Northern Illinois Hydropower, LLC
801 Oakland Avenue
Joliet, IL 60435

July 16, 2008

VIA ELECTRONIC FILING

Ms. Kimberley Bose, Secretary
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, DC 20426

Northern Illinois Hydropower, LLC
Notice of Intent to File, Pre-Application Document and Application to use the Traditional Licensing Process
Dresden Island Hydroelectric Project (FERC No. 12626)

Dear Secretary Bose:

Northern Illinois Hydropower, LLC (NIH) herein electronically files with the Federal Energy Regulatory Commission (Commission) its Notice of Intent (NOI) (Attachment 1) and its Pre-Application Document (PAD) (Attachment 3) for licensing of the Dresden Island Hydroelectric Project (FERC No. 12626). In accordance with 18CFR §5.5 of the Commission's regulations we are also transmitting copies of the PAD to relevant resource agencies, Tribes, non-governmental organizations and other stakeholders concurrent with this filing.

In addition to the NOI and PAD, NIH, as permitted under 18CFR §5.3, is filing an Application to use the Traditional Licensing Process (Attachment 2) to complete the licensing of the proposed project.

We have also published notice of this filing in the Herald News, a newspaper in general circulation in the project region. NIH will provide a copy of this notice to the Commission upon receipt of said from the referenced newspaper.

All materials related to the Project licensing as well as materials related to this NOI and PAD are available on-line at www.NIHydropower.com.

If there are any questions or comments regarding the NOI, PAD, Application to use the Traditional Licensing Process or any information provided by the Licensee, please contact Damon Zdunich, Northern Illinois Hydropower, LLC, 801 Oakland Avenue, Joliet, IL 60435, Phone (312) 408-4353, or by email at info@NIHydropower.com.

Sincerely,

Northern Illinois Hydropower, LLC

Damon Zdunich
President

DZ:nlp
Attachments
cc: Jeremiah L. Maher, Kleinschmidt Associates
Consulted Agencies/Stakeholders – see list

Distribution List

Organization	Dept/Office/Div	Contact
Advisory Council on Historic Preservation		
Federal Emergency Management Agency	Regional V	Lee Traeger
Federal Energy Regulatory Commission	Chicago Regional Office	
Federal Energy Regulatory Commission	Hydro East Branch 1	Vince Yearick
Illinois Department of Natural Resources	Illinois Natural History Survey	
Illinois Department of Natural Resources	Office of Resource Conservation	John Buhnerkempe
Illinois Department of Natural Resources	Wildlife Resources Division	
Illinois Department of Natural Resources	Office of Land Management	
Illinois Department of Natural Resources	Office of Realty and Environmental Planning	Bob Schanzle
Illinois Department of Natural Resources	Office of Water Resources, Resource Management Div.	Mike Diedrichsen, P.E.
Illinois Department of Natural Resources	Office of Water Resources, Resource Management Div.	Paul Mauer, P.E.
Illinois Environmental Protection Agency	Watershed Management Section, Bureau of Water	Bruce Yurdin
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US Army Corps of Engineers	Rock Island District	Michael Cox
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US Bureau of Land Management	Eastern States-Milwaukee Office	
US Environmental Protection Agency	Region V	
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US Fish and Wildlife Service	Chicago Field Office	Jeffrey Mengler
US Fish and Wildlife Service	Regional Office	Jeff Gosse
US Fish and Wildlife Service	Rock Island Ecological Services Field Office	Richard Nelson
US Geological Survey		
Will County	County Executive	Larry Walsh
Grundy County Commissioners Office		Francis E. Halpin
City of Joliet	Office of the City Manager	Tom Thanas
Village of Plainfield		Christopher Minick
Village Of New Lenox		Russ Loebe
Village of Mokena		
Village of Romeoville		Ray Holloway
City of Braidwood		Jim Hubbard
Village of Channahon	Administrative Office	Joe Cook
Coal City		
Village of Minooka		
City of Morris		John Enger
City of Wilmington	Wilmington City Hall	Sheila Long
Village of Bolingbrook		Carol Penning
City of Crest Hill		Christine Vershay-Hall
City of Frankfort	Administration Building	Bob Kennedy
Village of Lemont		Charlene Smollen
City of Lockport		Maria Esposito
Village of Orland Park		Paul Grimes
Village of Shorewood-Village Hall		Richard Chapman
Village of Tinley Park		Laura Godette
Village of Manhattan		Marian Gibson

ATTACHMENT NO. 1

Notice of Intent to File License Application

Dresden Island Hydroelectric Project, FERC No. 12626

July 16, 2008

NOTICE OF INTENT TO FILE
LICENSE APPLICATION
DRESDEN ISLAND HYDROELECTRIC PROJECT, FERC No. 12626

NORTHERN ILLINOIS HYDROPOWER, LLC

JULY 16, 2008

Northern Illinois Hydropower, LLC, hereby gives notice of their intent to file an application for an initial license for the proposed Dresden Island Hydroelectric Project (FERC No. 12626).

1) The potential applicant or existing licensee's name and address:

Northern Illinois Hydropower, LLC
801 Oakland Avenue
Joliet, IL 60435
(815) 723-6314

2) Project Number:

FERC No. 12626

3) License expiration date:

This Project has not yet been built; as such no license currently exists.

4) Applicant's statement of intention to file an application for a subsequent license:

Northern Illinois Hydropower, LLC hereby unequivocally declares their intent to apply for a license of the Dresden Island Hydroelectric Project, FERC Project Number 12626. Northern Illinois Hydropower, LLC requests that FERC conduct the licensing using the Traditional Licensing Process (TLP).

5) Principal Project works:

Northern Illinois Hydropower, LLC proposes to install a 75 ft by 125 ft powerhouse between headgate sections 10 through 16 immediately below the existing dam with a 50-ft by 50-ft switchyard adjacent and to the north of the powerhouse building. The existing transmission line is approximately 0.75 mi from the proposed switchyard to a Commonwealth Edison (CE) Substation.

6) Project location:

The proposed project is located immediately downstream of the confluence of the Des Plaines and Kankakee River on the Illinois River near the town of Morris at the existing United States Army Corps of Engineers Dresden Island Lock and Dam. The Project is located 271.5 miles above its confluence with the Mississippi River, and approximately 15 miles southwest of Joliet, Illinois.

7) Installed plant capacity:

The proposed Project will likely have an authorized installed capacity of approximately 10.2 MW.

8) The names and mailing addresses of:

a) Every county in which any part of the project is located, and in which any Federal facility that is used or to be used by the project is located:

The Project is located entirely within Grundy County, Illinois.

Grundy County
1320 Union Street
Morris, IL 60450

b) Every city, town, or similar political subdivision in which:

i) Any part of the project is or is to be located and any Federal facility that is or is to be used by the project is located:

The Project is not located within any city or town.

The existing Dresden Island Lock and Dam is owned by the Army Corps of Engineers and is operated primarily for navigation. The proposed Project will include Army Corps of Engineers facilities.

U.S. Army Corps of Engineers
Rock Island District
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204

ii) That has a population of 5,000 or more people and is located within 15 miles of the existing or proposed project dam:

The following towns or cities are located within 15 miles of the proposed Project:

Braidwood, IL
141 Main Street
Braidwood, IL 60408

Channahon, IL
Village of Channahon Administrative Office
24555 S. Navajo Drive
Channahon, IL 60410

Coal City, IL
515 South Broadway
Coal City, IL 60416

Minooka, IL
121 East McEvilly Road
Minooka, IL 60447

Morris, IL
320 Wauponsee Street
Morris, IL 60450

Wilmington, IL
1165 S. Water Street
Wilmington, IL 60481

c) Every irrigation district, drainage district, or similar special purpose political subdivision:

There are no irrigation, drainage or political subdivisions associated with the Project.

d) Every other political subdivision in the general area of the Project or proposed Project that there is reason to believe would be likely to be interested in, or affected by, the notification:

There are no other political subdivisions that are likely to be interested in, or affected by, the notification.

e) Affected Indian Tribes:

Northern Illinois Hydropower, LLC is not aware that the project affects any Indian tribe. The following tribe may have an interest in the area surrounding the Project:

Peoria Indian Tribe of Oklahoma
118 S. Eight Tribes Trail
P.O. Box 1527
Miami, OK 74355

ATTACHMENT NO. 2

Application for Authorization to Use the Traditional Licensing Process under Part 4 of the Commissions Regulations

Dresden Island Hydroelectric Project (FERC No. 12626)

July 16, 2008

Application for Authorization to Use the Traditional Licensing Process under Part 4 of the Commissions Regulations

Dresden Island Hydroelectric Project (FERC No. 12626)

As permitted by 18CFR §5.3, Northern Illinois Hydropower LLC, (NIH) hereby requests use of the Traditional Licensing Process (TLP) under 18CFR §4 Subpart D and Subpart F of the FERC regulations, for licensing the Dresden Island Hydroelectric Project FERC No 12626.

The justification for this request is addressed in the discussion of the criteria outlined in 18 CFR Section 5.3 (c)(1)(ii)A-F below.

General

The Dresden Island Project is located on the Illinois River on an existing U.S. Army Corp of Engineers (ACOE) dam. Flows are completely regulated by the ACOE; NIH is not permitted to store water, so water elevation changes are also at the ACOE's discretion and control. Because the proposed Project is at an ACOE facility, the proposed Project boundary is limited to the portion of the ACOE dam adjacent to the intake structure and to the footprint of the proposed structures and the immediate area of effect of the plant discharge. Other FERC licensed projects on the Illinois Waterway include the Lockport Project (FERC No. 2866) and the Starved Rock Project (FERC No. 4033). The agencies and other stakeholders likely to be involved with the licensing of this facility have recently participated in licensing other projects on the Illinois River and are familiar with the TLP.

Likelihood of timely license issuance (18 CFR §5.3 (c)(ii)(A))

Under the Federal Power Act and FERC regulations, a holder of a preliminary permit has 3 years to apply for a license application. After three years, the potential applicant loses his priority for developing the site. NIH has diligently pursued the analyses necessary for developing this site related to both the engineering and environmental feasibility of the proposed project. This diligence is demonstrated by NIH's filing of a PAD (concurrent with this request) for the project as well as preliminary contacts with ACOE and pertinent state and federal agencies. These initial efforts have taken over 2 years. For NIH to retain its priority for developing the site and to protect its investments to date, NIH must file a license application on or before April 12, 2009. Under the Integrated Licensing Process (ILP) regulations, meeting this deadline for filing the application is not possible. Under the TLP, NIH can take advantage of work undertaken under the Preliminary Permit and work with the agencies and other stakeholders to accelerate the consultation and other processes and file a complete license application with FERC on or before the expiration of the Preliminary Permit.

Complexity of the resource issues (18 CFR §5.3 (c)(ii)(B))

NIH discussed with several agencies potential issues at the proposed Dresden Island site. Because the water is controlled by the ACOE, and the Project boundary is very small (approximately one acre), the issues associated with developing Dresden Island appear straightforward and existing information on issues identified by the agencies is readily available to NIH.

The Illinois River (and the associated Illinois Waterway) has a long history of industrial development and hydroelectric power has been developed as a secondary objective at several existing navigation lock and dam sites such as Dresden Island. Similar and generally understood issues have been raised at other projects licensed on the Illinois River and have included effects on fish, fish habitat and water quality. Notably, recreational use has not been a significant factor at any of the ACOE dams on the waterway. NIH is beginning discussions with agencies to assess information needs to address these and other issues that may need to be addressed.

Level of anticipated controversy (18 CFR §5.3 (c)(ii)(C))

NIH anticipates very little involvement by the public and non-governmental organizations during the licensing based on other Illinois River proceedings. The applicable resource agencies have shown a distinct ability to work through and resolve issues with the licensee for other Illinois River hydroelectric projects. NIH anticipates the level of controversy to be low. However, NIH is planning to enhance consultation to include public meetings and to have regular agency meetings to resolve any potential issues.

Relative cost of the traditional licensing Process compared to the integrated process (18 CFR §5.3 (c)(ii)(D))

Due to the agencies' familiarity with the TLP, the time constraints of the Preliminary Permit process and with NIH's commitment to enhanced consultation in the relicensing process, NIH believes that the cost to complete the licensing process will be less under the TLP than it would be under the ILP for NIH, the agencies and FERC. Factors contributing to this include: no need to train agency staff, and the flexible nature of the TLP and the flexible timelines would allow NIH to work cooperatively with the agencies to develop information needed to resolve issues without requiring FERC staff involvement in the pre-filing stage. We are confident that under the TLP, NIH will be able to provide FERC with a complete application for licensing the Project at less cost and in less time than that required to undertake an ILP.

The amount of available information (18 CFR §5.3 (c)(ii)(E))

NIH has been collecting a variety of environmental and operational data over the past two and one half years. Because the Illinois waterway is of importance not just to the ACOE for navigation, but also to the Cities of Chicago, Joliet and numerous smaller municipalities for stormwater and wastewater discharge, economic development, and recreation - the waterway has had numerous short-term and on-going monitoring and research activities. There is specific information on water quality and sediment issues, as well as fishery, macroinvertebrate and other environmental resources. NIH believes that adequate information exists to analyze the potential

effects of developing the project. Furthermore, NIH has already begun the process to address any additional information requests or study needs with the agencies.

Other factors (18 CFR §5.3 (c)(ii)(F))

The Dresden Island Project is located on an ACOE lock and dam and, as noted above, NIH has no ability to control river flows; therefore, typical issues related to flows and water levels are not within the licensee's purview to control nor FERC's authority to regulate. Additionally, NIH will have very little land within the project boundary outside of the immediate powerhouse area.

For budget and planning purposes as well as to adequately communicate the process to potential stakeholders in the licensing, NIH respectfully requests that FERC provide a decision on NIH's proposal to use the TLP for the Dresden Island Project within 30 days of receipt of this letter. Granting NIH's request will not infringe on the ability for agencies or the public to provide comments on the proposed project, or on their ability to have their comments addressed.

Consultation and Notice

As required under 18CFR §5.3(d)(1), NIH has provided a copy of this application and request to all affected resource agencies. Similarly, as required under 18CFR §5.3(d)(2), and following the criteria therein, NIH has published notice of this request simultaneously with the publication of notice of availability for the NOI and PAD.

Comments on this Application

Comments on this request to use the Traditional Licensing Process (TLP) are due to the Commission and the potential applicant no later than 30 days following the filing date of this document. All responses must reference the project number (Dresden Island Hydroelectric Project, FERC No. 12626), and the name and address of the Applicant (Northern Illinois Hydropower, LLC, 801 Oakland Avenue, Joliet, IL 60435).

Comments should address, as appropriate to the circumstances of the request, the:

A. Likelihood of timely license issuance;

B. Complexity of the resource issues;

C. Level of anticipated controversy;

D. Relative cost of the traditional process compared to the integrated process;

E. The amount of available information and potential for significant disputes over studies; and

F. Other factors believed by the commenter to be pertinent.

Respondents must submit an electronic filing pursuant to §385.2003(c) or an original and eight copies of their comments to the Office of the Secretary, Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426.

ATTACHMENT NO. 3

PRE-APPLICATION DOCUMENT

DRESDEN ISLAND HYDROELECTRIC PROJECT, FERC No. 12626

July 16, 2008

NORTHERN ILLINOIS HYDROPOWER, LLC.

DRESDEN ISLAND HYDROELECTRIC PROJECT

FERC No. 12626

PRE-APPLICATION DOCUMENT

July 2008

Prepared by:

Kleinschmidt

Energy & Water Resource Consultants

NORTHERN ILLINOIS HYDROPOWER, LLC.

DRESDEN ISLAND HYDROELECTRIC PROJECT
FERC No. 12626

PRE-APPLICATION DOCUMENT

July 2008

Prepared by:

Kleinschmidt
Energy & Water Resource Consultants

DRESDEN ISLAND HYDROELECTRIC PROJECT
FERC No. 12626

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

ACOE	U.S. Army Corps of Engineers
ALP	Alternative Licensing Process
Applicant	Northern Illinois Hydropower, LLC
CE	Commonwealth Edison
CEII	Critical Energy Infrastructure Information
CFR	U.S. Code of Federal Regulations
Commission	Federal Energy Regulatory Commission
DOI	Department of the Interior
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
IHPA	Illinois Historic Preservation Agency
ILP	Integrated Licensing Process
INHS	Illinois Natural History Survey
Initial License	License Application
MWRD	Metropolitan Water Reclamation District of Greater Chicago
NEPA	National Environmental Policy Act
NIH	Northern Illinois Hydropower, LLC
NIPC	Northern Illinois Planning Commission
NMFS	National Marine Fisheries Service
NPS	National Park Service
NOI	Notification of Intent
NWI	National Wetland Inventory
PAD	Pre-Application Document
Project	Dresden Island Hydroelectric Project
TLP	Traditional Licensing Process

DRESDEN ISLAND HYDROELECTRIC PROJECT
FERC No. 12626

PRE-APPLICATION DOCUMENT

1.0 INTRODUCTION

Northern Illinois Hydropower, LLC ("NIH" or "Applicant") is filing with the Federal Energy Regulatory Commission ("FERC" or "Commission") its required Pre-Application Document (PAD) for the proposed Dresden Island Hydroelectric Project (FERC Project No. 12626 (Project or Dresden Island)). On April 12, 2006 FERC issued NIH a three-year Preliminary Permit for the site. NIH proposes to construct a new powerhouse at the existing U.S. Army Corps of Engineers (ACOE) Dresden Island Lock and Dam to accommodate a turbine generating system with an approximate maximum head of 21.75 ft. NIH expects 59,300 MWh estimated annual generation at the Project. NIH proposes to construct and operate the Project pursuant to the information provided in the Application for Preliminary Permit filed with FERC on November 29, 2005 and as contained herein.

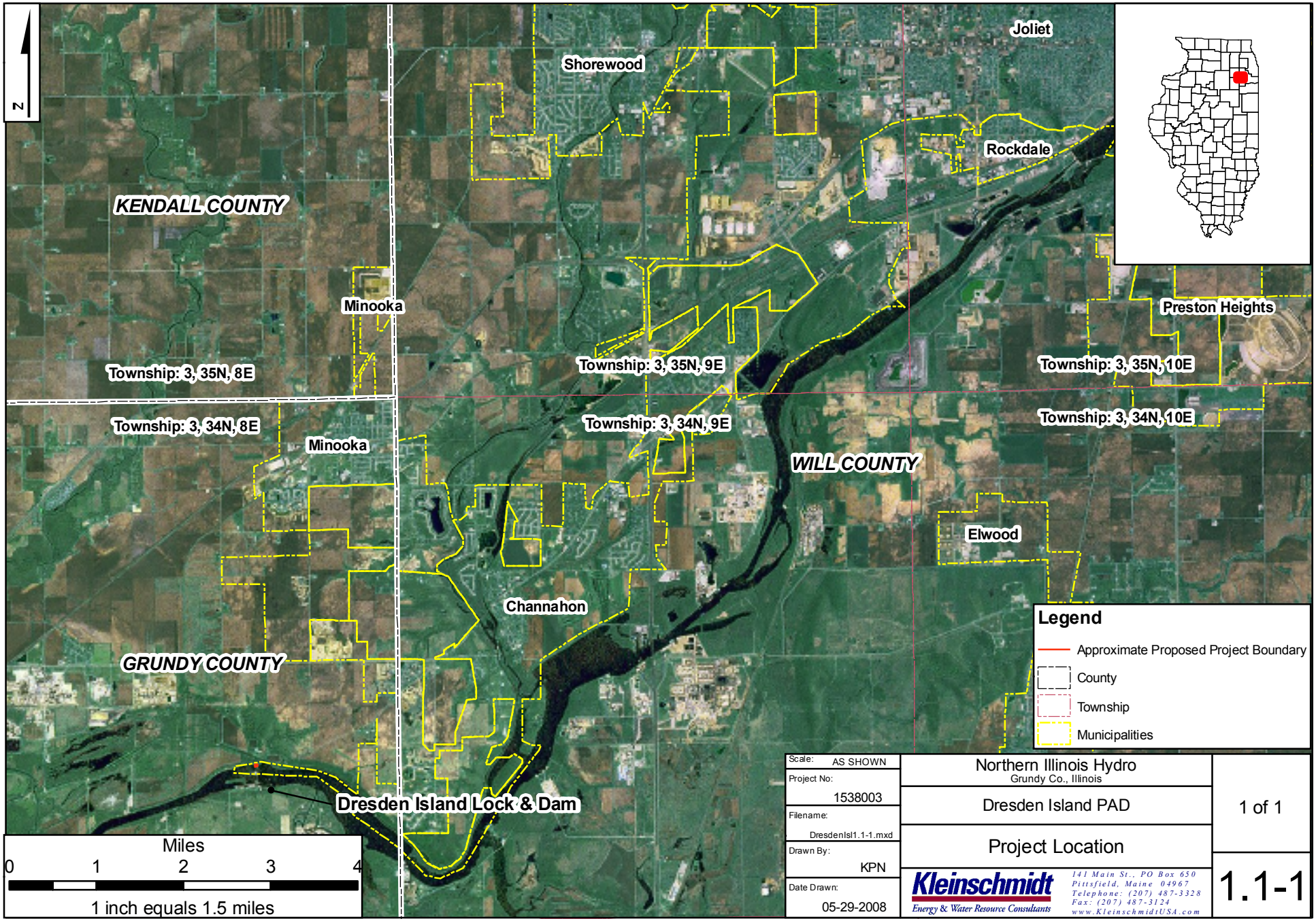
The proposed project is located immediately downstream of the confluence of the Des Plaines and Kankakee River on the Illinois River near the town of Morris. The Project is located 271.5 miles above its confluence with the Mississippi River, and approximately 15 miles southwest of Joliet, Illinois. Figure 1.1-1 provides a map of the Project location. The U.S. Army Corps of Engineers (ACOE) currently operates the Dresden Island Lock and Dam.

As the proposed development will occur at an existing lock and dam structure operated by the ACOE and will incur only minor modifications to the existing structures and surrounding waterway, NIH proposes using FERC's Traditional Licensing Process (TLP) as defined by Title 18 of the U.S. Code of Federal Regulations (CFR), Part 5. This PAD accompanies NIH's Notification of Intent (NOI) to seek an initial license for the Project. 18 CFR § 5.6 (c) and (d) specify the information required in the PAD.

This PAD provides FERC and interested parties with summaries of existing, relevant, and reasonably available information related to the Project that is in the Applicant's possession or it obtained through due diligence. To accomplish this, NIH thoroughly surveyed its own files for relevant information about the Project, reviewed past Preliminary Permits and FERC issued licenses for this site, and comments on the previous permits from state and federal agencies. NIH also contacted numerous agencies to request information and data that they may have about the Project or Project resources. NIH issued a PAD Questionnaire to stakeholders believed to be interested in the project (see Appendix B). NIH also conducted searches of other potential information sources including reference materials and the Internet.

NIH distributed this PAD and NOI simultaneously to FERC, other federal and state resource agencies, local governments, Native American tribes, members of the public, and others potentially interested in the licensing proceeding. Appendix A details the distribution list of the NOI and PAD. This PAD appropriately references all information sources cited and Appendix B contains a record of contacts made with agencies and other organizations to obtain Project resource data and information.

The existing, relevant, and reasonably available information contained in this PAD provides participants in this licensing proceeding the information necessary to identify issues and related information needs; develop study requests and study plans; and to prepare documents analyzing the Application for an Initial License (License Application) that will be filed with FERC on or before April 12, 2009. The PAD is also a precursor to the environmental analysis section of the License Application and to FERC's Scoping documents and Environmental Impact Statement (EIS) or Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). Filing the PAD concurrently with the NOI enables those who plan to participate in the licensing to familiarize themselves with the Project at the start of the proceeding. This familiarity will lead to enhanced success of FERC's Scoping process.


N
Joliet
Shorewood
Rockdale
KENDALL COUNTY
Minooka
Preston Heights
Township: 3, 35N, 8E
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Township: 3, 35N, 10E
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Township: 3, 34N, 10E
Minooka
WILL COUNTY
Elwood
Channahon
GRUNDY COUNTY
Dresden Island Lock & Dam
Miles
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Legend
Approximate Proposed Project Boundary
County
Township
Municipalities
Scale: AS SHOWN
Project No: 1538003
Filename: DresdenIsl1.1-1.mxd
Drawn By: KPN
Date Drawn: 05-29-2008
Northern Illinois Hydro
Grundy Co., Illinois
Dresden Island PAD
Project Location
1 of 1
1.1-1
Kleinschmidt
Energy & Water Resource Consultants
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtUSA.com

1.1 Agents for NIH

The following persons are authorized to act as agent for the applicant pursuant to 18 CFR § 5.6(d)(2)(i):

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1.2 PAD Content

This PAD follows the content and form requirements of 18 CFR 5.6(c) and (d), with minor changes in form for enhanced readability. The PAD is organized as follows:

Section 1.0 – Introduction; Table of Contents; List of Appendices; List of Figures; List of Tables; List of Photos; and Definitions of Terms, Acronyms, and Abbreviations.

Section 2.0 – Proposed Communication Protocols and TLP Flow Chart

Section 3.0 – General Description of the River Basin, per 18 CFR § 5.6(d)(3)(xiii)

Section 4.0 – Description of Project Location, Facilities, and Operation, per 18 CFR § 5.6(d)(2)

Section 5.0 – Description of the Existing Environment by Resource Area, per 18 CFR § 5.6(d)(3)(ii)-(xii)

Section 6.0 – Description of Impacts, Issues, Study and Information Needs, Resource Measures, and Existing Plans, per 18 CFR § 5.6(d)(3) and (4)

Appendices

Appendix A – Distribution List

Appendix B – Summary of Contacts and Consultation

Appendix C – Flow Duration Curves

Appendix D – Study Plans

Beginning on July 23, 2005, the Integrated Licensing Process (ILP) became FERC's default relicensing process. To use a different relicensing process such as the TLP or the Alternative Licensing Process (ALP), NIH must obtain FERC's permission based on a set of criteria outlined in 18 C.F.R. §5.3. As part of this filing NIH requests FERC's approval to use the TLP for the Dresden Island Project. Figure 1.3-1 depicts the regulatory milestones of the TLP using the timeline associated with the Dresden Island licensing process with the assumption that FERC approves use of the TLP.

Table 1.3-1. Dresden Island licensing timeline.

Responsible Entity	License Application Schedule Milestones	Date
NIH	Applicant files Notice of Intent and Pre-Application Document. Applicant requests use of Traditional Procedures	7/11/2008
NIH, Participants	Stakeholder meeting	8/1/2008
FERC	Commission Notice, Comments on use of TLP	8/10/2008
NIH, Participants	Joint agency/stakeholder meeting	8/28/2008
Participants	Study requests due	9/27/2008
NIH	Submit draft license application to agencies for review	12/1/2008
Participants	Comments on draft license application	3/2/2009
Participants	Joint meeting to discuss draft license application	3/9/2009
NIH	**File Final License Application (FLA)**	**4/12/2009**
FERC	Issue Director's Determination on any Additional Study Requests and Notification of any Deficiencies (w/in 30 days of FLA)	5/12/2009
FERC	Issue FERC Acceptance Notice and Ready for Environmental Analysis (REA) Notice	Summer 2009
Participants	File Comments, Interventions and 10(a) Recommendations (w/in 60 days of FERC Acceptance Notice)	Fall 2009
FWS, DEP	File 10(j) Recommendations	Fall 2009
NIH	Request Water Quality Certificate (WQC) from MD and WV (w/in 60 days of REA notice).	Fall 2009
FERC	Issue Environmental Assessment (EA); Issue Biological Assessment (if any); Issue draft Programmatic Agreement for Historic Properties (if any)	Early 2010
Participants	File Comments on EA (w/in 30 days of EA)	Early 2010
DEP	Issue Final WQC	Early 2010
FERC	Issue any New License Order	Spring 2010

2.0 PROPOSED COMMUNICATIONS PROTOCOLS

NIH will carefully document the entire licensing process, including any information received from the interested parties as well as records of communications. NIH will make information related to the licensing of the Dresden Island Project available through its licensing website at www.NIHydropower.com, by emailing requests to info@NIHydropower.com, or at its corporate offices in Joliet, Illinois by special appointment.

2.1 Documents and Mailing Lists

A library of copies of all mailing lists, announcements, notices, communications, and other documents related to the licensing of the Project will be maintained at the corporate offices in Joliet, IL. Anyone may obtain documents from this library by contacting Dennis Cohil at 801 Oakland Avenue, Joliet, IL 60435, at (815) 723-6314, or by emailing a request to info@NIHydropower.com. NIH will post documents and contact information on its website with the exceptions cited below.

Certain Project-related documents are restricted from public viewing in accordance with FERC regulations. Critical Energy Infrastructure Information (CEII) (18 CFR §388.113) related to the design and safety of dams and appurtenant facilities, and that is necessary to protect national security and public safety are restricted. Anyone seeking CEII information from FERC must file a CEII request. FERC's website at http://www.ferc.gov/help/filing-guide/ceii-request.asp contains additional details related to CEII. NIH will allow limited access to documents containing sensitive information regarding specific cultural or environmental resources to authorized entities.

2.1.1 Mailing Lists

There are two categories of participation in a FERC licensing and each requires different notification or frequency and type of communication. Interested Parties are a broad group of individuals and governmental and NGOs that have an interest in the licensing; sometimes this group is referred to as "stakeholders." NIH will maintain a mailing list of all Interested Parties. The list

will include both standard U.S. Post Office addresses and available email addresses for distributing notices and documents for public review.

After NIH files its License Application (scheduled for 2009), FERC will establish an official Service List for parties who formally intervene in the proceeding. Intervention is a formal legal process in the FERC regulations. Additional information may be found on FERC's website at http://www.ferc.gov. Once FERC establishes a Service List, any written documents filed with FERC must also be sent to the Service List. A Certificate of Service must be included with the document filed with FERC.

