IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF MICHIGAN, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

ON MOTION FOR PRELIMINARY INJUNCTION

APPENDIX TO MEMORANDUM FOR THE UNITED STATES IN OPPOSITION

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DECLARATION OF JO-ELLEN DARCY

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1. My name is Ms. Jo-Ellen Darcy. I am the Assistant Secretary of the Army (Civil Works). In this position, I establish policy direction and provide supervision of the Department of the Army functions relating to all aspects of the Civil Works program executed by the U.S Army Corps of Engineers (hereinafter "the Corps"), including all reimbursable work performed on behalf of Federal and non-Federal entities,

as well as the formulation and oversight of the program and budget of the Army National Cemeteries. My responsibilities include programs for conservation and development of the nation's water and wetland resources, flood control, navigation, and shore protection

2. I am familiar with the facts relative to the above captioned civil action and I submit this sworn Declaration in support of the United States' Opposition to the State of Michigan's Motion for Preliminary Injunction.

3. The Energy and Water Development and Related Agencies Appropriations Act, 2010, Pub .L. No. 111-85, § 126 123 Stat. 2845, 2853 (2009) (hereinafter "Section 126 authority") provides the Secretary of the Army with authority to approve temporary measures "to prevent aquatic nuisance species from bypassing the Chicago Sanitary and Ship Canal Dispersal Barrier Project …." Pursuant to Army General Orders No. 3, dated 9 July 2002, paragraph 6, the Secretary of the Army has delegated Section 126 authority to me. I exercise this authority based on my evaluation of recommendations by the Corps. Among the factors I would consider in evaluating such recommendations are: (a) the risk that an aquatic nuisance species will bypass the existing control measures; (b) the severity of the threat to the ecosystem that such an aquatic nuisance species presents; (c) the feasibility, efficacy, and environmental soundness of any recommended emergency measure; (d) the consequences of any recommended emergency measure with regard to Congress' directive that the Illinois Waterway be maintained for purposes of navigation; and (e) the consequences of any recommended measure on flood mitigation and control efforts. Furthermore, I expect the Corps' recommendations to take into account input from our Federal and non-Federal

agency partners and to leverage our partner agencies' authorities, capabilities, resources and expertise.

4. On November 23, 2009, I exercised Section 126 authority approving the Corps' provision of Federal funds to an inter-agency effort, led by the Illinois Department of Resources, to apply rotenone, a piscicide, in a section of the Chicago Sanitary and Ship Canal during the short maintenance shutdown of the Dispersal Barrier Project. Specifically, I approved the use of Federal funds in order to assist the State in its efforts to control the migration of Asian Carp, contingent upon the appropriate completion of the processes required by the National Environmental Policy Act and other applicable environmental laws.

5. During the first week of January 2010, the Corps is scheduled to brief me on another request to exercise Section 126 authority. The Corps recently completed the Dispersal Barrier Efficacy Study, Interim I – Dispersal Barrier Bypass Risk Reduction Study & Integrated Environmental Assessment (December 2009) (Efficacy Study, Interim I), which analyzes ways to stop the spread of Asian Carp from the Des Plaines River into the Chicago Sanitary and Ship Canal above the Dispersal Barrier during flood events. I understand the Efficacy Study, Interim I, will recommend the construction of concrete barricades and chain link fence over 13 miles of flood prone areas along the Chicago Sanitary and Ship Canal upstream of the currently placed Dispersal Barriers (the electric barriers) and the disabling of two culverts, in order to contain the spread of Asian Carp. After being fully briefed on the Efficacy Study, Interim I, I will determine whether it is appropriate to exercise Section 126 authority to construct these public works.

6. As of the date of this Declaration, although I have been continually briefed on developments regarding the Asian Carp migration toward the Great Lakes, the Corps has not requested or recommended that I further exercise Section 126 authority to affect a longer closure of the navigation and flood control structures at the O'Brien Lock and Dam and the Chicago Controlling Works. Major General John W. Peabody, the Corps' Commander of the Great Lakes and Ohio River Division, has concluded that at this time there is insufficient justification based on the information before him (including the interim findings of the presence of Asian Carp "eDNA" in certain areas of the Illinois Waterway) to support a finding that the Asian Carp threat to the Great Lakes warrants closure of these specific facilities. Furthermore, I have no independent information or reason(s) at this time to exercise Section 126 authority to compel the closure of these specific facilities. The Corps is in constant coordination with other Federal and non-Federal agencies and collectively they are actively monitoring the Asian Carp migration. If however through this process additional or new information becomes available supporting the closure of these specific facilities, I am prepared to take appropriate action pursuant to Section 126 authority.

I declare under penalty of perjury that the foregoing is true and correct, pursuant to 28 U.S.C. § 1746.

Executed on January 4, 2010
Arlington, Virginia

JO-ELLEN DARCY

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DECLARATION OF JOHN W. PEABODY

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1. My name is John W. Peabody. I am a career professional Army officer, currently serving as the Commander and Division Engineer of the Great Lakes and Ohio River Division of the United States Army Corps of Engineers (the "Corps"). I have command authority for seven Corps of Engineers Districts, including the Chicago District. In this capacity, I direct all U.S. Army Corps of Engineers water resources development in the Great Lakes and Ohio River basins, including all or parts of seventeen states. Our missions include planning,

construction and operation of navigation and flood damage reduction structures throughout the Ohio River and Great Lakes systems, as well as hydropower operations, environmental protection and restoration, water conservation, recreation and disaster assistance. I also have responsibility for military construction in Ohio, Kentucky, Indiana, Illinois and Michigan with design and construction of barracks, hospitals, airfields and family housing at Army, Air Force and Department of Defense installations.

2. I have held the position of Commander and Division Engineer of the Great Lakes and Ohio River Division since August 4, 2008. Immediately prior to reporting to Cincinnati, Ohio for this position, I served as the 27th Commander and Division Engineer for the Pacific Ocean Division headquartered in Hawaii from July 2005 through July 2008. I have served in various command and staff capacities in the United States Army since 1980, mostly as a combat engineer, including two combat tours in Somalia (1992-93) and Kuwait/Iraq (2002-03). I have also worked as a political-military analyst and Division Chief for the US Southern Command in Panama (1994-97), and as the Programs Division Chief for the Army's Office of Congressional Liaison, working with the Armed Forces Committees (2003-05).

3. I am a graduate of the United States Military Academy with a Bachelor of Science degree (concentrations in civil engineering and Spanish), of the Command and General Staff College, and of the Army War College with a Masters in Strategic Studies. I also hold a Master of Public Administration from Harvard University, and I studied political sociology and international relations at the doctorate level as an Olmsted Scholar at El Colegio de Mexico in Mexico City. I serve as an active duty Director on the Board of Directors for the George and Carol Olmsted Scholarship Foundation, and am a member of various professional organizations, including the Society of American Military Engineers, and the Army Engineer Association.

4. I am familiar with the facts relative to the above captioned civil action and I submit this sworn Declaration in support of the United States' Opposition to the State of Michigan's Motion for Preliminary Injunction.

I. The Potential Impact of Asian Carp on the Great Lakes.

5. I have primary leadership responsibility for the Corps of Engineers' efforts to address Asian carp migration towards the Great Lakes, principally associated with the Corps' mission to construct, operate, and maintain the electrical Chicago Sanitary and Ship Canal Dispersal Barrier Project ("fish barrier") located near Romeoville, Illinois. Two species of Asian carp are of particular concern – the silver carp and the bighead carp. The fish barrier was originally authorized with the purpose of preventing the round goby from migrating from Lake Michigan into the Illinois and Mississippi River system. As Asian carp have migrated steadily northward, the threat of this species gaining access to Lake Michigan and the Great Lakes has become generally recognized in the environmental community and throughout numerous federal, state and local government agencies as having great significance with potentially devastating ecological consequences for the Great Lakes. As such, the Corps operates the fish barrier in a way that is designed for the primary purpose of preventing Asian carp species' migration past the fish barrier, into the Chicago Area Waterway System (Exhibit A), then into Lake Michigan and possibly the rest of the Great Lakes.

6. Although I am aware of no scientific study that authoritatively predicts the impact to the Great Lakes if Asian carp were to populate its shoreline regions and tributaries, the Corps of Engineers has deferred to the judgment of professionals from the United States Environmental Protection Agency (EPA) and the United States Fish and Wildlife Service (USFWS) who have advised us that the impact has the potential to be quite significant. The Corps understands that, as a species which devours zooplankton, phytoplankton, and

vegetation – the basis for the food chain of all aquatic species – in huge quantities, Asian carp have crowded out most other species in some areas of the Mississippi River basin, and could have a similar impact on the shallow water areas, shorelines, and tributaries of the Great Lakes. The Asian carp could also limit recreational activity due to the silver carp's penchant for jumping out of the water when startled, and could significantly alter and perhaps permanently damage near shore wetlands' ecosystems. Indeed, senior officials in EPA have told us that preventing Asian carp migration into Lake Michigan is probably the most acute new invasive species threat facing the Great Lakes.

7. Based on the Corps' own authorities and the understanding, discussed above, of the potential impact of Asian carp on the Great Lakes, the Corps of Engineers has approached its responsibility to operate the fish barrier as an urgent and compelling priority requiring the application of the Corps of Engineers' full capabilities, in collaboration with the authorities and capabilities of all other relevant federal, state, and local agencies.

II. Corps of Engineers Authorities

8. Congress authorized construction of the first fish barrier project in 1996 in the National Invasive Species Act, 16 U.S.C. 4701. Congress supplemented that authority with further study authorization and authorizations to construct and operate the fish barrier as it exists today. The Corps continued construction of the fish barrier project under Section 1135 of the Continuing Authority Program, 33 U.S.C. 2903a, and Section 3061 of the Water Resources Development Act of 2007, Pub. L. 110-114, 121 Stat. 1121.

9. In addition, the Corps has authorities that allow it to study, evaluate and recommend long-term solutions to the threat posed by the migration of Asian carp toward the Great Lakes, based on authorities contained in the Water Resources Development Act (WRDA) of 2007. Section 3061 of WRDA 2007 provides for the "Efficacy Study" which

is intended to address the efficacy of the fish barrier and its possible susceptibility to bypass. This study will recommend solutions to possible Asian carp bypass scenarios and other potential barriers and impediments to Asian carp migration in the Chicago Area Waterway System. Interim studies and analyses will allow the Corps to execute measures in 2010, as discussed further below, to prevent the bypass of Asian carp past the fish barrier along the DesPlaines River and Illinois and Michigan Canal. The final Efficacy Study will be completed by late 2010, upon which we will recommend permanent solutions to the issue of bypass along these two channels. Under this study authority, as detailed below, the Corps also intends to evaluate the need for and feasibility of temporarily closing the Chicago Area Waterway System lock and dam structures, and the need for and feasibility of other barriers to Asian carp migration in the area.

10. Section 3061 WRDA 2007 also authorizes the Great Lakes and Mississippi River Interbasin Study, referred to as the Interbasin Transfer Study, and addresses the broader issue of all invasive species migration between the Great Lakes and the Mississippi River basins. The Corps will execute a multi-year comprehensive study of the entire Great Lakes and Mississippi River basin watersheds to identify pathways between them by which aquatic invasive species may migrate or "transfer" from one basin to the other. The Corps' plan for executing this study is discussed in more detail below.

11. Until late October of 2009, the Corps did not have any emergency authority to react quickly to changing circumstances associated with Asian carp migration, as virtually all of its authorities and appropriations were related to the fish barrier and the two study authorities outlined above. In late October, Congress enacted Section 126 of the 2010 Energy and Water Development Appropriations Act, Pub. L. 111-85, 123 Stat. 2845 (Section 126), which allows the Corps to implement certain interim and emergency measures, if approved by

the Secretary of the Army, "to prevent aquatic nuisance species from bypassing the Chicago Sanitary and Ship Canal Dispersal Barrier Project …" This authority expires on October 28, 2010. Applications of this authority are discussed below.

III. The Fish Barrier

12. The Fish Barrier as Research and Development Project. As the largest fielded operational electrical dispersal barrier in the world, the fish barrier is in fact a large and complex research and development (R&D) project with all of the attendant complexities and challenges of implementing a project while research and development evolves, and new information is learned. As the Corps gains improved understanding of how to best operate the project or new technologies become available, the Corps applies that new information, knowledge, or technology in the most effective and efficient method possible, consistent with the Corps' authorities and appropriations. Thus, as R&D evolves and improves, it informs the details of project construction, operations, and management, and as we gain insights and new technology becomes available, we apply those insights and technology as quickly as is technically feasible.

