activities (dredging). Authority for continued operation and maintenance of the Mississippi River Nine-Foot Channel Project is provided by the River and Harbor Act of 3 July 1930 and the River and Harbor Act of 24 February 1932.

Continued operation and maintenance of this project has increased interest in port facility development and expanded navigation activity. Private interests, the City of Prairie du Chien, and the State of Wisconsin are supporting port facility expansion/construction in this area. A rail spur has long existed to serve port facilities at the city dock. Port facilities have existed at the north end of St. Feriole Island since the turn of the century and at the city dock for many years. Prairie Sand and Gravel, Inc. began operations at the north end of St. Feriole Island in 1963, while Didion, Inc. began barge loading operations at the city dock in 1988. In recent years, modifications to both facilities have resulted in the need for numerous Department of the Army permits. In accordance with Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act (33 U.S.C. 1344), the Corps of Engineers is charged with issuing permits to: 1) perform work in or affecting navigable waters of the United States and 2) discharge dredged or fill material in waters of the United States, respectively.

III. PROJECT DESCRIPTION

The St. Paul District has formulated a long-term operation and maintenance plan for the East Channel. Figure 1 identifies a navigation corridor in the East Channel that would be maintained for commercial navigation. The corridor extends from the main channel of the Mississippi River to the city dock in the Federal harbor in Prairie du Chien. The East Channel south of the Highway 18 bridge is not considered part of the Nine-foot Channel project; therefore, no navigation corridor is proposed in this channel section.

No specific channel dimensions are provided in the authorizing legislation for the Prairie du Chien commercial harbor. The authorizing document (HD 71-81-1) implies access to the harbor is available via the East Channel. Therefore, the East Channel must be maintained to provide access to the commercial harbor and the associated city dock. We believe a minimum 100-foot wide channel at least 9 feet deep should be maintained in the East Channel to ensure access to the harbor. To ensure these channel dimensions, the Corps of Engineers would conduct surveys of the East Channel at intervals of approximately three years or upon request of project users. If surveys indicated channel widths were less than 200 feet between the 9-foot contours, a closer review and evaluation would be initiated to determine if dredging would be necessary to maintain a 100-foot wide channel.

Hydrographic surveys have been conducted in the East Channel periodically since 1976. Generally, these surveys indicate a 200-foot wide channel has always been present between the 9-foot contours. The most recent survey, conducted in 1992, indicates at minimum a 250-foot wide channel, and generally a 300(+)-foot wide channel, is available between the 9-foot contours. For most areas of the East Channel we believe a 200-foot wide channel is self-maintaining between the 9-foot contours. Because of these natural channel conditions and the level and type of navigation, dredging requirements are expected to be low.

Shoaling of bottom substrates does occur in areas of the East Channel navigated by commercial traffic. For navigation to continue in the East Channel, shoal areas need to be dredged periodically to remove materials which have been deposited and threaten to block navigation lanes. Dredging estimates are based on existing conditions, past conditions, hydraulic characteristics, anticipated levels of commercial barge traffic and professional judgment. An accurate projection of future dredging requirements is not possible, however, for planning and evaluation purposes a prediction of the most probable future is needed.

While the most recent hydrographic surveys indicate dredging is not required immediately in the East Channel, in our professional judgment two areas -- in the northern end of the East Channel (Cut 1; figure 1) and immediately in front of the city dock (Cut 2; figure 1) -- would require dredging at some time in the future.

It is very difficult to estimate dredging frequency. However, in our professional judgment dredging would be required in Cut 1 only once in the 40-year period of the channel maintenance plan (2.5% frequency). Assuming a cut width of 30.5 meters (100 feet), a length of 137 meters (450 feet) and an average face of 0.46 meter (1.5 feet), an estimated quantity of 1,922 m^3 (2,500 cubic yards) of dredged material would be removed from Cut 1. About 4,180 m^2 (44,980 ft^2) of bottom substrate surface would be disturbed in this cut.

The Federal commercial harbor has not required maintenance dredging since its construction in 1958. However, in our professional judgment, dredging would be required two times in the next 40 years (7.5% frequency) to provide access to the city dock. Assuming a cut width of 30.5 meters (100 feet), a length of 107 meters (350 feet) and an average face of 0.45 meters (1.5 feet), an

estimated quantity of 1,450 m^3 (1,900 cubic yards) of dredged material would be removed from Cut 2 during each dredging event. About 3,264 m^2 (35,000 ft^2) of bottom substrate surface would be disturbed in this cut. The total estimated dredging quantity from Cut 2 for the 40-year term of the channel maintenance plan is 2,905 m^3 (3,800 cubic yards).

Dredged materials from both cuts would be placed at an upland location immediately south of the Highway 18 bridge embankment (figure 1). The proposed placement site is approximately 12,540 m^2 (3.1 acres) in size and has been previously disturbed by placement of dredged materials and construction of the Highway 18 bridge. The site is small; therefore, dredged materials would be transported and placed on site mechanically. The shoreline adjacent to the site is steep. Access to the site would be provided at a location about 400 feet downstream of the bridge where the shoreline slope is more gradual. Some clearing of trees would be necessary to access the site.

The site is bounded on the south and east by floodplain forest, on the north by the Highway 18 bridge embankment and on the west by the Chicago, Milwaukee, St. Paul and Pacific (CMSPP) railroad tracks. Berming the area would not be required unless dredged materials had a high concentration of silt.

Upland access to the site is very good, and beneficial use removal of all materials placed on site is expected. The City of Prairie du Chien owns the site and anticipates needing material for beneficial use elsewhere.

The St. Paul District has received a permit application from Mr. Blair Dillman, owner of Prairie Sand and Gravel, Inc. (PS&G), to expand his barge loading operation, located on St. Feriole Island, by developing his property on the mainland, known as the Swingle site (figure 1). Barge traffic to and from the Prairie Sand and Gravel, Inc. docks passes through the northern portion of the East Channel, navigating through both Sawmill Slough and the barge turning basin area. Expanded operations at the PS&G/Swingle sites would increase levels of barge traffic navigating through the northern portion of the East Channel. The permit applicant has indicated no dredging will be necessary in Sawmill Slough to maintain navigable depths.

IV. AFFECTED ENVIRONMENT

At approximately Upper Mississippi River (UMR) mile 636.5, near Prairie du Chien, Wisconsin, the Mississippi River divides into two navigable channels. The easternmost channel, referred to as the East Channel, is about 5,633 meters (18,480 feet) long and passes by the City of Prairie du Chien, rejoining the main channel at approximately UMR mile 633.0.

The notable characteristics of the East Channel -- moderate to high flows, stable substrates, aquatic vegetation and high water quality -- make this area excellent habitat for freshwater mussels (Miller and Payne, 1990a; Wisconsin Department of Natural Resources, 1990). The East Channel, particularly its main channel, main channel border, and side channel areas, provides habitat for one of the richest populations of mussels in the Upper Mississippi River (Duncan and Thiel, 1983; Havlik and Marking, 1980; Holland-Bartels and Waller, 1988; Miller and Payne, 1986; Stern et al., 1982; Thiel, 1981). Historically, 44 species of freshwater mussels have been identified from the Prairie du Chien area (Havlik and Stansbery, 1977, and references therein). Recent studies indicate about 32 species of freshwater mussels, including the Federally listed endangered mussel L. higginsi, exist in the East Channel (Wisconsin Department of Natural Resources, 1990).

Estimates of mussel densities in the East Channel vary with location. Duncan and Thiel (1983) estimated an average density of 31.89 mussels/m^2 (2.96 mussels/ft^2). Miller, Payne and Hartfield (1984) sampled five sites in the East Channel and reported mussel densities of between 22.4 mussels/m^2 (2.08 mussels/ft^2) and 167.2 mussels/m^2 (15.53 mussels/ft^2). For comparative

purposes, mussel densities reported by Duncan and Thiel (1983) from other areas of Pool 10 ranged from 25.8 mussels/m^2 (2.40 mussels/ft^2) in the West Channel to 7.1 mussels/m^2 (0.66 mussels/ft^2) in the lower end of Pool 10.

In the northern portion of the East Channel, where dredging was conducted by the Corps of Engineers in 1976, the number of mussel species is relatively low, the density of mussels is lower, and the mussels are smaller than in other undisturbed areas (Miller, Payne, Hornbach and Ragland, 1990; Miller and Payne, 1986).

The presence of the endangered freshwater mussel species L. higginsi in the East Channel is well documented (Havlik and Stansbery, 1977; Kindschi, 1980; Thiel, 1981; Havlik, 1980; Stern et al., 1982; Duncan and Thiel, 1983; Holland-Bartels and Waller, 1988; Miller and Payne, 1992). Using information gathered from personal observations, published records, and unpublished field notes, Havlik (1991) prepared a map for the U.S. Fish and Wildlife Service delineating locations in the East Channel where L. higginsi specimens have been collected.

Duncan and Thiel (1983), Miller, Payne and Hartfield (1984), Holland-Bartels and Waller (1988), Clarke (1991), and Miller and Payne (1992) have gathered quantitative survey data assessing the relative abundance and density of L. higginsi populations in the East Channel. Of 1,142 mussel specimens collected by Miller, Payne and Hartfield (1984) in the East Channel, seven (0.61 percent) were L. higginsi individuals. Clarke (1991) reported that, of 762 mussel specimens collected in 1990, seven (0.92 percent) were L. higginsi individuals, while in 1991, 0.80 percent (11 of 1,389) were L. higginsi. Miller and Payne (1992) reported the relative abundance of L. higginsi in the turning basin area of the East Channel ranged from 0.00 percent to 1.21 percent from 1984 to 1990, while at a reference site area about 0.8 km downstream of the turning basin, the relative abundance of L. higginsi ranged from 0.00 percent to 1.44 percent.

While L. higginsi was never abundant in its historic range, the relative density of L. higginsi in the East Channel is high compared to other habitats. Duncan and Thiel (1983) reported an L. higginsi density of 0.172 mussel/m^2 (0.016 mussel/ft^2) while Holland-Bartels and Waller (1988) reported a density of 0.4 mussel/m^2 (0.037 mussel/ft^2). Clarke (1991) sampled four transects in the East Channel and reported L. higginsi densities of between 0.133 mussel/m^2 (0.012 mussel/ft^2) and 0.667 mussel/m^2 (0.062 mussel/ft^2). Miller and Payne (1992) have monitored mussel populations in the turning basin area of the East Channel and at a reference site about 0.8 km downriver since 1984 (figure 1). Their data indicates L. higginsi densities in the reference site area can be as high as 1.4 mussels/m^2 (0.13 mussel/ft^2), while densities of L. higginsi in the turning basin area can be as high as 0.6 mussel/m^2 (0.06 mussel/ft^2). The lower densities reported from the barge turning basin area are believed to be the result of Corps of Engineers' dredging operations conducted in 1976.

In comparison, the L. higginsi density reported from a 3-mile portion of the main (west) channel in the Prairie du Chien area was 0.086 mussel/m^2 (0.008 mussel/ft^2), while the density reported in all of Pool 10 was 0.054 mussel/m^2 (0.005 mussel/ft^2) (Duncan and Thiel, 1983). The population of L. higginsi in the East Channel is the largest known remaining population of this species in the Mississippi River (Stern et al., 1982). Consequently, the Higgins' Eye Mussel Recovery Team recommended the East Channel and a large segment of the main (west) channel from river mile 637.0 to approximately river mile 633.4 be classified as "essential habitat" for the recovery and eventual removal of L. higginsi from the Federal Endangered Species list (Stern et al., 1982).

The East Channel area provides potential breeding habitat for the Federally listed threatened bald eagle (Haliaeetus leucocephalus) and the Federally listed endangered peregrine falcon (Falco peregrinus). Bald eagle nest sites are known to exist several miles upstream of the East Channel area and a few

miles downstream of the East Channel area. No nesting sites for either the bald eagle or the peregrine falcon are known to exist in the immediate East Channel area.

The East Channel also provides suitable wintering habitat for bald eagles. Eagles are often observed roosting in streamside trees, floating on ice floes during spring thaw, and soaring overhead in the East Channel area.

An additional 15 species of mammals, invertebrates, and plants identified as threatened or endangered could be found in the East Channel area. However, no documentation exists of the presence of these species in the East Channel area. It is unlikely the proposed operation and maintenance and harbor expansion projects in the East Channel would affect any of these species.

The site proposed for placement of materials dredged from Cuts 1 and 2 is located on the south side of the Highway 18 bridge in Prairie du Chien (figure 1). The site has been previously disturbed by placement of materials dredged from the East Channel and by construction of the Highway 18 bridge. Soils on site are relatively sandy and support little vegetation. With the exception of a few trees, some shrubs and grasses the site is unvegetated.

The placement site is bordered by the Highway 18 bridge embankment on the north, a bottomland/floodplain forest on the south and east, and the CMSPP Railroad tracks on the west. An access corridor through the floodplain forest would be necessary to move dredged materials from transport barges to the placement site. The area disturbed by previous activities is approximately 12,540 m^2 (3.1 acres) in size. Overland access to the site is very good, and beneficial use removal of all material placed on site is expected. The City of Prairie du Chien would be the primary user.

V. BIOLOGICAL EFFECTS

The following discussion of impacts is for the proposed alternative (Alternative 1) of continued operation and maintenance to the Federal harbor at the city dock and granting the permit to allow harbor development/expansion at the PS&G/Swingle site.

1. IMPACTS TO BALD EAGLES AND OTHER THREATENED AND ENDANGERED SPECIES WITH THE EXCEPTION OF *Lampsilis higginsi*.

a. Dredging and Disposal

The impacts of channel maintenance activities on bald eagles and other Federally listed threatened and endangered species, excluding *L. higginsi*, in the East Channel area are limited. Potentially, these species could be disturbed by the noise and activity associated with dredging; however, these impacts would be minimal. Dredging operations would be conducted in main channel areas of the East Channel and would have minimal or negligible impact on bald eagles, peregrine falcons or other threatened or endangered species that may inhabit the East Channel area.

The proposed disposal site for materials dredged from Cuts 1 and 2 is a heavily disturbed upland area, providing little or no habitat for any endangered or threatened species. Some clearing of trees and shrubs would be necessary to provide access to the site, however, this is not expected to impact any threatened or endangered species. Use of this area for dredged material disposal would have no impact on any threatened or endangered species.

The Swingle site is also a heavily disturbed area that has received fill materials in the past. Development of this site, including placement of additional fill materials, would have no impact on any threatened or endangered species.

b. Increased Navigation

The impacts of increased navigation activities in the East Channel on bald eagles and other non-naiad threatened and endangered species would be minimal. Increased activity and noise levels in the East Channel could cause minor disturbances to nesting bald eagles in the spring; however, this impact would be minimal.

c. Cumulative Impacts

The cumulative impacts of operation and maintenance activities and increased navigation activities on bald eagles and other non-naiad endangered or threatened species would be minimal. No long-term negative impacts to these species are anticipated as a result of the proposed activities.

2. IMPACTS TO Lampsilis higginsi POPULATIONS IN THE EAST CHANNEL.

Several assumptions have been made and conclusions reached, based primarily on professional judgment, in the following discussion of impacts on L. higginsi populations in the East Channel. These assumptions are critical to the final determination of impacts; therefore, throughout this document, these assumptions are numbered and printed in bold lettering to alert the reader.

Research on spatial aggregation of freshwater mussels indicates many freshwater mussel populations are not significantly aggregated within their habitat with unionid mussel populations aggregated less frequently than other benthic taxa (Downing and Downing, 1992). Only 53 percent of the mussel populations observed were significantly aggregated. Also, for mussel populations occurring at higher spatial densities, the frequency of aggregation was much greater than for populations occurring at lower densities. Compared to densities of other mussels in the East Channel, L. higginsi densities are low. **1) We assume L. higginsi individuals are not significantly aggregated in the East Channel, but that their distribution is random.** We recognize habitat suitable for L. higginsi colonization in the East Channel is limited to those areas with appropriate depths, substrate types, current velocities, etc. **2) Therefore, only areas of the East Channel with depths greater than 0.9 meter (3 feet) will be considered as suitable habitat.** In addition, the East Channel has been stratified into distinct zones based on habitat conditions, including past disturbances by dredging and commercial navigation activity (see assumption 4 below).

Spatial density has an ecological meaning when considering mussel populations. Below some minimum density, freshwater mussel populations are unable to sustain themselves. Populations of freshwater mussels are normally not observed below densities of 0.02 mussel/m^2 (0.002 mussel/ft^2) (Miller, 1992). In higher quality habitats (including the East Channel) where density estimates have been calculated for L. higginsi, reported densities generally range between 0.2 mussel/m^2 (0.019 mussel/ft^2) and 0.6 mussel/m^2 (0.056 mussel/ft^2; Duncan and Thiel, 1983; Cawley, 1984; Miller and Payne, 1992). A conservative estimate of the minimum density necessary for L. higginsi populations to remain viable would be the lower end of this range, or 0.2 mussel/m^2 (0.019 mussel/ft^2). **3) We assume a density of 0.2 mussel/m^2 represents the minimum density necessary for a population of L. higginsi to be considered "high quality."** A minimum density of 0.2 mussel/m^2 should be maintained to ensure a viable, self-sustaining population of L. higginsi remains in the East Channel.

Based on past dredging events and current levels of navigation activity, the East Channel north of the Highway 18 bridge can be divided into three distinct zones:

1) The section between the Highway 18 bridge and the barge turning basin has not been dredged since construction of the city dock in the 1950's.

Navigation traffic in this portion of the East Channel is much lower than in the East Channel north of the barge turning basin.

2) The section between the barge turning basin and the main channel was dredged extensively in 1976. Navigation traffic in this portion of the channel is 3 to 5 times higher than from the city dock to the barge turning basin.

3) The upper portion of Sawmill Slough (figure 1), between the barge turning basin and the Swingle/PS&G site, has been extensively dredged for gravel and sand in the past. Levels of navigation traffic in Sawmill Slough are similar to those found in the barge turning basin to the main channel; about 3 to 5 times higher than from the city dock to the barge turning basin.

Density estimates of L. higginsi have been collected at sites in each of these sections of the East Channel. The estimates vary substantially for each section of the East Channel. **4) Based on assumption 1, we assume site specific estimates of spatial densities of L. higginsi in identified zones in the East Channel can be applied to, and are representative of, larger sections of the East Channel.**

Council on Environmental Quality (CEQ) regulations (40 CFR, 1502.22) and the Endangered Species Act of 1973 (16 USCA, 1531 - 1544) suggest that, in assessing the "reasonably foreseeable" impacts of proposed actions, a conservative approach be taken. For the purposes of this analysis, overall mean densities and mean population sizes were estimated based on recent site specific density measurements. The use of mean densities rather than maximum densities for estimating take and population size is a more conservative approach. "Take" as defined by the Endangered Species Act of 1973 means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct". With maximum densities, the "take" of individuals is much larger, but the overall impact is less significant because of the larger estimate of population size obtained using a maximum density. Larger populations are more resilient (i.e., better able to absorb losses). The use of mean densities results in a lower overall "take" estimate, but the projected impact on the estimated population is much greater because of the smaller estimated population size (i.e., less resilient).

Using site specific information collected by Clarke (1991) and Miller and Payne (1992) and general observations made by Heath (1992), a mean density of 0.360 L. higginsi/m^2 (0.033 mussel/ft^2) is estimated for the East Channel area north of the Highway 18 bridge, including Sawmill Slough to the southern end of the PS&G operation (figure 1). The estimated surface area of this segment of the East Channel which is greater than 0.9 meter (3 feet) deep is 771,977 m^2 (190 acres). The following assessment of impacts to mussel species will be limited to this portion of the East Channel for two reasons. First, little information is available concerning mussel resources south of the Highway 18 bridge; few estimates of mussel densities are available. Second, it is anticipated the major impacts to mussel resources will occur in this portion of the East Channel. Based on the assumptions stated above, a base population of 278,200 L. higginsi is estimated to exist in the East Channel north of the Highway 18 bridge, including the Sawmill Slough area.

a. Dredging and Disposal

Dredging results in the direct physical removal of freshwater mussel species from dredge cut locations, normally resulting in death. In addition, increased turbidity levels, resuspended pollutants, and direct coverage by settling sediments produced during the dredging process can adversely affect freshwater mussel species in the immediate vicinity of the dredge cut.

Following dredging, bottom substrates in dredge cuts are often unstable or shifting for some time, providing poor habitat for recolonization of these

areas by mussels (Burky, 1983). Also, the habitat conditions existing after dredging may not be suitable for use by fish host species, further delaying recolonization efforts.

L. higginsi populations have been affected by dredging in the East Channel in the past. Havlik and Marking (1980) examined dredged material deposited on an upland site after the Corps of Engineers' dredging operations in the East Channel in 1976. They documented the presence of an extremely rich freshwater mussel assemblage, including collection of 175 specimens of L. higginsi, which had been destroyed by the Corps' dredging operations. However, they did not attempt to calculate a total "take" of L. higginsi from this dredging operation.

The U.S. Fish and Wildlife Service (FWS) has recognized that impacts related to commercial navigation on endangered mussel species can be significant. Twice since 1976, the FWS has determined dredging or unlimited navigation in the East Channel could jeopardize the continued existence of L. higginsi.

Figure 1 identifies the areas proposed for dredging in the East Channel. Maps prepared by Havlik (1991) for the FWS indicate several known locations of L. higginsi specimens would be directly affected by dredging.

Dredging Cut 1, in the northern end of the East Channel, would disturb approximately 4,180 m^2 (44,980 ft^2) of bottom substrate. Miller and Payne (1992) have monitored mussel populations in the barge turning basin area of the East Channel for several years. Dredging by the Corps of Engineers in 1976 removed large numbers of mussels from the barge turning basin area; however, some recolonization of this area by freshwater mussels, including L. higginsi, has occurred. In some years, no L. higginsi individuals have been collected, while in other years L. higginsi densities as high as 0.6 mussel/m^2 (0.056 mussel/ft^2) have been reported. The average mean density of L. higginsi in the barge turning basin site since 1984 is 0.166 ($\pm$ 0.22) mussel/m^2 (0.015 mussel/ft^2). Little site specific density information is available for the area of the East Channel north of the barge turning basin to the main channel. **5) We assume the mean density of L. higginsi reported in the barge turning basin area is representative of L. higginsi densities in the East Channel between the barge turning basin and the main channel.** Conditions in this area are similar to those in the barge turning basin area in reference to current navigation activity and past dredging events. Preliminary estimates of dredging needs indicate dredging would be necessary in the northern 137 meters (450 feet) of the East Channel corridor. A one-time dredging operation in Cut 1 could destroy 694 (0.166 mussel/m^2 X 4,180 m^2) L. higginsi (table 1).

Dredging Cut 2, immediately in front of the city dock, would disturb approximately 3,264 m^2 (35,000 ft^2) of bottom substrate. L. higginsi densities of between 0.133 mussel/m^2 (0.012 mussel/ft^2) and 1.4 mussels/m^2 (0.13 mussel/ft^2) have been reported for the section of the East Channel between the city dock and the barge turning basin (Clarke, 1991; Miller and Payne, 1992). If Clarke's (1991) and Miller and Payne's (1992) estimates of L. higginsi densities in this portion of the East Channel are combined and averaged, a mean density estimate of 0.579 ($\pm$ 0.513) L. higginsi/m^2 (0.054 mussel/ft^2) results. Several site specific density estimates are included in the mean density estimate. **6) We assume this mean density is representative of L. higginsi densities in the East Channel between the Highway 18 bridge and the barge turning basin.** Preliminary estimates of dredging needs indicate a 30.5-meter (100-foot) wide and 107-meter (350-foot) long segment would need to be maintained by dredging in front of the city dock (Cut 2). A one-time dredging operation in Cut 2 could destroy 1,890 (0.579 mussels/m^2 X 3,264 m^2) L. higginsi.

7) We assume newly dredged areas will have habitat characteristics similar to those of the areas dredged by the Corps of Engineers in 1976. Therefore,

based on Miller and Payne's (1992) observations, we believe that following dredging, dredge cut areas would slowly be recolonized by L. higginsi individuals, probably to densities of approximately 0.166 (± 0.22) mussel/m^2 (mean density reported in the barge turning basin since 1984) in 8 to 12 years. Recolonization would buffer the impacts of the proposed channel maintenance plan by providing compensation for dredging effects on L. higginsi. We estimate dredging will be required twice in Cut 2 in the next 40 years. Assuming recolonization of Cut 2 by L. higginsi individuals occurs in the interval between the first and second dredging events, during the second dredging event approximately 542 (0.166 mussels/m^2 X 3,264 m^2) L. higginsi could be destroyed.

Assuming no other impacts (i.e. navigation traffic) are affecting the L. higginsi populations in the East Channel, we estimate that over the 40-year period of the channel maintenance plan 3,125 (694 + 1,890 + 542) L. higginsi could be destroyed as a result of dredging. For comparative purposes, 278,200 L. higginsi may exist in the East Channel north of the city dock including the Sawmill Slough area.

As discussed previously, the proposed disposal site for materials dredged from Cut 1 is a heavily disturbed upland area, providing little or no habitat for any endangered or threatened species. Use of this area for dredged material disposal would have no impact on L. higginsi populations in the East Channel.

b. Increased Navigation

In an attempt to assess the effects of commercial navigation traffic on freshwater mussel populations, Miller and Payne (1992) and Clarke (1991) have monitored mussel populations in the East Channel for several years. Since 1984, Miller and Payne (1992) have monitored mussel populations in the turning basin area of the East Channel and at a reference site relatively unaffected by vessel movement (barges going to and from the Didion, Inc. operation at the City Dock have passed over this site since 1988) about 0.8 km (0.5 mile) downriver (figure 1). Their research shows that from 1984 to 1991 mean mussel densities in the reference site area ranged from 68.5 mussels/m^2 (6.36 mussels/ft^2) to 149.1 mussels/m^2 (13.85 mussels/ft^2) while mean densities in the turning basin area ranged from 22.0 mussels/m^2 (2.04 mussels/ft^2) to 48.6 mussels/m^2 (4.52 mussels/ft^2). The lower mussel densities observed in the turning basin area were probably caused by channel maintenance operations (dredging) conducted by the Corps of Engineers in 1976. Also, from 20 to 50 percent of the mussels observed in the turning basin area showed evidence of physical damage from waterborne traffic. However, after approximately 8 years of monitoring, Miller and Payne (1992b) have observed no changes in mussel densities that can be related to navigation traffic.

Clarke (1991) sampled four sites, three transversed by commercial barges and one similar area not transversed by barges, in the East Channel in 1990 and 1991. He reported densities between 9.5 mussels/m^2 (0.88 mussel/ft^2) and 52.0 mussels/m^2 (4.83 mussels/ft^2) in the control area and densities between 34.9 mussels/m^2 (3.24 mussels/ft^2) and 53.2 mussels/m^2 (4.94 mussels/ft^2) in the areas transversed by barges. Clarke (1991) examined mussels in front of the City Dock and in navigation lanes to the city dock. Only 1.1 percent of the mussel shells collected in these areas were chipped, cracked, or scraped. Clarke (1991) concluded that barge traffic in the areas he examined in the East Channel caused little physical damage to the shells of live mussels. He proposed that brailing activities, rather than commercial navigation traffic, were probably responsible for more physical damage to mussels. These results are directly contradictive of those of Miller and Payne (1992b) who observed that 20 to 50 percent of the mussels in the barge turning basin showed evidence of physical damage. However, water depths are shallower and traffic levels are greater in the barge turning basin than in front of the city dock. Barges in the barge turning basin are more likely to scrape the bottom and cause damage to mussel shells. Vessel-caused shell damage is typically not a

uniformly distributed phenomenon, but is a localized, site-specific phenomenon where vessels are operating in relatively confined parts of waterways, shallow areas, near-shore areas, or areas where vessels are manuevering sharply with periods of full, or near-full power. Although very short-term in nature, Clarke's continuing work in the East Channel has not detected significant changes in mussel densities in two years of monitoring.

The Wisconsin Department of Natural Resources has prepared a Draft Environmental Impact Statement (EIS) on a proposal by Didion, Inc. to increase barge shipments from the city dock. The EIS contains the State's analysis of the impacts associated with movement of an unlimited number of barges from the city dock through the East Channel. The EIS provides a thorough review of the potential impacts of navigation traffic on freshwater mussels. While expansion of the PS&G facility would require navigation through only the northern one-third of the East Channel, the impacts of navigation traffic on freshwater mussels in this river reach would be similar to those described in the State EIS. The State EIS expresses concerns about chronic impacts to the mussel community in the East Channel as a result of increased barge traffic; however, it does not offer an estimate of effects on L. higginsi populations.

The proposal to expand operations at the Prairie Sand and Gravel operation and to develop the Swingle site as a barge shipping terminal would result in increased barge traffic levels in the East Channel. In 1991, 230 loaded barges left the Prairie Sand and Gravel, Inc. facility, while 131 loaded barges departed from the city dock. In 1991, 511,984 tons of grain were shipped from the ports at Prairie du Chien (Lester, 1992). The Wisconsin Department of Transportation, relying on information from industry sources, indicates that if improvements were made in harbor loading facilities, increased loading sites were provided, and temporary storage sites were provided, the tonnage of grain passing through Prairie du Chien could easily double in the next few years. For shipments of salt, fertilizer, and coal, the Wisconsin Department of Transportation (Glaze and Krikelas, 1990) has estimated an annual growth rate of 0.4, 1.5, and 1.0 percent, respectively. Using these data, it is estimated that 1.2 million tons of commodities could be shipped yearly through Prairie du Chien in the next 10 to 25 years. A loaded barge can hold about 1,500 tons of material; therefore, nearly 800 loaded barges would be required per year to move the estimated tonnage of commodities from Prairie du Chien, a 220-percent increase in loaded barge traffic in the East Channel.

Studies by Clarke (1991) and Miller and Payne (1992) have shown no detectable acute impacts to mussel resources as a result of current levels of barge traffic. **8) We believe an increase of up to 220 percent in barge traffic in the East Channel would have a direct negative influence on freshwater mussel species, including the Federally listed endangered species L. higginsi.** The impacts of increased navigation traffic, except those impacts associated with spills of hazardous materials which are covered in other areas of this report, would be imparted on mussel species within the confines of navigation passage routes and areas immediately adjacent. As indicated on figure 1, three distinct navigation lanes exist in the East Channel: from the main channel to the barge turning basin, from the barge turning basin to the city dock, and from the barge turning basin to the PS&G/Swingle site. If the permit were granted, increased levels of traffic would pass from the main channel to the barge turning basin to the PS&G/Swingle site, a distance of about 2,100 meters (7,000 feet).

Increased navigation traffic in the East Channel would increase levels of environmental stress on mussels within the channel. Resource agencies and malacological experts have identified various potential adverse impacts to mussel communities as a result of commercial traffic. These impacts include physiological stress from increased turbidity, turbulence, current changes, and increased water velocities. These impacts can negatively affect mussel feeding, metabolism, growth rates, and reproduction. Physical effects to

mussels may occur from direct contact with barges and barge tow propellers, especially during low water conditions. Host fish species may avoid areas heavily transversed by commercial traffic, reducing the likelihood of recolonization in these areas. A spill of a hazardous or toxic substance could threaten mussel populations in large portions of the East Channel. Any adverse impacts from increased navigation would negatively affect the growth and survival of the vulnerable juvenile mussels, resulting in long-term negative population impacts to the mussel community. Increased mortality rates as a result of environmental stress could also be manifested by increased navigation levels.

The effects of increased navigation traffic would be most readily imparted on freshwater mussels within an area extending outward from the middle of the main navigation lane. Impacts of increased navigation activities (i.e., suspended solids, current reversals, etc.) would extend to areas outside the main navigation routes; **9) however, we believe the most significant impacts would be imparted on organisms within the 61-meter (200-foot) wide navigation lanes.**

Based on density estimates reported in Miller and Payne (1992), approximately 14,784 L. higginsi may exist in the proposed 61-meter (200-foot) wide navigation lane extending from the main channel to the barge turning basin, a distance of about 1,460 meters (4,800 feet; table 1).

The proposed navigation corridor from the city dock northward to the barge turning basin (figure 1) is approximately 975 meters (3,200 feet) long and 61 meters (200 feet) wide. Based on Clarke's (1991) and Miller and Payne's (1992) estimates of L. higginsi densities in this portion of the East Channel, approximately 34,436 L. higginsi may exist in the navigation lane between the barge turning basin and the city dock (table 1).

Levels of navigation traffic in Sawmill Slough are similar to those found in the East Channel north of the barge turning basin. Observations by Wisconsin Department of Natural Resources diver David Heath (1992) indicate habitat conditions in Sawmill Slough are intermediate between conditions in the East Channel north of the barge turning basin and conditions in the East Channel between the city dock and the barge turning basin. **10) Therefore, we assume mussel densities in Sawmill Slough are intermediate between those found in the East Channel north of the barge turning basin (0.166 mussel/m^2 which was obtained by averaging density estimates from existing databases) and those in the East Channel between the city dock and the barge turning basin (0.579 mussel/m^2).** The mean of these two densities is 0.373 mussel/m^2. Using this density estimate, approximately 15,245 (0.373 mussel/m^2 X 40,870 m^2) L. higginsi may exist in the navigation lane from the barge turning basin to the PS&G/Swingle site, a distance of 670 meters (2,200 feet),

In total, an estimated 64,464 L. higginsi may exist within the 61-meter (200-foot) wide navigation lanes (figure 1; table 1).

While the potential effects of increased navigation traffic on freshwater mussels have been relatively defined, the impacts of navigation traffic on mussel populations have not been clearly documented; however, some anecdotal information exists. For example, much larger volumes of navigation traffic transverse the West Channel of the Mississippi River than the East Channel. L. higginsi densities in the West Channel are about half of those reported in the East Channel (Duncan and Thiel, 1983). Although habitat differences between the East and West Channels can probably account for much of the difference in mussel densities, the differing levels of navigation traffic may also be a causal factor. It is likely increased navigation in the East Channel would negatively affect mussel populations, although the extent of this impact is unclear. We would not expect increased navigation traffic in the East Channel to reduce mussel densities to those found in the West Channel (a 50-percent reduction) because of the better quality of habitat in the East

Channel. Conversely, the impact of increased navigation traffic in the East Channel would not be minimal or negligible. **11) Therefore, in our professional judgement, within the navigation lanes identified on figure 1, a 220-percent increase in barge traffic would result in up to a 20-percent reduction in the number of L. higginsi as a result of chronic perturbations over a 40-year period.** This would result in the loss of 12,893 L. higginsi from populations in the northern portion of the East Channel.

c. Cumulative Impacts

To accurately predict the effects of proposed actions on natural resources, consideration must be given to the cumulative effect of different actions, both natural and human-induced, on the resource; in this instance, freshwater mussels. The impacts of dredging and increased navigation activities on mussel populations in the East Channel are easily identified. However, these are not the only impacts that would affect mussel populations in the East Channel. Natural mortality, commercial clamming, additional development activities, the impending zebra mussel infestation, and recreational traffic could also impose some degree of impact on mussel populations. These latter impacts would remain regardless of whether dredging operations were conducted or navigation activity increased in the East Channel. For this assessment, it is assumed these impacts will not increase substantially in the future and are already reflected in current population levels. The following sections discuss these factors and the cumulative impact they could have on L. higginsi populations in the East Channel.

Natural Mortality

Natural mortality can take several forms. Death from old age, predation, disease, or accident reduces the number of viable individuals in a population. Heath, Engel and Holzer (1988) conducted an assessment of the 1986 commercial harvest of freshwater mussels in the Mississippi River. For washboard mussel (Megalonaias gigantea) populations, they estimated a natural mortality rate of about 5 percent. While L. higginsi is a different species than M. gigantea, this estimate of natural mortality is the best available. Normally, mortality is offset by recruitment in healthy populations, and no net reduction in population numbers or densities results. **12) We assume the population of L. higginsi in the East Channel is stable (i.e., natural mortality equals recruitment).** The estimated population of L. higginsi in the East Channel from the Highway 18 bridge upstream to the main channel, including Sawmill Slough, is 278,200.

Commercial Clamming

Two methods of harvesting freshwater mussels are generally employed, brailing and diving. The first method, brailing, is relatively non-selective for both species and size. A "crows-foot" wire device is dragged across the bottom substrate, and mussels contract around the tines of the "crows-foot." The second method, diving, can be somewhat more selective for both species and size depending on the experience and abilities of the diver. However, divers must still remove mussels from their positions in the substrate to assess their size and species, resulting in disturbance and displacement of the mussel. **13) In the following analysis, we assume mussels harvested from the East Channel are collected in a non-selective manner for both species and size.**

Since 1986, Commercial mussel harvest data for the Upper Mississippi River has been collected by the Wisconsin Department of Natural Resources (Welke, 1992a). This information indicates the gross commercial harvest of washboard and threeridge mussels (measured in pounds of shell) remained fairly constant between 1986 and 1991. While the harvest of washboard mussel shells has declined over this time period, the harvest of threeridge shells has increased. Since 1986 the mean poundage of threeridge and washboard shells

harvested is approximately 970,000 pounds. In 1986 approximately 970,000 pounds of mussel shells were harvested, a number representative of the harvest since 1986.

In 1986, an estimated 450,000 mussels (threeridge and washboard) were harvested from Pool 10 of the Upper Mississippi River. Experts believe the harvest in pool 10 has declined since 1986 (Welke, 1992b), therefore, this estimate probably overstates the long-term harvest from Pool 10. Estimates of mussels harvested from the East Channel are as high as 20 percent of this total, or 90,000 mussels. Of this total, approximately 29 percent, or 26,000, are threeridge and the remainder mostly washboard. Population estimates of threeridge mussels in the East Channel indicate about 1 in every 10 mussels is of legally harvestable size (66.7 mm or 2 5/8 inches) (Welke, 1992a). Therefore, approximately 260,000 threeridge would need to be handled to obtain a harvest of 26,000 mussels.

The community composition of mussels in the East Channel, as sampled by Miller and Payne (1992) since 1984, indicates threeridge mussels normally comprise about 50 percent of the mussel fauna in the East Channel. Thus, to obtain the needed 260,000 threeridge mussels, approximately 520,000 mussels in total would need to be collected from the East Channel, handled, and sorted. L. higginsi mussels normally comprise about 0.75 percent of the total population of mussels in the East Channel (Miller and Payne, 1992). Of the estimated 520,000 mussels handled, about 3,900 would be L. higginsi. Since L. higginsi is illegal to harvest, specimens collected during commercial clamming operations must be returned, unharmed, to the water. However, data from mussel relocation efforts suggests that generally mussel relocation results in high mortality. Imlay (1972) states, "It would appear that regulations for commercial clammers to toss back undersized mussels or mussels that are protected as endangered species may accomplish little because the mussels in question have been artificially displaced and are not expected to necessarily regain a viable posture in the substrate." This observation was based mainly on the use of a brail for collection, which was the predominant gear type used by commercial clammers. Brailing is only moderately size selective and requires the removal of mussels from the bottom substrate. Diving has become increasingly popular with commercial clammers. Divers do remove sub-legal sized specimens from the substrate but are capable of determining if mussels are generally within the size allowed. Therefore, most sub-legal sized mussels removed from the substrate are left on the bottom rather than brought to the surface. This probably increases survival of mussels removed from beds but not harvested. **14) Based on this conclusion, it is our professional judgment 10 percent of the mussels collected, but returned to the water during clamming operations, perish.** No studies have been conducted to document the specific mortality associated with the return of non-commercial or sub-legal mussels by commercial clammers. The figure used here (10 percent) is very speculative and should not be taken as the standard mortality rate of mussels replaced by commercial mussel harvest divers. With this in mind, if this figure is applied to the estimated number of L. higginsi handled by commercial clammers but returned to the river, an estimated 390 L. higginsi (annual mortality of 0.1 percent) would perish each year, assuming the year 1986 is representative of mussel harvest in the East Channel. Over a 40-year period, a total of 15,600 L. higginsi would be destroyed by commercial clammers.

Recreational Traffic

Recreational craft using the East Channel could potentially affect L. higginsi through habitat disturbance. Recreational traffic can cause bank erosion and elevated suspended sediment levels through increased wave action. Many of the impacts associated with commercial navigation traffic can be extrapolated, to a lesser degree, to recreational traffic. Large cruisers can produce waves as high as those produced by commercial tows; however, recreational craft normally draft far less water than commercial craft. Currently, it is difficult to assess to what degree recreational traffic would affect L.

higginsi populations in the East Channel. **15) We assume the impacts would be minor or non-detectable in relation to the other, more significant impacts imposed by navigation traffic and dredging; although it is possible that impacts from recreational traffic may increase stress on individuals and make them susceptible to impacts from the more significant perturbations.**

Future Development

Additional construction of ports or marinas and the associated increase in navigation traffic would have an incremental impact on freshwater mussel populations. These activities would require a permit from the Army Corps of Engineers. The cumulative impacts of any additional projects would need to be addressed before a permit could be issued.

Zebra Mussel Infestation

In 1991, the first observance of zebra mussels (Dreissena polymorpha) in the Upper Mississippi River was reported in Pool 8 near La Crosse, Wisconsin. Since then, zebra mussels have been observed at Locks and Dams Upper St. Anthony Falls (USAF), 1, 2, 3, 4, 5, 5A, 6, 8, 9 and 10. In October of 1992, zebra mussels were observed attached to native freshwater mussels near Clayton, Iowa, just downstream of the East Channel in Pool 10. The first reports of zebra mussels in the East Channel also occurred in October 1992. These reports indicated zebra mussels were observed attached to native mussels harvested from the East Channel by commercial clammers. Zebra mussels were also observed attached to wing dams in the East Channel.

Zebra mussels colonize new areas through natural dispersal of veligers on river currents or through adult migration on movable substrates, such as barge hulls. Zebra mussels can affect native mussel populations in two ways: through direct competition for food resources and by colonization on native mussel shells, resulting in suffocation and eventual death. In Lakes Erie and St. Clair, where zebra mussels have existed for several years, the native mussel populations have been devastated, and in some areas of both lakes, eradicated (Masteller and Schloesser, 1991; Gillis and Mackie, 1991). However, the extent of infestation in a riverine environment and the impacts of a zebra mussel infestation on native mussel populations in the Upper Mississippi River are unknown at this time. Potentially, a heavy zebra mussel infestation in the East Channel could significantly reduce the mussel resources of the East Channel, making the impacts of dredging and navigation seem moot. However, if the impacts of zebra mussels were moderate, the increased stress on mussel resources could increase the significance of the impacts of dredging and increased navigation activity. Without more information, it is impossible to assess the impacts of zebra mussels on mussel populations in the East Channel at this time.

Harbor Construction

The direct impact of harbor construction itself is probably minimal. Some riprapping of shorelines and minor dredging activities could affect L. higginsi individuals; however, the likelihood of this is low and the overall impact of harbor construction is probably minimal.

Increased Navigation Traffic

Increased navigation activity would stress mussel populations through increased turbidity, turbulence, current changes, and increased water velocities. Negative effects on mussel feeding, metabolism, growth rates, and reproduction can result from these impacts. As discussed above, we estimate that within the navigation routes, the chronic effects associated with increased navigation would result in the loss of up to 20 percent of the existing population, or 12,893 L. higginsi individuals, over a 40-year period (table 1).

Dredging

Dredging would result in an immediate, acute impact: direct removal and destruction of viable individuals. For the 40-year term of the channel maintenance plan, approximately 3,125 L. higginsi could be destroyed by dredging. Dredging would also destroy or disturb habitat, making conditions unfavorable for immediate recolonization of dredged areas. After dredging, increased navigation traffic would further inhibit recolonization efforts. However, compensatory replacement of lost individuals would occur in dredged areas through recolonization. For the 40-year term of the channel maintenance plan, the population of L. higginsi in navigation lanes in the East Channel north of the Highway 18 bridge would be reduced by 13,936 individuals (table 2) as a result of dredging and increased navigation activities.

In the navigation lanes identified on figure 1, L. higginsi numbers would be reduced as a result of dredging and increased navigation (table 1). In the navigation lane from the barge turning basin to the main channel, it is estimated dredging and increased navigation traffic would reduce the L. higginsi population from its current level of 14,784 individuals (0.166 mussel/m^2) to 11,832 individuals (0.133 mussel/m^2) (table 1). In the navigation lane from the city dock to the barge turning basin, it is estimated increased navigation traffic and dredging would reduce the L. higginsi population from its current level of 34,436 individuals (0.579 mussel/m^2) to 26,500 individuals (0.446 mussel/m^2) (table 1). In the navigation lane from the barge turning basin to the PS&G/Swingle site, it is estimated increased navigation traffic would reduce the L. higginsi population from its current level of 15,245 individuals (0.373 mussel/m^2) to 12,196 individuals (0.298 mussel/m^2; table 1).

Spills

A spill of hazardous materials, although remote and unlikely, could impose disastrous effects on mussel populations in the East Channel. A large spill of salt or fertilizer could potentially destroy large numbers of mussels. This, in combination with impacts associated with navigation and dredging, could have a significant impact on mussel populations. If the permit is approved, restrictions on the commodities that can be shipped may be included in the permit to reduce or eliminate the potential for unacceptable spills.