2.1.2 Public Reference File

The Applicant will maintain a public reference file in their office in Joliet, Illinois as well as online at www.NIHydropower.com . The public reference file is a listing of important materials pertaining to the licensing. This includes background reference material as well as the consultation record, all relevant studies and data collected during the development of the PAD, meeting summaries, notices, and reports, as well as Project documents such as the current FERC license. Hard copies of the PAD and other documents filed with FERC are available upon request or at the Joliet Public Library, 150 N. Ottowa Street, Joliet, IL 60432.

2.2 Communications Protocols

2.2.1 Document Distribution

NIH will distribute, whenever possible, all documents electronically in PDF format. NIH may distribute hard copies of some documents for convenience or by request. Distribution of information will follow the guidelines presented below (Table 2.2.1-1).

Table 2.2.1-1. Document distribution for the Dresden Island Licensing FERC Project No. 12626.

Document	Method	Distribution
Public Meeting Notices	Initial meetings by U.S. Mail and Newspapers. Thereafter by Email, and/or newspaper	Public and all Potential Interested Parties
Meeting Agendas	Email	Interested Parties
Meeting Summaries	Licensing website	Interested Parties
Process Plan & Schedule	Licensing website	Interested Parties
Major Documents: PAD, FERC Scoping Documents, Proposed Study Plans, Study Reports, Draft license Application, etc.	Licensing website (notice of availability by email), CD-ROM upon request, and view at Joliet Public Library	Service List, noted Interested Parties, Requesting Agencies
PAD support documents	Licensing website (notice of availability by email), CD-ROM upon request	Service List
FERC License and related documents	Licensing website (notice of availability by email), CD-ROM upon request	Service List
Written Communications	Licensing website (notice of availability by email), CD-ROM upon request	Service List

2.2.2 Providing Documents to NIH

NIH prefers to receive all documents electronically, in an appropriate Microsoft Office format. Email electronic documents to info@nihydropower.com. Hard copy documents may be mailed to Northern Illinois Hydropower, 801 Oakland Avenue, Joliet, IL 60435, at (815) 723-6314. In either case, all documents received become part of the consultation record for the licensing and are available for distribution to the public.

2.2.3 Meetings

NIH recognizes there are a number of agencies, groups, and individuals that may want to participate in the process. NIH will work with all Interested Parties to develop meeting schedules that include practical locations and times to accommodate the majority of participants. FERC Scoping meetings will be publicly noticed and include at least one evening meeting.

NIH will notify all Interested Parties at least two weeks in advance of the next planned public meeting and will maintain a schedule of meetings on its licensing website. At that time, NIH will provide a meeting agenda by email. NIH will also post any documents or other information that will be the subject of meeting discussions on the licensing website.

2.2.4 Study Requests

In the development of the PAD, NIH collected and summarized the information available regarding the Dresden Island Project and its environment. The PAD, however, may also indicate areas where there is limited or no information related to areas of potential critical concern. In those cases, Interested Parties may request additional studies or investigations to add to the knowledge of the Project. The FERC requires specific information from parties requesting studies related to the licensing. Draft study requests should follow the following format; NIH will assist parties with study requests as requested.

As specified by 18 CFR § 5.9(b) of FERC's regulations, any study request must:

- Describe the goals and objectives of each study proposal and the information to be obtained;
- If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

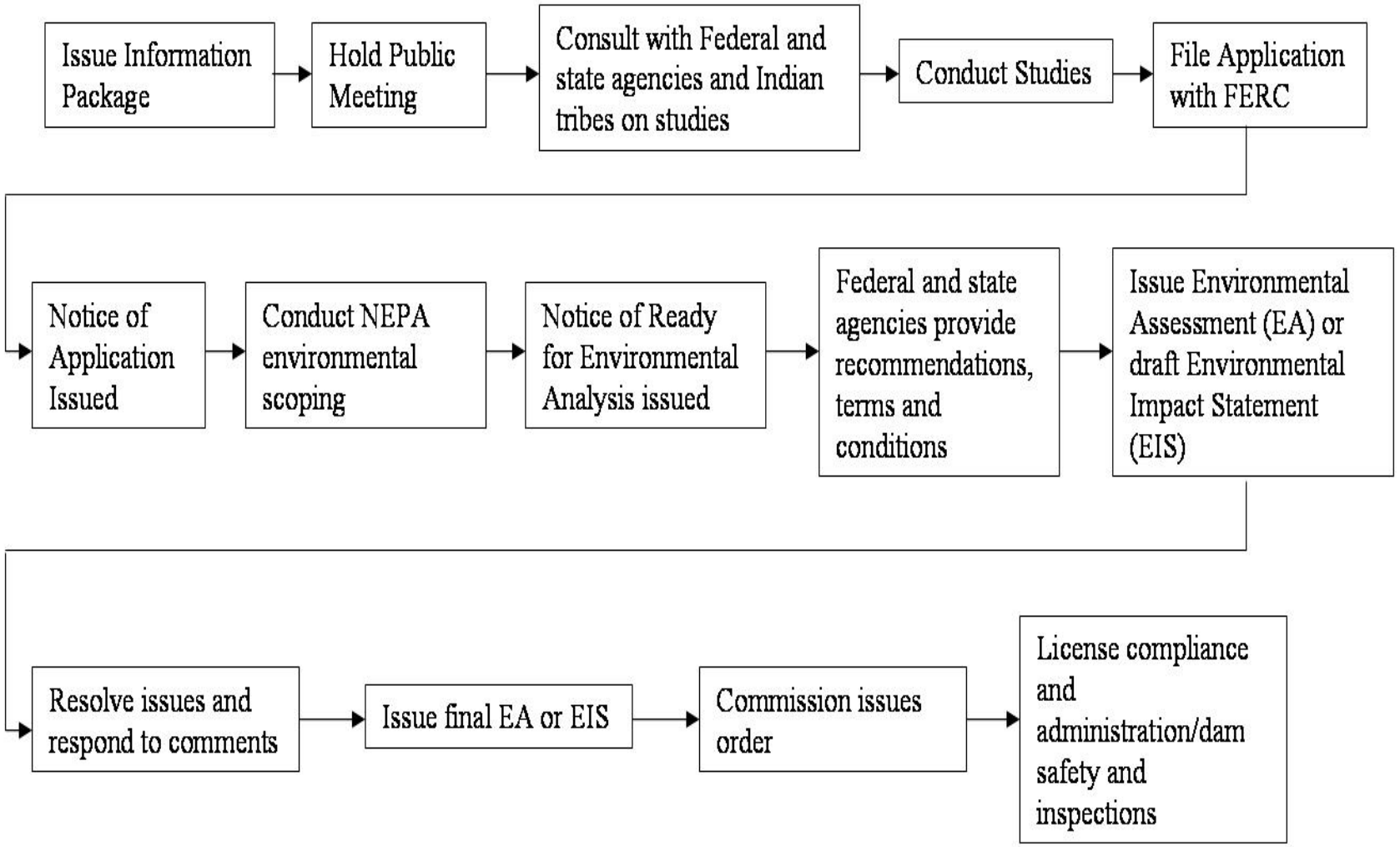
- If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;
- Describe existing information concerning the subject of the study proposal, and the need for additional information;
- Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;
- Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge; and
- Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

The requestor should also describe any available cost-share funds or in-kind services that the sponsor of the request may contribute towards the study effort. Requestors should email completed draft study requests in MS Word format to info@nihydropower.com or mail them to Northern Illinois Hydropower, LLC, 801 Oakland Avenue, Joliet, IL 60435.

2.3 Traditional Licensing Process Flow Chart

Figure 2.3-1 provides a flow chart of the TLP.

Figure 2.3-1. TLP flowchart.



3.0 GENERAL DESCRIPTION OF RIVER BASIN

The Illinois River Basin provides transportation for barge traffic from Lake Michigan in Chicago, Illinois to the Mississippi River at Grafton, Illinois. The Illinois Waterway flows 327 miles through eight navigational pools from Lake Michigan to the Mississippi River. Locks and dams are located at Lockport (mile 291.1), Brandon Road (mile 286.0), Dresden Island (mile 271.5), Marseilles (247.0), Starved Rock (mile 231.0), Peoria (mile 157.7), and LaGrange (mile 80.2) (Village of Rockdale 1990).

The Basin has a drainage area of 28,906 square miles and contains the following major subbasins: Kankakee, Iroquois, Fox, Des Plaines, Chicago, Vermilion, Mackinaw, Spoon, Sangamon and La Moine rivers. The Kankakee and Des Plaines together form the Illinois River. The Dresden Island project is located 1.5 miles below the confluence of the Des Plaines and the Kankakee Rivers (Village of Channahon, 1983). The watershed drains portions of Illinois (24,778 sq. miles), Indiana (3,058 sq. miles), and Wisconsin (1,070 sq. miles) (Illinois State Water Survey, 2003). From the headwaters to the confluence with the Mississippi River in Grafton, Illinois, the Illinois River drains 43 percent of the state of Illinois. Flows in the Des Plaines River are derived principally from three sources: discharge from Chicago area storm drains and sewage treatment plants, flow diversion from Lake Michigan, and runoff from its 1,500 square-mile drainage area. The Des Plaines and the Kankakee rivers drain 2,111 and 5,165 square miles, respectively (Illinois State Water Survey, 2003).

Prior to the Clean Water Act discharges from the Chicago area wastewater treatment facilities and chemical contamination from industrial waste heavily polluted the river system. In the early 20th century, aquatic organisms such as fish and mussels were virtually eliminated from the upper Illinois River (Starrett, 1971; Marseilles Hydro Power, 2001). Since the Clean Water Act the water quality has significantly improved and aquatic life is beginning to recolonize the river system (Sietman *et al*., 2001).

4.0 PROJECT LOCATION, FACILITIES, AND OPERATIONS

The Dresden Island Lock and Dam is located immediately downstream of the confluence of the Des Plaines and Kankakee River on the Illinois River near the town of Morris. The lock and dam is located 271.5 miles above its confluence with the Mississippi River, and about 15 miles southwest of Joliet, Illinois. The ACOE operates the facility.

4.1 Existing ACOE Lock and Dam Facilities

There are no existing hydropower facilities within the proposed project boundary. The following sections describe existing ACOE facilities that are adjacent to the proposed project.

4.1.1 Dam

The Dresden Island Lock and Dam was constructed in the early 1920s and is designed to allow for the future installation of hydroelectric generating facilities. The dam consists of a headgate section, an ice chute, a tainter gate section, a fixed dam overflow section, and an arch dam. The arch is constructed over what was to be the sill of the smaller navigation lock but was never built. The total length of the Lock and Dam from abutment to abutment is approximately 1,320 ft.

The headgate section of the dam is 298 ft long and contains 18 headgates. Each headgate opening measures 16.0 ft high and 13.33 ft wide with the flow line at elevation 488.5 ft NGVD. The headgate section has a crest width of 14 ft at elevation 513.0 ft NGVD, with a lower 5.7 ft wide deck upstream of the gate slot at elevation 509.5 ft NGVD. The piers separating the headgates are 3 ft wide, with every third pier 4 ft wide. Rehabilitation work in 1982 included placement of a 3-ft thick concrete plug in each of the head-gate openings. A very short, earth-fill section connects the head-gate section to the right abutment.

The ice chute is a 30-ft wide concrete ogee section containing a radial gate operated as moveable weir. In its upper position, the gate provides two feet of freeboard above the normal water surface. In its lowered position, the flow line

over the gates is at El. 499.5 ft NGVD, 5 feet below normal water surface permitting large sheets of ice to pass the structure.

The tainter gate section is 616 ft long and contains nine 60-ft wide and 21-ft high gate bays. The flow line at the gate sill is at El. 490.5 NGVD. The ACOE uses the tainter gates to maintain the upper pool at El. 504.5 ft NGVD while passing the river flows.

The fixed dam, located at the south end of the tainter gate sections, is an overflow spillway section approximately 35 ft long with its crest at El. 504.5 NGVD.

The concrete arch dam section, located adjacent to the lock chamber, has a crest length of 110 ft at El. 509.5 ft NGVD.

The useable lock chamber is 110 ft wide by 600 ft long and sealed by miter gates at both ends. The lock, located at the left abutment of the dam, extends over 700 ft downstream. The lock walls are concrete gravity walls with a top width of 10 ft at El. 509.5 ft NGVD. The lock has a maximum lift of 21.75 ft from the normal lower pool elevation of 485.5 ft NGVD to the normal upper pool elevation of 504.5 ft NGVD.

4.1.2 Reservoir

The existing Dresden Island Lock and Dam was constructed as part of the Illinois Waterway System to create a navigational pool for the original 9-ft deep channel. The ACOE holds the upper pool water surface elevation relatively constant at elevation 504.5 NGVD.

4.2 Proposed Project

4.2.1 Proposed Project Boundary

The proposed Project Boundary is identified in Figure 1.1-1. The proposed Project includes only those lands necessary for project operations. The Project Area (land and water within the Project boundary) will include an intake structure, powerhouse, discharge works, and transmission line.

4.2.2 Proposed Infrastructure

The maximum head at the lock is approximately 21.75 ft; however the spillway side of the project experiences approximately 1 ft to 2.5 ft less head depending on flow. NIH currently proposes to install a 10.2 MW capacity powerhouse on the spillway side of the Dresden Island Lock and Dam with an estimated annual energy production of 59,300,000 kWh pending final design and economic analysis. This plant would have three 3.1-m runner diameter Bulb-type Kaplan turbines coupled to a 3,000 rated, 0.9 PF, 3-phase, 60 Hz, 2.3 kV, 150 rpm synchronous type generator.

NIH proposes to install a 75 ft by 125 ft powerhouse between headgate sections 10 through 16 immediately below the existing dam with a 50 ft by 50 ft switchyard adjacent and to the north of the powerhouse building. The existing transmission line is approximately 0.75 mi from the proposed switchyard to a Commonwealth Edison (CE) Substation.

4.2.3 Current and Proposed Operations

The ACOE currently operates the lock and dam to maintain a navigation pool at a constant 504.5 ft NGVD. Because of the established navigation use of the canal system, reservoir storage cannot be assigned to power generation. NIH proposes to operate the plant on a strict run-of-river mode in compliance with the ACOE's reservoir regulation and navigation guidelines.

NIH will control the project with an automated system that will automatically start up, run, and shut down the turbines. The automated control package will have overload, fault, and runaway speed protection. The system will allow the ACOE to modify hydroelectric operations in response to emergencies related to the Lock operation or flood control instantaneously. NIH will purchase new turbines and generators for this hydropower project. The proposed plan is similar to the Recommended Plan contained within the November 1981 Draft Feasibility Report for Hydropower, Dresden Island Lock and Dam, Illinois Waterway, Main Report with an environmental assessment prepared by the ACOE, Rock Island District.

4.3 Other Project Information

4.3.1 Delivery of Water for Non-Power Uses

The State of Illinois owns the water rights at the Dresden Island Lock and Dam. Navigation is the primary water use at the Dresden Island Project; disposal of treated wastewater is also a use of the Illinois Waterway. There are currently no water withdrawals from the Dresden Island Reservoir.

5.0 DESCRIPTION OF EXISTING ENVIRONMENT

5.1 Geology and Soils

5.1.1 Geology

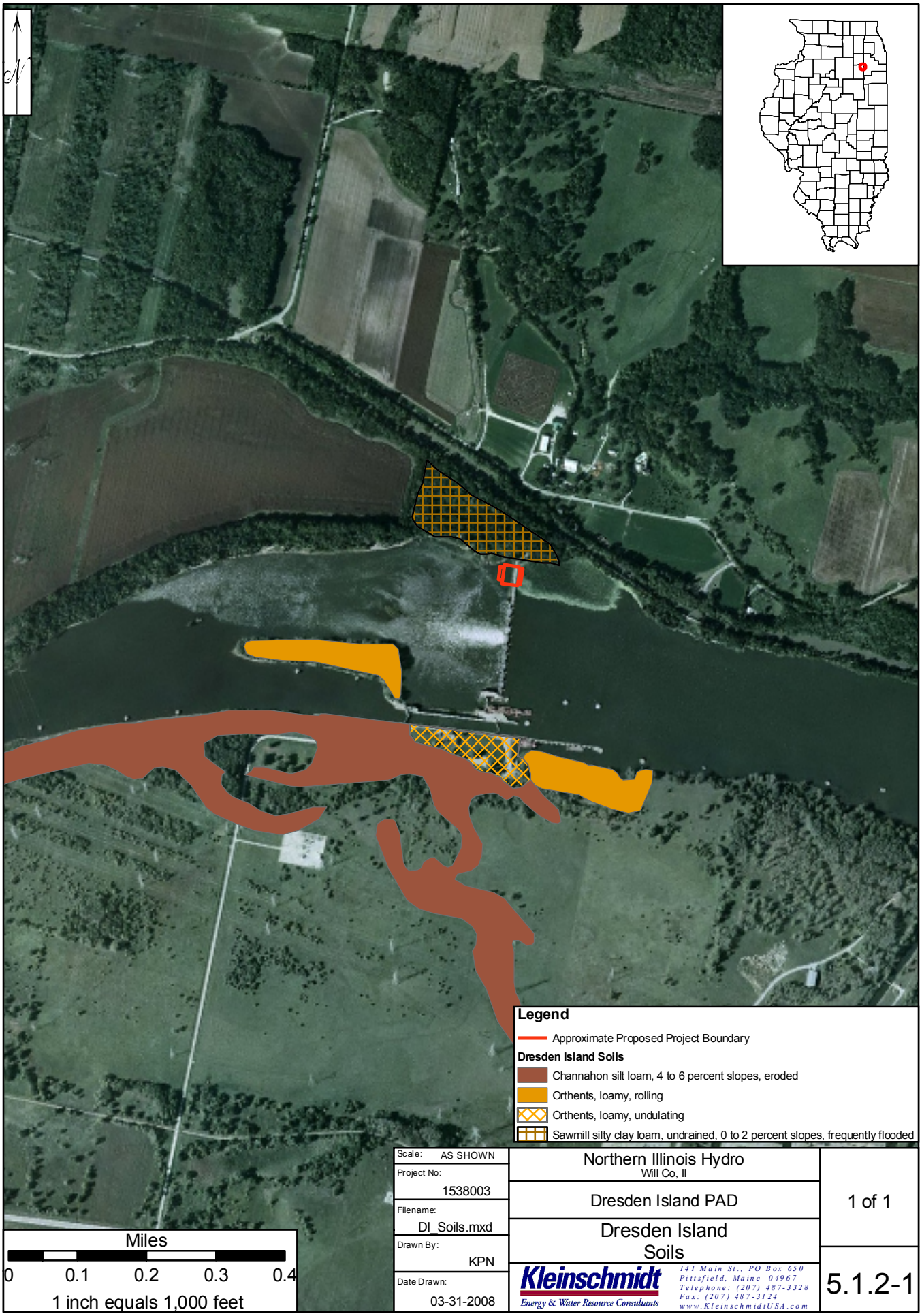
Glacial scour during the Ice Age and filling by glacial melt water formed the Great Lakes Basin. During the Pleistocene, at least four great ice sheets are thought to have influenced the Great Lakes region. These glaciers occurred during the Nebraskan, Kansan, Illinoian, and Wisconsinan glacial ages. The slightly rolling topography in the Des Plaines river valley is the result of advance and retreat of the Wisconsin Glacier, some 10,000 to 14,000 years ago. The Des Plaines River bluffs typically rise 30-40 feet above the valley floor and consist of gravelly till deposited by glacial moraines (MWRD, 1999).

The upper layer of bedrock varies across the area, being primarily of Silurian or Ordovician age, with a smaller portion being of Pennsylvanian age. Precambrian granitic rocks underlie the area at depths ranging from about 1,000 ft below land surface in the northern part of the basin to about 7,000 ft in the southeastern part. Ordovician-aged rocks (Maquoketa Shale) overlie the Cambrian rocks and are composed predominately of limestone and dolomite, but also include some sandstone and shale. These sedimentary rocks include three of the most heavily used aquifers (MWRD, 1999). The Dresden Island Lock and Dam lies on Ordovician-aged bedrock (Maquoketa shale) (ISGS, 1996).

The topography of Dresden Island is relatively flat with elevations varying from 509 ft to 526 ft (NGVD) with the only significant topographic feature being the Kankakee Bluffs, which are 70 to 100 feet high to elevation 624 ft (NGVD), located east of the lock and dam on the north side of the river (Village of Channahon, 1983).

5.1.2 Soils

The project lies in the Central Lowland physiographic area, - a great basin stretching from the Appalachians to the Rocky Mountains. The Central Lowland is one of the richest agricultural areas in the world with extensive flat to rolling topography (MWRD, 1999; USGS, 2003). Black silt with some sand, clay, and organic material compose the surface soil. Soils classified as sawmill silty clay loam with 0 to 2 percent slope occur in the area proposed for the Dresden Island powerhouse. The soil survey also indicates that this property is frequently flooded and undrained (NRCS, 2007). Figure 5.1.2-1 shows other soils near the Dresden Island Lock and Dam.



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Date Drawn:	03-31-2008

Northern Illinois Hydro
Will Co, Il

Dresden Island PAD

Dresden Island
Soils

Kleinschmidt
Energy & Water Resource Consultants
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtUSA.com

5.2 Water Resources

5.2.1 Drainage Area

The drainage area at the Dresden Island Lock and Dam is 7,183 square miles. Flows from the drainage area are derived from three principal sources: spring rains and snowmelt, stormwater runoff and wastewater treatment plants in the Chicago area, and diversions from Lake Michigan for sanitary and navigational purposes.

5.2.2 Existing and Proposed Uses of Water

The primary role of the dam and reservoir is to maintain water at an elevation acceptable for commercial navigation. The ACOE maintains the pool at 504.5 ft. Proposed power generation would take a secondary role to navigation.

5.2.3 Existing Instream Flow

The average annual flow at the Dresden Island site is 6,000 cfs; peak flows occur in spring and minimum flows in the summer and fall. Table 5.2.3-1 provides the mean, minimum, and maximum recorded flow on the Illinois River at Marseilles, IL.

NIH determined mean daily flow at the Dresden Island Lock and Dam by prorating the published mean daily data from the USGS Gage No. 05543500 Illinois River at Marseilles, IL by the ratio of the respective drainage areas raised to the 1.15 power (7,183 sq. mi. / 8,259 sq. mi.$^{1.15}$ where, 7,183 sq. mi. is the drainage area of the Dresden Island Lock and Dam and 8,259 sq. mi. is the drainage area of the Marseilles gage). The analysis used 1985 to 2005 as the period of record. To confirm the accuracy of the calculated flows, NIH compared calculated mean daily flows to the published annual flow duration curve of USACE Gage No. IL04 (1987-2002), located near the Dresden Island Lock and Dam. The two curves were very similar (Kleinschmidt, unpublished data, 2007).

Based on this method, the maximum daily average flow at Dresden Island from 1985 to 2004 was 76,312 cfs. The minimum daily average flow during this time was 393 cfs. The mean daily flow during this period was approximately 6,600 cfs (Kleinschmidt, unpublished data, 2007). Because of required releases from Lake Michigan, flows rarely drop below 2,000 cfs. The ACOE maintains the reservoir above Dresden Island at 504.5 ft NGVD for navigational purposes. Operation of the Dresden lock and dam is run-of-river with no active storage in the reservoir. Twenty-five miles downstream, the Marseilles Lock and Dam controls the normal tailwater pool elevation of 485.5 ft NGVD. During high flows, the tailwater elevation increases, reducing the difference in elevation between the reservoir and the tailwater pool. During the peak flow of record, the difference in the elevation of the upper and lower pools was approximately 1.5 feet. Flow duration curves are provided in Appendix C.

Table 5.2.3-1. Mean, minimum, and maximum recorded flow at USGS Gage 05543500 on the Illinois River at Marseilles, IL. Period of record: 1919 to 2007.

Month	Mean (cfs)	Minimum (cfs)	Maximum (cfs)
January	10,100	2,899	28,430
February	11,600	2,906	25,970
March	15,000	4,748	41,290
April	15,900	6,516	33,180
May	13,700	5,419	35,180
June	11,700	3,978	25,940
July	9,180	3,120	21,020
August	7,870	3,875	19,220
September	7,630	3,345	22,770
October	7,460	2,608	21,050
November	8,450	2,278	24,180
December	9,760	3,551	30,100

Source: USGS 2008

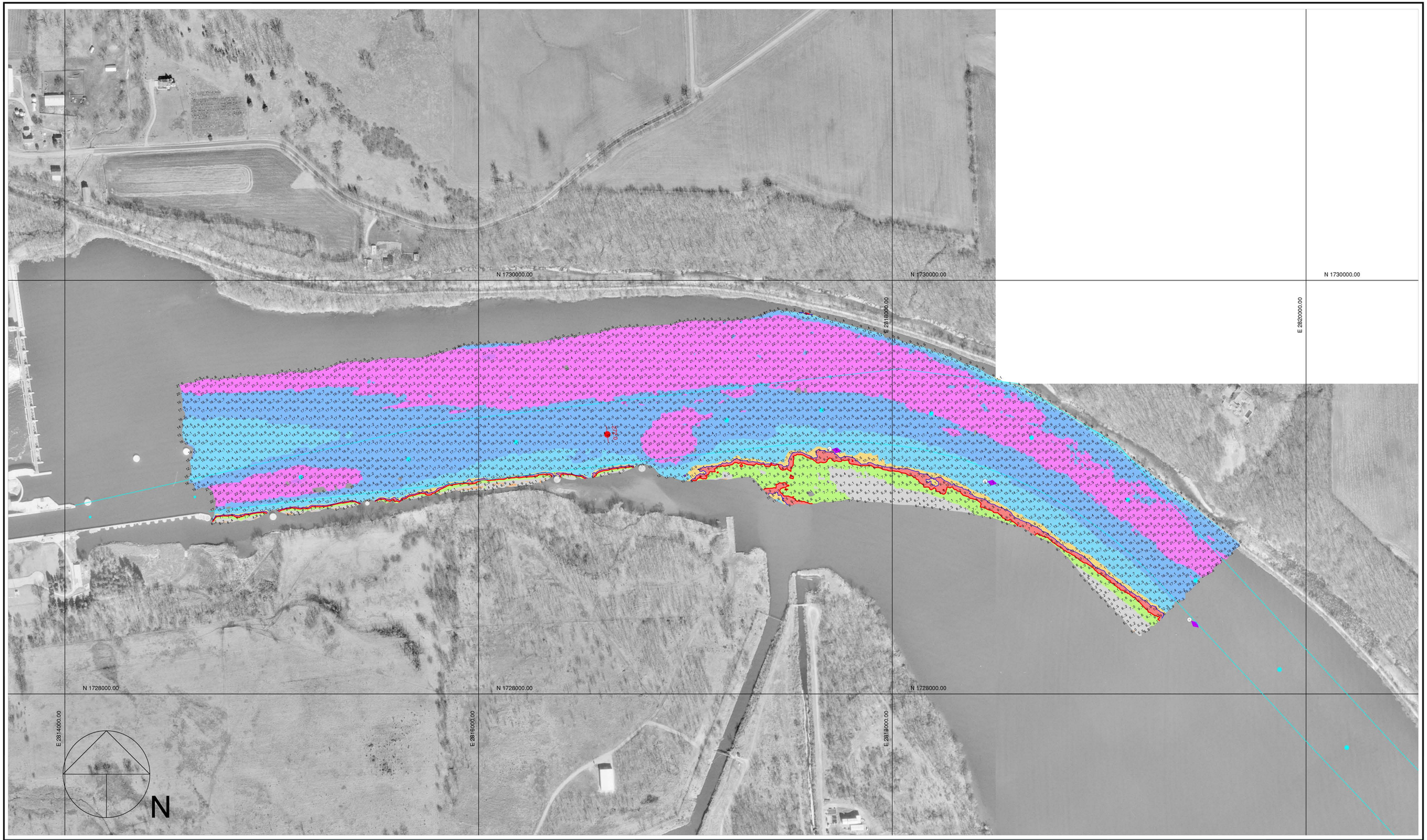
5.2.4 Ownership and Water Rights

The State of Illinois owns the Illinois Waterway, including its lock and dam structures, in title; however, agreements made in 1929 between the State of Illinois and the United States recognize the United States as having sole jurisdiction and control of the waterway, structures and waterpower rights (Chief of Engineers, United States Army, 1930).

The Illinois Department of Natural Resources (IDNR) notes that the State of Illinois owns the land and water rights at the Dresden Island Lock and Dam, that the IDNR administers the use of those lands and waters, and that it requires leases for occupancy of the land and use of the water for generation. A preliminary permit confers no authority to occupy or use lands or other property of the United States or any entity. IDNR indicates that should NIH apply for and obtain from the Commission a license to construct and operate the project, the license should specify a period of time for NIH to obtain rights such as those necessary for project development.

5.2.5 Morphometric Data for Existing Reservoirs

The Dresden Island reservoir experiences some deposition of silt and sediment. The ACOE Rock Island District maintains the navigation channels on the Illinois Waterway by periodically dredging the deposited sediment. The Rivers and Harbors Acts of 1927, 1932, and 1935 stipulate that the District is to maintain a navigation channel not less than 9 feet in depth and 300 feet in width, where feasible. Between 1940 and 2000, The ACOE conducted approximately 66 dredging events removing approximately 372,625 cubic yards of material from the Dresden Island reservoir to maintain the navigation channel. The need for dredging has decreased in the last several decades (ACOE 2003). As a result of this periodic dredging activity, the Dresden Island reservoir is somewhat uniform in depth, as shown in Figure 5.2.5-1 and Figure 5.2.5-2. The majority of the channel is generally between 11 ft and 22 ft deep. From the edges of the navigation channel, the stream bed slopes upward to the shore.