13. Fish Barrier Description. This barrier is actually a system of three separate barriers first authorized by Congress in 1996 (Exhibit B), and described in more detail by Colonel Vincent Quarles, the Corps' Chicago District Commander, and Mr. Charles Shea, the Project Manager for the fish barrier project, in their declarations. Barrier I, the "demonstration" barrier, became operational in 2002 and was rehabilitated in 2009 to extend its useful life. Further upgrade to make the barrier permanent was recently authorized and is dependent on future appropriations. Its basic operational parameters are limited to 1 Volt per inch (V/in). The second barrier, Barrier IIA, is designed to work in tandem with a slightly improved twin, Barrier IIB, so that either can be taken down for maintenance while assuring an

operational barrier to prevent Asian carp (or other species) from migrating past the barrier system. Barrier IIA was constructed in 2006 and following extensive safety testing with the US Coast Guard (USCG), went into operation in April of 2009. Based on information from Dr. Mark Pegg, an outside scientist, who had conducted experiments in 2004 indicating that juvenile Asian carp are only deterred by voltages higher than those used at Barrier I, Barrier IIA's design was modified so that it could operate along a range of each of the parameters that affect the electrical field in the water. This included voltage able to operate at these higher levels, up to approximately 4 volts per inch.

14. Fish Barrier Comprehensive Strategic Review. As a consequence of our understanding of the potential impact of Asian carp on the Great Lakes, and after becoming acquainted with this issue following my assumption of command, in the fall of 2008 I directed a comprehensive review of our operation of the fish barrier to assess the adequacy of current approaches, and take actions where we found shortfalls in order to optimize all aspects of fish barrier operations. This review was designed to take a few months, but has evolved into an on-going and nearly continual assessment as changing information has developed. As evidence has emerged to indicate changes should be considered to optimize fish barrier operations, we have evaluated the evidence and adjusted operation of the barriers to take into account the evolving information. The principal aspects of our comprehensive review are described below, including a description of various initiatives and changes we implemented as a result of this comprehensive review:

(a) Bring Barrier IIA into Operation. The Corps decided to accelerate, in coordination with the USCG, the then on-going navigation safety testing and our own Barrier IIA operational testing so that we could bring Barrier IIA into operation in time for increased fish activity in spring, 2009. As a result, Barrier IIA went into operation in April, 2009;

(b) ERDC Optimal Parameter Testing (Exhibit C). This effort involved coordinating with the Corps' ERDC to evaluate the conclusions of Dr. Pegg, and determine the actual optimal operating parameters needed to deter all sizes of Asian carp. As a result of two series of laboratory tests by ERDC conducted in mid-2009, ERDC determined that Dr. Pegg's research did not evaluate all of the operational parameters of the barriers, and that voltage level alone is inadequate to deter Asian carp. In fact, a combination of three parameters – voltage per inch, frequency or Hertz, and pulse rate – are required to affect fish reaction to the electrical charge in the water. ERDC found that the combination that either repelled or stunned (i.e., rendered unconscious) all sizes of Asian carp is 15 pulses per second with each pulse 6.5 milliseconds, and a maximum in-water electric field strength of 2 Volts per inch. These parameters have been applied in Barrier IIA ever since the discovery of environmental DNA (eDNA – discussed in detail below) indicating Asian carp could be closer to the barrier than previously thought. ERDC is preparing to conduct flume tests this month to replicate field conditions in order to confirm that the optimal parameters tested in the laboratory are equally effective in natural conditions. As with all evolving information, we will consider changing the operating parameters based on any new evidence that may be derived from these tests.

(c) Impacts of Operating the Fish Barrier at Maximum Voltage. Michigan requests that the court order the Corps to increase Barrier IIA's operating parameters to maximum voltage. Although it is possible to operate Barrier IIA at voltages above 2 Volts per inch, all scientific studies and evidence available indicates clearly that such an increase is not necessary to successfully deter all sizes of Asian carp, as discussed in this declaration and in detail in Colonel Quarles' and Mr. Shea's declarations. Additionally, it is not prudent to operate Barrier IIA at levels above the optimal levels required to deter Asian carp with confidence, as such operations will shorten the barrier's lifespan, increase maintenance

requirements and the risk of system failure, create unnecessary increased safety risks, and increase costs to the taxpayer. Safety risks and challenges of operating at higher voltage are discussed at length in Mr. Shea's and the USCG's declarations.

(d) Accelerate Barrier IIB Completion. We assessed our ability to bring Barrier IIB operational more quickly, but determined that this was limited by funding, which is subject to the appropriations process. However, following the discovery of positive eDNA evidence closer to, but downstream of, the fish barrier than previously thought in late July of 2009 (as outlined here and detailed in the declarations of Dr. Lodge and Colonel Quarles), the Corps requested funding under the American Reinvestment and Recovery Act of $7 million from the Office of Management and Budget in order to accelerate the execution of this component of the barrier. This funding was approved, and we expect to complete construction of Barrier IIB by September 2010, and complete operational and safety testing soon thereafter.

(e) Accelerate the Efficacy Study to address potential bypasses of the fish barrier. Upon the discovery of the first positive eDNA evidence in late July 2009, the Corps developed a plan to accelerate aspects of the Efficacy Study. This triggered by the discovery of eDNA near the confluence of the Chicago Sanitary and Ship Canal with the DesPlaines River and Illinois and Michigan (I&M) Canal. This information meant that, if the eDNA evidence was accurate, it was possible that Asian carp could migrate into either the Des Plaines River or the I&M Canal, both of which parallel the Chicago Sanitary and Ship Canal below and above the fish barrier (Exhibit D). In the event of a significant flood, pathways between these waterways and the Chicago Sanitary and Ship Canal would be opened up, allowing any Asian carp that may be present in them to access the Chicago Sanitary and Ship Canal above the fish barrier, and thus bypass it.

(f) Early Asian Carp Monitoring in the Illinois Waterway System (Exhibit E). Asian carp were first detected in the lower reaches of the Illinois River in 2000, and subsequently migrated up the Illinois River, as discussed by Colonel Quarles' declaration. Based on the evidence of captured Asian carp, it appeared that the carp migration stalled in the Dresden Island Pool, as none of the species were found above that pool between 2006-2008. This assessment was reinforced by Asian carp from this pool that were tagged, released, and their movement monitored. None of the tagged fish ventured beyond the Dresden Island pool, reinforcing the conclusion that the species' migration had stagnated. This understanding informed multiple management decisions during this period, to include the need to take the time required to address the significant safety concerns of operating Barrier IIA.

(g) Asian Carp Monitoring Technologies. As part of our comprehensive review in the fall of 2008, we decided to assess the full suite of capabilities then available to locate and monitor Asian carp as they migrated up the Illinois River system, evaluating these tools for the ability to deliver high confidence that we were locating the leading front of the migrating fish. This assessment resulted in the Corps concluding that the then available tools, principally netting and electro-fishing conducted primarily by our partner agencies, could tell us the locations where fish were likely located in abundance, but not necessarily how far they had migrated up the system in smaller numbers. In other words, we knew where we had found Asian carp, but we were not sure if this indicated how far Asian carp had actually migrated up the Illinois River system. This meant that we lacked an acceptable level of confidence that we knew the extent of Asian carp migration, and we needed better information in order to make appropriate management decisions related to the operation of the fish barrier.

As a result the Corps canvassed the scientific community for alternative methods of detection, resulting in our discovery of the University of Notre Dame's (UND)

environmental DNA (eDNA) research in May, 2009. The discovery of this research, and our subsequent agreement with the University of Notre Dame's Dr. David Lodge to apply it for the purposes of attempting to monitor the extent of Asian carp migration in the Chicago Area Waterway System, has been especially significant in informing the evolving understanding of how best to manage the fish barrier and associated activities, as discussed below. How eDNA works and the results eDNA sampling has produced to date are described in more detail by Dr. Lodge and Colonel Quarles in their declarations. In essence water samples are taken from waterways, suspended solids, many containing fish feces, scales, and other tissue with DNA, are removed and then tested using DNA technology to identify the DNA markers of a target species, in this case, silver and bighead Asian carp, and the results are then reported. The application of eDNA is discussed in more detail below.

IV. Understanding the Threat: eDNA Capabilities and Limitations

15. As soon as the Corps learned of the eDNA technology mentioned above, we consulted internally to determine whether we should consider applying Dr. Lodge's eDNA testing to help us determine the possible location of the Asian carp. While we were excited about this technology's promise, we were concerned that as an emerging technology still in the research stage, it had never been applied in the field before. Nor had it undergone independent scientific studies or peer reviews that the Corps would normally require before applying a new technology which would inform management decisions. In short, the Corps had to evaluate and assess the risks associated with using and relying on an emerging technology, against our lack of confidence that existing techniques could provide us an adequate confidence level on the leading front of Asian carp migration. Our conclusion was that this new eDNA technology had significant promise and potential capability to increase confidence in our fish monitoring efforts, and that the need to go forward with the

testing outweighed the potential uncertainties associated with this emerging and not fully tested technology. Dr. Lodge and his team agreed to work with us to sample portions of the Chicago Sanitary and Ship Canal above the Dresden Island pool to see if his eDNA tool would indicate if Asian carp DNA was present upstream of where Asian carp had been previously detected. Professor Lodge agreed to work with us for an indefinite period of time, memorialized in August 2009 in a cooperative agreement for an initial nine month period. The Corps concluded discussions with Dr. Lodge in mid-December to modify and update this agreement to meet changing operational needs.

16. Results to Date. The specifics of the results to date are summarized in detail in the Declarations of Colonel Quarles and Dr. Lodge. A graphical representation of positive and negative results for eDNA results reported through mid-December 2009 are at Exhibit F. Some of the key findings are:

(a) Dr. Lodge's team conducted some sampling in the Chicago Sanitary and Ship Canal in the vicinity of the Brandon Road Pool (a "pool" as used here indicates a stretch of river whose water height is determined by the lock and dam controlling structures at its downstream-most point), which is the next pool below the Lockport pool where the fish barrier is located. In late July, UND notified the Corps of positive results found in various water samples taken from this pool, which could indicate the presence of Asian carp closer than previously thought. The Corps decided to increase the operating parameters of Barrier IIA. There followed a two week period necessary to prepare the barrier to increase its parameters, and during which the Corps conducted coordination with the USCG, EPA, the navigation industry and other stakeholders. On 17 August 2009 the Corps raised the operating parameters of Barrier IIA, resulting in the closure of the channel to navigation for several days until safety testing with the USCG could be completed, as discussed in the USCG declaration.

(b) On November 17, 2009 it was reported to the Corps that Asian carp DNA was detected in the Cal-Sag channel and the Calumet River near the O'Brien Lock, approximately 30 miles upstream of the fish barrier, from samples collected on September 23, 2009. This was the first detection of Asian carp DNA upstream of the barriers and, as discussed below, it added increased urgency to Corps and inter-agency efforts.

(c) I understand that very recent preliminary analysis of eDNA samples indicates the potential for positive findings of Asian carp DNA near the Wilmette Pumping Station. Once that analysis is finalized, the interagency team will assess the information and consult to determine appropriate actions.

17. In addition to the eDNA, we continue to rely on netting and fishing operations conducted by the State of Illinois, the USFWS, and Corps employees to inform the Corps and other agencies about the potential presence of Asian carp above and below the barriers. Since the advent of the employment of eDNA sampling, these tools have been used primarily to attempt to confirm eDNA results with the capture of physical Asian carp specimen, as discussed below.

While the Corps understands that netting and electrofishing have limitations, the Corps relies on the assessment of other experts, including the USFWS, and Illinois DNR experts that these techniques are effective tools in helping to identify the extent of Asian carp migration, and are important to assist our efforts to confirm positive eDNA evidence with the presence of live Asian carp. The total inability to capture any live Asian carp above the fish barriers to date despite significant fishing efforts since August emphasizes the need to continue our initiatives in collaboration with UND to determine how eDNA can be used as a predictor of the presence or the population sizes of target species and the relative threat that they pose. Several theories have been advanced from various quarters suggesting that Asian carp DNA

may have been found in areas above the fish barrier from sources other than live fish, such as disposed Asian carp remains (communities in the Chicago area consume this fish), remnants of bait used for fishing, or possibly carried there in ballast water or in barge traffic. While these and other theories are only possibilities, the Corps believes it would be irresponsible not to explore their viability as appropriate. The information below addresses our current efforts to assess the viability of some of these theories within the limitations of our authorities and to better understand the meaning of the eDNA results in coordination with UND.

18. USCG Efforts Concerning Ballast Water and Barges as a Vector. In September of 2009, I communicated to the USCG Ninth District Commander, Rear Admiral Peter Neffenger, a concern that either Asian carp or Asian carp DNA may be transiting from below the fish barrier to above it via the ballast water of navigation barges. Rear Admiral Neffenger agreed to investigate the issue, and shortly thereafter issued a decision directing that no ballast water could be carried from south of the fish barrier to the north of it. On December 16, 2009, Rear Admiral Neffenger discussed USCG plans to work with the navigation industry to request voluntary testing to confirm whether some Asian carp might be crushed between barges and falling out above the fish barrier. The USCG also is working to test the possibility that Asian carp, or its DNA suspended in ballast water, might be transiting the fish barrier in ballast water. Results from these efforts may inform future conclusions about how some eDNA evidence is being found above the fish barrier.