Summary

The cumulative impacts of dredging, increased navigation, commercial clamming, and recreational traffic on freshwater mussels, including the endangered species L. higginsi, could result in long-term reductions in productivity. Assuming the population of L. higginsi is at a steady state and any additional mortality above natural mortality will not be compensated for by reproduction, an annual take as a result of navigation of 0.1 percent of the existing population of L. higginsi would occur. Under these same assumptions, when the proposed dredging is conducted (predicted at year 10) an annual take as a result of navigation **and** dredging of 0.9 percent of the total population would result. Adding in natural mortality (estimated at 5 percent) and mortality as a result of commercial clamming (0.1 percent) results in an annual total mortality rate of between 5.2 percent and 6.0 percent of the existing population. Heath, Engel and Holzer (1988) predicted steady state conditions for M. gigantea populations, albeit at lower population levels, would be achieved at an annual mortality rate of 10 percent, which includes mortality as a result of commercial exploitation and natural mortality. Beyond an annual mortality rate of 10 percent, negative impacts to recruitment and reproduction would occur, resulting in declines in washboard population numbers. Their research was focused on heavily exploited populations (washboard and threeridge) which were already at a somewhat reduced level. Exploited mussels species are commonly the more abundant and are better able to offset losses by reproduction. For an endangered species the annual

mortality which could be offset by reproduction is probably lower than 10 percent.

The Corps of Engineers believes if the permit is granted and operation and maintenance activities are conducted in the northern portion of the East Channel, L. higginsi populations from the Highway 18 bridge northward to the main channel, including Sawmill Slough, would be reduced by approximately 5.0 percent (table 1; figure 2) over a 40-year period. A reduction in population size of 13,936 individuals is estimated for the 40-year project life. L. higginsi densities would decline from 0.360 mussel/m^2 to 0.342 mussel/m^2 in the designated portion of the East Channel (table 1; figure 1). However, this loss would not be spread evenly over this area. The reduction in L. higginsi densities in the navigation lanes themselves would be much greater. For instance, in the navigation lane from the barge turning basin to the main channel, L. higginsi densities would decline from their current level of 0.166 mussel/m^2 to a projected level of 0.133 mussel/m^2 (table 1; figure 2).

Cawley (1984) reported L. higginsi densities between 0.2 mussel/m^2 and 0.55 mussel/m^2 from high quality mussel beds in Pools 17, 18, and 19. Duncan and Thiel (1983) reported a L. higginsi density of 0.086 mussel/m^2 from the West Channel of the Mississippi River near Prairie du Chien. The estimated with project density of 0.342 mussel/m^2 is within the range of densities reported for other populations of L. higginsi in the Upper Mississippi River.

d. Alternatives to the Proposed Actions

Three main alternatives to the proposed actions of continuing to maintain the East Channel and granting the harbor expansion permit have been identified:

(1) Alternative 2 (No Action) - continued maintenance of a navigation channel to the city dock with denial of the permit application for harbor expansion.

(2) Alternative 3 - inactivation of the Federal harbor at the city dock with permit approval.

(3) Alternative 4 (Without Project) - deauthorization of the Federal harbor at the city dock and permit denial.

Alternative 2 would involve continued maintenance of the navigation lanes to the city dock. Denial of the permit application would eliminate the navigation impacts associated with expanded harbor facilities at the PS&G/Swingle site. If Alternative 2 were implemented, we estimate the population of L. higginsi in the East Channel north of the Highway 18 bridge would be reduced by 10,888 individuals (table 2), a reduction of approximately 3.9 percent over 40 years. The resulting estimated density of L. higginsi at year 40 under Alternative 2 would be 0.346 mussel/m^2.

Alternative 3 would eliminate the impacts of navigation traffic in the navigation lane from the barge turning basin to the city dock. However, permit approval would increase levels of navigation in the lanes from the main channel to the barge turning basin and from the barge turning basin to the PS&G/Swingle site. The Corps of Engineers would probably be responsible for maintaining a channel only to the barge turning basin. Dredging activities in Sawmill Slough would be the responsibility of the permit applicant. If Alternative 3 were implemented, we estimate the population of L. higginsi in the East Channel north of the Highway 18 bridge would be reduced by 6,001 individuals (table 2), a reduction of approximately 2.2 percent over 40 years. The resulting estimated density of L. higginsi at year 40 under Alternative 3 would be 0.353 mussel/m^2.

Alternative 4 would eliminate all impacts associated with dredging and increased navigation activities. Navigation would remain at current levels.

No reduction in the population size of L. higginsi would occur under Alternative 4. Densities of L. higginsi in the East Channel north of the Highway 18 bridge would remain at current levels (0.360 mussel/m^2).

All of these alternatives would have less impact on L. higginsi populations in the East Channel than would the proposed actions. Additionally, relocation of mussels from navigation lanes would be considered under any of the above or the proposed alternative. However, the relocation of L. higginsi individuals from the proposed navigation lanes in the East Channel has several disadvantages. Relocation has been considered previously by the Wisconsin Department of Natural Resources and is discussed extensively in WDNR (1990). Briefly, the WDNR (1990) determined the physical effort and time required to gather and reposition mussels in the navigation lanes in the East Channel would be so great such an effort would not be warranted. The navigation lanes identified in the East Channel are in total, approximately 3,100 meters long. Within these 200-foot wide lanes, approximately 64,464 L. higginsi may exist. The cost of relocating these mussels would be exceptionally high. Additionally, there are several disadvantages to physically transplanting mussels (WDNR, 1990).

1. Moving threatened and endangered species out of their natural habitat is contrary to the intent and spirit of endangered species laws.

2. There are no provisions in the law to "trade off" endangered and threatened species habitat for economic gain.

3. Complete removal of all endangered mussels could not be achieved. In the East Channel, where visibility is poor small or juvenile mussels would be left behind. This could jeopardize the viability of the population if reproduction is lower after transplanting. Essentially a single generation or more of mussels could be lost.

4. Transplanting, although protecting the mussels themselves, would result in a loss of suitable habitat.

5. While moving mussels might have minimal impacts to the animals, there would be some mortality. Additionally, placing a large number of mussels in a new habitat would likely result in additional mortality as a result of over-crowding or some other unknown impacts.

Based on the above analysis, transplanting mussels out of navigation lanes is neither economically nor environmentally feasible, but would be considered as part of any proposed channel maintenance.

e. Alternatives Eliminated from Further Consideration

A fifth alternative of dredging the East Channel south of the Highway 18 bridge to allow access to the city dock via a south route was considered. Approximately 19,110 m^3 (25,000 cubic yards) of material would need to be dredged once every 3 years for a total volume of approximately 254,500 m^3 (333,000 cubic yards), considerably higher than the estimated total for any of the other alternatives. Additionally, assuming mussel densities in the southern portion of the East Channel are similar to those in the East Channel between the city dock and the barge turning basin, an assumption supported by resource experts, an estimated take of 98,700 L. higginsi could occur over a 40-year period as a result of dredging and navigation activities in the southern portion of the East Channel. Because of the higher economic costs and greater environmental impacts associated with a southern route in the East Channel, this alternative was eliminated from further consideration.

Originally, the channel maintenance plan proposed a 61-meter (200-foot) wide navigation lane be maintained in the East Channel by following maintenance criteria established for the main stem of the Mississippi River. Under these

main stem criteria, dredging would be required once every 12 years. However, the estimated take of L. higginsi over 40 years under this alternative was 85,258 individuals. After further consultation with the FWS as required by Section 7 of the Endangered Species Act, re-evaluation of the maintenance criteria, and consideration of the anticipated type and level of barge traffic anticipated in the East Channel, we determined the availability of a self-maintained 61-meter (200-foot) wide navigation lane was highly probable and a 30.5-meter (100-foot) wide channel could be ensured with greatly reduced dredging frequency and volume.

f. Sensitivity of Impact Assessment

The impacts presented in this assessment are highly dependent on, and sensitive to, the assumptions presented and highlighted in this document. If assumption 1, 2, 3 or 4 is erroneous, then the impacts of dredging and increased navigation could be substantially lesser or greater than presented in this assessment. For instance, if assumption 1 is false, and L. higginsi populations are actually clumped within the navigation lanes, then the entire population of L. higginsi in the East Channel north of the Highway 18 bridge could be threatened by dredging and/or increased navigation. By the same token, if L. higginsi populations are clumped outside of main channel areas, then the impacts suggested in this document would be grossly overstated. Similarly, if assumption 4 is false and site specific density estimates are exceedingly high or low in comparison to other areas of the East Channel, dredging and navigation could have a significantly greater or lesser impact, respectively, on L. higginsi populations in the East Channel north of the Highway 18 bridge.

Also, the impacts of navigation on L. higginsi could result in population reductions of greater than 20 percent or could have no impact. If navigation truly has no impact on L. higginsi numbers, then the population reductions presented in this document are overstated. However, if navigation has greater impacts on L. higginsi than currently believed, population numbers of L. higginsi could be reduced by greater than 20 percent.

Estimates of dredging freqencies and volumes are based on an analysis of past dredging needs and current channel conditions. The information presented in this document represents the "most likely forseeable future" for channel maintenance needs in the East Channel. It is possible dredging will not be required in the northern end of the East Channel. However, it is more likely dredging will be required at some time in the future. We predict over the 40-year period of the channel maintenance plan, dredging and increased navigation could result in a total cumulative take of 15,624 L. higginsi (table 2). However, if no dredging is required, the take of L. higginsi would be reduced by approximately 3,250 individuals. The possibility also exists of additional channel maintenance actions being necessary in the channel reach between the city dock and the barge turning basin. If additional channel maintenance is ever required in this channel reach, Section 7 consultation would need to be reinitiated and the impacts of additional channel maintenance assessed.

We assume the population of L. higginsi is a stable population (assumption 11). Some resource experts have disputed this claim, suggesting that L. higginsi populations in the East Channel have declined in recent years. If indeed L. higginsi are declining, then the impacts of the proposed projects are underestimated.

The impacts of commercial clamming and recreational traffic are believed to be minimal. However, if the impacts of these activities on L. higginsi are greater than assumed, then the cumulative impact of dredging and increased navigation becomes of even greater importance.

VI. SUMMARY AND CONCLUSIONS

The impacts of operation and maintenance activities and increased navigation activities on bald eagles and other endangered or threatened species, except

freshwater mussel species, would be minimal. No long-term negative impacts to these species are anticipated as a result of the proposed activities.

Although the concern for adverse acute effects of increased traffic on the East Channel mussels has been reduced by recent study results (Clarke, 1991; Miller and Payne, 1992), the concern for potential adverse chronic effects remains. Recent studies have shown no statistically significant impacts at current traffic levels. It is not known if chronic effects would eventually be observed at these same traffic levels. Logically, we assume marked increases in commercial traffic would impose some degree of additional adverse impact on the mussel community of the East Channel. A 220-percent increase in barge traffic is expected if the permit is granted. This increase could result in the loss of 20 percent of existing L. higginsi populations in identified navigation lanes over a 40-year period.

Dredging results in the direct removal and destruction of benthic species within the dredge cuts. Approximately 3,250 L. higginsi individuals could be destroyed by dredging operations in the East Channel over the 40-year term of the channel maintenance plan. We believe dredged areas would be recolonized in 8 to 12 years and compensatory replacement of L. higginsi individuals destroyed by dredging would occur. However, the cumulative impacts of dredging and increased navigation on L. higginsi populations in the East Channel north of the Highway 18 bridge would result in a reduction in population size of 13,936 individuals.

Separately or cumulatively, operation and maintenance activities and increased navigation activities in the East Channel could cause long-term negative impacts to mussel populations, including the Federally-listed endangered species L. higginsi. The cumulative impacts on L. higginsi in the East Channel from the Highway 18 bridge upstream to the main channel including Sawmill Slough would result in a 5.0 percent reduction in population numbers over a 40-year period. In navigation lanes maintained for commercial traffic, a substantial loss of L. higginsi individuals could occur. An intense zebra mussel infestation could make these impacts meaningless. A moderate infestation could increase the significance of these impacts.

VII. BIBLIOGRAPHY

Burky, A.J. 1983. Physiological ecology of freshwater bivalves. in: The Mollusca, Vol. 6, Ecology. K.M. Wilbur, ed. Academic Press, New York.

Cawley, E.T. 1984. Report of mussel survey of high quality beds, pools 17, 18, 19 UMR. Endangered Species Research - Higgins' Eye Pearly Mussel, Environmental Research Center, Loras College, Dubuque, Iowa.

Clarke, A.H. 1991. Results of the nineteen ninety-one mussel monitoring program in the Mississippi River at Prairie du Chien, Wisconsin. A report prepared for Didion, Inc., McFarland, Wisconsin, by A.H. Clarke, EcoSearch Inc., Portland, Texas. 44 pp.

Downing, J.A. and W.L. Downing. 1992. Spatial aggregation, precision, and power in surveys of freshwater mussel populations. Canadian Journal of Fisheries and Aquatic Sciences 49:985-991.

Duncan, R.E. and P.A. Thiel. 1983. A survey of the mussel densities in pool 10 of the Upper Mississippi River. Technical Bulletin No. 139, Department of Natural Resources, P.O. Box 7921, Madison, Wisconsin 53707. 14 pp.

Gillis, P.L. and G.L. Mackie. 1991. The effect of the exotic zebra mussel (Dreissena polymorpha) on native bivalves (Unionidae) in Lake St. Clair. Presented at the 1991 Electric Utility Zebra Mussel Control Technology Conference.

Glaze, J. and A. Krikelas. 1990. An evaluation of the economic benefits associated with shipping through the ports of Prairie du Chien. Wisconsin Department of Transportation, Bureau of Policy Planning and Analysis. 43 pp.

Havlik, M.E. 1980. The historic and present distribution of the endangered naiad mollusk Lampsilis higginsi (Lea, 1857). Bulletin of the American Malacological Union for 1980:19-22.

Havlik, M.E. 1991. Documentation of available data: Lampsilis higginsi (Lea, 1857), Prairie du Chien, Crawford County, Wisconsin, Area, Mississippi River, River Mile 628 to 646, 1972-1990. Prepared for the U.S. Fish and Wildlife Service, Region 3. Malacological Consultants, 1603 Mississippi Street, La Crosse, Wisconsin 54601.

Havlik, M.E. and D.H. Stansbery. 1977. The naiad mollusks of the Mississippi River in the vicinity of Prairie du Chien, Wisconsin. Bulletin of the American Malacological Union for 1977:9-12.

Havlik, M.E. and L.L. Marking. 1980. A quantitative analysis of naiad mollusks from the Prairie du Chien, Wisconsin, dredge material site on the Mississippi River. Bulletin of the American Malacological Union for 1980:30-34.

Holland-Bartels, L.E. and D.L. Waller. 1988. Aspects of the life history of the endangered Higgins' Eye Pearly Mussel Lampsilis higginsi (Lea, 1857). U.S. Fish and Wildlife Service, National Fisheries Research Center, P.O. Box 818, La Crosse, Wisconsin 54602. 187 pp.

Heath, D. 1992. Personal communication.

Heath, D.J., M.P. Engel and J.A. Holzer. 1988. An assessment of the 1986 commercial harvest of freshwater mussels in the Mississippi River bordering Wisconsin. Wisconsin Department of Natural Resources, La Crosse Area Office, 3550 Mormon Coulee Road, La Crosse, Wisconsin.

Imlay, M.J. 1972. Greater adaptability of freshwater mussels to natural rather than to artificial displacement. The Nautilus 86:76-79.

Lester, M.J. 1992. Personal communication (letter) to Mr. Bluhm, PD-ES, Army Corps of Engineers, April 15, 1992.

Kindschi, G.A., ed. 1980. A compendium of mollusk (naiad) surveys taken from the upper Mississippi River and major tributaries. United States Department of the Interior, Fish and Wildlife Service, Office of Endangered Species, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111.

Masteller, E.C. and D.W. Schloesser. 1991. Infestation and impact of zebra mussels on the native unionid population at Presque Isle State Park, Erie, PA. Presented at the 1991 Electric Utility Zebra Mussel Control Technology Conference.

Miller, A.C. and B.S. Payne. 1976. An assessment of mussel community and population structure at a dredged site in the Upper Mississippi River. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C. and B.S. Payne. 1986. Community characteristics and demography of bivalves in the Mississippi River near Prairie du Chien, Wisconsin, 1984-85. U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Mississippi 39180. 27 pp. + figures.

Miller, A.C. and B.S. Payne. 1990a. Comments on: Environmental impact statement on a proposal to increase barge shipment from the city dock in Crawford County, Wisconsin, and an analysis of alternative commercial harbor sites in the Prairie du Chien area. Prepared by the Wisconsin Department of Natural Resources, 31 August 1990. Unpublished report.

Miller, A.C. and B.S. Payne. 1990b. The effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: 1990 studies. Technical Report EL 91, U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, P.O. Box 631, Vicksburg, Mississippi 39180. 51 pp. + appendices.

Miller, A.C. and B.S. Payne. 1992. A summary of studies on freshwater molluscs in the East Channel of the Upper Mississippi River conducted by the U.S. Army Engineer Waterways Experiment Station, 1984-1990. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C., B.S. Payne, and P.D. Hartfield. 1984. A mussel study at Prairie du Chien, Wisconsin, 1-4 October 1984. U.S. Army Engineer Waterways Experiment Station Environmental Laboratory, Vicksburg, Mississippi 39180. 13 pp. + appendices.

Miller, A.C, B.S. Payne, D.J. Hornbach, and D.V. Ragland. 1990. Physical effects of increased commercial navigation traffic on freshwater mussels in the Upper Mississippi River: phase I studies. Technical Report EL-90-3, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi 39180.

Miller, A.C. 1992. Personal communication.

Stern, H., W. Emanuel, H.F. Kroch, J. Mick, D. Nelson, D. Roosa, M. Vanderford, and R. Whiting. 1982. Higgins' Eye Mussel Recovery Plan. Fish and Wildlife Reference Service, 1776 E. Jefferson Street, 4th Floor, Rockville, Maryland 20852.

Thiel, P.A. 1981. A survey of unionid mussels in the Upper Mississippi River (pools 3 through 11). Technical Bulletin No. 124, Department of Natural Resources, Madison, Wisconsin. 24 pp.

Welke, K. 1992a. A 10-year re-evaluation of mussel densities and populations in pool 10, Upper Mississippi River. Wisconsin Department of Natural Resources, Prairie du Chien, Wisconsin.

_____. 1992b. personal communication.

Wisconsin Department of Natural Resources. 1990. Environmental impact statement on a proposal to increase barge shipment from the city dock in Crawford County, Wisconsin, and an analysis of alternative commercial harbor sites in the Prairie du Chien area. Wisconsin Department of Natural Resources, Bureau of Environmental Analysis and Review, Box 7921, 101 South Webster Street, Madison, Wisconsin 53707. 61 pp.

Table 1. Lampsilis higginsi Number and Density Estimates for Selected Areas of the East Channel

	Barge Turning Basin to Main Channel			City Dock to Barge Turning Basin			Barge Turning Basin to PS&G/Swingle Site		Totals for East Channel North of the HWY 18 Bridge including Sawmill Slough
	Cut 1	Navigation Lane	Total	Cut 2	Navigation Lane	Total	Navigation Lane	Total	
Estimated Area (square meters)	4,180	89,060	369,275	3,264	59,475	323,748	40,870	78,954	771,977
Estimated Density of Lampsilis higginsi (mussels/m2)	0.166	0.166	0.166	0.579	0.579	0.579	0.373	0.373	0.360
Estimated Numbers of Lampsilis higginsi	694	14,784	61,300	1,890	34,436	187,450	15,245	29,450	278,200
Estimated Cumulative Loss of Individuals from existing populations at Year 40	134	2,952	2,952	1,427	7,936	7,936	3,049	3,049	13,936
Estimated Density with Project at Year 40 (mussels/m2)	0.134	0.133	0.158	0.142	0.446	0.554	0.298	0.334	0.342
Estimated Numbers with Project at Year 40	560	11,832	58,348	463	26,500	179,514	12,196	26,401	264,263

Note: Estimated cumulative losses, densities and numbers in Cuts 1 and 2 refer to the impacts of both dredging and navigation in dredge cut locations.

Estimated cumulative losses, densities and numbers in Navigation Lanes refers to the impacts of both dredging and navigation in specified navigation lanes, including dredge cut locations.

Estimated cumulative losses, densities and numbers in Total refers to the impacts of both dredging and navigation on identified channel segments greater than 3-foot deep, including navigation lanes and dredge cut locations.

Table 2. Impacts of various alternatives on L. higginsi populations in the East Channel, north of the Highway 18 bridge including Sawmill Slough.

	Alternative 1 unrestricted navigation	Alternative 2 O&M and navigation to City Dock only	Alternative 3 deauthorization of City Dock - navigation to PS&G/Swingle only	Without Project
Estimated Cumulative Take at Year 40	15,624	12,575	6,659	0
Estimated Cumulative Loss of Individuals from existing Populations at Year 40	13,936	10,888	6,001	0
Estimated Density with Project at Year 40 (mussels/m2)	0.342	0.346	0.353	0.360
Estimated Numbers with Project at Year 40	264,263	267,312	272,199	278,200

Note: Estimated cumulative take, losses, densities and numbers refers to the impacts of both dredging and navigation on identified channel segments, including navigation lanes and dredge cut locations.

Estimated area of East Channel north of the Highway 18 bridge greater than 3 feet deep is 771,977 m2.

FIGURE 1. Location Map East Channel of Mississippi River, Prairie du Chien, WI.

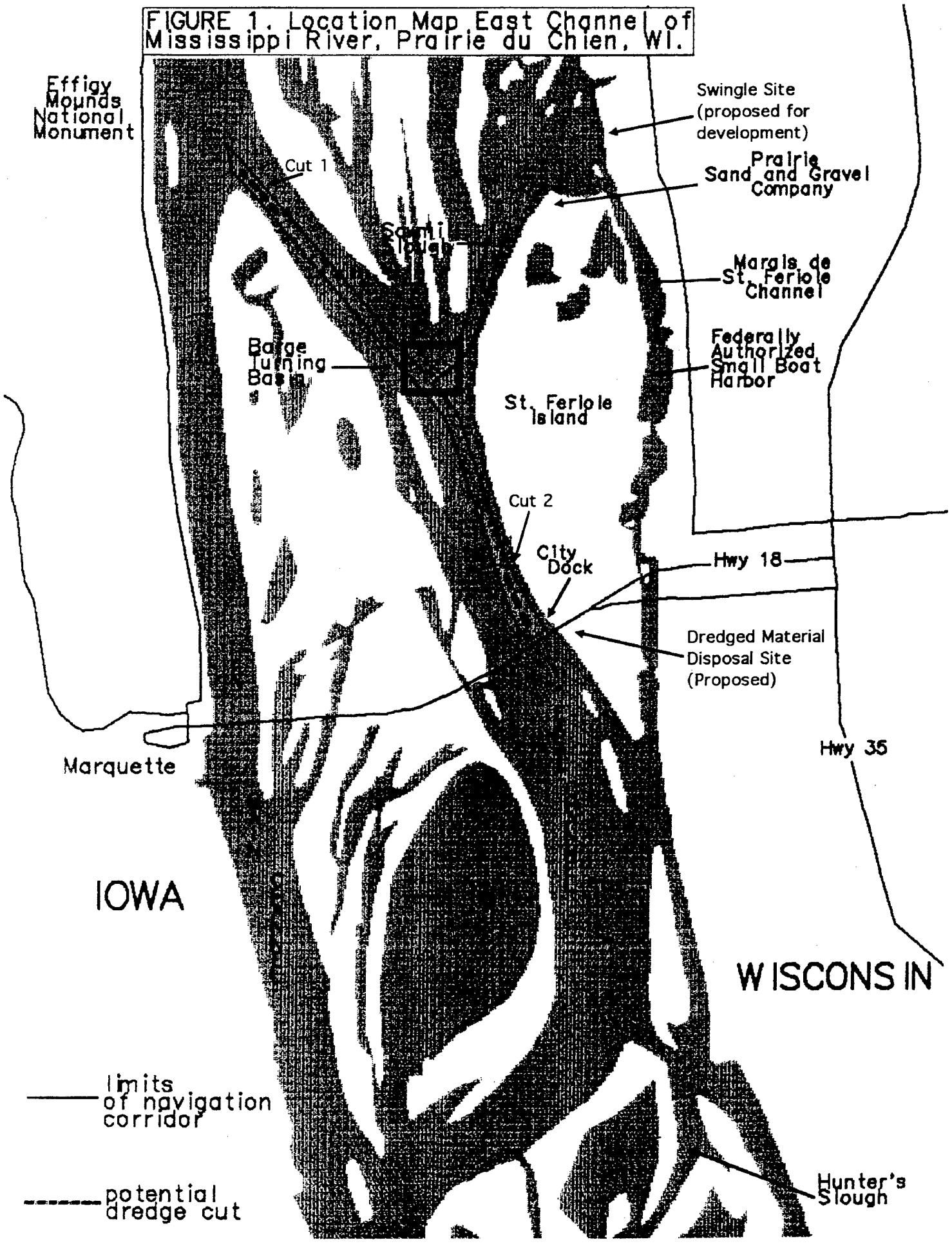
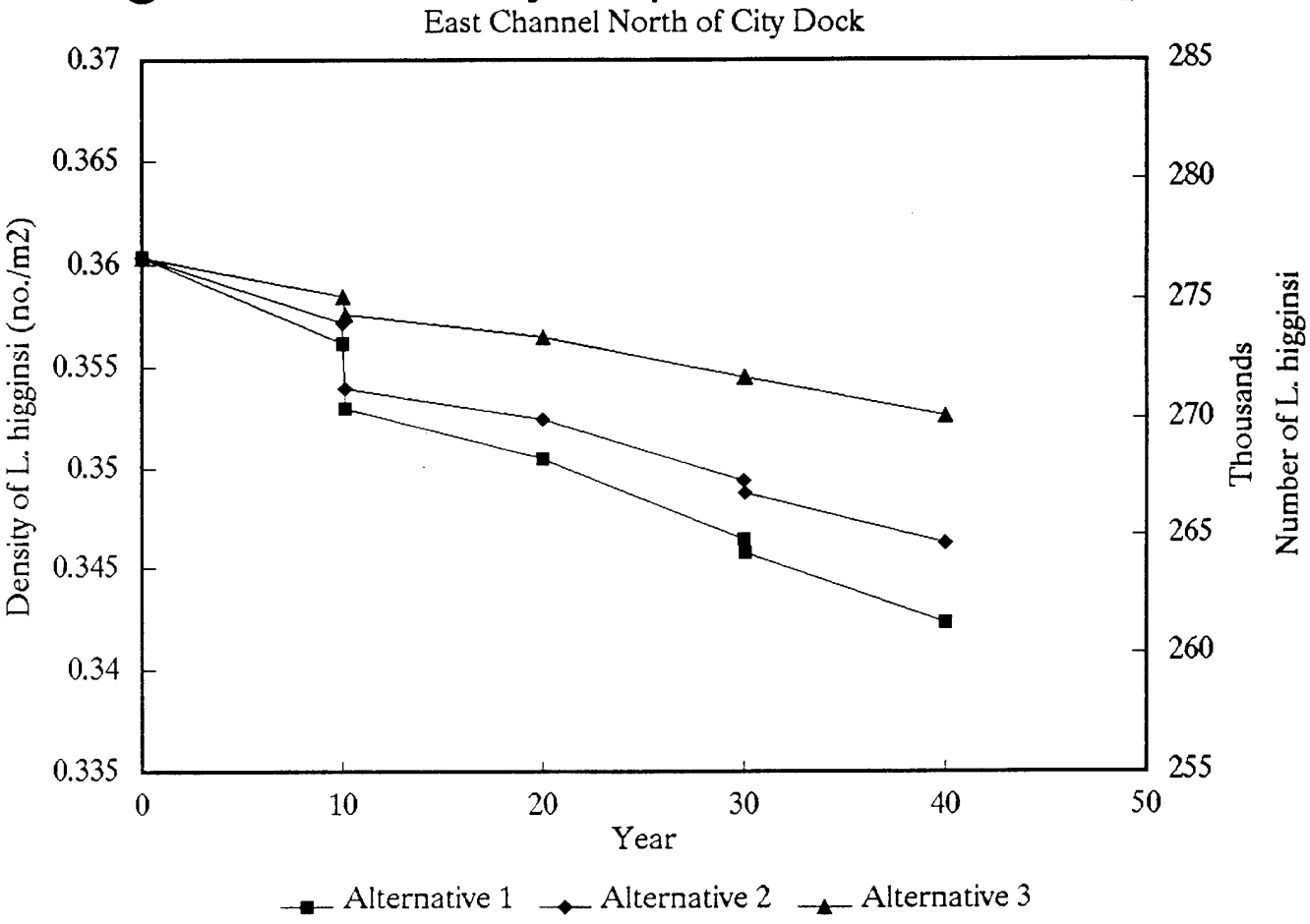


Figure 2. Density/Pop. Number Changes



10.5 APPENDIX E

SECTION 404(b)(1) EVALUATION

PRAIRIE SAND AND GRAVEL, INC.

SHORELINE STABILIZATION

PRAIRIE DU CHIEN, WISCONSIN

DECEMBER 31, 1995

I. PROJECT DESCRIPTION

A. Location

The proposed shoreline stabilization project is located in pool 10 of the Mississippi River near Prairie du Chien, Wisconsin (EIS figure 1). The Prairie Sand and Gravel, Inc. (PS&G) operation is located on the north end of St. Feriole Island. The Swingle site is located on the mainland directly adjacent to and northeast of the PS&G facility. Boat traffic using the PS&G facilities must navigate through the northern portion of the East Channel of the Mississippi River and through a tertiary channel known as Sawmill Slough.

B. General Description

PS&G proposes to construct a commercial commodity shipping harbor at the undeveloped Swingle site and expand the present shipping operation at the PS&G site. Included in the proposed harbor development is the placement of bedding materials and rock riprap along approximately 4,900 feet of unprotected shoreline adjacent to the Swingle and PS&G sites and the installation of 27 mooring dolphins (see EIS figures 2 through 4). Bedding and riprap would be placed in a 33-foot-wide band between elevations 595.0 feet mean sea level (ft msl) and 616.0 ft msl. Within this 33-foot-wide band, bedding materials would be approximately 1 foot thick, while riprap would be between 1 and 2 feet thick, for a total fill thickness of 2 to 3 feet. The dolphins would be 10-foot-diameter steel cylinders filled with granular material and capped with cement. This evaluation addresses the impacts resulting from the placement of fill material (bedding, riprap, and mooring dolphins) in waters of the United States in compliance with Section 404 of the Clean Water Act.

C. Authority and Purpose

Under the Clean Water Act of 1968, the Corps of Engineers is responsible for granting permits for the placement of fill materials in waters, and their adjacent wetlands, of the United States. The permit applicant feels the placement of riprap is necessary to stabilize the shorelines surrounding the PS&G and Swingle sites.

D. General Description of Dredged or Fill Material

1. General Characteristics of Material

Riprap would be clean rock obtained from local quarries. Bedding material would be clean sands obtained from the PS&G mining operations. The permit applicant has the capability of reducing large stone to riprap with a maximum diameter of 12 inches. Riprap would meet Wisconsin Department of Transportation specifications for "heavy riprap."

2. Quality of Material

Clean, contaminant-free riprap would be obtained from existing pits and quarries in the area. Use of clean riprap would not introduce contaminants into the aquatic ecosystem. The sand used as bedding materials would be obtained from the PS&G mining operations. Essentially, bedding materials would be obtained on-site. Use of these materials should not introduce any contaminants into the aquatic ecosystem.

3. Quantity of Material

The permit applicant estimated that approximately 5,000 cubic yards of rock riprap would be required to complete the project. Approximately 3,000 cubic yards of bedding materials would be required to complete the project. The limited cross sections available make it difficult to estimate precise quantities of material needed, but based on calculations by the Corps of Engineers, the actual quantities may be double the permit applicant's estimates. However, changes in the final quantities needed to accomplish the project would not change the effects of the project, because the affected area would remain the same.

4. Source of Material

All rock riprap materials would be obtained from approved existing pits and quarries in the area. The permit applicant would provide a crushing facility to reduce large stones to the desired 12-inch maximum diameter size. PS&G is a sand and gravel mining operation and would provide all needed bedding material.

E. Description of the Proposed Fill Site

1. Location

Riprap would be placed along approximately 4,900 lineal feet of shoreline adjacent to the Swingle and PS&G sites (EIS figure 1). Riprap would be placed in a 33-foot-wide band, 1 to 2 feet thick between elevations 595.5 ft msl and 616.0 ft msl. Riprap would be bedded in a 1-foot-thick sand blanket. The low control pool (LCP) elevation at Prairie du Chien is approximately 611.0 ft msl.

2. Size

The permit applicant would crush large stones obtained from local quarries to provide riprap with maximum size of 12 inches in diameter. All riprap materials would be 12 inches or less in diameter. Bedding materials would be sand obtained from the PS&G mining operation on St. Feriole Island.

3. Type of Site

Bedding/riprap placement is proposed on eroding/eroded shoreline areas adjacent to the PS&G and Swingle sites. The PS&G site is a developed commodity shipping and gravel and sand mining operation. Shoreline areas adjacent to the PS&G facility are heavily disturbed. Waves created by barges using the site and barge docking along shoreline areas have created erosion and scour problems. The permit applicant has placed dredged materials, mainly sands and small rocks, on the Swingle site to raise the site above the 100-year flood elevation. Shoreline areas adjacent to the Swingle site are sandy slopes with little vegetation.

4. Types of Habitat

The shoreline areas proposed for placement of riprap are heavily disturbed and provide little habitat for fish and wildlife species. With the exception of some small willows along the Swingle site shoreline and isolated willow patches along the PS&G shoreline, the areas proposed for riprap placement are bare. Because of the barge traffic and the other industrial activities occurring at the PS&G site, few species of wildlife inhabit the project vicinity. Mussel surveys of the littoral area indicate that poor substrate, low current, and the disturbed nature of the area have greatly limited mussel habitat in the area.

F. Description of Disposal Method

Materials would be placed with backhoes and/or front-end loaders.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

1. Substrate Elevation and Slope

Substrate elevation and slope would not be changed appreciably by the proposed project. Bedding and riprap would be placed on a 2 horizontal to 1 vertical slope extending from elevation 611.0 ft msl to 595.5 ft msl. Current slopes in the project area are relatively steep and are experiencing erosion. Placement of riprap materials should reduce erosion and stabilize the protected shorelines.

2. Sediment Type

Sediment types in the project vicinity consist primarily of sands, gravel, and rock from previsouly placed riprap. Some pockets of fine material are also present at the site.

3. Dredged/Fill Material Movement

The use of sufficiently large riprap should preclude any movement of fill material after the project is in place. Additionally, bedding the riprap in sand should improve the stability of the completed project. Only minimal movement of fill material is expected to occur during construction.

4. Physical Effects on Benthos

The shoreline areas proposed for riprap placement and installation of dolphins have been heavily disturbed by the barge shipping activities occurring at the PS&G facility. Barge induced waves and wave wash have scoured shoreline areas in the project vicinity, limiting the quality of benthic habitats in the area. Only six species and 100 live specimens of mussels were found in surveys conducted along these shoreline areas, indicating a rather impoverished mussel fauna. Bedding and riprap materials and the mooring dolphins would generally destroy the existing impoverished benthic fauna. Placement of large stones and rocks would improve the quality of benthic habitat, providing increased substrate area for attachment of benthic organisms. While the initial placement of riprap would destroy any benthic organisms in the immediate project vicinity, the long-term impact of riprap placement would be beneficial.

5. Actions Taken to Minimize Impacts

Because the placement of materials would have only minimal impacts, no special actions to minimize adverse impacts would be taken.

B. Water Circulation, Fluctuation, and Salinity Determination

1. Water

a. Salinity

Not applicable.

b. Water Chemistry

The use of clean fill material and mechanical placement procedures would preclude any significant impacts on water chemistry.

c. Clarity

Some minor, short-term decreases in water clarity are expected from the proposed fill activities. The long-term effect from fill placement should be a slight improvement in water clarity because any erosion presently occurring would be eliminated.

d. Color

The proposed fill activities should have no effect on water color.

e. Odor

The proposed fill activities should have no effect on water odor.

f. Taste

The proposed fill activities should have no effect on water taste.

g. Dissolved Oxygen Levels

The proposed fill activities should have no effect on dissolved oxygen levels.

h. Nutrients

The proposed fill activities should have no effect on nutrient levels in the water.

i. Eutrophication

The proposed fill activities should have no effect on the level or rate of eutrophication of the water.

j. Temperature

The proposed fill activities should have no effect on water temperature.

2. Current Patterns and Circulation

a. Current Patterns and Flow

The proposed fill activities would have no effect on current patterns and flow.

b. Velocity

The proposed fill activities would have no effect on water velocity.

c. Stratification

The proposed fill activities would have no effect on stratification conditions.

d. Hydrologic Regime

The proposed fill activities would have no significant effects on the hydrologic regime.

3. Normal Water Level Fluctuations

The proposed fill activities would have no effect on normal water level fluctuations.

4. Salinity Gradient

Not applicable.

5. Actions Taken to Minimize Impacts

Placement of fill material would be done by mechanical means during periods of normal to low water. No special actions would be taken to minimize project impacts.

C. Suspended Particulate/Turbidity Determination

Turbidity and the concentration of suspended solids would be expected to temporarily increase during construction. The use of sufficiently large riprap and bedding of riprap in sand would preclude any particulate movement after the project is in place. Placement of rock riprap for shoreline stabilization would eliminate erosion currently occurring in this area and result in long-term reductions in suspended particulates and turbidity in the project area.

1. Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site

Although minor temporary increases in suspended particulates and turbidity would occur during project construction, conditions would return to normal after construction. The addition of riprap would eliminate/reduce erosion and thereby reduce suspended particulates and turbidity in the project vicinity.

2. Effects on Chemical and Physical Properties of the Water Column

No effects are expected on light penetration, dissolved oxygen, toxic metals, organisms, pathogens, or the aesthetics of the water column after the project is in place.

3. Effects on Biota

Benthic organisms in the project vicinity would be buried by riprap placement. However, the new substrates provided by riprap would be quickly recolonized by benthic organisms.

4. Actions Taken to Minimize Impacts

No special actions are anticipated.

D. Contaminant Determinations

The use of clean, rock riprap would not introduce contaminants into the aquatic system. Neither the materials nor their placement should cause relocation or increases of contaminants in the aquatic system.

E. Aquatic Ecosystem and Organism Determination

Riprap placement would reduce erosion of shoreline areas, resulting in improved water quality. The completed project would have little or no effect on the aquatic ecosystem.

1. Effects on Plankton

During construction, increases in turbidity and suspended solids near the fill activities would have a localized suppressing effect on phytoplankton productivity. However, these local effects are not considered significant. Plankton populations should recover quickly once construction activities have ceased.

2. Effects on Benthos

The limited benthic communities in the area of the proposed riprap and dolphin placement would be eliminated. However, the substrate provided by riprap would be more stable and diverse than the current.

3. Effects on Nekton

Increases in turbidity and suspended solids during construction, would temporarily displace the nekton occupying the area. Nekton communities would return to normal after project completion.

4. Effects on Aquatic Food Web

The long-term effect of the project on the total productivity of the area is expected to be very minor, although there would be a temporary disruption to the aquatic biota present. Addition of rock riprap could provide a more diverse and stable habitat for benthos, nekton, and small fish in those areas.

5. Effects on Special Aquatic Sites

No special aquatic sites are located in the project area.

6. Threatened and Endangered Species

The Federally listed endangered freshwater mussel species Lampsilis higginsi is known to exist in the general project vicinity. Mussel surveys of the impact areas indicate that the mussel community is both low in density and diversity (only 5 species and 100 individuals were collected). The proposed riprapping would eliminate mussel habitat, however, the COE, USFWS and WDNR have concluded the PS&G construction areas are presently unsuitable mussel habitat and unlikely to contain L. higginsi or significant numbers of other mussel species.

7. Other Wildlife

The habitat provided by the existing eroded shoreline areas is marginal. The fill activities would not result in the significant loss of aquatic or terrestrial habitat. The general diversity and productivity of the affected areas would be maintained.

8. Actions Taken to Minimize Impacts

No special actions are required.

F. Proposed Disposal Site Determination

1. Mixing Zone Determination

The proposed fill activities would create no mixing zones. The rock riprap material would be sufficiently large and relatively clean so that little, if any, material would be suspended in the water column as a result of riprap placement.

2. Determination of Compliance with Applicable Water Quality Standards

The fill materials would be obtained from approved pits and quarries in the project area. The area does not have a history of contamination, which should insure that State water quality standards would not be violated because of project-related activities.

3. Potential Effects on Human Use Characteristics

Because of the present and projected human use characteristics, the existing physical conditions, the proposed construction methods, and the clean material, this proposed action would have no significant adverse effects on human use characteristics. The shoreline protection project is part of a larger harbor expansion project which, if permitted, would increase use of the Prairie Sand and Gravel, Inc. and Swingle sites substantially.

G. Determination of Cumulative Effects on the Aquatic Ecosystem

Implementation of the proposed fill actions would cause no significant impacts on the aquatic ecosystem. However, the project is part of a larger harbor development plan which could result in substantial increases in barge traffic in the area. The impacts of this harbor development are being addressed in an Environmental Impact Statement (EIS) to which this 404(b)(1) evaluation is appended.

H. Determination of Secondary Effects on the Aquatic Ecosystem

No significant secondary effects on the aquatic ecosystem would be expected as a result of this project. However, as stated in Item II.G above, this project is part of a larger harbor development project. The impacts of the overall harbor development are addressed in an EIS to which this 404(b)(1) evaluation is appended.

I. Alternatives to the Proposed Fill Activity

The placement of fill is required to provide the desired benefits. Taking no action or placing riprap on a smaller area of shoreline would expose unprotected areas to erosion. The no action alternative would result in increased potential for shoreline erosion and resultant degredations in water quality. The no action alternative would not provide the desired shoreline protection.

III. FINDING OF COMPLIANCE WITH RESTRICTIONS ON DISCHARGE

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

2. The proposed fill activity would comply with the Section 404(b)(1) guidelines of the Clean Water Act. The placement of fill is required to provide the desired benefits. Other alternatives would not provide the desired results.

3. The proposed fill activities would comply with all State water quality standards. The disposal operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

4. The proposed shoreline stabilization project would not harm any endangered species or their critical habitat.

5. The proposed project would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation, and commercial fishing. It would not adversely affect plankton, fish, shellfish, wildlife, and special aquatic sites. Life stages of aquatic life and other wildlife would not be adversely affected. Adverse effects on aquatic ecosystem diversity, productivity, and stability and on recreational, aesthetic, and economic values would not occur. The rock riprap could provide a more diverse benthic habitat than currently exists and would reduce erosion and turbidity.

6. To minimize the potential for adverse impacts, the fill would be placed during periods of normal to low water levels. Since the proposed action would result in few adverse effects, no additional measures to minimize impacts would be required.

7. On the basis of this evaluation, I specify the proposed disposal site complies with the requirements of the guidelines for discharge of fill material.

Date _____

J.M. Wonsik
Colonel, Corps of Engineers
District Engineer

10.6 APPENDIX F

CULTURAL RESOURCES

MEMORANDUM OF AGREEMENT REGARDING A DEPARTMENT OF THE ARMY PERMIT FOR EXPANSION AND DEVELOPMENT OF A COMMERCIAL HARBOR ON ST. FERIOLE ISLAND AT PRAIRIE DU CHIEN, WISCONSIN

CULTURAL RESOURCES CORRESPONDENCE

MEMORANDUM OF AGREEMENT

REGARDING A DEPARTMENT OF THE ARMY PERMIT FOR EXPANSION AND DEVELOPMENT OF A COMMERCIAL HARBOR ON ST. FERIOLE ISLAND AT PRAIRIE DU CHIEN, WISCONSIN

WHEREAS, the Corps of Engineers, St. Paul District (Corps) has determined that the proposed expansion and development of a commercial harbor by Prairie Sand and Gravel, Inc. (Applicant) under a Department of the Army permit (No. 91-01040-IP-DLB) will have an effect upon the St. Feriole Island Archeological and Historic District, including the individually listed Rolette House; the National Historic Landmarks of Villa Louis, the Astor Fur Warehouse, the Brisbois House and the Dousman Hotel; and the Effigy Mounds National Monument, and the Corps has consulted with the Wisconsin and Iowa State Historic Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the State Historical Society of Wisconsin (SHSW) operates the Villa Louis complex, including the Villa Louis, the Astor Fur Warehouse, the Brisbois House and the Rolette House, as an interpretive historic site of the State of Wisconsin; the National Park Service (NPS) operates the Effigy Mound National Monument as an interpretive site in Iowa; the City of Prairie du Chien (City) owns lands adjacent to the railroad on St. Feriole Island; the Wisconsin and Southern Railroad (Railroad) operates and maintains the rail line that transports commodities to and from the Applicant's harbor, and is an integral part of the harbor operations; and

WHEREAS, the Wisconsin River Rail Transit Commission owns the track and improvements included in the St. Feriole Island rail line, has a land use agreement with the Wisconsin Department of Transportation for use of the real property, and has an operating agreement with the Wisconsin & Southern Railroad for the operation and maintenance of the rail line; and the Wisconsin Department of Transportation, the Wisconsin River Rail Transit Commission, and the Wisconsin and Southern Railroad have recently rehabilitated the rail line on St. Feriole Island in a cooperative effort, including adding ballast to the tracks; and

WHEREAS, the permit Applicant, the National Park Service, the State Historical Society of Wisconsin, the Wisconsin and Southern Railroad, and the City of Prairie du Chien have participated in the consultation and have been invited to concur in this Memorandum of Agreement;

NOW, THEREFORE, the Corps, the Iowa SHPO, the Wisconsin SHPO and the Advisory Council on Historic Preservation (Council) agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The Corps shall condition the permit on the following measures:

A. Harbor Access Road:

(1). Approval of Design: The Applicant shall complete the harbor access road previously begun along the east side of the Island. This access shall be used by the Applicant for all vehicular traffic associated with the Prairie Sand and Gravel and other industrial harbor facilities on the Island. The City shall approve the final location, dedication, and reconfiguration of the harbor access road.