200 0 200 400 600

Scale 1" = 200'

Multi-Transducer Survey with Complete Coverage

Channel Contour Fill Legend:

-10 TO -1 FT	9 FT	11 - 19 FT
0 - 6 FT	10 FT	20 - 29 FT
7 - 8 FT		30 - 50 FT

Location	Stage	Flat Pool
Morris	4.3	482.8
LaSalle	10.2	440.2
Peoria	11.6	440.0
Havana	4.8	429.2
Beardstown	9.1	429.0

Hydrographic Survey of the **Illinois Waterway** Ortho photography flown 1995

Horizontal Projection: State Plane, NAD1983, Illinois West - 1202 U.S. Survey Feet

Vertical Datum: NGVD 1929 U.S. Survey Feet. All soundings adjusted to Flat Pool: 504.5

Water Surface at time of survey: 504.7 / Water Stage: +0.2 Feet

Survey Vessel: MV Hines

Conducted by: Chris Reger and Lee Schweiger

Processed in Autodesk LDDT by: Bob Adams on 9 Jan 2007

File Name: IWW_DR_2716-2726_06A.dwg

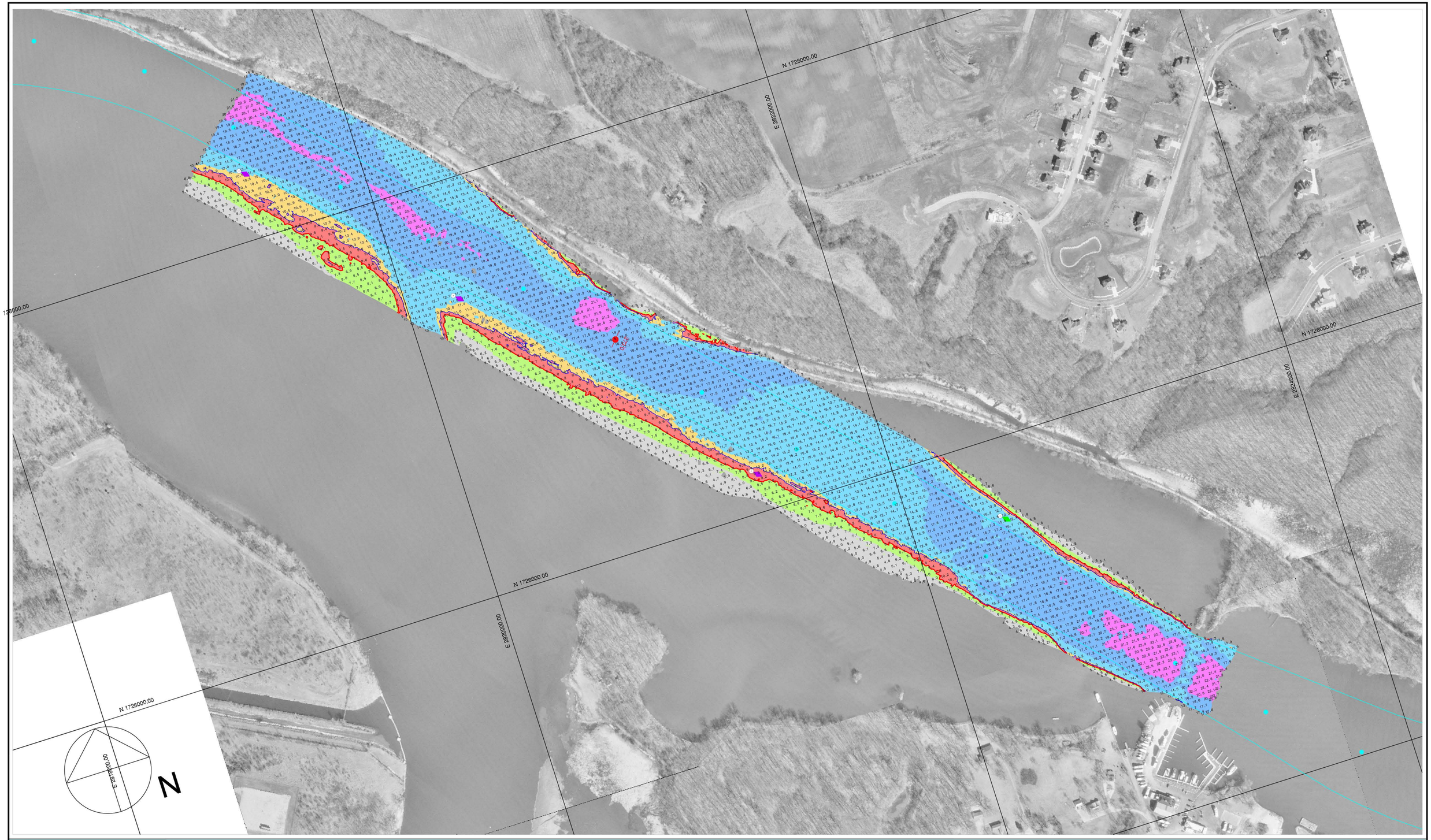
US ARMY CORPS OF ENGINEERS
MVR-ROCK ISLAND DISTRICT
OPERATIONS DIVISION - TECH SUPPORT BRANCH

Dresden Lock Upper

Survey Date: 20 Dec 2006

IWW / Dresden Pool - Reach River Miles: 271.6 - 272.6

I/D



200 0 200 400 600

Scale 1" = 200'

Multi-Transducer Survey with Complete Coverage

Channel Contour Fill Legend:

-10 TO -1 FT	9 FT	11 - 19 FT
0 - 6 FT	10 FT	20 - 29 FT
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Location	Stage	Flat Pool
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Hydrographic Survey of the **Illinois Waterway** Ortho photography flown 1995

Horizontal Projection: State Plane, NAD1983, Illinois West - 1202 U.S. Survey Feet

Vertical Datum: NGVD 1929 U.S. Survey Feet. All soundings adjusted to Flat Pool: 504.5

Water Surface at time of survey: 504.7 / Water Stage: +0.2 Feet

Survey Vessel: MV Hines

Conducted by: Chris Reger and Lee Schweiger

Processed in Autodesk LDDT by: Bob Adams on 9 Jan 2007

File Name: IWW_DR_2726-2736_06A.dwg

US ARMY CORPS OF ENGINEERS
MVR-ROCK ISLAND DISTRICT
OPERATIONS DIVISION - TECH SUPPORT BRANCH

Kankakee to Harborside

Survey Date: 20 Dec 2006

IWW / Dresden Pool - Reach River Miles: 272.6 - 273.6

I/D

5.2.6 Gradient of Downstream Reaches

Below the Dresden Island Lock and Dam the Illinois River is a low-gradient system ranging from 1.1 ft/mi upstream of the Starved Rock Dam (approximately 40 miles downstream of Dresden Island Lock and Dam) to 0.2 ft/mi downstream of the Starved Rock Dam.

5.2.7 Federally Approved Water Quality Standards

Water quality standards provided here are classified as General Use Water Quality Standards of the Illinois Administrative Code Title 35, Subtitle C, Chapter 1, Part 302, Subparts A through F, and apply to the proposed project waters. The general use standards are designed to protect the state of Illinois' water for aquatic life, wildlife, agricultural use, secondary use, most industrial uses, and ensure the aesthetic quality of the state's aquatic environment.

Between March and July, state standards require that DO levels exceed 5 mg/l at any time and must be at least 6.0 mg/l as a daily mean averaged over 7 days. From August to February, DO levels must meet 3.5 mg/l at any time, 4.0 mg/l as a daily minimum averaged over 7 days, and 5.5 mg/l as a daily mean averaged over 30 days (Illinois General Assembly 2008).

By Order of the Illinois General Assembly, temperatures in the river must not exceed the maximum limits provided in Table 5.2.7-1 more than one percent of the hours in the 12-month period ending with any month. At no time should the water temperature exceed the maximum limit by more than 1.7 degrees C (3 degrees F) (Illinois General Assembly 2008).

Table 5.2.7-1. Maximum temperature limits. Source: Illinois General Assembly 2008.

Month	ºC	ºF
January	16	60
February	16	60
March	16	60
April	32	90
May	32	90
June	32	90

Month	ºC	ºF
July	32	90
August	32	90
September	32	90
October	32	90
November	32	90
December	16	60

During the months May through October, based on a minimum of five samples taken over not more than a 30 day period, fecal coliform must not exceed a geometric mean of 200 per 100 ml, nor should more than 10% of the samples during any 30 day period exceed 400 per 100 ml (Illinois General Assembly 2008). In addition, pH is to remain between 6.5 and 9.0 except when due to natural causes. Table 5.2.7-2 provides additional water quality standards for chemical constituents.

Table 5.2.7-2. Water quality standards for various chemicals. Source: Illinois General Assembly 2008.

Constituent	Acute Standard (µg/L)	Chronic Standard (µg/L)
Arsenic (trivalent, dissolved)	360 X 1.0*=360	190 X 1.0*=190
Cadmium (dissolved)	$\exp^{A+Bln(H)}$ X {1.138672-[(lnH)(0.041838)0}*, where A=-2.918 and B=1.128	$\exp^{A+Bln(H)}$ X {1.101672-[(lnH)(0.041838)}]*, where A=-3.490 and B=0.7852
Chromium (hexavalent, total)	16	11
Chromium (trivalent, dissolved)	exp[A+Bln(H)] X 0.316*, where A=3.688 and B=0.8190	exp[A+Bln(H)] X 0.860*, where A=1.561 and B=0.8190
Copper (dissolved)	$\exp^{A+Bln(H)}$ X 0.960*, where A=-1.464 and B=0.9422	$\exp^{A+Bln(H)}$ X 0.960*, where A=-1.465 and B=0.8545
Cyanide	22	5.2
Lead (dissolved)	$\exp^{A+Bln(H)}$ X {1.46203-((lnH)(0.145712)]}*, where A=-1.301 and B=1.273	$\exp^{A+Bln(H)}$ X {1.46203-[(lnH)(0.145712)]}*, where A=-2.863 and B=1.273
Mercury (dissolved)	2.6 X 0.85*=2.2	1.3 X 0.85*=1.1
Nickel (dissolved)	$\exp^{A+Bln(H)}$ X 0.998*, where A=0.5173 and B=0.8460	$\exp^{A+Bln(H)}$ X 0.997*, where A=-2.286 and B=0.8460
TRC	19	11
Zinc (dissolved)	$\exp^{A+Bln(H)}$ X 0.978*, where A=0.9035 and B=0.8473	$Exp^{A+Bln(H)}$ X 0.986*, where A=-0.8165 and B=0.8473

µg/L = microgram per liter
exp[x] = base natural logarithms raised to the x-power,
ln(H) = natural logarithm of Hardness (STORET 00900), and
* = conversion factor multiplier for dissolved metals

5.2.8 Existing Water Quality Data

Industrial and navigational discharges and urban wastewater in the 19th and 20th centuries resulted in contaminated reservoir water and sediments. Wind, wave action, and ship traffic may re-suspend these contaminants. Water quality constituents identified in 1990 as in violation of Illinois state water quality standards near the project site included ammonia, phosphorus, fecal coliform

bacteria, iron, lead, copper, mercury, and DO levels (Village of Channahon, 1990).

Dissolved oxygen (DO) levels in the Illinois River may be low because of the assimilation of waste by the river and the subsequent action of bacteria, blue greens and other living components within the river (biological oxygen demand - BOD) as well as the reactions of the waste with the chemical constituents in the water (chemical oxygen demand – COD). The natural replenishment of DO from air is a slow process. In a slow-moving, pooled river such as the Illinois, it may require many days before DO levels are replenished. As shown in Table 5.2.8-1, DO in the Dresden Island reservoir typically exceeds the state minimum instantaneous DO concentration standard of 5.0. However, DO in the Des Plaines River system can fall below standards in the summer. Between July 1 and September 30 of 2007, DO concentrations measured throughout the Des Plaines River system met or exceeded state standards in 84.2% of the samples (MWRD, 2007).

In this navigational system, aeration at locks and dams provides significant increases in DO. In May, August, and October of 2006, the MWRD measured DO concentrations along the Illinois Waterway. The average DO concentration in the upper Dresden Island reservoir (mile 285) was 8.4 mg/L; DO declined gradually to 7.9 mg/L at mile 272.4 above Dresden Island Dam. Below the dam, at mile 270.0 in Marseilles pool, the average DO concentration was 9.0 mg/L. DO remained between 8.7 mg/L and 9.0 mg/L throughout the Marseilles pool.

Table 5.2.8-1 provides water quality data taken from the Dresden Island reservoir from 2002 through 2006.

Table 5.2.8-1. Summary of water quality data from the Dresden Island reservoir in May, August, and October of 2002 through 2006. Source: Metropolitan Water Reclamation District of Greater Chicago 2002, 2003, 2004, 2005, and 2006.

Constituents [a]	2002		2003		2004		2005		2006	
	Range	Average	Range	Average	Range	Average	Range	Average	Range	Average
Water Temperature (°C) [b]	14.2 - 34.1	23.5	15.0 - 31.0	21.8	16.1 - 32.1	24	12.8 - 33.7	24.5	15.6 - 33.1	22.7
TSS	5.0 - 97.0	26.7	10 - 91	30	10 - 185	33	<3 - 69	14	7 - 320	33
Turbidity (NTU) [b]	6.7 - 164.3	33.7	16 - 160	38	15 - 864	67	4 - 69	17	9 - 174	29
Conductivity (mS/cm) [b]	591 - 1,121	795	677 - 1079	882	690 - 1,219	901	582 - 1,265	884	647 - 1,277	910
BOD_5	<2 - 8	3	<2 - 10	4	<2 - 19	4	<2 - 9	4	<2 - 6	3
Dissolved Oxygen (DO) [b]	5.9 - 10.7	7.9	5.7 - 10.0	7.8	5.9 - 11.5	7.8	5.4 - 11.1	7.9	5.6 - 9.7	7.8
pH (units) [b]	7.1 - 8.5	7.5	6.7 - 8.1	7.4	7.2 - 8.1	7.6	7.2 - 8.2	7.6	7.3 - 7.9	7.5
NH_4-N	0.07 - 0.30	0.19	0.17 - 0.63	0.32	0.07 - 0.62	0.3	0.06 - 0.80	0.32	0.02 - 0.52	0.23
Un-ionized Ammonia	0.001 - 0.013	0.004	<0.001 - 0.016	0.004	0.003 - 0.020	0.008	0.001 - 0.021	0.007	<0.001 - 0.009	0.004
TKN	0.46 - 1.56	1.2	0.58 - 2.91	1.27	0.45 - 2.85	1.06	0.73 - 1.93	1.19	0.89 - 2.27	1.43
NO_2+NO_3-N	2.39 - 6.18	4.61	3.04 - 6.31	4.22	3.30 - 7.51	5.83	2.45 - 8.40	5.8	3.57 - 7.5	5.37
TN	3.63 - 7.42	5.81	4.29 - 7.74	5.49	4.07 - 8.93	6.89	3.18 - 9.72	6.99	4.69 - 9.36	6.80
TP	0.36 - 1.59	0.9	0.30 - 1.69	0.90	0.58 - 2.05	1.2	0.66 - 1.77	1.22	0.58 - 1.78	0.97
Chlorophyll a (µg/L)	4.5 - 35.8	13.3	4.2 - 40.4	15.6	2.2 - 43.6	18	1.7 - 37.8	15	2 - 34	10
Total Cyanide	<0.002 - 0.005	0.003	<0.002 - 0.003	0.003	<0.002 - 0.006	0.003	<0.003 - 0.005	0.003	<0.003 - 0.004	0.003
Phenols	0.001 - 0.019	0.01	<0.003 - 0.014	0.008	0.004 - 0.015	0.009	<0.003 - 0.013	0.008	All values <0.005	<0.005
FC (cfu/100 ml) [c]	10 - 430	59	20 - 1500	216	<10 - 2,900	73	<10 - 600	87	<10 - 6,000	240
E. coli (cfu/100 mL)							<10 - 170	29	<10 - 6,500	137

[a] ***Expressed in mg/L except where noted.***

[b] ***Field measurement.***

[c] ***Geometric mean.***

5.2.9 Existing Sediment Data

Table 5.2.9-1 provides trace metals data from sediments collected in the Dresden Island pool in October 2004, 2005, and 2006. The existing data show detectable levels of several trace metals including copper, lead, iron, and mercury. Elevated levels of metals can restrict dredging and disposal methods. Additional sediment sampling is scheduled to occur during the summer of 2008, as described in Section 6.0.

The applicant plans to conduct an additional sediment analysis in the Dresden Island impoundment, as the existing data is not specific to the proposed Project forebay. The target survey area encompasses approximately 1.5 acres both upstream and downstream of the existing dam. Contractors will collect sediment cores by boat at specific locations recorded using GPS within the defined target area and will submit samples to a certified laboratory for chemical and pollutant analysis. NIH developed its sampling and testing protocol in coordination with the Illinois Environmental Protection Agency (IEPA) and the Illinois Department of Natural Resources (IDNR).

Table 5.2.9-1. Trace metals in sediments.

	2004		2005		2006	
	Range	**Average**	**Range**	**Average**	**Range**	**Average**
Total Arsenic	<0.003 - 0.007	0.003	<0.003 – 0.003	0.003	<0.02 - 0.02	0.02
Dissolved Arsenic	All values <0.002	0.002	<0.002 – 0.009	0.002	<0.01 - 0.01	0.01
Total Cadmium	<0.0004 - 0.0010	0.0004	<0.0004 – 0.0024	0.0008	<0.002 - 0.005	0.002
Dissolved Cadmium	<0.0003 - 0.0005	0.0003	<0.0003 – 0.0015	0.0005	<0.0004 - 0.0016	0.0007
Total Chromium	<0.004 - 0.009	0.004	<0.004 – 0.006	0.004	0.0007 - 0.0339	0.0048
Dissolved Chromium	<0.0007 - 0.0017	0.001	<0.0007 – 0.0016	0.0009	<0.0005 - 0.0017	0.0008
Total Copper	0.0009 - 0.029	0.016	0.006 – 0.023	0.014	<0.0005 - 0.0430	0.0045
Dissolved Copper	<0.002 - 0.006	0.003	<0.002 – 0.003	0.002	<0.002 - 0.002	0.002
Total Iron	0.283 - 5.436	0.908	0.177 – 1.073	0.343	0.26 - 9.85	1.06
Dissolved Iron	0.004 - 0.057	0.016	0.004 – 0.039	0.016	<0.004 - 0.87	0.029
Total Lead	0.007 - 0.018	0.011	<0.002 – 0.018	0.007	<0.003 - 0.051	0.008
Dissolved Lead	0.0021 - 0.0126	0.006	<0.0009 – 0.0076	0.0029	<0.004 - 0.009	0.005
Total Manganese	0.0193 - 0.1272	0.0402	0.0177 – 0.0494	0.0306	0.0215 - 0.2033	0.0433
Dissolved Manganese	0.0010 - 0.0303	0.0121	<0.0004 – 0.0264	0.0108	0.0012 - 0.0357	0.0204
Total Mercury (ug/L)	<0.06 - 0.75	0.12	<0.05 – 0.12	0.05	<0.05 - 0.29	0.07
Dissolved Mercury (ug/L)	<0.06 - 0.48	0.15	All values <0.05	<0.05	<0.05 - 0.14	0.07
Total Nickel	0.003 - 0.010	0.006	<0.002 – 0.007	0.004	0.003 - 0.014	0.005
Dissolved Nickel	0.002 - 0.009	0.004	0.002 – 0.005	0.004	0.002 - 0.0043	0.0029
Total Silver	<0.0008 - 0.0321	0.0009	<0.0008 – 0.0008	0.0008	<0.0006 - 0.0013	0.0007
Dissolved Silver	All values <0.0003	0.0003	<0.0003 – 0.0003	0.0003	All values	<0.0006
Total Zinc	0.024 - 0.071	0.04	0.013 – 0.085	0.032	0.015 - 0.219	0.038
Dissolved Zinc	0.005 - 0.021	0.014	<0.002 – 0.023	0.014	0.008 - 0.043	0.016

Source: Metropolitan Water Reclamation District of Greater Chicago, 2004, 2005, and 2006.

5.3 Fish and Aquatic Resources

5.3.1 Overview of Fish Resources

Due to historic high levels of pollution, the river did not support a significant fishery of any kind in the late 1920s; however, with improvement of water quality over the last decade, the Illinois River is now a growing fishery. The Illinois Natural History Survey (INHS) documented the increase of fish species and populations from 1957 to the present (INHS, 2006). Metropolitan Water Reclamation District of Greater Chicago (MWRD) has also sampled the Upper Illinois Waterway for over 10 years. A study of the Upper Illinois Waterway conducted for Commonwealth Edison (CE) in 1993 and 1994 included samples from the Dresden Pool (CE, 1996a). In addition, Midwest Biodiversity conducted fisheries surveys throughout the Des Plaines River and Illinois River in 2006 (Midwest Biodiversity, unpublished data, 2006).

These fishery studies indicate that aquatic resources remain limited by water quality and lack of suitable habitat in the man-made canals that make up the impoundments both upstream and downstream of the Project. Dissolved oxygen improves below the lock and dam due to the turbulence associated with the structures. The improved dissolved oxygen has produced an improved fishery and the resumption of bank fishing (Village of Rockdale, 1983). In some sites, fish abundance increased over 100 percent, and several additional species were encountered (Village of Rockdale, 1983; Village of Rockdale, 1990).

In the INHS study, nine species accounted for 95.5% of the total catch in the upper Illinois River near the project. These species included gizzard shad (*Dorosoma* cepedianum), bluntnose minnow (*Pimephales* notatus), emerald shiner (*Notropis atherinoides*), spotfin shiner (*Cyprinella spiloptera*), blackstripe topminnow (*Fundulus notatus*), bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), orangespotted sunfish (*Lepomis humilis*), and rock bass (*Ambloplites rupestris*) (INHS, 2006). Bluegill and bluntnose minnow were the two most dominant species totaling

36.4% and 24.3% of the catch, respectively. Bluegill was also dominant downstream of Dresden Island, however; gizzard shad became more dominant than bluntnose minnow (INHS, 2006).

The Illinois Waterway provides a means by which Great Lakes species such as yellow perch (*Perca flavescens*) and alewife can enter the Illinois River from Lake Michigan. The diverse Mississippi River fauna, including many minnows and suckers, can also access Lake Michigan through the waterway. Currently, approximately 46 species may be found in the project area; however, a combination of prolific pelagic species (*e.g.*, gizzard shad and emerald shiner) and highly pollutant tolerant species (*e.g.*, bluntnose minnow and common carp (*Cyprinus carpio*)) now dominate the fishery (Table 5.3.1-1).

The CE report notes that the fish communities in the upper and lower Dresden Pool and downstream of Dresden Lock and Dam are similar and noticeably more diverse than upstream of Brandon Road Lock and Dam (CE, 1996b). The majority of spawning in Upper Dresden Pool (RM 285.5-284.4) is by rough and forage fish species (CE, 1996b). Together the gizzard shad, common carp, and bluntnose minnow accounted for 49 percent of the larval and juvenile fish in Upper Dresden Pool. Approximately 35 percent of the larval and juvenile fish in the Upper Dresden Pool were from the sunfish family, *Lepomis spp.* (CE, 1996b). The spatial distribution and abundance of larvae/juvenile fishes was expected based on the trends observed in the adult populations (CE, 1996b). The CE study did not sample larvae/juvenile fish near the Dresden Island Lock and Dam.

Several other piscivorous fish species occur in the Illinois River. Walleye, sauger (*Stizostedion vitreum*), smallmouth bass (*Micropterus dolomieu*) and white bass (*Morone chrysops*) tend to favor swift moving cooler river channels and eddies behind boulders and rock piles in faster waters. These habitats tend to occur just below lock and dam structures. Largemouth, black crappie (*Pomoxis nigromaculatus*), and sunfish species such as the bluegill prefer shorelines with

aquatic plants that provide cover to ambush prey and to hide from predatory mammals and birds. Channel catfish and grass pickerel (*Essox americanus vermiculatus*) occur in all areas of the Illinois River. Fish deformities, eroded fins, lesions and tumors associated with chemical contamination showed up in less than seven percent of the sampled piscivorous species (CE, 1996b).

Other species found in the Illinois River are scavengers and insectivores that feed on detritus, macroinvertebrates, and decaying matter in the benthos of the river. These species include the common carp, redhorse (*Castomid. Spp.),* smallmouth buffalo (*Ictiobus bubalus*), freshwater drum (*Aplodinotus grunniens*), and catfish. Catfish will feed in the benthos, but are also successful predators of living fish (Marseilles Hydro Power, LLC, 2001). These bottom feeding habits have made these species the most susceptible to fish abnormalities associated with polluted sediments (CE, 1996b). Most (65.8 percent) channel catfish were affected as well as 47.4 percent of the silver redhorse (*Moxostoma anisurum*) and 14 to 30 percent of carp, goldfish, their hybrids, black bullhead (*Ameiurus melas*) and freshwater drum. White sucker (*Catostomus comershonii*) and yellow bullhead (*Ameiurus natalis*) were affected less than other bottom feeders.

Smaller non-game fish include the bluntnose minnow, bullhead minnow, emerald shiner, red shiner (*Cyprinella lutrensis*), golden shiner (*Notemigonus crysoleucas*), silverband shiner (*Notropis shumardi*), and gizzard shad. These fish species provide the forage base for the predatory fish. Shad also play an important role as hosts for the glochidiad stages of mussels and therefore act to spread and maintain the freshwater mussel populations of the Illinois River (Marseilles Hydro Power, LLC, 2001). Fish abnormalities associated with water pollution were also less than seven percent in this group of species.

The upper Illinois River also contains several state protected species. Section 5.7 discusses these species.

Table 5.3.3-1. Fish species likely to be found in the project area.

Common Name	Species Name
alewife	*Alosa pseudoharengus*
black bullhead	*Ameiurus melas*
black crappie	*Pomoxis nigromaculatus*
blackstripe topminnow	*Fundulus notatus*
bluegill	*Lepomis macrochirus*
bluntnose minnow	*Pimephales notatus*
bullhead minnow	*Pimephales vigilax*
carp	*Cyprinus carpio*
central mudminnow	*Umbra limi*
central stoneroller	*Campostoma anomalum*
channel catfish	*Ictalurus punctatus*
common shiner	*Luxilus cornutus*
emerald shiner	*Notropis atherinoides*
fathead minnow	*Pimephales promelas*
freshwater drum	*Aplodinotus grunniens*
gizzard shad	*Dorosoma cepedianum*
golden shiner	*Notemigonus crysoleucas*
goldfish	*Carassius auratus*
grass pickerel	*Esox americanus vermiculatus*
greater redhorse	*Moxostoma valenciennesi*
green sunfish	*Lepomis cyanellus*
largemouth bass	*Micropterus salmoides*
mosquitofish	*Gambusia affinis*
northern pike	*Esox lucius*
orangespotted sunfish	*Lepomis humilis*
pumpkinseed	*Lepomis gibbosus*
red shiner	*Cyprinella lutrensis*
river carpsucker	*Carpoides carpio*
river redhorse	*Moxostoma carinatum*
rock bass	*Ambloplites macropterus*
sauger	*Sander canadensis*
shorthead redhorse	*Moxostoma macrolepidotum*
silver redhorse	*Moxostoma anisurum*
silverband shiner	*Notropis shumardi*
skipjack herring	*Alosa chrysochloris*
smallmouth bass	*Micropterus dolomieu*
smallmouth buffalo	*Ictiobus bubalus*
spotfin shiner	*Cyprinella spiloptera*
spottail shiner	*Notropis hudsonius*
tadpole madtom	*Noturus gyrinus*
walleye	*Sander vitreus*
white bass	*Morone chrysops*
white perch	*Morone americana*
white sucker	*Catostomus commersonii*
yellow bullhead	*Ameiurus natalis*
yellow perch	*Perca flavescens*

5.3.2 Overview of Amphibians and Aquatic Reptiles

A number of reptile and amphibian species occur in Grundy County. Some of the more common species may also use the waters and adjacent lands used by the Project. Table 5.3.2-1 lists potential species that may occur within the Project boundary.

Table 5.3.2-1. Reptiles and Amphibian Species of Grundy County (INHS, 2003).

Scientific Name	**Common Name**
Ambystoma tigrinum	Tiger Salamander
Bufo americanus	American Toad
Bufo fowleri	Fowler's Toad
Acris crepitans	Cricket Frog
Rana blairi	Plains Leopard Frog
Rana clamitans	Green Frog
Rana pipiens	Northern Leopard Frog
Chelydra serpentina	Snapping Turtle
Chrysemys picta	Painted Turtle
Emydoidea blandingii	Blanding's Turtle
Graptemys geographica	Map Turtle
Apalone spinifera	Spiny Shoftshell
Ophisaurus attenuatus	Slender Glass Lizard
Cnemidophorus sexlineatus	Six-Lined Racerunner
Coluber constrictor	Racer
Elaphe vulpina	Fox Snake
Heterodon platirhinos	Eastern Hognose Snake
Nerodia sipedon	Northern Water Snake
Pituophis melanoleucus	Bull Snake
Regina septemvittata	Queen Snake
Thamnophis radix	Plains Garter Snake
Thamnophis sirtalis	Common Garter Snake

5.3.3 Overview of Benthic Macroinvertebrates

Studies conducted by MWRD and CE in 1989, 1991, 1993, and 1994 indicated low quality habitat and a relatively pollution-tolerant invertebrate community in the Upper Illinois Waterway. Habitat condition, sediment and water quality, rather than temperature, appeared to be the primary factors determining benthic invertebrate community composition. Dominant species in the benthic community included sludgeworms (Tubifix), and bloodworms (*Chironomus sp.*), with sludgeworms occurring in massive quantities in the Dresden Island pool (Butts, 1974). These taxa characteristically are capable of surviving low-DO environments such as the soft, fine sediments of many depositional habitats. The 1999 study by MWRD (MWRD, 1999) found a greater number of less tolerant taxa such as caddisflies (*Trichoptera spp.*) and mayflies (*Ephemeroptera spp.*) within the water column where dissolved oxygen was more favorable. Below the Dresden Island lock and dam, the river has a rocky bottom which was relatively devoid of benthic organisms (Village of Channahon, 1983).