19. Continued Assessment of eDNA Data and Limitations. Since eDNA is a new approach to assessing the presence of Asian carp, and as indicated above is being applied operationally before full scientific validation can occur, the Corps is continuing to collaborate with the University of Notre Dame to determine what eDNA does and does not

tell us, and to improve the usefulness of this technology to inform management decisions and policy recommendations. In this regard the positive test results for Asian carp eDNA reported in mid-November 2009 from the Calumet River near the O'Brien Lock, upon which Michigan relies, caused the Corps to accelerate efforts to improve our understanding of eDNA research. Shortly thereafter the Corps reinvigorated previous tentative discussions with Dr. Lodge and his team to increase eDNA test processing capacity, laboratory validation, and additional eDNA testing and research to more fully understand what eDNA evidence tells us with improved specificity. These discussions resulted in an agreement with UND, which is in the process of being memorialized in a written cooperative agreement, to include not only an assessment of the accuracy of the eDNA test, methods, and protocols, but also additional testing and research on the specificity of the test in the field. This effort is consistent with the Corps' policy of ensuring that its technical, engineering and scientific work undergoes an open, dynamic, and vigorous review process to ensure appropriate confidence in our decisions and policy recommendations. This obligation is heightened in situations, such as this case, where a high level of complexity and novel or precedent-setting approaches are involved, and which involve significant interagency interest. In addition, UND is cooperating with the Corps to help transfer its knowledge and capabilities to ERDC, and is working to increase sampling processing rates, discussed below. Some of these efforts have started, some are ongoing and other portions are in planning, but for simplicity of discussion these efforts can be broken into four over-lapping and concurrent phases:

(a) Phase 1 Field Tests. Phase 1 is the ongoing field tests of electro-fishing, netting operations, and application of rotenone in an attempt to verify positive eDNA results with the capture of physical Asian carp specimen. These field tests are being

performed by multiple agencies including the Corps, USFWS, and IDNR. To date, these field tests have only produced two Asian carp, both of which were below the fish barrier, near the Lockport Lock and Dam. One of these was a visual sighting of a silver carp by a USFWS employee, and the other was a bighead carp collected during the rotenone application carried out in early December. No physical Asian carp specimen has been caught by electro-fishing or fish netting operations conducted since August of 2009 by the USFWS, IDNR, and the Corps in areas where positive eDNA results have been reported, either above or below the fish barrier. This includes an especially intensive 7 day fish netting operation in the vicinity of the O'Brien Lock and Dam in early December 2009 conducted by commercial fisherman with experience fishing for Asian carp. Despite netting over a thousand fish of various species, as discussed in the USFWS declaration, none were Asian carp.

(b) Phase 2, Increase eDNA Processing Capacity. The relationship between the Corps and the UND has been a positive and unique collaboration that has allowed us together to rapidly cycle out an emerging technology and apply it for operational purposes to meet a compelling need. As our collaboration has matured over the last few months, the Corps has realized that increasing operational needs for quickly processed information have outpaced the UND's research-oriented capabilities. The laboratory at the UND is designed for education and research, not to support the Corps' increasing requirements for near-real-time eDNA information. As a result, recent discussions, in December 2009, with Dr. Lodge and his team have resulted in a plan, which is being finalized, to increase his laboratory's weekly processing capacity from 40 to 60 samples per week, and for UND to assist ERDC to develop an internal or commercial laboratory capability of an additional 60 samples per week. When this effort matures in the

next few months, our weekly processing capacity will have expanded 200% to 120 samples per week. As operational requirements for information evolve, we will continue to find ways to expand eDNA sampling capacity.

(c) Phase 3 Laboratory Validation. This effort is intended to identify the adequacy of the quality assurance and quality controls associated with collecting water samples, sample handling, and laboratory techniques, methods and protocols to assure there are no technical errors in performing the assay. A four person team from EPA accomplished this verification on December 15 and 16, 2009 at Notre Dame. The review team not only examined reports provided to the Corps but also inspected the laboratory, examined laboratory notebooks, observed and discussed all details of the eDNA protocols, and provided blind samples for Notre Dame to process. Although the final EPA report has not been received, preliminary results indicate the EPA team has concluded that the methods and protocols are reliable and they have a high degree of confidence in the methods used for detecting silver and bighead carp eDNA. This is discussed in some detail in Dr. Lodge's declaration.

(d) Phase 4 Additional Testing and Research. This phase involves additional testing and research on the specificity of detecting the presence of Asian carp in the field. In other words, this research is designed to increase our specific understanding of what eDNA tells us other than that Asian carp DNA is present in the water samples. Many questions will be addressed, including such issues as:

- Can the DNA tell us anything about the population size?
- Can the DNA tell us if the fish was alive or dead?
- How recently must a fish have been present for a positive test?
- Will the eDNA travel far from the location of a fish?

- What is the likelihood of false positive and false negative tests?

- What environmental factors, such as cold water, turbidity, or salinity, influence the eDNA test performance?

- What is the effect of the flushing rate, time of eDNA in water, eDNA degradation rates, and density of Asian carp under laboratory conditions?

Phase 4 will include laboratory studies with captive Asian carp in tanks and also of field tests in ponds and possibly in controlled riverine environments. These studies are longer term and are expected to take several months to prepare before we can start gathering data. The Corps is working with ERDC and with the University of Notre Dame to scope these efforts and proceed with Phase 4 testing over the next six months.

20. Conclusions about eDNA based on current data. At present, eDNA evidence cannot verify the number of Asian carp in an area or whether a viable population of Asian carp are present. What it does suggest is that Asian carp DNA is present, but it does not tell us how it got there, whether it is from a live or dead Asian carp, or from water containing Asian carp DNA transported from other locations, or other sources. Notwithstanding these limitations, Corps, EPA, and USFWS experts all agree that the evolving technology of eDNA can be a valuable tool for suggesting the presence of Asian carp DNA, and therefore a valuable indicator that living Asian carp may be present in the sampled area, and an aid to inform further Asian carp monitoring efforts. To my knowledge, none of our interagency partners have opined that eDNA evidence alone should be used, in the absence of confirmatory evidence, to take major policy steps like closing the locks open to Lake Michigan. ERDC will continue working with the University of Notre Dame to increase the capacity for processing eDNA samples, to improve our understanding of what eDNA does and does not tell us, and to improve the eDNA technology.

V. Coordination with Other Agencies.

21. The Corps has a long history of collaboration with other agencies and stakeholders related to the fish barrier, going back to planning and preparations for Barrier I construction in the late 1990s. The structure of advisory panels related to the fish barrier has evolved over time, as described in Colonel Quarles' declaration. Following the initial reports of Asian carp eDNA closer to the fish barrier than fish were previously thought to be present, and the subsequent increase in Barrier IIA's operating parameters, in late summer of 2009 the Corps joined with a federal, state, and local ad hoc team formed to coordinate and take action as necessary to reduce the vulnerability of the Great Lakes to the migration of Asian carp through the Chicago Sanitary and Ship Canal and nearby bodies of water. The team is titled the "Executive Committee of the Rapid Response Working Group", (RRWG) and includes senior leaders and representatives from the USEPA, the USCG, the USFWS, the Illinois Department of Natural Resources, the Metropolitan Water Reclamation District, the City of Chicago, and others, including the Great Lakes Commission and the International Joint Commission. The RRWG was formed under the authority of Executive Order 13340 and operates under the guidance of the EPA's Mr. Cameron Davis, but does not supplant any of the independent authorities of the various federal, state, and local governmental agencies supporting the RRWG.

22. RRWG Support of Rotenone Application for Barrier IIA Maintenance. Once we found eDNA evidence that indicated the possible presence of Asian carp in the Lockport pool, which is in the same pool as the fish barrier, the Corps began discussions with the RRWG about how we would address the 48 hour shut-down of Barrier IIA required to execute the necessary periodic maintenance on Barrier IIA. There is no alternative to this maintenance shut-down, as the risk of electro-mechanical breakdown in the absence of scheduled

maintenance is unacceptably high. Because the fish barrier remains the primary defense mechanism against the threat of Asian carp migration, the RRWG decided to develop a plan to ensure no Asian carp that might be present in the Lockport pool could migrate through the barrier during its maintenance down period. Over the course of the fall, the RRWG developed a plan to apply rotenone, a piscicide, during the expected 48 hour period that the Corps would take the barrier down for maintenance. Other agencies applied the rotenone in early December 2009, most notably the Illinois Department of Natural Resources (IDNR) and USFWS, while the Corps executed the maintenance of Barrier IIA and Barrier I, in sequence. The Corps agreed to provide some financing as approved by the Assistant Secretary of the Army for Civil Works under Section 126 and participated in all aspects of planning and preparation. As a result of the team's close collaboration, careful detailed planning, synchronization rehearsals, and establishment of a unified command center, this operation was smoothly and successfully conducted. Of the estimated tens of thousands of fish collected during the rotenone application, only one Asian carp was discovered near the Lockport Lock and Dam, below the fish barrier, although the Corps understands that some believe many dead fish sank to the bottom and were not seen.

23. Evolution of the RRWG**.** Following the successful application of rotenone between the fish barrier and the Lockport Lock and Dam and the 7-day intensive commercial fish netting operation near the O'Brien Lock, on December 16, 2009, the RRWG Executive Committee provided a telephonic update to the Great Lakes Council of Governors' representatives, and then convened to discuss possible future actions, considering the eDNA evidence found above the fish barrier in the vicinity of the O'Brien Lock. In addition to reviewing the rotenone application effort and netting operation near O'Brien Lock, discussions included the challenges of addressing potential Asian carp presence above the fish barrier

under winter conditions, when fish activity slows significantly and efforts to detect eDNA or net fish are prone to lower success rates. At the same time, RRWG members are in continual communications and actively working on a plan for continued coordinated action to address this threat. The group convened telephonically as recently as December 30, 2009, to review all agencies' current action plans and resources available, and to consider additional actions.

VI. Evaluation of Solutions

24. Required Study Characteristics. Any study that recommends significant Federal action that would modify or alter the authorized purposes of Corps projects, to include the closure of the Chicago Area Waterway System locks and control structures, must be supported by sufficient information allowing the evaluation of the costs, benefits, and impacts of various alternatives. The level of detail and confidence in the supporting information should be commensurate with the magnitude of the environmental, social, and economic impacts, and of the costs of the proposed actions. Based on the initial analysis of potential impacts to lock closure discussed below, the Corps believes additional analysis is required. Alternatives that would alter the existing flow, capacity, or uses of that system will require sufficient analysis to provide information that will allow adequate understanding of the expected impacts on water quality, the environment, flooding risks, economic uses, and critical infrastructure, as well as the benefits from avoiding impacts from Asian carp.

25. The Efficacy Study and Interim Reports. The Efficacy Study, which was initiated in January 2009, has focused on the immediate threat from Asian carp bypassing the fish barrier, and actions that might be appropriate to enhance the efficiency of existing, planned, or potential electrical barriers, as well as preventing potential bypass routes around the electrical dispersal barriers. The details of this report are further amplified in Colonel

Quarles' declaration. In order to accelerate our ability to execute emergency and short-term actions related to the Efficacy Study, it has been organized into three phases, Interim Report I, Interim Report II, and the Final Report. Interim Report I was completed in November of 2009. Its recommendations to implement immediate but temporary actions to reduce the risk of potential bypass of the existing barriers by flooding from the DesPlaines River and increased flow through the I&M Canal is currently under agency review. Assuming approval by the Assistant Secretary of the Army for Civil Works, and no significant legal, permitting, real estate acquisition, or construction management obstacles, the Corps expects to complete these barriers in 2010. Other interim reports could also provide a basis for action pursuant to Section 126. The Interim II Report will further refine the optimal parameters for operating the electric field of the Dispersal Barriers to deter both adult and juvenile Asian carp.

26. Final Efficacy Study Scope. The final report will summarize interim reports and recommend a long-term, multi-agency comprehensive strategy to improve the efficacy of the dispersal barriers and additional measures throughout the Chicago Area Waterway System to minimize the risk of Asian carp migrating into Lake Michigan. This final report will include assessments of pathways around and beyond the fish barrier in order to determine the advisability and feasibility of permanent solutions to potential bypasses from the DesPlaines River and I&M Canal. It will also consider additional fish barriers or other impediments to the migration of Asian carp and other aquatic invasive species', as is possible in the relatively short time frame of this review, through the Chicago Area Waterways System into Lake Michigan. In addition it will evaluate the possibility that Asian carp or Asian carp eDNA may be transported from below to above the fish barrier via navigation barge ballast water. Finally, it will address potential operational changes to existing Corps waterway structures, which

could include temporary closure, and will determine preliminary environmental, economic, and social benefits and costs of any proposed actions. The Corps is planning to complete the Final Report for the Efficacy Study in the summer of 2010 and intends to finalize recommendations in September of 2010 after public review. Subject to Section 126 approval (if this authority is extended beyond the current fiscal year) and/or Congressional authorization and available funds, work to implement Final Efficacy Study Report recommendations could begin as early as FY 2011.