(2). Archeological Survey of Harbor Access Road: The Applicant has conducted an archeological survey of the harbor access road under a previous Corps permit. Further archeological survey of the harbor access road is not necessary, unless changes are made to the road's location which would require additional archeological survey. The final location shall be coordinated with the Corps and the Wisconsin SHPO to determine if further archeological survey is necessary.

(3). Completion and Use of Harbor Access Route: The new access road shall be completed no later than December 1, 1995. The Applicant may use temporary, alternate access during periods of high water when the designated harbor access road is unavailable for use. Alternate access routes and the time periods during which these alternate routes can be used must be approved by the City.

B. Future Yarding: The Applicant, in consultation with and approved by the Railroad, shall design a yard of 100 car capacity on the Applicant's property at the Prairie Sand and Gravel facility. The Applicant shall design the yard in a manner which maximizes switching at the Applicant's facility and minimizes switching in front of the historic structures on St. Feriole Island. The Applicant shall construct the approved design no later than September 1, 1997.

C. Visual Impact Reduction:

(1). Visual Impact Reduction Plan: No later than September 1, 1995, the Applicant shall develop a Visual Impact Reduction Plan to provide visual and audible screening of the Applicant's facilities, including access roads, from historic properties on St. Feriole Island and from Effigy Mound National Monument. The Plan shall include the following components:

(a). Visual Screening: This component of the Plan shall discuss and provide measures for the visual and audible screening of the Prairie Sand and Gravel and other industrial harbor facilities that protects the viewshed of Effigy Mounds National Monument. The Plan shall also discuss establishment of a greenbelt between the Applicant's Island facilities and the historic/recreational lands on St. Feriole Island. The Plan shall consider the greenbelt's size, composition, critical times during which

screening is needed, and the height of stockpiled commodities that will be screened as a result of Plan implementation.

(b). Built Environment: This component of the Plan shall discuss and provide measures to reduce the visual impacts of the harbor's built environment. At a minimum, this shall include measures to limit building size, building orientation, building materials and colors, and commodity stockpile heights.

(2). Construction Prior to Plan Completion: Should the Applicant need to initiate construction or other activities on the Island or at the Swingle Site prior to approval of the Plan, the Applicant shall coordinate the proposed activities with the NPS and the SHSW prior to completing these activities. The Applicant shall provide the Corps written verification that the NPS and the Wisconsin and Iowa SHPOs approve of the activities.

(3). Reviewing and Approving the Plan: The Applicant shall prepare the Plan in consultation with the SHSW and the NPS, and it shall be reviewed for approval by the Wisconsin SHPO, the Iowa SHPO and the Corps. Upon final approval, the Applicant shall implement the Plan completing the work no later than October 1, 1995. At any time, the Applicant may request changes to the Plan, provided that requested changes are reviewed and approved in accordance with this stipulation prior to implementation.

(4). Maintenance of Screening: The Applicant shall maintain the vegetative screening and replace plantings as necessary.

D. Harbor Tariffs: The Applicant shall establish a tariff on shipped commodities in accordance with the attached agreement between the City and the Applicant. Funds from this tariff may be used for historic preservation purposes associated with recreation, including implementing the visitor safety measures identified in stipulation J(3), below.

E. Track Retrofitting: The Applicant shall insure that funding is provided to the Railroad for retrofitting the tracks as specified in Stipulation F, below.

The Railroad shall ensure that the following measures are implemented:

F. Track Retrofit: The Railroad shall use funding provided by the Applicant for retrofitting the trackage on St. Feriole Island for historic preservation purposes. The work shall consist of the installation of rubberized vibration pads on the railroad ties, on the main operating track, between the tie plate and the tie to reduce vibrations to historic structures on St. Feriole Island from train operations. Retrofitting shall be done on 1300 feet of track beginning at a point 200 feet south of the Dousman Hotel and continuing north to a point 200 feet north of the Astor Fur Warehouse. The Railroad shall maintain the railroad tracks on State of Wisconsin owned land on St. Feriole Island in accordance with applicable Federal and State standards governing it operation. The Railroad shall ensure that all future maintenance

includes replacement of the vibration pads, as necessary, to continue to provide for reductions in vibration. The Railroad shall work with other involved agencies to ensure that the track retrofitting is completed by October 1, 1996.

G. Yarding of Trains: The Railroad shall not yard trains or park engines between Rolette Street and the yard to be constructed by the Applicant under Stipulation B, above.

H. Switch and Track Usage: The Railroad shall designate and use the track furthermost west as its operating track in front of the historic structures on St. Feriole Island. Upon completion of the Applicant's yard, as stipulated in B, above, the Railroad shall limit use of the easternmost track for emergency operations and/or passenger traffic.

I. Visitor Safety:

(1). Operating Schedules: During periods of seasonal operation of the Villa Louis complex, the Railroad shall make a good faith effort to maintain a consistent arrival and departure schedule onto and off of St. Feriole Island. Should the Railroad have arrivals and departures that vary from the norm during Villa Louis' daily visitation hours, either the Railroad or the Applicant shall notify the Villa Louis Visitor Center of the estimated change in schedule. The Villa Louis Visitor Center shall notify the Railroad of seasonal opening and closing dates and hours of operation, and will provide the Railroad a telephone number or fax number that will be used for notification purposes.

(2). Speed Limits: The Railroad shall not operate trains in excess of 10 miles per hour on St. Feriole Island. The Railroad shall, in appropriate locations on the Island, post the speed limit. The Railroad shall complete posting no later than completion of the track retrofitting project as specified in Stipulation F, above.

The City shall ensure that the following measures are implemented:

J. Visitor Safety Plan: No later than January 1, 1996, the City in consultation with the SHSW the Applicant, and the Railroad shall prepare a Visitor Safety Plan to ensure that visitors to St. Feriole Island have a safe visitor experience. At a minimum, the Plan shall include the following:

(1) Visitor Flow: The Plan shall identify pedestrian traffic flows between points of interest on St. Feriole Island and their relationship to vehicular and train traffic patterns for both daily visitation and visitation during major visitor events.

(2). Major Scheduled Visitor Events: The Plan shall identify the major scheduled visitor events and their associated dates. During these times, the Applicant and the

Railroad shall make a good faith effort to minimize track usage through shipment rescheduling to non-event dates or non-peak visitor hours. [Major visitor event is herein defined as an event requiring planning well in advance of the event. Normally scheduled visitation, passenger boat arrivals and departures, school field trips, etc. are not considered major visitor events].

(3). Identifying Safety Measures: The Plan shall identify measures needed to ensure visitor safety, such as establishing crosswalks and parking areas, marking designated visitor routes and flow patterns, posting road restrictions, and other measures that would increase visitor safety. The Plan shall consider the need for construction of a crosswalk at the Brisbois House which would link the main (west) entrance of the house to the Lawler Park parking area.

(4) Reviewing and Approving the Plan: The Plan shall be reviewed for approval by the Wisconsin SHPO and the Corps. Upon approval, the City and the SHSW shall implement the measures identified in the Visitor Safety Plan.

K. Track Retrofitting: If an ISTEA grant for track retrofitting is funded, the City shall reimburse the Applicant, up to the total amount of the grant, for retrofitting, as specified in Stipulation F, above.

L. Harbor Tariffs: The City Council and the Harbor Commission shall consider the use of harbor tariffs, as defined in Stipulation D, above, for historic preservation purposes associated with Island recreation, such as implementing visitor safety measures.

Measures for Monitoring and Dispute Resolution

M. Monitoring: The Council, the Wisconsin SHPO, the Iowa SHPO and the NPS may monitor activities carried out pursuant to this agreement, and the Council will review such activities if so requested. The Corps will cooperate with the Council, the Wisconsin SHPO, the Iowa SHPO, and the NPS in carrying out their monitoring and review responsibilities.

N. Dispute Resolution:

(1). Should the Corps, the Iowa SHPO, the Wisconsin SHPO, the SHSW, the Applicant, the Railroad, the City, or the NPS object within 30 calendar days to any action or plan provided pursuant to this agreement, the Corps shall consult with the objecting party to resolve the objection. If the Corps determines that the objection cannot be resolved, the Corps shall request the further comments of the Council pursuant to 36 CFR § 800.6(b).

(2). Any Council comment provided in response to such a request will be taken into account by the Corps in accordance with 36 CFR § 800.6(c)(2) with reference only to the subject of the dispute; responsibility to carry out all actions under this agreement that are not the subject of the dispute will remain unchanged.

(3). In cases of unresolved objections, the Corps shall consider the nature of the objection and the need for modifying, revoking, or suspending the permit, in accordance with its regulations under 33 CFR Part 325.7, until the objections can be resolved.

Execution of this Memorandum of Agreement and implementation of its terms evidence that the Corps has afforded the Council an opportunity to comment on issuance of a Department of the Army permit for harbor development at Prairie du Chien and its effect on historic properties, and the Corps has taken into account the effects of the undertaking on historic properties.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Robert D. Bush Date: 12/5/95

U.S. ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT

By: _____ Date: 10 Aug 95

J.M. Wonsik
Colonel Corps of Engineers
District Engineer

WISCONSIN STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 23 AUG. 1995

IOWA STATE HISTORIC PRESERVATION OFFICER

By: Patricia Ohlendorf Date: 8-10-95

Concur:

STATE HISTORICAL SOCIETY OF WISCONSIN

By: Robert Strommen
Associate Director Date: 8/21/95

NATIONAL PARK SERVICE

By: William W. Schenk Date: 9/1/95

PRAIRIE SAND AND GRAVEL, INC.

By: Blue E Dutton Date: 9/6/95

CITY OF PRAIRIE DU CHIEN

By: William Freeman Date: 11-9-95

WISCONSIN AND SOUTHERN RAILROAD

By: Wells - Lash Date: Nov 1-95

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

FEB 25 1994

Mr. Robert J. Whiting
Chief, Environmental Resources Section
Planning Branch
St. Paul District, Corps of Engineers
190 Fifth Street East
St. Paul, Minnesota 55101-1638

RE: Report of Vibration Studies
Prairie du Chien, Wisconsin

Dear Mr. Whiting:

On February 2, 1992, the Council received a copy of the referenced report for our review. This study was requested of Prairie Sand and Gravel, permit applicant, by the Corps and the Wisconsin State Historic Preservation Office (SHPO) to address concerns that continued, and proposed increased, train traffic would adversely affect historic properties, including four National Historic Landmarks, on St. Feriole Island at Praire du Chien. The properties in question include: the Villa Louis House, the Astor Fur Warehouse, the Brisbois House, the Rolette House, and the Dousman Hotel.

We have completed our review and find that you have not provided us with the Corps' views on the results of the study. We do, however, understand that the report documented no substantial vibration impacts to the properties with the exception of the Dousman Hotel. The report asserts that vibration-related damage to the property might result because of the current poor condition of the building.

We are interested in both the Corps' and the SHPO's assessment of this report. Please provide us with this information to facilitate our participation in the Section 106 consultation.

We understand that the Corps intends to proceed with the development of a Memorandum of Agreement. We are somewhat puzzled by this given that we understand that a harbor site has not yet been selected. What is the status of the Final Environmental Impact Statement (EIS) and the Section 107 study?

Additionally, we have not yet received a response to our comments on the Draft EIS nor have we seen a response from the Corps to the SHPO's comments. We believe the issues raised by both the Council and the SHPO need to be addressed prior to proceeding further in the consultation, and certainly prior to concluding the Section 106 review process for this undertaking.

Thank you for the opportunity to review the results of the vibration study. We look forward to response. If you have any questions, please contact Valerie DeCarlo at (202) 606-8505.

Sincerely,

Don L. Klima
Director
Eastern Office of Review

THE STATE HISTORICAL SOCIETY OF WISCONSIN

H. Nicholas Muller III, Director

816 State Street • Madison, Wisconsin 53706-1488
608/264-6400 • FAX: 608/264-6404

April 12, 1994

Mr. Robert Whiting
Planning Branch
St. Paul District, Corps of Engineers
190 Fifth St. East
St. Paul, Minnesota 55101-1638

RE: Vibration Monitoring Report, St. Feriole Island

Dear Mr. Whiting:

Staff in the Divisions of Historic Preservation and Historic Sites at the State Historic Society have had an opportunity to review and comment on the results of the Vibration Monitoring Report prepared by Twin City Testing Corporation for Prairie Sand and Gravel, Inc. While we are not vibration experts, the conclusions of this report appear reasonable and well researched. They also lead us to further questions.

The second conclusion (p. 14) indicates "an increase in train traffic levels of up to one train per day will not significantly affect the buildings in good structural condition." What does this mean for an increase in traffic that goes beyond a one train increase for any significant number of days?

The fifth conclusion (p. 14) indicates current vibration levels, as measured by the study, would have negative effects on three buildings, should their maintenance decline. Because of their closeness to the tracks, what would be the effects if track maintenance, including butted rail ends, declined and joint wheel shock vibration increased?

It seems to us the report suggests little vibration problems should current traffic, rail maintenance and building maintenance conditions prevail. A change in any of the three -- two of the Society's Division Historic Sites cannot control, and the third which requires successfully competing against other state agencies for funds -- could have serious impacts on several of the historic buildings.

We also must question the validity of the presumed standard of damage of 0.50 in./sec. ppv. In Appendix E to the report, a list is provided of national and international regulated vibration levels. The low range values of 0.080 in./sec. established in Australia and West Germany for historic buildings is dismissed in the text as not being "explainable by scientific principles" (page 11). These standards are probably not arbitrary. Two major countries have established standards for regulating vibration effects on historic buildings. According to these standards, the rail vibrations recorded in

Prairie du Chien would have an adverse effect on at least four of the five historic structures monitored. In the absence of any United States standard for vibration damage to historic property, it would seem better to err on the conservative side and utilize an adopted standard for historic building damage in another country, rather than accept the validity of the 0.50 in./sec. level which apparently did not relate to historic buildings.

The report noted (page 9 item 4) train engines generated larger vibrations than did train cars. Is this increased vibration level caused by the greater weight of the engine or is it caused by the mechanical operation of the engine itself? This has relevance because of current practice for engines to be parked in front of the Rolette and Brisbois Houses for up to twenty-four hours (or more) -- often with the engines running.

It is clear the effects of rail operations on the historic resources on St. Feriole Island will have to be addressed in any agreement we may reach concerning the proposed expanded harbor operations and its effects on historic resources. In addition to vibrations, requirements for track maintenance and traffic control, there are considerations of (a) public safety, (b) incompatibility of industrial rail traffic with the operations of a state historical site (park), (c) the effects of rail traffic on the visitor "experience" at the site, (d) the economic impact this may cause to site operations and (e) the establishment of an artificial site boundary that will preclude the Society's future options to develop this site.

Sincerely,

H. Nicholas Muller III
Director
(608) 264-6441

HNM:cm
51294/12-13

Advisory
Council On
Historic
Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

MAY 11 1994

The Honorable Roger Kennedy
Director
National Park Service
1849 C Street, NW
Washington, D.C. 20240

Dear Mr. Kennedy:

Pursuant to Section 106 of the National Historic Preservation Act (NHPA), the Council is currently in consultation with the Corps of Engineers, St. Paul District regarding the issuance of permits for harbor development and maintenance of the navigation channel at Prairie du Chien, Wisconsin. These actions will affect numerous historic properties, including Villa Louis, Astor Fur Warehouse, Brisbois House, and Dousman Hotel, National Historic Landmarks in Wisconsin, and Effigy Mounds National Monument, a unit of the National Park Service, in Iowa.

Section 800.10 of the Council's regulations (36 CFR Part 800) outlines provisions whereby the Council will give special consideration to National Historic Landmarks during review of Federal undertakings. Requesting a report from the Department of Interior pursuant to Section 213 of NHPA is cited as one such provision. Section 213 states:

> To assist the Council in discharging its responsibilities under this Act, the Secretary [of Interior] at the request of the Chairman, shall provide a report to the Council detailing the significance of any historic property, describing the effects of any proposed undertaking on the affected property, and recommending measures to avoid, minimize, or mitigate adverse effects.

Given the importance of the National Historic Landmarks and Effigy Mounds and the complex nature of the project, we feel it important that the Council take advantage of all mechanisms for gathering information and input. Therefore, we ask that the National Park Service, acting on behalf of the Secretary of Interior as

provided for in Section 301 of the NHPA, provide the Council with a Section 213 report on the National Historic Landmarks and Effigy Mounds and the harbor development.

In our view, this case presents interesting challenges for the Corps in balancing the needs of harbor development with the requirements of both the National Historic Preservation Act and the Endangered Species Act. The Corps has prepared a Draft Environmental Impact Statement (DEIS) on the Long-Term Channel Maintenance Plan for the Federal Harbor and a Permit Application to Construct and Expand Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin. The DEIS outlines the complexity of the issues but, we believe, does not adequately explore alternatives that avoid adverse effects to the National Historic Landmarks. A copy of this document has been forwarded to the Rocky Mountain Regional Office by the Corps.

We would greatly appreciate receiving your reports by June 3, 1994, to facilitate our consultation and to allow the Corps to consider the views of the Department of Interior in drafting the Final EIS.

Finally, in view of the fact that harbor development may affect Effigy Mounds, we would like to invite the National Park Service to participate in the Section 106 consultation as an interested party pursuant to the Programmatic Agreement among the National Park Service, the Council, and the National Conference of State Historic Preservation Officers.

We will be happy to make available documentation we have received on the project and to assist in coordinating with the Corps of Engineers in obtaining copies of needed material. The staff member handling this case, Valerie DeCarlo, may be reached at (202) 606-8505.

We look forward to obtaining the Department of Interior's views on this project. Thank you for your assistance.

Sincerely,

Robert D. Bush

Robert D. Bush
Executive Director

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

May 17, 1994

REPLY TO
ATTENTION OF

Planning Branch
Engineering and Planning Division

Mr. Robert Baker
Regional Director
Rocky Mountain Region
National Park Service
12795 West Alemeda Parkway
Denver, Colorado 80225-0287

Dear Mr. Baker:

On May 11, 1994, the Advisory Council on Historic Preservation requested the Director of the National Park Service provide a report on the significance of a number of National Historic Landmarks at Prairie du Chien, Wisconsin and Effigy Mounds National Monument in Iowa under Section 213 of the National Historic Preservation Act of 1966, as amended. The Advisory Council made this request as a result of their review of a Department of the Army permit application for harbor development at Prairie du Chien.

In order to facilitate your analysis of the effects that this undertaking may have on these properties and suggest appropriate mitigation measures to reduce impacts, we are enclosing the following documents and correspondence:

1. Draft Environmental Impact Statement - Long-Term Channel Maintenance Plan for the Federal Harbor and a Permit Application to Construct and Expand Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin.

2. Vibration Monitoring Report: Study of Train Vibrations, Prairie du Chien, Wisconsin.

3. The comments of the Wisconsin State Historic Preservation Office (letter dated April 12, 1994) on the vibration monitoring report.

We have requested the applicant to have their contractor address the issues raised by the Wisconsin SHPO in their letter of April 12, 1994, but we have not yet received a response.

If you need additional information in your review for the Advisory Council on Historic Preservation, please contact Mr. David Berwick, Archeologist, at (612) 290-5261.

Sincerely,

James T. Scott
Colonel, Corps of Engineers
District Engineer

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

NOV 18 1994

Mr. Robert J. Whiting
Chief, Environmental Resources Section
Planning Branch
St. Paul District, Corps of Engineers
Army Corps of Engineers Centre
190 Fifth Street East
St. Paul, Minnesota 55101-1638

RE: Long-Term Channel Maintenance Plan for the Federal Channel and a Permit Application to Construct and Expand Barge Terminal Facilities
Prairie du Chien, Wisconsin

Dear Mr. Whiting:

On October 31, 1994, the Council received the comments of the National Park Service (NPS) regarding the effects of the referenced project on historic properties, including four National Historic Landmarks and a National Historic Site. As you know, the Council requested the comments of NPS pursuant to Section 213 of the National Historic Preservation Act. We have enclosed a copy of the report for your information.

We have reviewed the Section 213 report and agree with its findings and recommendations. We share NPS' view that harbor expansion will further compromise the visual integrity of Effigy Mounds. Accordingly, we reiterate the recommendation that a viewshed analysis be undertaken to determine both the extent of visual impacts and ways to eliminate or substantially reduce such impacts.

The issue of vibration impacts has, as you know, been of concern to the Council, the Wisconsin State Historic Preservation Office (SHPO), and the Wisconsin State Historical Society (SHS) throughout this consultation, hence, the vibration study conducted on behalf of the applicant. The SHPO, in the letter dated April 12, 1994, raised a number of questions and noted that the standard for damage used in the study is applicable to new structures. The National Park Service also questioned the applicability of the .5 in/sec standard and referenced other sources that suggest lower thresholds for historic buildings.

We would add that to determine acceptable levels of vibration for historic structures knowledge of materials and construction as well as a current conditions assessment is required. While the report included brief descriptions of the conditions, it did not provide adequate details regarding current conditions. What are the consultants' qualifications reqarding historic architecture?

It is clear that the whole issue of vibration damage deserves closer attention. We recommend that a historic architect conduct a professional conditions assessment of all the buildings. In the assessment, sources of current problems such as cracking should be identified. In addition, the results of the vibration monitoring should be reviewed by the historic architect. This information should then become the basis for determining the extent of damage from current train traffic, what the effect of increased traffic would be, and what, if possible, is an acceptable vibration level.

As NPS points out in the Section 213 report, and as previously noted by the SHPO and SHS, there are indirect impacts to the historic properties that require consideration. These include conflicts between train traffic and visitor safety and increased audible and visual impacts detracting from the visitor experience. These are important issues for a heritage tourist site that depends on visitorship for continued existence. Impacts to the economic viability of the property as a tourist attraction could result in the loss of the historic properties.

In our view, the issues need to be addressed either through further exploration of ways to reduce or eliminate adverse effects from the proposed alternatives or through the consideration of entirely new alternatives. While we are aware of the Corps' interest in concluding the Section 106 process, we believe that an acceptable alternative has not yet been proposed. Perhaps through a more comprehensive approach a resolution that minimizes harm to both these Nationally significant properties and endangered species can be found. Given that there are factors beyond historic preservation that seem to be constraining the ability of the consulting parties to construct a reasonable solution, we believe the consultation process should be expanded. Accordingly, we suggest that the Corps invite state and local agencies with authority over related issues such as natural resources and rail transportation to actively participate in the consultation process to assist us in resolving these complex issues.

We appreciate the Corps' obvious committment to ensuring that all the historic properties, and especially the NHLs, are given appropriate consideration. We commend the continuing efforts of all the parties in this process to achieve a successful resolution. If you have any questions, or wish to discuss these issues further, please contact Valerie DeCarlo at (202) 606-8505.

Sincerely,

John L. Klima
Director
Eastern Office of Review

L76 (RMR-PPO)

Robert D. Bush
Executive Director
Advisory Council on Historic Preservation
The Old Post Office Building
1100 Pennsylvania Avenue, NW. #809
Washington, DC 20004

Subject: **Section 213 Report**
Draft Environmental Impact Statement on the Long Term Channel Maintenance Plan for the Federal Harbor and Permit Application to Construct and Expand Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin (DEIS).

Dear Mr. Bush:

Thank you for asking the National Park Service to comment on the proposed harbor development at Prairie du Chien. Attached please find our revised Section 213 report, discussing the National Park Service's concerns over the Prairie du Chien harbor development project. If you have any further questions regarding this matter, please contact Ramona Ruhl at (303) 969-2875.

Sincerely,

Roger Maxwell, Chief
Division of Partnerships and Outreach

Enclosures

RRUhl:lsl:8/25/94:2875:c:prairie.eis

PRAIRIE DU CHIEN SECTION 213 REPORT

SIGNIFICANCE OF EFFIGY MOUNDS NATIONAL MONUMENT

The Effigy Mounds National Monument is significant for its archaeological resources as it represents an outstanding example of the Indian Mound Building Culture of the Prehistoric American Indians. Prehistoric burial mounds are common from the eastern plains to the Atlantic seaboard, but only in the Prairie du Chien area were some of the mounds constructed in an effigy outline of mammals, birds, or reptiles. Within the monument boundaries, there are over two hundred mounds representing bear, bird, conical, and linear forms; these range in dates from circa 600 B.C. to circa A.D. 1400. The prehistoric cultures associated with Effigy Mounds National Monument include the Red Ocher Culture, Hopewell Culture, Effigy Mound Culture, and the Oneota Culture. With the advent of the fur-trade era, Indian occupation of this area ended.

EFFECTS OF HARBOR DEVELOPMENT ON EFFIGY MOUNDS NATIONAL MONUMENT

According to the DEIS, alternatives D and F1 will further compromise the viewshed of Effigy Mounds National Monument. These two alternatives involve an expansion in harbor activity, resulting in the increased size of commodity stockpiles, which would be clearly visible from all overlooks in the monument.

RECOMMENDATIONS

In order to identify all potential impacts on the viewshed of Effigy Mounds National Monument, we recommend that a viewshed analysis be prepared before any action on harbor development is pursued. From this analysis, a report should be prepared, which identifies threats to the viewshed, and explores options to eliminate or reduce these threats. For example, the DEIS mentions that stockpiles on the northern portion of the island would be highly visible, and that the visibility of stockpiles could be reduced by increasing the number of stockpiles in order to reduce their mass.

SIGNIFICANCE OF THE NATIONAL HISTORIC LANDMARKS (NHLs) ON ST. FERIOLE ISLAND

The NHLs on St. Feriole Island that could be impacted by the proposed harbor expansion are the Astor Fur Warehouse, Villa Louis, the Brisbois House, and the Dousman Hotel. All four of these NHLs are significant because of their association with nationally significant persons, and/or their representation of significant cultural themes of our Nation's heritage.

The Astor Fur Warehouse, Villa Louis, and the Brisbois House are all representative of Prairie du Chien's prominence as one of the nation's fur trading centers. In particular, the Astor Fur Warehouse was an establishment of the American Fur Trading Company, and recalls the political and economic prominence of the Astor family. Villa Louis was constructed by Hercules Louis Dousman, who was prominent in the fur trade and transportation industries in the Northwest Territory. The Brisbois House is exemplary of the prosperity brought to Prairie du Chien by the fur trade industry. The Dousman Hotel is significant for its association with the westward movement of emigrants. After the Civil War, Prairie du Chien served as a gateway for thousands of emigrants heading west. The Dousman Hotel provided a respite for these emigrants.

EFFECTS OF HARBOR DEVELOPMENT ON THE ST. FERIOLE ISLAND NHLs

From reviewing the DEIS, it appears that the most significant impact concerning the four NHLs on St. Feriole Island is the effect of rail line vibrations. The *Vibration Monitoring Report*, prepared by Twin City Testing Corporation for Prairie Sand and Gravel, Inc., summarizes the results of a study undertaken to determine the severity of vibration effects on these four NHLs. In their letter of April 12, 1994, the Wisconsin State Historic Preservation Office (SHPO) noted several topics of the vibration report needing further investigation. We concur with the SHPO's comments, and again stress the need for more investigation on the effects of vibrations on

structures. In particular, the National Park Service calls into question the **Vibration Monitoring Report's** presumption of a .5 in/sec standard. Two other sources (see attached bibliography) suggest lower thresholds for damage to buildings. Wiffin et al. indicates that architectural damage can occur at approximately .2 in/sec; and King et al. recommends a .08 in/sec threshold for the structures at Chaco Culture National Historic Park. This .08 in/sec recommendation is consistent with the standards set in Germany and Australia, which the **Vibration Monitoring Report** dismissed as unscientific. Furthermore, both Wiffin et al. and King et al. discuss the effect of uneven road surfaces increasing vibrations, thus raising the issue of railroad track maintenance. Finally, King et al. recommends that a loaded coal carrying train should not come within 1,584 feet of the ruins at Chaco Culture National Historic Park. This recommendation is in conflict with the situation at Prairie du Chien, where all of the NHLs lie within 300 feet of the railroad tracks.

Finally, other potential impacts on the St. Feriole Island NHLs caused by the proposed increase in harbor activity and facilities need to be considered. These impacts include:

- The issue of visitor safety at the four NHLs on St. Feriole Island due to the proposed increase in train traffic.
- Audible and visual impacts detracting from the visitor experience at the four NHLs on St. Feriole Island due to the increase in train traffic.
- Economic impacts on St. Feriole Island as a National Historic District listed on the National Register of Historic Places. In particular, the reduction of the marketability of the Dousman Hotel as a developable historic property is of concern.

RECOMMENDATIONS

In light of the aforementioned concerns, we feel that increased harbor and rail activity at Prairie du Chien will compromise the historic integrity of the Astor Fur Warehouse, Brisbois House, Dousman Hotel, and Villa Louis. Therefore, we recommend that there be no increase in rail activity. We also recommend that further investigation be undertaken to more fully understand the effects of present rail activity on the four NHLs on St. Feriole Island. From this investigation, a plan to protect these NHLs from railroad vibrations should be prepared. This plan should summarize the investigation, and establish vibration standards for the NHLs on St. Feriole Island.

Bibliography

King, Kenneth W., S. T. Algermissen, and P. J. McDermott. *Seismic and Vibration Hazard Investigations of Chaco Culture National Historical Park.* Open-file Report 85-529. Denver, CO: U. S. Geological Survey, Department of the Interior, 1985. Pages 12, 14, and 42.

Whiffin, A. C., and D. R. Leonard. *A Survey of Traffic-Induced Vibrations.* RRL Report LR 418. Crowthorne, Berkshire, England: Design Division, Road Research Laboratory, Department of the Environment, 1971. Pages 1 and 22.

February 10, 1995

Management and Evaluation Branch
Engineering and Planning Division

Ms. Valerie DeCarlo
Advisory Council on Historic Preservation
The Old Post Office Building
1100 Pennsylvania Avenue, #809
Washington, D.C. 20004

Dear Ms. DeCarlo:

In consideration of your request of November 18, 1994, we have spent some time reviewing vibration standards for the application for harbor development at Prairie du Chien, Wisconsin, as it relates to increases in train traffic. Based on this review, we believe that it would not be advisable to attempt to establish a standard for vibration for this project or to use standards that are found in the literature. We agree with your recommendation to conduct a building condition survey of the structures on the island so we can attempt to determine the causes of building deterioration in relation to past and present train traffic. This letter will attempt to outline our reasoning and recommend further studies to be conducted which we believe are appropriate to determining the conditions of the buildings under review.

The St. Paul District does not believe that establishing vibration standards for the State of Wisconsin or the City of Prairie du Chien is the responsibility of the Corps of Engineers. If either the State or the city would establish a standard, we would be in a position to enforce the standard as it relates to this permit issue. In reviewing the literature on vibration, we have not found significant, good research on the effects of vibration on historic structures which would allow us to set standards that may be of value in our particular permit case at Prairie du Chien. While we believe that research which focuses on historic structures would be of value to our case, we do not believe that the permit applicant, Prairie Sand and Gravel, Inc., should be responsible for funding further research into the general question of railroad vibrations on historic buildings.

We have included, for your review, copies of pertinent literature we reviewed on the issue of vibration in historic buildings (Whiffen, 1971; Rainer, et al 1982; Martin, et al, 1978; and Konon and Schuring, 1985). We have also included additional information gathered by the Wisconsin Department of Development (WisDOD). The vibration study conducted for this project, which was previously provided to you, is included again in the package from WisDOD.

In a December 12, 1994, meeting with the Wisconsin Department of Natural Resources, WisDOD, the permit applicant, and the State Historical Society of Wisconsin

(SHSW), we specifically asked the SHSW for information on the condition of the buildings that were owned by them. The reasoning behind our request was we believed that, with the recent renovation of some of these buildings, the SHSW would have conducted condition surveys prior to renovation. However, we were told that no condition surveys for these buildings existed, but funding was being made available for conducting such a survey at the Villa Louis.

Between the December meeting and late January, we spoke several times with Mr. Horace Foxall, Historic Architect, Seattle District Corps of Engineers, and Mr. Don Kermath, Architect, Corps of Engineers Construction Engineering Research Laboratory, in an effort to gather information for the preparation of a scope of work for conducting a building condition survey at Prairie du Chien. During this same period, Mr. David Pamperin, Director of Historic Sites for the SHSW was also to review SHSW files for reports of building conditions and provide what the SHSW felt would be appropriate for a condition survey. The SHSW information was to be provided by January 31, 1995; however, we have not yet received this information.

In reviewing the information gathered by WisDOD, we were surprised to see that many of the buildings for which we are addressing vibration impacts have had condition surveys completed within the past several years - some as recently as the spring of 1994. Information in the WisDOD packet includes condition surveys for the Dousman Hotel conducted in August 1991 and again in April 1992 and condition surveys for 10 buildings owned by the SHSW including the Astor Fur Warehouse, the Brisbois House and the Rolette House conducted in April 1994. The latter study was evidently funded by a National Park Service grant to assess damage caused by the flooding of 1993.

We offer the following assessment of the information we are providing as enclosures to this letter:

- The literature on vibration impacts as they relate to historic buildings has been sporadic and is often contradictory in establishing appropriate peak particle velocity acceptable for historic buildings. Appropriate levels of peak particle velocity may be related to specific construction techniques used in any given building and the nature, condition, and significance of its architectural features.

- Vibration impacts from traffic, because of their continual nature, must include consideration of building fatigue; however, fatigue on historic building materials is not well understood.

- Building deterioration is a complex problem and may include many environmental factors unrelated to vibration.

- Vibration impacts should be looked at as both architectural and structural. Structural impacts are those that jeopardize the ability of the affected building to remain standing, and architectural impacts are those that cause cosmetic impacts in plaster and other architectural components that do not jeopardize a building's structural integrity.

- Building condition assessments may not be able to specifically relate building deterioration to vibration impacts; however, they provide the basis for future monitoring efforts to detect and correct adverse impacts.

- The first line of defense against building deterioration from vibration impacts is good building maintenance.

We believe that the condition survey conducted for the Dousman Hotel is acceptable for our permit action, especially in light of the fact that the structural and architectural elements of the hotel are being renovated. Furthermore, we believe that the condition survey for the 10 structures owned by the SHSW could easily be made acceptable with the collection of some additional data. Specifically, the 1994 study focused on the structural integrity of the buildings at-grade and below. This study should be expanded to gather information on the above-grade structural condition of the buildings and the architectural condition of the buildings.

At this point, we believe we have collected enough additional data, as outlined in your letter of November 18, 1994, to begin the consultation process (visual impact assessment for Effigy Mounds was provided in our letter dated January 24, 1995). We do not believe that the additional information we are suggesting for the condition survey at the Astor Fur Warehouse, the Brisbois House and the Rolette House needs to be collected prior to beginning the consultation process. We feel we now have the basis for beginning to develop a memorandum of agreement, and the additional information on conditions can be incorporated into the process as we move along.

We believe that the St. Paul District has acted in good faith to consider the impacts to historic properties as they relate to this permit action, even though this has caused considerable delays in our permit review process and inconvenience to the permit applicant. We must now insist that this process move forward towards consultation so that we may conclude the Section 106 process and our requirements under the National Environmental Policy Act. We look forward to working with you and the Wisconsin State Historic Preservation Officer in identifying consulting parties to participate in the consultation process.

Sincerely,

Enclosures

Robert F. Post, P.E.
Chief, Engineering and Planning Division

BERWICK PE-M ____
WHITING PE-M ____
CRIST PE-M ____
BALLMAN CO-R ____
WOPAT CO-R ____
POST PE ____

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

MAR 1 [illegible] 1995

Mr. Robert F. Post, P.E.
Chief, Engineering and Planning Division
St. Paul District, Corps of Engineers
Army Corps of Engineers Centre
190 Fifth Street East
St. Paul, Minnesota 55101-1638

RE: Transshipment Permit and Harbor Development
Prairie du Chien, Wisconsin

Dear Mr. Post:

We have completed our review of the documentation you forwarded including information on vibration impacts on both modern and historic structures and the condition assessments for some of the affected historic properties.

As your correspondence indicates, the literature is contradictory regarding safe levels of vibration for historic buildings. Further, building deterioration may be the result of many factors including vibration, inadequate maintenance, and environmental conditions. Thus, it can be very difficult to accurately assess the source of damage for a building. We believe, however, that the affected historic properties on St. Feriole Island will require some reasonable protection against potential vibration damage from the freight trains used by the permit applicant, Mr. Dillman. We also believe that it is appropriate to assume that the State Historical Society and the owner of the Dousman Hotel will ensure adequate maintenance of these significant properties.

In any case, we are in complete agreement with your assessment that the District has compiled sufficient information to continue the consultation process and to begin exploring mitigation measures. We suggest that a draft Memorandum of Agreement (MOA) be developed and circulated among the consulting parties to facilitate the dialogue. We understand that the District is awaiting comments from both the Iowa and Wisconsin State Historic Preservation Offices and the National Park Service regarding the viewshed analysis and vibration impact information. In any case, we suggest that the MOA, at a minimum, address visual impacts of the harbor operations on Effigy Mounds and on historic properties on St. Feriole Island. Of particular concern are the height and scale of the storage piles. The MOA should also outline measures to minimize vibration impacts from train traffic as well as provisions to ensure ongoing

maintenance of historic properties. The other area of concern to be addressed in the MOA is the impact of train traffic on visitorship at the Villa Louis site.

The consulting parties should forward comments on the draft agreement to the District. The District can then distribute all the comments among the parties. We understand that the District and others are interested in another Section 106 consultation meeting. We believe that the basis of such a meeting should be the proposed mitigation measures outlined in the MOA.

Finally, we would like to commend your staff once again for the thorough research and committed effort to ensuring that the District seeks to the maximum extent possible ways to avoid or minimize adverse effects to the affected National Historic Landmarks.

If you have any questions or wish to discuss this matter further, please contact Valerie DeCarlo at (202) 606-8505.

Sincerely,

John L. Klima
Director
Eastern Office of Review

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

March 27, 1995

REPLY TO
ATTENTION OF

Management and Evaluation Branch
Engineering and Planning Division

Mr. Blair Dillman
Prairie Sand and Gravel, Inc.
800 North Villa Louis Road
Prairie du Chien, Wisconsin 53821

Dear Mr. Dillman:

After considerable collection and review of cultural resources data concerning the request from Prairie Sand and Gravel, Inc. for a Department of the Army permit to expand harbor facilities at Prairie du Chien, Wisconsin, the St. Paul District has prepared a draft memorandum of agreement (enclosed) outlining mitigation measures to deal with impacts to these resources. As a potential participant in the Section 106 process, we would appreciate your review and comments on this draft agreement.

On April 25-26, 1995, we will meet with interested parties at Prairie du Chien to discuss mitigation measures for protecting and preserving significant resources affected by the proposed permit action. The meeting, to be held at the Prairie City Bank, 300 E. Blackhawk Avenue, will begin at 10 a.m. on Tuesday and continue through mid-afternoon on Wednesday. This should provide enough time for discussion of mitigation measures and a tour of the project areas, if necessary.

We would appreciate your participation and input into the Section 106 process at this meeting. In reviewing the draft memorandum of agreement, please consider your involvement in the proposed harbor development, your relationship to impacts to cultural resources and your willingness to participate in the process by becoming a signatory to the memorandum of agreement. St. Paul District's goal for the Prairie du Chien meeting is to reach substantial enough agreement among the participants to prepare a draft final of the memorandum of agreement and to determine the signatories to the memorandum.

Please provide us with your comments on the draft memorandum of agreement and let us know if you will be attending the meeting in Prairie du Chien by April 17, 1995. Should you need any additional information, please contact Mr. David Berwick of my staff at (612) 290-5261.

Sincerely,

Enclosure

James T. Scott
Colonel, Corps of Engineers
District Engineer

CF:
Ms. Valerie DeCarlo
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, Suite 809
Washington, D.C. 20004

Identical ltrs to:

Mr. Blair Dillman
Prairie Sand and Gravel, Inc.
800 North Villa Louis Road
Prairie du Chien, Wisconsin 53821

Mr. Gary Koch
City Administrator
City of Prairie du Chien
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Prairie du Chien, Wisconsin 53821

Mr. Michael Cain
Wisconsin Department of Natural Resources
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Madison, Wisconsin 53707

Ms. Ellen Fisher
Wisconsin Department of Transportation
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Ms. Karen Gustin
Superintendent
Effigy Mounds National Monument
151 Highway 76
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Mr. Dennis W. Leong
Wisconsin Department of Development
123 West Washington Avenue
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Madison, Wisconsin 53707

Mr. William E. Gardner
President
Wisconsin and Southern Railroad
5300 N. 33rd Street
P.O. Box 9229
Milwaukee, Wisconsin 53209

10.7 APPENDIX G

RESULTS OF PRAIRIE DU CHIEN

PUBLIC MEETINGS

APRIL 20, 1992

Overview: The COE and the Wisconsin Department of Natural Resources sponsored two public meetings in Prairie du Chien on April 20, 1992, one at 1:00 p.m and the other at 7:30 p.m. The afternoon meeting was designed to target the business and city leaders and the evening meeting was open for the general public. The purpose of the meetings was to solicit the public's views and concerns about the current permit actions being considered at Prairie du Chien, Wisconsin.

The meetings started with introductions and an overview of the study process. A brief description of the separate Commercial Harbor Study at Prairie du Chien was given and a summary of the Federal environmental impact statement (EIS) process was presented. Then the meeting was split up into small groups.

The small groups were designed using the nominal group process to obtain comments from all people in attendance. The nominal group process allows each participant to present any issues and/or concerns they have about the current permits being reviewed at Prairie du Chien. About 80 people attended the meetings (45 at the day and 35 at the evening) and 44 people (26 at the day and 18 at the evening) participated in the nominal group session. The audience was divided into small groups. There were seven groups total, four in the day and three in the evening. Each group moved to an assigned area. The groups took turns stating their concerns and issues about the East Channel of Prairie du Chien, and a recorder from each group wrote down the issues/concerns. Four votes were cast by each member of the group. The votes could be placed all on one issue, or any number they felt represented their importance in that issue. After voting, the results were found and the groups reconvened into one large body to share the results and to close the meeting.

Each group read the most important issues/concerns that their group voted for. Then the floor was opened for questions and answers before the meeting was adjourned.

All the issues/concerns that were brought out in the groups were compiled into a database and then sorted several ways. The total issues/concerns brought up was 146 and the total number of votes was 173 (4 votes per individual). Of the total, 73 of the issues/concerns received no votes at all, while 23 received only one vote. This may be because the issues/concerns were not complete, well thought out, or relevant, or there may have been better issues/concerns expressed by other group members. The remaining 77 issues/concerns received between 2 and 9 votes from the group members. These could be thought of as the more pressing or more widely accepted issues/concerns of the people that participated in the group process.

The issues/concerns were then entered into seven categories based upon groupings that help analyze the data. The seven categories used are:

1) ENVIRONMENTAL CONCERNS
2) ECONOMIC CONCERNS
3) HISTORICAL CONCERNS

4) RECREATION CONCERNS
5) STATE GOVERNMENT CONCERNS
6) STUDY CONCERNS
7) CITY/LOCAL CONCERNS

Category 1, Environmental concerns, had 31 issues listed and 35 votes total. This is 21.2% of all the issues/concerns listed and 20.2% of the total votes. This is also 1.1 votes per issue. The most popular issue/concern received 6 votes and read, "Abundance of L. Higginsi outside of East Channel and is it really endangered? Need to conduct studies out of East Channel." Over half of the issues stated mentioned the L. Higginsi. This was a very representative sample of all 31 issues/concerns listed for this category. Other issues in category 1 dealt with water quality, danger of spills in the channel, and concern with the "human element."

Category 2, Economic concerns, had 40 issues listed and 50 votes total. This is 27.4% of all issues/concerns listed and 28.9% of the total votes. This works out to be 1.25 votes per issue. The most popular issue/concern received 9 votes and read "Economic impacts considered-jobs, etc." This was also a very representative sample of all 40 issues/concerns listed.

Category 3, Historical concerns, had 4 issues listed and received 5 votes total. This is 2.7% of the total issues listed and 2.9% of the total votes. This works out to 1.25 votes per issue. The most popular issue/concern received 3 votes and read "Maintain and enhance the historical significance of Prairie du Chien, especially the island." The issues in this category centered around using existing historical structures and the hotel to revitalize the island. In many ways, these concerns are linked to the economic concerns in category 2.