While widely distributed in the Illinois River before 1900, pollution and siltation between 1900 and 1930 gradually eliminated mussel species (Starrett, 1971). In 1971, Starrett collected no living mussels from the Starved Rock Dam to the confluence of the Des Plaines and Kankakee Rivers. Improvements in water quality and the elimination of most toxic discharges resulted in the Illinois River now supporting a wide variety of freshwater mussel species (Table 5.3.3-1). In particular, IDNR discovered a mussel bed along the southern shores of Dresden Island downstream from the Lock and Dam. Mucket (*Actinonaias ligamentina*), zebra mussel (*Dreissena polymorpha*), butterfly (*Ellipsaria lineolata*), snuffbox (*Epioblasma triquetra*), round pigtoe (*Pleurobema sintoxia*), pistolgrip (*Tritogonia verrucosa*), elktoe (*Alasmidonta marginata*), creeper (*Strophitus undulates*), deertoe (*Truncilla truncate*), and hickorynut (*Obovaria olivaria*), prefer sand and gravel bottom habitats generally found in faster moving water of river narrows and rapids. Three ridge (*Amblema plicata*), Asian clam (*Corbicula fluminea*), white heelsplitter (*Lasmigona complanata*), fragile papershell (*Leptodea fragilis*), pink heelsplitter (*Potamilus alatus*), pink papershell

(*Potamilus ohiensis*), pimpleback (*Quadrula pustulosa*), mapleleaf (*Quadrula quadrula*), fragile papershell (*Leptodea fragilis*), fluted-shell (*Lasmigona costata*) and salamander mussel (*Simposonaias ambigua*) are more tolerant of slower moving waters resulting from wider section of the river where sediment settles to form muddier bottoms. Flat floater (*Anodonta suborbiculata*) and giant floater (*Pyganodon grandis*) are also found in muddier bottoms but more often in backwater areas of the river (INHS, 2002). The butterfly is an Illinois state threatened mollusk and the snuffbox and salamander mussels are state endangered. Further discussion of threatened and endangered species can be found in Section 5.7.

The INHS conducted a freshwater mussel study from 1993-1995 on the Illinois River (Whitney *et al*., 1997). In the study the investigators found a developing mussel bed on the downstream end of Big Dresden Island which is downstream of the Dresden Island Lock and Dam. At this location the investigators found mucket, elktoe, threeridge, white heelsplitter, flutedshell, fragile papershell, giant floater, pimpleback, mapleleaf, and creeper mussels. The most abundant species was fragile papershell.

Table 5.3.3-1. Mussel species likely to be found in the Project Area (Sietman *et al.*, 2001; Marseilles Hydro Power, 2001).

Common Name	Species Name
mucket	*Actinonaias ligamentina*
zebra mussel	*Dreissena polymorpha*
butterfly	*Ellipsaria lineolata*
snuffbox	*Epioblasma triquetra*
hickorynut	*Obovaria olivaria*
threeridge	*Amblema plicata*
asian clam	*Corbicula fluminea*
white heelsplitter	*Lasmigona complanata*
pink papershell	*Potamilus ohiensis*
pimpleback	*Quadrula pustulosa*
mapleleaf	*Quadrula quadrula*
salamander mussel	*Simposonaias ambigua*
flat floater	*Anodonta suborbiculata*
giant floater	*Pyganodon grandis*
round pigtoe	*Pleurobema sintoxia*
pistolgrip	*Tritogonia verrucosa*
elktoe	*Alasmidonta marginata*
flutedshell	*Lasmigona costata*
creeper	*Strophitus undulatus*
fragile papershell	*Leptodea fragilis*
pink heelsplitter	*Potamilus alatus*
deertoe	*Truncilla truncata*

5.3.4 Essential Fish Habitat As Defined Under Magnuson-Stevens Fishery

The 1996 amendments to the Magnuson-Stevens Act strengthened the ability of National Marine Fisheries Service (NMFS) and the Fishery Management Councils to protect and conserve the habitat of marine, estuarine, and anadromous finfish, mollusks, and crustaceans. This habitat is termed Essential Fish Habitat (EFH) and is broadly defined to include waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. The river in the vicinity of the proposed Brandon Road Project is not designated an EFH and therefore the project would have no effect on EFH.

5.4 Wildlife Resources

The Project is located within an industrialized section of the Upper Illinois Waterway. This does not prevent wildlife from using the land, but it does limit the species to generalist species adapted to human occupation of the land. Wildlife species in the project area include large and small mammals, migratory and resident waterfowl, songbirds, reptiles, and amphibians. Wildlife species commonly found in the forest habitat include white-tailed deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), and black-capped chickadee (*Poecile atricapilla*). The forest habitat is not ideal due to the lack of large continuous tracts of habitat that would provide an interior core for shelter or corridors for migration. Migratory waterfowl such as mallard (*Anas platyrhynchos*), black duck (*Anas rubripes*), and Canada goose (*Branta canadensis*) nest near the lock and dam because the turbulent waters provide productive foraging habitat. Bald eagle (*Haliaeetus leucocephalus*) also use the Illinois Waterway in the winter and fall (Village of Channahon, 1983 and 1990).

5.5 Botanical Resources

The original vegetation along the river was a mosaic of upland forests, dolomite prairies, and wetlands. Much of this natural diversity was lost with industrial development of the area. Three dominant vegetation types - dry prairie/old field/shrub, forest, and wetland presently occur within the project area. These vegetation types are a result of past disturbance, but are now in a stable, somewhat natural state (MWRD, 1999).

The prairie/old field/shrub communities previously disturbed by various activities are in the process of reverting to a more natural setting. The vegetation in these communities is a mixture of dry prairie species and species that typically colonize cleared areas. Typical species include little bluestem (*Schizachyrium scoparium*), side-oats (*Bouteloua curtipendula*), hairy aster (A*ster sp.*), wild carrot (*Daucus sp.*), tall goldenrod (*Solidago sp.*), yarrow (*Achillea sp.*), whorled milkweed (*Asclepias verticillata*), and

white sweet clover (*Melilotus sp*.), with common buckthorn (*Rhamnus cathartica*) and tree of heaven (*Alanthus altissima*) as a shrub layer (MWRD, 1999).

The upland forest in the project area consists of deciduous species, such as box elder (*Acer negundo*), silver maple (*Acer saccharinum*), rock elm (*Ulmus thomasii*), Chinese elm (*Ulmus parvifolia*), hackberry (*Celtis sp*.), green ash (*Fraxinus pennsylvanica*), tree-of-heaven, red oak (*Quercus rubra*), white oak (*Quercus alba*), slippery elm (*Ulmus rubra*), and hickories (*Carya sp.*). Sumac (*Rhus sp*.) and gooseberry (*Ribes sp*.) grow as shrubs in the understory and along the forest edges (Village of Rockdale, 1983).

5.6 Riparian, Wetland, and Littoral Habitat

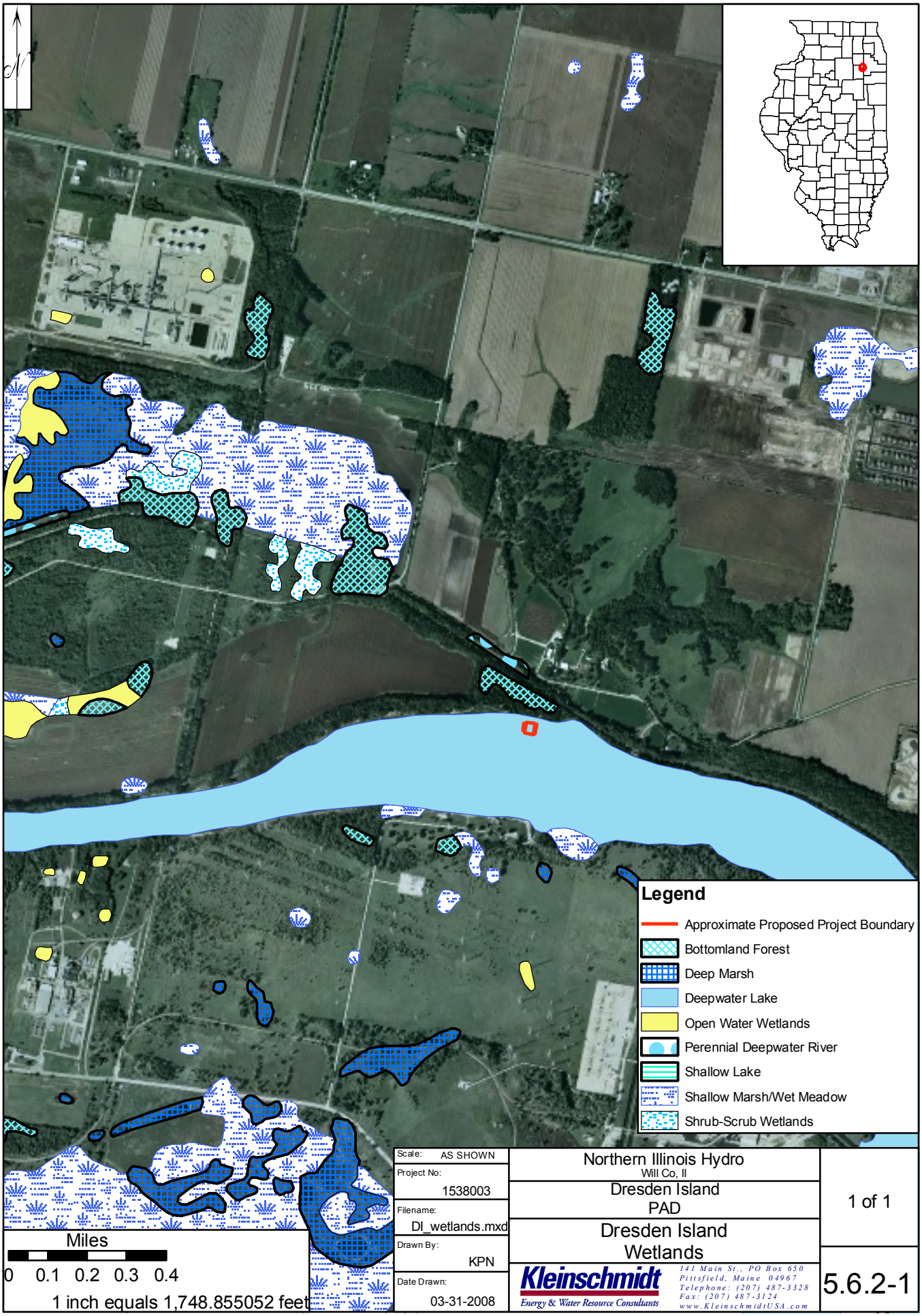
5.6.1 Riparian Habitats

Bottomland forests border the Upper Illinois Waterway in many areas. These forests contain a variety of deciduous species typical of these forests, including hackberry, American elm (*Ulmus americana*), green ash, white ash (Fraxinus americana), silver maple, box elder, sandbar willow (*Salix sp*.), black willow (*Salix nigra*) and cottonwood (*Populus deltoides*.). Undergrowth species that grow in these communities include elderberry (*Sambucus sp*.), dogwood (*Cornus sp*.), riverbank grape (*Vitis sp*.), poison ivy (*Toxicodendron radicans*), giant ragweed (Ambrosia sp.), Virginia creeper (*Parthenocissus quinquefolia*), and black snakeroot (*Sanicula sp*.) (MWRD, 1999).

5.6.2 Wetland Habitats

The wetland systems of the area are primarily associated with river hydrology or associated with isolated depressions. Disturbance activities such as excavation, dikes, or impoundments created many of the isolated wetlands (MWRD, 1999). Cattail (*Typha sp*.), arrowhead (*Sagittaria sp.*), and sedge (*Carex sp*.) growing along the water's edge dominate emergent wetlands in the vicinity of the project (Village of Rockdale, 1983). Figure 5.6.2-1 shows the known wetlands near the Dresden Island Lock and Dam. National Wetland

Inventory (NWI) surveys indicate a 4.92 acre bottomland forested wetland adjacent to the proposed location of the Dresden Island powerhouse (USFWS, 1987). Soil surveys in this area also indicate the presence of possible hydric or wetland soils (NRCS, 2007). Wetland species found in scrub-shrub or bottomland forests include reed canarygrass (*Phalaris arundinacea*), with shrub species such as riverbank grape, smartweed (*Polygonum sp*.), dogwood, sandbar willow, and with a sparse tree cover of black willow, green ash, and cottonwood (MWRD, 1999).



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Dresden Island
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Dresden Island
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5.6.3 Littoral Habitat

CE studied aquatic macrophytes in the Upper Illinois Waterway from 1992 through 1995. The investigations resulted in the identification of 34 distinct aquatic macrophyte taxa, most of which are common and relatively pollution tolerant. Total macrophyte cover strongly correlated with nitrogen levels in interstitial water at the rooting depths. Correlation and ordination analyses showed that macrophyte cover related to sediment type and density. Macrophyte cover was negatively correlated with water depth and turbidity. Temperature positively correlated with total macrophyte cover. These studies also indicated that macrophyte distribution and abundance is most limited by available habitat (CE 1996a). Several areas contained small submersed beds of *Potomageton sp*. and *Elodea canadensis* (MWRD, 1999).

5.7 Rare, Threatened, Endangered and Special Status Species

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of such species. In addition to the federal list of RTE species, the state of Illinois has a separate list of species that are listed as threatened or endangered.

The Dresden Island Lock and Dam is within the known historic range of one federally and state endangered species, the Indiana bat (*Myotis sodalis*). The USFWS also lists the Hine's emerald dragonfly (*Somatochlora hineana*) as an endangered species. The USFWS lists the Sheepnose mussel (*Plethobasus cyphyus*) and Spectaclecase mussel (*Cumberlandia mondonta*) as candidate species in the county. Additionally, the Illinois River Waterway may contain the state endangered snuffbox, salamander mussel, greater redhorse (*Moxostoma valenciennesi*), and pallid shiner (*Hybopsis amnis*) as well as the state threatened butterfly mollusk and river redhorse (*Moxostoma carinatum*).

5.7.1 Federally Listed Species

5.7.1.1 Indiana Bat

On March 10, 1967 the USFWS listed the Indiana bat as an endangered species. The Indiana bat is also an Illinois state endangered species. The Indiana bat may use the proposed project area for foraging and roosting and/or for wintering. Their habitat typically consists of riparian, bottomland, or upland forest, as well as old fields or pastures with scattered trees. These bats hibernate in caves and abandoned mine shafts (hibernacula) from October through April. From April through August, Indiana bats inhabit floodplain, riparian, and upland forests for roosting and foraging habitat. Roosting and maternity habitat consists primarily of live or dead hardwood tree species which have exfoliating crevices, splits, or hollow portions of tree boles and limbs also provide roost sites. Currently, these bats are threatened by disturbance or killing of hibernating and maternity colonies; vandalism and improper gating of hibernacula; fragmentation, degradation, and destruction of forested summer habitats; and use of pesticides and other environmental contaminants (USFWS, 2007).

5.7.1.2 Sheepnose

On April 16, 2007 the USFWS began reviewing the sheepnose mussel for listing as a threatened species. The sheepnose is primarily a larger-stream species. It frequents shallow shoal habitats with moderate to swift currents over coarse sand and gravel (Oesch, 1984). The species occurs in the Kankakee River in Illinois. Creation of impoundments may be one reason for the decline of this species. Impoundments that modify riffle and shoal habitat and generally disrupt hydrology limit this species (USFWS, 2007). Remnant habitats are typically found just downstream of dams.

5.7.1.3 Spectaclecase

On April 3, 2007 the USFWS began reviewing the spectaclecase for listing as a threatened species. The spectaclecase occurs in large rivers and, relative to other mussel species is a habitat specialist. It occurs on outside river bends below bluff lines. It most often inhabits riverine microhabitats sheltered from the main force of current (Baird 2000). This species was historically found in the Des Plaines and Kankakee Rivers (USFWS, 2007).

5.7.1.4 Hine's Emerald Dragonfly

On January 26, 1995 the USFWS listed the Hines's emerald dragonfly (*Somatochlora hineana*) as an endangered species. The Hine's emerald dragonfly lives in calcareous spring-fed marshes and sedge meadows overlaying dolomite bedrock. The species is currently known to occur in the lower Des Plaines River valley. This species is most threatened by the destruction of habitat for development or conversion of land for agriculture (USFWS, 2001).

5.7.2 State Listed Species

5.7.2.1 Mussels

The butterfly and snuffbox freshwater mollusks prefer sand and gravel bottom habitats generally found in faster moving water of river narrows and rapids. Salamander mussels are more tolerant of slower moving waters resulting from wider sections of the river where sediment settles to form muddier bottoms (INHS, 2002). Freshwater mussels would likely be competing with the introduced zebra mussel.

5.7.2.2 Greater Redhorse and Pallid Shiner

The greater redhorse was caught downstream of Dresden Island in 1985. The river redhorse and pallid shiner were also found within the Dresden pool in 1985; river redhorse was detected more recently in 2006

in the tailwater of Dresden Island (IDNR, 2008; Midwest Biodiversity Institute, 2008).

5.8 Recreation and Land Use

The Project boundary includes only existing structures associated with the Dresden Island Lock and Dam facility and the immediate adjacent waterway. Accordingly, it is not accessible to the public.

The land surrounding the proposed Project is primarily agricultural with limited industrial uses. The towns of Morris, 7 miles to the southwest, and Channahon, 5 miles to the northeast, are primarily single family residential communities with some commercial and industrial areas.

5.8.1 Existing Recreation Facilities and Opportunities in the Project Boundary

As the Project boundary encompasses only portions of the Dresden Island dam and adjacent waters required for Project operations, there are no recreational facilities located within the Project boundary; however, the lock is used to transport various recreational watercraft, including yachts, sailboats, runabouts, and jet skis (Grundy County, 2004).

5.8.2 Recreational Opportunities Adjacent to Project Boundary

The ACOE maintains a visitor's observation area located south of and adjacent to the Dresden Island Lock. The observation area is open to the public during daylight hours. Recreation along the river in the area of the Dresden Lock and Dam is used primarily for bank fishing and boating.

The 96-mile Illinois and Michigan Canal (I&M Canal), completed in 1848, connected the Great Lakes to the Mississippi watershed along an Indian portage route and runs parallel to the Illinois River in the vicinity of the Dresden Island Project. The canal helped to transform Chicago from a small settlement to a critical transportation hub between the East and the developing Midwest.

Currently, the towpath trail along the canal is an Illinois state park and runs through a rural and wooded landscape linking a number of towns laid out by the original canal commission. Additional state parks are located along the canal, including Channahon State Park, William G. Stratton State Park, Gebhard Wood State Park, and Buffalo Rock State Park.

In 1984, the I&M Canal was designated as a National Heritage Corridor. National Heritage Areas are established by Congress and conservation, interpretation, and other activities are managed by partnerships among federal, state, and local governments and the public sector. The NPS does not operate any facilities within the I&M Canal corridor; however, the NPS provides technical assistance as well as financial assistance for a limited number of years following designation of National Heritage Areas. The Illinois and Michigan Canal National Heritage Corridor is currently managed by the non-profit Canal Corridor Association. The Association partners with state governments and federal agencies, including the National Park Service, to manage the corridor.

The I&M Canal is also listed under the National Register of Historic Places and is registered as a National Historic Landmark. The I&M Canal corridor offers recreational opportunities for automobile touring, biking, boating, fishing, hiking, camping, and hunting, as well as other outdoor activities and winter activities.

Downstream of the Dresden Island Project is the Starved Rock Lock and Dam, which is adjacent to the Starved Rock State Park. In addition to a Visitor's Center providing historic information about the Illinois Waterway, the park offers hiking, camping, picnicking, hunting, horseback riding, and water-based recreation including fishing and boating. Cross-country skiing and eagle watching are also popular activities within the park (Illinois Department of Natural Resources 2008).

5.8.3 Current ACOE Recreation Use Levels and Capacities

In 2007, 724 completed lockages were made for recreational watercraft at the Dresden Island Lock. During that time, a total of 3,411 total lockages were completed. Table 5.8.3-1 shows the seasonal distribution of recreational lockages and total lockages in 2007 (ACOE 2008). No recreational access is available within the proposed Project boundary, thus no assessment on recreational capacity has been conducted.

Table 5.8.3-1. Seasonal distribution of lockages at Dresden Island Lock.

Month	Recreational Watercraft	Total Vessels
January	0	222
February	0	100
March	7	234
April	43	239
May	98	356
June	111	358
July	129	389
August	102	306
September	121	391
October	98	352
November	13	252
December	2	212
Total	**724**	**3,411**

5.8.4 Shoreline Buffer Zones

While there are no formal shoreline buffer zones for the Dresden Island pool, the State of Illinois, under its 2020 Comprehensive Plan, is attempting to rehabilitate the Illinois River corridor and restore floodplain wetlands.

5.8.5 Regional Needs Identified in Management Plans

The *Grundy County 2020 Comprehensive Land Use Plan* (Grundy County 2004) recommends that Grundy County obtain funding and coordinate with other public and private organizations as necessary to establish a forest preserve system, including a nature preserve. A forest preserve system will be part of a

Greenway/Greenbelt, Farmland Preservation, and Alternate Transportation Plan. This sub-plan will identify significant watersheds and other natural features for preservation in conjunction with the greenbelts that will be created along the outer edges of the urban growth boundaries. The vision is to create an interconnected series of county, state and municipal parks, in addition to greenbelts and linear greenways that will primarily serve to protect natural resources and provide corridors for wildlife. These areas will also provide an array of recreational uses including pathways for pedestrians and bicyclists. The sub-plan will also promote development of a commercial recreation/tourism area along the Illinois River, especially in those areas where extraction operations have been completed and reclaimed (Grundy County 2004).

Some of the areas designated as public or semi-public uses that are already in operation include: the two state parks (William G. Stratton and Gebhard Woods); the Goose Lake Prairie State Natural Area; Heidecke State Fish and Wildlife Area and Lake; the I&M Canal National Heritage Corridor; Dresden Island Lock and Dam; Dresden Nuclear Power Station; and the various private hunting and swimming clubs. A significant portion of the public open space proposed by the Land Use Plan will be recreational and tourism areas which can serve not only the citizens of Grundy County but the surrounding region as well. According to population projections, by 2020 the northeastern Illinois area population will increase by 1,700,000 persons bringing the total to approximately 9,000,000. In order to provide adequate recreational facilities in this region, a tremendous increase in the amount of park camp sites, conservation areas, picnic areas, hiking paths, water trails and nature centers will be needed (Grundy County 2004).

The *Will County, IL Land Resource Management Plan* identifies several county initiatives to develop and protect recreation areas throughout the county, although currently many of the densely developed areas of Will County have Municipal Park Districts to meet recreation needs at a community and neighborhood scale. In general, initiatives involve acquiring land central to the

county for future recreation (Will County Land Use Department 2002), and protecting open space for recreation and to improve water quality, which in turn, would improve water-based recreation.

Various planning commissions and nongovernmental organizations are making efforts in the Greater Chicago Metropolitan Area to identify the green areas in need of protection and enhancement through restoration. The Northern Illinois Planning Commission (NIPC) and Openlands Project developed the *Northeastern Illinois Greenways and Trails Implementation* Program. It serves as a regional guide to opportunities for preservation. Chicago Wilderness, a regional coalition of more than 170 public and private organizations to protect, restore, and manage the region's natural lands, created the *Biodiversity Recovery Plan* (Chicago Wilderness 1999).

Openlands, a non-profit organization, designated the major river corridors in Will County - Des Plaines, DuPage, and Kankakee - regional water trails through a partnership with state and local governments. These Water Trails provide regional tourism and economic benefits, educational and stewardship programs, and recreational opportunities for canoeists and kayakers in northeastern Illinois (Will County Land Use Department 2002).

5.8.6 National Designations

There are no known areas within the proposed project boundary included in or designated for study for inclusion in the National Wild and Scenic Rivers system. There are no areas within the proposed Project boundary that are under the provisions of the Wilderness Act that have been designated as a wilderness area or wilderness study area.

The project is proposed for construction adjacent to the I&M Canal National Heritage Corridor, which runs parallel to the Illinois River in the vicinity of the project. The Canal was also listed as a National Historic Landmark in 1964

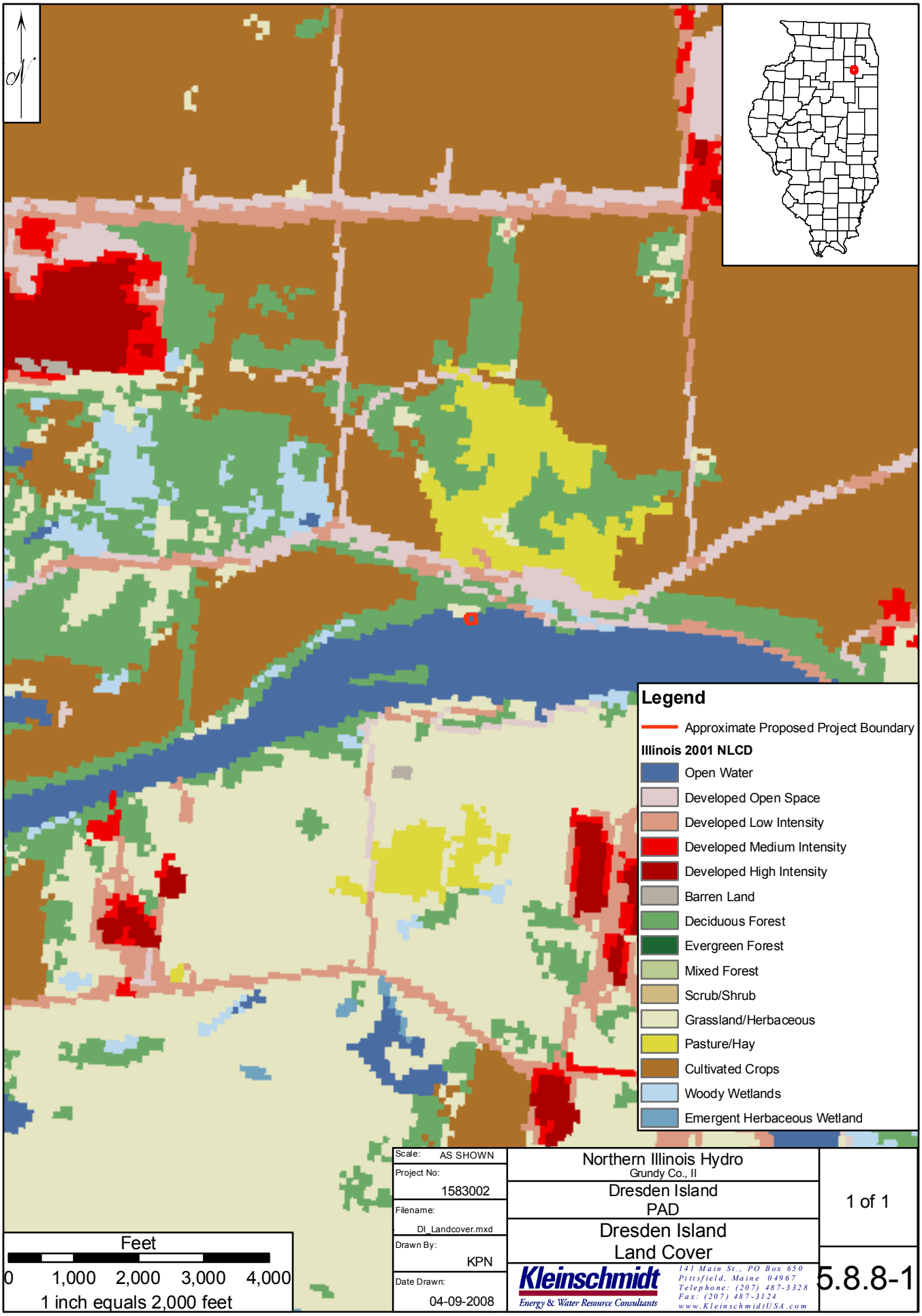
and was listed under the National Register of Historic Places in 1966. Section 5.8.2 provides a description of the canal and its national designation.

5.8.7 Non-Recreational Land Use and Management within the Project Boundary

NIH will use facilities within the Project boundary solely for power production.

5.8.8 Non-Recreational Land Use and Management Adjacent to the Project Boundary

The land surrounding the Dresden Island Project is largely agricultural and residential. Industrial areas and residential areas associated with Channahon and Morris are nearby. As shown in Figure 5.8.8-1, land immediately adjacent to the proposed Project Boundary is mainly agricultural or grassland. Table 5.8.8-1 summarizes land cover information for the Illinois River Basin.



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5.8.8-1

Table 5.8.8-1. Land cover information for the Des Plaines subbasin.

Land Cover Types	Acres
Agricultural Land	10,468,901
Forest Cover	1,702,586
Grassland	1,654,417
Urban Lands	1,517,660
Open Water	229,405
Wetlands	112,468

Source: Charles W. Foors, IDNR, October 30, 2003. Compiled from Land Sat 7 Imagery based on 1999 - 2000 data.