27. Final Efficacy Study Limitations. With its compressed schedule, the Final Efficacy Study will not be able to provide sufficient information to support decision making for actions which permanently alter the existing flow, capacity, or use of the Chicago waterways. Such an action would require extensive planning to address the need for alternative flood control methods in the Chicago area, among many other environmental and engineering challenges inherent in changing the existing waterways. The Efficacy Study should provide adequate information to support decision making for actions that could enhance the level of protection provided by the existing electrical barriers, as well as the potential for additional barriers. It will also address potential modifications of existing structures to use them as additional obstacles to aquatic species migration, without permanently altering these structures' existing purposes, or affecting the existing flow, capacity, or uses of the Chicago waterways.

28. The Great Lakes and Mississippi River Interbasin Study (Interbasin Transfer Study). The scope of the Interbasin Transfer Study is far more comprehensive than the Efficacy Study, so its expansive nature and added complexity also make it much more time-consuming. While it will incorporate all of the information developed in the Efficacy Study, it

will also consider the risks from other known and suspected hydraulic pathways between the Great Lakes and Mississippi River Basins, not just the Chicago Area Waterway System. The Interbasin Transfer Study will evaluate all manners of aquatic invasive species in both the Great Lakes and in the Mississippi River systems, not just Asian carp. This study will also consider actions that are needed to prevent inter-basin migration of aquatic invasive species in both directions, not just into the Great Lakes. Normally, a study of this magnitude would require at least 3-5 years to complete, with additional time required for Congressional authorization for implementation. Pending coordination with partner agencies, the Corps anticipates that the initial emphasis of this Interbasin Transfer Study will focus on the pathways in the Chicago Area Waterway system, to include an assessment of the feasibility of permanent lock closure, while additional study work will be organized to simultaneously address other potential points of entry to the Great Lakes, such as the Fox River in Wisconsin and Ohio River and tributaries in Ohio.

29. Interbasin Transfer Study Scope and Outline. The Corps received $287,000 in funding for this effort in FY 2009. The Corps has initiated internal coordination to begin organizing this major study effort. Letters went out during the week of December 28, 2009 to other Federal agencies to request their participation and recommendations in study scoping efforts. We hope to have responses available in January 2010 so that we can execute our planned initial study scoping meeting among relevant agencies in late January 2010. A Project Management Plan or Plan of Study will be discussed at the scoping meeting to inform follow on activities and subsequently be used to obtain input from state, local and nongovernment interests. The Corps has already begun informal discussions with the EPA and other relevant agencies to explore potential roles that they might play to leverage their authorities and

capabilities in order to facilitate the development of an efficient and effective study plan. Within the Interbasin Transfer Study, the Corps intends to develop the type and quality of information needed to support decision making on alternatives that may alter the existing flow, capacity, or uses of the Chicago waterways. Similar to our R&D approach to the fish barrier as described earlier, new methodologies may have to be developed in order to obtain some of this information. We intend to conduct the Interbasin Transfer Study in a manner by which actionable items identified through the study might be broken out for implementation before study completion, if warranted and authorization is available.

VII. Analysis of Potential Lock Closure Impacts Based On Current Information

30. As is explained in the various declarations, after the discovery of positive eDNA near the O'Brien lock, the Corps conducted a preliminary analysis of the need for and the efficacy of lock closure as Michigan suggests. For a variety of reasons explained below and in other declarations from Corps professionals, such actions would present extraordinary challenges to execute on either a deliberate or an emergency basis.

(a) First, as explained in the declarations of Mr. Mike Cox and Dr. Su, these locks must be able to allow waters to flow in both directions in the event of high water flood events if they are to function as intended to prevent severe flood damages and possibly loss of life. In order for the lock gates to be available in a severe flooding event, they must be cycled open and closed several times a day, up to an hourly basis depending on temperatures, at least during the winter months, as described in detail by Mr. Cox.

(b) Second, neither the O'Brien nor the Chicago Locks are water-tight due to their highly advanced age and deteriorated condition. It is not clear whether Asian carp could pass through these leaks, but it is a possibility that might have to be addressed by

buttressing the structures with bulkheads engineered to minimize water transfer. In any event, developing completely water-tight solutions at these structures is problematic. The Corps would also have to consider how the sluice gates could be made water tight.

(c) Third, as Michigan notes, there are at least two uncontrolled pathways to Lake Michigan that currently have no structures that could be closed, limiting the efficacy of closing existing structures. The weir that EPA is currently constructing on the Grand Calumet River is designed for ecological and environmental purposes, and the Corps understands it would only be effective in preventing water transfer for a ten-year probability flood event. Even if the Corps were directed and funded to immediately build permanent structures to block these uncontrolled pathways, multiple requirements taking months and perhaps years of time would be required to comply with other elements of law, to include:

- Studies to determine alternatives and the optimal location,
- Real Estate Acquisition actions
- Various Permitting actions,
- Significant flood structures would have to be planned, resourced, and constructed due to the flat topography and significant flow diversion from the envisioned closed structures, in order to account for the dramatically changed hydrographic conditions that blocking current river and channel flows would entail.

(d) Fourth, significant and severe flood events would certainly have the potential of overtopping closed existing structures, as well as other proposed structures, as outlined in Dr. Su's declaration. The potential impact from a severe flood event is substantial. Damages in downtown Chicago and environs could approach or exceed $1 billion, and over 14,000 homes and structures could be affected in the O'Brien Lock area.

(e) Finally, as discussed below, there are many potential impacts of short or long term closures that are not fully understood, and have the potential for dramatically negative impacts that should be fully considered and balanced before taking action.

VIII. Potential Impacts of Lock Closure

31. The Corps believes that a comprehensive analysis is needed to properly and adequately analyze the potential impacts resulting from the potential closure of the Chicago and O'Brien Locks, closure of the North Shore Channel and/or construction of permanent blockages in the Grand Calumet and Little Calumet Rivers, as proposed by Michigan. Shortly after the discovery of Asian carp eDNA near the O'Brien Lock, the Corps began a preliminary analysis of potential economic, social, environmental and flood risk impacts resulting from lock closure to inform internal Corps discussions on alternative actions, as well as discussions with the RRWG. Subsequently, we have conducted informal investigation into the installation of permanent closures of all known pathways from the Illinois Waterway to the Great Lakes within the Chicago Area Waterway System. It is important to note that this preliminary analysis was developed on an expedited timeline referencing readily available data from Corps archives, the Corps' Waterborne Commerce Statistics Center, project information for the Little Calumet and Grand Calumet Rivers, and professional judgment. It is therefore tentative, incomplete, and represents estimates that can only provide a likely order of magnitude.

(a) Flooding Impacts: Closure of locks and controlling works at the lakefront and blocking flows in the Little Calumet and Grand Calumet Rivers would likely induce significant flood risk to metro Chicago including flooding to downtown businesses and Union Station, basement flooding and sewer backup in Chicago and suburbs, overtopping at Brandon Road Lock, and significant flooding along North Branch Chicago River, including Albany

Park and other neighborhoods, as declared by Colonel Quarles and Dr. Su. Any structures that would be overtopped in a flood event would allow a pathway for aquatic species to move in the direction of the flow. During an extreme flood event, Asian Carp migration could still occur from overland flow in the absence of sandbagging or structural measures, and from overtopping of the Chicago Lock and turning basin walls. Although we have not modeled the size of the storm event that would overtop the lock wall with gates closed, we have modeled a 500 year event that would overtop the wall and turning basin if the sluice gates are open. The Corps projects with a high level of confidence that overtopping with larger flow depths will occur when the sluice gates are shut during a major flood event. Impacts from closure of O'Brien Lock include flood damages to about 14,000 homes during certain storm events. Damages from closure of the Little Calumet River are estimated at approximately $56 million during certain storm events and could dramatically reduce flood protection of area projects from the authorized and designed level of a 200 year storm, as declared by Dr. Su. Preliminary estimates of flood damages due to closure of Chicago Lock could approach or exceed $1 billion during an extreme event. As indicated earlier, EPA's construction of a weir structure underway in the Grand Calumet River is not designed to be a complete barrier to water flow.

(b) Environmental and Social Impacts. Due to inadequate data currently available, these impacts are not fully understood. General impacts could include stagnant water conditions and associated water quality and health hazards, low flow rates leading to low dissolved oxygen levels and reduced water quality, less dilution into the system from Lake Michigan, high seasonal chloride levels from road salt run-off, and downstream impacts to water users and permit holders. Analysis and coordination of these impacts are needed between the Corps, Illinois Department of Natural Resources, Illinois EPA, and the

Metropolitan Water Reclamation District of Greater Chicago. Also, numerous industrial and public dischargers could be affected by the need to extend discharge pipelines directly into the lake and upgrading treatment works to meet more restrictive discharge standards into the lake. Impacts due to Clean Water Act requirements for 303(d) impaired waters are as yet undefined. Other impacts that need to be investigated include impacts to the USCG Search and Rescue and security operations, International Joint Commission concerns to address impaired use of the Grand Calumet River, minor water users and natural or altered surface drainage pathways. Traffic congestion would definitely be exacerbated as currently waterborne commodities would have to shift to ground surface (rail and road) modes of transportation. The Corps does not have ready access to data on details of potential transportation impacts, but anyone with experience driving in the Chicago area would surmise that adding up to seven million tons of commodities to truck traffic in the area could significantly increase congestion, noise and emissions. This could present a significant challenge to the Chicago area surface transportation network. Our initial analysis does not provide details on the destinations of the commodities that transit the O'Brien Lock (see Mr. Mike Cox's declaration for a detailed description of these commodities). However, because significant amounts of coal pass through the O'Brien Lock, an area for further study is whether there might be any impact on electrical supply from any interruption in shipping.

(c) Economic Impacts: Much additional analysis is needed to understand potential economic impacts. Approximately 7 million tons transited thru the Chicago and O'Brien locks in 2008. The top commodities that ship through these locks are coal, petroleum products, coke, bitumen, asphalt, sodium chloride, iron ore, portland cement, iron products, calcium chloride, fuel oils, and scrap metal. In 2008, an estimated $192 million in

transportation savings resulted from utilization of the O'Brien and Chicago Locks vs. the least cost overland routing. Chicago Lock also serves a large amount of recreational traffic and has 10,000 lockages per year, over 40,000 vessels per year, and 700,000 passengers per year. The impact to harbor owners/operators, commercial and sport fisheries, the dinner cruise industry, and neighboring businesses requires research. Preliminary analysis indicates that many jobs could be affected within the region by termination of operations at Chicago and O'Brien Locks. These impacts would need to be assessed in comparison to the expected impact to the Great Lakes recreation and fishery industries, based on additional data on the expected manner and extent to which Asian carp are likely to affect the Great Lakes.

IX. Evaluation of Relief Requested by Michigan

32. The State of Michigan has asked the Supreme Court for various forms of relief, including the temporary severing of the connection between the Great Lakes and the Mississippi River Basin by closing the various elements of the Chicago Works, closing the various elements of the O'Brien Lock and Dam, by putting barriers in the Grand Calumet and Little Calumet Rivers, increasing Barrier IIA power, and other relief. The Corps agrees that we must keep Asian carp from becoming established in the Great Lakes, but the measures to be taken to further that goal must be evaluated based on the state of the evidence related to whether Asian carp are postured to migrate into and establish viable populations in Lake Michigan. Senior experts from the federal government agencies working this issue as part of the RRWG agree that in the absence of more complete understanding of what the eDNA research tells us and what it does not tell us, and in the absence of reinforcing evidence such as the capture of live Asian carp, the current evidence that Asian carp will soon migrate into and establish a viable population in Lake Michigan

does not warrant immediate drastic action such as closing lock structures. Further, our current inability to understand consequences associated with such a drastic action is a serious data gap that must be addressed. The potential for extremely harmful second and third order consequences from flooding and the inability to deliver essential commodities to critical industries or infrastructure, such as power plants, among many other potential serious consequences, weighs in favor of exercising a cautious approach.

33. As explained in detail above, the Corps of Engineers has developed a strategy to close our gaps in data related to all of the above issues by using the Efficacy Study and Interbasin Transfer Study as vehicles to develop knowledge via a disciplined and thorough review of the facts. The development of the data needed to understand where Asian carp are located, in what abundance, and what threat this portends, buttressed by information that provides adequate understanding of the consequences of various alternative actions to address the threat, is the appropriate action at this time, unless and until we gain more compelling information about the threat of Asian carp migration.