Category 4, Recreation concerns, had 12 issues listed and received 5 votes total. This is 8.2% of all issues/concerns listed and 2.9% of the total votes. This equals 0.42 vote per issue. The most popular issue/concern received 2 votes and read "How would the cost/benefit of a major recreational development on the island compare with commercial navigation?" This category had many different viewpoints from "Commercial use has not hindered small boat use" to "Conflict between recreation and commercial activities."

Category 5, State Government concerns, had 4 issues listed and received 4 votes total. This is 2.7% of the total issues listed and 2.3% of the total votes. This works out to 1 vote per issue. The most popular issue/concern received 2 votes and read "Department of Ag. strongly supports grain loading facility in Prairie du Chien."

Category 6, Study concerns, had 41 issues listed and received 57 votes total. This is 28.1% of the total issues listed and 32.9% of the total votes. This works out to 1.39 votes per issue. The most popular issue/concern received 8 votes and read "#2 is not an alternative, 1 and 3 are!" This statement was fairly representative of the category.

Category 7, City/Local concerns, had 14 issues listed and received 17 votes total. This is 9.6% of the total issues listed and 9.8% of the total votes. This works out to 1.2 votes per

issue. The most popular issue/concern received 3 votes and read "Need expansion of existing City Dock." There were several different responses concerning the community's voice in the matter and a need for more public involvement and awareness at the local level.

From a summary of all categories listed, it is apparent that the public is very much consumed with finding an answer to the future use of the East Channel and St. Feriole Island. The economics of the commercial harbor and bringing money to Prairie du Chien was the topic most discussed in the group meetings. Many statements center around "more jobs" and "must have it to survive" responses. This indicates that the study must be detailed so the proper alternatives can be analyzed.

A strong discussion about clams and the L. Higginsi mussel took place in almost every group. The study should take the time to answer some of the questions that appeared over and over again. This was the second most discussed topic in the group meetings.

The study concerns category was the third most discussed topic in the group meetings. This shows that there is concern with the study and the time required to complete it.

The top three categories received 142, votes which is over 82% of the total votes for all issues listed. This may indicate that these categories are the most supported and the areas that the study team should concentrate on to provide effective responses to these issues.

10.8 APPENDIX H

CORRESPONDENCE

WISCONSIN
DEPT. OF NATURAL RESOURCES
George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

June 24, 1993

Dennis Leong
Wisconsin Department of Development
123 W. Washington Ave.
Madison, WI

Mr. Gary Koch
City Administrator
City of Prairie du Chien
P.O. Box 324
Prairie du Chien, WI 53821

Mr. Blair Dillman
Prairie Sand and Gravel
800 N. Villa Road
P.O. Box 210
Prairie du Chien, WI 53821

Mr. John Didion
Didion, Inc.
210 Grell Lane
Johnson Creek, WI 53821

SUBJECT: Prairie du Chien- Joint Harbor Agreement

Gentlemen:

This letter is in response to your request concerning the permitting issues related to the application by the City of Prairie du Chien, Didion, Inc., and Prairie Sand and Gravel to develop a joint harbor facility on the north end of St. Feriole Island in Prairie du Chien. This is the "final" version of the letter which we previously discussed in "draft" form and which has been reviewed by the other parties to this action.

You have all received a copy of the letter from Public Intervenor Thomas Dawson dated June 15, 1993, which contains the comments of his office and the other parties. I am encouraged that, while some issues remain to be resolved, the Public Intervenor noted that they are "pleased with the progress we have made, and we pledge our best efforts to achieve settlement." It is clear from his letter that the process in which we are involved will lead to a mutually acceptable resolution of this matter.

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As you are aware, the Department has been deeply involved with all the state agencies and parties in this matter to attempt to locate an alternative site for a combined harbor facility in Prairie du Chien. We are committed to working with all parties to see that this is accomplished.

We are very pleased that the parties have been able to make substantial progress toward an agreement which will result in a joint harbor facility in Prairie du Chien. I want to thank you all for your significant contributions in this effort.

Because of our role as the regulatory agency which must process and review these permit applications under the laws of this state, we cannot give you or the applicants a statement of our final position on any permit issues. The review of the applications must include public notices, review under WEPA, and approval of the specific permit proposals under standards of our statutes and rules.

We can, however, give you the following responses based on the information currently available to us about the proposal:

1. Chapter 30 permits for the harbor and commercial operations.

Based on the information we currently have about the proposed facilities on the north end of St. Feriole Island, we would intend to issue permits for the construction work and docking structures that would contain few restrictions. One restriction that we have discussed historically would relate to the type of commodities handled at these facilities. We would anticipate permitting the movement of those commodities historically handled, such as grain, coal, salt, aggregates, fertilizer components such as urea and potash, and wood products.

We would anticipate problems with things like petroleum products or other hazardous substances as defined by the U.S. Coast Guard. If the City can provide us with ideas concerning the potential commodities they wish to transport, we can discuss any problems we anticipate.

2. DNR assistance with federal permits and approvals.

The Department would continue to coordinate and assist in the processing of the federal permits. We are currently working with the COE on the EIS for the Dillman proposal. It is our understanding that the Dillman expansion proposal as submitted to the COE and DNR represents facilities sufficient to support the consolidation. Additionally, we will continue to work with the USFWS on the issues relating to the endangered resources involved.

It is our hope that any permits and approvals which are issued for the combined harbor facilities will avoid the counting of barges and will minimize any monitoring requirements. We will work toward that goal with the federal agencies.

3. Access to the West Channel through the East Channel and Saw Mill Slough.

We have been supportive of this route for many years in the discussion of these issues. We would continue to support access to the new harbor facilities through the northern end of the East Channel, the turning basin, and Sawmill Slough. If future dredging is required in these areas, we will have to review methods to minimize any adverse impacts due to that dredging.

4. City dock remains open to permitted activities.

We understand that the City has an interest in assuring that a federal harbor remain at Prairie du Chien. We are hopeful that the COE 107 Study will help to maintain the federal harbor at the most appropriate site.

We agree that the existing City dock can be used for those uses and traffic levels that existed prior to 1988. Our records show the average annual level of traffic to be 15. The City has suggested that there is evidence that the historical numbers are higher, with some records indicating that 51 barges were moved in 1965. We would like to review whatever additional records the City has concerning this.

It is our further opinion, however, that it is in the best interests of the resources and parties involved that a new federal harbor be established on the north end of the island and that the nine foot navigation channel to the current site not be maintained in the future. We will work with all parties and the federal government to try to accomplish this change.

At our meeting on May 24, questions were raised concerning the continued access to the City by the Delta Queen and other tour boats. We would agree that this type of access to the City must be maintained, however, we would hope that, in the long term, this access would be at a location which would avoid maintenance dredging.

5. Review of all necessary permits to insure conditions to allow maximum use of the harbor.

You have listed a number of permits here, including;

A. Fleeting permits. The Department recognizes the need for limited barge fleeting in the vicinity of the joint harbor. There may be issues concerning the location of the fleeting, potential conflicts with recreational traffic, etc., but these issues should be resolvable.

B. Flood plain issues. Any proposed developments will need to comply with the provisions of NR 116.

Because the north end of the island is in the floodway, there will be limitations on the amount of fill, structures, and storage of materials. Fill will be limited to that needed for leveling the site and providing approach elevations to docks. Short-term storage structures (for transloading convenience only) cannot be an obstruction to flood flow, and will need to be elevated on stilts or constructed in such a way to provide floodwater flow-through. Commodity storage will be limited to types and conditions of storage

in the floodway that are consistent with DNR and DOT regulations. For example, you can expect that coal will be allowed to be stored on the island from June to February (inclusive) only, and salt and certain fertilizer components will be permitted storage on the Swingle site only.

We would urge the City or Mr. Dillman to provide information as soon as possible concerning elevations on the island and proposed facility development so that we can jointly work through any floodplain issues.

C. Dredging. We will need more detail on proposed dredging. It is our initial reaction that there will not need to be any significant dredging other than that necessary to develop access to the new dock structures. We should be able to work through the wastewater issue which Mr. Dillman raised at our recent meeting. Contact should be made with Dave Pericak concerning that issue.

D. Other issues. Air permits will be required but should not be a problem. Any facilities for the storage of salt must comply with TRANS 277, which will require substantial upgrade of such facilities.

As we indicated at our May 24 meeting, it will be necessary to coordinate timelines for the various activities involving DNR and the other agencies. We will work to develop a timeline which will assist all parties in anticipating activities in this project.

6. Barges allowed during 1993.

Based on the substantial progress which has been made by the parties, the Department will not have any objection to the extension of the 1993 permit through December 31, 1993, for 135 barges. This will have to be reviewed with the other parties to the litigation, but we would hope they will also not object to the extension.

7. Barges allowed during 1994.

Based on the comments of the other agencies and the parties at our May 24 meeting, it appears that funding and initial construction of the combined harbor facilities cannot start until 1994. It appears, therefore, that a permit in 1994 will be required until the new facilities are finished.

The Department would not object to a permit in 1994 at the existing traffic levels and with the existing conditions in place. Such a permit would be subject to public notice requirements, and, based on the comments of Marion Havlik at our meeting, it appears such a permit would be issued incrementally to insure that progress toward development of a new harbor continues to be made.

8. Financial or Technical Assistance from DNR.

There is no financial assistance available from the DNR for these commercial harbor facilities. We will continue to work with the other state agencies to put together the assistance package which has been previously discussed.

We will continue to provide technical review of any proposed or final plans to advise you of any concerns or suggestions we may have.

9. DNR Assistance in Consensus Building.

We will continue to work with all parties and agencies to build consensus concerning these issues and to achieve a mutually acceptable solution to these long standing issues.

I hope this assists the parties in understanding the position of this agency relating to those regulatory matters which remain to be resolved. I, and Department staff, will be happy to meet with the parties to discuss these issues if you feel this is necessary.

We will be meeting with the Federal agencies in the near future to discuss the status of their activities relating to these issues. We will provide a timeline of the regulatory activities once we have had these discussions.

Again, thank you all for your efforts in working toward resolution of these matters.

Sincerely,

George E. Meyer

cc: Governor Tommy Thompson
Secretary Charles Thompson-DOT
Ellen Fisher-DOT
Secretary Alan Tracy-DATCP
Michael Lester-DATCP
H. Nicholas Muller-Historical Society
Rick Dexter-Historical Society
Thomas Dawson-Public Intervenor
Bill Redding-Sierra Club
Brett Hulsey-Sierra Club
Marion Havlik
Peter Peshek
WD
WZ/6
Dave Pericak-LAX
Michael Cain-LC/5
Robert Read-EA/6

C:PDC.MJC

Rendezvous in Prairie du Chien
A center of trade for 300 years!

City of Prairie du Chien

207 West Blackhawk Avenue
Post Office Box 324
Prairie du Chien, Wisconsin 53821
Phone: (608) 326-6406



June 11,1993

George E. Meyer
Secretary, Dept of Natural Resources
101 S. Webster St
Box 7921
Madison, Wisc. 53707

Dear Mr. Meyer:

The Harbor Commision of the City of Prairie du Chien wishes to thank you and your department for the preparation of the draft letter outlining matters that are important to the proposed combined harbor facility in Prairie du Chien.

The Harbor Commission met and is in accord with your draft letter. If any of the other parties involved have questions or would like another opportunity to discuss these issues, the Harbor Commission would certainly participate.

Please be in contact with the Commission with regard to the proposed timeline being developed so that all parties involv- are aware of deadlines to keep the process on track to a successful conclusion.

Thanks again for your efforts in securing a solution to the Harbor question in Prairie du Chien.

Sincerely,

Gary Koch

Gary Koch, CMC
City Administrator

cc Chr. Jerde
file

RECEIVED
JUN 14 1993
OFFICE OF THE SECRETARY

STATE OF WISCONSIN
DEPARTMENT OF JUSTICE

JAMES E. DOYLE
ATTORNEY GENERAL

Patricia J. Gorence
Deputy Attorney General

123 West Washington Avenue
P.O. Box 7857
Madison, WI 53707-7857
Thomas J. Dawson
Wisconsin Public Intervenor
Phone 608/266-8985
FAX 608/267-2223

June 15, 1993

Secretary George E. Meyer
Wisconsin Department of Natural Resources
Bureau of Legal Services
GEF 2, 5th Floor
101 South Webster Street
Madison, Wisconsin 53703

Re: Settlement Discussions - City of Prairie du Chien

Dear Secretary Meyer:

Thank you for your May 25, 1993, letter soliciting our comments on the "draft" response to the City of Prairie du Chien's request concerning permit issues related to the application by the City and Prairie Sand & Gravel to develop a harbor facility on the north end of St. Feriole Island. You requested a response by June 14, and we appreciate your indulgence in accepting this today.

Your letter appropriately refers to the draft response as just that -- a draft, a proposal, that is still evolving. And we appreciate your soliciting "any concerns about those matters discussed" in the "draft" response.

The draft itself state's DNR's position that "we cannot give you a statement of our final position on any permit issues" as "the applications must include public notices, review under WEPA, and approval of the specific permit proposals under standards of our statutes and rules." We concur.

Your letter and draft response were the subject of review by the Public Intervenor office's Citizens Advisory Committee (CAC) on June 7, 1993. There were appearances at the meeting by Prairie du Chien City Manager Gary Koch, Malacologist Marian Havlik, and Sierra Club's William Redding.

The CAC unanimously (6-0, with 2 absences) stated its favorable response to your draft proposal subject to the following. First, the CAC concurred with your letter that we were not being asked to agree to a settlement at this time, but rather to a proposal for settlement that DNR acknowledges will undergo some evolution as discussions continue. The CAC agrees that the proposed terms of settlement must, as you state in your draft, be subject to review and compliance with public review, WEPA review,

and statutory and regulatory standards. As an example, the impacts described in a WEPA-compliant environmental impact statement (EIS) must be considered before permits may be issued. The Public Intervenor, like the DNR, does not waive the right or duty to protect public rights in the state's natural resources from threats that might be revealed in an EIS. Still, the CAC wishes to convey its favorable response to the proposal as one that has serious promise of settling the matter, assuming the permit, regulatory and WEPA considerations can be met.

Second, the CAC supports moving forward with the proposal with the understanding that we wish to see negotiated acceptable conditions for removal of barge traffic, and its incumbent tugboat activity, adjacent to the city dock. We do not agree with the proposal that historical barge uses and traffic levels should be, or need to be, maintained at the city dock. The Public Intervenor and the CAC believe the north harbor facility is the alternative to using the city dock for barges, and should be viewed as such. However, subject to your proposal's conditions regarding regulatory and WEPA review, and in deference to the City Manager's expressed willingness to discuss and negotiate on this, we are very open to discussing other less environmentally obtrusive activities, such as the city's desire to use the dock for excursion boats, and other navigational uses. We are also willing to discuss carefully crafted conditions of settlement under which the city may reserve its right to apply for permits to use the city dock in the future for barge traffic, such as if, as the city manager mentioned at our meeting, the endangered and threatened resources are irretrievably destroyed by natural forces.

We appreciate very much Mr. Koch's general support for your proposal, particularly his conciliatory remarks to us on the city dock issue. We have good reason to believe this issue can be amicably worked out in future discussions.

We share Ms. Havlik's concern that any settlement should not become operative until its environmental consequences have been adequately studied and reviewed in the EIS. We believe your proposal adequately addresses this concern by making settlement contingent on compliance with WEPA and other regulatory laws.

We also share Mr. Redding's concern about continuing extensions of barging permits at the city dock pending the completion of the north harbor facility as proposed in your draft. This illustrates the need to move with "all due deliberate speed" on this proposal in order to minimize the need for extensions.

We wish to express our appreciation to all of the parties and their representatives for their persistent and diligent efforts in

bringing us to the point of this proposal. These efforts can not be understated. We are extremely pleased with the progress we have made, and we pledge our best efforts to achieve settlement.

By copies of this letter to the parties, we ask them to provide our office with a copy of their responses to your letter.

Thank you for efforts and consideration of our views.

Sincerely yours,

Thomas J. Dawson
Wisconsin Public Intervenor

cc: See Attached List

\DAWSON\chienset.tle

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

IN REPLY REFER TO:
FWS/AFWE-TCFO

MAY 0 ? 1993

Colonel Richard W. Craig
District Engineer
U.S. Army Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101-1479

Dear Colonel Craig:

The Fish and Wildlife Service (Service) and the Corps of Engineers have concluded formal endangered species consultation on proposed Corps navigation channel maintenance and permit action at Prairie du Chien, Wisconsin. The Service will begin preparation of a Biological Opinion on the project. Pursuant to the regulations governing interagency consultations (50 CFR 402), we have 45 days to complete our Biological Opinion, unless our two agencies mutually agree to an extension. We will deliver our Biological Opinion to your office on or before June 21, 1993.

During this 45-day period, your agency may request a copy of our draft Biological Opinion to review and comment upon. Your request should be in writing and should be directed to me at the above address. If you have questions or concerns about this consultation, please feel free to call me at 725-3548.

Sincerely,

Lynn M. Lewis

Lynn M. Lewis
Field Supervisor

MAY 10 1993

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

IN REPLY REFER TO:
FWS: AFWE-TCFO

MAR 22 1993

Mr. Robert J. Whiting
Chief, Environmental Resources Branch
Planning Division
St. Paul District, Corps of Engineers
180 East Kellogg Boulevard, Room 1421
St. Paul, Minnesota 55101-1479

Dear Mr. Whiting:

We have received your revised (January 1993) Biological Assessment (BA) covering both the permit application of Mr. Blair Dillman, owner of Prairie Sand and Gravel, Inc., and Corps of Engineers (Corps) channel maintenance in the Mississippi River (East Channel and Sawmill Slough) in the vicinity of Prairie du Chien, Crawford County, Wisconsin. The BA was revised to reflect revised project plans. We have also received your letter of February 3, 1993, transmitting the revised BA and requesting re-initiation of formal consultation under Section 7 of the Endangered Species Act of 1973, as amended.

Thank you for the revised BA and for your request to reinitiate consultation; we commence formal consultation effective February, 5, 1993, the date we received your revised BA and consultation request letter. Pursuant to regulations governing consultations (50 CFR 402), we have 90 days to conclude consultation and 45 days to prepare our biological opinion, unless our two agencies mutually agree to an extension. Therefore, we expect to conclude formal consultation and begin preparing the Biological Opinion on or before May 6, 1993, and we expect to complete the Biological Opinion on or before June 21, 1993.

During the 90-day consultation period, we will try to cooperatively determine the effects of the proposed actions on Federally-listed species and critical habitat. If we believe the proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat, we will rely on your agency's expertise to develop reasonable and prudent alternatives that will avoid the likelihood of jeopardy. We look forward to this cooperative effort.

If you have questions or concerns about this consultation or the consultation process in general, please feel free to call me at 725-3548.

Sincerely,

James L. Smith

for Lynn M. Lewis
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

IN REPLY REFER TO:
FWS: AFWE-TCFO

DEC 29 1992

Mr. Robert J. Whiting
Chief, Environmental Resources Branch
Planning Division
St. Paul District, Corps of Engineers
180 East Kellogg Boulevard, Room 1421
St. Paul, Minnesota 55101-1479

Dear Mr. Whiting:

The Fish and Wildlife Service (Service) has received all of the information necessary to initiate formal consultation on Corps of Engineers (Corps) navigation channel maintenance in the East Channel of the Mississippi River in the vicinity of Prairie du Chien, Crawford County, Wisconsin. The Service will start formally consulting with your agency on the project pursuant to the regulations governing interagency consultations (50 CFR 402). We have 90 days to conclude formal consultation with your agency, unless our two agencies mutually agree to an extension. Therefore, we expect to conclude formal consultation and begin preparing a biological opinion on the project on or before March 10, 1993.

During this 90-day period, we will try to cooperatively determine the effects of the East Channel project on federally-listed species and critical habitat. If we believe the proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat, we will rely on your agency's expertise to develop reasonable and prudent alternatives that will avoid the likelihood of jeopardy. We look forward to this cooperative effort.

If you have questions or concerns about this consultation or the consultation process in general, please feel free to call me at 612/725-3548.

Sincerely,

Lynn M. Lewis

Lynn M. Lewis
Field Office Supervisor

PRAIRIE SAND & GRAVEL, INC.

Washed Sand & Gravel • Excavation
800 N. Villa Louis Road • P.O. Box 210 • Prairie du Chien, WI 53821 • (608) 326-6471

November 16, 1992

Department of the Army
St. Paul District, Corps of Engineers
180 E. Kellogg Blvd., Room 1421
St. Paul, Mn. 55101-1479

Attention: Dave Ballman

Following is the information you requested in your recent letter.

Dredging requirements will be for the connection from Sawmill Slough into our existing pit. I have located this area on the enclosed map. The estimated yards are 25,000.

This material would be hydraulically pumped to the Swingle site. This is an approved fill site and the site has a holding and dewatering pond which we are presently using.

There will also be some mechanical dredging at each proposed dock face. We estimate that to be from 400 to 800 yards. All this material will also be disposed of at the Swingle site.

I have contracted Mr. Jim Graves to do the necessary survey for our proposed road from the Swingle site to Highway 35. This will be done as soon as the corn is picked by the owner. I will have Mr. graves look at the Swingle site even though the site has been covered with 5 to 15 ft. of fill.

As for the vibration study, I have spoken with the Wisc. Dept. of Transportation and I believe they have been in contact with your Department.

It is my understanding they are planning to completely rehab. the rail lines on St. Feriole Island in 1993. It is also my understanding they plan on meeting the requirements requested by the State of Wisconsin Historical Society.

In 1992 we will have handled approximate 16,000 truck loads of products coming into and leaving our existing harbor. Of this, approximately 11,000 is grain with the balance being fertilizer, salt, and lightweight agg. which represents approximately 260 plus barges. Also approximately 1,200 rail cars will be loaded or unloaded in 1992.

NOV 27 1992

U.S. Corps of Engineers
St. Paul District

If new dock facilities are built as proposed for Didion, Inc. we would anticipate an additional 250 to 300 barges loaded at the Prairie Sand & Gravel site.

If new docks are built on the Swingle site the present number of trucks would be reduced by approximately 6000 the first year. This would represent all fertilizer, salt and lightweight agg. This traffic would go directly East on the new proposed road to Highway 35.

Reference to our new grain bin. It has a capacity of 65,000 bushels and is used primarily as a collecting bin for the transfer to barges. We at this time have no plan to construct additional bins.

As for the developement of the old F.S. facility, we consider this not to be an appropriate location for a new facility. It is located in a residential area and does not have adequate acreage. It would also be cost prohibitive to relocate our existing operation.

If any additional information is needed, please don't hesitate to call. You can reach me at (608) 326-6471.

Sincerely,

Blair E. Dillman

BED/lg

CHANNEL
MARGARITA
628000 E
5860000 N
25 AUG. 1992
U.S. 912.1

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
FWS AFWE-TCFO

SEP 11 1992

Mr. Robert J. Whiting
Chief, Environmental Resources Branch
Planning Division
St. Paul District, Corps of Engineers
180 East Kellogg Boulevard, Room 1421
St. Paul, Minnesota 55101-1479

Dear Mr. Whiting:

Enclosed is a copy of a Corps of Engineers (Corps) working paper that contains information on natural resources and project information for Corps activities in the vicinity of Prairie du Chien, Wisconsin. You requested my office's informal review of the document, and we appreciate the opportunity you have given us.

Mr. Chuck Kjos, of my staff, reviewed the document and made notations directly on the enclosed copy - "X" in the upper right corner indicates a page with comments. If you or your staff have questions, you may contact him or me.

Our notations are very minor -- the document is well organized and clearly written. In addition to our notations, I would like to mention several points of concern to us.

One concern is project and permit action consequences for the number of vessels, especially barges and barge towboats, using the East Channel and connecting waterways, such as Sawmill Slough. The working paper gave an excellent overview of dredging and dredged material disposal and associated impacts, and we suggest including similar description of East Channel traffic projections and consequences, too, for vessel passage can be a major factor affecting mussels and the local interest in increasing shipping has been demonstrated.

Another point relates to endangered species. The working paper correctly characterizes the East Channel as a premier mussel area and the premier Higgins' eye mussel site on the Mississippi River (and thus for North America and the world). Documented Higgins' eye densities and reproduction are matched nowhere else, and as the working document correctly states, the East Channel is in the most important of the "essential habitat" areas delineated by the Higgins' Eye Recovery Team in the Higgins' eye recovery plan. The East Channel population is the only confirmed healthy population from which Higgins' eyes might be taken for reintroduction elsewhere to recover the species. It is the one population where, to date, natural and man-made environmental factors do not appear to be reducing its numbers and we believe that the preservation of the species may depend heavily on the continued welfare of this site.

Preliminary analysis by your staff indicates that many thousands of Higgins' eye mussels would be killed should the East Channel be dredged to maintain the 9-foot Federal navigation channel and harbor. Mr. Kjos has discussed the preliminary analysis with your staff and is in general agreement with it. The dredging mortality by itself could degrade the East Channel as one of the last, perhaps the last, healthy, self-sustaining Higgins' eye sites. Local interests have demonstrated a desire to increase barge shipping, so the impacts of barge traffic on mussels must also be considered. In sum, the project, as planned to date, might further endanger the species and further reduce the possibility of the Higgins' eye mussel ever being recovered from the danger of extinction.

In view of the importance of this project to the involved parties, and in view of the endangered Higgins' eye mussel involvement, we should search for alternatives to the present East Channel work. We are ready to work diligently to find or develop a practical solution that meets legal requirements and that serves project needs.

Sincerely,

Lynn M. Lewis

Lynn M. Lewis
Field Supervisor

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:

AUG 21 1992

Mr. Robert J. Whiting
Chief, Environmental Resources Branch
Planning Division
St. Paul District, Corps of Engineers
180 East Kellogg Boulevard, Room 1421
St. Paul, Minnesota 55101-1479

Dear Mr. Whiting:

This letter concerns Corps of Engineers (Corps) permit and channel maintenance activities in the East Channel area of the Mississippi River at Prairie du Chien, Wisconsin. The Fish and Wildlife Service (Service), through its Twin Cities Field Office (TCFO), is involved with the Corps in these activities through several Federal laws, including Section 7 consultation under the Endangered Species Act of 1973, as amended (Act).

Service procedural regulations (Regulations) implementing Section 7 of the Act (50 CFR Part 402, Interagency Cooperation -- Endangered Species Act of 1973, as Amended; Final Rule) were published in the *Federal Register*, Vol. 51, No. 106, pp. 19926 - 19963, on June 3, 1986.

You recently requested that I provide you with the Service's view of the commencement of formal Section 7 consultation under the Regulations for the navigation channel maintenance and for the Prairie Sand and Gravel permit application at Prairie du Chien. I am pleased to do this to correct any misinformation or misunderstanding that may have occurred to date, before our formal coordination begins.

Section 402.14(c) of the regulations, *Initiation of formal consultation*, lists six items to be included in requests to initiate formal consultation. The biological assessment, mentioned in item 5, can provide the information mentioned in items 1 through 4 and in item 6. The Service must have the biological assessment before initiating formal consultation. The Service also considers the environmental impact statement (EIS) mentioned in item 5 to be a necessary document, if an EIS is to be prepared. The Service will accept the draft EIS as meeting the item 5 EIS stipulation, and will consult on the preferred alternative identified in the draft EIS. The Service will review the Corps' request to initiate consultation, including information provided in the environmental assessment and draft EIS, to see if additional information is needed before consultation can begin. If the necessary information is present, the Service will initiate consultation; if additional information is needed, the Service will request the needed information, and will initiate formal consultation when the needed information is received.

Section 402.14 (e), *Duration and extension of formal consultation*, of the Regulations provides for a 90-day consultation period, after which the Service has 45 days to prepare its Biological Opinion. The Regulations also describe procedures for time extension for Biological Opinions.

We understand that you will prepare both a biological assessment and an EIS for Prairie du Chien and we look forward to continued coordination with you on the project.

Sincerely,

Lynn M. Lewis

Lynn M. Lewis
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
FWS: AFWE-TCFO

JUL 31 1992

Mr. Robert J. Whiting
Chief, Environmental Resources Branch
Planning Division
St. Paul District, Corps of Engineers
180 East Kellogg Boulevard, Room 1421
St. Paul, Minnesota 55101-1479

Dear Mr. Whiting:

This letter requests extension of our formal consultation under the Endangered Species Act for Corps of Engineers maintenance of the navigation channel and other activities in the Mississippi River near Prairie du Chien, Wisconsin. We also request your lead and assistance in obtaining additional information for our consultation.

The extension is requested to enable our agencies to obtain and consider additional necessary information for our formal consultation before the Fish and Wildlife Service (Service) prepares its Biological Opinion for the work.

The following information is requested:

- The Corps of Engineer's present preferred alternative. Preferred alternatives may change, but of necessity the Service can consult only on the current preferred alternative.

- For the preferred alternative, confirmation of the need, or lack of need, for dredging by the Corps of Engineers or by the applicant.

  For example, should the Swingle site be the preferred alternative, would dredging be needed in Sawmill Slough from the East Channel to the barge access to be made at the north end of St. Feriole Island? [See Prairie Sand and Gravel application, Public Notice CENCS-CO-R (91-1040-15), dated September 6, 1991, and subsequently received project description information.]

- For area(s) to receive continued or new commercial boat traffic in the preferred alternative, the results of recent (since January 1987) mussel survey, particularly for Higgins' eye pearly mussel. Mussel survey information on areas to be dredged is included in this request. We particularly request a mussel survey of Sawmill Slough if the Swingle site is the preferred alternative.

- If dredging will be needed to execute the preferred alternative, delineation of the areas to be dredged, the estimated volume of material to be dredged, the intended dredging method, and contaminant analysis of sediment in the areas to be dredged.

We request that our formal consultation be extended to 30 days after our receipt of the above requested material, the 30 days to be used for our staffs to consider the above information we have requested and to complete the formal consultation. We will commence preparation of the Service Biological Opinion upon completion of the formal consultation.

Thank you for your consideration of this request and for your and your staff's excellent participation in the formal consultation on this complex issue.

Sincerely,

Lynn M. Lewis

Lynn M. Lewis
Field Supervisor

COPY

July 30, 1992

Environmental Resources Branch
Planning Division

Mr. Carroll D. Besadny
Secretary
Wisconsin Department of Natural Resources
Box 7921
Madison, Wisconsin 53707

Dear Mr. Besadny:

Enclosed for your review and signature are two copies of the Cooperative Agency Agreement developed for preparation of a joint Environmental Impact Statement at Prairie du Chien, Wisconsin.

Please sign both copies of the agreement, retain one for your records, and return the other signed copy to us. If you have any questions, please contact Robert Whiting at (612) 220-0264.

Sincerely,

Enclosure

Richard W. Craig
Colonel, Corps of Engineers
District Engineer

WHITING PD-ER _____
KNOTT PD _____
KOWALSKI PD _____
NICHOLSON CO _____
BANKSTON OC _____
MAHONEY DD _____
CRAIG DE _____

COOPERATIVE AGENCY AGREEMENT

BETWEEN

THE UNITED STATES ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT AND THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES FOR PREPARATION OF A JOINT ENVIRONMENTAL IMPACT STATEMENT AT PRAIRIE DU CHIEN, WISCONSIN

REGARDING

DEVELOPMENT OF HARBOR FACILITIES AND RELATED NAVIGATION OPERATIONS

GENERAL

This Cooperative Agency Agreement (CAA) describes the respective responsibilities and procedures to be used by the U.S. Army Corps of Engineers, St. Paul District (COE) and the Wisconsin Department of Natural Resources (DNR) for the purposes of preparing a joint Environmental Impact Statement (EIS) on pending State and Federal water regulatory permits for certain harbor facilities and related commercial navigation operations by the COE at Prairie du Chien, Wisconsin. The goals for preparing a joint EIS on these actions are:

to assure that the proposed and authorized harbor activities at Prairie du Chien comply with both the National and Wisconsin Environmental Policy Acts (NEPA and WEPA, respectively),

to achieve maximum public administrative efficiency,

to minimize confusion regarding Federal and State regulatory matters among the applicant and the public, and

to provide information that assists in regulatory decisions that are consistent in time and substance between the State and Federal governments.

RESPECTIVE RESPONSIBILITIES

COE and DNR JOINT RESPONSIBILITIES

Subject to availability of funds, both agencies agree to:

publish jointly a draft and final EIS for the pending private commercial harbor expansion proposal of Prairie Sand & Gravel and associated commercial navigation uses of the East Channel at Prairie du Chien;

freely share information they possess and acquire that is needed to prepare the EIS;

help each other prepare and review portions of the EIS (as mutually determined by the agency points of contact), in a timeframe responsive to the needs of both agencies;

conduct mailings and public meetings jointly that meet the scheduling and procedural, legal requirements of both agencies;

release the draft and final EIS at concurrent times after both agencies have reviewed and certified these documents as representing the positions of both agencies and complying with the legal requirements of their mandates;

include joint agency authorship credit in all news releases, public notices and information summaries regarding the Prairie du Chien EIS;

each bear the internal staff, equipment, and agency-specific legal notice and mailing costs of developing the draft and final EIS, coordinate the costs of mutually agreed upon contracted work in a way that recovers these costs from the applicant, and share costs in a mutually agreeable way for EIS production expenses.

U.S. Army Corps of Engineers

The COE will serve as principal coordinator (senior author) in preparation of the EIS. Activities of principal coordination include providing COE staff and facilities for preparation and production of the EIS, providing primary coordination with other federal agencies (e.g., Environmental Protection Agency, Fish and Wildlife Service, Coast Guard, National Park Service), and scheduling agency and public meetings that are jointly needed to meet mutual legal requirements for the EIS. The Corps will also act as contracting officer for any external studies that need to be accomplished in conjunction with obtaining information needed for a complete EIS, unless it is mutually agreed that the DNR is the more appropriate contracting officer for a specific study.

The Wisconsin Department of Natural Resources

The DNR will serve as the second lead agency (junior author) in preparation of the EIS. Activities of the second lead agency include providing writing and editing functions for the EIS, furnishing primary coordination with other state agencies (e.g., Department of Transportation; Department of Agriculture, Trade and Consumer Protection; Department of Development; State Historical Society)[1], and participating with the COE in public participation events. The DNR will also provide staff support and equipment, as available, for field work done as part of this EIS effort.

CONFLICT RESOLUTION PROCEDURES

Every effort will be made for the joint agencies to reach mutual agreement in the production of the EIS. In the event that conflicts arise between the COE and the DNR on any aspects of this EIS effort, the following procedures will be used in sequence to attempt to resolve these conflicts:

---

[1] Both the COE and the DNR are encouraged to contact any agencies directly to acquire in a timely manner information and data needed in preparation of the EIS. The coordination function is meant to identify a point of contact for general and EIS status inquiries.

concerted effort will be made for resolution between the agency points of contact for this CAA;

second step resolution will be attempted by the Director, Bureau of Environmental Analysis and Review (DNR), and Chief of Planning, St. Paul District (COE);

third step resolution will be attempted by the Office of the Secretary, DNR, and the District Engineer (COE);

in the event that unresolved issues remain, both agency positions will be presented in the EIS and any public summaries.

EXPIRATION OF THIS CAA

This CAA will remain in effect through the publication of the final EIS, unless it is extended by mutual agreement of both agencies.

AGENCY POINTS OF CONTACT

The primary agency points of contact for this CAA are:

Robert H. Read, Bureau of Environmental Analysis and Review, Wisconsin Department of Natural Resources, P.O. Box 7921, Madison, WI 53707-7921.

Robert J. Whiting, Environmental Resources Branch, Planning Division, U.S. Army Corps of Engineers, 180 East Kellogg Boulevard, Room 1421, St. Paul, MN 55101-1479.

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

_____ _____

Richard W. Craig — Date
Colonel, Corps of Engineers
District Engineer

Wisconsin Department of Natural Resources

_____ _____

C. D. Besadny, Secretary — Date

U.S. Department
of Transportation
**Maritime
Administration**

Great Lakes Region

2300 East Devon Avenue
Suite 366
Des Plaines, Illinois 60018-4605
(708) 298-4535

July 14, 1992

Louis Kowalski, Chief, Planning Division
St. Paul District
U.S. Army Corps of Engineers
ATTN: PD-ER
180 Kellogg Blvd. East - Room 1421
St. Paul, MN 55101-1479

Dear Mr. Kowalski:

Please consider the following comments and suggestions in your review and development of the Environmental Impact Statement (EIS) for the development harbor permit of Prairie du Chien, WI.

As background information, the Maritime Administration is a promotional agency providing financial assistance programs for American vessel owners and operators, including mortgage guarantees for new construction of towboats and barges. We also offer a service in technical assistance to local communities in port and maritime planning activities.

In our opinion, the port facilities at Prairie du Chien, Wisconsin, are an extremely valuable resource to the local community, regional area, and the State of Wisconsin. Port terminal operators have expressed considerable enthusiasm for the potential of increasing cargoes across port terminal docks. Privately owned terminals have a substantial investment in equipment necessary to handle cargoes in an efficient manner. These financial investments are paying off in a strong market position for customers of the Port of Prairie du Chien. Throughout our region we find that as Great Lakes ports become less competitive in World markets, these cargoes are shifting to the Inland Waterway System. More and more general cargo is being handled by barge in addition to traditional bulk commodities.

In addition the State of Wisconsin has invested several million dollars in refurbishing the rail line to the port facilities.

In our opinion, the Port of Prairie du Chien is being stifled by exaggerated claims of environmental impact by barge operations and unrealistic operating permits that are designed to restrict Interstate Commerce to the point of

FAX (708) 298-4537

nonprofitability for the terminal operator.

In addition, Federal and State policy toward environment is inconsistent and used to retard economic development. Case in point is the ongoing concern for the endangered mussel species Lampsiles higginsi supposedly found in the East Channel area. There appears to be no accurate data on the number of these mussels. One survey, a few years ago, identified 14 in the entire pool area. This number seems extremely small and needs verification. As a result of this mussels presence, barge loading is limited to a minimum number each year by the Federal and State permits. As part of the permit, local dock operators are required to survey the mussel beds for damage. According to the dock operators barge operations show no sign of damage to the mussels habitat. It's interesting to note that while Prairie du Chien is supposedly the largest mussel bed in the Upper Mississippi, data issued by the U.S. Fish and Wildlife Service, lists mussel beds in nearly the entire length and all pools in the Upper Mississippi River. A confirmation of this data is available from shoreside and towboat operators who face daily conflicts with commercial clammers operating from small boats. Clammers are most commonly found around barge fleeting sites throughout the Upper Mississippi.

In regard to inconsistent Federal and State permit policies, while the barge terminal operators are severely restricted by limited barge loadings, commercial clammers, on the other hand, are free to harvest as many mussels as they want. Interviews with professional malacologists have indicated that endangered species may be harvested along with other mussels but are "generally thrown back into the river if they are found in the harvest". Harvesting mussels in areas where there are alleged to be endangered species is certainly more damaging to the mussel bed than the operation of tugs and barges.

Another example of inconsistent policy is the expansion and promotion of recreational boating throughout the Upper Mississippi. This expansion appears to be unlimited and is causing serious navigation safety conflicts between commercial and recreational boaters. In addition, the majority of small recreational boats are capable of navigating in shallow draft backwater areas. These boats may be powered by two-cycle "oil spewing" engines that are slowly causing serious pollution in the river environment. Yet, there are no regulations or restrictions for the operation of recreational boaters. Why isn't this a concern for Federal and State environmental regulatory agencies?

We are a representative in the $300 million Upper Mississippi River Environmental Management Program. We understand that certain funds can be designed for special projects by the Wisconsin Department of Natural Resources, such as the Habitat Rehabilitation Evaluation Project (HREP). Why not consider Prairie du Chien East Channel for a special HREP funding? This

type of project funding could assist in the resolution of the habitat concerns in the East Channel.

In summary, we support the redevelopment of the Port of Prairie du Chien. The tradition of commercial navigation dates back to early explorers passing through the area in the year 1673. The harbor plan and request for permit should be given full support for the commercial development in order to compliment the growing demands of the City of Prairie du Chien and surrounding regions

Please feel free to contact us if you have further questions. We look forward to assisting you in the development of your Environmental Impact Statement.

Yours truly,

Alpha H. Ames, Jr.
Great Lakes Region Director

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

IN REPLY REFER TO:
FWS/AFWE-TCFO

JUN 02 1992

Colonel Richard W. Craig
District Engineer
St. Paul District, Corps of Engineers
180 Kellogg Boulevard East, Room 1421
St. Paul, Minnesota 55101-1479

Dear Colonel Craig:

This letter provides information in accordance with U.S. Fish and Wildlife Service (Service) participation as a Cooperating Agency with the Corps of Engineers (COE) in COE's preparation of an Environmental Impact Statement (EIS) for activities in the East channel of the Mississippi River at Prairie du Chien, Crawford County, Wisconsin.

The enclosed document entitled "Upper Mississippi National Wildlife and Fish Refuge" provides general information on the Upper Mississippi National Wildlife and Fish Refuge (Refuge), including several pertinent laws. The report also provides specific information on Refuge resources from Mississippi River Mile (RM) 630 upstream to RM 637.

Additional resources in the project vicinity include an active bald eagle nest site at approximately RM 642.7, toward the northwestern part of Mudhen Lake. At approximately RM 639.6, on the Wisconsin side, in an area known locally as Vogt Lake, is an active mixed nesting colony of great blue heron, double-crested cormorant, and great egret. Garnet Lake, between RM 631 and 633, is a shallow area relatively rich in fish life and is a traditionally important and heavily-used wading bird feeding area. It historically had heronries near by and today it may support a black tern nesting colony.

The Higgins' eye mussel, a Federally-listed endangered species, is of particular importance to the project. Mr. Chuck Kjos, of my office, has asked Mr. Dave Ballman, of your staff, to contact Mr. Bob Read, of the Wisconsin Department of Natural Resources, for East Channel Higgins' eye location information, as we have loaned our project area map of Higgins' eye mussel locations to Mr. Read. I trust that Mr. Read will send our copy of the map directly to Mr. Ballman.

The Service has stewardship responsibilities for the natural resources described above and in the enclosed report and we look forward to working further with you to incorporate protection of these resources into COE plans for the area.

Sincerely,

Lynn M. Lewis

Lynn M. Lewis
Field Office Supervisor

Enclosure

cc: Mr. Bob Whiting, St. Paul Dist., Corps of Engineers

UPPER MISSISSIPPI RIVER NATIONAL WILDLIFE AND FISH REFUGE

General

The Upper Mississippi River National Wildlife and Fish Refuge (Refuge) is the longest one in the lower 48 states, extending 261 miles from the Chippewa River in Wisconsin to Rock Island, Illinois. Authorized in 1924, the refuge protects approximately 194,000 acres of bottomland habitat in parts of Minnesota, Wisconsin, Iowa and Illinois. The refuge was established in part to meet the obligations accepted by the United States through the Migratory Bird Treaties - obligations delegated to federal agencies by the Migratory Bird Treaty Act. In addition to the focus on migratory birds, the refuge was also established "as a breeding place for other wild birds, game animals, fur-bearing animals, and for the conservation of wild flowers and aquatic plants and...as a breeding place for fish and other aquatic animal life." (Upper Mississippi River Wildlife and Fish Refuge Act). More than half the refuge land is owned by the Corps of Engineers, but is managed by the Fish and Wildlife Service under a cooperative agreement.

The 1934 Fish and Wildlife Coordination Act and subsequent amendments to the Act provide the authority for FWS to enter into a cooperative agreement with COE for the transfer of lands suitable for migratory bird programs into the refuge, and to develop general plans with COE and states for management of the transferred lands. The Act also requires agencies involved in water projects to give full consideration to the effects of such projects on wildlife.

Purpose and Need

Concerns regarding the long-term viability of the Upper Mississippi River's fish and wildlife resources relate directly to the adverse effects of sedimentation, operation and maintenance of the 9-foot channel navigation project, navigation-induced developments, industrial and sewer effluents, urban and agricultural runoff, and other outside influences. Where fish and wildlife have been subjected to intense and cumulative impacts, such as on the Illinois River, the Lower Missouri River, and the Lower Mississippi River, once flourishing habitats now support a small fraction of their former fish and wildlife populations. Protection is needed to assure the Upper Mississippi River a better fate.

The Refuge provides essential habitat for a wide variety of plants, fish, migratory birds and other animals. The river's importance to fish and wildlife is increasing with reduction of habitat elsewhere throughout the midwest. For bald eagles, canvasbacks, tundra swans, sturgeon and Higgins-eye pearly mussels, a healthy river can hold the key to survival. The Upper Mississippi is becoming an oasis in America's heartland where natural lakes are scarce, bottomland forests are vanishing, many streams have been adversely affected by channelization, and more than half the wetlands have been lost.

Background

The Upper Mississippi River National Wildlife and Fish Refuge provides one of the largest areas of contiguous wildlife habitat remaining in the central United States. The river has always provided an important haven for wildlife, particularly aquatic types, but this importance has greatly increased in

recent years. With the continuing loss of wetlands and forests, expansion of urban and agricultural areas, and channelization of many rivers, much habitat has been lost. These losses have concentrated more wildlife and related recreation uses in remaining areas such as the Mississippi River, with its tremendous quantity and quality of natural resources.