5.9 Aesthetic Resources

5.9.1 Overview

The Project lies in a largely agricultural area along the outside extent of what is considered the Greater Chicago Metropolitan Area. The surrounding landscape is relatively flat, although adjacent to the Dresden Island Lock and Dam the topography shifts from approximately 500 ft to approximately 600 ft in a short distance. A small ridge of bluffs rise abruptly from the floodplain north of the project, running adjacent to the river for several miles. The Dresden Island Lock and Dam itself is composed of a lock chamber and a concrete gravity dam. The total length of the Lock and Dam from abutment to abutment is about 1,320 ft. Photos 5.9.1-1 and 5.9.1-2 show the lock and dam structures. Photos 5.9.1-3 and 5.9.1-4 show the Dresden Island Dam and the surrounding landscape.

Photo 5.9.1-1. Dresden Island Lock and Dam.

Photo 5.9.1-2. Dresden Island Dam (upstream face).

Photo 5.9.1-3. Dresden Island Dam

Photo 5.9.1-4. Shoreline from Dresden Island Dam.

5.9.2 Management Plans

Grundy County provides general guidance regarding the maintenance of natural viewsheds in the County when considering new residential development in rural resource and agricultural resource areas. Resources include farm fields, forests, scenic views, environmentally sensitive areas, and cultural features such as historic sites. However, no specific aesthetics management plans apply directly to the Dresden Island Project

5.9.3 Nearby Scenic Attractions

The Starved Rock State Park, located along the Illinois Waterway at the Starved Rock Lock and Dam Project, approximately 40 miles downstream of the Dresden Island Project, provides overlooks of the lock and dam as well as recreational activities in a hilly and forested natural area that contrasts the flat terrain of much of the surrounding landscape.

5.10 Cultural Resources

5.10.1 National Register of Historic Places

There are no known historic or archaeological sites within the proposed Project boundary that are listed or recommended for the National Register of Historic Places. A portion of the Illinois and Michigan Canal, a National Historic Landmark, is located adjacent to the lock and dam (National Park Service 2008).

The Dresden Island complex has been previously determined to be eligible for listing on the National Register of Historic Places (IHPA, 2001).

5.10.2 Discovery Measures

There are no known ongoing discovery measures such as surveys, inventories, or subsurface testing within the Project boundary.

5.10.3 Sites of Cultural Significance to Indian Tribes

There are no known sites within the proposed Project Boundary that are of religious or cultural significance to Indian Tribes. The federally recognized Peoria Nation, however, may have an interest in the project.

5.11 Socioeconomic Resources

5.11.1 General Land Use Patterns

As noted in Section 5.8, land use around the Dresden Island project is largely agricultural; however, as a "collar" community of the Greater Chicago Metropolitan Area, the population has been dramatically increasing over the past decade, leading to an increased number of housing units and increased urban sprawl. Expansive multi-home developments, associated new support services, and commercial enterprises are replacing previously agricultural lands and open space at a rapid rate.

5.11.2 Population Patterns

The population of Channahon has recently undergone a sharp population increase. Between 1990 and 2000, the population increased from 4,266 to 7,344, a 72% change (Grundy Economic Development Council 2008). Table 5.11.2-1 provides a summary of population distribution information in the vicinity of the Dresden Island project.

Table 5.11.2-1. Population distribution information near the Dresden Island Project.

	Channahon	**Grundy County**	**Illinois**
2000 Population	7,344	37,535	12,419,293
Average Household Size (2000)	3.22	2.6	2.63
Average Family Size (2000)	3.47	3.09	3.23
Total Housing Units (2000)	2,346	15,040	4,885,615

Source: U.S. Census Bureau 2008.

5.11.3 Households/Family Distribution and Income

The median household income in Channahon and Grundy County is significantly higher than the median for Illinois. In addition, the unemployment rate and the percent of individuals below the poverty line are lower in Grundy County and Channahon than in the state of Illinois. Table 5.11.3-1 summarizes economic information in the vicinity of the Dresden Island Project.

Table 5.11.3-1. Economic data for the Dresden Island Project vicinity.

	Channahon	Grundy County	Illinois
Median household income in 1999	$71,991	$51,719	$46,560
Per capita income in 1999	$22,867	$22,591	$23,104
Unemployment rate (2000)	3.7	3.1	3.9
Percent of individuals below poverty line (2000)	1.7	3.4	10.7
Median housing value (owner-occupied units) (2000)	$157,700	$128,600	$130,800

Source: U.S. Census Bureau 2008.

5.11.4 Project Vicinity Employment Sources

The main industries in Grundy County and Channahon are manufacturing, transportation and warehousing, utilities, and educational, health and social services. Table 5.11.4-1 provides a summary of industries in the vicinity of the Dresden Island project. The largest employers in Grundy County include R.R. Donnelley & Sons, Morris Hospital, Exelon – Dresden Station, Lyondell, and Wal-Mart (Grundy Economic Development Council 2008).

Table 5.11.4-1. Distribution of industries (percent of total) in 2000.

	Channahon	Grundy County	Illinois
Agriculture, forestry, fishing and hunting, and mining	0.2	2.2	1.1
Construction	9.1	10.2	5.7
Manufacturing	17.9	17.7	16
Wholesale trade	3.0	2.3	3.8
Retail trade	9.4	11.1	11
Transportation and warehousing, and utilities	13.1	10.5	6
Information	2.8	2.7	3
Finance, insurance, real estate, and rental and leasing	4.2	4.8	7.9
Professional, scientific, management, administrative, and waste management services	6.4	6.2	10.1
Educational, health and social services	19.7	17.0	19.4
Arts, entertainment, recreation, accommodation and food services	7.6	8.0	7.2
Other services (except public administration)	4.1	4.0	4.7
Public administration	2.6	3.2	4

Source: U.S. Census Bureau 2008.

5.12 Tribal Resources

A confederation of tribes known as the Illini originally inhabited areas in the present day State of Illinois, on both sides of the Mississippi and south to the Arkansas River. At the time of the arrival of the Europeans around 1600 there were as many as sixty Illini villages. The numbers of Illini reported by the French in the mid 1650s varied considerably from 2,000 to as many as 20,000 due to constant migrating by many bands. Scholars estimate about 12,000.

The tribe population declined due to the Beaver Wars and epidemics introduced by the Europeans. By 1768 there were only about 1,800 Illini. When tribal enemies attacked this band that number was further reduced to 600. By 1854, there were just 84

left. At this time they united with the Wea and Piankashaw and became the United Peoria Tribe. Today the remnants of the Illini can be found among the Peoria Nation of about 2,000 people living on their Oklahoma reservation (500 Nations 2008).

There are no known tribal cultural or economic interests within the Project boundary or within an area that may be affected by the Project. Project construction and operation should not affect any Indian tribal interests. No other projects in the vicinity likely affect Indian tribe interests.

6.0 PROJECT EFFECTS, ISSUES, STUDIES, AND MEASURES

6.1 Geology and Soils

6.1.1 Potential Studies and Information Gathering Needs

Adequate information exists to assess the resource as it relates to the proposed project. NIH proposes no studies related to geology and soils.

6.1.2 Proposed Protection, Mitigation, and Enhancement Measures

NIH proposes to develop a Construction Erosion and Sedimentation Plan to address the volume, composition, and location of required dredging and spoil disposal and sediment and erosion control during and after construction. NIH will develop this plan in consultation with the appropriate agencies and filed prior to commencement of any construction activities.

NIH proposes to develop a Post Construction Monitoring Plan to be filed following post licensing. NIH will develop the plan in consultation with the appropriate agencies and would address any needs to monitor the project for erosion or runoff.

6.2 Water Resources

Previous studies acknowledge that industrial and navigational discharges and urban wastewater resulted in contaminated reservoir water and sediments at the Dresden Island Lock and Dam. Construction of the Project will likely require dredging and disposing of sediments from the Project impoundments. Additionally, initial operations of the Project may temporarily disturb and displace finer sediment until the channel establishes a new flow pattern.

DO levels in the Illinois River are low because assimilation of waste by the river removes DO from the river water. In this navigational system aeration at locks and dams provides some increases in DO. The addition of a hydroelectric facility may or may not alter the current DO regime. Some types of turbine installations may enhance DO. NIH

is committed to a design and operations regime that maintains the current DO conditions in the system.

6.2.1 Potential Studies and Information Gathering Needs

NIH is proposing to undertake a study to characterize and quantify sediment in the impoundment. Specifically, the objective of the study is to provide a chemical analysis of sediment in the impoundments. The purpose of the study is to identify pollutants in the sediments in areas likely to be disturbed by the proposed project and to use this data to prepare best management practices for construction and operations. Appendix D includes study and sampling methodology.

NIH is proposing to undertake a study to characterize and quantify dissolved oxygen in the impoundment and below the dam. Specifically, the objective of the study is to determine seasonal variations in DO at the site to establish site-specific requirements for operations. Appendix D includes study and sampling methodology.

6.2.2 Proposed Protection, Mitigation, and Enhancement Measures

NIH will use the appropriate Best Management Practices to minimize the likelihood of releasing chemicals contained within the sediments to the water column. Should preconstruction sediment surveys indicate contamination, NIH will develop a plan for disposal of any dredged materials in keeping with Illinois state guidelines for hazardous waste disposal.

To address potential post-construction effects related to sediment dispersal and potential effects to DO, NIH proposes to develop a water quality monitoring plan for the construction phase of the project. This monitoring plan would be developed in consultation with the appropriate agencies. The water quality study would monitor for chemicals and pollutants that are currently contained within the sediments as well as DO.

6.3 Fish and Aquatic Resources (Including Related RT&E and Riparian, Wetland and Littoral Habitat Resources)

IDNR expressed concern regarding the potential effects of project operation on freshwater mussels. Construction activities and sediment displacement related to hydroelectric generation have the potential to displace or harm mussels and cover mussel beds with displaced sediments.

6.3.1 Potential Studies and Information Gathering Needs

NIH proposed to conduct a survey to identify the presence of any federal or state protected freshwater mussel species downstream of the project and within the immediate construction area. Appendix D contains a preliminary study plan mussel survey.

6.3.2 Proposed Protection, Mitigation, and Enhancement Measures

NIH proposes to include in its Construction Plan for the proposed project appropriate best management practices to avoid or minimize any effect of construction activities on fish habitat.

6.4 Wildlife Resources (Including Related RT&E and Riparian, Wetland, and Littoral Habitat Resources)

The Dresden Island Lock and Dam is within the known historic range of the Indiana bat (Myotis sodalis), a federal and state endangered species. The Indiana bat may use the proposed project area for foraging and roosting and/or for wintering. Construction of the Project may temporarily disturb roosting or rearing Indiana bats.

6.4.1 Potential Studies and Information Gathering Needs

NIH proposes no specific studies at this time.

6.4.2 Proposed Protection, Mitigation, and Enhancement Measures

Northern Illinois Hydro proposes to conduct a survey of the dam structure for use by bats prior to construction. NIH will develop the survey in coordination with IDNR. If bats presently use the dam in the area of construction, NIH will develop an appropriate management plan at that time.

6.5 Botanical Resources (Including Related RT&E and Riparian, Wetland and Littoral Habitat Resources)

6.5.1 Potential Studies and Information Gathering Needs

Northern Illinois Hydro believes adequate information exists to assess the resource as it relates to the proposed project. NIH proposes no studies related to botanical resources.

6.5.2 Proposed Protection, Mitigation, and Enhancement Measures

As the construction and operation of the Project will occur exclusively adjacent to and upon the existing dam structures, and will not result in any changes to water levels or shoreline habitat that could potentially affect botanical resources, NIH proposes no specific PM&E measures for this resource.

6.6 Riparian, Wetland and Littoral Habitat

6.6.1 Potential Studies and Information Gathering Needs

Northern Illinois Hydro believes adequate information exists to assess the resource as it relates to the proposed project. NIH proposes no studies related to riparian, wetland, and littoral habitat.

6.6.2 Proposed Protection, Mitigation, and Enhancement Measures

As the construction and operation of the Project will occur exclusively adjacent to and upon the existing dam structures, and will not result in any changes to water levels or shoreline habitat that could potentially affect riparian,

wetland, and littoral habitat, NIH proposes no specific PM&E measures for this resource.

6.7 Rare, Threatened, Endangered, and Special Status Species

Issues and proposed studies relating to rare, threatened, endangered, and special status species are addressed in section 6.3, 6.4, 6.5, and 6.6.

6.8 Recreation and Land Use

6.8.1 Potential Studies and Information Gathering Needs

Adequate information exists to assess the effect of the proposed project on recreation and land use. NIH does not propose any studies at this time.

6.8.2 Proposed Protection, Mitigation, and Enhancement Measures

The construction and operation of the Project will occur adjacent to and upon an existing ACOE lock and dam. Accordingly the Project boundary will not encompass any areas appropriate for recreation or other uses. NIH does not proposed any PM&E measures for this resource.

6.9 Aesthetic Resources

6.9.1 Potential Studies and Information Gathering Needs

Adequate information exists to assess the effect of the proposed project on aesthetic resources. NIH does not propose any studies at this time.

6.9.2 Proposed Protection, Mitigation, and Enhancement Measures

NIH proposes no specific PM&E measures for this resource.

6.10 Cultural Resources

6.10.1 Potential Studies and Information Gathering Needs

Adequate information exists to assess the effect of the proposed project on cultural resources. NIH does not propose any studies at this time.

6.10.2 Proposed Protection, Mitigation, and Enhancement Measures

NIH proposes no specific PM&E measures for this resource.

6.11 Socioeconomic Resources

6.11.1 Potential Studies and Information Gathering Needs

Adequate information exists to assess the effect of the proposed project on socioeconomics. NIH does not propose any studies at this time.

6.11.2 Proposed Protection, Mitigation, and Enhancement Measures

NIH proposes no specific PM&E measures for this resource.

6.12 Tribal Resources

6.12.1 Potential Studies and Information Gathering Needs

Adequate information exists to assess the effect of the proposed project on tribal resources. NIH does not propose any studies at this time.

6.12.2 Proposed Protection, Mitigation, and Enhancement Measures

NIH proposes no specific PM&E measures for this resource.

7.0 RELEVANT PLANS

This section provides, in accordance with 18 CFR § 5.6 (d)(4), a list of relevant federal, state or tribal waterway plans as well as relevant resource management plans that NIH consulted in the development of this PAD.

7.1 Potentially Relevant Qualifying Federal, State, or Tribal Comprehensive Plans

Section 10(a) of the Federal Power Act (FPA), 16 U.S.C. § 803(a)(2)(A), requires FERC to consider the extent to which a project is consistent with Federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the Project. On April 27, 1988, FERC issued Order No. 481-A revising Order No. 481, issued October 26, 1987, establishing that FERC will accord FPA Section 10(a)(2)(A) comprehensive plan status to any Federal or state plan that:

- is a comprehensive study of one or more of the beneficial uses of a waterway or waterways;
- specifies the standards, the data, and the methodology used; and
- is filed with the Secretary of the Commission.

Two comprehensive plans are currently on the Commission's list for the state of Illinois, as well as nationwide federal plans that may address various resources in the state. The following presents a current listing of Commission-approved comprehensive plans that may be applicable to the licensing of the Dresden Island Project:

Table 7-1. List of qualifying federal and state comprehensive Waterway Plans potentially relevant to the Dresden Island Project.

Resource	Comprehensive Plan
Water Resources	Illinois Environmental Protection Agency. 1992. Illinois water quality management plan. Springfield, Illinois. December 1992. 100 pp.
Recreation	Illinois Department of Conservation. 1983. Outdoor recreation in Illinois: 1983 policy plan. Springfield, Illinois. November 1983. 100 pp.
Recreation, Water Resources	National Park Service. 1982. The nationwide rivers inventory. DOI, Washington, D.C. January 1982.
Fisheries	U.S. Fish and Wildlife Service. Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C. 11 pp.

7.2 Potentially Relevant Resource Management Plans

In addition to the qualifying Federal, state, and Tribal comprehensive waterway plans listed in Section 6.5, some resource agencies have developed resource management plans to help guide their actions regarding specific resources of jurisdiction. The resource management plans listed in Table 7-2 may be relevant to the Project and may be useful in the licensing proceeding for characterizing desired conditions.

Table 7-2. List of resource management plans potentially relevant to the Dresden Island Project.

Resource	**Comprehensive Plan**
Wildlife	USFWS. 2001. Hine's Emerald Dragonfly (*Somatochlora hineana*) Recovery Plan. Fort Snelling, MN. 120p.
Wildlife	Chicago Wilderness. 1999. Biodiversity Recovery Plan. Accessed on April 9, 2008 from <http://www.chicagowilderness.org/pubprod/brp/index.cfm>
Land Use	Grundy County. 2004. Grundy County 2020 Comprehensive Land Use Plan. Accessed on April 9, 2008 from <http://www.co.adams.il.us/planning/documents/grundycounty.pdf>
Recreation and Water Resource	Northeastern Illinois Planning Commission. 1999. Northeastern Illinois Regional Water Trails Plan, Executive Summary. Openlands Project, Illinois Paddling Council.

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8.1 Section 3.0. General Description of the River Basin

Marseilles Hydro Power, LLC. 2001. Marseilles Hydroelectric Project License Application (FERC No. 11863).

Illinois State Water Survey. 2003. http://ilrdss.sws.uiuc.edu/maps/maps_thematic/irwsdis.pdf. Accessed March 25, 2008.

Sietman, B.E., S.D. Whitney, D.E., Kelner, K.D. Blodgett, and H.L. Dunn. 2001. Post-extirpation recovery of the freshwater mussel (bivalvia: Unionidae) fauna in the Upper Illinois River. Journal of Freshwater Ecology. Vol. 16. pp. 271-281.

Starrett, W.C. 1971. A survey of the mussels (Unionacea) of the Illinois River: a polluted stream. Illinois Natural History Survey Bulletin. Vol. 30. Article 5. pp. 403.

Village of Rockdale. 1990. Environmental Assessment, Brandon Road Lock and Dam Project. (FERC No. 3944-002)

Village of Channahon. 1983. License application.

8.2 Section 5.1 Geology and Soils

Metropolitan Water Reclamation District of Greater Chicago (MWRD). 1999. Lockport License Application (FERC No. 2866).

Illinois State Geological Survey (ISGS). 1996. Quaternary Deposits of Illinois, 1996. http://www.isgs.uiuc.edu/nsdihome/

Natural Resources Conservation Service (NRCS). 2007. U.S. Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Grundy, Will, and Kendall County, Illinois. Updated 8/2/2007.

U. S. Geological Survey (USGS). 2003. A tapestry of time and terrain: The union of two maps- geology and topography. http://tapestry.usgs.gov/physiogr/physio.html. Last updated April 17, 2003.

Village of Channahon. 1983. License application.

8.3 Section 5.2 Water Resources

Army Corps of Engineers (ACOE). 2003. Summary of Cumulative Dredging, Dredged Material Placement Actions, and Programmatic Environmental Assessment for Future Dredged Material Placement Associated with Channel Maintenance Activities. U. S. Army Corps of Engineers, Rock Island District. February 2003.

Army Corps of Engineers (ACOE) MVR - Rock Island District. 2006. Hydrographic Survey of the Illinois Waterway. Operations Division - Tech Support Branch. Survey Date: 20 Dec 2006.

Chief of Engineers, United States Army. 1930. The Illinois Waterway. War Department Office of the Chief of Engineers. U. S. Government Printing Office.

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Illinois General Assembly. 2008. General Use Water Quality Standards. Title 35, Subtitle C, Chapter I, Part 302 of the General Assembly's Illinois Administrative Code. Accessed online on March 24, 2008 from: http:// www.ilga.gov/commission/jcar/admincode/035/03500302sections.html

Metropolitan Water Reclamation District of Greater Chicago. 2002, 2003, 2004, 2005, 2006. Water and Sediment Quality along the Illinois Waterway from the Lockport Lock to the Peoria Lock.

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Village of Channahon. 1990. Environmental Assessment, Dresden Island Lock and Dam Project. FERC No. 3943-003. July 18, 1990.

8.4 Section 5.3 Fish and Aquatic Resources

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Commonwealth Edison Company and the Upper Illinois Waterway Ecological Study Task Force (CE). 1996a. Final Report. Aquatic Ecological Study of the Upper Illinois Waterway Volume 1 of 2. Commonwealth Edison Company, Chicago, Illinois.

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Illinois Natural History Survey (INHS). 2006. The long-term Illinois River fish population monitoring program. Project F-101-R-17. Annual report to the Illinois Department of Natural Resources. Havana, Illinois.

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Starrett, W.C. 1971. A survey of the mussels (Unionacea) of the Illinois River: a polluted stream. Illinois Natural History Survey Bulletin. Vol. 30. Article 5. pp. 403.

Marseilles Hydro Power, LLC. 2001. Marseilles Hydroelectric Project License Application (FERC No. 11863).

Midwest Biodiversity. 2006. Unpublished data.

MWRD. 1999. Lockport License Application (FERC No. 2866).

Village of Channahon. 1983. License application.

Village of Rockdale. 1983. License Application, Brandon Road Lock and Dam Project.

Village of Rockdale. 1990. Environmental Assessment, Brandon Road Lock and Dam Project. FERC Project No. 3944-002--Illinois.

Whitney, S.D., D.K.Blodgett, and R.E.Sparks. 1997. A comprehensive evaluation of three mussel beds in Reach 15 of the Upper Mississippi River. Onalaska, Wis.: U.S. Geological Survey, Environmental Management Technical Center; Springfield, VA: National Technical Information Service [distributor, 1997].

8.5 Section 5.4 Wildlife Resources

Village of Channahon. 1983 and 1990. License application.

8.6 Section 5.5 Botanical Resources

Metropolitan Water Reclamation District of Greater Chicago (MWRD). 1999. Lockport License Application (FERC No. 2866).

Village of Rockdale. 1983. License application.

8.7 Section 5.6 Riparian, Wetland and Littoral Habitat

Commonwealth Edison Company and the Upper Illinois Waterway Ecological Study Task Force (CE). 1996a. Final Report. Aquatic Ecological Study of the Upper Illinois Waterway Volume 1 of 2. Commonwealth Edison Company, Chicago, Illinois.

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Natural Resources Conservation Service (NRCS). 2007. U.S. Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Grundy, Will, and Kendall County, Illinois. Updated 8/2/2007.

8.8 Section 5.7 Rare, Threatened and Endangered Species

Idaho Department of Natural Resources (IDNR). 2008. Letter from Robert W. Schanzle to Nick Morgan. March 28, 2008.

Illinois Natural History Survey (INHS). 2002. Freshwater Mussel Manual. http://www.inhs.uiuc.edu/cbd/musselmanual/ Last updated Oct. 5, 2002.

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Oesch, R. 1984. Missouri naiades, a guide to the mussels of Missouri. Jefferson City, Missouri: Missouri Department of Conservation.

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USFWS. 2007. Species Assessment and Listing Priority Assignment Form: Sheepnose (*Plethobasus cyphyus*). http://ecos.fws.gov/docs/candforms_pdf/r3/F046_I01.pdf.

8.9 Section 5.8 Recreation and Land Use

ACOE. 2008. Navigation Information. Accessed on April 9, 2008 from <http://www2.mvr.us.army.mil/omni/webrpts/menu.html>.

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Grundy County. 2004. Grundy County 2020 Comprehensive Land Use Plan. Accessed on April 9, 2008 from <http://www.co.adams.il.us/planning/documents/grundycounty.pdf>

Illinois Department of Natural Resources. 2008. Starved Rock State Park. Accessed on April 9, 2008 from <http://dnr.state.il.us/lands/landmgt/parks/i&m/east/starve/park.htm>.

Northeastern Illinois Planning Commission. 1999. Northeastern Illinois Regional Water Trails Plan, Executive Summary. Openlands Project, Illinois Paddling Council.

Will County Land Use Department. 2002. Will County Land Resource Management Plan. Accessed on April 9, 2008 from <http://www.willcountylanduse.com/LRMP/index.html>.

8.10 Section 5.10 Cultural Resources

Illinois Historic Preservation Agency. 2001. Letter to David Boergers, Federal Energy Regulatory Commission. March 8, 2001.

National Park Service. 2008. National Register of Historic Places. Retrieved on April 9, 2008 from <http://www.nps.gov/nr/>.

8.11 Section 5.11 Socio-Economic Resources

U.S. Census Bureau. 2008. American FactFinder, 2006 American Community Survey. Accessed online at: http://factfinder.census.gov

Grundy Economic Development Council. 2008. Employment. Accessed online on April 8, 2008 at: http://www.gedc.com/employment.htm

8.12 Section 5.12 Tribal Resources

500 Nations. 2008. Illinois Tribes. Accessed on April 9, 2008 from http://500nations.com/Illinois_Tribes.asp

APPENDIX A

DISTRIBUTION LIST

Distribution List

Organization	Dept/Office/Div	Contact
Advisory Council on Historic Preservation		
Federal Emergency Management Agency	Regional V	Lee Traeger
Federal Energy Regulatory Commission	Chicago Regional Office	
Federal Energy Regulatory Commission	Hydro East Branch 1	Vince Yearick
Illinois Department of Natural Resources	Illinois Natural History Survey	
Illinois Department of Natural Resources	Office of Resource Conservation	John Buhnerkempe
Illinois Department of Natural Resources	Wildlife Resources Division	
Illinois Department of Natural Resources	Office of Land Management	
Illinois Department of Natural Resources	Office of Realty and Environmental Planning	Bob Schanzle
Illinois Department of Natural Resources	Office of Water Resources, Resource Management Div.	Mike Diedrichsen, P.E.
Illinois Department of Natural Resources	Office of Water Resources, Resource Management Div.	Paul Mauer, P.E.
Illinois Environmental Protection Agency	Watershed Management Section, Bureau of Water	Bruce Yurdin
Illinois Historic Preservation Commission	Division of Preservation Services	Anne Haaker
Canal Corridor Association		Ana Koval
National Park Service	Midwest Region	
National Park Service	Midwest Region - Rivers and Trails	Diana Banta
US Army Corps of Engineers	Chicago District	
US Army Corps of Engineers	Rock Island District	Jim Bartek
US Army Corps of Engineers	Rock Island District	Michael Cox
US Bureau of Indian Affairs	Office of Trust Responsibilities	
US Bureau of Land Management	Eastern States-Milwaukee Office	
US Environmental Protection Agency	Region V	
US Fish and Wildlife Service	Office of Environmental Policy and Compliance	Michael Chezik
US Fish and Wildlife Service	Chicago Field Office	Jeffrey Mengler
US Fish and Wildlife Service	Regional Office	Jeff Gosse
US Fish and Wildlife Service	Rock Island Ecological Services Field Office	Richard Nelson
US Geological Survey		
Will County	County Executive	Larry Walsh
Grundy County Commissioners Office		Francis E. Halpin
City of Joliet	Office of the City Manager	Tom Thanas
Village of Plainfield		Christopher Minick
Village Of New Lenox		Russ Loebe
Village of Mokena		
Village of Romeoville		Ray Holloway
City of Braidwood		Jim Hubbard
Village of Channahon	Administrative Office	Joe Cook
Coal City		
Village of Minooka		
City of Morris		John Enger
City of Wilmington	Wilmington City Hall	Sheila Long
Village of Bolingbrook		Carol Penning
City of Crest Hill		Christine Vershay-Hall
City of Frankfort	Administration Building	Bob Kennedy
Village of Lemont		Charlene Smollen
City of Lockport		Maria Esposito
Village of Orland Park		Paul Grimes
Village of Shorewood-Village Hall		Richard Chapman
Village of Tinley Park		Laura Godette
Village of Manhattan		Marian Gibson

APPENDIX B

SUMMARY OF CONTACTS AND CONSULTATION

The following individuals or organizations were mailed a PAD Questionnaire in 2008. A copy of all completed questionnaires is provided below.

Organization	Dept/Office/Div	Contact
Federal Emergency Management Agency	Regional V	Lee Traeger
Federal Energy Regulatory Commission	Chicago Regional Office	Peggy Harding
Federal Energy Regulatory Commission	Hydro East Branch 1	Vince Yearick
Grundy County Commissioners Office		Francis E. Halpin
Illinois Department of Natural Resources	Illinois Natural History Survey	
Illinois Department of Natural Resources	Office of Resource Conservation	John Buhnerkempe
Illinois Department of Natural Resources	Wildlife Resources Division	
Illinois Department of Natural Resources	Office of Land Management	
Illinois Department of Natural Resources	Office of Realty and Environmental Planning	Bob Schanzle
Illinois Department of Natural Resources	Office of Water Resources, Resource Management Division	Mike Diedrichsen, P.E.
Illinois Department of Natural Resources	Office of Water Resources, Resource Management Division	Paul Mauer, P.E.
Illinois Environmental Protection Agency	Watershed Management Section, Bureau of Water	Bruce Yurdin
Illinois Historic Preservation Commission	Division of Preservation Services	Anne Haaker
National Park Service	Midwest Region	
National Park Service	Midwest Region - Rivers and Trails	Diana Banta
US Army Corps of Engineers	Rock Island District	Jim Bartek
US Bureau of Indian Affairs	Office of Trust Responsibilities	
US Bureau of Land Management	Eastern States-Milwaukee Office	
US Environmental Protection Agency	Region V	
US Fish and Wildlife Service	Office of Environmental Policy and Compliance	Michael Chezik
US Fish and Wildlife Service	Chicago Field Office	Jeffrey Mengler
US Fish and Wildlife Service	Regional Office	Jeff Gosse
US Fish and Wildlife Service	Rock Island Ecological Services Field Office	Richard Nelson
US Fish and Wildlife Service	Rock Island Field Office	Robert Clevenstine
US Geological Survey		
Will County Commissioners Office		James Moustis

In addition, contact was made with the following individuals in development of the PAD.