34. Thus, the Corps believes that preventing Asian carp migration and establishment in the Great Lakes is a national imperative, but one which must be pursued in as measured and careful a fashion as possible given the potentially dramatic consequences of suddenly severing a century-old waterway system. In my professional judgment, and taking into account all relevant information as discussed in all of the declarations submitted with the United States' filing, currently available information about the imminence of the risk does not warrant recommending closing any of the structures that allows water flow and navigation to transit between the Chicago Area Waterways System and Lake Michigan. This professional judgment is informed by the opinions of the senior members of the Executive Steering Committee of the RRWG (especially EPA, USFWS, and IDNR) in

matters of their competency related to this issue. Nor is now the time to operate Barrier IIA at full power as Michigan proposes, given the research by ERDC that the current operating level is effective and given the significant safety and maintenance concerns, and risk of electro-mechanical failure implicated in increasing the voltage to the barrier. If, however, additional or new information becomes available, which in the judgment of appropriate experts represents a significant threat of Asian carp migration into Lake Michigan, I would re-visit the conclusions related to lock closure and consider any other appropriate actions.

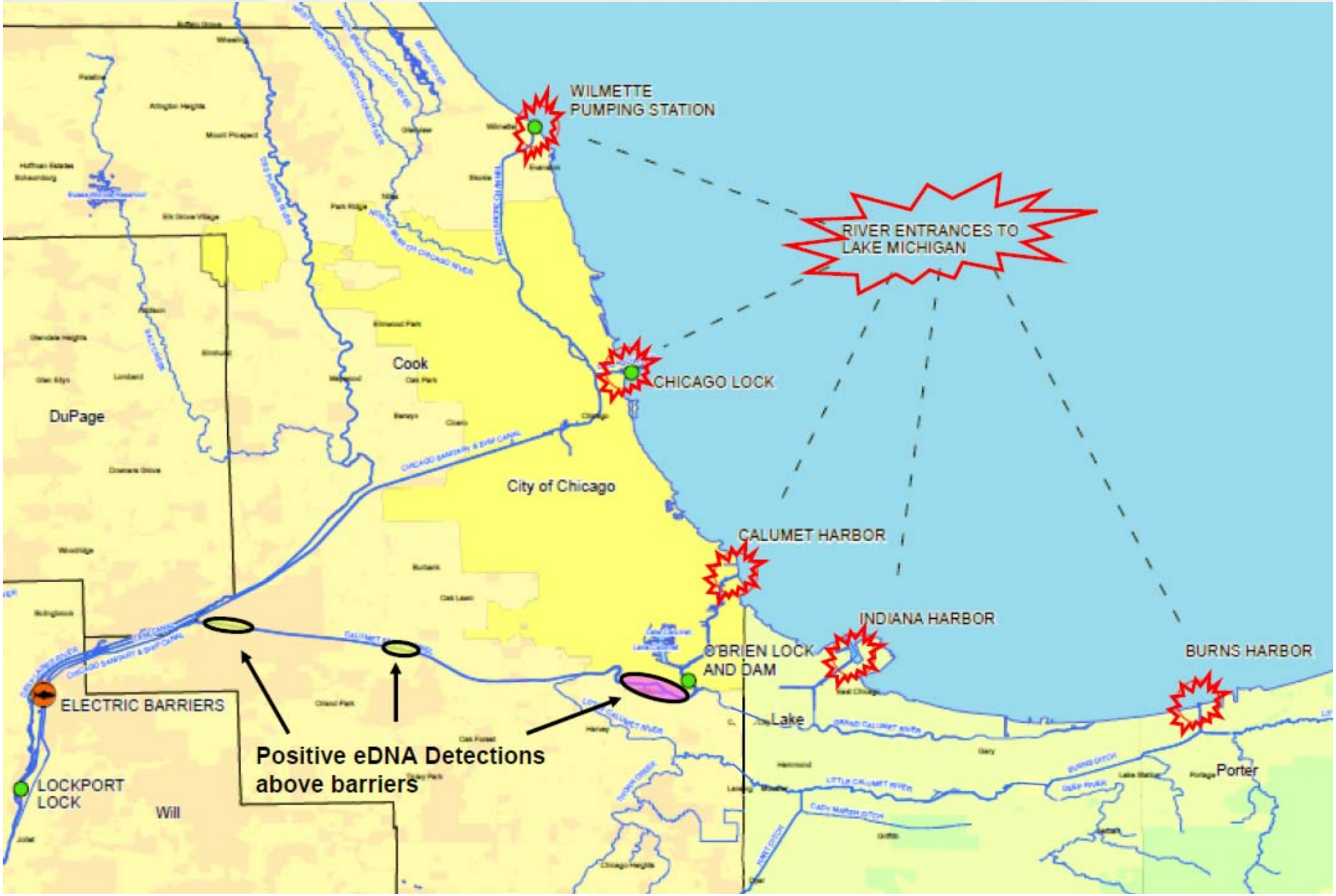
35. While we are not prepared to take these most extreme measures now, the Corps, along with other agencies, is aggressively pursuing the other relief that Michigan seeks. The Corps has expedited the completion of Barrier IIB. The Corps is planning, pending Secretarial approval, to construct barriers along the DesPlaines River and the I&M Canal to prevent the bypass of the fish barrier in the event of flooding that overflows into the Chicago Sanitary and Ship Canal. I expect Secretarial action on this matter sometime this month and, assuming approval and no unforeseen obstacles to permitting and construction, those barriers should be constructed by October of 2010. The Corps is continuing to evaluate other interim measures in the Efficacy Study, to be completed this year. The Corps has initiated an EIS and Feasibility Study, the InterBasin Transfer Study, to evaluate permanent solutions to the Asian carp migration problem. The RRWG is continually discussing evolving events, and poised to address all new information and the discovery of bighead or silver carp in the Chicago Area Waterways System. Finally, the Corps is continuing to use the eDNA research and other monitoring, in coordination with our partner agencies, to better understand the Asian carp presence in the waterway.

In my judgment, the Corps and its partner agencies are addressing Michigan's concerns in an aggressive, coordinated, and appropriate manner.

I declare under penalty of perjury that the foregoing is true and correct, pursuant to 28 U.S.C. § 1746.

Executed on January 4, 2010
Cincinnati, Ohio

JOHN W. PEABODY
Major General
U. S. Army


WILMETTE
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CHICAGO LOCK
Cook
DuPage
City of Chicago
CALUMET HARBOR
INDIANA HARBOR
O'BRIEN LOCK
AND DAM
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Will
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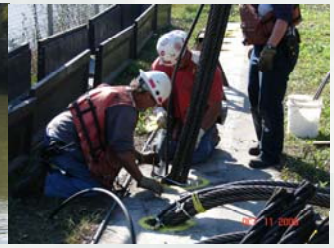


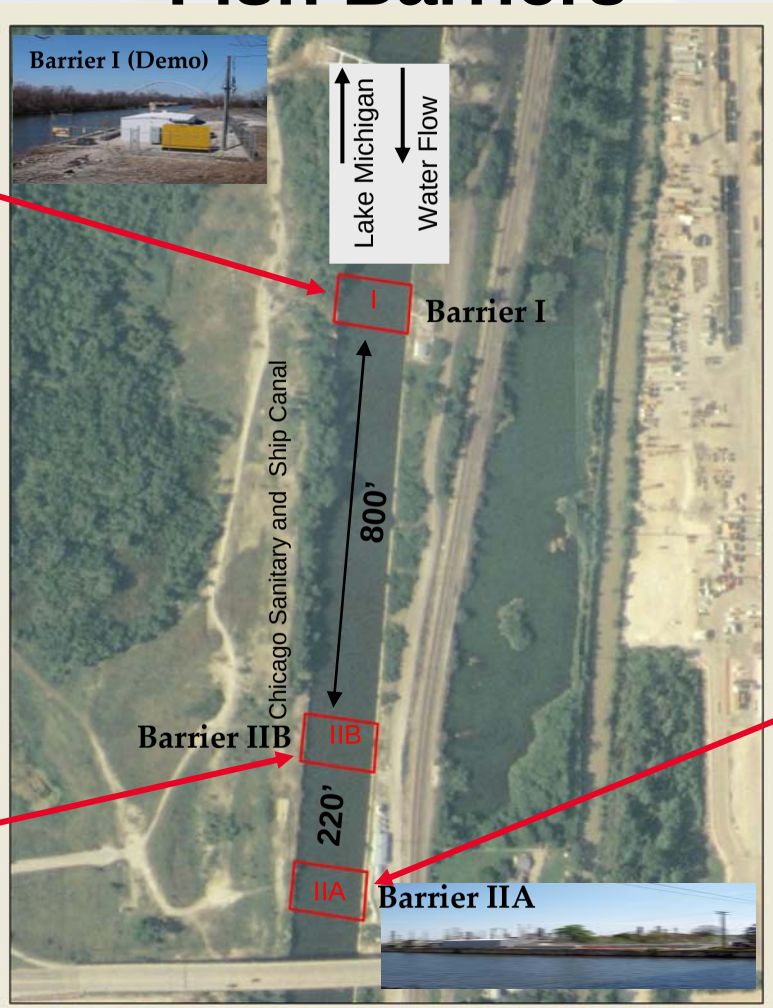
Ex. B, Peabody Decl., Wisconsin v. Illinois
(Nos. 1, 2, 3 Original) (S.Ct.)

Electric Dispersal Fish Barriers

Barrier I (Demonstration):
-In continuous operation since 2002 @ 1 Volt/in, 5 hz, 4 ms
- Rehabilitated in Oct 2008

Barrier I (Permanent):
- Upgrade to a permanent barrier authorized; plan activation by 2013 if funded

Barrier IIB:
- Site prep completed
- Building construction contract NTP issued 3 Dec
- Electronics design ongoing
- Construction to be completed 30 Sep 10

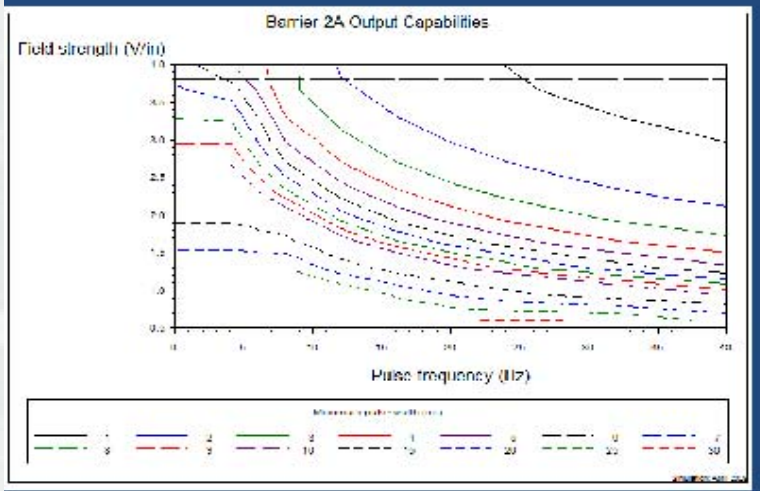


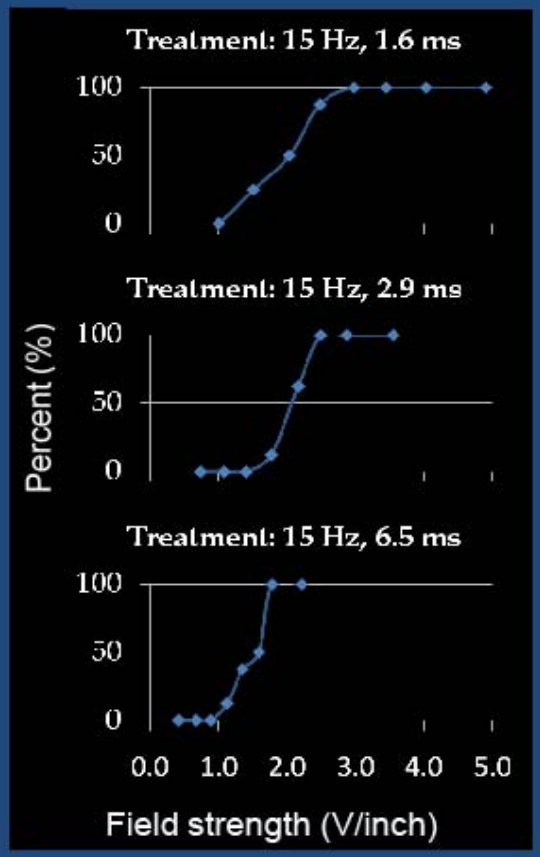
Other Ongoing Efforts:
- Asian Carp Monitoring
- Research on Optimum Operating Parameters
- eDNA Research
- Efficacy Study Interim I: Potential Barrier Bypass Solutions

Barrier IIA:
- Activated @ 1 Volt/in, 5 hz, 4 ms in APR 09.
- Increased to 2 Volt/in, 15 hz, 6.5 ms in AUG 09
- Maintenance shutdown completed 3 – 4 Dec w/rotenone support by State