Vegetation

The refuge has a great deal of ecological diversity due to its location in a sheltered river floodplain and its north-south expanse. A majority of the vegetative communities is wetlands, both forested and herbaceous. Scattered hardwood stands do occur, including the most northerly known stand of pecans. Silver maple, cottonwoods, and willow are other common tree species occurring in the forested wetlands. Among the more common aquatic species are wild celery, arrowhead, American lotus, pondweeds, bulrushes, phragmites, and water lily, although many more species occur. In many places it is possible to locate the refuge boundary by noting where the natural vegetation stops and development begins. It is apparent that the presence of the refuge has preserved in a more natural state a large portion of the river floodplain. Public pressures to expand development and reduce vegetation, even on the refuge, are constant.

Wildlife and Fish

As reflected by the habitat, wildlife and fish species utilizing the river are also diverse and numerous. The extensive backwater lakes provide resting and feeding areas for migratory waterfowl. The north-south orientation and contiguous habitat adds to the value for migratory species. Diving ducks, such as canvasbacks, scaup, and ring-necked ducks, along with tundra swans are perhaps the most numerous in the large open-water pools. Mallards and blue-winged teal make extensive use of the marshes. Wood ducks utilize smaller pools and timbered areas. Many other migratory birds, such as herons, egrets, bitterns, and rails, utilize the marsh areas, while songbirds use the extensive forest, brush and edge habitats. Heron and egret colonies (rookeries) are also found in some of the mature forests. This forest habitat is also used by bald eagles, with several nests located in the more isolated portions. Larger trees near open water areas are used for eagle roosting during migration and wintering times. It is possible that the river supports the largest winter concentration of bald eagles outside Alaska. Many of the species using the river are species that FWS has declared warrant special attention and will be emphasized in accordance with national objectives. They include canvasbacks, redheads, wood ducks, mallards, ring-necked ducks, black ducks, tundra swans, many of the herons and egrets, bald eagles, and several other less visible species.

The river also supports numerous sport and commercial fish species, such as walleye, sauger, catfish, bass, and carp. The tailwaters (below the dams), backwaters, tributaries, and other areas provide diverse habitats for many other aquatic species such as mussels. FWS is conducting mussel research to learn more about the diversity, distribution, and habitats of the mussels. A major increase in the FWS fishery program on the refuge is planned, in coordination with existing state programs. The states maintain active fishery programs, and fishing is one of the most popular recreation activities on the river.

Endangered Species

Several federally listed threatened or endangered species find important habitat on or near the refuge. These include the bald eagle, peregrine falcon, Higgins-eye pearly mussel, Indiana bat, Iowa pleistocene snail, northern wild monkshood, Minnesota trout lily, and prairie bush-clover. Many plant and animal species listed by the four states as threatened or endangered also occur on the refuge.

Human Use

The Mississippi River valley has a long history of use by man. Early Indian mound cultures left many evidences of both settlement and migratory use in the valley. A number of these archaeological sites are threatened by erosion due to wave action and fluctuating water levels; action will be needed to preserve the heritage of the sites.

PROJECT STUDY AREA

Local Characteristics and Values

The project vicinity (RM 630-637, see map) contains irregular islands, narrow deep-running sloughs, and shallow, backwater lake habitats. Second-growth bottomland hardwoods dominate islands and shoreline floodplains. Common trees include silver maple, cottonwoods, and willow. Dense understories comprised of alder, nettle, and poison ivy and other species can be found in many areas. Transitional sites such as mudflats and sandbars are often dominated by young willows and cottonwoods.

Backwater lakes in the project area support submerged and floating macrophytes such as pondweeds, wild celery, and American lotus. Because of the mid-pool location, littoral zone development between RM 630 and 637 provides typically richer habitat than upper or lower pool reaches.

Historically, celery beds in McGregor Lake (RM 634) encouraged use by canvasback ducks. Current use is reduced markedly corresponding to reduced

wild celery and other aquatic vegetation. The Lower Bottoms (RM 631-633) also provide good waterfowl habitat. Extensive wood duck nesting and brood-rearing habitat is available. During spring and fall migrations some divers, such as ring-necked ducks, scaup, and canvasbacks, use deeper areas, while many wood ducks, mallards, wigeon, blue-winged teal and other dabblers are found in shallower wetlands.

Backwaters in the project area provide feeding habitat for wading birds from rookeries both upstream and downstream. Marsh and shorebird species, passerines, aquatic furbearers, and reptiles also favor many of the same habitats, particularly in the biologically rich Lower Bottoms. Turtle, muskrat, and beaver are commonly trapped there.

Catfish in the East Channel are important to commercial and recreational fishermen. Studies by the Wisconsin Department of Natural Resources have indicated the significance of this area as overwintering habitat for this valuable species. Commercial fishing for rough fish also occurs. Sportfishing for white bass, walleye, and sauger is popular near wing dams. The Garnet Lake backwater is believed to provide important spawning habitats for northern pike, bass, crappie, and bluegill. Due to the close proximity of Prairie du Chien, this entire reach of the river (RM 630-637) is an important sport fishery. Quality, productive freshwater mussel habitat has also been identified in the East Channel.

Threatened and Endangered Species

Bald eagles are common visitors to the project area. While there are no known active nests in the designated reach, this vicinity is recognized for its feeding, loafing, and roosting habitat values, particularly during migrations.

Another federally listed species present is the Higgins-eye Pearly Mussel. The East Channel has been found to contain the highest densities of this endangered species and is reputed to be among the very best mussel habitats on the Upper River.

Cultural Resources

Over the last decade, the University of Wisconsin - Madison has focused attention on archeological sites in the reach from RM 631-641 to develop a more complete understanding of prehistoric activity in Pool 10. Apparently, the floodplain of Pool 10 was the scene of intensive Native American occupation through most of prehistory. In addition, the Alfred Reed Mound Group, located in the McGregor Lake area, is the only fully documented archeological site on the McGregor District. Surveys have revealed widespread remnants of earlier occupation warranting further investigation.

Discussion

As with much of the Upper Mississippi River National Wildlife and Fish Refuge, the project area contains important biological and cultural resources. Protection from various development pressures, and rigorous enforcement of Refuge regulations has helped to preserve its integrity to the end that

regional and national as well as local values have been served. As recreational and commercial uses of the River increase, the impact of disturbance on fish and wildlife must be recognized and controlled, accepted, or mitigated. Some uses or activities will be inappropriate and unacceptable.

Project proposals offering threat of spill in or upstream of the East Channel, Hunter Channel or the slough fronting Prairie du Chien above Garnet Lake could be extremely dangerous to aquatic resource values, including mussel and fish populations. Only inert materials should be handled there.

Dredging, spoiling or other activity affecting sediment distribution, accretion or resuspension should be controlled to protect valued riverine or wetland habitats, particularly the East Channel and Lower Bottoms. Habitat values for migrants which populate much of the continent could be compromised.

Factors such as barge or boat surface use, new routing or concentrated activity would have direct and indirect disturbance impacts, reducing the systemic and local value of Refuge and riverine habitats for sensitive game and non-game bird species, mussels and fish.

Refuge Protection

While the Upper Mississippi River Wildlife and Fish Refuge Act (Attachment 1) specifically prohibits activities that adversely impact Refuge flora and fauna, further protections were included under the National Wildlife Refuge Administration Act of 1966 (Attachment 2). This latter Act required a compatibility determination for use of refuge lands. This means that a proposed use or project, if it is to be allowed, must be shown to be compatible with the major purposes for which the refuge was established, the goals of the National Wildlife Refuge System and the objectives of the Refuge. In addition, Refuge lands taken or degraded by a project must be replaced with lands of equal or greater wildlife and monetary value.

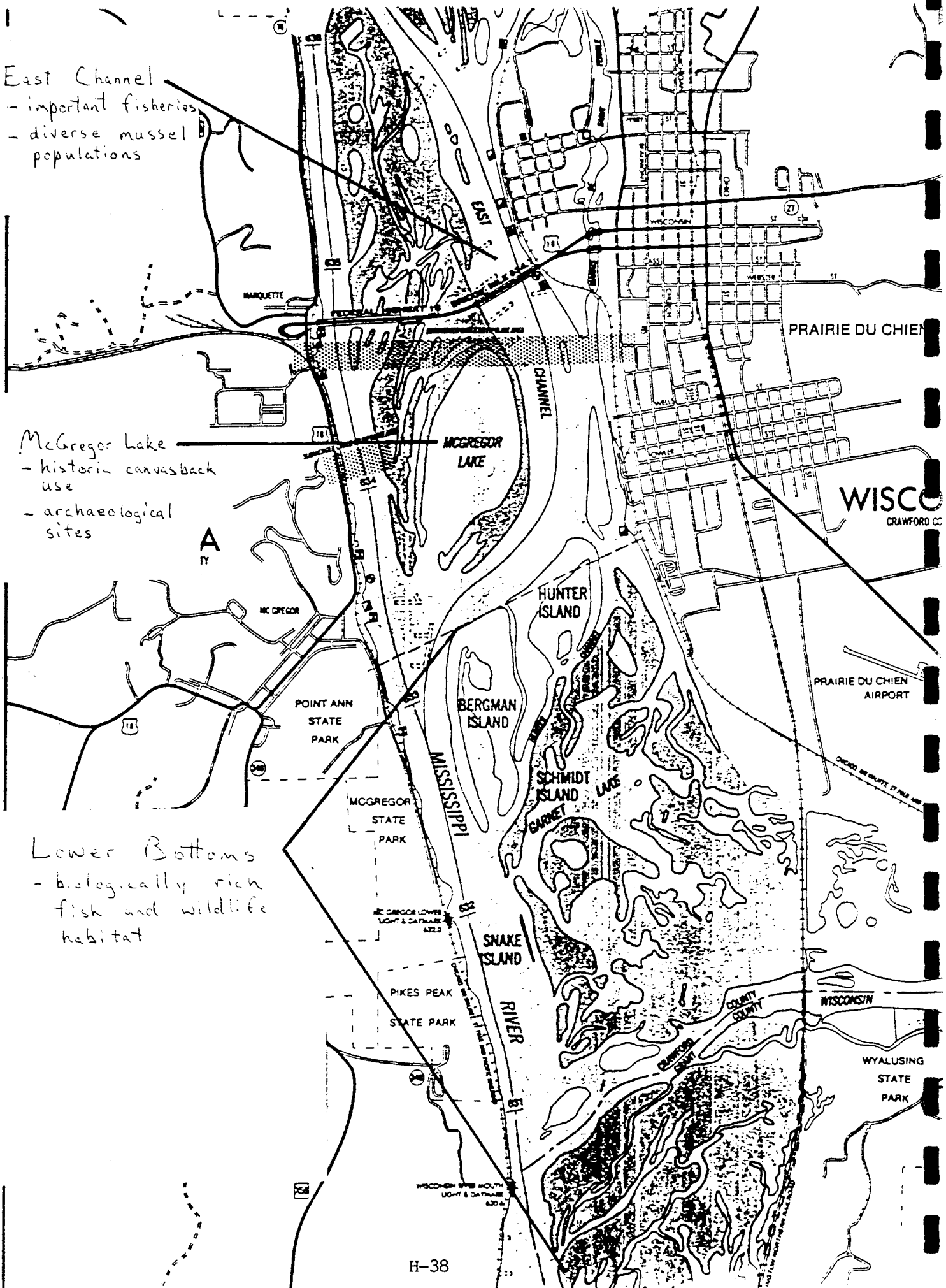
Procedurally, this means:

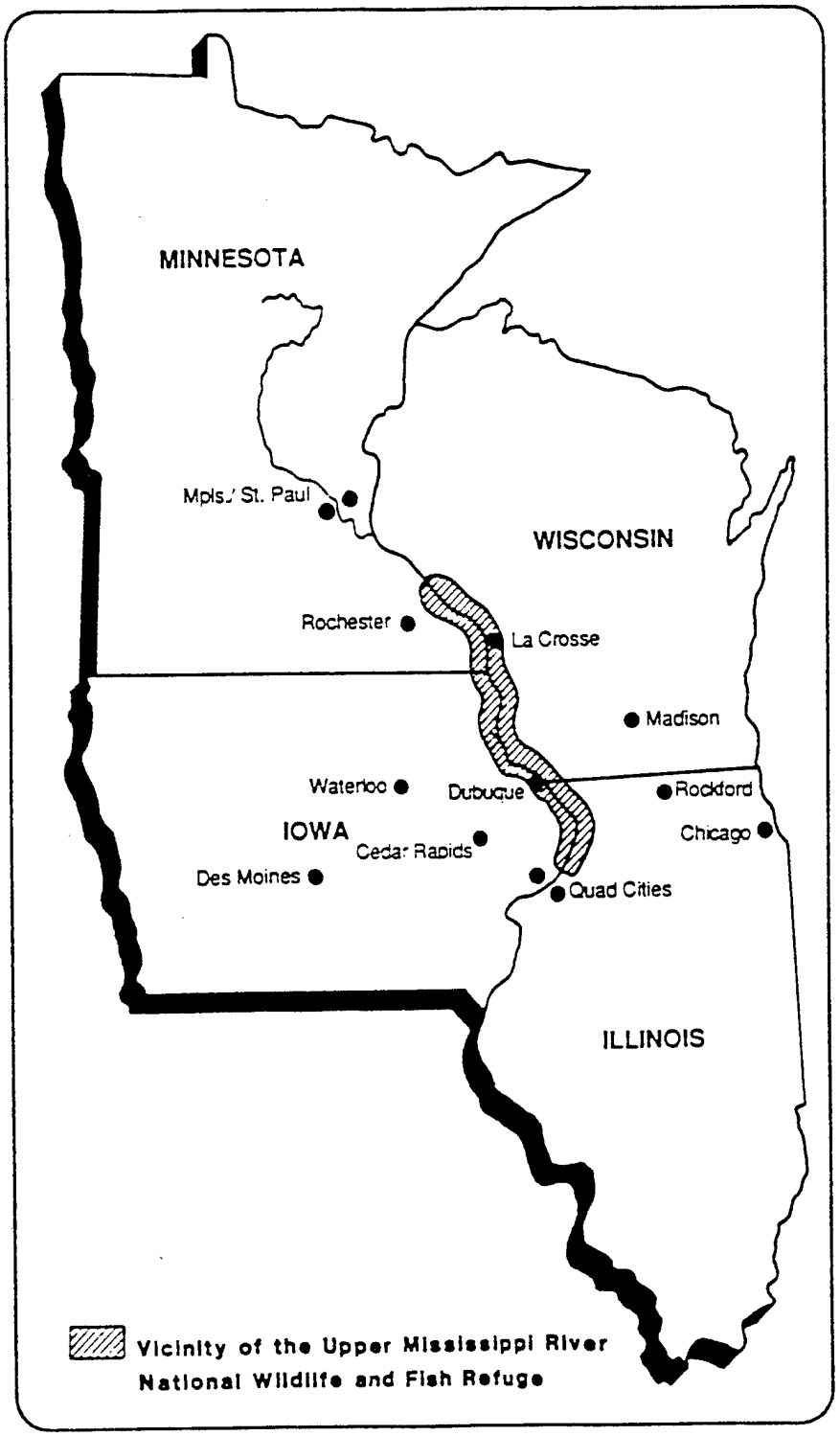
1. A regional analysis must demonstrate a need that can not be satisfied except at the subject location.

2. Compatibility must be shown as described above if an activity is to be allowed on Refuge lands.

3. Any kind of land exchange would require replacement with property of equal or greater wildlife and monetary value.

4. We would recommend, in keeping with regulations and FWS policy that a "no net loss" compensation requirement must be met in addition, which would involve creation or restoration of habitat elements, not simply purchase and transfer of existing habitats.


East Channel
- important fisheries
- diverse mussel populations
McGregor Lake
- historic canvasback use
- archaeological sites
Lower Bottoms
- biologically rich fish and wildlife habitat
EAST CHANNEL
MCGREGOR LAKE
MARQUETTE
PRAIRIE DU CHIEN
WISCONSIN
HUNTER ISLAND
BERGMAN ISLAND
SCHMIDT ISLAND
GARNET LAKE
SNAKE ISLAND
MISSISSIPPI RIVER
POINT ANN STATE PARK
MCGREGOR STATE PARK
PIKES PEAK STATE PARK
PRAIRIE DU CHIEN AIRPORT
WYALUSING STATE PARK
CRAWFORD CO
GRANT COUNTY



UPPER MISSISSIPPI RIVER NATIONAL WILDLIFE AND FISH REFUGE

Appendix A



PUBLIC LAW No. 268
68th CONGRESS
THE UPPER MISSISSIPPI RIVER WILDLIFE AND FISH REFUGE ACT

[PUBLIC—No. 268—68TH CONGRESS.]
[H. R. 4088.]

An Act To establish the Upper Mississippi River Wild Life and Fish Refuge.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as "The Upper Mississippi River Wild Life and Fish Refuge Act."

SEC. 2. The Secretary of Agriculture is authorized and directed to acquire by purchase, gift, or lease, such areas of land, or of land and water, situated between Rock Island, Illinois, and Wabasha, Minnesota, on either side of or upon islands in the Mississippi River which are subject to overflow by such river and which are not used for agricultural purposes, as he determines suitable for the purposes of this Act.

SEC. 3. Any such area, when acquired in accordance with the provisions of this Act, shall become a part of the Upper Mississippi River Wild Life and Fish Refuge (hereinafter in this Act referred to as the "refuge"). The refuge shall be established and maintained (a) as a refuge and breeding place for migratory birds included in the terms of the convention between the United States and Great Britain for the protection of migratory birds, concluded August 16, 1916, and (b) to such extent as the Secretary of Agriculture may by regulations prescribe, as a refuge and breeding place for other wild birds, game animals, fur-bearing animals, and for the conservation of wild flowers and aquatic plants, and (c) to such extent as the Secretary of Commerce may by regulations prescribe as a refuge and breeding place for fish and other aquatic animal life.

SEC. 4. (a) No such area shall be acquired by the Secretary of Agriculture until the legislature of each State in which is situated any part of the areas to be acquired under this Act has consented to the acquisition of such part by the United States for the purposes of this Act, and, except in the case of a lease, no payment shall be made by the United States for any such area until title thereto is satisfactory to the Attorney General and is vested in the United States.

(b) The existence of a right of way, easement, or other reservation or exception in respect of such area shall not be a bar to its acquisition (1) if the Secretary of Agriculture determines that any such reservation or exception will in no manner interfere with the use of the area for the purposes of this Act, or (2) if in the deed or other conveyance it is stipulated that any reservation or exception in respect of such area, in favor of the person from whom the United States receives title, shall be subject to regulations prescribed under authority of this Act.

SEC. 5. Except where it is specifically provided otherwise, the Secretary of Agriculture and the Secretary of Commerce shall jointly

prescribe such regulations, exercise such functions, and perform such duties as may be necessary to carry out the purposes of this Act.

SEC. 6. No person shall, except in accordance with regulations prescribed by the Secretary of Agriculture in respect of wild birds, game animals, fur-bearing animals, wild flowers, and aquatic plants, or by the Secretary of Commerce in respect of fish and other aquatic-animal life—

(a) Enter the refuge for any purpose; or

(b) Disturb, injure, kill, or remove, or attempt to disturb, injure, kill, or remove any wild bird, game animal, fur-bearing animal, fish or other aquatic-animal life on the refuge; or

(c) Remove from the refuge, or injure or destroy thereon any flower, plant, tree, or other natural growth, or the nest or egg of any wild bird; or

(d) Injure or destroy any notice, sign board, fence, building, or other property of the United States thereon.

SEC. 7. Commercial fishing may be conducted in the waters of this refuge under regulation by the Secretary of Commerce.

SEC. 8. (a) Any employee of the Department of Agriculture authorized by the Secretary of Agriculture to enforce the provisions of this Act, and any employee of the Department of Commerce so authorized by the Secretary of Commerce (1) shall have power, without warrant, to arrest any person committing in the presence of such employee a violation of this Act or of any regulation made pursuant to this Act, and to take such person immediately for examination or trial before an officer or court of competent jurisdiction, (2) shall have power to execute any warrant or other process issued by an officer or court of competent jurisdiction to enforce the provisions of this Act or regulations made pursuant thereto,. and (3) shall have authority, with a search warrant issued by an officer or court of competent jurisdiction to make a search in accordance with the terms of such warrant. Any judge of a court established under the laws of the United States, or any United States commissioner may, within his respective jurisdiction, upon proper oath or affirmation showing probable cause, issue warrants in all such cases.

(b) All birds, animals, fish, or parts thereof captured, injured, or killed, and all flowers, plants, trees, and other natural growths, and nests and eggs of birds removed, and all implements or paraphernalia, including guns, fishing equipment, and boats used or attempted to be used contrary to the provisions of this Act or any regulations made pursuant thereto, shall, when found by such employee or by any marshal or deputy marshal, be summarily seized by him and placed in the custody of such persons as the Secretary of Agriculture and the Secretary of Commerce may jointly by regulation prescribe.

(c) A report of the seizure shall be made to the United States attorney for the judicial district in which the seizure is made, for forfeiture either (1) upon conviction of the offender under section 11, or (2) by proceedings by libel in rem. Such libel proceedings shall conform as near as may be to civil suits in admiralty, except that either party may demand trial by jury upon any issue of fact when the value in controversy exceeds $20. In case of a jury trial the verdict of the jury shall have the same effect as the finding of the court upon the facts. Libel proceedings shall be at the suit and in the name of the United States. If such forfeiture proceedings

are not instituted within a reasonable time, the United States attorney shall give notice thereof, and the custodian shall thereupon release the articles seized.

SEC. 9. (a) The Secretary of Agriculture and the Secretary of Commerce are authorized to make such expenditures for construction, equipment, maintenance, repairs, and improvements, including expenditures for personal services at the seat of government and elsewhere, as may be necessary to execute the functions imposed upon them by this Act and as may be provided for by Congress from time to time.

(b) For such expenditures there is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $50,000, to be available until expended, $25,000 of such sum to be available for expenditure by the Secretary of Agriculture and $25,000 by the Secretary of Commerce.

SEC. 10. There is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, and to be available until expended, the sum of $1,500,000, or so much thereof as may be necessary for the acquisition of any areas authorized by this Act to be acquired for such refuge and for all necessary expense incident to the acquisition of such areas; but no money shall be available for the acquisition of any area until the Secretary of Agriculture has ascertained that all of the areas to be acquired under this Act will be acquired within the amounts appropriated or authorized to be appropriated therefor and at an average price not in excess of $5 per acre, and not in excess of the average selling price, during the years 1921, 1922, and 1923, of comparable lands within the vicinity of such areas.

SEC. 11. Any person who shall violate or fail to comply with any provision of or any regulation made pursuant to this Act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not more than $500 or be imprisoned not more than six months, or both.

SEC. 12. As used in this Act the term "person" includes an individual, partnership, association, or corporation.

SEC. 13. Nothing in this Act shall be construed as exempting any portion of the Mississippi River from the provisions of Federal laws for the improvement, preservation, and protection of navigable waters, nor as authorizing any interference with the operations of the War Department in carrying out any project now or hereafter adopted for the improvement of said river.

Approved, June 7, 1924.

[PUBLIC RESOLUTION—No. 70—68TH CONGRESS]

[S. J. Res. 179]

Joint Resolution To amend section 10 of the Act entitled "An Act to establish the upper Mississippi River wild life and fish refuge"

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That section 10 of the Act entitled "An Act to establish the upper Mississippi River wild life and fish refuge," approved June 7, 1924 (Forty-third Statutes at Large, page 650), be, and the same hereby is, amended by striking out that part of said section which reads: "but no money shall be available for the acquisition of any area until the Secretary of Agriculture has ascertained that all of the areas to be acquired under this Act will be acquired within the amounts appropriated or authorized to be appropriated therefor and at an average price not in excess of $5 per acre, and not in excess of the average selling price, during the years 1921, 1922, and 1923, of comparable lands within the vicinity of such areas," and by substituting in lieu thereof the following: "*Provided*, That the Secretary of Agriculture shall not pay for any land or land and water a price which when added to the price of land or land and water theretofore purchased, shall exceed an average cost of $5 per acre."

Approved, March 4, 1925.

NATIC WILDLIFE REFUGE SYSTEM ADMINI ATION ACT OF 1966
16 U.S.C. 668dd-668ee

§ 668dd. National Wildlife Refuge System

(a) Designation; administration; continuance of resources-management-programs for refuge lands in Alaska; disposal of acquired lands; proceeds

(1) For the purpose of consolidating the authorities relating to the various categories of areas that are administered by the Secretary of the Interior for the conservation of fish and wildlife, including species that are threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas are hereby designated as the "National Wildlife Refuge System" (referred to herein as the "System"), which shall be subject to the provisions of this section, and shall be administered by the Secretary through the United States Fish and Wildlife Service. With respect to refuge lands in the State of Alaska, those programs relating to the management of resources for which any other agency of the Federal Government exercises administrative responsibility through cooperative agreement shall remain in effect, subject to the direct supervision of the United States Fish and Wildlife Service, as long as such agency agrees to exercise such responsibility.

(2) No acquired lands which are or become a part of the System may be transferred or otherwise disposed of under any provision of law (except by exchange pursuant to subsection (b)(3) of this section) unless—

(A) the Secretary of the Interior determines with the approval of the Migratory Bird Conservation Commission that such lands are no longer needed for the purposes for which the System was established; and

(B) such lands are transferred or otherwise disposed of for an amount not less than—

(i) the acquisition costs of such lands, in the case of lands of the System which were purchased by the United States with funds from the migratory bird conservation fund, or fair market value, whichever is greater; or

(ii) the fair market value of such lands (as determined by the Secretary as of the date of the transfer or disposal), in the case of lands of the System which were donated to the System.

The Secretary shall pay into the migratory bird conservation fund the aggregate amount of the proceeds of any transfer or disposal referred to in the preceding sentence.

(3) Each area which is included within the System on January 1, 1975, or thereafter, and which was or is—

(A) designated as an area within such System by law, Executive order, or secretarial order; or

(B) so included by public land withdrawal, donation, purchase, exchange, or pursuant to a cooperative agreement with any State or local government, any Federal department or agency, or any other governmental entity,

shall continue to be a part of the System until otherwise specified by Act of Congress, except that nothing in this paragraph shall be construed as precluding—

(i) the transfer or disposal of acquired lands within any such area pursuant to paragraph (2) of this subsection;

(ii) the exchange of lands within any such area pursuant to subsection (b)(3) of this section; or

(iii) the disposal of any lands within any such area pursuant to the terms of any cooperative agreement referred to in subparagraph (B) of this paragraph.

(b) Administration; public accommodations contracts; acceptance and use of funds; exchange of properties; cash equalization payments

In administering the System, the Secretary is authorized—

(1) to enter into contracts with any person or public or private agency through negotiation for the provision of public accommodations when, and in such locations, and to the extent that the Secretary determines will not be inconsistent with the primary purpose for which the affected area was established.

(2) to accept donations of funds and to use such funds to acquire or manage lands or interests therein, and

(3) to acquire lands or interests therein by exchange (A) for acquired lands or public lands, or for interests in acquired or public lands, under his jurisdiction which he finds to be suitable for disposition, or (B) for the right to remove, in accordance with such terms and conditions as he may prescribe, products from the acquired or public lands within the System. The values of the properties so exchanged either shall be approximately equal, or if they are not approximately equal the values shall be equalized by the payment of cash to the grantor or to the Secretary as the circumstances require.

(c) Prohibited and permitted activities; application of mining and mineral leasing laws, hunting or fishing regulations, and State laws or regulations

No person shall knowingly disturb, injure, cut, burn, remove, destroy, or possess any real or personal property of the United States, including natural growth, in any area of the System; or take or possess any fish, bird, mammal, or other wild vertebrate or invertebrate animals or part or nest or egg thereof within any such area; or enter, use, or otherwise occupy any such area for any purpose; unless such activities are performed by persons authorized to manage such area, or unless such activities are permitted either under subsection

(d) of this section or by express provision of the law, proclamation, Executive order, or public land order establishing the area, or amendment thereof: *Provided*, That the United States mining and mineral leasing laws shall continue to apply to any lands within the System to the same extent they apply prior to October 15, 1966, unless subsequently withdrawn under other authority of law. With the exception of endangered species and threatened species listed by the Secretary pursuant to section 1533 of this title in States wherein a cooperative agreement does not exist pursuant to section 1535(c) of this title, nothing in this Act shall be construed to authorize the Secretary to control or regulate hunting or fishing of resident fish and wildlife on lands not within the system. The regulations permitting hunting and fishing of resident fish and wildlife within the System shall be, to the extent practicable, consistent with State fish and wildlife laws and regulations. The provisions of this Act shall not be construed as affecting the authority, jurisdiction, or responsibility of the several States to manage, control, or regulate fish and resident wildlife under State law or regulations in any area within the System.

(d) Use of areas; administration of migratory bird sanctuaries as game taking areas; rights of way, easements, and reservations; payment of fair market value

(1) The Secretary is authorized, under such regulations as he may prescribe, to—

(A) permit the use of any area within the System for any purpose, including but not limited to hunting, fishing, public recreation and accommodations, and access whenever he determines that such uses are compatible with the major purposes for which such areas were established: *Provided*, That not to exceed 40 per centum at any one time of any area that has been, or hereafter may be acquired, reserved, or set apart as an inviolate sanctuary for migratory birds, under any law, proclamation, Executive order, or public land order may be administered by the Secretary as an area within which the taking of migratory game birds may be permitted under such regulations as he may prescribe; unless the Secretary finds that the taking of any species of migratory game birds in more than 40 percent of such area would be beneficial to the species; and

(B) permit the use of, or grant easements in, over, across, upon, through, or under any areas within the System for purposes such as but not necessarily limited to, powerlines, telephone lines, canals, ditches, pipelines, and roads, including the construction, operation, and maintenance thereof, whenever he determines that such uses are compatible with the purposes for which these areas are established.

(2) Notwithstanding any other provision of law, the Secretary of the Interior may not grant to any Federal, State, or local agency or to any private individual or organization any right-of-way, easement, or reservation in, over, across, through, or under any area within the system in connection with any use permitted by him under paragraph (1)(B) of this subsection unless the grantee pays to the Secretary, at the option of the Secretary, either (A) in lump sum the fair market value (determined by the Secretary as of the date of conveyance to the grantee) of the right-of-way, easement, or reservation; or (B) annually in advance the fair market rental value (determined by the Secretary) of the right-of-way, easement, or reservation. If any Federal, State, or local agency is exempted from such payment by any other provision of Federal law, such agency shall otherwise compensate the Secretary by any other means agreeable to the Secretary, including, but not limited to, making other land available or the loan of equipment or personnel; except that (A) any such compensation shall relate to, and be consistent with, the objectives of the National Wildlife Refuge System, and (B) the Secretary may waive such requirement for compensation if he finds such requirement impracticable or unnecessary. All sums received by the Secretary of the Interior pursuant to this paragraph shall, after payment of any necessary expenses incurred by him in administering this paragraph, be deposited into the Migratory Bird Conservation Fund and shall be available to carry out the provisions for land acquisition of the Migratory Bird Conservation Act (16 U.S.C. 715 et seq.) and the Migratory Bird Hunting Stamp Act (16 U.S.C. 718 et seq.).

(e) Penalties

Any person who violates or fails to comply with any of the provisions of this Act or any regulations issued thereunder shall be fined not more than $500 or be imprisoned not more than six months, or both.

(f) Enforcement provision; arrests, searches, and seizures; custody of property; forfeitures; disposition

Any person authorized by the Secretary of the Interior to enforce the provisions of this Act or any regulations issued thereunder, may, without a warrant, arrest any person violating this Act or regulations in his presence or view, and may execute any warrant or other process issued by an officer or court of competence jurisdiction to enforce the provisions of this Act or regulations, and may with a search warrant search for and seize any property, fish, bird, mammal, or other wild vertebrate or invertebrate animals or part or nest or egg thereof, taken or possessed in violation of this Act or the regulations issued thereunder. Any property, fish, bird, mammal, or other wild vertebrate or invertebrate animals or part or egg thereof seized with or without a search warrant shall be held by such person or by a United States marshal, and upon conviction, shall be forfeited to the United States and disposed of by the Secretary, in accordance with law.

(g) Regulations; continuation, modification, or rescission

Regulations applicable to areas of the System that are in effect on October 15, 1966, shall continue in effect until modified or rescinded.

(h) National conservation recreational area provisions; amendment, repeal, or modification

Nothing in this section shall be construed to amend, repeal, or otherwise modify the provision of the Act of September 28, 1962 (76 Stat. 653; 16 U.S.C. 460K-460K-4) which authorizes the Secretary of the Interior to administer the areas within the System for public recreation. The provisions of this section relating to recreation shall be administered in accordance with the provisions of said sections.

(i) Exemption from State water laws

Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(Pub.L. 89-669, § 4, Oct. 15, 1966, 80 Stat. 927; Pub.L. 90-404, § 1, July 18, 1968, 82 Stat. 359; Pub.L. 205, § 13(a), Dec. 28, 1973, 87 Stat. 902; Pub.L. 93-509, § 2, Dec. 3, 1974, 88 Stat. 1603; Pub.L. 94-215, § 5, Feb. 17, 1976, 90 Stat. 190; Pub.L. 94-223, Feb. 27, 1976, 90 Stat. 199; Pub.L. 95-616, §§ 3(f), 6, Nov. 8, 1978, 92 Stat. 3111, 3114.)

§ 668ee. Definitions

(a) The term "person" as used in this Act means any individual, partnership, corporation, or association.

(b) The terms "take" or "taking" or "taken" as used in this Act mean to pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill.

(c) The terms "State" and the "United States" as used in this Act mean the several States of the United States, the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, and Guam.

(Pub. L. 89-669, § 5, Oct. 15, 1966, 80 Stat. 929.)

State of Wisconsin

Department of Agriculture, Trade & Consumer Protection

Alan T. Tracy
Secretary

801 West Badger Road
PO Box 8911
Madison, WI 53708-8911

April 15, 1992

U.S. Army Corps of Engineers
180 East Kellogg Boulevard, Room 1421
St. Paul MN 55101-1479

Attn: PD-ES/Bluhm

Dr. Mr. Bluhm:

In response to the Prairie du Chien EIS being conducted by the Corps of Engineers, the Wisconsin Department of Agriculture, Trade & Consumer Protection strongly supports the need for grain loading facilities in the Port of Prairie du Chien.

The harbor in Prairie du Chien is a vital link for Wisconsin's agricultural products shipped to export markets. The Port of Prairie du Chien is significant in that it has the capability to service southcentral and southwestern Wisconsin's grain producers. In 1991 the 17 counties located in the southcentral and southwestern regions produced approximately 50% of the state's 380 million bushels of corn. Of the 190 million bushels, approximately 40% or 76 million bushels were marketed off the farm representing $178.6 million to Wisconsin farmers.

The demand for a harbor in Prairie du Chien is evidenced by the number of grain barges loaded out of Prairie du Chien since 1989.

Year	Barges	Tons	Bushels
1989	259	384,359	13,727,000
1990	300	445,203	15,900.000
1991	345	511,984	18,285,000

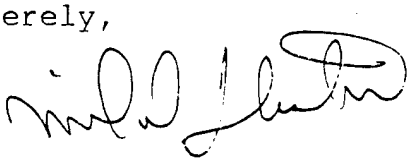
Grain shipments have grown 15% each year resulting in an increase of 60,800 tons in 1990 and 66,800 tons in 1991

Industry sources are telling us that if improvements were made in the harbor loading facilities, increased loading sites and a temporary loading storage provided, the tonnage of grain exports through Prairie du Chien could easily double in the next couple of years.

The importance of the harbor at Prairie du Chien takes on a regional and statewide perspective when you consider that the harbor represents one of four possible alternatives for grain movement out of southcentral and southwestern Wisconsin. Wisconsin agriculture must have equal access to the gulf port markets. Agriculture and the marketing of its commodities are vital to the economic health of the State of Wisconsin.

Therefore, the further development of a full service viable harbor at Prairie du Chien is a necessity. We stand ready to assist the city and the agricultural industry on this most important issue.

Sincerely,



Michael J. Lester
Assistant Administrator
MARKETING DIVISION
608/267-9052

MJL/js
A/A

cc: Secretary Tracy
Mayor James Bittner, Prairie du Chien

Attachment: An evaluation of the Economic Benefits Associated with shipping through the Port of Prairie du Chien by the Wisconsin Department of Transportation, 9-12-1990.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
FWS: AFWE-TCFO

APR 0 1992

Colonel Richard W. Craig
District Engineer
St. Paul District, Corps of Engineers
180 Kellogg Boulevard East, Room 1421
St. Paul, Minnesota 55101-1479

Dear Colonel Craig:

This letter describes U.S. Fish and Wildlife Service (Service) participation as a Cooperating Agency with the Corps of Engineers (COE) in COE's preparation of an Environmental Impact Statement (EIS) for activities in the East Channel of the Mississippi River at Prairie du Chien, Crawford County, Wisconsin.

During the planning study phase, the Service will participate with COE in evaluating impacts to fish and wildlife that may occur as a consequence of the various activities in the East Channel. Service participation will include:

1. Participation in public and agency scoping meetings. We understand that the first meetings are planned for April 20, 1992, at the public library in Prairie du Chien.

2. A description of fish and wildlife resources of the Upper Mississippi River Wildlife and Fish Refuge (UMRWFR) in the Prairie du Chien area with particular reference to the significance of the UMRWFR in this area.

3. A description of fish and wildlife resources of the East Channel based on review of existing information, including conversations with individuals knowledgeable in the resources of the area. Particular note will be made of endangered, threatened, and candidate species; important fish and wildlife species; important habitats; and other items pertinent to the fish and wildlife resources of the area, including information needs.

4. Participation in development and evaluation of project alternatives, including development of measures to reduce damages to fish and wildlife resources and to enhance fish and wildlife resources, and including identification of information needs for alternatives development and evaluation.

5. The Service will provide the following information along with any studies it may recommend:

   a. Rationale for the study.

   b. Description of the study, *i.e.*, scope and level of detail.

   c. The Service's capability and desire to conduct the study. If the Service desires to conduct the study, the Service will provide a study cost estimate.

The Service intends to provide useful, timely information for this undertaking. Our understanding is that at present, the COE needs the above Service input on the following schedule:

Item 1, public and agency meetings: As needed, beginning with meetings scheduled for April 20, 1992, at Prairie du Chien.

Items 2 and 3, area fish and wildlife resource descriptions: May 31, 1992, and as needed thereafter.

Item 4, alternatives: July 31, 1992, and as needed thereafter.

We look forward to your response to the Cooperating Agency participation described above. Please contact Mr. Charles Kjos, Endangered Species Biologist, or me if you have questions regarding Service participation as a Cooperating Agency.

Sincerely,

Lynn M. Lewis

Lynn M. Lewis
Field Office Supervisor

cc: AFWE/FAC
AFWE/SE
Upper Mississippi River Wildlife and Fish Refuge
McGregor, Iowa

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

APR 02

REPLY TO THE ATTENTION OF:

Colonel Richard W. Craig
Department of the Army
St. Paul District, Corps of Engineers
1421 U.S. Post Office & Custom House
St. Paul, Minnesota 55101-1479

Dear Colonel Craig:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA), we have reviewed your agency's scoping letter regarding the actions proposed to occur in the east channel of the Mississippi River at Prairie du Chien, Crawford County, Wisconsin. Your agency is in the process of preparing a draft Environmental Impact Statement (EIS) to assess the potential impacts of the project. The proposed activities include the expansion of the barge terminal of Prairie Sand and Gravel, Inc. on St. Feriole Island, the development of additional barge loading facilities on a nearby mainland area (the "Swingle site"), the development of a recreational marina near Hunter's Slough, and maintenance dredging of the accumulated sediments in the east channel.

We are encouraged that you have decided to prepare an EIS on the variety of resource and historic preservation issues at Prairie du Chien. However, since this has not been the only recent permit application for a barge terminal in the Prairie du Chien area, to be fully effective, the EIS must be broad enough in scope to address the environmental impacts of all barge operations at Prairie du Chien. This would include the municipal dock in Prairie du Chien, factoring in likely future operations. We have seen a high level of permit application activity at the municipal dock, and it is reasonable to assume that this interest will continue into the future. Additionally, the EIS should evaluate all potential sites in the area and assess the environmental impacts associated with each. Such an EIS would provide an indication of sites which could provide the desired barge terminal while identifying areas having significant environmental value.

We regret that, due to travel constraints, we were unable to attend the scoping meeting in February; however, we have several comments on the project as proposed in the scoping letter and on other issues that we wish to see addressed in the EIS. We appreciate the opportunity to comment on this project and we commend your agency on the decision to prepare an EIS and on the

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early initiation of the scoping process. If you have any questions on our comments, please contact Holly Wirick of my staff at (312/FTS) 353-6704.

Sincerely yours,

William D. Franz

William D. Franz, Acting Chief
Planning and Assessment Branch
Planning and Management Division

U.S. Environmental Protection Agency
Region V Scoping Comments
Operation/Maintenance Activities
in the East Channel of the Mississippi River
at Prairie du Chien, Wisconsin

As in the Section 404 permit process, a key to a sound EIS is the examination of a full range of alternatives to the proposed project activities. In this case, the EIS must examine alternatives beyond the immediate vicinity of Prairie du Chien and beyond the map included with the scoping materials.

It will be important to define geographic terms in the EIS. Having clear maps and an understanding of the extent of the east channel, turning basins, various docks and harbors, dredging areas, and wildlife refuges will ensure a common language for EIS comments. Please bear in mind that without these precise geographic definitions, our scoping comments should be interpreted broadly.

The east channel of the Mississippi River at Prairie du Chien contains the largest known concentration of the Federally endangered Higgins' Eye Pearly Mussel (Lampsilis higginsi) and other species of bivalves, in an exceptional benthic community. Due to the potential for the proposed project activities to significantly impact this unique resource, alternatives beyond the immediate vicinity of present operations at the Prairie du Chien area should be evaluated in the EIS. Alternative shipping routes and docking sites need to be evaluated, and consideration must be given to relocating the terminal to a site that would eliminate the need to navigate through the east channel; alternatives that will not adversely impact other L. higginsi populations or high quality benthic communities. Also, individual permit requests from several operators for additional barge fleeting, mooring and terminal areas need to be considered in the EIS. These incremental actions, when added to other past, present, and reasonably foreseeable future actions, may result in significant adverse impacts to the environment.

With regard to your agency's proposed regulatory and operation/maintenance activities in the east channel of the Mississippi River at Prairie du Chien, the following issues need to be addressed in the EIS.

Information on the east channel and other affected areas of the Mississippi River needs to be provided in the EIS. This should include resources of the channel, sediment characterization data, and a biological assessment on the impacts of the various shipping alternatives to L. higginsi and the entire riverine community.

The proposed expansion of the Prairie Sand and Gravel barge terminal and the development of additional barge loading facilities would result in a substantial increase in the number of barges in the area annually. This increase has the potential to significantly impact the environment due to the effects of propeller wash churning, scouring, turbidity, potential fuel leaks or cargo spills, as well as air quality degradation and impacts to the scenic quality of the area. Of main import would be the impact on L. higginsi. The increase in the number of barges may jeopardize the continued existence of this endangered species, as in addition to the potential for dislodging, crushing and contaminating these organisms, increased siltation resulting from the additional barges would affect the mussels' ability to feed, reproduce and reach maturity. We would have similar concerns with other east channel barge operations.

To minimize adverse impacts to the mussels, alternatives to avoid the sensitive areas must first be developed and examined. If unavoidable, then we recommend that strict guidelines be established to regulate the activities of barge operators. The guidelines may include (i) requiring barge operators to be restricted to the north end of the east channel when traveling to and from the Prairie Sand and Gravel facility, (ii) stipulate that hazardous materials may not be transported across the north end of the east channel, (iii) prevent wastewater from the barge maintenance and cleaning operations from entering the waterway, and (iv) plan for the immediate retrieval of barges if they break away.

Other impacts associated with the proposed increase in barge transportation include the introduction of additional hydrocarbons, increased erosion and siltation, conflicts with commercial clamming and fishing, higher levels of noise and exhaust fumes, elevated risk of spillage, and conflicts with recreational boaters and fishermen. Development of barge terminals could alter truck traffic patterns and increase truck traffic, potentially resulting in the need for more frequent road repairs as well as interrupting normal traffic patterns and flows.

To facilitate barge loading and unloading operations, two separate upland areas would need to be excavated for the Prairie Sand and Gravel operations. The first area is a 50 to 200 foot wide strip of land extending northward approximately 650 feet from St. Feriole Island to the southern limits of the existing permitted dredging operations, creating approximately two acres of open water. Enlargement is also proposed at the northern end of St. Feriole Island where approximately 1,000 feet of shoreline would be excavated. These activities may destroy wildlife

habitat and disrupt the aquatic environment. Also, water quality may be degraded due to the introduction of runoff caused by construction activities and by the resuspension of sediment that may be contaminated from prior spills or leaks. Describe in the EIS plans to compensate for any adverse impacts. Also, identify the disposal site proposed for the excavated material.

It is stated in the environmental documentation that construction of the loading facilities may require maintenance of the shoreline at a steeper angle than that which can be maintained by the natural soils. To accomplish this, your agency proposes to stabilize approximately 1,300 lineal feet of shoreline with riprap. We recommend that the project contract mandate the use of clean quarry rock to ensure that wetlands and other unique area habitats are not impacted when obtaining or placing the material.