Organization	Dept/Office/Div	Contact
US Army Corps of Engineers	Rock Island District	Jim Bartek
Illinois Department of Natural Resources	Region 2 (Will County)	Bob Rung
Illinois Department of Natural Resources	Havana Office (Grundy County)	Jim Mick
Illinois Natural History Survey		Dr. Greg Sass
Metropolitan Water Reclamation District of Greater Chicago	Aquatic Ecology Section	Jennifer Wasik
US Fish and Wildlife Service	Rock Island Field Office	Robert Clevenstine
US Fish and Wildlife Service	Chicago Field Office	Jeffrey Mengler

Northern Illinois Hydropower and its engineering and licensing consultant Kleinschmidt met with the ACOE in Rock Island, Illinois on April 29, 2008. The purpose of the meeting was to discuss any potential issues related to the facilities, the facilities' preliminary design, and to collect information and data necessary for the PAD and project development. NIH has scheduled an additional meeting in Springfield, Illinois for the first week of August with the affected agencies.

Dresden Island Project, FERC No. 12626
Brandon Road Project, FERC No. 12717

Pre-Application Document - Information Questionnaire for FERC Licensing

Northern Illinois Hydropower (NIH) is preparing to license two new hydroelectric facilities with the Federal Energy Regulatory Commission (FERC). The proposed Dresden Island Project (FERC No. 12626) would be located on the Illinois River, in Grundy County, Illinois. The proposed project would use the U.S. Army Corps of Engineers' (ACOE) Dresden Island Dam and consist of: (1) a proposed powerhouse containing several generating units with a total installed capacity of approximately 11 mega watts, (2) a short transmission line, and (3) appurtenant facilities. The project would have a total installed capacity of approximately 10 megawatts. The proposed Brandon Road Project (FERC No. 12717) would be located on the Des Plaines River, in Will County, Illinois. The proposed project would use the U.S. Army Corps of Engineers' (ACOE) Brandon Road Dam and consist of: (1) a proposed powerhouse containing several generating units with a total installed capacity of approximately 12 megawatts, (2) a transmission line, and (3) appurtenant facilities. The ACOE will continue to manage and decide all matters associated with water discharge from the dam and all hydroelectric operations will be consistent with and dictated by the ACOE operations plan.

Under FERC regulations, NIH is preparing Pre-Application Documents (PAD) to provide FERC, agencies, and stakeholders with available information pertaining to the Projects. This information will be used to identify issues and information needs regarding the licensing of the project, and to develop preliminary study plans where information gaps may exist. Information gathered for the PAD will be used throughout the licensing process to prepare documents analyzing Project effects. **This questionnaire** will help NIH to identify sources of existing, relevant, and reasonably available information.

1. Contact Information for person completing the questionnaire:

Name & Title:	JAMES BARTEK SUPV. MECHANICAL ENGINEER
Organization:	U.S. ARMY CORPS OF ENGINEERS
Address:	CLOCK TOWER BLDG PO BOX 2004 ROCK ISLAND, IL 61204-2004
Phone:	(309) 794-5599
Email Address:	james.w.bartek@usace.army.mil

2. Do you know of any reasonably available materials or information related to the Project or the Project's environment?

☒ Yes ***(If yes, please complete 2a thru 2f.)*** ☐ No ***(If no, please go to 3.)***

a. Please indicate the specific resource area(s) for which you have information:

- ☒ Geology and soils
- ☒ Water resources
- ☒ Fish and aquatic resources
- ☒ Wildlife and botanical resources
- ☒ Wetlands, riparian, and littoral habitat
- ☒ Rare, threatened & endangered species
- ☒ Recreation and land use
- ☒ Aesthetic resources
- ☒ Cultural resources
- ☒ Socio-economic resources
- ☐ Tribal resources
- ☐ Other resource information

b. Please briefly describe the information or list available documents: ***(Additional information may be provided on a separate page.)***

PLANS/DRAWINGS OF SITES
PREVIOUS NEPA DOCUMENTATION

c. Where and how can NIH obtain this information?

REQUEST AND VISIT THE DISTRICT OFFICE
SIGN A NON DISCLOSURE AGREEMENT

d. Please provide the names of other persons in your organization whom you wish to designate for a potential follow-up contact by NIH's representative for the resource area(s) checked above. If you know of others who are not part of your organization but who may have relevant information, please provide their name(s) and contact information as well. ***(Additional contacts may be provided on a separate page.)***

Representative Contact Information

Name:
Address:
Phone:
Email Address:

Other Contact Information

Name:
Address:
Phone:
Email Address:

e. Based on the resources listed in 2a, are you aware of any specific issues pertaining to the identified resource area(s) such as water quality, wildlife habitat, endangered species or cultural resources that may be affected by the Project operations? ***(Additional information may be provided on a separate page.)***

☐ Yes *(Please list specific issues below.)* ☐ No

Resource Area	Specific Issue

3. Do you or your organization plan to participate in the licensing process for these two Projects?

☒ Yes ☐ No

4. We are interested in your comments. If you have comments and/or questions regarding the Projects, the Pre-Application Document, or FERC licensing, please note them below:

Comments

Please return this Questionnaire to Allison Murray in the enclosed self-addressed, stamped envelope, by FAX to (207) 487.3124, or by email (address below) within 15 days of receipt. Comments and/or questions may be emailed to Allison.murray@kleinschmidtusa.com.

As needed, follow-up contacts will be made by NIH's representative. Not responding within 30 days will indicate that you are not aware of any existing, relevant, and reasonably available information that describes the existing Project environment or known potential effects of the Project.

Dresden Island Project, FERC No. 12626
Brandon Road Project, FERC No. 12717

Pre-Application Document - Information Questionnaire for FERC Licensing

Northern Illinois Hydropower (NIH) is preparing to license two new hydroelectric facilities with the Federal Energy Regulatory Commission (FERC). The proposed Dresden Island Project (FERC No. 12626) would be located on the Illinois River, in Grundy County, Illinois. The proposed project would use the U.S. Army Corps of Engineers' (ACOE) Dresden Island Dam and consist of: (1) a proposed powerhouse containing several generating units with a total installed capacity of approximately 11 mega watts, (2) a short transmission line, and (3) appurtenant facilities. The project would have a total installed capacity of approximately 10 megawatts. The proposed Brandon Road Project (FERC No. 12717) would be located on the Des Plaines River, in Will County, Illinois. The proposed project would use the U.S. Army Corps of Engineers' (ACOE) Brandon Road Dam and consist of: (1) a proposed powerhouse containing several generating units with a total installed capacity of approximately 12 megawatts, (2) a transmission line, and (3) appurtenant facilities. The ACOE will continue to manage and decide all matters associated with water discharge from the dam and all hydroelectric operations will be consistent with and dictated by the ACOE operations plan.

Under FERC regulations, NIH is preparing Pre-Application Documents (PAD) to provide FERC, agencies, and stakeholders with available information pertaining to the Projects. This information will be used to identify issues and information needs regarding the licensing of the project, and to develop preliminary study plans where information gaps may exist. Information gathered for the PAD will be used throughout the licensing process to prepare documents analyzing Project effects. **This questionnaire** will help NIH to identify sources of existing, relevant, and reasonably available information.

1. Contact Information for person completing the questionnaire:

Name & Title:	John Latour, Hydrologist
Organization:	U.S. Geological Survey
Address:	1201 West University Ave., Suite 100
	Urbana, IL 61801-2347
Phone:	217-344-0037 ext 3018
Email Address:	jklatour@usgs.gov

2. Do you know of any reasonably available materials or information related to the Project or the Project's environment?

☑ Yes ***(If yes, please complete 2a thru 2f.)*** ☐ No ***(If no, please go to 3.)***

a. Please indicate the specific resource area(s) for which you have information:

- ☐ Geology and soils
- ☑ Water resources
- ☐ Fish and aquatic resources
- ☐ Wildlife and botanical resources
- ☐ Wetlands, riparian, and littoral habitat
- ☐ Rare, threatened & endangered species
- ☐ Recreation and land use
- ☐ Aesthetic resources
- ☐ Cultural resources
- ☐ Socio-economic resources
- ☐ Tribal resources
- ☐ Other resource information

b. Please briefly describe the information or list available documents: ***(Additional information may be provided on a separate page.)***

Streamgages:
05537980 Des Plaines R. @ Rt 53 @ Joliet
05540500 DuPage R. @ Shorewood
05527500 Kankakee R. near Wilmington
05543500 Illinois R. @ Marseilles

c. Where and how can NIH obtain this information?

Water Data Reports online @:
pubs.usgs.gov/wdr/2005/wdr-il-05/start.htm
wdr.water.usgs.gov

Real-time data online @:
waterdata.usgs.gov/il/nwis/nwis

d. Please provide the names of other persons in your organization whom you wish to designate for a potential follow-up contact by NIH's representative for the resource area(s) checked above. If you know of others who are not part of your organization but who may have relevant information, please provide their name(s) and contact information as well. ***(Additional contacts may be provided on a separate page.)***

Representative Contact Information

Name:
Address:
Phone:
Email Address:

Other Contact Information

Name:
Address:
Phone:
Email Address:

e. Based on the resources listed in 2a, are you aware of any specific issues pertaining to the identified resource area(s) such as water quality, wildlife habitat, endangered species or cultural resources that may be affected by the Project operations? ***(Additional information may be provided on a separate page.)***

3

☐ Yes *(Please list specific issues below.)* ☐ No

Resource Area	Specific Issue
	Not sure probably fish spawning

3. Do you or your organization plan to participate in the licensing process for these two Projects?

☐ Yes ☑ No

4. We are interested in your comments. If you have comments and/or questions regarding the Projects, the Pre-Application Document, or FERC licensing, please note them below:

Comments

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Dresden Island Project, FERC No. 12626
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Under FERC regulations, NIH is preparing Pre-Application Documents (PAD) to provide FERC, agencies, and stakeholders with available information pertaining to the Projects. This information will be used to identify issues and information needs regarding the licensing of the project, and to develop preliminary study plans where information gaps may exist. Information gathered for the PAD will be used throughout the licensing process to prepare documents analyzing Project effects. **This questionnaire** will help NIH to identify sources of existing, relevant, and reasonably available information.

1. Contact Information for person completing the questionnaire:

Name & Title:	Marcia Sieckman, Supervisor Natural Res. Team
Organization:	Bureau of Land Management, Milwaukee Field Office
Address:	626 E. Wisconsin Ave. Suite 200
	Milwaukee, WI 53202
Phone:	414-297-4402
Email Address:	msieckman@blm.gov

2. Do you know of any reasonably available materials or information related to the Project or the Project's environment?

☐ Yes *(If yes, please complete 2a thru 2f.)* ☒ No *(If no, please go to 3.)*

a. Please indicate the specific resource area(s) for which you have information:

- ☐ Geology and soils
- ☐ Water resources
- ☐ Fish and aquatic resources
- ☐ Wildlife and botanical resources
- ☐ Wetlands, riparian, and littoral habitat
- ☐ Rare, threatened & endangered species
- ☐ Recreation and land use
- ☐ Aesthetic resources
- ☐ Cultural resources
- ☐ Socio-economic resources
- ☐ Tribal resources
- ☐ Other resource information

b. Please briefly describe the information or list available documents: ***(Additional information may be provided on a separate page.)***

c. Where and how can NIH obtain this information?

d. Please provide the names of other persons in your organization whom you wish to designate for a potential follow-up contact by NIH's representative for the resource area(s) checked above. If you know of others who are not part of your organization but who may have relevant information, please provide their name(s) and contact information as well. ***(Additional contacts may be provided on a separate page.)***

Representative Contact Information

Name:

Address:

Phone:

Email Address:

Other Contact Information

Name:

Address:

Phone:

Email Address:

e. Based on the resources listed in 2a, are you aware of any specific issues pertaining to the identified resource area(s) such as water quality, wildlife habitat, endangered species or cultural resources that may be affected by the Project operations? ***(Additional information may be provided on a separate page.)***

☐ Yes *(Please list specific issues below.)* ☐ No

Resource Area	Specific Issue

3. Do you or your organization plan to participate in the licensing process for these two Projects?

☐ Yes ☒ No

4. We are interested in your comments. If you have comments and/or questions regarding the Projects, the Pre-Application Document, or FERC licensing, please note them below:

Comments

Please return this Questionnaire to Allison Murray in the enclosed self-addressed, stamped envelope, by FAX to (207) 487.3124, or by email (address below) within 15 days of receipt. Comments and/or questions may be emailed to Allison.murray@kleinschmidtusa.com.

As needed, follow-up contacts will be made by NIH's representative. Not responding within 30 days will indicate that you are not aware of any existing, relevant, and reasonably available information that describes the existing Project environment or known potential effects of the Project.

Dresden Island Project, FERC No. 12626
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Under FERC regulations, NIH is preparing Pre-Application Documents (PAD) to provide FERC, agencies, and stakeholders with available information pertaining to the Projects. This information will be used to identify issues and information needs regarding the licensing of the project, and to develop preliminary study plans where information gaps may exist. Information gathered for the PAD will be used throughout the licensing process to prepare documents analyzing Project effects. **This questionnaire** will help NIH to identify sources of existing, relevant, and reasonably available information.

1. Contact Information for person completing the questionnaire:

Name & Title:	Michael Bryant
Organization:	FEMA RV
Address:	536 S. Clark
	Chicago IL 60605
Phone:	312-408-5341
Email Address:	Michael.Bryant@OHS.gov

2. Do you know of any reasonably available materials or information related to the Project or the Project's environment?

☒ Yes *(If yes, please complete 2a thru 2f.)* ☐ No *(If no, please go to 3.)*

a. Please indicate the specific resource area(s) for which you have information:

- ☐ Geology and soils
- ☒ Water resources
- ☐ Fish and aquatic resources
- ☐ Wildlife and botanical resources
- ☐ Wetlands, riparian, and littoral habitat
- ☐ Rare, threatened & endangered species
- ☐ Recreation and land use
- ☐ Aesthetic resources
- ☐ Cultural resources
- ☐ Socio-economic resources
- ☐ Tribal resources
- ☐ Other resource information

b. Please briefly describe the information or list available documents: ***(Additional information may be provided on a separate page.)***

Flood plain Delineations on the Flood Insurance Rate Maps (FIRM's)

c. Where and how can NIH obtain this information?

Through the County or local community

d. Please provide the names of other persons in your organization whom you wish to designate for a potential follow-up contact by NIH's representative for the resource area(s) checked above. If you know of others who are not part of your organization but who may have relevant information, please provide their name(s) and contact information as well. ***(Additional contacts may be provided on a separate page.)***

Representative Contact Information

Name: Terry Reuss-Fell
Address: 536 S. Clark
Chicago IL 60605
Phone: 312-408-5587
Email Address:

Other Contact Information

Name:
Address:
Phone:
Email Address:

e. Based on the resources listed in 2a, are you aware of any specific issues pertaining to the identified resource area(s) such as water quality, wildlife habitat, endangered species or cultural resources that may be affected by the Project operations? ***(Additional information may be provided on a separate page.)***

☐ Yes *(Please list specific issues below.)* ☐ No

Resource Area	Specific Issue

3. Do you or your organization plan to participate in the licensing process for these two Projects?

☐ Yes ☒ No

4. We are interested in your comments. If you have comments and/or questions regarding the Projects, the Pre-Application Document, or FERC licensing, please note them below:

Comments

Please return this Questionnaire to Allison Murray in the enclosed self-addressed, stamped envelope, by FAX to (207) 487.3124, or by email (address below) within 15 days of receipt. Comments and/or questions may be emailed to Allison.murray@kleinschmidtusa.com.

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1. Contact Information for person completing the questionnaire:

Name & Title: Peggy Harding, Regional Engineer.
Organization: FERC-CRO
Address: 230 S. Dearborn St, RM 3130
Chicago
Phone: 312-596-4438
Email Address: peggy.harding@ferc.gov.

2. Do you know of any reasonably available materials or information related to the Project or the Project's environment?

☐ Yes ***(If yes, please complete 2a thru 2f.)*** ☐ No ***(If no, please go to 3.)***

a. Please indicate the specific resource area(s) for which you have information:

☐ Geology and soils
☐ Water resources
☐ Fish and aquatic resources
☐ Wildlife and botanical resources
☐ Wetlands, riparian, and littoral habitat
☐ Rare, threatened & endangered species
☐ Recreation and land use
☐ Aesthetic resources
☐ Cultural resources
☐ Socio-economic resources
☐ Tribal resources
☐ Other resource information

Receipt acknowledged. Please follow routine FERC filing procedures. DO Leach 4/8/08

b. Please briefly describe the information or list available documents: ***(Additional information may be provided on a separate page.)***

c. Where and how can NIH obtain this information?

d. Please provide the names of other persons in your organization whom you wish to designate for a potential follow-up contact by NIH's representative for the resource area(s) checked above. If you know of others who are not part of your organization but who may have relevant information, please provide their name(s) and contact information as well. ***(Additional contacts may be provided on a separate page.)***

Representative Contact Information

Name:

Address:

Phone:

Email Address:

Other Contact Information

Name:

Address:

Phone:

Email Address:

e. Based on the resources listed in 2a, are you aware of any specific issues pertaining to the identified resource area(s) such as water quality, wildlife habitat, endangered species or cultural resources that may be affected by the Project operations? ***(Additional information may be provided on a separate page.)***

☐ Yes *(Please list specific issues below.)* ☐ No

Resource Area	Specific Issue

3. Do you or your organization plan to participate in the licensing process for these two Projects?

☐ Yes ☐ No

4. We are interested in your comments. If you have comments and/or questions regarding the Projects, the Pre-Application Document, or FERC licensing, please note them below:

Comments

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1. Contact Information for person completing the questionnaire:

Name & Title:	Robert W. Schanzle, Permit Program Mgr.
Organization:	Ill. Dept. of Natural Resources
Address:	One Natural Resource Way
	Springfield Ill 62702-1271
Phone:	217-785-5500
Email Address:	bob.schanzle@illinois.gov

2. Do you know of any reasonably available materials or information related to the Project or the Project's environment?

☒ Yes ***(If yes, please complete 2a thru 2f.)*** ☐ No ***(If no, please go to 3.)***

a. Please indicate the specific resource area(s) for which you have information:

☐ Geology and soils	☐ Recreation and land use
☐ Water resources	☐ Aesthetic resources
☒ Fish and aquatic resources	☐ Cultural resources
☐ Wildlife and botanical resources	☐ Socio-economic resources
☐ Wetlands, riparian, and littoral habitat	☐ Tribal resources
☒ Rare, threatened & endangered species	☐ Other resource information

b. Please briefly describe the information or list available documents: ***(Additional information may be provided on a separate page.)***

Illinois Natural Heritage Database - info on state T/E species

Sietman et al. 2001. Post extirpation recovery of the freshwater mussel fauna in the upper Illinois River.

Whitney et al. 1997 A comprehensive mussel survey of the Illinois River, 1993-95

c. Where and how can NIH obtain this information?

Already forwarded to Nick Morgan of Kleinschmidt Assoc. by letter dated March 28, 2008

d. Please provide the names of other persons in your organization whom you wish to designate for a potential follow-up contact by NIH's representative for the resource area(s) checked above. If you know of others who are not part of your organization but who may have relevant information, please provide their name(s) and contact information as well. ***(Additional contacts may be provided on a separate page.)***

Representative Contact Information

Name:

Address:

Phone:

Email Address:

Other Contact Information

Name:

Address:

Phone:

Email Address:

e. Based on the resources listed in 2a, are you aware of any specific issues pertaining to the identified resource area(s) such as water quality, wildlife habitat, endangered species or cultural resources that may be affected by the Project operations? ***(Additional information may be provided on a separate page.)***

☒ Yes *(Please list specific issues below.)* ☐ No

Resource Area	Specific Issue
Fisheries	State listed fish are known to occur near Dresden L+D
Mussels	A developing mussel bed was identified by Whitney et al. just below Dresden L+D

3. Do you or your organization plan to participate in the licensing process for these two Projects?

☒ Yes ☐ No

4. We are interested in your comments. If you have comments and/or questions regarding the Projects, the Pre-Application Document, or FERC licensing, please note them below:

Comments

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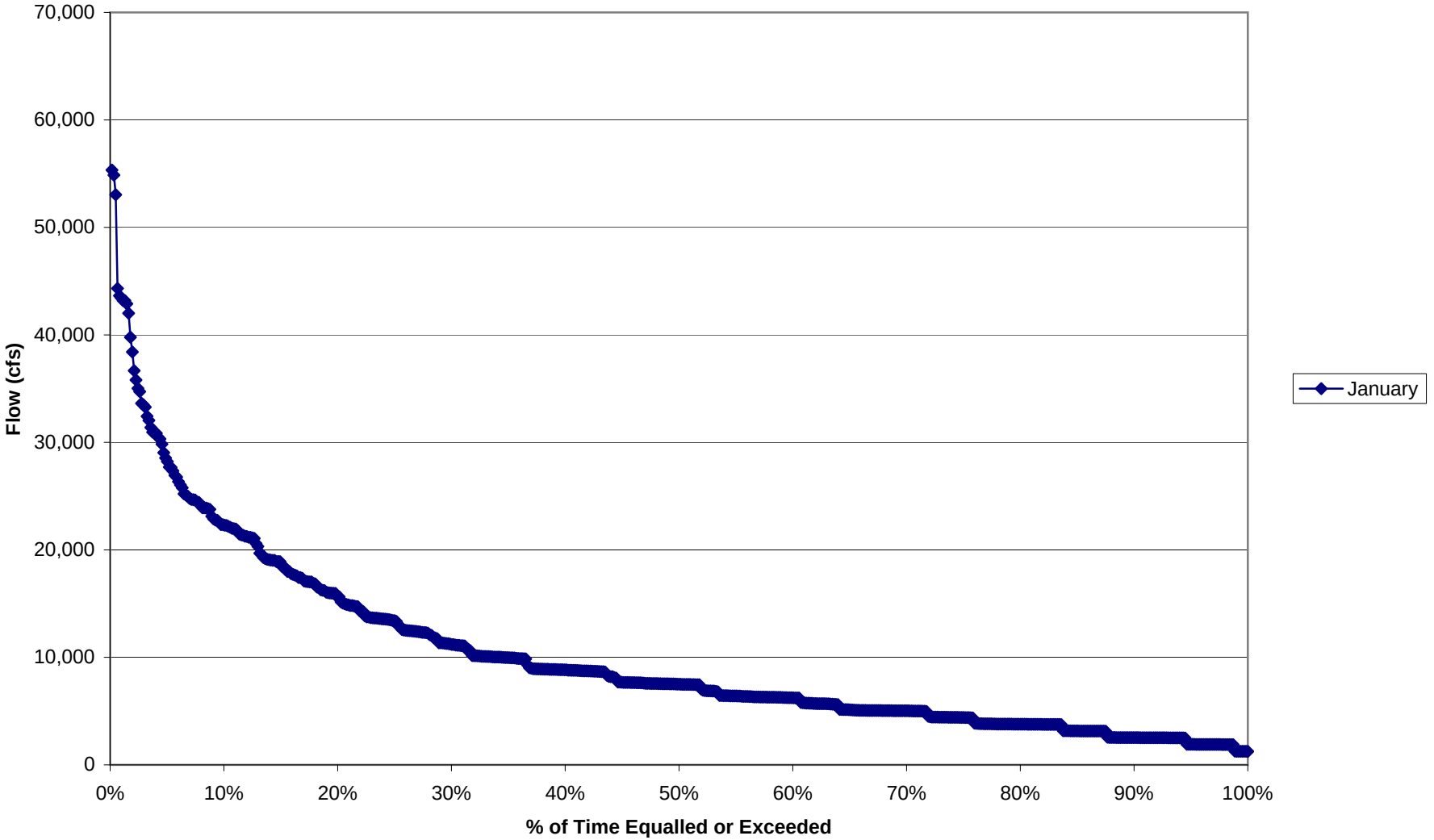
APPENDIX C

FLOW DURATION CURVES

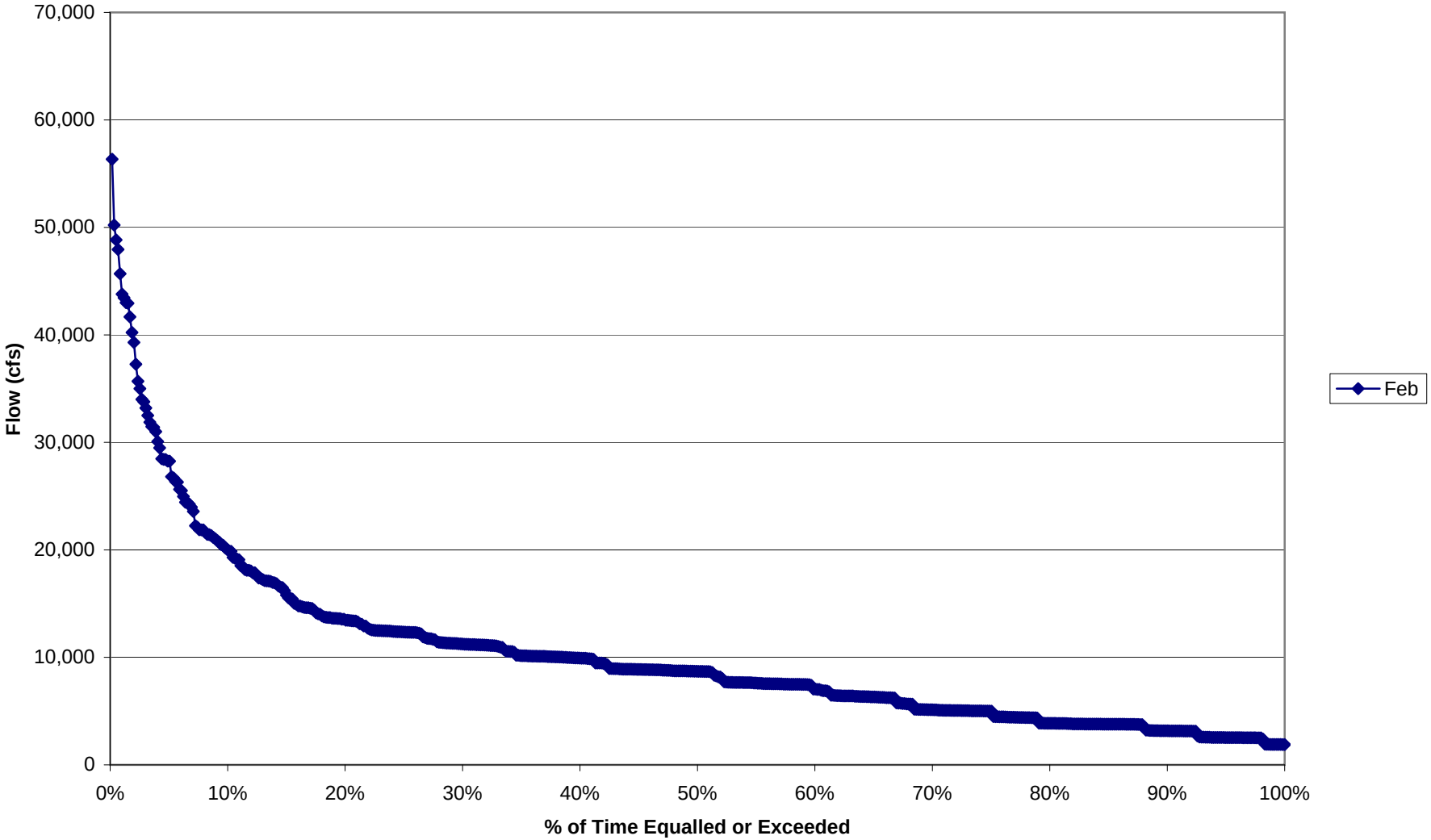
Dresden Island - January Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



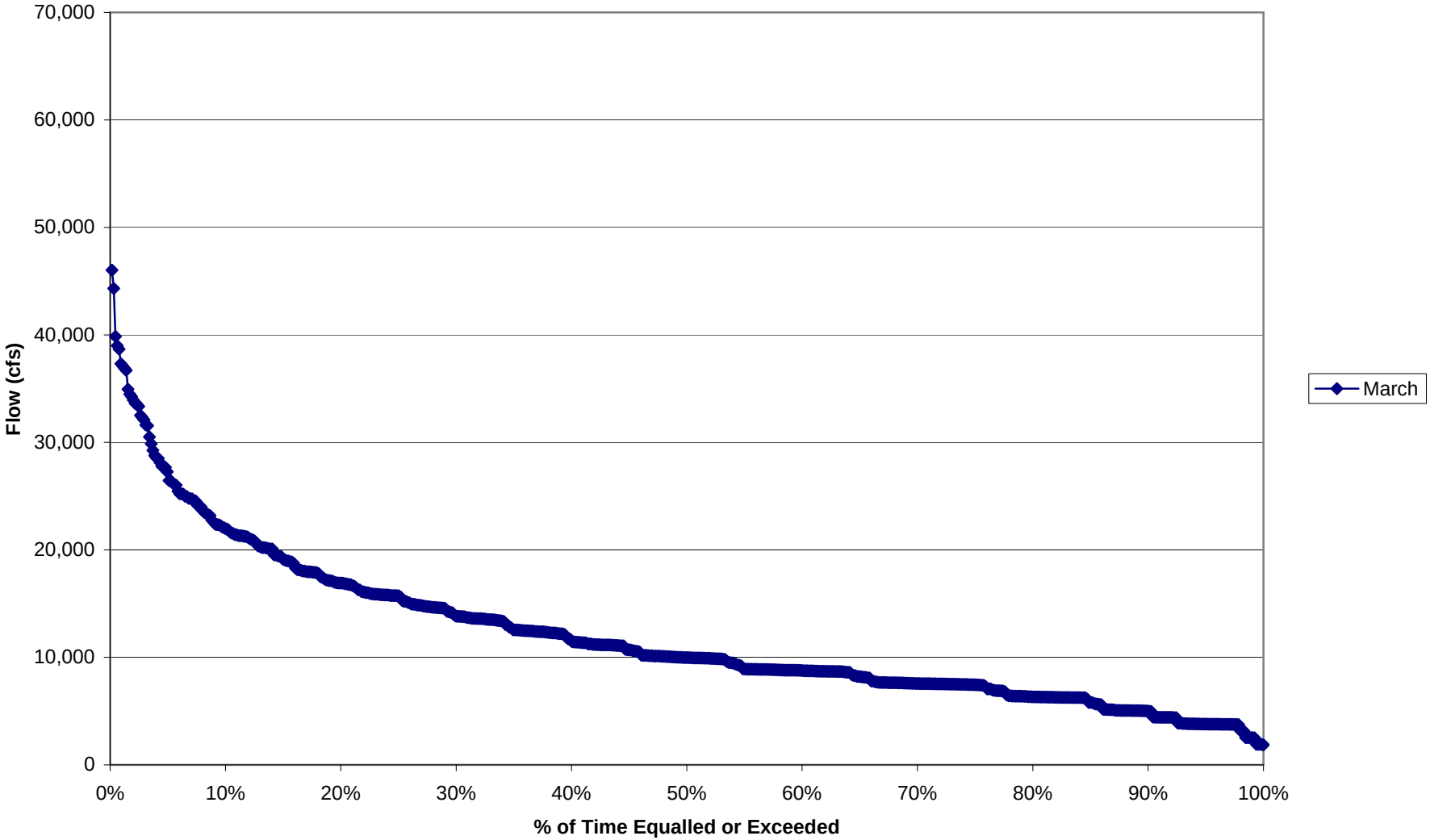
Dresden Island - February Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