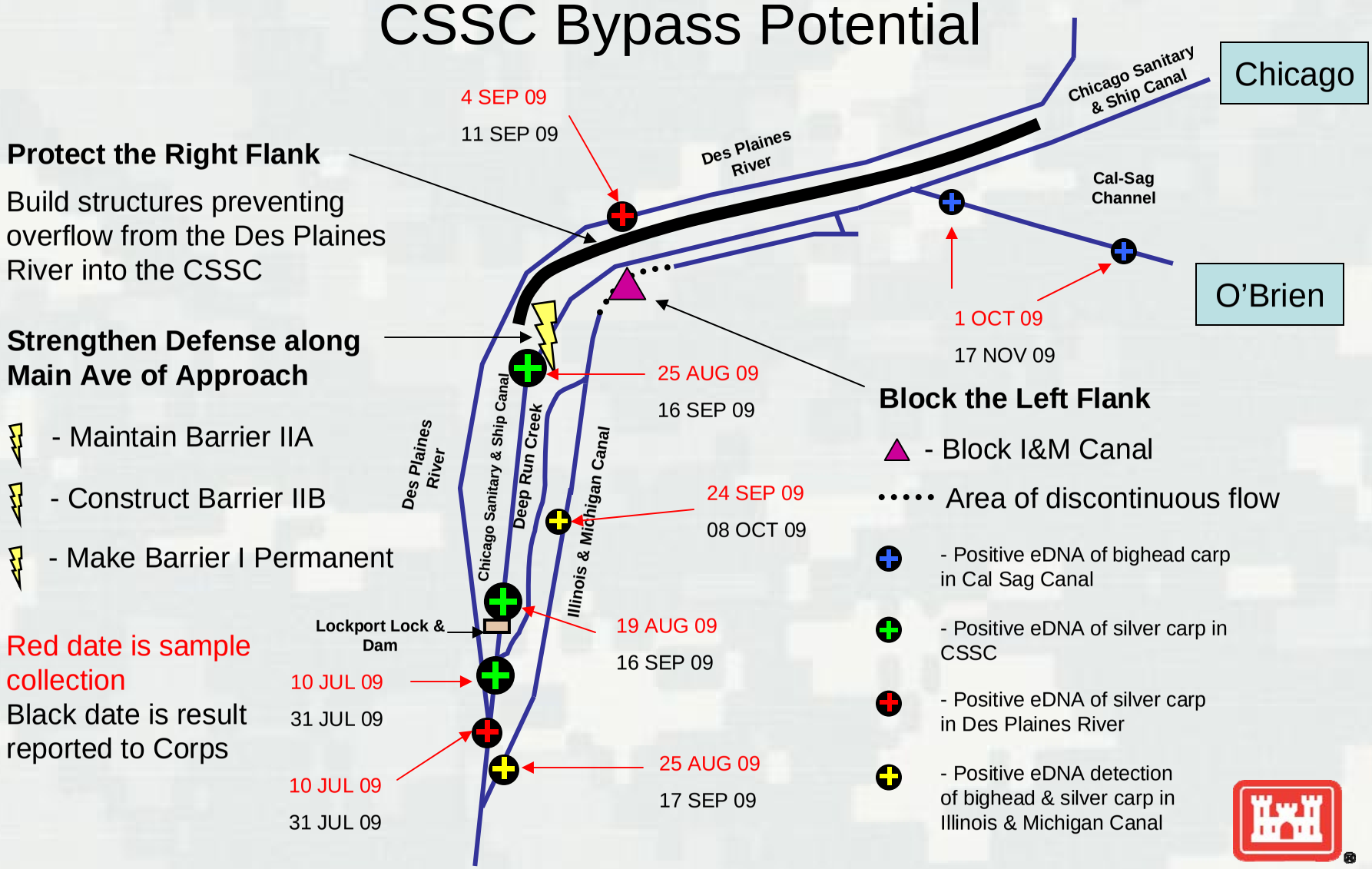
Optimum Barrier Operating Voltage Laboratory Test Results

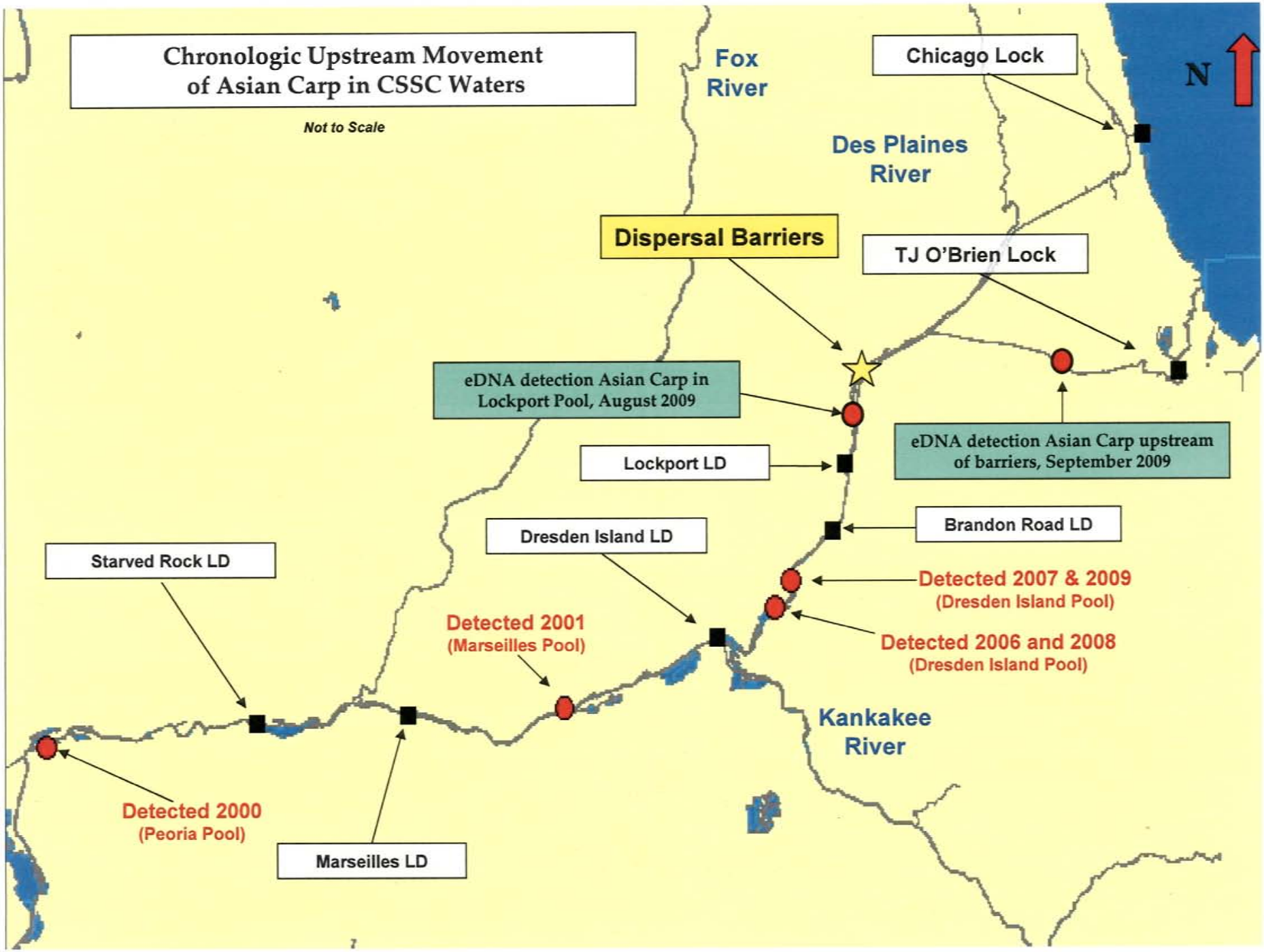
Outcomes





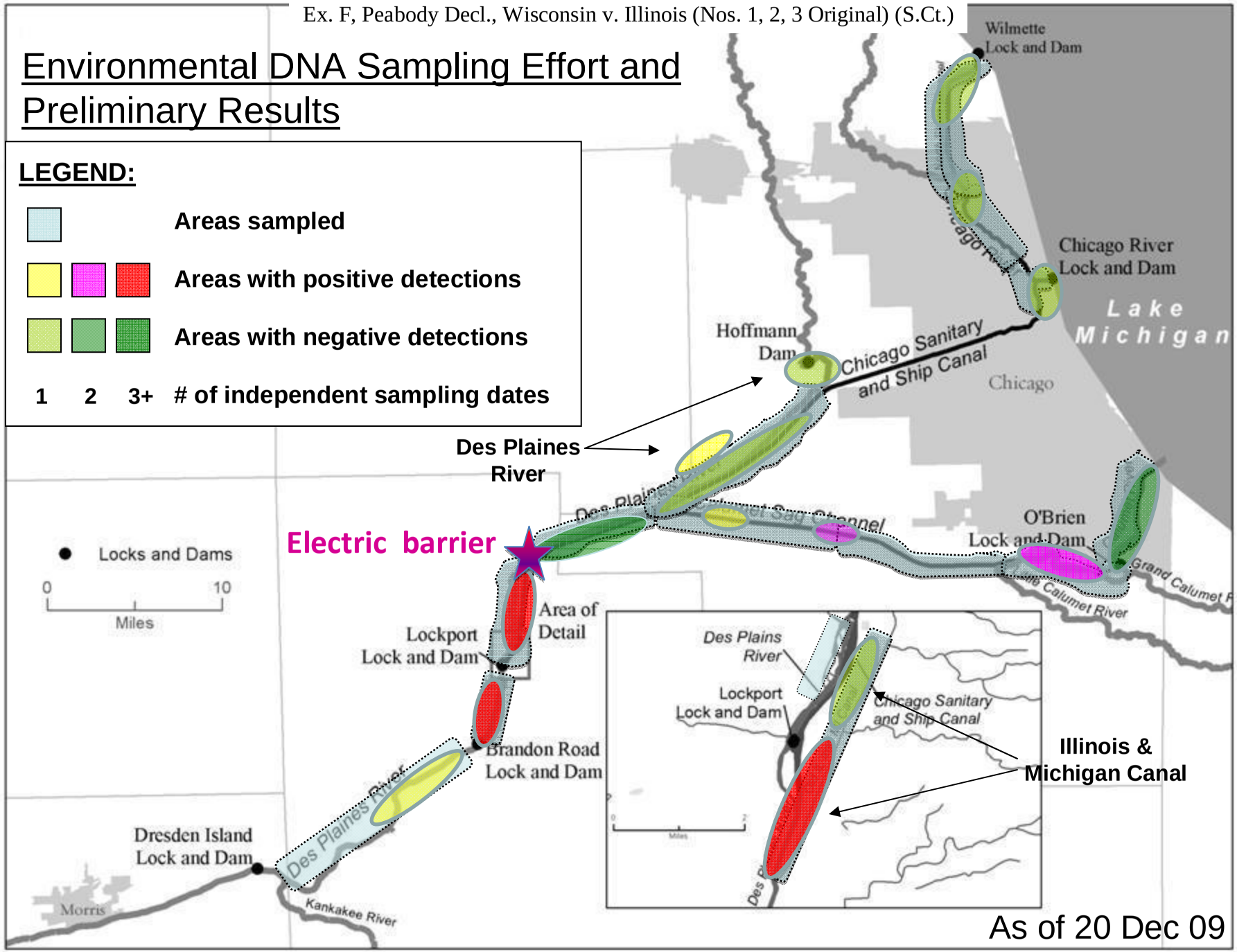
CSSC Bypass Potential




Chronologic Upstream Movement of Asian Carp in CSSC Waters
Not to Scale
Fox River
Chicago Lock
N
Des Plaines River
Dispersal Barriers
TJ O'Brien Lock
eDNA detection Asian Carp in Lockport Pool, August 2009
eDNA detection Asian Carp upstream of barriers, September 2009
Lockport LD
Brandon Road LD
Dresden Island LD
Starved Rock LD
Detected 2007 & 2009
(Dresden Island Pool)
Detected 2001
(Marseilles Pool)
Detected 2006 and 2008
(Dresden Island Pool)
Kankakee River
Detected 2000
(Peoria Pool)
Marseilles LD

App. 42a

Environmental DNA Sampling Effort and Preliminary Results



IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF MICHIGAN, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

DECLARATION OF VINCENT V. QUARLES

1. My name is Colonel Vincent V. Quarles. I am the Commander of the Chicago District (the "Chicago District") of the Great Lakes and Ohio River Division of the United States Army Corps of Engineers (the "Corps"). In this capacity, I direct all operations of the Chicago District. Our district missions include the planning, construction and operation of navigation and flood damage reduction facilities throughout the Chicago metropolitan area, encompassing 5,000 square miles and serving a

population of over 8 million people, in addition to environmental protection and restoration, and disaster assistance.

2. I have been the Commander of the Chicago District since July 1, 2008. Immediately prior to reporting to the Chicago District, I served as the Mobility Team Chief, Dominant Maneuver Division of Force Development, Army G-8 from 2006 to 2008 where I developed and managed an annual budget exceeding one billion dollars for developing and distributing mobility systems across the Army. I was commissioned into the Corps of Engineers and entered active service in 1987. I have served in various command and staff positions, mostly as a combat engineer, including combat tours during Operations Desert Shield/Desert Storm and two tours to Iraq for Operation Iraqi Freedom, the latter tour as the commander of the 4-3 Brigade Troops Battalion, where my battalion managed more than 300 construction projects exceeding $326 million. I have also served as the executive officer in the department of Civil and Mechanical Engineering at the United States Military Academy at West Point.