The environmental documentation states that project activities, such as road and rail construction, may require the removal of trees and other vegetation. To mitigate the loss of trees, we recommend that they be replaced with native saplings at a minimum ratio of 1:1 and that they be placed as close as possible to the impacted areas. The EIS should include a description of your agency's proposed mitigation plan for environmental losses. With regard to disposal of removed trees, decaying trees are important components of forest ecosystems because they provide habitat to insects, birds and other forms of wildlife, and detritus provides essential nutrients to the soil. We recommend that removed trees be placed in a forested area to provide habitat for wildlife rather than burning them or putting them in a landfill. Trees could also be provided to the community as firewood or mulch.

The development of additional barge loading facilities at the proposed Swingle site would remove a portion of lowland forest which would displace or destroy most of the wetland and lowland forest wildlife species that inhabit the project area. The proposed mitigation and restoration measures of this ecosystem and the habitats that would be affected should be discussed in the EIS. Also, additional information would need to be provided on the acreage, type, functions and values of the forest wetland habitat proposed to be impacted, as all unavoidable losses of wetlands must be mitigated. Our general policy is to request that a minimum of 1.5 acres of compensatory wetlands be provided for each acre of naturally-occurring wetlands unavoidably lost due to project implementation activities. The compensatory wetlands should be located as close as possible to the impacted wetlands and should be designed to replicate as closely as possible, the types, functions and values of the impacted

wetlands. The Section 404 Guidelines require that every effort be made to avoid and minimize project-related losses of wetlands; thus, the project alternative which has the least potential to adversely impact naturally-occurring wetlands should be selected for implementation, provided that this does not cause greater environmental problems.

The development of the Swingle site would also completely alter aesthetics from a natural to a commercial-industrial setting with the placement of riprap and the addition of docks, cranes, roadways, buildings, and storage areas. This would also reduce wildlife habitat in the area. Describe what measures are proposed to be implemented to mitigate and compensate for these impacts.

With regard to the maintenance dredging proposed to occur in the east channel, the environmental documentation states that approximately 185,000 cubic yards of sediment is proposed to be removed, 30,000 of which is to be used in roadway construction and 45,000 to 50,000 cubic yards will be used to raise the buildings and storage areas above the regional flood elevation. Information should be provided on the exact location of the sites proposed to be excavated as well as the physical, chemical, and biological characteristics of the sediment. Also, the sites being considered for placement of the excess dredge material should be identified and discussed, including information on the current land use of the site, underlying soils, existing biota, the physical characteristics of the site, and an identification of habitats that may be impacted. All sediment disposal options should be discussed in the EIS.

It is stated in the scoping information that to facilitate the movement of barge traffic in Sawmill and Marais de St. Friol Sloughs, excavation and maintenance of a 9 foot deep channel would be required. The aquatic environment of this site should be described, including an indication of whether mussels are present, the sediment to be removed should be characterized, state the amount of material proposed to be excavated, and provide a description of prospective sediment disposal sites. It should also be indicated whether this channel would have to be maintained routinely and what the ecological impacts of the increased depths and dredging would be.

Dredging and construction activities will result in the resuspension of fine particles causing turbidity. Measures should be taken to minimize water quality degradation such as the use of silt screens or sediment traps to contain material within the project area. The use of such measures should be included in the project contract that is put out for bid.

An access road to the Swingle site is proposed to be constructed north of Frederick Street between STH 35 and CTH K. The road would be approximately 4,000 feet long with a right-of-way of 66 to 90 feet wide (six to eight acres). A ten acre parking lot is proposed for construction adjacent to the road. Identify what habitats exist in the area, indicate whether construction activities would adversely impact these habitats, and describe proposed mitigation plans. Also, if these sites are proposed to be covered in asphalt, describe what measures would be taken to compensate for the loss of watershed in the area.

The amount of noise, dust and exhaust fumes generated from construction activities may be significant since there are permanent homes and summer trailers near the project area. To minimize these impacts we recommend that the contractor be required to control noise and fumes emitted by equipment by installing control devices and employing prescribed control methods. Dust levels should also be kept to a minimum by requiring the contractor to water the gravel roads periodically.

With regard to impacts the proposed project may have on historic sites in the project area, it is stated in the environmental documentation that the vibration from passing trains has the potential to damage buildings that have been in existence for over 100 years. Construction of the rail system may also affect air quality, traffic, safety and contribute to noise impacts. Describe in the EIS what measures can be taken to minimize these adverse impacts. Other historic preservation issues should be addressed in the EIS as well.

Identify in the EIS what erosion control measures are proposed to be taken during project activities. Such measures may include establishing a staging area for the construction equipment in an environmentally non-sensitive area, limiting the number of access points to the site, and revegetating all disturbed areas upon completion of project activities. In this regard and in accordance with NEPA, which states that it is the continuing responsibility of the Federal government to maintain an environment which supports diversity, we recommend that your agency restore disturbed areas to their native habitat by removing exotic, invasive species and revegetating the area with plants and trees that existed in the area prior to development. In addition to providing erosion control, increasing drainage capacity, and mitigating the loss of habitat in the area, restoration would improve the aesthetics by increasing the number and diversity of species inhabiting the project site. The Wisconsin Department of Natural Resources, the local historical society, conservation organization, library or greenhouse may be able to assist you with research and provide information on where to obtain native vegetation.

Our final recommendation is that your agency implement energy and water conservation and waste minimization measures whenever possible. This is in accordance with our pollution prevention policy, implemented due to reduced landfill space, depleting natural resources and associated environmental impacts. Such measures may include the use of uncontaminated construction or demolition debris in construction of the roads and for use as backfill for the dock structures, the use of recycled materials in construction of the docks; particularly recycled plastic, as it is an extremely durable material, and the reuse of barge washing wastewater in controlling dust on the gravel roads rather than disposing it at an upland site, as proposed in the environmental documentation.

Please note that many of these comments would apply to new site alternatives beyond the immediate sites discussed in the scoping materials.

We would be willing to discuss our comments with you and assist you in addressing them.

Wisconsin Department of Transportation

TRANSPORTATION DISTRICT 5
3550 Mormon Coulee Road
P.O. Box 337
La Crosse, WI 54602-0337

March 19, 1992

U.S. Army Corps of Engineers
Environmental Resources Branch
Planning Division
180 Kellogg Boulevard East
Room 1421
St. Paul, Minnesota 55101-1479

Attn.: Mr. Dennis Anderson

Subject: Blair Dillman Permit Application
Prairie du Chien, Wisconsin

Dear Mr. Anderson:

On February 26, 1992, our District planning supervisor, Mr. Ron Puestow attended your agency scoping meeting regarding the EIS that is to be prepared by your agency regarding the subject permit application. Also discussed as part of this meeting was the upcoming Section 107 Reconnaissance Study that will be prepared for the City of Prairie du Chien for the potential relocation of the existing municipal harbor. Both of these activities are of importance to our Department with respect to their impacts/effects upon land-side transportation elements, particularly the short-line railroad.

As Ron pointed out at this meeting, our Department has been extensively involved in the entire alternative harbor location process/study over the last several years, particularly with regards to evaluating the various land-side transportation implications for the various alternative harbor sites. We have worked closely with City of Prairie du Chien, the Wisconsin DNR and the Mississippi Regional Planning Commission in the identification and impact evaluation process, as well as evaluating the economic importance to Wisconsin of a harbor connection/interchange with the short line railroad.

Given our Department's past activities and interest in the entire Prairie du Chien harbor location issue, we wish to be involved in both the EIS for Blair Dillman's permit application and Section 107 reconnaissance study as a "participating agency." To this end, we will provide you assistance as well as copies of our past engineering studies for the various alternative harbor sites. Ron Puestow will serve as our District person, and his telephone number

is 608-785-9044. Please feel free to contact him for any information that you need.

By;

Alan L. Lorenz

Alan Lorenz, P.E.
District Engineer
District 5, La Crosse

cc: Paul Heitman
Director of Rails and Harbors

Ellen Fisher, Chief
Harbors and Waterways Section

CENCS-PD-ER (1105) 16 March 1992

MEMORANDUM FOR: Prairie du Chien EIS scoping record

SUBJECT: March 16, 1992, meeting with Mr. Rod Rovang of the National Park Service at Effigy Mounds National Monument

1. Mr. Rod Rovang with the National Park Service at Effigy Mounds National Monument visited with Dave Ballman, Dave Berwick and myself on March 16, 1992. Mr. Rovang had several slides with him which depicted the Prairie Sand and Gravel operation as viewed from overlooks (Firepoint and ???) in Effigy Mounds National Monument. Mr. Rovang expressed concern that continued development at the PS&G site could adversely affect the viewsheds of Effigy Mounds. The detrimental visual impacts on Effigy Mounds caused by the PS&G facility are somewhat reduced by foliage in the spring and summer, however, if the Swingle site is developed and the PS&G facility is expanded increased visual impacts could occur. Additionally, harbor development upstream of Prairie du Chien (for approximately 20 miles) could detrimentally impact the viewshed of Effigy Mounds. He was unaware that a site in the Picatee Creek area had been evaluated as a potential harbor development site. He requested that a map showing the location of this site be forwarded to him.

2. Mr. Rovang presented a slide which showed a recreational harbor developed by Mr. Blair Dillman which exists directly across the Mississippi River from Effigy Mounds. The impact of this facility on the viewshed of Effigy Mounds was quite apparent. The presence of a recreational harbor and the associated docks, boat houses, etc. is out of character with the relatively undeveloped, forested bottomlands in the surrounding area and the scenic limestone outcroppings and bluffs of the Wisconsin side of the River. Mr. Rovang stated that the National Park Service was not informed of the development of this recreational harbor and therefore did not have a chance to comment on its visual impacts to Effigy Mounds prior to construction.

3. The COE will continue to coordinate with Mr. Rovang in the areas discussed above. The visual impacts of harbor development on Effigy Mounds will be addressed in the EIS.

Tim Yager

Tim Yager
Fishery Biologist
Environmental Resources

Wisconsin Department of Transportation

BUREAU OF RAILROADS AND HARBORS
4802 Sheboygan Avenue
P. O. Box 7914
Madison, WI 53707-7914

Telephone (608) 267-7348
FAX (608) 267-6748

March 6, 1992

Dennis Anderson
Environmental Resource Branch, Rm. 1421
Corps of Engineers
180 Kellogg Blvd.
St. Paul, Minnesota 55101

Dear Mr. Anderson:

RE: Blair Dillman Permit Application - East Channel, Prairie du Chien

The following is provided in response to a COE request made during the 2/26/92 scoping meeting on the above permit application.

Railroad service directly to the port at Prairie du Chien by a railroad serving the interior of the State of Wisconsin is a significant economic resource to the state.

As Wisconsin continues to grow as an exporter of cash grain crops, access to the river system becomes increasingly important. Negotiations among grain dealers to bring unit trains of grain from as far as origins north of Green Bay, Wisconsin to Prairie du Chien by rail are known to be underway.

Use of the port at Prairie du Chien as a rail-barge transload facility is hampered by many things, one of which is the physical condition of the rail line serving the interior of the state. The Wisconsin Department of Transportation (WisDOT) has expended $1,607,000 on rail routes serving products moved through the port. In 1992, it is expected that $4,700,000 will be expended on the line serving the port. Upon completing the rehabilitation of this line of railroad, operating efficiencies resulting from the work are expected to influence transportation costs in a positive way and thereby further enhance the use of the port for transportation of a variety of commodities.

Please note that this letter is neither in support nor opposition to the permit application but is provided as information requested by the COE as to the view held by WisDOT that rail service is a significant resource to a port at Prairie du Chien from the interior of the state.

Sincerely,

Paul Heitmann

Paul C. Heitmann, Director
Bureau of Railroads & Harbors

PCH:dla:1070-p

DT79

WISCONSIN
DEPT. OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

February 28, 1992

IN REPLY REFER TO: 1600

Colonel Richard Craig, District Engineer
St. Paul District, Corps of Engineers
1421 U.S. Post Office and Custom House
St. Paul, MN 55101-1479

Dear Colonel Craig:

This responds to your February 7, 1992, letter to me informing the Department of the Corps of Engineers' intent to prepare an Environmental Impact Statement (EIS) related to proposed permit applications, and federally authorized uses and Corps responsibilities in the Mississippi River at Prairie du Chien, Wisconsin. You also request that the Department confirm its role as lead Wisconsin agency in the federal EIS effort, and that the Department participate as a "cooperating agency" in preparation of the EIS.

The Department also has pending water regulatory permit applications for Mr. Blair Dillman's commercial harbor expansion and new recreational marina development near Hunter's Slough. We notified Mr. Dillman shortly after he applied for expansion of his commercial harbor facilities on the north end of St. Feriole Island and adjacent mainland Swingle site that we intended to do a state EIS on this proposal. We also informed Mr. Dillman that the Department would postpone processing his permit applications until we received further information on certain details needed to evaluate this proposal, and until state-facilitated negotiations to consolidate harbor facilities between the City of Prairie du Chien and Mr. Dillman were concluded.

Because of Wisconsin's similar regulatory and environmental evaluation requirements to those of the Corps of Engineers, I recommend not only that the Department be considered the lead state agency, but additionally that we work with your agency as a joint author on the EIS rather than as a cooperating agency. Such an integration would better help insure that duplication of effort is minimized (including especially data collection, document preparation, and public participation), and that mutually agreeable, coordinated regulatory decisions on similar regularity permits are achieved for Mr. Dillman's proposals. The Department has worked jointly on EIS preparation with the U.S. Environmental Protection

MAR 10 1992

U.S. CORPS OF ENG...
St. Paul District
Regulatory Br...

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Agency in the past and have found such joint EIS's work quite well to fulfill both federal and state needs.

In order for our agencies to work most efficiently on a joint EIS, I recommend that our staffs develop a Memorandum of Understanding (MOU) to guide preparation responsibilities, completion timeframes, and conflict resolution procedures for the document. I hope that this MOU can be developed during EIS scoping meetings that are being held in March.

Please contact Mr. Robert Read of my staff for further coordination on the MOU and regarding the EIS. His telephone number is (608) 266-1962.

Sincerely,

C. D. Besadny
Secretary

U.S.Department of Transportation

United States Coast Guard

Commander
Second Coast Guard District

1222 Spruce St.
St. Louis MO 63103-2838
Staff Symbol: (meps)
Phone: (314) 539-2655

16600
26 Feb 92

Department of the Army
St. Paul District, Corps of Engineers
1421 Post Office and Custom House
St. Paul, MN 55101-1479

Attn: Environmental Resources Branch, Planning Division

Gentlemen:

This is in response to your letter of 13 February 1992 concerning the preparation of an Environmental Impact Statement (EIS) relative to proposed actions in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin.

We have reviewed the materials you provided and it appears that the significant areas of concern have been identified. Our primary area of concern is navigation safety for both commercial and recreational vessels. In that regard, we would like the opportunity to review the draft EIS and any preliminary materials dealing with potential conflicts between commercial vessel traffic and recreational vessels. At this time, we have no other input for the scoping study.

The primary point of contact for the Coast Guard for local vessel safety issues in this case is:

Commanding Officer
U. S. Coast Guard Marine Safety Office
1222 Spruce Street
Room 1.215
St. Louis, MO 63103-2835

The Commanding Officer, CDR D. B. Anderson, can be reached by telephone at (314) 539-3091. Your letter and the attached materials have been forwarded to his attention.

If we can be of further assistance, please contact CDR T. B. Rodino on my staff at by telephone at (314) 539-2655.

Sincerely,

R. E. Luchun
Captain, U. S. Coast Guard
Chief, Marine Safety Division
by direction of the District Commander

Copy: MSO St. Louis

SEND WHITE & PINK COPIES WITH CARBONS INTACT. WHITE COPY IS RETURNED WITH REPLY.

TO: Dept of Army - St. Paul District
Corps of Engineers
1421 U.S. Post Office & Custom House
St. Paul, Mn 55101-1479

FROM:

CITY OF PRAIRIE DU CHIEN
207 West Blackhawk
PRAIRIE DU CHIEN, WI 53821
(608) 326-6406

SUBJECT: proposed truck route construction DATE 12/27/91

Dear Colonel Baldwin:

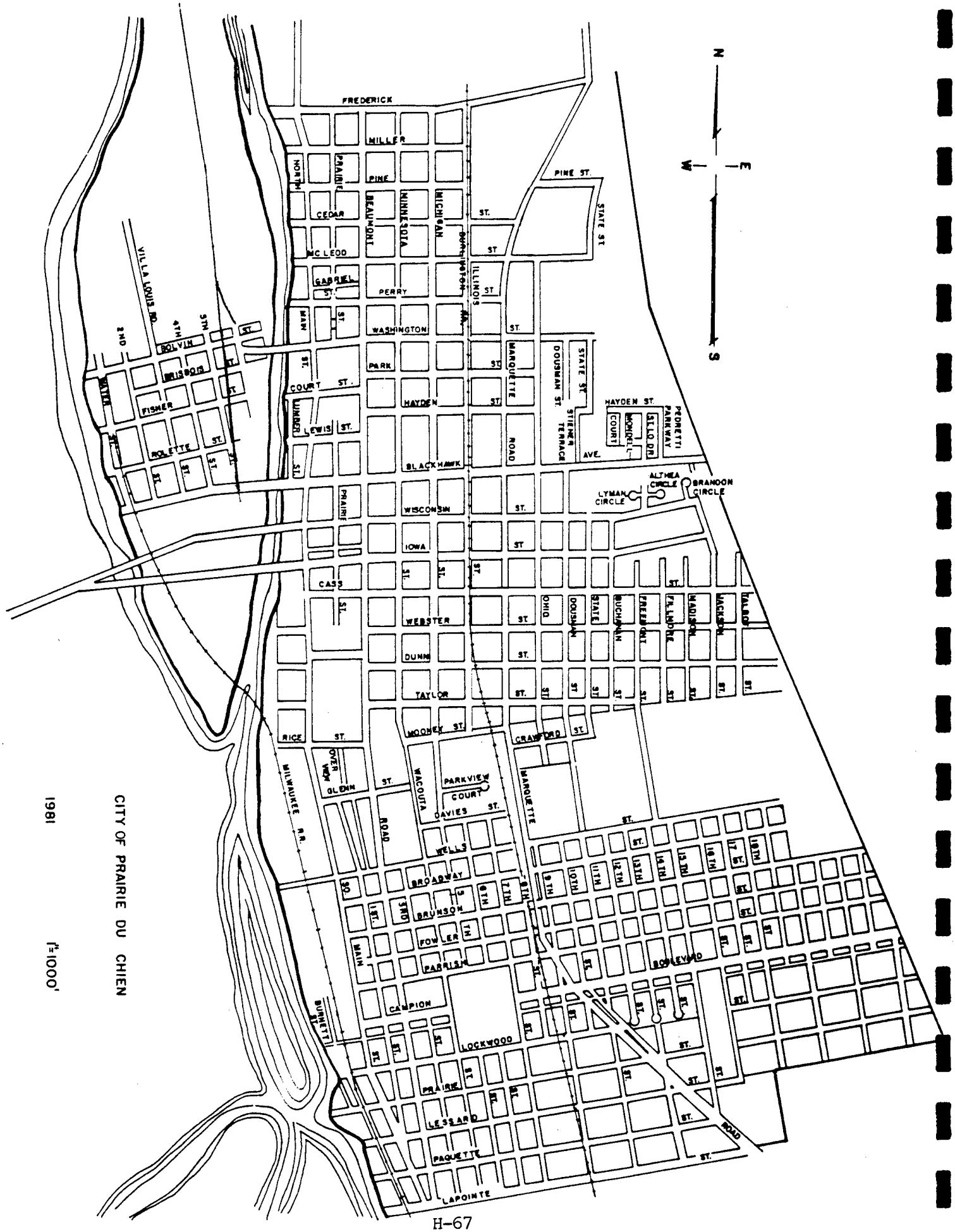
Please find enclosed an attached map showing a proposed new truck route. The new road is shown in red. The Relief Committee and the City Council has approved the concept of this new road. It would take truck traffic away from historical sites on the island, and also take the traffic away from the middle of the island. Prairie Sand & Gravel Co. would like to construct

REPLY TO _____ BY _____
DATE

this new road in the spring of 1992. Please review this proposal preliminarily and I will be forwarding a more detailed construction plan in the future. Thank you in advance for your cooperation in this matter

RETURN PART 1 TO SENDER WITH REPLY BY

RM-857-3



CITY OF PRAIRIE DU CHIEN

1981

1"=1000'

MEMO FOR RECORD

SUBJECT: PRAIRIE SAND AND GRAVEL

1. On January 21, 1992, I contacted Mr Blair Dillman regarding the status of his pending Corps permit application for a commercial harbor in Prairie du Chien. I informed Mr. Dillman that the St. Paul District had determined that a federal EIS was required for the review of his project. The EIS would also review potential impacts associated with any future federal dredging requirements in the East Channel, as well as impacts associated with barge traffic at the City Dock. As expected, Mr. Dillman was not pleased at the delay and/or potential costs associated with preparing an EIS. He stated that the WDNR has done their EIS and that the East Channel has been studied to death. He has operated there for over thirty years, and doesn't feel his proposal will impact the mussels. He stated that he expects to reach agreement with Didion, Inc. this week, that would allow Didion to load barges at PS and G. If an agreement was reached, Didion may move their entire loading operations from the City Dock. Mr. Dillman requested that this information not be publicized until the agreement is finalized.

2. Mr. Dillman further stated that he is meeting with the City of Prairie du Chien regarding the construction of a new access road from Highway 35 to County Road "K", thereby providing access to the proposed Swingle site. The 3M Company, which is located along Highway 35 on the north end of town, is proposing a large expansion that would require the construction of a new access road. Mr. Dillman stated that it would likely be a combined City-3M-PS and G project, with the funding to be shared by all parties. He stated that the delay caused by the EIS could also jeopardize that proposal.

3. I told Mr. Dillman that the District Office would be following up my call with a letter informing him of the determination that an EIS will be required for his proposal. I stated that Dave Ballman would be the new contact person if he has any additional questions regarding the status of his application.

Bruce Norton

Bruce Norton
Project Manager
La Crosse Field Office

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

WISCONSIN
Carroll D. Besadny
DEPT. OF NATURAL RESOURCES
Secretary

December 30, 1991

IN REPLY REFER TO: 1600

Mr. Robert Whiting
U.S. Army Corps of Engineers
1421 U.S. Post Office & Custom House
St. Paul, MN 55101

Dear Mr. Whiting:

In late November the Department of Natural Resources met with Didion, Inc. and the City of Prairie du Chien along with other parties involved in the City's municipal barge harbor project. As a result of that meeting, the parties have tentatively agreed to granting a one year permit extension to allow loading of 135 barges at the municipal harbor in 1992. In addition, the applicants will withdraw their permit application for loading an unlimited number of barges at the municipal harbor and have agreed to participate in meetings with a mediator, beginning in January 1992, to attempt to find an alternative harbor site. Therefore, the hearing we had tentatively scheduled for early in 1992 has been cancelled.

To provide more detail on the recent project events, I have attached a December 13, 1991 letter to the parties transmitting a proposed stipulation and order.

We thank you very much for your help in reviewing the literature, inspecting the site and preparing for the hearing on the project proposal. While we are uncertain how the harbor situation eventually might be resolved, we are hopeful that mediation will be successful. In addition, the City continues to seek an alternative harbor site through a U.S. Army Corps of Engineers "Section 107" study scheduled to begin in early 1992.

Should these or other initiatives fail, we could be faced, ultimately, with a hearing to resolve the issue and will once again be seeking your participation. We will keep you posted on the progress of the project.

If you have any questions or comments, please call me at (608) 266-2177.

Again, thank you for your cooperation and assistance in developing our case.

Sincerely,

Michael J. Cain
Attorney at Law

WISCONSIN
DEPT. OF NATURAL RESOURCES

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

Carroll D. Besadny
Secretary

December 13, 1991

IN REPLY REFER TO: 8300

Mr. Brett Hulsey
Sierra Club
214 North Henry Street
Madison, WI 53703

Mr. Peter Peshek
Attorney at Law
P.O. Box 2509
Madison, WI 53703-2509

Ms. Marian E. Havlik
1603 Mississippi Street
LaCrosse, WI 54601

Mr. Thomas Dawson
Wisconsin Public Intervenor
P.O. Box 7857
Madison, WI 53707-7857

SUBJECT: Stipulation and Order- Prairie du Chien

Dear Gentlemen and Madame:

Enclosed please find the MEETING SUMMARY, STIPULATION AND ORDER which I have prepared subsequent to further discussions with the parties after the second draft was circulated I received verbal comments from Marian Havlik and from Peter Peshek, representing the City of Prairie du Chien and Didion. I have incorporated two minor changes in the final document pursuant to those discussions.

The changes which have been made are to numbered paragraph 1. on page two, where language was inserted to clarify that the permit we are dealing with is the Didion/City grain loading permit. The other clarification is on page three, numbered paragraph 2, where the phrase "are lessened" was changed to "may be lessened".

I an sending each of you a copy of this "final" document. I am signing one copy and am sending it to Peter Peshek for signature. I ask that he forward it on for other signatures. It is understood in the agreement that it is not effective until "all parties" have signed. If there are any problems which need resolution, please let me know and I will initiate a conference call to discuss them.

Once I have received the fully executed agreement, I will provide a copy to each of you. Didion and the City can then submit the letter of withdrawal to the Department and the Hearing Examiner. The Hearing Examiner will then issue an order of dismissal in that application docket.

I had contacted each of you in an attempt to set up our initial meeting with the mediator, Howard Bellman. I had hoped we could set up an initial meeting

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to discuss procedures and preliminary matters on December 20, 1991. Due to busy calendars that date will not work. It now appears that we will have to schedule our first meeting sometime after January 13, 1991. I have not consulted with anyone concerning dates, but I propose that we meet in Madison in the late morning or early afternoon on either January 14, 15, 21, 22 or 23, 1992. Please advise me by telephone or letter as soon as possible which, if any, of those dates will not work for you. If I have not heard from you by December 19, I will assume these dates will work and will schedule the meeting for one of these dates.

If you have any questions or comments, please call me at 608-266-2177.

Sincerely,

Michael J. Cain
Attorney at Law

cc: George Meyer-AD/5
Dave Pericak-LAX
Ken Johnson-WZ/6
Bob Read-EA/6
Bill Tans-EA/6
Dennis Leong-DOD

DEC 16

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

Application of Didion, Inc., and the City of Prairie du Chien for an Extension and Modification of an Existing Permit for Maintenance and Operation of Barge Loading Facilities on the Bed of the Mississippi River, City of Prairie du Chien, Crawford County, Wisconsin	)	3-WC-88-3701

MEETING SUMMARY, STIPULATION AND ORDER

A meeting of the parties to this action took place in Madison, WI, on November 21, 1991, to discuss the status of this issue and to determine whether an extension to the permit should be issued pending final resolution of these issues.

The parties who participated in the meeting were as follows:

Didion, Inc. and City of Prairie du Chien, by

Peter A. Peshek, Attorney
P.O. Box 2509
Madison, WI 53703

Department of Natural Resources, by

Michael Cain, Attorney
P.O. Box 7921
Madison, WI 53707

Sierra Club, by

Brett Hulsey
214 North Henry Street
Madison, WI 53703

Marian E. Havlik
1603 Mississippi Street
LaCrosse, WI 54601

Thomas Dawson
Wisconsin Public Intervenor
123 West Washington Ave.
P.O. Box 7857
Madison, WI 53707-7857

In addition to the above parties, Dennis Leong of the Wisconsin Department of Development was in attendance at this meeting. Other persons in attendance were John Didion and Roger Blimling of Didion, Inc.; Harbor Commissioners

Herman Wolfgram, George Sutton and Robert Valley from the City of Prairie du Chien; Bill Redding of the Sierra Club; and George Meyer, David Pericak, Robert Read and William Tans of the DNR.

The parties agreed to the following at this meeting:

1. The City of Prairie du Chien and Didion, Inc., will withdraw their application for a long-term permit for the construction and operation of a grain loading facility at the City Harbor site. The City and Didion, by entering into this agreement and withdrawing their application, do not waive the right to reapply for a permit for grain loading operations at this site. Their participation in this agreement may not be used against them in any subsequent applications and the processing of any subsequent applications should be done in a manner which incorporates the information which has already been developed relative to this permit process.

2. The parties agree that a mediator should be retained to mediate the issues relating to this matter. The Department of Natural Resources agrees to make initial contact with a mediator to determine availability and to set up an initial meeting. The parties agree to participate in the mediation process, to encourage the participation of other appropriate agencies and parties in the process, and, as resources of individual parties allow, to assist in funding the mediation process.

3. The parties agree they will stipulate to the issuance of the following "Interlocutory Permit" which will authorize the loading of 135 barges during the 1992 shipping season. The parties opposing the activities at the existing site do not, by entering into this agreement, affirmatively endorse the permit or waive their objections to the existing site, nor may their entry into this agreement be used against their objections to the site, and they reserve their rights to object to any further extensions of this permit.

The INTERLOCUTORY PERMIT which the parties agreed to provides as follows:

INTERLOCUTORY PERMIT

Permit No. 3-WC-88-3701-III

Didion, Inc., c/o Mr. John Didion, President, 210 Grell Lane, Johnson Creek, Wisconsin 53038, and the City of Prairie du Chien, c/o Honorable James Bittner, City of Prairie du Chien, Prairie du Chien, Wisconsin 53821, were issued a permit on May 24, 1988, for the construction, maintenance and short-term operation of a rail-to-barge grain-loading facilities on the bed of the

East Channel of the Mississippi River. A number of Interlocutory Permits have been issued authorizing additional operations at this location.

Didion, Inc., and the City have agreed to withdraw their application for a long-term permit at this site and have requested another Interlocutory Permit to allow them to move 135 barges per year for the next two years consistent with the federal permit they now hold.

There continues to be a concerted effort on the part of Didion, the City of Prairie du Chien, the DNR, the other parties to this action, and other state and local agencies involved with this issue, to attempt to find a suitable long term municipal harbor site and avoid protracted litigation on these issues. Progress has been, and continues to be, made toward this end. No final solution has yet been identified, however.

In an attempt to continue to focus the energy and resources of all parties on finding a solution to this matter, the parties have agreed, as outlined herein, to issue another interlocutory permit to allow Didion, Inc., and the City to continue to operate during the 1992 shipping season. Factors which have been considered in reviewing this request include the agreement of the parties to enter into a mediation process to attempt to resolve differences and locate an alternative harbor site; the initiation of a "Section 107" harbor study by the U.S. Army Corps of Engineers to look at the existing and alternative harbor sites at Prairie du Chien; the fact that other state agencies are actively involved in pursuing alternative harbor locations at Prairie du Chien and are willing to participate in the mediation process and the federal study; the fact the federal agencies have agreed to allow barges to be moved during the 1992 season; the monitoring data which Didion, the Corps of Engineers, and other parties have developed; and the U.S. Fish and Wildlife Service's "biological opinion" which was developed under the Endangered Species Act.

Based on all of the above factors, and recognizing that progress continues to be made toward resolving the issues in this matter, the Department and the parties have agreed to the issuance of the following interlocutory permit.

THIS INTERLOCUTORY PERMIT NO. 3-WC-88-3701-III, IS GRANTED to the applicants, Didion, Inc. and the City of Prairie du Chien, with the same conditions as the previous Permit No. 3-WC-88-3701, which is incorporated herein, except that conditions Numbers 1, 2 and 8 shall now read:

1. The permit granted herein shall expire on December 31, 1992, or upon completion of loading 135 barges, at which time the use of the existing grain loading facilities shall cease.

2. The Department and other parties continue to have concerns with the issues relating to long term maintenance of the navigation channel, the impacts which are occurring in the vicinity of the current municipal dock, and the chronic impacts of navigation of barges in the East Channel. It is recognized that the risks of acute impacts to mussels may be lessened when water levels are

sufficiently high, but we still have concerns with the chronic impacts that may be occurring even during high water periods. The authority herein granted can be amended or rescinded prior to December 31, 1992, if the use of these structures becomes a material obstruction to navigation or becomes detrimental to the public interest.

In addition, the following conditions have been added to further protect the East Channel mussel resource and to encourage an alternate municipal harbor location in Prairie du Chien.

17. To minimize the impacts to mussels and destruction of habitat, the applicant shall light-load the barges at any time the water elevation is below 612.0 (msl). Didion, Inc., does not believe that this permit condition is required. The applicant and the Department agree that the fact that this condition is attached to this interlocutory permit shall not be considered precedent, nor may it be used by any party at any subsequent permit hearing as evidence of the need for, or lack of need for, such a permit condition.

The remainder of the permit and its conditions are valid and shall remain unmodified in all other respects.

This STIPULATION and INTERLOCUTORY PERMIT are effective upon signing by all the parties.

_____ DATE: _____
DEPARTMENT OF NATURAL RESOURCES

_____ DATE: _____
DIDION, INC.

_____ DATE: _____
CITY OF PRAIRIE DU CHIEN

_____ DATE: _____
THOMAS DAWSON, PUBLIC INTERVENOR

_____ DATE: _____
MARIAN HAVLIK

_____ DATE: _____
BRETT HULSEY, SIERRA CLUB

LAW OFFICES OF
PETERSON, ANTOINE & PETERSON, S. C.

C. B. PETERSON (1892-1988)
R. J. ANTOINE
LEART G. PETERSON
MARK A. PETERSON
THOMAS F. PETERSON

110 EAST MAIN STREET
P. O. BOX 339
PRAIRIE DU CHIEN, WISCONSIN 53821
AREA CODE 608 326-6466

February 2, 1990

RE: Additional Proposals Relative to Harbor Site and Access

Dear Sir or Madame:

Our firm represents William Hubbard who has requested that we be in contact with you relative to an additional proposal that he would like put forth as to access to the proposed harbor at the sewer plant site and a proposal relative to fleeting and unloading at Hunters Lake. As to the first proposal please see Exhibit "A", as to the second proposal please see Exhibit "B".

As to the first proposal, specifically entry to the proposed harbor at the sewer plant site, Mr. Hubbard would propose dredging from the east side of the west channel in a northeasterly direction through Indian Isle and Hunters Lake to the proposed sewer plant site. The benefits to this entry way in comparison to the others already proposed are obvious, specifically, there would be no danger nor impact to the Higgens Eye Clam nor other clam species. Under the present three proposals for entry to the sewer plant site dredging would adversely impact the clam beds that are situated within those proposed routes. Likewise Mr. Hubbard's proposal would have no impact on fish habitat as would the dredging that would be necessary with the presently proposed entry ways to the sewer plant site. Finally the land in question under Mr. Hubbard's proposal is privately owned and then there would be no need to deal with the U.S. Fish and Wildlife Service.

In the event you do not wish to consider a new access route to the proposed sewer plant site Mr. Hubbard would like you to consider using Hunters Lake as a harbor site rather than the other proposed sites. Same could be accomplished by dredging Hunters Island and the construction of a conveyer system or roadway from Hunters Island east to the mainland. Again the advantages are obvious, specifically no disruption to the Higgens Eye Clam, minimal disruption to other clam species and fish habitat, utilization of the short line railroad, utilization of the truck route, which both are in very close proximity to Hunters Lake, plus close access to sewer, water and other utilities. Spillage, if any at the Hunters Island site, could be quickly and efficiently contained with far less environmental impact than a spillage that might occur at any other of the proposed sites. Finally the City could be assured of a harbor open to all at the above proposed site.

Mr. Hubbard would request that both proposals be taken under advisement and would welcome your comments or concerns about either of these proposals.

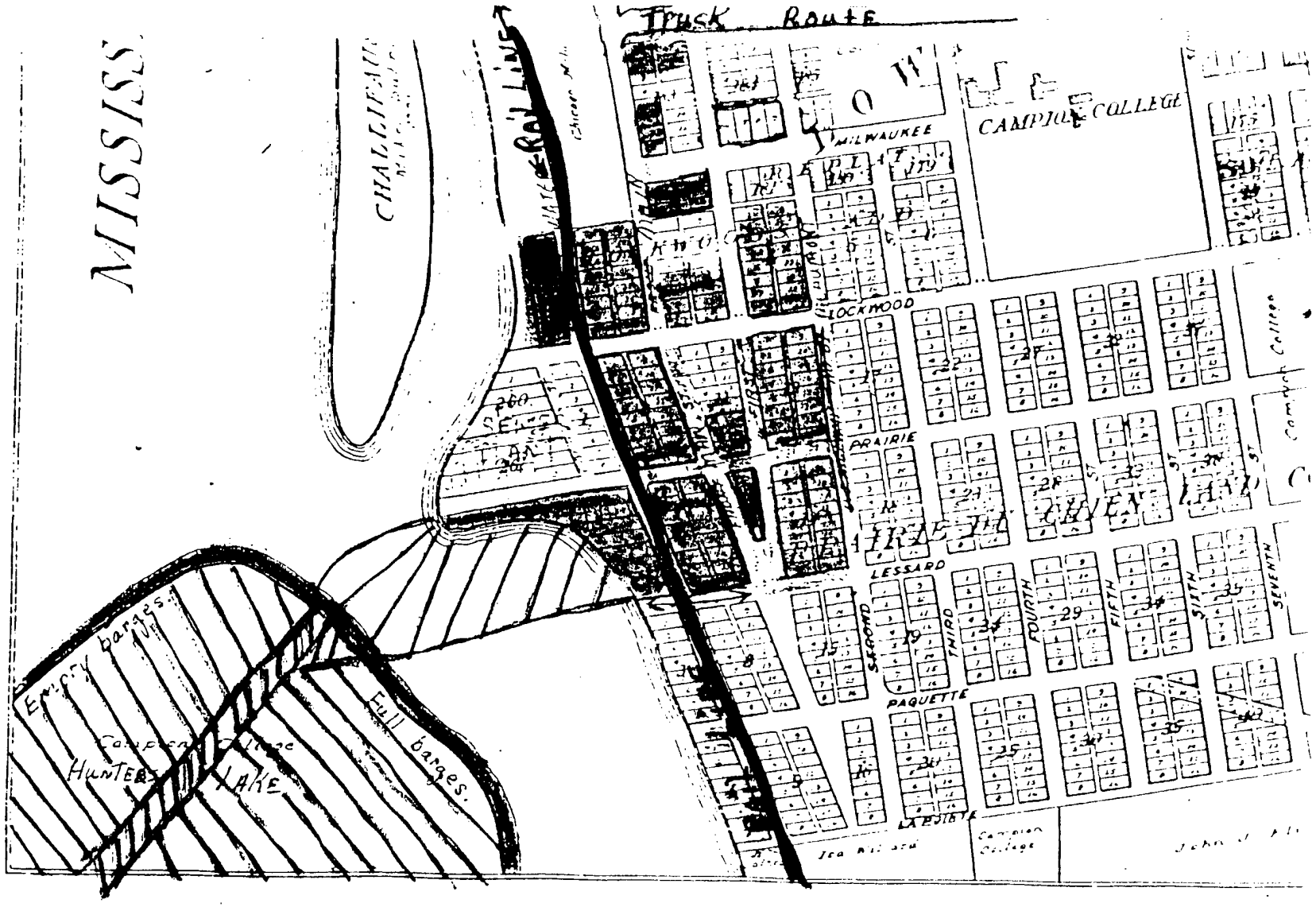
Sincerely,

PETERSON, ANTOINE & PETERSON, S.C.
By:

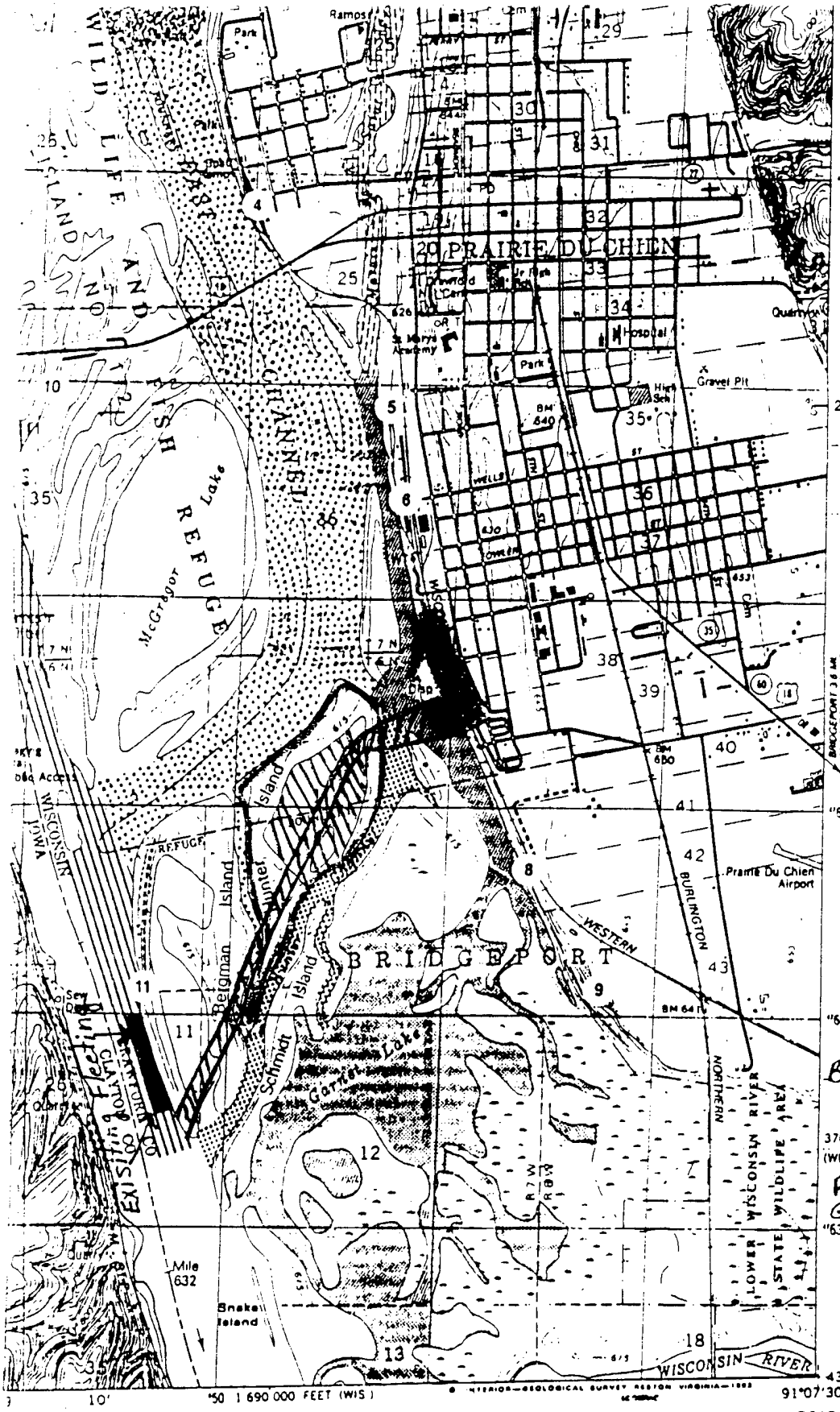
Thomas P. Peterson

TFP:kat

Enc.



Blue is Land owned by Hubbard, Hubbard & Dippong.
Land slashed in red is proposed dredging.



ST. FERIOLE SLOU
LOWER EAST CHANNE
SOUTHERN CITY SI
HUNTER CHANNEL
GARNET LAKE
McGREGOR/INDIAN
*PICATTEE CREEK- not located on

SITE KEY

1 PICATTEE CREEK
2 SWINGLE
3 PRAIRIE SAND & GR
4 MUNICIPAL DOCK
5 DEPOT
6 FS
7 SEWER PLANT
8 PRAIRIE CAMPGROUN
9 BLOYER
10 McGREGOR LAKE
11 INDIAN ISLE

Sewer Plant opt. #4
Blue Land owned by Hubbard
Hubbard a Dippong.
Red slashed land is proposed dredging.
Green is existing fleeting area.

SCALE 1:24 000

ROAD CLASSIFICATION

Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

H-80

...ion USGS 7.5 Minute Quadrangle

Hidden Valley Shell, Inc.
William James Hubbard Sr.
1533 South Beaumont Road
Prairie du Chien, Wisconsin 53821

Dear Dennis,
Attachment 1
My thoughts on the two harbors in the East Channel were, if there is one harbor site there is no reason that two can't be there ,until I read Operation\Maintenance Activities in the East Channel! That means "DREDGING" and "DREDGING" means disaster to the Mussel Shell. I will not agree on that in any way! The State of Wisconsin protects the Mussel Shell from the Clamming Industry! Any time that there is a license, season, size limit, that animal is protected. As far as the truck traffic going on Iowa Street and going on Marquette Road, I think that is suicide, any way you look at it! What is wrong with going back to the first draft when it involved railroad, utilities, truck route, water, and sewer? I believe they wondered away from this! If they were to go back to that there is no way that the Harbor Site would not be on the South end of the town and at the Sewer Site. If not than the site should be the City Dock, but no "DREDGING".