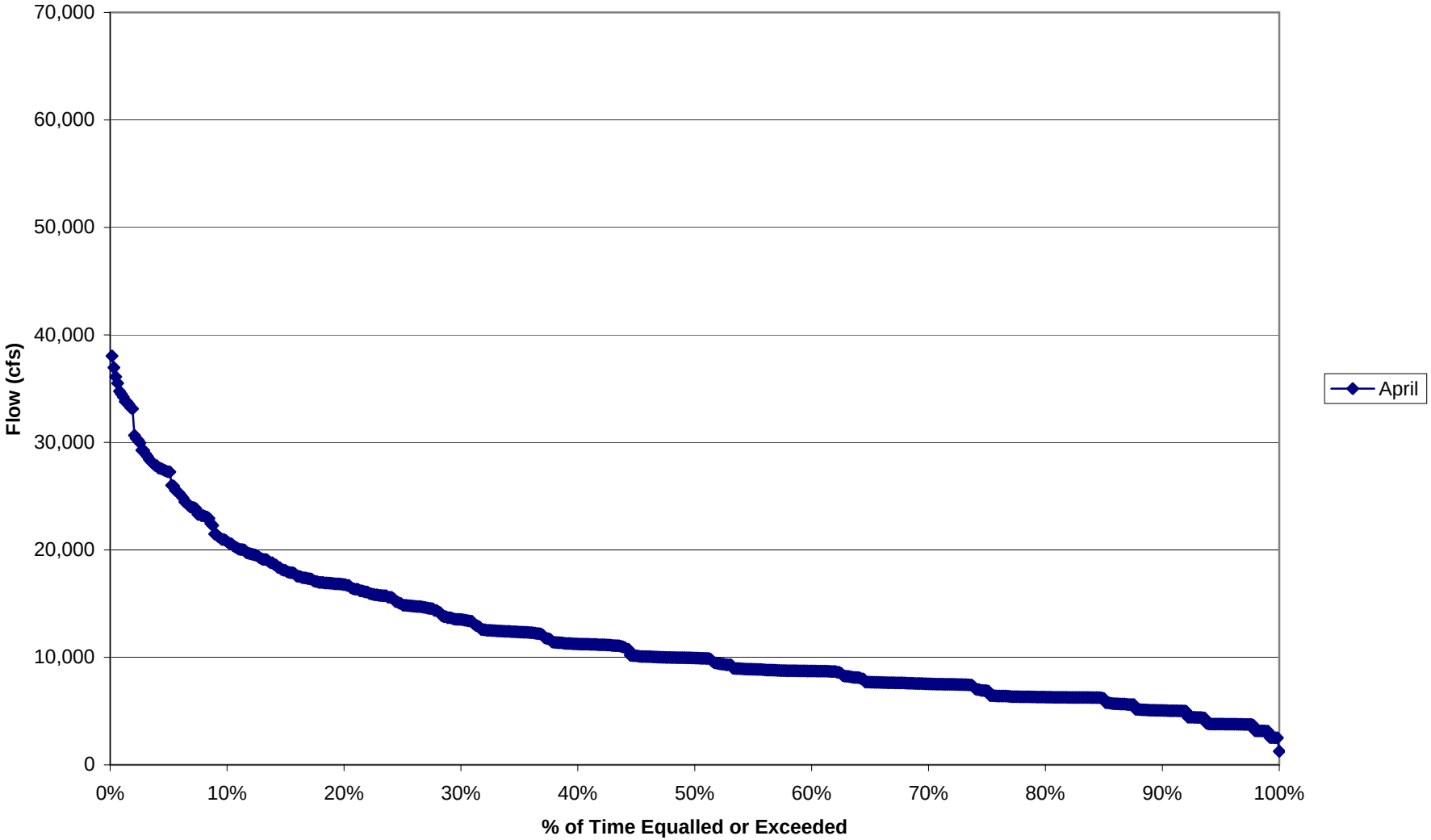
Dresden Island - March Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



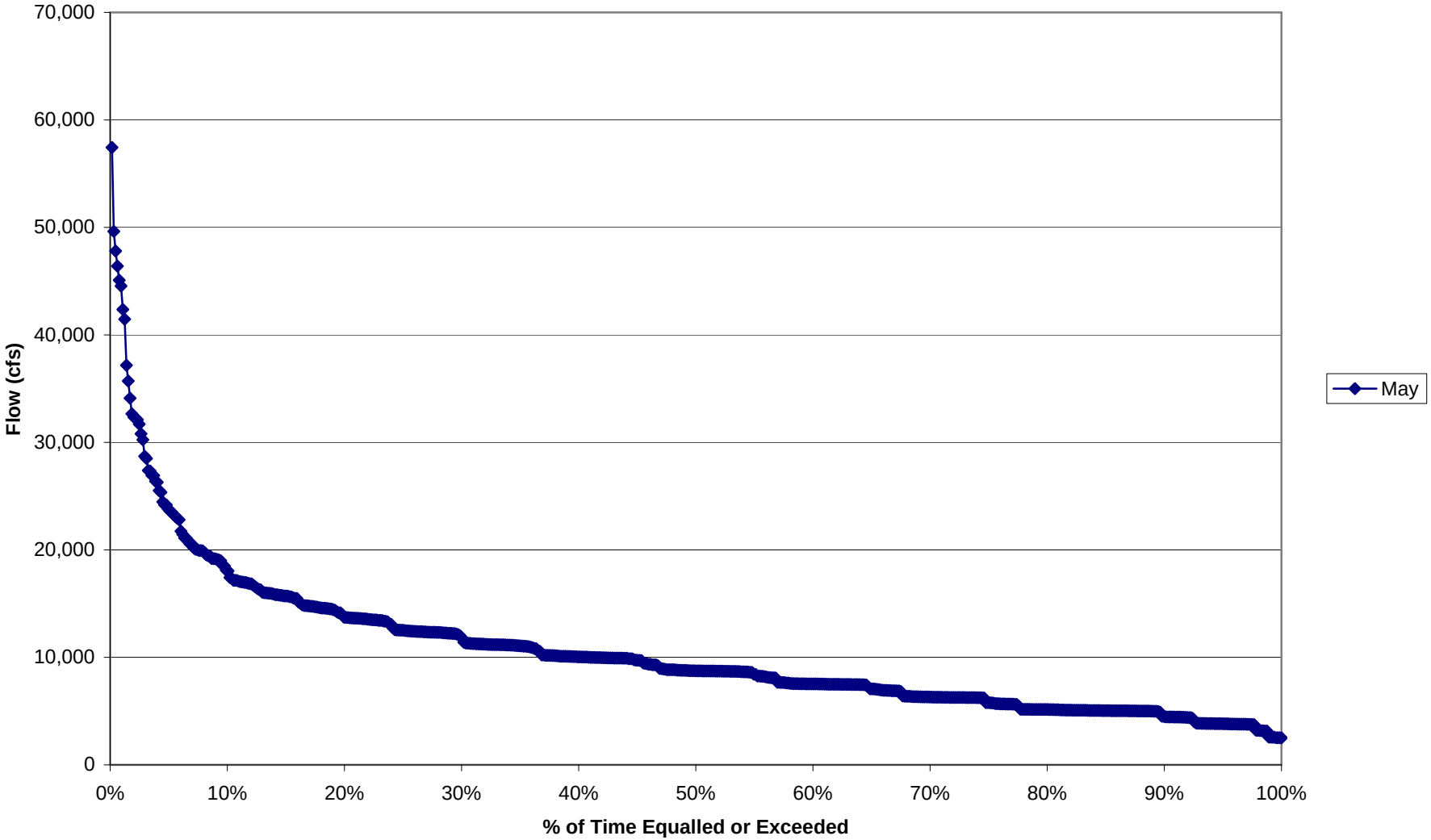
Dresden Island - April Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



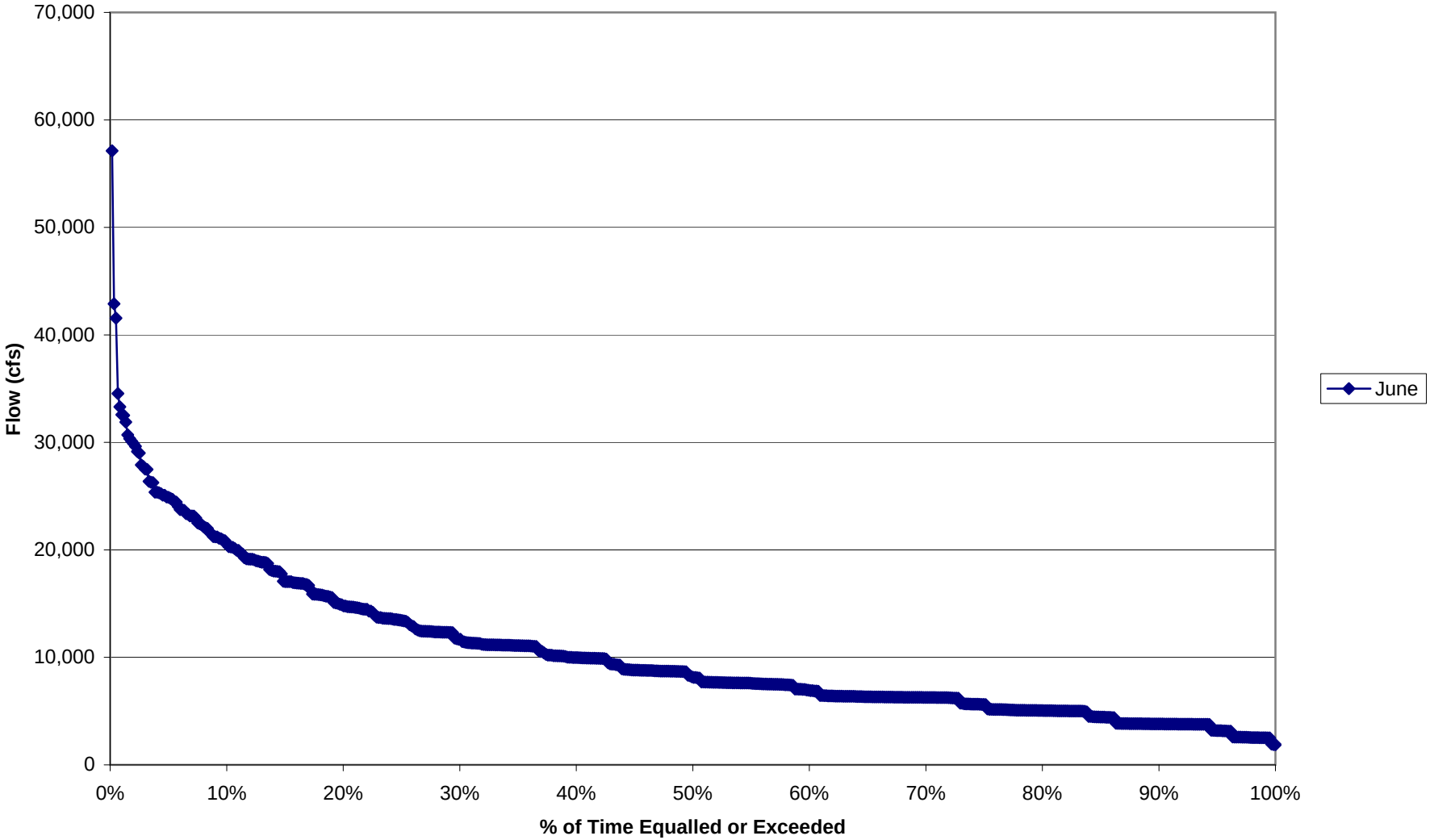
Dresden Island - May Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



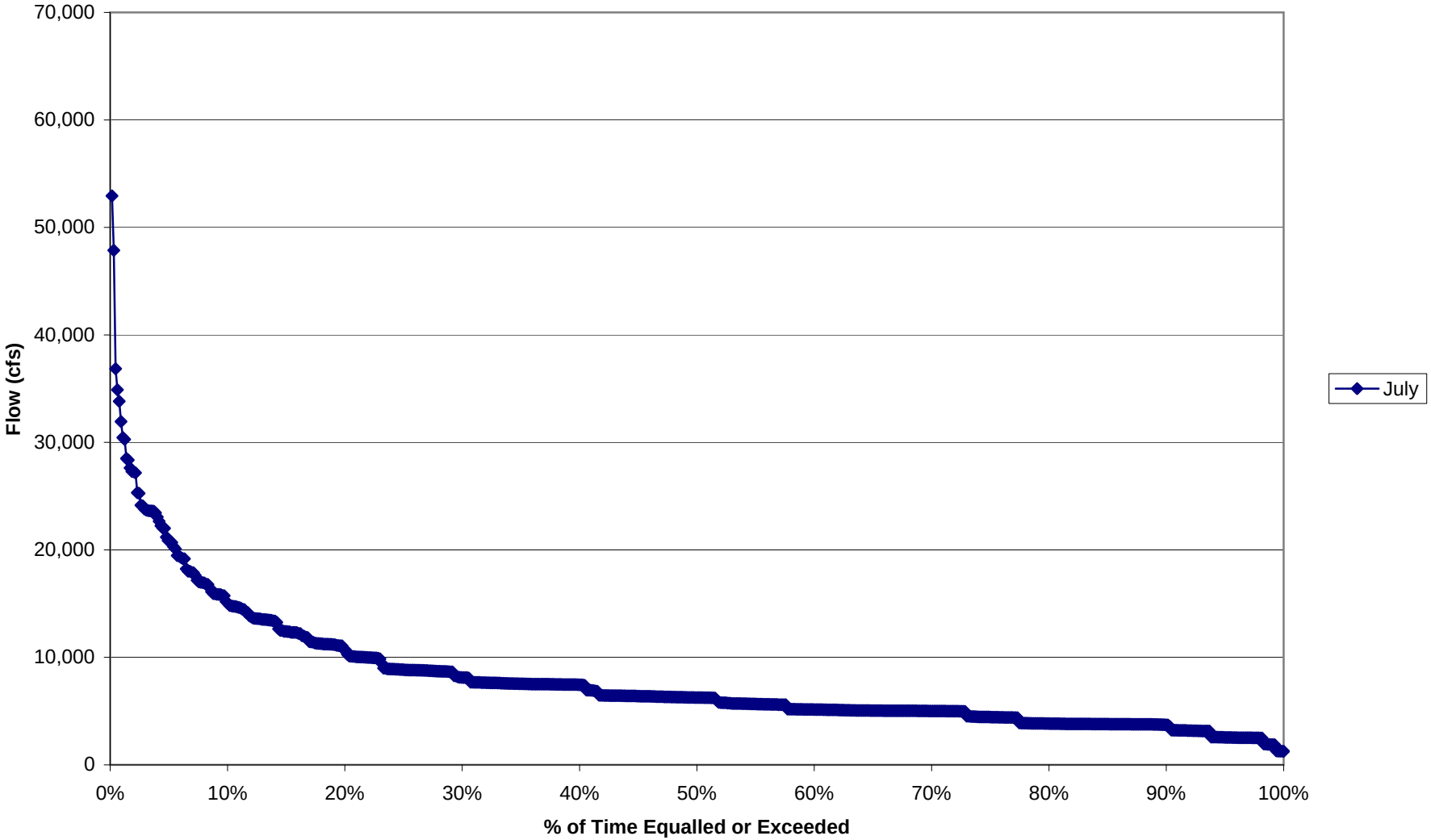
Dresden Island - June Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



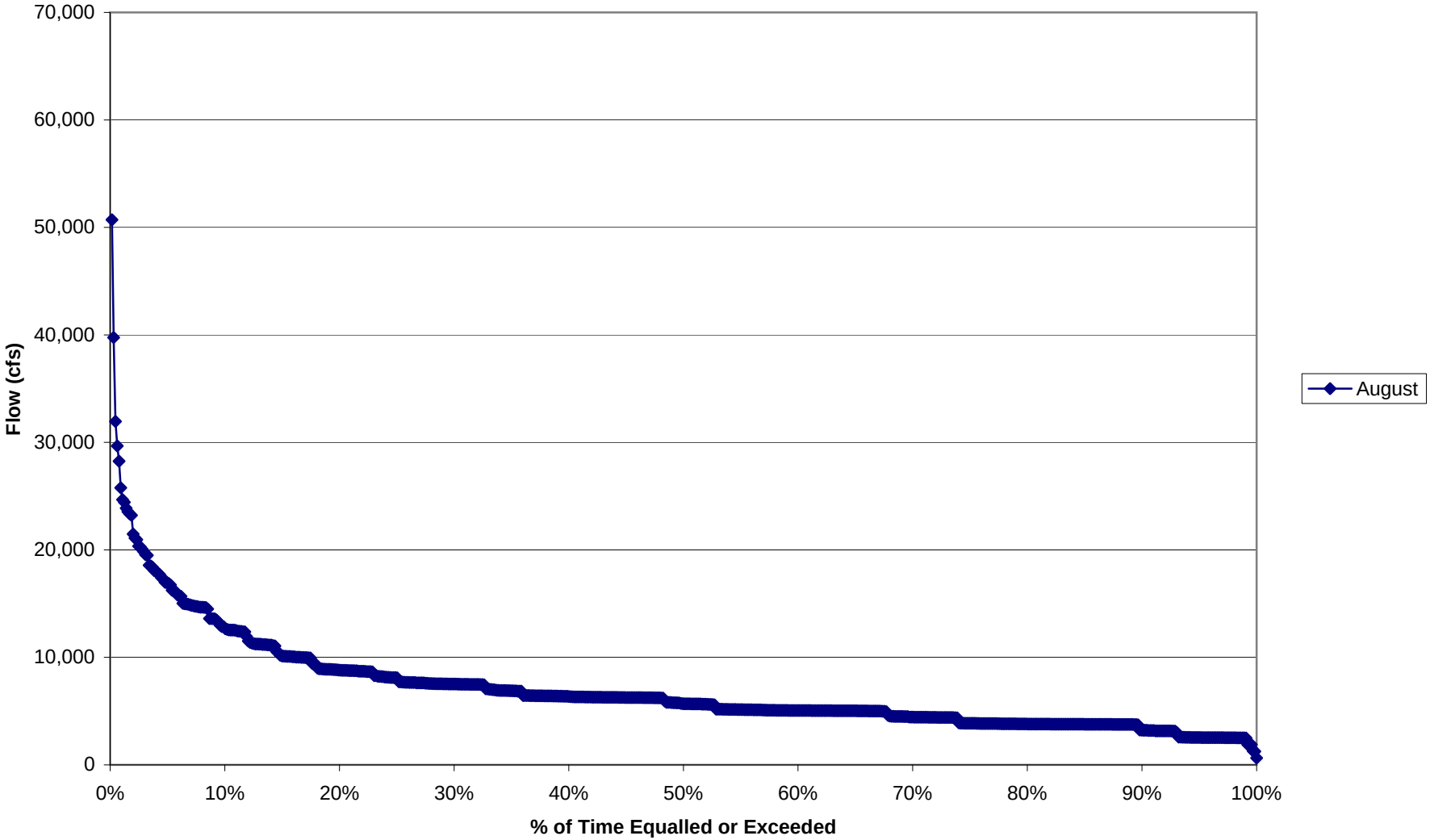
Dresden Island - July Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



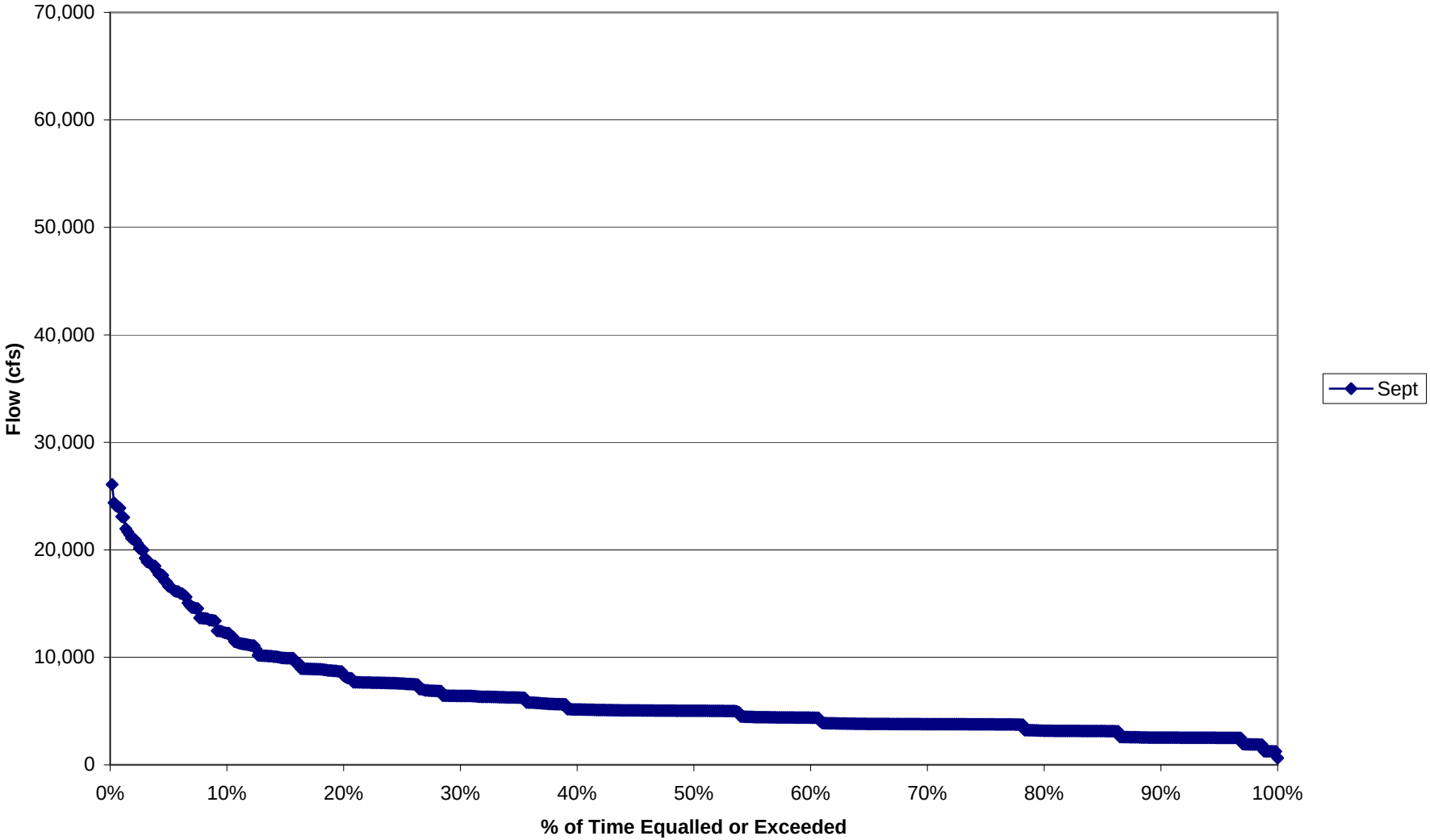
Dresden Island - August Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



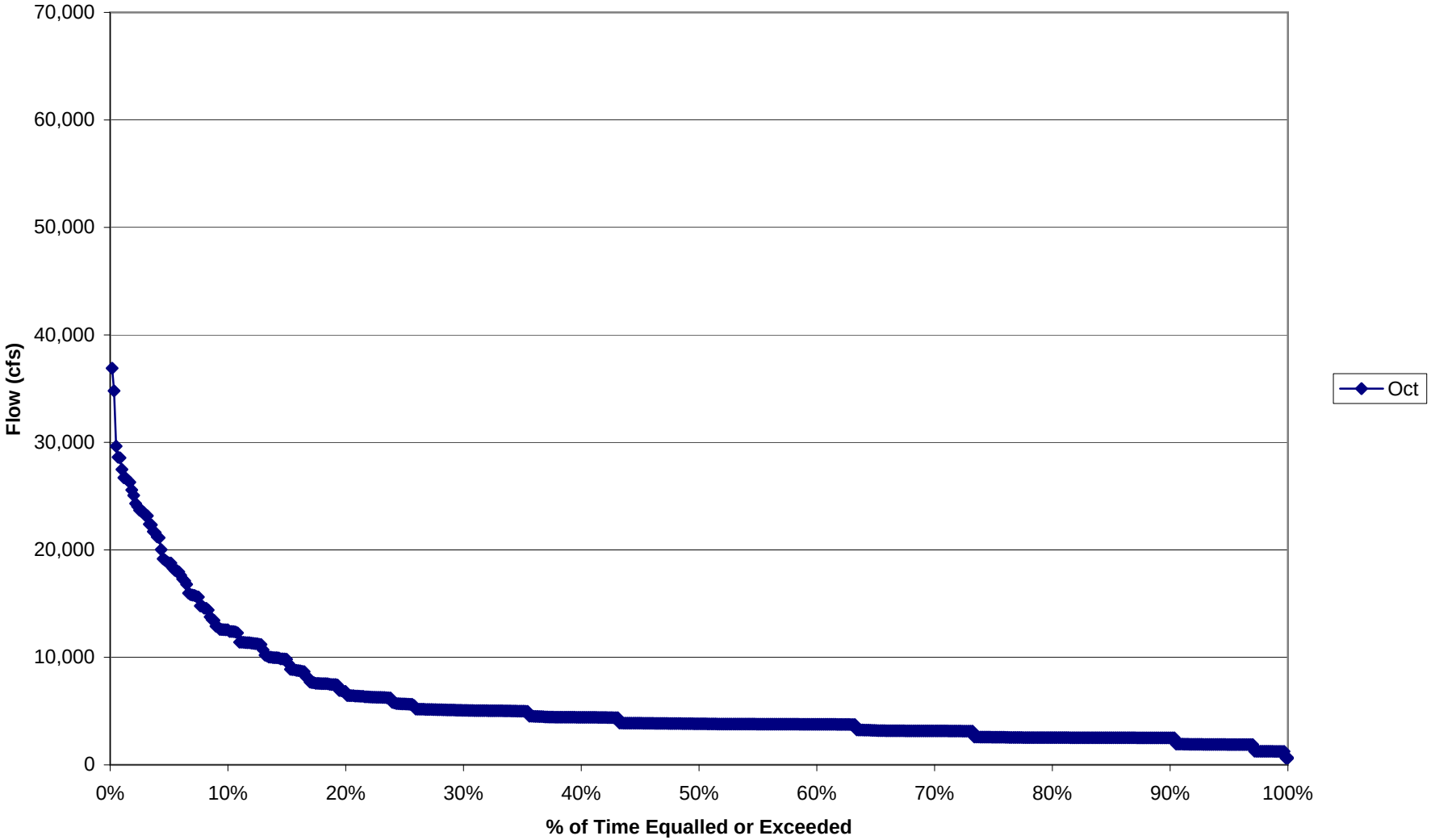
Dresden Island - September Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