3. I am a graduate of Norfolk State University, the U.S. Army Command and General Staff College, and North Carolina State University, where I earned a Master of Mechanical Engineering degree. I also taught Civil and Mechanical Engineering at the United States Military Academy at West Point from 1997 to 1999.

4. I am familiar with the facts relative to the above captioned civil action, and I submit this sworn Declaration in support of the United States' Opposition to the State of Michigan's Motion for Preliminary Injunction.

Corps' Efforts to Mitigate Asian Carp Migration

5. Asian carp, specifically bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*H. molitrix*), were imported into the southern United States in the 1970s, and they have escaped into and spread throughout the Mississippi River basin. To deter migration of the Asian carp into the Great Lakes, the Corps has constructed, is operating, and is further improving an electrical Dispersal Barrier system in the Chicago Sanitary and Ship Canal ("CSSC") as authorized by Congress. The Corps is also engaged in extensive fish monitoring and is undertaking congressionally authorized studies to identify additional emergency and long term actions needed to deter the migration of this invasive species.

6. As part of our efforts, the Corps has coordinated with numerous federal, state, and local entities to deter the migration of Asian carp. Specifically, the Dispersal Barrier Advisory Panel, comprised of numerous federal, state, local, scientific, and commercial entities, was formed in 1995 to advise the Corps of Engineers on issues pertaining to the development of a barrier to prevent the migration of aquatic invasive species between the Great Lakes and Mississippi River basins via the CSSC. The Advisory Panel formed three subcommittees to advance its work: safety, monitoring and rapid response.

7. In August 2009, senior leaders of the principal agencies of the Great Lakes Interagency Task Force, established by Executive Order 13340, determined that there was a need to confer regularly regarding contingency planning at an executive level, and formed an Executive Steering Committee entitled the Asian carp "Rapid Response Working Group". This group includes representatives from the United States Environmental Protection Agency ("EPA"), the United States Coast Guard, the United States Fish and Wildlife Service ("USFWS"), the Illinois Department of Natural

Resources ("IDNR"), the Metropolitan Water Reclamation District of Greater Chicago ("MWRDGC"), the City of Chicago, as well as the Corps and others. The Rapid Response Working Group has met extensively to address preventative actions, such as the use of rotenone, a piscicide, as discussed below. The Corps will continue to work with all of these entities to fulfill a common goal of deterring Asian carp migration into the Great Lakes.

Dispersal Barriers

8. A major component of the Corps' efforts to prevent the migration of Asian carp into the Great Lakes is the construction and operation of electrical Dispersal Barriers, also known as fish barriers, in the CSSC located near Romeoville, Illinois. To the Corps' knowledge, the barriers are the largest, in terms of size of electrical fields, operational dispersal barriers in the world. The project is composed of three separate barriers: Barriers I (Demonstration), IIA, and IIB, as described below.

Barrier I

9. On October 26, 1996, the National Invasive Species Act ("NISA"), 16 U.S.C. § 4701 et seq., became law and authorized the Corps to construct a Demonstration Dispersal Barrier ("Demonstration Barrier" or "Barrier I") on the CSSC. Barrier I was originally authorized as a demonstration of a potential means of stopping the movement of aquatic nuisance species through the CSSC. At the time, the primary concern of stakeholders was the potential migration of the round goby from Lake Michigan into the Illinois and Mississippi River system. However, after the significance of the threat of Asian carp became known, the Corps focused on designing a barrier system for the purpose of preventing the migration of Asian carp into the Great Lakes.

10. After receiving authorization and appropriations to construct a demonstration barrier, the Corps consulted with the Advisory Panel on what type of barrier to construct. After reviewing several available technologies, the Corps determined that an electric dispersal barrier was the most effective option. An electric barrier was selected primarily because it was a proven technology on a smaller scale, it is not lethal to fish and other aquatic species, and it does not interfere with the flow of water or movement of vessels in the CSSC, allowing the canal to continue to serve its intended purposes.

11. After completing a National Environmental Policy Act ("NEPA") analysis, the Corps awarded a contract for the design of Barrier I in December 1999, and construction was completed in January 2002. Barrier I was activated for full-time operation in April 2002.

12. Barrier I is located at river mile 296.5 in Romeoville, Illinois, and it consists of 12 steel cable bundles that are secured to the bottom of the canal and extend over approximately 54 feet of the canal bottom. Each steel cable bundle is called an electrode. A low-voltage, pulsing DC current is sent through the electrodes, creating an electric field in the water.

13. The Demonstration Barrier's electric field is designed to repel fish. Fish penetrating the electric field are exposed to increasingly unpleasant electrical stimuli. Thus, the electric field is repulsive to fish and deters them from swimming through the electrified area. The Demonstration Barrier is operated at settings of 5 pulses per second with each pulse 4 milliseconds long and a maximum in-water electric field strength of 1 Volt per inch.

14. In 2004, the Corps and the U.S. Coast Guard became aware of a reported incident of sparking occurring during barge operations in the vicinity of Barrier I. After coordination with the Coast Guard and the navigation industry, in 2005 the Corps completed tests to evaluate sparking potential within and between vessels and potential health risks to a person in the water at Barrier I. The testing showed that under certain conditions sparking could occur between vessels within the barrier's electric field and between a vessel within the electric field and conductive objects on land. Due to these concerns, the U.S. Coast Guard established a Regulated Navigation Area ("RNA") addressing navigation safety requirements. Barrier IIA was under construction at this time and the extent of the RNA was defined to include the location of Barrier II as well as Barrier I.

15. Because of its original status as a demonstration project, Barrier I was designed and built with materials that were not intended for long-term use. Barrier I was taken off line, once Barrier IIA was operable, for approximately 4 weeks in September and October 2008 for major rehabilitation that extended Barrier I's operating life by an estimated three to five years.

16. Section 3061 of the Water Resources Development Act of 2007, Pub. L. 110-114, 121 Stat. 1121 ("Section 3061 of WRDA 2007") authorized the Corps to upgrade and make permanent Barrier I. If funding is provided by Congress, the Corps intends to take Barrier I off line and upgrade it to a permanent status after Barrier IIB is fully operational.

Barrier IIA

17. In January 2003, the design and construction of a permanent barrier, called Barrier II, was approved under Section 1135 of the Continuing Authority Program, 33 U.S.C. § 2309a ("Section 1135 of the Continuing Authority Program").

18. The Barrier II project consists of two sets of electrical arrays and control houses, known as Barriers IIA and IIB. Each control house and set of arrays can be operated independently, but ultimately the goal is to operate both concurrently.

19. During the design of Barrier II, the Corps considered and included results from various research studies regarding fish deterrence. Specifically, the Corps became aware of an independent research study conducted by Dr. Mark A. Pegg and Dr. John H. Chick, as set forth in a 2004 report titled "Aquatic Nuisance Species: An Evaluation of Barriers for Preventing the Spread of Bighead and Silver Carp to the Great Lakes", which indicated that smaller, juvenile fish may require higher voltages than those in use at Barrier I to be repelled. As a result of this study and discussions with the Barrier Advisory Panel and other subject matter experts, the Corps modified the design of Barrier IIA to operate at variable parameters to include reaching field strengths of approximately 4 volts per inch.

20. The Barrier IIA design was completed in July 2004, and a construction contract was awarded in October 2004. Construction of Barrier IIA was complete in March 2006.

21. Barrier IIA is located at approximately River Mile 296.25, approximately 1,200 feet downstream of Barrier I. Barrier IIA consists of 42 solid steel billets that are secured to the bottom of the canal and extend over approximately 130 feet of the canal bottom

upstream to downstream. A pulsing DC current is sent through the billets, creating an electric field in the water that deters fish from passing across the area.

22. Although Barrier IIA was operational in March 2006, full time operation of Barrier IIA did not occur until 2009 because the Corps and the Coast Guard were involved in an extensive safety testing program.

23. After Barrier IIA became operational, the Corps and the US Coast Guard began testing to define the extent and magnitude of the electric field generated, evalulate the potential to create sparking between vessels, and evaluate the physiologic effects a person in the electrified water would experience. Initial measurements in April 2006 of the strength and extent of the electric field generated by Barrier IIA showed that the field extended beyond the southern end of the RNA. This generated concerns that the field would negatively impact operations in a fleeting area located approximately 150 feet south of the RNA. Tests were completed in which a barge tow bumped into a barge moored in the fleeting area and sparking did occur between the contacting barges. Therefore, physical and operational changes were evaluated to reduce the electric field beyond the RNA.

24. The Corps determined that placing electrically conductive material in the canal between Barrier IIA and the southern end of the RNA would reduce the electric field extent. In May 2006, the Corps constructed a grounding system consisting of interconnected steel blast mats on the canal bottom south of the barrier. With the blast mat system in place, the Corps conducted additional testing in May and June 2006. This additional testing involved measuring the extent and strength of the electric field while varying barrier operating parameters and the way the blast mats were grounded.

25. Analysis of the data collected in May and June 2006 led the Corps to identify several operating configurations that were most successful at reducing the spread of the electric field beyond the RNA. In February 2007, additional tests were completed to determine if the grounding system had reduced sparking potential in the fleeting area and, if so, to identify the single optimal operating configuration for Barrier IIA. The bumping test from April 2006 was repeated for several operating configurations and no sparking was observed. Other tests were done that simulated a towing operation in the fleeting area. No sparking attributable to operation of Barrier IIA was observed.

26. After review of the February 2007 test results, a single optimal operating configuration for Barrier IIA was determined. However, there were still concerns that sparking could occur if a tow long enough to simultaneously span the active electrodes of Barrier IIA and the fleeting area south of the RNA collided with moored barges in the fleeting area. It was also necessary to examine the electrical effects on a long tow transiting the RNA when both Barrier IIA and Barrier I are operating.

27. Additional testing to evaluate these long tow scenarios was completed in April 2008. Sparking was not observed during any of the tests when the long tow was connected between barges with wire rope. The voltage differences that develop within a long tow transiting when both barriers are operating are low enough to make sparking unlikely.

28. In addition to investigating and designing solutions to sparking, the Corps retained the U.S. Navy Experimental Diving Unit ("NEDU") in December 2006 to evaluate the potential effects on people of immersion in electrified water at the barriers. In June 2008, NEDU completed a final report and concluded that serious injury or death

could occur from immersion in the barrier electric fields. As a result, appropriate safety measures for personal safety were developed and reviewed by a number of stakeholders, including the US Coast Guard and the navigation industry.

29. From September 3 to October 24, 2008, Barrier IIA was operated on a trial basis, and the results were evaluated as part of the safety program. In December 2008, the Corps was notified by the U.S. Coast Guard that it would not object to permanent activation of Barrier IIA at the 1 Volt per inch level. In January 2009, U.S. Coast Guard implemented a revised RNA in the vicinity of the barrier system that included additional safety provisions.

30. In April 2009, the Corps began full-time operation of Barrier IIA at the same operating parameters as Barrier I (5 pulses per second with each pulse 4 milliseconds long and a maximum in-water electric field strength of 1 Volt per inch). At this time there was no definitive information that other operating parameters would be more effective.

31. After receiving funding to study the efficacy of the Barrier System, as discussed below, the Corps began a comprehensive analysis which included an evaluation of the operating parameters of the barriers. In April 2009, upon the request of the Chicago District, the Corps Engineer Research and Development Center ("ERDC") began a research program in coordination with Smith–Root, Inc. of Vancouver, Washington, the contractors who designed the barriers for the Corps, to identify optimal barrier operating parameters to deter all sizes of bighead and silver carp. In June 2009, initial results indicated that the optimal operating settings should be 15 pulses per second with each pulse 6.5 milliseconds long and a maximum in-water electric field strength of 2 Volts per

inch. The ERDC investigations found that these operating parameters were not only sufficient to deter adult Asian carp but juvenile Asian carp as well. The Corps began operating Barrier IIA at the parameters recommended by ERDC in August 2009 after eDNA results from late July indicated that Asian carp were in the Brandon Road Pool of the Illinois Waterway, closer to the barriers than ever before detected.

32. The recent studies at ERDC of Barrier IIA optimal operating parameters are more comprehensive and more specific to the CSSC Barriers than the studies presented by Pegg and Chick. Dr. Pegg's study suggested that field strengths higher than 1 Volt per inch may be necessary to deter juvenile Asian carp. The recent ERDC studies investigated the effects of varying all three critical operating parameters (pulse frequency, pulse duration, and voltage) on both adult and juvenile Asian carp as small as 2 to 3 inches. The studies at ERDC more accurately model the CSSC barriers and include more iterations and variations of operating parameters than previously considered, and ERDC determined that the recommended optimum parameters are 2 Volts per inch, 15 pulses per second with each pulse 6.5 milliseconds long, as discussed above.