Attachment 2
1. Freshwater Mussel
As far as the East Channel being the most Diverse and Abundant Freshwater Mussel Beds in the Mississippi River, it's possible, but there are more than just one! This part of the river has been clammed as long as I know and it is still one of the most populated Mussel Beds in the river!!
2. Federally Threatened And Endangered Species
Why is the Lampsilis Higginsi the only Freshwater Mussel Shell being mentioned? There are other Mussel Shell in the Mississippi that you should be looking at. Look at the State Threatened and Endangered Species.
3. Cultural Resources
I agree with paragraph 3. I know the places personally. I was born and raised on St. Feriole Island. Regarding the sunken vessel located adjacent to St. Feriole Island, I know where this vessel is because I'm the one who reported the finding!!
4. Effigy Mounds National Monument
This could be a true statement. No other comment.
5. Mississippi River Nine Foot Channel Project
The East Channel being part of the Federally Authorized Mississippi River Nine Foot Channel. I hope this stays a Nine Foot Channel only and "NO DREDGING" Please!! The small Boat Harbor is fine right where it is. The Commercial Harbor in the EAst Channel, well I guess this is to decide the life or death of the City Dock!

6. Upper Mississippi River National Wildlife and Fish Refuge
The Fish and Wildlife do a good job of managing the lands.
7. The Wisconsin and Calument Rail-line
The Wisconsin Dept. of Transportation identified the rail -line as being a significant socioeconomic resource and I don't have any doubt it may be right, so why isn't the D.O.T. working to use the rail-line on the South side of town instead of a site where there isn't a rail-line owned by the Calument Railroad.

Attachment 3
1.It looks like the Fish and Wildlife has it under control.
2.State Historical Society of Wisconsin is looking out for St. Feriole Island. No other comments.
3. I'm against dredging the East Channel.This would destroy the Mussel Beds. As for the recreational boat traffic using the area turning basin, I would leave this up to the person in charge of safety on the waterway.I think we should let the river boats like the Delta, Mississippi Queen, and others of this type come in the East Channel.
4.The statement made in four maybe true,but I believe if anyone is concerned about aquatic habitat, fish entrainment, disturbance of migrating birds, and bank erosion,they should take a serious look at our pool fluctuation of water..It is ridiculous!!The migrating birds nests get drowned out just about every year. The bank erosion, if you watch the inland banks, you will see one tree at a time go down. The muskrat get drowned out every spring and in the fall as well! I would like someone to explain why our pool is the holding pool of all the water no one else wants! Just look at the river stages up the river from us. I watch T.V. Channel 8 LaCrosse and their water rises maybe two or three feet at the most. While our pool will rise from normal stage to somewhere around ten feet or more. I wish someone would take a look at this for me and explain it.
5.No comment at this time.
6. This may be right. No other comment at this time.
7. Would have to see further evidence on this before further comment.

I would like to thank you for the opportunity to comment on these matters.

William James Hubbard Sr.



10.9 APPENDIX I

COMMENTS RECEIVED ON

DRAFT EIS AND RESPONSES

COMMENTS

CENCS-PD-ER 29 October 1993

MEMORANDUM FOR RECORD

SUBJECT: Comments received from individuals at August 11, 1993 public meeting in Prairie du Chien, Wisconsin.

1. Ms. Marian Havlik had the following comments:

1 o The following references should be incorporated into the EIS:
Samuel Fuller's article in a 1980 UMRRC document.
Coker's 1919 study on brail mortality.
Marking and Bill's (1979) study on the burial of mussels by silt and sand.
Marian Havlik's article on her 1990 study in the 1992 proceedings of the Upper Mississippi River Consortium.

2 o Ms. Havlik indicated she did not support the assumption, used in the biological assessment/opinion and EIS, that *L. higginsi* populations are stable. She believes they are declining and that recruitment is not equaling mortality.

3 2. Mr. Ingle Jerde, Chairman of the Prairie du Chien Harbor Commission, wants to be on the EIS mailing list.

4 3. Mr. John Didion wants copies of Drew Miller's studies - post lock and dam 26 work (WES reports).

Dennis Anderson
DENNIS ANDERSON
Chief, Project Evaluation Section
Environmental Resources Branch
Planning Division

I-1

RESPONSES

1. We have reviewed these references and find they provide further support to our biological assessment that the proposed actions would affect the Higgins' eye pearly mussel.

2. A number of malacological experts familiar with the East Channel were consulted during preparation of the biological assessment/biological opinion. The consensus of the experts was that no indication of either increase or decline was apparent in studies conducted on the Higgins' eye pearly mussel populations in the East Channel. While we appreciate and respect your opinion, and are willing to review information you may have available on Higgins' eye pearly mussels in the East Channel, without further evidence to the contrary we continue to believe the Higgins' eye pearly mussel population of the East Channel is stable.

3. Mr. Jerde has been placed on the EIS mailing list (see Section 8.0).

4. Inquires on Dr. Miller's work should be sent to:

Dr. Drew Miller
Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Oral Comments - Didion, Inc., regarding the draft environmental impact statement: "Long-term channel maintenance plan for the federal harbor and a permit application to construct and expand barge terminal facilities in the east channel of the Upper Mississippi River at Prairie du Chien, Wisconsin."

August 11, 1993

INTRODUCTION

My name is John Didion. I am President of Didion, Inc. The purpose of my testimony this evening is to provide a preliminary oral response to the draft environmental impact statement (EIS) which is the subject of this evening's hearing. Didion, Inc. will supplement its oral testimony with a written statement.

DESCRIPTION OF DIDION, INC.

Didion, Inc. was founded in 1972 by myself. Didion is a grain processing and merchandising company. The company handles corn, soybeans, red, white and spring wheat, oats, barley and grain by-products such as corn mill feed, soybean meal, corn glutton feed, cotton seed, distillers grain, linseed meal, malt sprouts, barley needles, corn and soybean screening.

Today, the company has seven facilities around Wisconsin. Locations include Cambria, Green Bay, Johnson Creek, Ripon, Horicon, McFarland, Milwaukee and Prairie du Chien, with a combined storage capacity of over 13,000,000 bushels. The company also has within its operations a seed division, a feed and products division, a food products division, corn and bean processing facilities, and a transportation division. Resident employees live in the communities serviced by the Didion facilities.

Except for its home office, all of Didion's facilities are located on railroad lines. Didion's utilization of Wisconsin short line railroads increases volume for a transportation network which was seeking rail shippers, adds value to the grain from the rural community which it serves, and thus substantially adds value to each local economy in its market area.

OVERVIEW

Because of the Wisconsin Department of Natural Resources' position and the aggressive leadership of the Wisconsin Department of Development, the Wisconsin Department of Agriculture, Trade and Consumer Protection, the Wisconsin Department of Transportation, as well as other agencies of state government, there has been a concerted effort to bring all interested parties, including the City of Prairie du Chien and Didion, Inc., together to reach a common agreement on a preferred alternative for the location of a harbor to serve the City of Prairie du Chien and the southern one-third of Wisconsin. This alternative is described on page 36 of the draft EIS.

On behalf of my company, I want to once again publicly reemphasize our commitment to successful development of this alternative. Clearly, the draft EIS provides and intellectual basis and solid foundation for the permitting of this consolidated option.

COMMENTS

1 At the same time, it must be emphasized that the company also believes that both the draft EIS and the public record would support continued operation and indeed the expansion of operations at the existing municipal harbor. In many respects, the physical as well as socioeconomic resources of the state would be better served by expanding the existing municipal harbor.

However, if all parties are prepared to approach a global solution to a publicly-owned municipal harbor facility available to multiple private sector parties, then Didion, Inc. is prepared to enthusiastically and whole-heartedly support this regulatory alternative. This means that (1) governmental agencies at the local, state and federal level must be sensitive to the competitive and economic forces which drive private sector grain handling, transportation and marketing operations, and (2) the private landowner who would turn over key land positions to the ownership of the City must do so in a way which is fair, open and economically sensitive. Should this occur, both the economy of Wisconsin and the environment of Wisconsin will find themselves in a win-win situation as well as the various private sector interests in this project and the local unit(s) of government.

WISCONSIN HARBOR ASSISTANCE PROGRAM FUNDING APPLICATION

The City and Town of Prairie du Chien have submitted to the Harbors and Waterway Section, Division of Transportation Assistance, Wisconsin Department of Transportation, an August 1, 1993 application for Harbor Assistance Program funding for the harbor which is described on page 36 of the draft EIS. For your convenience, I am providing the hearing panel with a copy of that application and its attachments this evening. This application for funding was prepared by Johnson, Johnson & Roy, Inc., a noted consulting firm in the field of municipal harbors, based on information provided by the City of Prairie du Chien, Didion, Inc., and Prairie Sand and Gravel. There are a number of aspects to that application which merit highlighting.

The total estimated project cost is $6,303,000, of which 80% would be fundable by the Wisconsin Department of Transportation. The funding is obviously subject not only to approval by the Department of Transportation, but will be conditioned upon requisite approvals by federal and state environmental regulatory agencies.

ECONOMIC IMPACTS OF A MODERN MUNICIPAL HARBOR

The draft EIS mentions a number of the economic advantages that a modern City of Prairie du Chien municipal harbor will have for the City and the State of Wisconsin. I would like to refocus some of that information and add additional prospective. 2 In addition, I would call the Army Corps of Engineers' attention to Chapter 3 of the Environmental Impact Report prepared by Didion, Inc. in June of 1990. This report is found as Appendix 4 to the application for state aid and I am providing a copy to you this evening.

Over the next two decades, Wisconsin's agricultural community will see an ever-increasing development of a cash crop economy. The municipal harbor at Prairie du Chien plays an important role in grain trade for farmers in the southern and central portion of the State of Wisconsin. Grain, by volume, is presently the single most important product shipped through the municipal harbor and will continue to be in the future. Seventeen corn-producing counties in Wisconsin will be served by the municipal harbor at Prairie du Chien. The seven leading

RESPONSES

1. The impacts of proposed actions on all resources, including physical and socioeconomic resources, will be considered before any decisions are made on the proposed actions.

2. We have reviewed the Environmental Impact Report you submitted and have utilized information contained in the report appropriately.

corn producing counties in this state are located in the regions of Wisconsin served by the harbor at Prairie du Chien. Approximately 40% of state grown crop is sold off farm. This means that over 75 million bushels of corn are available for off-site sale in the region serviced by the Prairie du Chien harbor. Less than 10% of that corn is currently able to utilize the municipal harbor at Prairie du Chien.

On pages 22 and 23 of the environmental impact report, the following information is found from information provided by the Wisconsin Department of Agriculture, Trade and Consumer Protection:

> The majority of Wisconsin's corn is produced in South Central, Southwestern, and Southeastern Wisconsin. In grain exports, the primary crops are corn, representing 90% of total exports, followed by wheat and soybeans. The most competitive route to market, giving most advantage to Wisconsin farmers, is barging down the Mississippi River. The key to barging grain down the Mississippi is an economical method to get the grain to a barge loading facility. To this end, rail transportation is vital.
>
> There is normally a 6 to 11 cent per bushel price advantage in south central and southwestern Wisconsin in moving food and feed grains through the Mississippi River ports rather than through the area Great Lakes ports. County elevators and farmers who ship grains direct to terminal markets report the price advantage averages about 10 cents per bushel.
>
> In years when considerable corn is coming out of storage with some damage or the crop has been weather damaged the price advantage could be much higher. Grain shippers are generally able to negotiate a better price on damaged number 3 yellow corn at river ports than at Great Lakes ports.
>
> In such years, the price advantage could reach 15 to 18 cents per bushel. An increase or decrease in demand for barge capacity could result in a corresponding increase or decrease in price advantage as barge operators negotiate around the established freight tariff.
>
> The grain marketing industry is a highly competitive mix. A shift in price to the farmer as low as 1 cent per bushel, other things being equal, can result in a farmer's decision to change his/her point of sale. Hence, most savings achieved by a county elevator, that are above the normal required business margin, are generally passed on to the producer. ...[W]e do know that ... Didion could ship 2 to 3 1/2 times last year's [1989] grain volume of 7 million bushels (some 137 barges). Didion has a separate application for a permit for 500 barges per year for 5 years. We believe that the market will support that volume of traffic. ..."[T]he advantage to Wisconsin farmers from shipping corn via rail via the port of Prairie du Chien is significant. For example, the benefits to the farmer based on last years' crop average 9 cents per bushel. In 1989, 7 million bushels (141 barges) were shipped out of the port of Prairie du Chien. THis resulted in $630,000 in increased income or savings to the farming community. A double of this volume (300 barges) would have resulted in over $1.2 million in increased income or savings.

Taking this from the perspective of the individual farmer, using the 9 cents per bushel average increase in benefits earned on last year's crop and based on an average yield of 118 bushels per acre, the farmer had an increased income or savings of $10.62 per acre. Assuming a market price of $2.25 per bushel, the total return is $265.50. Comparing that with an increase of $10.62 per acre, this amounts to a 4 % net increase of farmer income per acre.

In short, the Wisconsin Department of Agriculture, Trade and Consumer Protection has estimated a transportation cost savings for regional export corn relocating the harbor at Prairie du Chien to be $7,876,000. The Department believes that that figure is extremely conservative. The Department estimates the transportation cost savings to be 10 cents per bushel.

IMPACT OF THE MUNICIPAL HARBOR ON HIGHWAY AND RAILROAD SYSTEMS

The draft EIS discusses the impact of the proposed project on fuel economy. The Didion EIR has additional information relevant to this issue. Within the concept of a balanced transportation system lies public safety. One of the primary elements is highway safety. Specifically, the safety implications of mixing large commercial vehicles and passengers automobiles. That mix has particular safety implications on highway facilities built to lesser standards and any facility on which the volume of traffic has significantly decreased the level service - such as many of the facilities serving southern Wisconsin.

For example, during the 1989 season, Didion's operation generated 1000 car loads on the lines of WICT essentially all diverted from the highway and new traffic for the railroad. One barge is the equivalent of 16 rail car loads or 128 truck trips including empty return which is generally the case. The reduced miles of highway operation also reduces exposure and incidents of accidents and injury.

The harbor at Prairie du Chien is the only harbor connection with a publicly owned railroad system that runs from Prairie du Chien to Madison and then to Waukesha, Monroe, Janesville, Chicago and beyond to other short line railroads. There is no other option for the short line railroad system and its $25,000,000 plus of public investment.

CITY DOCK HARBOR ALTERNATIVE

The draft EIS correctly states that "... studies have detected no significant changes in L. higginsi number in the East Channel as a result of the current levels of barge traffic from the city dock ...." This statement is generally consistent with other reports, government and non-government alike, and suggests that there are no acute impacts on endangered species from the current barge activity at the city dock.

3 The report also states that "recent studies of long-term effects of current barge traffic levels and mussel populations in the East Channel are inconclusive to date." Respectfully, we must challenge this conclusion. Where it not for the hypothetical possibility of a need to dredge at what has been described as "cut 2" in the draft EIS, we believe there would be neither a factual or a theoretical basis for environmental concern regarding these city dock harbor alternatives.

RESPONSES

3. The studies conducted in the East Channel to date have been very short-term in nature, generally, only 5 to 10 years of data has been collected. We believe that although the studies have shown no acute impacts, they have not adequately documented the absence of chronic, long-term impacts. We believe additional study is needed before conclusions can be drawn on the long-term effects of barge traffic on freshwater mussels.

It should be emphasized that Didion barge traffic directly effects less than 1.2% of the area of the East Channel. The portion of the East Channel utilized by the barges in the immediate dock area is approximately 120,000 square feet (400 feet X 300 feet). This constitutes .46% (.0046) of the total area of the East Channel.

4 I am compelled to also observe that the draft EIS points out that the existing private north island harbor operates without significant permit conditions while the municipal harbor is burdened with many permit restrictions. One is compelled to ask if this regulatory distinction can be justified. I personally believe it cannot be rationalized.

TRANSITION PERMITS

There needs to be a clear and unequivocal discussion of the regulatory program which will be advanced should the municipal harbor, under the ownership of the City of Prairie du Chien, be moved to the north end of the island and the necessary grants for the project be issued by the Wisconsin Department of Transportation. Permits to cover the transition period between the issuance of approvals for the relocation of the municipal harbor and the completion of project must be available to Didion and the City for the existing harbor. These transition permits must provide for an economically viable number of barges to use the existing municipal harbor during the transition period.

CONCLUSION

5 The city dock harbor alternative is clearly the economic preference, the transforation preference, the alternative with the least impact on historical facilities and least likely to impact other multiple uses on the island. We also believe that it is not an alternative which would impact on the natural resources that are so important to this state.

Having said that, however, I want to reemphasize my company's commitment to the regulatory/policy compromise which has been advanced. We are pleased to work hand-in-hand with the regulatory agencies, the local units of government, a number of environmental advocates and hopefully, other private sector parties advancing a proposal which brings an end to 15 years of acrimonious atmosphere over this critically needed local and state harbor resource. All regulatory fights of this nature need to be brought to an end some day. It is my personal wish that all who are involved in this matter will put the broader good of the state and the local community ahead of whatever short term perceived economic interest they may have in the maintenance of the status quo or the defeat of the alternative which is being advanced by so many people. We at Didion have done so.

4. The significance of the mussel resources immediately in front of the City Dock has prompted the need for regulation of barge shipping from this facility in order to provide some level of protection to this resource. The mussel resources in Sawmill Slough and near the PS&G facility are of lower quality and have therefore received less protection.

5. Comment noted. We will consider your opinion before any decisions are made on the proposed actions.

STATE OF WISCONSIN
DEPARTMENT OF JUSTICE

JAMES E. DOYLE
ATTORNEY GENERAL

Patricia J. Cormack
Deputy Attorney General

114 West Washington Avenue
P.O. Box 7857
Madison, WI 53707-7857

Thomas J. Dawson
Wisconsin Public Intervenor
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September 15, 1993

Colonel Richard W. Craig
District Engineer
Corps of Engineers-St. Paul District
Attention: Environmental Resources Branch
180 East Kellogg Boulevard, Room 1421
St. Paul, Minnesota 55101-1479

Re: Draft Environmental Impact Statement: Long-Term Channel Maintenance Plan for the Federal Harbor and a Permit Application to Construct and Expand Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin (July 31, 1993)

Dear Colonel Craig:

This is in response to your August 2, 1993, letter soliciting comments on the above draft environmental impact statement. We appreciate the opportunity to do so. These comments are made in the spirit of making the final environmental assessment for this project complete and relevant to the real decisions that are to be made with regard to this project.

For the most part, we find the draft environmental impact statement (DEIS) to be a useful document that discusses the potential environmental impacts of alternatives regarding the current proposal by Prairie Sand and Gravel, Inc., to construct and expand barge terminal facilities in the east channel of the Upper Mississippi River at Prairie du Chien. However, we find there to be three major issues relating to the DEIS.

1 First, we find it puzzling that although the DEIS at 15, 36 acknowledges current efforts to negotiate and develop a leading proposal for relocating the existing public commercial harbor to a site "where natural resource protection can be achieved consistent with project operation," the Corps and DNR decline to discuss the potential environmental impacts of that proposal. We believe it should be. The DEIS at 36 states:

> In the event agreement to consolidate all industrial port functions is successful, the State has agreed to work with the municipal government towards achieving relocation of the

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1. See response to comment 1 of the Department of the Interior letter.

existing Federal harbor to the consolidated site. The on-going COE's Section 107 study for Prairie du Chien . . . is a vehicle for accomplishing such a relocation.

And at 16, the DEIS states:

If the reconnaissance report indicates a harbor relocation project that's feasible, a cost-shared facility study may be done. Environmental impact documents would be prepared during the feasibility study.

1 All the major parties, including the applicant here, state and federal regulatory agencies, the City of Prairie du Chien, environmental groups and other interested persons have been working diligently toward developing this alternative. Aside from the proposal that is the subject of the DEIS, this alternative has been "the only game in town." We are concerned that a decision on the current proposal, based on this DEIS, may have the effect of impeding the progress and practicability of proceeding with the alternative relocation of the federal harbor to the consolidated site. In our view, the alternative is certainly feasible, is in progress of being developed, and is even further along in its development than other hypothetical alternatives cited in the DEIS. The environmental impacts of the alternative should be fully developed on par with other alternatives so that a reasonably-informed decision on this project and all reasonable alternatives can be made.

2 The second major concern we have with the DEIS is its failure to contain requisite studies discussed in DEIS at 5 with regard to the unresolved issue of cultural resources. There it is stated:

The COE had asked the permit applicant to conduct appropriate studies to determine the nature and extent of potential impacts when a Wisconsin Department of Transportation (WDOT) project to rehabilitate the tracks was contracted. . . . However, the Wisconsin State Historical Preservation Office (SHPO), in reviewing the environmental documents of WDOT, disagreed with their conclusion on the significance of vibration impacts, and has requested the COE conduct these studies. In turn, the COE again requested the applicant undertake these studies. As of the writing of this draft EIS, the applicant has selected a consultant to assess railway vibration impacts

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2. See response to comment 3 of the Advisory Council on Historic Preservation letter dated October 7, 1993.

on historic buildings. These results will be known and evaluated as part of the final EIS.

3 While we are pleased to see that the requisite studies are being done, we believe the DEIS should have awaited the completion of these studies. Otherwise, we have the piecemeal writing of the DEIS. Unless the public has an opportunity to scrutinize these studies and to comment on them, we are concerned that a major issue may arise regarding the adequacy of the environmental assessment process here.

Lastly, while we are pleased that the Army Corps has acknowledged the following possible impacts from various alternatives, the statements appear to be conclusory in nature without sufficient documentation to back them up. They include the following conclusions:

4 -- The no harbor alternative would result in the loss of investment in the Wisconsin railway system route from Central Wisconsin to Prairie du Chien. (DEIS at 28.)

5 -- The no harbor alternative would foreclose on the opportunity for significant community growth and development. (DEIS at 28.)

6 -- The no harbor alternative would have substantial adverse effects on tax revenues, public facilities, local employment and business activity, and commercial navigation and farmland-food supply, and remove business and related activities from tax roles. (DEIS at 28.)

7 -- The no harbor alternative, while having a positive effect on other Wisconsin ports, "could" raise transportation costs and effect costs associated with food supply. (DEIS at 29.)

8 -- Social economic resources would be significantly adversely affected. (DEIS at 29.)

9 -- Permit denial could have substantial adverse effects on transportation and regional growth as well as community growth and development. (DEIS at 33.)

Even if these statements, and others like them, in the DEIS appear to more likely than not to occur, they fail to quantify and put in prospective the proportion of their impacts, as well as other factors that may mitigate or cancel out their effects. For example, the DEIS does not discuss the development opportunities for this area as a result of harbor facilities being discontinued.

3. The Final EIS includes the results of the vibration study conducted on St. Feriole Island by Huntington, Inc. We do not believe the results of this study brought forward any new or major alternatives or changes in those alternatives originally discussed in the draft EIS. Evaluation of impacts to historic resources and plans for mitigation of these resources have been ongoing since completion of the cultural resources studies. Parties interested in the resolution of historic issues arising from this permit have been involved in the public interest review process associated with Section 106 of the National Historic Preservation Act as provided for by the regulation of the Advisory Council on Historic Preservation. These interested parties were involved in the development of the memorandum of agreement which is included as Appendix F of this final EIS.

4 through 9. Section 3.1.11 of the Final EIS has been revised to reflect the conclusory nature of these statements or provide additional detail to support these statements.

10 In particular, growth opportunities for the tourist trade, through potential development of recreational and historic facilities, are not discussed as alternatives to the no commercial harbor alternative. These are serious considerations that should be discussed and quantified.

Again, thank you for the opportunity for commenting on this DEIS.

Sincerely,

Thomas J. Dawson
Wisconsin Public Intervenor

TJD:lsc
cc: Secretary George Meyer
Department of Natural Resources

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10. Section 3.1.11 of the Final EIS includes a discussion of the potential benefits to the tourist trade from implementation of a No Harbor alternative.

COMMENTS

9-15-93

Mr. Dennis Anderson
Corps of Engineers

Interested parties anticipated the publishing of the C.O.E. draft E.I.S. Some time has elapsed and no one involved with the P.D.C harbor problem seems to want the E.I.S. addressed. Mostly do not like what they see in the alternatives. At the Aug. 11th meeting Bob Read of the WDNR sumed it up by his speech addressing and threatening the city with a law suit if your E.I.S alternatives were implemented. The alternatives as stated in the E.I.S. should be highly considered. The W.D.N.R. should be more responsive to the citizens of P.D.C. Much is being said about re-inventing government and treat we the people more like customers.

1 The human needs surely out weigh the Higgins Eye clam.

RESPONSES

1. The impacts of proposed actions on all resources, including threatened and endangered species and socioeconomic resources, will be considered before any decisions are made on the proposed actions.

COMMENTS

2 Enclosed is Bob Read's 1987 clam harvest report to the C.O.E. The WDNR seems totally contradictory in their analysis of the East Channel. If the East Channel is only 5.3% of all pool 10 and ratio's of Higgins Eye to all mussels are consistent, more study and attention should be paid to the remaining 95% of pool 10

3 The Harbor Commission took the position of supporting the unrestricted use of our current municipal harbor. Enclosed is our letter to Col T. Ballowin of June 5, 1990 addressing the same.

I wholeheartedly support John Didion's enclosed comments of Aug 11, '93.

The alternative's put forth by the E.I.S. and the unknown of the Zebra mussel seems to say hold on. Don't spend millions of $'s of taxpayers money just to satisfy the W.D.N.R.'s heavy stance on putting our harbor out of business.

Robert L. Valley
D.D.C Harbor Commissioner

RESPONSES

2. The East Channel is habitat for the largest known concentration of Higgins' eye pearly mussels in the Mississippi River.

3. In 1990, the U.S. Fish and Wildlife Service issued a biological opinion which effectively restricted use of the City Dock to 135 barges per year. Unrestricted use of the City Dock was evaluated in Sections 3.1.12 and 3.1.13 of the final EIS. Because of the previous biological opinion, alternatives which included unrestricted use of the City Dock were determined to be infeasible and were eliminated from further consideration.

PRAIRIE DU CHIEN MARINA

ST. FERIOLE OR. P.O. BOX 380
PRAIRIE DU CHIEN, WIS. 53821
(608)-326 8032

Prairie du Chien Harbor Commission
207 E. Blackhawk Ave.
Prarie du Chien, Wi. 53821

Attn: Mr. Ingle Jerde, Chairman

Dear Mr. Jerde:

The Prairie du Chien Marina is very concerned with the proposed north St. Feriole Island and Swingle site harbor expansion and development from three aspects:

1. That boat access in and out of the Prairie du Chien Marina at marina channel not be interrupted or restricted.
2. That the harbor development does not create a safety hazard from the standpoint of barge traffic and storage.
3. The truck traffic on the road next to the Marina does not create a safety hazard, traffic congestion, or undue dust and noise problems.

Please read this letter at the public EIS meeting, and include it as part of the official records of that meeting.

Sincerely,

Klemis Regel (owner)

A FULL SERVICE MARINA
MURCRUISER AND MURCURY OUTBOARDS

1. The consequences of the various alternatives on marina access are evaluated in Section 5.4 of the final EIS. The permit applicant has revised previous plans for docks at the Swingle Site to help alleviate conflicts with marina users. Additionally, conditions could be placed on the permit to help ensure access to the marina is provided (see Section 3.4).

2. The permit applicant plans on utilizing an existing borrow pit for barge fleeting (see Section 2.1.4.1). Use of the pit should not create a safety hazard for marina users (see Section 5.4).

3. The impacts of the proposed access road on marina users are assessed in Section 5.4. It is our assessment the proposed road would have minor impacts on marina use.

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

OCT 7 1993

Colonel Richard W. Craig
District Engineer
St. Paul District, Corps of Engineers
180 E. Kellogg Boulevard, Room 1421
St. Paul, Minnesota 55101-1479

RE: Long-Term Channel Maintenance Plan for the Federal Channel and a Permit Application to Construct and Expand Barge Terminal Facilities
Prairie du Chien, Wisconsin

Dear Colonel Craig:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the referenced undertakings. The DEIS clearly outlines the complex issues surrounding the proposed actions.

The DEIS, described as the basis for Section 106 consultation among the Corps, the Wisconsin State Historic Preservation Office (SHPO), and the Council, includes a request from the Corps for the Council's views.

1 We have completed our review of the document and agree that it should serve as the basis for consultation. We are concerned, however, that the proposed alternatives that were evaluated in detail do not include an alternative that avoids adverse effects to the four National Historic Landmark (NHL) properties on St. Feriole Island in Wisconsin and Effigy Mounds National Monument in Iowa. While we understand that there may be limitations imposed by the Endangered Species Act or other statutory requirements on the consideration of alternatives that might affect resources, we remind you that Section 110(f) of the National Historic Preservation Act and Section 800.10 of the Council's regulations, "Protection of Historic Properties", requires Federal agencies "to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking." Given that all of the proposed alternatives will result, at a minimum, in adverse visual affects to the NHLs and Effigy Mounds, we believe the Corps has not fully explored alternatives that avoid possible adverse effects to these properties. It would appear, instead, that such alternatives have been eliminated from further study for reasons other than potential effects to historic properties.

1. Regrettably, the draft EIS only addressed the direct effects to archeological and historic resources associated with a specific alternative. None of the alternatives that would result in relocation of harbor facilities off St. Feriole Island discussed the beneficial impact of a relocated harbor on those historic properties located on St. Feriole Island or on visual impacts to Effigy Mounds National Monument. Discussions of alternatives in the final EIS have been changed to reflect these beneficial effects on Island resources and on Effigy Mounds.

Since dissemination of the draft EIS, the COE has worked with the Advisory Council on Historic Preservation, the Wisconsin and Iowa State Historic Preservation Officers, the State Historical Society of Wisconsin, the National Park Service, the Wisconsin and Southern Railroad, the city of Prairie du Chien, and the permit applicant to develop a memorandum of agreement to mitigate the adverse effects of harbor development and expansion on historic properties. This memorandum of agreement is included in the final EIS in Appendix F.

COMMENTS

RESPONSES

2 We understand that there is public concern regarding potential adverse effects to Dousman Hotel because the current rail line runs too close to the property to allow for development as a hotel. As identified in the DEIS this would likely result in the property's loss through deterioration.

3 We also understand that the results of vibration studies on the historic properties are not yet available, therefore a determination as to how this may or may not affect these properties is not possible. Additionally, there are concerns by

4 the public, the State Historical Society (owner and operator of Villa Louis), and the Wisconsin SHPO that the rail line, truck traffic, and other harbor-related activities will adversely impact tourist development in general as well as visitorship to the SHS properties. Visitorship, no doubt, is related to the economic viability of the SHS facility and the continued maintenance of the historic properties.

5 Finally, we understand that the Corps is conducting a Section 107 study to determine the possibility of relocating the existing public commercial harbor to a site that achieves protection for natural resources. We are unclear what the relationship is between the DEIS and the Section 107 study. We understand from earlier discussions that there may be a southern location suitable for a combined harbor facility. Is this alternative being explored in the context of the Section 107 study? For purposes of avoiding adverse effects to historic properties such a location would certainly be preferable. Please advise us regarding this other study.

6 Given the outstanding issues regarding historic properties, we believe it is premature to discuss possible mitigation measures, or the terms of a Memorandum of Agreement, as is suggested in the DEIS. Instead, we suggest that the Corps explore alternatives that avoid adverse effects to the NHLs and Effigy Mounds, and provide the parties to the consultation with such information as the results of the vibration studies.

Again, we appreciate the opportunity to review the DEIS. We look forward to working with the Corps, the SHPO, and interested parties to resolve these complex and challenging issues. If you have any questions, please contact Valerie DeCarlo at (202) 606-8505.

Sincerely,

Don L. Klima
Director
Eastern Office of Review

2. The Dousman Hotel has recently been purchased by the permit applicant and is being rehabilitated for future use.

3. Vibration studies have been completed and the results incorporated into the final EIS. The memorandum of agreement (see Appendix F) provides for reduction of vibration impacts by retrofitting the railroad ties with vibration mats to reduce impacts adjacent to the historic structures

4. The memorandum of agreement provides for rerouting of vehicular traffic, establishment of speed limits for rail traffic, and the development of visitor safety plans to reduce visitor/harbor use conflicts.

5. See reponse to comment 4 of the Wisconsin SHPO letter dated October 27, 1993.

6. The results of the vibration study, along with additional research into vibration issues, provided the basis for development of the mitigation measures which are part of the memorandum of agreement (see Appendix F).

United States Department of the Interior

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

ER-93/655

October 14, 1993

Colonel Richard W. Craig
District Engineer
U.S. Army Engineer District, St. Paul
180 East Kellogg Boulevard
St. Paul, Minnesota 55101-1479

Dear Colonel Craig:

The Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS) for the Long-Term Channel Maintenance for Barge Terminal Facilities at Prairie du Chien, Crawford County, Wisconsin. We offer the following comments for your consideration.

GENERAL COMMENTS

The U.S. Fish and Wildlife Service (Service) is a cooperating agency with the U.S. Army Corps of Engineers (Corps) and Wisconsin Department of Natural Resources (DNR) in developing this DEIS. The document describes and evaluates the environmental impacts of two distinct elements relating to commercial navigation in the Prairie du Chien area: 1) a proposed permit for Prairie Sand and Gravel (PS&G) to upgrade and expand an existing barge transloading facility, and 2) the Corps' proposed Long-Term Channel Maintenance Plan (LTCMP) for the Federal Harbor in the East Channel of the Mississippi River at Prairie du Chien. All project alternatives evaluated in the DEIS are combinations of issuance or denial of the PS&G permit, and full, partial, or non-implementation of the LTCMP.

The DEIS has accurately reflected the Service's previous comments and actions relating to the two navigation elements being analyzed. The document also provides an adequate description of the natural resources of the project area, and of the potential impacts upon these resources of the alternatives that

1 were developed and evaluated. However, the Service believes that an additional practicable alternative exists that would provide for expanded commercial navigation, while reducing adverse impacts upon natural resources. This alternative is described below and should be analyzed in detail in the Final Environmental Impact Statement (FEIS).

I-16

1. We believe implementation of Alternative D would be consistent with the potential consolidation of harbor functions currently being negotiated by local interests in Prairie du Chien. However, this consolidation is outside of the Federal and State decision making process. The environmental consequences of Alternative D are discussed in Section 5.0 of the final EIS. We believe these consequences would be similar for a consolidated harbor at the Prairie Sand and Gravel/Swingle Site.

COMMENTS

Colonel Richard W. Craig 2.

SPECIFIC COMMENTS

Fish and Wildlife Resources

The natural resource of primary importance to the Service in evaluating the proposed alternatives is the extraordinary mussel community of the project area, particularly the Higgins' eye pearly mussel (*Lampsilis higginsi*), a species listed as endangered under the Endangered Species Act of 1973, as amended. The East Channel contains the largest, most vital of the known populations of Higgins' eye pearly mussels, the best of seven "essential habitat" areas identified in the *Higgins' Eye Pearly Mussel Recovery Plan*. Surveys further indicate that within the East Channel, the densest concentration of Higgins' eye pearly mussels occurs in the City Dock to the turning basin segment. The final paragraph of DEIS Section 4.1.6.1 presents density estimates for the Higgins' eye pearly mussel in and near the East Channel; Section 5.1.6 is a general presentation of project impacts on listed mussels, especially on Higgins' eye pearly mussels. The Table 1 addendum to DEIS Appendix D (the Corps' January 1993 Biological Assessment) presents Higgins' eye pearly mussel density estimates for the three directly affected navigation lane segments in the project area (Sawmill Slough, East Channel from the turning basin to the north end, and from the City Dock to the turning basin). These density estimates are basic information for assessing the impacts of each alternative on the East Channel Higgins' eye pearly mussel population. As such, we recommend that these estimates also be presented in the narratives of sections 4.1.5.1 and 5.1.6 in order to facilitate the decision making process. 2

The Service believes that preservation of the Higgins' eye pearly mussel as a viable species, capable of surviving and recovering from the recurring natural and man-made catastrophic events, requires preservation of the Higgins' eye pearly mussel in each of its seven "essential habitat" areas. Continued existence of the East Channel Higgins' eye pearly mussel bed, and hence the survival of the species, would likely be jeopardized by increased barge traffic on the turning basin to the City Dock portion of that bed. The Service has previously acted to prevent an increase in barge traffic between the turning basin and the City Dock and it continues to believe that such traffic must not increase over the present level of approximately 150 barges per year. Therefore, the Service remains opposed to any project alternative or other action that could potentially increase barge traffic beyond its present level in the City Dock to the turning basin segment of the East Channel. 3

The Corps' authority for constructing and maintaining channels and harbors provides for unrestricted use of such facilities. Full implementation of the LTCMP, including the dredging of Cut 2, directly off the City Dock, would remove any physical restrictions to increased use. Various sources have identified economic demand for significantly increased barge shipping from the Prairie du Chien area. Thus, the dredging of Cut 2 would provide for an anticipated increase in barge traffic, and the Service has determined that such an increase would likely jeopardize the Higgins' eye pearly mussel.

RESPONSES

2. Agreed. Estimates have been included in Sections 4.1.6.1 and 5.1.6.

3. All alternatives which included barge traffic levels in excess of 150 barges per year were eliminated from further consideration (see Section 3.1).

COMMENTS

Colonel Richard W. Craig 3.

4 Alternatives A, C1, D, and F1, which have City Dock barge loading/unloading operations at or below 150 barges per year, while not posing likely jeopardy to the Higgins' eye pearly mussel, do pose adverse impacts to mussels, including the Higgins' eye pearly mussel. These adverse effects increase in severity from Alternative A to D to C1 to F1. This ranking is consistent with information presented in the DEIS, although the DEIS does not rank the alternatives' adverse impacts to mussels in one summary narrative statement.

1 Recognizing that there will be commercial barge shipping at Prairie du Chien and that it will be from the City Dock and/or PS&G property, the Service recommends consideration of an alternative not presented in the DEIS. That alternative would involve the consolidation at or near PS&G on Sawmill Slough of all commercial barge loading and unloading facilities and operations, with phase out of commercial barge shipping at the City Dock. The result would be the relocation of the vast majority of commercial navigation from the crucial mussel bed and mussel habitat between the City Dock and the turning basin, and into the less densely populated mussel habitat area of Sawmill Slough. Implementation of this alternative would result in reduced impacts to mussels.

1 It would rank between Alternatives A and D in severity of impacts. In view of these reduced impacts, the Service recommends that this alternative for consolidation at or near PS&G, coupled with phase out of barge operations at the City Dock, be fully described and analyzed in the FEIS.

1,5 The DEIS briefly discusses the idea of consolidation of all industrial port functions at a site other than the City Dock Federal Harbor. However, the idea was not developed into a detailed alternative, apparently based on the assertion that the EIS must address alternatives that provide continuing service to the Congressionally authorized commercial harbor (see Section 3.3). Such an assertion may be incorrect. National Environmental Policy Act (NEPA) regulations indicate that reasonable alternatives not within the jurisdiction of the lead agency should be included in the EIS (40 CFR 1502.14 (c)). Further, alternatives outside the scope of what Congress has approved must be evaluated in the EIS, because the EIS may serve as the basis for modifying Congressional approval or funding (Council on Environmental Quality Memorandum: Questions and Answers About The NEPA Regulations, 46 Fed. Reg. 18026 (March 23, 1981), as amended, Question 2b.). As the consolidation alternative may be the most environmentally preferable of the alternatives that provide for reasonable expansion of commercial shipping, we believe that it should be fully evaluated in the FEIS.

Fish and Wildlife Coordination Act Comments

6 The Service would not object to the issuance of the Department of the Army permit for the upgrading and expansion of the PS&G barge transloading facility, provided that: a) permit issuance is not part of the implementation of an alternative or action that would allow barge traffic between the City Dock and the turning basin to exceed 150 barges a year, and b) the permit include a condition to require the applicant to have a spill prevention and contingency plan approved by the Service and the Wisconsin DNR. In order to

7 further minimize adverse effects, the Service recommends that permit issuance be part of an alternative that will reduce to historical levels or completely

RESPONSES

4. A summary narrative statement ranking the severity of impacts on the Higgins' eye pearly mussel has been included in Section 5.1.6.

5. The environmentally preferred alternative will be identified in the Record of Decision for the permit application.

6. None of the alternatives evaluated in further detail (see Section 3.2) would allow shipping from the City Dock to exceed 150 barges per year. Permit conditions would require the submission of a spill contingency plan (see Section 3.4.1).

7. We will consider your recommendation prior to making a decision on the proposed actions. We look forward to further coordination with the U.S. Fish and Wildlife Service on the PS&G permit application.

7 eliminate commercial traffic at the City Dock and in the City Dock to the turning basin segment of the Federal navigation channel. The Service's Twin Cities Ecological Services Field Office will continue to work closely with the Corps and the Wisconsin DNR regarding the PS&G permit application.

Recreational Resources

8 The National Park Service has reviewed the proposed alternatives in the document for possible impacts on recreational resources. The Corps should contact the following official to determine any impacts on Land and Water Conservation Fund (LWCF), Project 55-0006, Villa Louis Acquisition, and compliance with Section 6(f) of the LWCF Act: Ms. Paulette Harder, Director, Office of Interagency Programs, Department of Natural Resources, P. O. Box 7921, Madison, Wisconsin 53707.

SUMMARY COMMENTS

We are opposed to implementation of any project alternative or other action that could potentially increase barge traffic beyond its present level in the City Dock to the turning basin segment of the East Channel. Even though the Service has determined that the present level of traffic in this segment (up to 150 barges per year) is not likely to pose jeopardy to the Higgins' eye pearly mussel, we encourage the development and implementation of alternatives

1 that will reduce or eliminate this traffic over time. Therefore, we recommend that the FEIS include an environmental analysis of an alternative for consolidation at or near PS&G on Sawmill Slough of all commercial barge loading and unloading facilities and operations, with phase out of commercial barge shipping at the City Dock. In our considered opinion, this alternative would allow for a substantial increase in commercial shipping in the Prairie du Chien area, while reducing potential adverse impacts to the mussel community, including the Higgins' eye pearly mussel.

We appreciate the opportunity to review the subject document and provide these comments.

Sincerely,

Sheila Minor Huff

Sheila Minor Huff
Regional Environmental Officer

8. We have contacted Ms. Harder concerning impacts to Land and Water Conservation Fund projects and compliance with Section 6(f) of the LWCF Act. No projects would be affected by the proposed actions.



Lampsilis higginsi (Lea, 1857)

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25 October 1993

Colonel Richard W. Craig, District Engineer,
St. Paul District, U.S. Army Corps of Engineers
1421 U.S. Post Office and Custom House
St. Paul, MN 55101-1479

Re: Draft Environmental Impact Statement (DEIS), Long Term Channel Maintenance Plan for the Federal Harbor and a Permit Application to Construct and Expand Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, WI, July 31, 1993

Thank you for the opportunity to comment on this DEIS. This document reflects the time your staff spent assessing this project.

In spite of the depth of the discussion in the DEIS, there are still a number of things that are not fully discussed. Although I agree with a number of the assumptions made, upon which the conclusions of the DEIS are based, a number of other assumptions, conclusions, and statements must be seriously questioned.

1 I did not approve of the FSG/Swingle site for an enlarged harbor in the early 1980's, and do not approve of it now for these (and other) reasons given in this letter. I also do not approve of the increased traffic that has been occurring at the Prairie du Chien City Dock (since 1989) for the same environmental reasons, and want traffic at the City Dock to cease, or at the very least, return to the historic levels of 10 to 15 barges per year.

Although this project is being touted for it's financial benefits to the area, perhaps the time has come for the state of Wisconsin to cut its loses on the millions it has spent on the this project and the Western Wisconsin shortline railroad. Instead, the state of Wisconsin and the City of Prairie du Chien should promote tourism on the Island.

2 THE BOTTOM LINE IS; How can state and federal agencies conceive of approving permits that will ultimately end up killing 6000 (or more) Lampsilis higginsi (Lea, 1857), Higgins' Eye Pearly Mussels? If this is number of L. higginsi will be killed over the next 40 years, then up to 150 federally endangered mussels are currently being killed each year, or up to 2250 Higgins' Eye Mussels since 1978, the start of the increase in barge traffic in the East Channel.

Since the mid-1980's the Federal Office of Endangered Species has not allowed researchers to "take" (kill) any living Lampsilis higginsi, for research purposes. The logic of allowing a large number of federally endangered mussels to be killed in the course of commercial navigation, but not even to allow a small number to be taken for research, is unbelievable. A jeopardy opinion is the only conclusion when increased navigation is expected to cause a 20% mortality (D-16).

Among pertinent missing references are: Fuller 1980 (in 1979

1. Two alternatives considered in detail, Alternatives A and D, would return traffic levels at the City Dock to historic levels. All consequences, including environmental impacts, will be considered before a decision on the permit is reached.

2. As stated in the Biological Opinion for this project, the projected take for Alternatives C1, D and F1, while high would not jeopardize the continued existence of the Higgin's eye pearly mussel. The 20% mortality is an estimated loss within the navigation lanes in the East Channel. Less than 2% of the Higgin's eye pearly mussels in the East Channel north of the Highway 18 bridge would be affected under any alternative.

Bivalve Mollusk Symposium, J. Rasmussen, Ed.), and "A River of Grain, The Evolution of Commercial Navigation on the Upper Mississippi River" by Richard Hoops (released late April 1993).