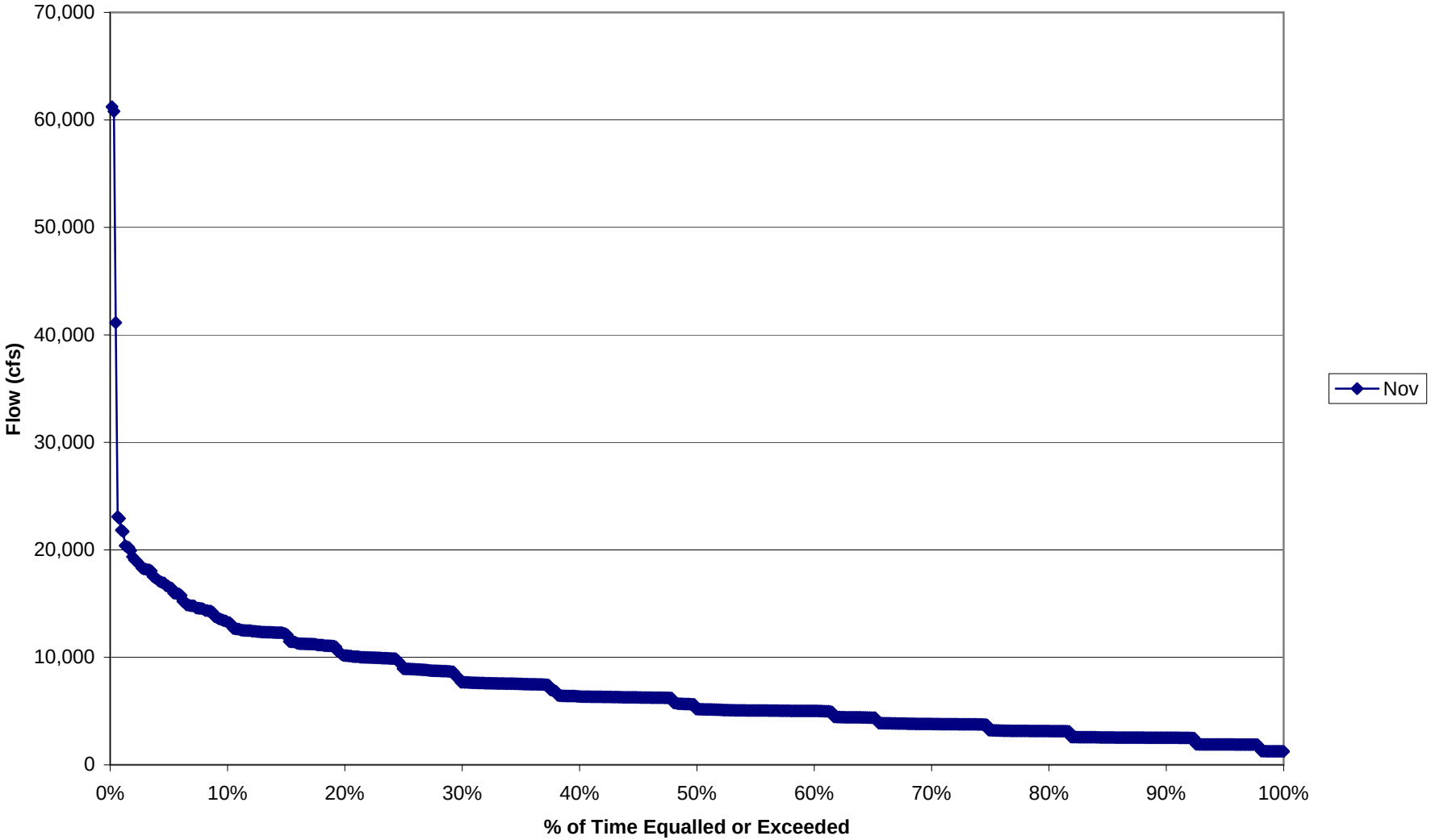
Dresden Island - October Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



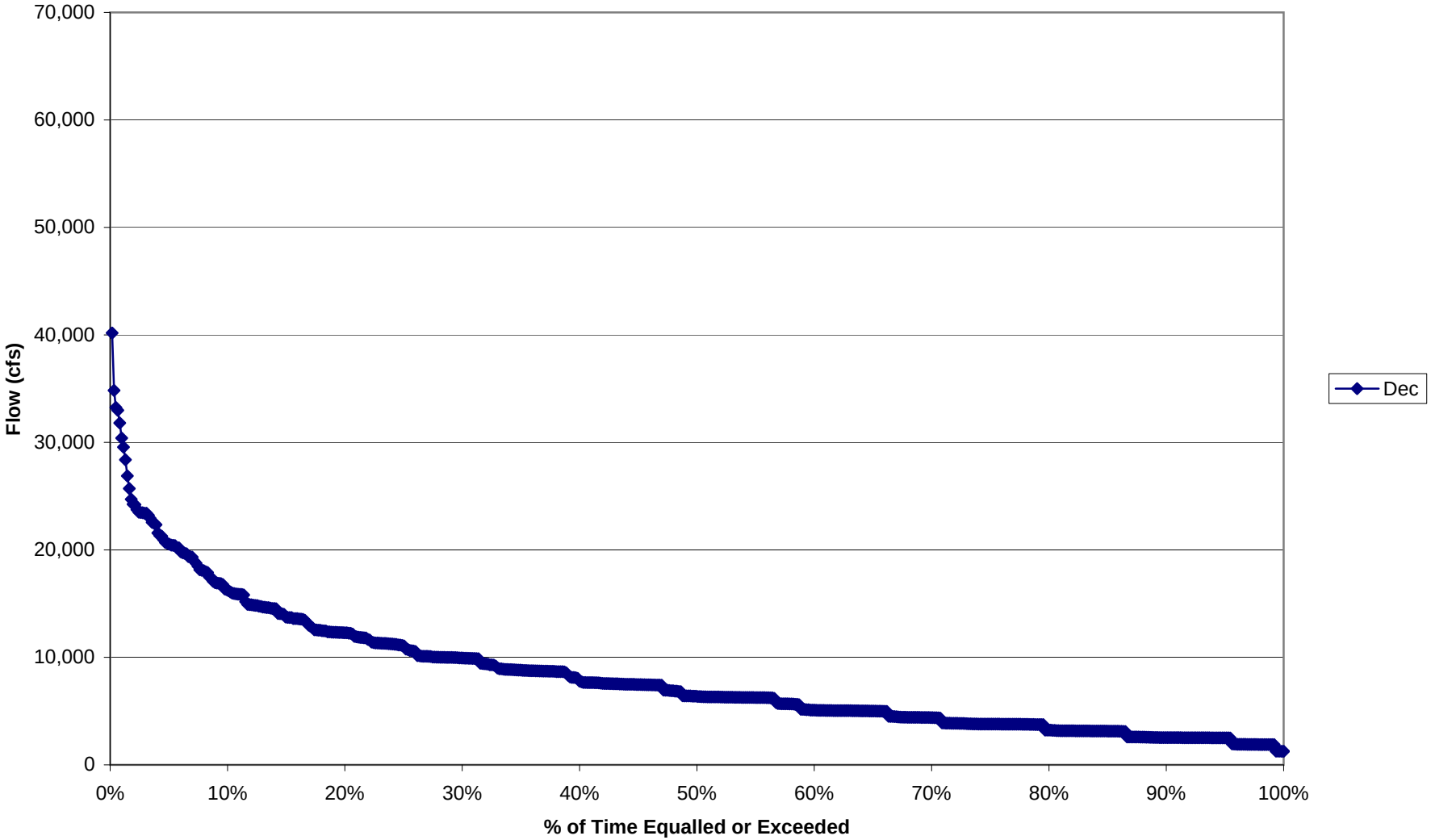
Dresden Island - November Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



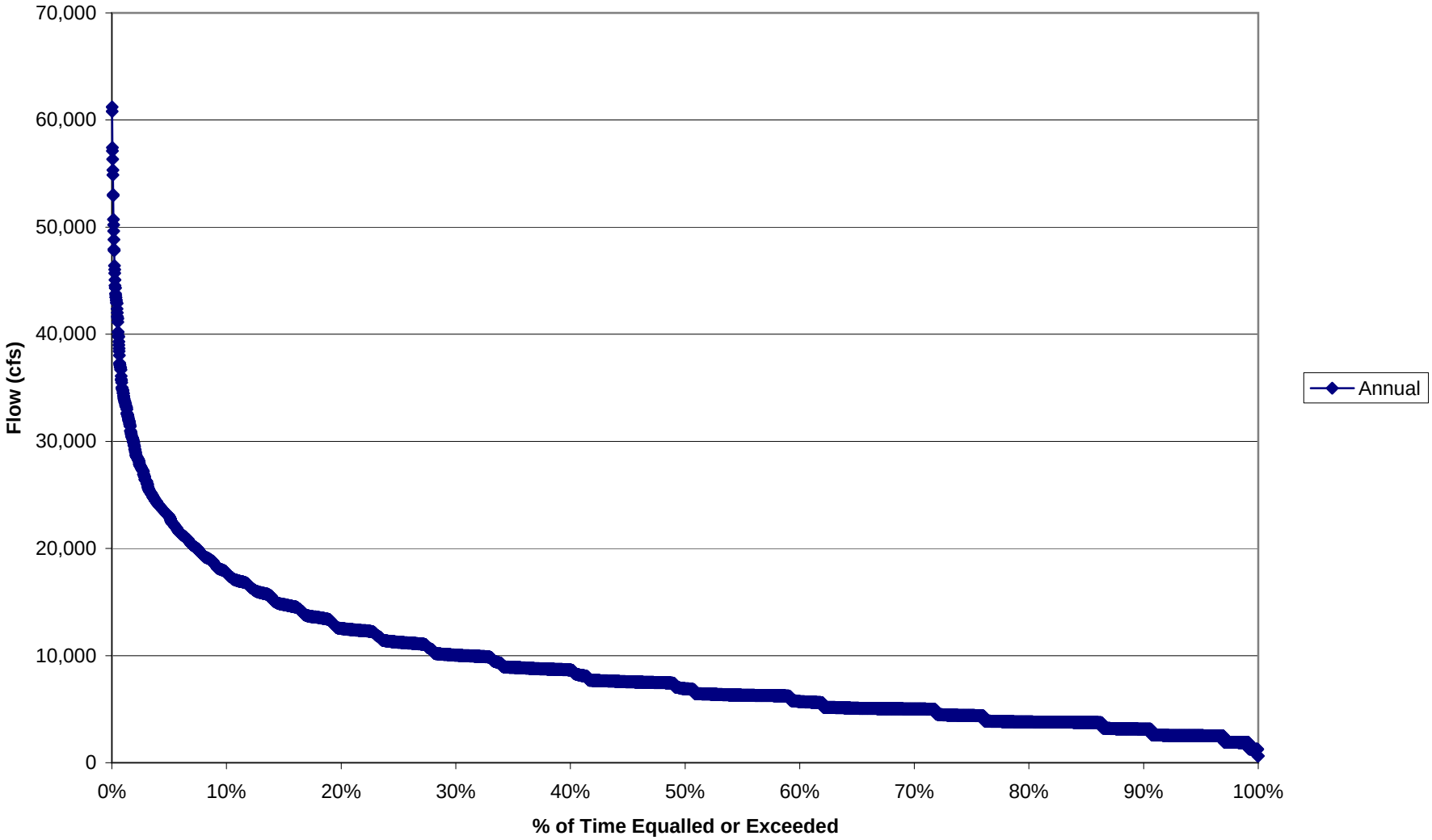
Dresden Island - December Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



Dresden Island - Annual Flow Duration Curve

(COE Dresden Island Gage - Period of Record: 6/1/1987 - 6/1/2008)



APPENDIX D

STUDY PLANS

NORTHERN ILLINOIS HYDROPOWER, LLC
FERC NO. 12626

DRESDEN ISLAND HYDROPOWER PROJECT

SEDIMENT SURVEY STUDY PLAN

1.0 GOALS AND OBJECTIVES OF STUDY

The Dresden Island Hydropower Project (Project) Pre-Application Document (PAD) identifies potential issue(s) associated with Project sediments for which the existing, relevant, and reasonably available information was insufficient to address the issue(s). The PAD identified a lack of information pertaining to sediment constituents and there associated concentrations in the general vicinity of proposed powerhouse construction.

The goal of this study is to collect additional information necessary to address the identified resource issue(s). Accordingly, this study will evaluate concentrations of specific constituents in the defined area where proposed construction and dredging may occur. NIH will use this information to assess the presence or absence of contaminated sediments; the potential for construction and operation of the Project to disturb any contamination found, and, if necessary, appropriate methods for removal and disposal of the material.

Upon completion of this study NIH will determine, in consultation with the resource agencies, if the proposed Project has the potential to disturb contaminated sediments and the most appropriate method for evaluating the potential techniques to remove and dispose of these materials.

2.0 RELEVANT RESOURCE MANAGEMENT GOALS

The state of Illinois and the U. S. Environmental Protection Agency (EPA) define acceptable levels for contaminants in sediments. For disposal of dredged material, an analysis of the sediment is needed to remediate any potential pollutants that may be present.

3.0 BACKGROUND AND EXISTING INFORMATION

Prior to the Clean Water Act, discharges from the Chicago area wastewater treatment facilities and chemical contamination from industrial waste heavily polluted the river system. Over time the quality of the river has improved; however, sediments within the river still contain elevated levels of harmful compounds accumulated from prior years.

Within the Dresden impoundment, surveys have been conducted on surface sediments analyzing metals and other pollutants. Recent surveys, from 2004 - 2006, collected trace metal concentrations in the impoundment (MWRD 2007). There is little or no known information describing the sediments in the specific locations proposed as the footprint of the powerhouse.

4.0 PROJECT NEXUS

Although NIH proposes to construct the project on an existing dam structure, powerhouse placement excavation will require riverbed excavation. This has the potential to expose polluted sediments. Because the proposed construction is located above the dam, where sediments have settled out over time, disturbance and remobilization of the sediments could affect water quality. Additionally, material removed from the river may contain toxins that require special disposal techniques.

5.0 STUDY AREA AND STUDY SITES

NIH will conduct a field investigation in the area of the proposed sediment displacement. The target survey area encompasses approximately 1.5 acres both upstream and downstream of the existing dam, as shown in Figure 1. In representative areas, investigators will collect 6 cores for laboratory analysis.

6.0 PROPOSED METHODOLOGY

Investigators will conduct sediment cores in the proposed area of displacement down to bedrock. A certified laboratory will then analyze sediment cores for various analytes.

6.1 Data Collection Techniques

Investigators will collect sediment cores by boat at specific locations recorded using GPS within the defined target area. Samples will be collected from substrates with a grain size smaller than sand (0.0625 mm). Depth of cores will depend on depth to bedrock as well as equipment limitations (approximately 10 ft). NIH will submit samples to a certified laboratory for chemical and pollutant analysis.

6.2 Data Analysis

NIH will analyze all laboratory results of chemicals and pollutants found in the sediments and compare them to current state and/or federal standards. A determination will be made as to whether the constituent meets or exceeds identified thresholds.

7.0 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This study will employ generally accepted practices for sediment collection. In addition, laboratory analysis will follow procedures established by the EPA and Standard Methods for the Examination of Water and Wastewater.

8.0 PRODUCTS

NIH will compile and compare data and analysis from sediment surveys with standards to produce a report of any concentrations found above acceptable limits. The report will also provide a list of concentrations of all chemicals detected in the sediments for determination of potential disposal methods as necessary.

9.0 SCHEDULE

Fieldwork is scheduled for the summer of 2008 with analysis of sediments and a report on the finding to follow later in 2008.

10.0 LEVEL OF EFFORT AND COST

NIH estimates the cost of conducting sediment cores and laboratory analysis of identified analytes to be $10,000.

11.0 REFERENCES (RELATED TO EXISTING INFORMATION)

Metropolitan Water Reclamation District of Greater Chicago (MWRD). 2007. Water and Sediment Quality Along the Illinois Waterway from the Lockport Lock to the Peoria Lock and Dam During 2006. Research and Development Department. Report # 07-39.

NORTHERN ILLINOIS HYDROPOWER, LLC
FERC NO. 12626
FERC NO. 12717

DRESDEN ISLAND AND BRANDON ROAD

MUSSEL STUDY PLAN

1.0 GOALS AND OBJECTIVES OF STUDY

The Illinois Department of Natural Resources has expressed concern regarding impacts to mussel species found near the proposed hydropower development at the Dresden Island Lock and Dam and Brandon Road Lock and Dam. The PADs for both projects identified potential issues associated with mussel species and habitats for which the existing, relevant, and reasonably available information was insufficient to address. NIH designed this study to provide the information necessary to assess more accurately the potential effects of the construction and operation of the projects on mussel species within the proposed tailraces, and in areas extending to below the Dresden Island and Brandon Road Dams to approximately 0.5 miles. Investigators will: a) identify existing mussel species and relative abundance at each site, b) qualitatively evaluate the habitat potentially affected during construction and operation, and c) analyze the potential effects of the construction and operation of the powerhouses on populations and their present habitat.

2.0 RELEVANT RESOURCE MANAGEMENT GOALS

The Illinois Department of Natural Resources (IDNR) regulates the commercial harvest of freshwater mussels in the state. Several state threatened and endangered mussel species have been found in the Illinois River. The butterfly is an Illinois state threatened mollusk and the snuffbox and salamander mussels are state endangered. The Illinois Non-Game Wildlife Protection Act and the Illinois Endangered Species Protection Act gives the IDNR the authority to protect species that are rare, threatened, and endangered. The Illinois Endangered Species Protection Board determines which plant and animal species are threatened or endangered in the state and advises the IDNR regarding measures to protect these species. Several mussel species have been included among the threatened and endangered species protected identified by the

Illinois Endangered Species Protection Board. In addition, the IDNR has expressed concern for redeveloping populations of mussels in the Illinois River, specifically a mussel bed discovered on the shores of Big Dresden Island, which is located immediately downstream of the Dresden Island Lock and Dam.

3.0 BACKGROUND AND EXISTING INFORMATION

While widely distributed before 1900, pollution and siltation between 1900 and 1930 gradually eliminated mussel species in the Illinois River (Starrett, 1971). In 1971, Starrett was unable to collect living mussels from the Starved Rock Dam to the confluence of the Des Plaines and Kankakee Rivers (just above the Dresden Island Lock and Dam). Due to recent improvements in water quality and the elimination of most toxic discharges, the Illinois River now supports a wide variety of freshwater mussel species (Table 1). Mucket (*Actinonaias ligamentina*), zebra mussel (*Dreissena polymorpha*), butterfly (*Ellipsaria lineolata*), snuffbox (*Epioblasma triquetra*), round pigtoe (*Pleurobema sintoxia*), pistolgrip (*Tritogonia verrucosa*), elktoe (*Alasmidonta marginata*), creeper (*Strophitus undulates*), deertoe (*Truncilla truncate*), and hickorynut (*Obovaria olivaria*), prefer sand and gravel bottom habitats and are generally found in faster moving water of river narrows and rapids. Three ridge (*Amblema plicata*), asian clam (*Corbicula fluminea*), white heelsplitter (*Lasmigona complanata*), fragile papershell (*Leptodea fragilis*), pink heelsplitter (*Potamilus alatus*), pink papershell (*Potamilus ohiensis*), pimpleback (*Quadrula pustulosa*), mapleleaf (*Quadrula quadrula*), fragile papershell (*Leptodea fragilis*), fluted-shell (*Lasmigona costata*) and salamander mussel (*Simposonaias ambigua*) are more tolerant of slower moving waters in wider sections of the river where sediment settles to form muddier bottoms. Flat floater (*Anodonta suborbiculata*) and giant floater (*Pyganodon grandis*) are also found in muddier bottoms, but more often in backwatered areas of the river (INHS, 2002). The butterfly is an Illinois state threatened mollusk and the snuffbox and salamander mussels are state endangered.

The Illinois Natural History Survey conducted a freshwater mussel study from 1993-1995 on the Illinois River (Whitney *et al*., 1997). Investigators found a developing mussel bed on the downstream end of Big Dresden Island, which is downstream of the Dresden Island Lock and Dam. At this location the investigators found mucket, elktoe, threeridge, white heelsplitter,

flutedshell, fragile papershell, giant floater, pimpleback, mapleleaf, and creeper mussels. The most abundant species was fragile papershell.

Table 1. Mussel species likely to be found in the Project Area (Sietman *et al*., 2001; Marseilles Hydro Power, 2001).

Common Name	**Species Name**
mucket	*Actinonaias ligamentina*
zebra mussel	*Dreissena polymorpha*
butterfly	*Ellipsaria lineolata*
snuffbox	*Epioblasma triquetra*
hickorynut	*Obovaria olivaria*
threeridge	*Amblema plicata*
asian clam	*Corbicula fluminea*
white heelsplitter	*Lasmigona complanata*
pink papershell	*Potamilus ohiensis*
pimpleback	*Quadrula pustulosa*
mapleleaf	*Quadrula quadrula*
salamander mussel	*Simposonaias ambigua*
flat floater	*Anodonta suborbiculata*
giant floater	*Pyganodon grandis*
round pigtoe	*Pleurobema sintoxia*
pistolgrip	*Tritogonia verrucosa*
elktoe	*Alasmidonta marginata*
flutedshell	*Lasmigona costata*
creeper	*Strophitus undulatus*
fragile papershell	*Leptodea fragilis*
pink heelsplitter	*Potamilus alatus*
deertoe	*Truncilla truncata*

4.0 PROJECT NEXUS

While construction plans will use best management practices to minimize sediment release, construction may result in the liberation of fine sediment and associated materials. The resulting movement of benthic fine sediments to areas currently occupied by mussels may result in uptake of potentially harmful pollutants that are bound to the sediments or alter existing habitat.

This study provides baseline information regarding existing mussel populations and habitat in areas that may be affected by construction of the proposed hydroelectric facilities. Any identified beds could then be monitored during construction to measure changes in the mussel populations and habitat that may be the result of construction activities, or if feasible, relocation efforts could be implemented.

In addition, baseline mussel population and habitat data would allow investigators to assess long-term changes to habitat features and mussel populations resulting from proposed Project operations. Although the Projects are designed to operate in a run-of-river fashion (*i.e.*, inflow equal to outflow), the discharge from the powerhouses may alter the hydrology of the habitat located in the tailrace and immediately downstream of the existing dams. This change in hydrology may affect some mussel beds immediately adjacent to the dams.

5.0 STUDY AREA AND STUDY SITES

NIH will survey the Illinois River and Des Plaines River within Brandon Pool and Dresden Pool and the tailwaters of the proposed project downstream approximately 0.5 miles.

6.0 PROPOSED METHODOLOGY

NIH proposes to conduct a field reconnaissance survey to document existing habitat conditions, species composition, and the spatial distribution of mussels in the proposed Project tailraces and downstream of both dams approximately 0.5 miles. The protocol for this study has been designed based on the mussel study method described by the U. S. Army Corps of Engineers (2005). Survey locations will initially be identified based on habitat preferences for those species potentially existing in the proposed study area. The assessment will occur during low flow or normal flow conditions (*i.e.*, not during high flow conditions). Survey methods will consist of surveying the river by boat to identify potential mussel habitat and searching for mussels and shells in shallow water. Signs of nearby mussel beds would include any mussels, shells, or middens found in shallow water. This reconnaissance will help narrow the search for more intensive mussel bed characterization and population analysis. In addition, known mussel beds such as the one located at Big Dresden Island will be specifically targeted to determine population changes since the study by Whitney *et al.* in the early 1990s.

A brail would be used to locate mussel beds identified during initial reconnaissance. Sietman *et al*., 2001 used a brail that was 157.5 cm in length, with 21 chains measuring 30.5 cm, and three four pronged hooks per chain. Sietman dragged the brail to locate mussel beds. On average Sietman made two brail runs that average 290 m in length every river mile. All mussels caught with the brail would be identified, enumerated, and measured for length and weight. A similar brail would be used to identify mussel bed boundaries and establish its spatial extent. Mussel bed boundaries would be marked using GPS and transferred to a GIS database for mapping.

Investigators would use a sampling dredge to quantitatively sample each mussel bed population for relative abundance, age structure, and species composition. This dredge would be used to sample mussels along a standard 10 m transect (USACOE, 2005) running perpendicular to the shore nearest to the identified mussel bed. Each transect would be spaced 10 m along the shoreline to cover the length of the mussel bed.

Substrate, depth, and river flow at each habitat would be used to characterize existing habitat at each bed. Each habitat characteristic would be sampled at 1 m intervals along each transect. Depth will be measured using a standard survey rod, marked in tenth of foot intervals. A Ponar grab or underwater camera will be used to sample and identify substrates when the bottom is not visible. Substrates will be classified as a percent of several possible types including silt, clay, sand, gravel, cobble, bedrock, boulder, or organics based on a Wentworth substrate scale (Wentworth, 1922) Flow velocity would be measured in the field using a digital Marsh McBirney Flow-Mate 2000 with ±2% accuracy.

7.0 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

These methods have been adapted from the protocols described by the U. S. Army Corps of Engineers Environmental Laboratory for qualitative and semi-quantitative mussel surveys (USACOE, 2005). Descriptions of equipment and field surveys are consistent with other studies conducted on the Illinois River by Starrett, 1971 and Sietman *et al*., 2001.

8.0 PRODUCTS

A summary of the species and habitats encountered in the areas proposed for construction, and in areas where operations would potentially affect existing mussel populations (*i.e.*, both Project tailraces and downstream of the existing dams) will be incorporated into the draft license application. Photographs of typical and/or significant habitat would be included in the summary, as well as GIS maps locating any species populations found during the field survey.

9.0 SCHEDULE

NIH will conduct the mussel survey during the 2008 field season, preferably during low flow conditions. The Draft License Application document, tentatively due to agencies and FERC for review in March 2009, will include the summary report.

10.0 LEVEL OF EFFORT AND COST

NIH estimates the cost of conducting the survey and reporting as approximately $16,000.

11.0 REFERENCES

Sietman, B.E., S.D. Whitney, D.E., Kelner, K.D. Blodgett, and H.L. Dunn. 2001. Post-extirpation recovery of the freshwater mussel (bivalvia: Unionidae) fauna in the Upper Illinois River. Journal of Freshwater Ecology. Vol. 16. pp. 271-281.

Starrett, W.C. 1971. A Survey of the Mussels (Unionacea) of the Illinois River: a Polluted Stream. Illinois Natural History Survey Bulletin. pp. 403.

Illinois Natural History Survey (INHS). 2002. Freshwater Mussel Manual. http://www.inhs.uiuc.edu/cbd/musselmanual/ Last updated Oct. 5, 2002.

Marseilles Hydro Power, LLC. 2001. Marseilles Hydroelectric Project License Application (FERC No. 11863).

U. S. Army Corps of Engineers. 2005. Sampling for Mussels. http://el.erdc.usace.army.mil/mussels/sampling.html. Last updated October 2005.

Wentworth, C.K. 1922. A scale of grades and class terms for clastic sediments. Journal of Geology. v. 30, p 377-392.

NORTHERN ILLINOIS HYDROPOWER, LLC
FERC NO. 12717

DRESDEN ISLAND HYDROELECTRIC PROJECT

DRAFT WATER QUALITY STUDY PLAN

1.0 GOALS AND OBJECTIVES OF STUDY

The Dresden Island Hydroelectric Project (Project) Pre-Application Document (PAD) identifies a potential issue associated with water quality for which the existing, relevant, and reasonably available information was insufficient to address. The PAD identified a lack of information pertaining to dissolved oxygen (DO) concentrations above and below the Dresden Island Dam.

The goal of this study is to collect additional information necessary to address the identified resource issue. Specifically, this study will evaluate the effect of current operations at Dresden Island on DO concentrations in the Illinois River.

2.0 RELEVANT RESOURCE MANAGEMENT GOALS

Water quality standards near the Dresden Island project are classified as General Use Water Quality Standards of the Illinois Administrative Code Title 35, Subtitle C, Chapter 1, Part 302, Subparts A through F, and apply to the proposed project waters. The general use standards are designed to protect the state of Illinois' water for aquatic life, wildlife, agricultural use, secondary contact use, most industrial uses and ensure the aesthetic quality of the state's aquatic environment.

Between March and July, DO levels must exceed 5.0 mg/l at any time and must be at least 6.0 mg/l as a daily mean averaged over 7 days. From August to February, DO levels must meet 3.5 mg/l at any time, 4.0 mg/l as a daily minimum averaged over 7 days, and 5.5 mg/l as a daily mean averaged over 30 days (Illinois General Assembly, 2008).

3.0 BACKGROUND AND EXISTING INFORMATION

Prior to the Clean Water Act, discharges from the Chicago area wastewater treatment facilities and chemical contamination from industrial waste heavily polluted the river system and contributed to low DO concentrations in the river. Over time the quality of the river has improved; however, low DO concentrations can still occur during hot, low-flow conditions.

The natural replenishment of DO from air is a slow process. In a slow-moving, pooled river such as the Illinois, it may require many days before DO levels are replenished. In this navigational system, aeration at locks and dams provides significant increases in DO.

4.0 PROJECT NEXUS

Existing operation of the Lock and Dam provides an important improvement to DO in the Illinois River. By diverting a portion of the flows through a turbine, the amount of DO improvement may be somewhat lower than what is currently provided.

5.0 STUDY AREA AND STUDY SITES

NIH will conduct a field investigation in an area upstream and downstream of Dresden Island Lock and Dam. NIH will place an upstream monitor within 1,000 ft of the dam in an area greater than five feet in depth and easily accessible. It will place a downstream monitor in the river between 500 ft and 1,500 ft downstream of the dam in an accessible area. NIH will place the upstream and downstream monitors in areas with continuous flow.

6.0 PROPOSED METHODOLOGY

NIH will conduct monitoring of the tailrace using Hydrolab Datasonde constant monitors or similar monitors located both upstream and downstream of the Dresden Island Dam. DO and temperature will be recorded in 30 minute intervals from July 1 through September 15. NIH chose this period to characterize summer water quality when worst-case (high temperature and low flow) conditions exist. Field staff will download data, maintain the monitor, and recalibrate on an approximately weekly basis. Field staff will take spot measurements using a handheld

dissolved oxygen meter before and after deployment to confirm constant monitor data and to account for instrument drift and fouling.

7.0 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This study will employ generally accepted practices for dissolved oxygen monitoring. Methods used in the proposed study are consistent with the USGS document *Guidelines and Standard Procedures for Continuous Water Quality Monitors: Station Operation, Record Computation, and Data Reporting* (2006).

8.0 PRODUCTS

Data and analysis from the water quality study will be compiled and analyzed to determine the contribution of the Dresden Island lock and dam to DO concentrations in the Illinois River.

9.0 SCHEDULE

Fieldwork is scheduled for the summer of 2010.

10.0 LEVEL OF EFFORT AND COST

NIH estimates the cost of conducting water quality analysis to be $12,500.

11.0 REFERENCES (RELATED TO EXISTING INFORMATION)

Kleinschmidt Associates. 1988. Analysis of Water Quality, Brandon Road and Dresden Island Projects. Prepared for Villages of Rockdale and Channahon, Illinois. Pittsfield, ME.

USGS. 2006. Guidelines and Standard Procedures for Continuous Water Quality Monitors: Station Operation, Record Computation, and Data Reporting. Reston, Virginia.