3 There were no references of the 1990 East Channel study by C. B. Stein and M. E. Havlik. For the convenience of the COE, a full abstract is printed below. Although this abstract was printed previously, questions were asked, August 1993, as to whether or not these results were consulted for the DEIS. The 1990 Stein and Havlik study did not appear to have been considered since it is not referenced in the DEIS.

EFFECTS OF COMMERCIAL NAVIGATION ON UNIONID MOLLUSKS NEAR THE CITY DOCK, EAST CHANNEL, MISSISSIPPI RIVER, PRAIRIE DU CHIEN, WI, OCTOBER 1990. Marian E. Havlik, Malacological Consultants, 1603 Mississippi Street, La Crosse, WI 54601, and Carol B. Stein, The Ohio State University Museum of Zoology, Columbus, OH 43210.

A unionid mollusk study in the Mississippi River, Mile 634.7 - 635.2, East Channel, near the City Dock, Prairie du Chien, WI, was conducted 19-22 October 1990, sponsored by the Sierra Club. Six 90 m transects, corresponding to 1987 USFWS transects, were established perpendicular to the east shore. A seventh transect was extended to 120 m to cross the barge channel. Unionids were sampled by SCUBA divers who collected two 0.25 m^2 quadrats every 15 m on each transect. In addition, one specimen was collected every meter on both sides of each transect line as qualitative samples. All live specimens were measured, visually inspected for damage, and aged twice by counting annular rings. Our study covered the same area as a portion of the 1987 USFWS study area, but we sampled more sites both quantitatively and qualitatively. A total of 3,308 unionids representing 34 species were collected and identified. Maximum density of live unionids was 116/m^2; mean density was 39.4/m^2. The 1,240 living specimens comprised 28 species, including five Federally endangered Lampsilis higginsi (Lea, 1857). Twice as many (10) living L. higginsi were reported from the same area by the 1987 USFWS study. A 1980 WDNR study indicated L. higginsi was even more abundant then, since a single 5 X 5 foot quadrat contained 3 living L. higginsi, with 2 more found immediately outside the quadrat frame. In a 1.5 m^2 quadrat near the City Dock in 1980, the WDNR collected 102 living unionids; in 1990 we found only 4 in a similar quadrat. At one transect downstream of the City Dock, the 1987 study revealed 404 unionids. We found only 203 live unionids in the same area. No live specimens were found in 15.9% of the 94 quadrats sampled (most near the City Dock). Of the 73 females among the sexually-dimorphic species, 62 were gravid. Despite continuing commercial harvest of Amblema plicata (Say, 1817), this species increased in relative abundance from 52.9% in 1980 to 60.9% in 1990, though it declined in actual abundance. In 1990 14% of the A. plicata were of legal height (67 mm); 25% of the Magnonaias nervosa (Rafinesque, 1820) were over 89 mm, but none were over the legal height of 102 mm. Only 3.18% of the A. plicata were less than 35 mm long; those 24 ranged in age from 2 - 7 years. Not all individuals grew at the same rate; 2 A. plicata from the same

3. The conclusions reached in this paper and summarized in the abstract, are based largely on anecdotal information. Much of the information presented by Havlik and Stein (1990) is based on observation. The study lacked adequate replication and statistical tests. Benthic communities are spatially heterogeneous, it is not suprising that density and presence of uncommon species varies from place to place or through time. Ellis (van der Schalie and van der Schalie 1950) reported that Higgin's eye pearly mussels comprised 0.09% of the mussel community in the East Channel. Havlik and Stansbery (1978) reported a percent composition for this species of 1.01%. In 1984 and 1989, respectively, Miller and Payne found that Higgin's eye pearly mussels comprised 1.23% and 1.44% of the community. In 1987 and 1989, respectively, Higgin's eye pearly mussels comprised 1.21% and 1.23% of the mussel community in the barge turning basin area. However, Miller and Payne did not collect this species using quantitative methods in 1984, 1985 and 1990 in the turning basin, or in 1990 at the reference site. The results of the above studies indicate that overall Higgin's eye pearly mussel presence is highly variable and probably not currently decreasing in the East Channel. There is not sufficient statistically reliable evidence to indicate that the Higgin's eye pearly mussel is currently decreasing or increasing in the East Channel.

quadrat, both 67 mm long, were 8 and 23 years old. Length data for A. plicata showed a typical bell curve (Fig. 1). However, the age data for this species (Fig. 2) showed a bimodal distribution with a decline in the 14 year age class, whose birth year corresponded to the 1976 channel maintenance dredging. Regression analyses of age versus measurements of 754 A. plicata and 104 M. nervosa showed that length yielded a slightly higher R^2, 0.71 and 0.79 respectively, than height or width. This indicates that length is a better indicator of age than is height or width. Some unionid shells had damage which might be attributable to barge traffic.

(Havlik, M. E., and C. B. Stein. 1992. Effects of commercial navigation on unionid mollusks near the City Dock, East Channel, Mississippi River, Prairie du Chien, WI, October 1990. Proceedings of the 24th Mississippi River Research Consortium, Inc., April 1992, La Crosse, Wisconsin. Vol. 24:23-24.)

4 There should be additional tabular data, such as a comparison of the number of mussel species found by various researchers.

DATE	SOURCE	# MUSSEL SP. (Mean density/m2, if known, below species number) (TURNING BASIN)	# MUSSEL SP. (REFERENCE SITE)	LOCATION
1984	COE	18 sp. 31.2 /m2 108 MaxDen/m2 0.61% L. higginsi	24 sp. 113.6 /m2 188 MaxDen/m2	East Ch. (22.4 - 167.2/m2)
1985	COE	19 sp. 27.3 /m2 56 MaxDen/m2	28 sp. 149.2 /m2 252 MaxDen/m2	East Ch.
1987	COE	18 sp. 22.0 /m2 52 MaxDen/m2	23 sp. 68.5 /m2 128 MaxDen/m2	East Ch.
1988	COE	18 sp. 33.2 /m2 84 MaxDen/m2	25 sp. 79.5 /m2 112 MaxDen/m2	East Ch.
1989	COE	14 sp. 48.6 /m2 144 MaxDen/m2	18 sp. 83.6 /m2 164 MaxDen/m2	East Ch.
1990	COE	15 sp. 29.7 /m2 112 MaxDen/m2 (70% A. plicata)	19 sp. 80.0 /m2 148 MaxDen/m2	East Ch.
1991	COE	?	?	East Ch.
1992	COE	?	?	East Ch.

4. Miller and Payne used divers to collect quantitative total substratum samples in the East Channel of the UMR in 1984-85, 1987-90 and 1992-93. These quantitative samples were used to obtain data on density, evidence of recent recruitment, and population structure of dominant species. Results of this quantitative sampling should not be used to determine species richness or attempt to identify loss of uncommon species. The number of species identified is related to the number of individuals collected. In 1985, Miller and Payne collected 1,119 individuals and identified 28 species; in 1990, 600 individuals were collected and 19 species were identified. Menhinick's index, a measure of species richness, takes into account differences in numbers of individuals sampled. This index is 0.84 for 1985 and 0.78 for 1990. Unionidae species richness is stable in the East Channel of the UMR at Prairie du Chien.

Table 1 presents four sets of data from the East Channel and illustrates the complexity of analyzing species lists to make definitive statements on species richness. Havlik and Marking (1980) sieved 10 cubic meters of recently deposited dredged materials that included recently dead organisms as well as relict shells. This is clearly reflected by the shared dominance of Amblema plicata plicata (the present dominant) and Fusconaia ebena (once dominant but now extirpated). The data of Ellis (compiled by van der Schalie and van der Schalie1950) was collected in 1930-31. Havlik and Stansbery (1978) collected in 1978 using qualitative methods. They collected by making " . . . an effort to collect at least some specimens of every species present." Therefore, their relative species abundance data are not valid; however, they are included in Table 1 for comparative

COMMENTS

Havlik 4

1993 COE ? ? East Ch.

NOTE: THERE IS A STEADILY DECLINING NUMBER OF MUSSEL SPECIES AT BOTH THE TURNING BASIN AND THE REFERENCE SITE!

4 Considering all COE sampling years, there is a 36% decrease in the number of species at the Reference Site (18/28), and a 27% decrease in the number of species at the Turning Basin (14/19). If you look at just the post-Didion years, there is a 28% decrease in the number of species at the Reference Site (18/25), and a 23% decrease in the number of species at the Turning Basin (14/18).

4 While one may argue that the decline is not statistically significant, THE UNDENIABLE TREND IS THERE. The COE studies show a steady decline in species. That decline has become worse since the increase of commercial navigation at both PSG and the City Dock.

The maximum number of specimens/m^2 found by Stein and Havlik in 1990 was 116, at a site was downstream of the Hwy 18 bridge. This number is considerably less than that found by Miller at his Reference Site during most years.

4 Since I do not have all COE data, the percentages given may even be worse. WES yearly reports just state what was found each year, and no comparisons are made except to tell how great reproduction is of a few, mostly non-commercial, mussel species.

5 A mussel assemblage is not healthy when 17 of 29 species are represented by less than 1% of the population. Since COE data shows A. plicata has increased to 70%, there is an obvious decline of rare species, and the overall health, of a once fine mussel bed at Prairie du Chien, even at the present levels of barge traffic.

4 In 1987 I participated in a federal agency meeting to decide criteria to determine the effects of navigation on mussels. A 25% decrease in the number of species would indicate adverse effects. The COE chose to start with 1987 for comparisons. Regardless, the COE's own research still shows there has been a consistent decline in mussel species in the East Channel, and that decline has exceeded 25% at both the Turning Basin and the Reference Site from 1984 to 1990.

6 When a harbor permit was issued to PSG in the early 1980's, the COE was supposed to develop sampling techniques to answer various questions regarding the status of the Prairie du Chien mussel population. The COE is still trying to decided how to determine impacts. Consequently, we still do not have the answers 2we need after nearly 10 years of sampling. WES reports tell little about the comparisons of COE studies in the East Channel since 1984.

Look at other research done in the East Channel:

RESPONSES

purposes. Data collected by Miller and Payne are from six years between 1984 and 1990, and were obtained by divers using quantitative methods. Although no single year is expected to represent all species present, the combined result of samples from 1984 to 1990 probably represent virtually all species present.

Havlik and Stansbery (1978) did not obtain five species collected in 1930-31 by Ellis. Two species not taken by Havlik and Stansbery (1978) were collected by Miller and Payne (Actinonaias ligamentina carinata and Lampsilis radiata luteola). However, Havlik and Stansbery (and Miller and Payne) collected four species not found by Ellis.

The species list developed by Miller and Payne is not much different from that of Havlik and Stansbery. Havlik and Stansbery collected 30 living species and Payne and Miller collected 29. However, two species of Havlik and Stansbery (Lampsilis teres forma teres and Lampsilsi teres forma anodontoides) are listed as a single species by Miller and Payne (see Williams et al. 1993); therefore, the two lists contain 29 species. Havlik and Stansbery found Tritogonia verrucosa, and Fusconaia ebena which have probably been extirpated from the UMR. The loss of the latter species (because of extirpation of a fish host, see Fuller 1974) is certainly not related to conditions specific to the East Channel. It is misleading to infer that species not taken in quantitative samples have been extirpated. Total species richness in the East Channel has changed little since the survey of Ellis. As noted in the abstract on page 2, Havlik and Stein collected 28 species in the East Channel in 1990.

COMMENTS

DATE	SOURCE	# MUSSEL SP. (Mean density given, if known)	LOCATION
1976	Havlik/Stansbery	30	Dredge Spoils (Upper East Ch.)
1983	WDNR	29	Entire East Ch.
	6% negative sites	31.9 /m2	
1987	FWS-Holland	29 sp.	Entire East Ch.,
	14% negative sites	58.3 /m2	mostly mid-East Ch.
	0.68% L. higginsi		
1990	Havlik & Stein	28 sp.	Middle of East Ch.
	15.9% negative sites	37.7 /m2	& downstream
	0.4% L. higginsi		

NOTE: NUMBER OF NEGATIVE SITES STEADILY INCREASING

1990	Clarke	22 sp.	Middle of East Ch.
	0.92% L. higginsi	34.9 /m2	9.5 - 52.0/m2 m barge channel
1991	Clarke	26 sp.	Middle of East Ch.
	0.8% L. higginsi	53.2 /m2	34.9 - 53.2/m2 control area
1992	Clarke	?	Middle of East Ch.
1993	Clarke	?	Middle of East Ch.

NOTE: NUMBER OF SPECIES DECREASING

COMPARABLE AREAS				
1987 HOLLAND			1990 STEIN/HAVLIK	
SITE #	SPECIMENS		SITE #	SPECIMENS	% OF 1990 DECREASE
32	365	=	2	182	49.86%
734	366	=	3	111	30.33%
35	232	=	4	118	50.86%
37	124	=	6	47	37.90%
38	64	=	7	31	48.44%
39	404	=	8	205	50.74%
740	307	=	9	147	47.88%

COMMENTS ON FWS BIOLOGICAL OPINION

The City Dock must be closed. Even with that, we still may cause jeopardy to the continued existence of Lampsilis higginsi. If we

RESPONSES

Table 1. Unionidae Found by Selected Previous Workers, East Channel of the Upper Mississippi River near Prairie du Chien, Wisconsin.

Scientific Name	Havlik and Marking	Ellis	Havlik and Stansbery	Miller and Payne
Anodonta imbecillis Say, 1829	0.43	0.89	0.29	3
Anodonta grandis corpulenta Cooper, 1834	0.05	7.19	0.07	5
Strophitus undulatus undulatus (Say, 1817)	0.43	0.09	0.51	4
Alasmidonta marginata Say, 1818	0.02	--	--	--
Arcidens confragosus (Say, 1829)	0.14	0.27	0.36	3
Simpsonaias ambigua (Say, 1825)	--	0.09	--	--
Lasmigona complanata (Barnes, 1823)	0.98	--	0.43	5
Lasmigona costata (Rafinesque, 1820)	0.05	--	--	--
Megalonaias nervosa (Rafinesque, 1820)	0.33	1.33	3.97	6
Tritogonia verrucosa (Rafinesque, 1820)	0.38	2.04	0.65	--
Quadrula quadrula (Rafinesque, 1820)	0.82	0.09	3.56	6
Quadrula fragosa (Conrad, 1835)	0.03	--	--	--
Quadrula metanevra (Rafinesque, 1820)	1.87	0.09	1.30	6
Quadrula nodulata (Rafinesque, 1820)	5.27	0.71	4.91	5
Quadrula pustulosa pustulosa (Lea, 1831)	10.73	2.93	11.84	6
Amblema plicata plicata (Say, 1817)	22.98	7.46	13.21	6
Fusconaia ebena (Lea, 1831)	22.44	0.18	7.44	--
Fusconaia flava (Rafinesque, 1820)	6.80	1.24	8.74	6
Plethobasus cyphyus (Rafinesque, 1820)	0.08	--	--	--
Cyclonaias tuberculata (Rafinesque, 1820)	--	0.09	--	--
Pleurobema sintoxia (Conrad, 1836)	1.66	--	0.07	3
Elliptio crassidens crassidens (Lamarck, 1819)	0.69	--	--	--
Elliptio dilatata (Rafinesque, 1820)	0.21	3.20	0.29	4
Obliquaria reflexa (Rafinesque, 1820)	3.96	3.02	5.42	6
Actinonaias ligamentina carinata (Barnes, 1823)	2.35	0.53	--	3
Plagiola lineolata (Rafinesque, 1820)	0.11	0.36	0.07	3
Obovaria olivaria (Rafinesque, 1820)	4.59	0.36	12.85	6
Truncilla truncata Rafinesque, 1820	3.31	2.04	6.14	6
Truncilla donaciformis (Lea, 1827)	6.78	0.09	5.49	6
Leptodea fragilis (Rafinesque, 1820)	0.68	4.44	1.01	6
Potamilus alatus (Say, 1817)	0.27	6.39	0.87	6
Potamilus laevissima (Say, 1829)	0.09	--	0.65	2
Potamilus capax (Green, 1832)	--	0.09	--	--
Toxolasma parvus (Barnes, 1823)	0.05	--	0.07	6
Ligumia recta (Lamarck, 1829)	0.85	0.53	3.61	6
Lampsilis teres forma teres (Rafinesque, 1820)	0.23	0.27	0.07	3
Lampsilis teres forma anodontoides (Lea, 1831)	0.02	47.51	0.58	--
Lampsilis radiata luteola (Lamarck, 1819)	0.06	3.68	--	3
Lampsilis higginsi (Lea, 1857)	0.52	0.09	1.01	5
Lampsilis ventricosa (Barnes, 1823)	1.39	0.71	2.53	6
Epioblasma triquetra (Rafinesque, 1820)	0.02	--	--	--
Total individuals	6339	1126	1385	4847
Total species	38	31	30	29

Notes:

Havlik and Marking (1980) presented quantitative data from analysis of 10 cu m of dredged material.

Ellis collected in 1930-31 as reported by van der Schalie (1950). The very high abundance of Lampsilis teres forma anodontoides was probably the result of sampling a sand bar.

Havlik and Stansbery (1978) reported on qualitative collections by hand at the surface of the dredged material disposal site that was later sampled quantitatively and reported in Havlik and Marking (1980). These collections were biased toward uncommon species, therefore relative abundance data, as calculated by Havlik and Stansbery (1978) are not entirely valid.

Miller and Payne used divers to collect total substratum samples in the East Channel of the Mississippi River in 1984-85, 1987-90. The number of years each species was collected is listed.

cannot protect the mussel fauna of the Mississippi River at Prairie du Chien, WI, we will not be able to protect it anywhere on the Mississippi River.

7 The two host fish species for Lampsilis higginsi (sauger and freshwater drum) have never been confirmed as host fish in recent years (C-7).

COMMENTS ON COE BIOLOGICAL ASSESSMENT

8 On D-2 it states that the East Channel south of the Hwy 18 bridge is not considered part of the 9-foot Channel project. Why then are channel buoys in place, and why has barge traffic been allowed in that area? In the early 1990's I understood there were threats of a lawsuit if barge traffic was not allowed in the lower East Channel. Apparently agencies gave in and allowed tugs to traverse the lower end of the East Channel, even though the area has only minimal depths at low control pool. Commercial navigation (even of a tug) is known to have caused a considerable substrata disturbance where depths are shallow.

9 How can the statement (12, 93, D-14) be made that the mussel population is stable, that is that recruitment equals mortality? The DEIS shows no data to back up this assumption, therefore one must conclude that the statement cannot be backed up by the COE or WDNR.

There is a discussion of natural mortality, but no discussion of recruitment rates. One of Miller's early reports stated that he considered the recruitment of Megalonaias nervosa (Rafinesque, 1820), Washboard, to be low, at 11%. If one figures the rate of recruitment for L. higginsi in the same manner, it is definitely low. I believe that the biological impacts of the proposed project are seriously underestimated (D-21).

During the 1990 Stein and Havlik study, 65.5% of their juvenile A. plicata (under 5 years of age), were found downstream of the bridge, although more of their sampling sites (61.7%) were upstream of the bridge. This seems to indicate that the areas upstream of the bridge, subject to the effects of commercial navigation, are already less productive, even for the most common species.

Recent COE and WDNR data agrees with my observations since the mid-1970's: There is only weak recruitment of the commercial species M. nervosa, and apparently there is a continuing increase of the common A. plicata. The latter situation means that all other mussel species are declining, including rare and endangered species since overall densities are declining.

The 1990 East Channel Stein and Havlik study showed a considerable decline in the 14 year old age class of A. plicata. These specimens were born in 1976, the year of the big COE East Channel dredging. Analysis of the number/age class of all species found, shows a similar trend. If the age class of A. plicata was impacted, then one can assume the same age class of all other species were similarly impacted. A 1986 WDNR study also showed a decline in the 10 year age class of

5. If a community consisted of 30 evely distributed species then each species would comprise about 3.3% of the community. It is misleading to infer that stressful conditions exist if 17 species comprise less than 1% of the community. Low percentages of these species are simply the result of extreme dominance of a single species (in this case Amblema plicata plicata). As Raunkiaer's law of frequencies elucidated in 1928, a series of subsamples from nearly any single natural community will show that most species are rare and only a few are dominant (McNaughton and Wolf 1973). The greater the species richness, the greater the likelihood of finding very uncommon species.

6. Comment noted.

7. The sauger and drum were implicated as host fish species for Lampsilis higginsi by Coker et al. 1921, Surber 1913 and Wilson 1916. More recently, lab research by Holland and Waller 1986 verified northern pike, bluegill, green sunfish, smallmouth bass, largemouth bass, white bass, walleye and yellow perch as host species for Lampsilis higginsi. Their results suggested that many species of fish in higher order families such as Centrarchidae (bass and sunfish) and Percidae (sauger, walleye, perch) are suitable hosts. No evidence exists to dispute the findings of earlier researchers.

8. The lower East Channel is not considered to be a part of the nine-foot channel project. The lower East Channel is not maintained for use by commercial navigation, although tows may use this area at their own risk.

9. Miller and Payne considered all individuals less than 30 mm total shell length as evidence of recent recruitment. As the following data indicate, recruitment varies annually;

A. plicata (those born the year of the 1976 dredging).

10 Another indication of current stress to East Channel unionids is that of 104 Megalonaias nervosa (Rafinesque, 1820), Washboard, found in 1990 (Stein and Havlik), none were of commercial height, although they were up to 33 years of age. We will never get the answers to determine the effects of commercial navigation, unless sufficient amounts of the right kind of data are obtained.

11 Among the more recent adverse developments in the East Channel has been the flooding of 1993. Apparently sand "waves" have been deposited in the navigation channel in the upper end of the East Channel. While flooding is a natural phenomena, the prolonged 1993 flood may have added stress to an already stressed mussel population. That added stress could be the straw that broke the camel's back. Are the federal and state agencies willing to take this risk?

12 Are additional harbor facilities actually needed? PSG loaded 323 barges in 1982, 414 barges in 1983, 652 barges in 1984, 437 barges in 1985, and 518 barges in 1986. Upgrading harbor facilities should be ON HOLD until the Section 107 study, currently on hold, is finished.

13 In 1989 your predecessor promised me a comprehensive report of various COE East Channel studies. Some real issues are still being avoided. The Miller etc. reports tell little about the cumulative results of COE studies since 1984. Did Miller & Payne find any evidence of recruitment for L. higginsi, and what age classes were represented each year? Mussels must be aged, as well as measured.

11 The mussel resource in the East Channel is a significant endangered resource worthy of more protection than it is presently receives, or than it would receive if these permits are granted.

A Lampsilis higginsi collected spring 1990, from an East Channel area close to Sawmill Slough, MRM 635.6, was severely chipped on both umbos. Damage is consistent with that seen on mussels in the barge turning zone. This adult male was dead less than one year. One cannot tell if the prop damage killed the specimen, or if the damage was done after death. Regardless, this was the most severe damage seen on a relatively fresh L. higginsi in the past 15 years, and certainly constitutes HARASSMENT to an endangered species.

A number of editorial corrections need to be made to the DEIS, and some of the maps could be of a better quality. Thank you.

Sincerely,

Marian E. Havlik

Marian E. Havlik
Malacological Consultants

cc: Dr. C. B. Stein

Percent Individuals < 30 mm Total Shell Length

Year	Turning Basin	Reference Site
1984	25	10
1985	61	61
1987	46	34
1988	24	42
1989	16	21
1990	15	18

In 1984 and 1987 evidence of recent recruitment was greater in the turning basin than the reference site. It would appear that commercial vessels moving through the turning basin are not having an observable effect on recruitment. In most years there has not been a significant difference ($p>0.05$) between density of juvenile Amblema plicata plicata at the two sites. Therefore, recruitment of this species appears to be independent of vessel passage.

10. Megalonaias nervosa is a commercially harvested species, it is not suprising, therefore, that none were of commercial height.

11. All alternatives evaluated in detail would have adverse impacts on Lampsilis higginsi. These impacts will be identified in the Record of Decision for the permit action and will receive equal consideration before a decision on the permit is made.

12. Comment noted. However, the Section 107 study would determine the feasibilily of relocating the City Dock. The actions evaluated in this EIS are for an existing private facility.

13. COE studies documented recruitment of Amblema plicata plicata. No specific information on recruitment of Lampsilis higginsi was collected.

COMMENTS

State Historical Society of Wisconsin
Division of Historic Preservation
816 State Street • Madison, Wisconsin 53706-1488
☎ (608) 264-6500 • FAX (608) 264-6404

October 27, 1993

Colonel Richard W. Craig
District Engineer
St. Paul District, Corps of Engineers
180 East Kellogg Blvd. Room 1421
St. Paul, Minnesota 55101-1479

RE: Draft Environmental Impact Statement

Dear Colonel Craig :

Thank you for the opportunity to comment on the "Draft Environmental Impact Statement for the Long-Term Channel Maintenance Plan for the Federal Harbor and a Permit Application to Construct and Expand Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin".

1 As recognized in this document, this project, if permitted, will have an effect on four National Historic Landmarks as well as other historical and archeological sites that are individually listed in, or determined eligible for inclusion in, the National Register of Historic Places. In addition to the pending evaluation of the possible effects of rail generated vibrations on the historic masonry buildings, we believe that you have not addressed all of the direct and indirect effects of construction of the harbor on the historic resources. It is our belief that the proposed harbor facility at the North End of St. Feriole Island is incompatible with the continued operation and interpretation of the State Historical Society of Wisconsin's historical site - Villa Louis. This incompatibility stems from conflicting land use.

2 Another area of concern is the economic impact of the harbor. Generalizations are made concerning the positive economic impact of the harbor facility on the local economy. The effect of harbor construction and harbor operation on the operations of the Villa Louis were not discussed. We believe that harbor operations will affect negatively the current volume of visitors and the visitor experience at Villa Louis. Furthermore, we do not believe that the continued development and expansion of an industrial area on the North end of the island is consistent with the recreation objectives as stated by the Villa Louis and by the City Of Prairie du Chien's St. Feriole Island Reuse Committee. We foresee a negative impact on the public appeal and interest in our programs due to the conflicting land uses, i.e., industrialization vs. recreation. The State of Wisconsin has a multimillion dollar

RESPONSES

1. We have addressed the issue of incompatible land uses in Section 5.2.1 of the final EIS, where physical, audible-visual, and safety impacts on significant resources are presented. The memorandum of agreement (see Appendix F) provides for mitigation measures to reduce impacts stemming from incompatible land uses.

2. Section 3.1.11 discusses the positive benefits to tourism associated with a No Harbor alternative.

2 investment in the irreplaceable resource that is the Villa Louis. This site in turn has a significant impact on the local economy.

3 Noise, dust, and traffic conflicts generated by cars and trucks create safety problems for recreation seeking visitors and affect the operations at Villa Louis. These are problems that we face today. We estimate that 30% of current visitor time at the Villa Louis is spent outdoors. That experience will diminish in quality as industrial traffic increases, resulting in a decrease in attendance at the site.

Land use changes resulting from this project need to be anticipated. The effects of these land use changes on cultural resources need to be addressed. These changes will compound the predictable problems noted above regarding the operations at the Villa Louis.

4 In Section 2.1.5 of the Draft EIS (pp. 15-16), it is stated that a "Section 107 Study" is being conducted to "investigate the feasibility of relocating the existing public commercial harbor to a site where natural resource protection can be achieved consistent with project operation" (emphasis added). It is then stated that this study is being suspended pending the outcome of this EIS. It seems to us that this decision should be reconsidered. The Section 107 Study should continue with the goal of selecting a harbor site that has the least effects on both natural and historical resources. Consideration of the current permits should be tabled pending the results of that study.

We look forward to working with you in completing your responsibilities for compliance with Sections 106 and 110 of the National Historic Preservation Act as well as completing your environmental impact assessment for this undertaking. Questions on this matter should be directed to Richard Dexter at (608) 264-6509.

Sincerely,

Jeff Dean
State Historic Preservation Officer

CC: Don Klima, ACHP
David Pamperin, SHSW
Robert Thomasgard, SHSW

3. The memorandum of agreement (see Appendix F) addresses these conflicts by requiring traffic to be relocated away from Villa Louis.

4. The question of which sites should be evaluated for development by the Section 107 study has been rendered moot by recent local developments. The primary user of the municipal dock, Didion, Inc., will be moving its operation to the private terminal owned by PS&G per an agreement reached between the parties. Traffic utilizing the municipal dock will likely revert to historic (i.e., pre-Didion) levels of approximately 15 barges per year. Considering the prospects for this minimal amount of future traffic, city officials do not see a need to relocate the municipal dock. Consequently, the need for a Section 107 study has diminished.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

November 18, 1993

REPLY TO THE ATTENTION OF:

ME-19J

Colonel Richard W. Craig
Department of the Army
St. Paul District, Corps of Engineers
1421 U.S. Post Office & Custom House
St. Paul, Minnesota 55101-1479

Dear Colonel Craig:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA), we have reviewed the Draft Environmental Impact Statement (EIS) on the proposed Long-Term Channel Maintenance Plan (LTCMP) for the Federal Harbor, and a permit application to construct and expand barge terminal facilities in the east channel of the Upper Mississippi River at Prairie du Chien, Crawford County, Wisconsin. Region 5 requested that the Corps of Engineers prepare an EIS on Prairie du Chien barge activities on January 12, 1990. We also submitted scoping comments on the project on April 1, 1992.

Based upon our review of the Draft EIS, and in accordance with our policy, we have environmental objections to the proposed project activities. Our objections are related to the impacts the proposed project could have on high quality aquatic habitat, Federally-endangered species, water quality, and historic resources. Our comments concerning these impacts are attached. We discussed these comments with your staff on November 1, 1993.

We appreciate the opportunity to provide comments on the Draft EIS. Based upon our review, we have assigned a rating of "EO-2" which will be published in the Federal Register. The "EO" indicates that we have environmental objections to the project alternatives presented in the Draft EIS. The "2" indicates that additional information should be provided in the Final EIS. If you have any questions on our comments, please contact William D. Franz, Acting Chief, Planning and Assessment Branch at (312) 886-7500.

Sincerely yours,

Robert Springer
Assistant Regional Administrator
for Planning and Management

Attachment

Printed on Recycled Paper

U.S. Environmental Protection Agency
Region V Comments
Draft Environmental Impact Statement
Long-Term Channel Maintenance Plan for the Federal Harbor and Expansion of Barge Terminal Facilities in the East Channel of the Upper Mississippi River at Prairie du Chien, Wisconsin

The proposed action involves a permit application by Prairie Sand & Gravel (PS&G) to expand its barge loading and unloading facilities in the east channel of the Upper Mississippi River, and the U.S. Army Corps of Engineers' (Corps) proposed Long-Term Channel Maintenance Plan (LTCMP) for the Federal Harbor at Prairie du Chien, Crawford County, Wisconsin.

The Federal commercial harbor was constructed by the Corps as part of navigation improvements authorized by the 1950 Rivers and Harbors Act. The City of Prairie du Chien constructed the existing dock (City Dock), which is located on St. Feriole Island at Upper Mississippi River mile 635.0 on the east channel. The east channel is used primarily as an access channel to the City Dock and the PS&G terminal.

PS&G is located at the north end of St. Feriole Island. It is at the mouth of Sawmill Slough at UMR mile 636.0. Water access is via the upper end of the east channel, and land access is provided by road and by rail owned by the Wisconsin and Calumet Railroad. The proposed PS&G expansion of barge transloading facilities includes the development of the Swingle site, which is located on the mainland. The proposed permit application involves the construction of a channel between Sawmill Slough and the existing borrow pit that is located on the east side of PS&G. Other project activities include the construction of a new grain loading dock on Sawmill Slough, an addition to the existing grain loading dock, rehabilitation of the existing coal unloading dock, construction of a commodity unloading dock, construction of a cleaning and maintenance dock, construction of a truck access road, and the installation of riprap along the unprotected shoreline.

The proposed LTCMP involves future dredging at two areas, Cut 1 and Cut 2. Cut 1 is located at the northern entrance of the east channel and would be dredged once in the 40-year period of the LTCMP. An estimated 2,500 cubic yards of material is proposed to be removed from an area 100 feet wide, 450 feet long and 11 feet deep, and is proposed to be disposed of at a site on the south side of the Highway 18 bridge. The dredged material is proposed to be reused by the City of Prairie du Chien and local contractors. Cut 2 is located immediately in front of the City Dock; however, because this area is extraordinarily rich in the Federally-listed endangered Higgins' Eye Pearly Mussel (Lampsilis higginsi), dredging of Cut 2 has been deferred. Since this area provides habitat to such a valuable resource, our Agency

1

1. Comment noted. An alternative which includes deauthorization of the City Dock is discussed in Section 3.1. However, this alternative would not meet the economic need for harbor facilities in the Prairie du Chien area as defined in the purpose and need statement for this EIS, therefore, this alternative was eliminated from further consideration.

1 recommends that the Corps seek deauthorization of the Federal harbor at the City Dock. Deauthorization would cease future operation and maintenance activities in this section of the channel which is largely self-maintaining.

The following project alternatives were discussed in the Draft EIS.

Alternative A: No action. This alternative would involve denial of the permit for the harbor expansion proposed by PS&G. Barge traffic to the City Dock and PS&G would return to historic levels. Historic levels of barge traffic at the City Dock would be approximately 15 barges per year, while historic levels at PS&G would be about 230 barges per year. The implementation of this alternative would reduce barge traffic in the east channel from current levels (approximately 380 barges per year) to historic levels (approximately 245 barges per year). The implementation of the LTCMP would be deferred by placing the City Dock in an "inactive" status.

Alternative C1: The implementation of this alternative would require denial of the permit for harbor expansion proposed by PS&G, continued use of facilities at the City Dock at recent levels of barge traffic, and continued maintenance of Cut 1 in the east channel according to the LTCMP. The maximum use of the City Dock would be limited to 135 permitted and 15 unregulated barges per year. Approximately 230 barges per year would continue to use the PS&G harbor.

Alternative D: This alternative would require approval of the permit for harbor expansion proposed by PS&G. PS&G would connect its existing gravel quarry to Sawmill Slough by dredging an area that would connect waters in Sawmill Slough with a deep water pit previously excavated by PS&G (referred to as Cut 3). Projected dredging of Cut 1 would be completed as outlined in the LTCMP. The implementation of this alternative would result in increased levels of traffic in navigation lanes between the barge turning basin and the main channel, and between the barge turning basin and the proposed PS&G/Swingle harbor. The City Dock Harbor would return to historic levels of barge activity, and PS&G/Swingle Harbor would be expanded to approximately 500 barges per year.

Alternative F1: This alternative is a combination of Alternatives C1 and D. The City Dock Harbor would be expanded up to 150 barges per year, and PS&G/Swingle Harbor would be expanded
2 to approximately 500 barges per year. Because of the likelihood that significant impacts would be incurred if this alternative were to be implemented, our Agency finds it environmentally unacceptable.

2. Comment noted. Your objection to alternative F1 will be noted in the Record of Decision for the permit application and will be duly considered before any decisions are made on the actions proposed in this EIS.

COMMENTS

RESPONSES

-3-

3 As we discussed in our telephone conference of November 1, 1993, from the information provided in the Draft EIS, it appears that the implementation of Alternative D would result in a greater loss of freshwater mussels than Alternative C1. This is because the number of lost mussels indicated in Alternative D reflects impacts resulting from dredging cut 1 as well as increased barge traffic. However, the description of Alternative C1 only discusses the impacts to mussels resulting from dredging cut 1; impacts to mussels from barge traffic are not discussed. The Final EIS should identify all impacts that are expected to occur, including provision of an estimate of the number of mussels that may be impacted as a result of the implementation of all components of each alternative.

4 There have long been discussions on a new consolidated municipal harbor alternative for Prairie du Chien. It is important that the Final EIS analysis explain this alternative and that it not preclude this long-range option. Its similarities and differences to Alternative D need to be clearly stated. In

5 addition, due to the complex human and natural issues of the east channel at Prairie du Chien, it would be prudent for the lead agencies to evaluate an alternative site outside of the east channel, where natural and cultural resource protection can be achieved consistent with project operation.

The purpose and need statement provided in the Draft EIS, states, "the purpose is to provide for environmentally sustainable public and/or private commercial navigation, including harbor and terminal facilities, in the East Channel of the Mississippi River at Prairie du Chien, Wisconsin, to meet the need for continued

6 growth and development." This statement is unduly restrictive. Because the project's purpose and need statement focuses on retaining barge operations in the east channel, consideration of other reasonable alternatives has been excluded. Relocation of the barge terminal facilities to a site outside of the east channel is likely to be environmentally preferable. We recommend that alternatives outside of the east channel be thoroughly evaluated in the Final EIS.

The Draft EIS states that relocating the barge terminal facilities away from Prairie du Chien would significantly adversely impact the socioeconomic resources of the community. However, there is nothing in the Draft EIS to substantiate this

7 claim. The Final EIS should provide information on potential adverse impacts relocating the barge terminal facilities would have on revenue and jobs in Prairie du Chien. Information should also include the number of jobs projected with the various alternatives, whether they are full or part time, year-round or seasonal, and whether alternatives associated with these jobs preclude or retard any jobs or economic benefits associated with enhanced tourism development from emphasizing the natural,

3. Table 4 provides a side-by-side comparison of the relative impacts of the various alternatives on freshwater mussels. Also, Sections 5.1.5 and 5.1.6 have been revised in an attempt to quantify impacts on freshwater mussels, however, as discussed in these sections, it is difficult to provide a specific number of mussels which would be destroyed under the various alternatives, particularly alternatives C1 and F1. Therefore, a range of impacts resulting from navigation traffic have been considered. Depending on the level of impact chosen, alternative C1 would have comparable or larger impacts on freshwater mussels than alternative D.

4. Alternative D is a fair representation of the consolidated harbor currently being considered by interested parties in Prairie du Chien. Further discussion of the potential for a consolidated harbor is included in Section 3.3.

5. The permit application which this EIS addresses is for modification of an existing facility. Discussions of alternative harbor locations outside of the East Channel are included in Section 3, however, we do not believe alternatives which consider relocation of the existing PS&G facilility can be considered reasonable for the permit applicant. The purpose of this EIS is to evaluate the impacts of granting the current permit application, not the impacts of relocating the harbors at Prairie du Chien. Also, as discussed in Section 3.0 the intimate link between the need for expansion of barge terminal facilities and the rail link to central Wisconsin, limit practicable alternatives for expansion to the Prairie du Chien area.

6. See Section 3.0 for further discussion of alternatives which meet the defined purpose and need.

COMMENTS

7 recreational and historic attributes of Prairie du Chien. Other factors should be considered as well, such as the potential improvement of socioeconomic resources of the community and the job market area that would service the relocated barge terminal facilities.

8 In addition to the potential for dislodging, crushing and contaminating freshwater mussels, increased siltation resulting from the additional barges would also affect the remaining mussels' ability to feed, reproduce and reach maturity. In addition, a large spill of a material being transported could threaten the mussel populations. To minimize adverse impacts to mussels, alternatives to avoid sensitive areas should be developed. An increase in the number of barges in the area annually is also likely to significantly impact water quality due to the effects of propeller wash churning, scouring, and

9 turbidity. Water quality may also be degraded due to potential fuel leaks or cargo spills, the introduction of additional hydrocarbons, runoff caused by construction activities and by barge washing operations.

10 Measures should be taken to avoid, minimize and compensate for any adverse impacts that may occur. Such measures may include issuing travel restrictions to barge operators, limiting the types of materials shipped, developing a spill contingency plan, preventing wastewater from the barge maintenance and cleaning operations from entering the waterway, regulating the number of barges entering the channel during rough weather conditions, and planning for the immediate retrieval of barges if they break away. Plans to minimize and compensate for any adverse impacts, as well as measures proposed to be taken, should be identified in the Final EIS.

According to the Draft EIS, the barge facility expansion project proposed by PS&G would result in an increase in rail traffic. This increase has the potential to adversely impact significant historic structures in the project area that are listed on the National Register of Historic Places. The vibration from additional trains in the project area has the potential to damage buildings that have been in existence for over 100 years. In addition, heavy train traffic may impede the successful reuse of the historic Dousman Hotel. Currently, several trains pass the hotel daily and the tracks are located only about 30 feet away from the Dousman Hotel.

In addition, the area around Prairie du Chien is one of the best known archeological sites along the Upper Mississippi River. Hundreds of prehistoric archeological sites exist on the floodplain and along terraces and adjacent uplands of the Mississippi River. Several prehistoric archeological sites have been recorded as existing on St. Feriole Island.

RESPONSES

7. Further analysis of economic information has been included in Section 5.3.

8. Concur. Two alternatives, D and A, minimize and/or avoid impacts to the sensitive mussel resources located between the City Dock and Barge Turning Basin area of the East Channel. All alternatives considered in detail attempt to minimize impacts to sensitive areas in the southern half of the East Channel.

9. As identified in Section 3.4.1 of the final EIS, spill contingency planning would be required of the permit applicant if a permit is issued.

10. Potential mitigation measures are identified and discussed in Section 3.4. If a permit is granted many of these measures would be implemented.

COMMENTS

It is evident that the proposed project activities have the potential to significantly impact important historic, archeological, and cultural resources in the project area.

11 However, the Draft EIS does not provide a fully developed archaeological and historic preservation analysis. This omission detracts from the strength of the document and results in a fragmented analysis. Environmental information should be available to public officials and citizens before decisions are made and before actions are taken.

12 It is indicated in the Draft EIS that one of the components of the development of the Swingle site is the construction of a truck access road. Information should be provided in the Final EIS regarding the types of habitat that may be impacted as a result of road construction, as well as proposed compensatory measures. The types of measures that would be taken to compensate for the loss of watershed in the area due to road construction should also be identified in the Final EIS.

Our Agency would like to commend the lead agencies for initiating the scoping process so early in the process due to the number and scope of environmental issues involved, and we are glad to see that an EIS has been written on this project (as recommended in our January 12, 1990 letter to the Corps).

13 In our scoping letter to the Corps, dated April 1, 1992 (which was not included in the Appendix of the Draft EIS), we requested that certain issues be addressed in the Draft EIS; most of the issues were addressed thoroughly; however, the following issues remain to be addressed in the Final EIS. We also encourage the lead agencies to coordinate with our Agency on any activity related to this project.

14 Construction noise, dust and exhaust fumes generated from the proposed project activities have the potential to be significant. Because permanent and summer residences are located near the project area, the contractor should be required to control noise and fumes emitted by equipment by installing control devices and employing prescribed control methods. Dust levels should also be kept to a minimum by requiring that gravel roads be watered periodically.

15 Identify the types of erosion control measures that are proposed to be implemented during project activities. Such measures may include establishing a staging area for the construction equipment in an environmentally non-sensitive area, limiting the number of access points to the site, and revegetating all disturbed areas upon completion of project activities with native flora, if practicable. Natural vegetation would provide erosion control as well as increase the drainage capacity of the area.

RESPONSES

11. See response to comment 2 of the State of Wisconsin, Department of Justice letter of September 15, 1993.

12. Sections 5.1.3, 5.2.1 and 5.3 of the final EIS include discussions of the impacts of the proposed truck access route between the Swingle site and State Trunk Highway 35.

13. Your scoping letter is included in Appendix H of the final EIS.

14. PS&G's current state air quality permit requires dust suppression.

15. Included in the development plans for the PS&G/Swingle site are erosion control measures (i.e. riprap placement on shoreline scour areas, revegetation).

COMMENTS

16 It is indicated in the Draft EIS that project activities, such as road construction, may require the removal of trees and other vegetation. To compensate for the loss of trees, we recommend that they be replaced with native saplings, if practicable, at a minimum ratio of 1:1, and that they be placed as close as possible to the impacted areas. With regard to disposal of removed trees, decaying trees are important components of forest ecosystems because they provide habitat to wildlife, as well as important nutrients to the soil. Therefore, we recommend that removed trees be placed in a forested area to provide habitat for wildlife rather than disposing of them in a landfill. Trees may also be provided to the community as firewood or mulch.

17 If wetlands have the potential to be impacted by the implementation of the proposed project activities, information should be provided in the Final EIS on the acreage, type, functions and values of the wetlands proposed to be impacted. All unavoidable losses of wetlands must be mitigated. Our general policy is to request that a minimum of 1.5 acres of compensatory wetlands be provided for each acre of naturally-occurring wetlands unavoidably lost due to project implementation activities. The compensatory wetlands should be located as close as possible to the impacted wetlands and should be designed to replicate, as closely as possible, the types, functions and values of the impacted wetlands.

18 Finally, in accordance with our pollution prevention policy, we recommend that your agency consider implementing energy conservation and waste minimization measures whenever possible. Such measures may include the use of uncontaminated construction or demolition debris in construction of the access road, and the use of recycled plastic timber in construction of the docks.

RESPONSES

16. As discussed under response 11, the access road to the PS&G site was previously relocated. Some disturbance of small willow saplings along the shoreline areas of the Swingle site would occur if the permit were granted, however, natural replacement of these trees would occur at a rapid rate.

17. No wetlands would be filled or impacted if the permit were granted. Some disturbance of less than 0.1 acre of floodplain forest would occur during dredge material disposal operations at the proposed placement site south of the Highway 18 bridge.

18. Comment noted. However, we have no power to require the permit applicant to use these materials.