33. Although it is possible to operate Barrier IIA at voltages above 2 Volts per inch, at this time there is no evidence that such an increase is necessary to successfully deter all sizes of Asian carp given the Corps' August 2009 operational changes to voltage and pulse frequency and duration in accordance with scientific studies performed at ERDC.

34. Additionally, it is not prudent to operate Barrier IIA at higher levels than required as such operations will shorten the barrier's lifespan and create unnecessary increased safety risks. Moreover, environmental factors may affect the maximum voltage of the Barriers. Barrier operation is affected by environmental factors such as water

conductivity and water temperature. The barriers were designed to operate under typical environmental conditions. Occasionally, there are short-term extreme variations in environmental conditions, such as peaks in water temperature during the summer months or peaks in water conductivity when road salts wash into the canal during winter thaws. These events place added stress on the barrier electronics and cooling systems. While the Corps can maintain barrier operation during these events, it may not be possible to operate at high voltages, pulse rates, or pulse durations until the environmental parameters return to more typical levels.

35. Further optimal operating parameters research is ongoing at ERDC to include flume and swim tunnel studies which are scheduled for completion in January of 2010. These studies will provide additional observations on the behavior of Asian carp when encountering simulated barrier electrical fields in larger models with flowing water. ERDC subject matter experts believe that these additional studies will confirm that the current operating parameters of Barrier IIA successfully deter all sizes of Asian carp as documented by preliminary reports.

Barrier IIB

36. The current Barrier system will be further strengthened by the Corps' construction of the additional component of Barrier II, Barrier IIB. Section 3061 of WRDA 2007 authorized the Corps to complete Barrier II, including the Barrier IIB component. Following the discovery of eDNA evidence closer to the fish barrier in late July of 2009, the Corps requested and received $7 million of American Recovery and Reinvestment Act ("Stimulus") funding to accelerate the execution of this component of the barrier.

37. A construction contract for the Barrier IIB building was awarded in October 2009. Design of the electrical components is ongoing and installation of the electrical components is scheduled to begin in June 2010. Construction of Barrier IIB was initially expected to be completed in 2011. With receipt of the aforementioned additional Stimulus funding, construction completion is now scheduled for September 2010. The Corps expects that Barrier IIB will be placed into full service in fiscal year 2011 following completion of safety testing. Safety testing will need to be coordinated with the US Coast Guard to gauge the effect of operating Barriers I, IIA and IIB simultaneously.

38. Barrier IIB will be located approximately 220 feet north of Barrier IIA. Barrier IIB will be formed of 42 solid steel billets that are secured to the bottom of the canal and extend over approximately 130 feet of the canal bottom upstream to downstream. Barrier IIB will also include design improvements to address issues discovered during the operation of Barrier IIA such as an improved cooling system, and potentially longer periods between maintenance.

Barrier Maintenance and Rotenone Application

39. The barriers are electrical and mechanical systems and as such require regularly scheduled maintenance. The Barrier II system is designed to have Barriers IIA and IIB operate independently, if needed, so that one component barrier can be turned off for maintenance while the other barrier remains in operation. Periodic maintenance activities involve cleaning, lubricating, and inspecting select barrier electrical generation and distribution components, which requires shutting off the electrical current due to

personnel safety concerns. This is similar to shutting off electrical current before working on a home power distribution system.

40. Barriers I and IIA were shut down for maintenance in early December 2009. Barrier IIA was de-energized for approximately 36 hours on December 3 and 4, 2009. Barrier I was operated during this time. Barrier I was de-energized for approximately four hours on December 5, 2009 after Barrier IIA was re-energized. Both barriers have been in continuous operation since the maintenance shutdown.

41. In coordination with the Rapid Response Working Group, the maintenance operation was synchronized with the application of rotenone, a commonly used fish toxin, in the Chicago Sanitary and Ship Canal by the Illinois Department of Natural Resources. Application of rotenone not only served to minimize the risk of Asian carp traversing the Barriers during this time, but it also allowed biologists to investigate the presence of Asian carp in the vicinity.

42. Approximately 30,000 to 40,000 fish were collected during the rotenone application consisting of 32 species, including common carp, gizzard shad, yellow bullhead, yellow perch, spotted gar, and shortnose gar. Of the tens of thousands of fish recovered, only one Asian carp (bighead carp) was found. The single Asian carp was recovered at River Mile marker 291.5, approximately 5 miles downstream, or south, of the Barrier system.

43. The Corps is working aggressively to complete construction of Barrier IIB by the fall of 2010. Due to recent maintenance activities and inspections, the Corps does not plan to turn Barrier IIA off for periodic maintenance until after fully constructing Barrier IIB. However, the Corps continues to conduct contingency planning with other agencies

within the Rapid Response Workgroup should electrical barriers not be available for a short period of time due to required periodic checks and services or unforeseen outages.

Asian Carp Monitoring

44. In addition to the information obtained from the rotenone effort, the Corps has been conducting extensive monitoring of the location of the Asian carp through a variety of methodologies, including electro-fishing, netting, telemetry, and environmental DNA ("eDNA") testing in coordination with numerous other federal, state and local entities including the USFWS, the INDR and the University of Notre Dame.

45. Beginning in 2000, the USFWS has organized a multi-agency annual sampling event, called the "Carp Corral", which covers the entire Illinois Waterway from the LaGrange Lock and Dam to above the Barrier System. The participants include federal, state and non-governmental agencies. The event normally spans 4 days and participants use electrofishing and trammel nets to survey for bighead and silver carp.

46. Traditional fish monitoring techniques, such as electro-fishing, netting, and telemetry first detected the physical presence of Asian carp in the Peoria pool in the Illinois River in 2000 by the Illinois Natural History Survey. The Peoria pool occupies an approximately 73 mile stretch of the Illinois River that begins approximately 150 miles upstream of the confluence between the Mississippi and Illinois rivers. See Exhibit 1.

47. In 2001, Asian carp were detected in the Marseilles pool, approximately 90 miles upstream of the Peoria pool and approximately 50 miles below, or downstream of, the Barrier system by a USFWS crew using electrofishing. See Exhibit 1. In 2006, Asian

carp were captured in the Dresden Island pool, approximately 25 miles downstream of the Barrier system, by the USFWS and the Corps using electrofishing. See Exhibit 1.

48. In 2007, monthly sampling using electro-fishing and trammel nets was added to the monitoring program implemented by the Corps and other federal and state agencies. Such sampling now covers the entire Lockport and Brandon road pools, and the frequency, usually twice a month, is determined by the protocol in the monitoring plan developed by the Corps in collaboration with the Advisory Panel.

49. In addition, in 2007, the Corps and other agencies implemented the use of acoustic telemetry to tag and track Asian carp in the upper pools of the Illinois Waterway. Fish were captured and tagged from Starved Rock, Marseilles, and Dresden Island pools. Passive telemetry receivers were placed from Starved Rock pool up to Lockport Pool to detect inter and intra pool movements.

50. Twelve more Asian carp were captured in the Dresden Island pool between 2007 and 2009 during the Carp Corral and through the Corps' independent efforts. Some of the Asian carp captured in the Dresden pool were tagged for telemetry and released. The Corps' telemetry receivers detect movement of the tagged carp. To date none of the tagged carp have ventured upstream of the Dresden Island pool. The density of Asian carp in the Dresden Island pool remains significantly lower than in pools downstream of it.

51. I have questioned subject matter experts within and outside of the Corps on a number of occasions on why Asian carp dispersal apparently stalled within the Dresden Island pool. Most experts agree that Asian carp behavioral movement and subsequent residency is greatly dependent on a number of factors to include food abundance and

preferred habitat. The Dresden Island pool provides suitable habitat for both bighead and silver carp (two species of Asian carp). The Dresden Island, Marseilles, and Starved Rock pools of the Illinois Waterway have several areas that possess characteristics similar to a backwater, while still having access to the main channel. Asian carp need the flow of the main channel for two reasons: to spawn, and to bring in plankton resources to the backwater areas where they reside. Some experts believe that the diversity of habitat coupled with the food resources sustain their populations in the Dresden Island Pool and other lower pools, and the lack of these characteristics upstream may explain why we have not observed Asian carp presence above the Brandon Road Lock and Dam.

52. The structure of habitat and available food resources within the upper pools (Brandon Road pool and Lockport pools) differ greatly from the lower pools such as the Dresden Island pool. The channelized nature of the upper pools does not allow for this diverse habitat combination. In addition to the lack of preferred habitat, there is also a marked decrease in the measurements of chlorophyll-a concentrations (generally used as an indicator of plankton production). Work completed by IDNR, Great Lakes Fishery Commission, and Illinois Natural History Survey biologists have found the highest levels of chlorophyll-a in the upper river in the Starved Rock pool and the lowest in Lockport pool. This work classified levels of chlorophyll-a concentrations in the Dresden Island pool as "moderate" and classified chlorophyll-a concentrations in the Brandon and Lockport pools as "low" to no production. Such observations may explain why detectable numbers of Asian carp have not been found above the Brandon Road Lock and Dam, although further study would be needed to verify these conclusions.

53. The University of Illinois and the Illinois Natural History Survey have conducted a research program in which common carp have radio transmitters surgically implanted. One hundred forty five radio-tagged common carp were placed downstream of Barrier I during this program. One radio transmitter crossed from downstream to upstream of Barrier I in 2003. The Corps does not believe that the tagged fish survived because the transmitter remained stationary shortly after crossing Barrier I. This crossing resulted in additional studies and changes to the design of Barrier II. In September 2008, testing with tagged fish indicated that common carp may be able to pass through Barrier IIA from upstream to downstream, away from Lake Michigan flowing with the current. However, the migration of Asian carp is against the current, i.e. from downstream of the barrier to upstream of the barrier toward Lake Michigan.

54. After assuming command of Chicago District, I attended an advisory panel meeting in January 2009, and I questioned attending subject matter experts on the accuracy of employed monitoring tools and techniques. Soon after these discussions, I met with the Monitoring Sub-Committee of the Barrier Advisory Panel and asked these experts to provide insights and recommendations on on-going monitoring operations. Advice from this sub-committee and other referenced agencies led to the development of an Enhanced Monitoring Plan that better focused traditional monitoring tools as provided by several agencies and recommended new tools that offered different benefits. This new plan offered a suite of tools for which frequency of use was dependent on risks defined by the confirmed location of both “Adult” and “Juvenile” Asian carp.

55. In May 2009, Dr. David Lodge, Director, Center for Aquatic Conservation, University of Notre Dame, provided an overview of a new monitoring technique, eDNA,

during a semi-annual meeting of the Barrier Advisory Panel. The Corps first employed this new tool to search for Asian carp through a cooperative agreement with the University of Notre Dame in August 2009. As discussed in Professor Lodge's Declaration, eDNA testing detects the presence of species DNA through water sampling, without physically capturing or sighting the fish.

56. During the summer and fall of 2009, eDNA testing detected Asian carp DNA in waters adjacent to the Dispersal Barrier. In July 2009, the Corps received a report from Notre Dame that Asian carp DNA was detected on the Des Plaines River in the Brandon Road pool approximately 6 miles south of the Barrier. See Exhibit 2.

57. The Corps received eDNA results in August 2009 that indicated Asian carp could be 0.8 miles south of Barrier IIA. At that time, the Corps also received reports that Asian carp DNA was detected in the Lockport pool, approximately five miles downstream of the Barriers. See Exhibit 2. As discussed above, during the aforementioned rotenone application on December 3, 2009, a single Asian carp was recovered in the Lockport pool below the fish barrier.

58. In response to the eDNA results received in July 2009, the Corps increased Barrier IIA's operating parameters to optimum levels (15 pulses per second with each pulse 6.5 milliseconds long and a maximum in-water electric field strength of 2 Volts per inch) in August 2009 as recommended by ERDC after close coordination with the US Coast Guard and other agencies, and additional safety testing.

59. In October 2009, the Corp learned that Asian carp DNA was also detected in the Illinois and Michigan Canal ("I&M Canal"). In response, the Corps and several other

agencies conducted intensive electro-fishing and netting in the lower I&M Canal in October, 2009. However, no Asian carp were captured.

60. In September 2009, Asian carp DNA was detected on the Des Plaines River in a location several miles north of the fish barrier. While the Des Plaines River is geographically separate from the Chicago Sanitary and Ship Canal above the Barrier system, there are potential pathways between the two during flood events. As a result, the Corps is evaluating a proposal to construct barriers between these two waterways as part of the Efficacy Study discussed in more depth below.

61. On November 17, 2009, it was reported to the Corps that Asian carp DNA was detected in the Cal Sag Channel near the O'Brien Lock, approximately 30 miles upstream of the Barrier system, from samples collected in September and October 2009. This was the first detection of Asian carp upstream of the Barriers in waters that directly connect to the CSSC.

62. In response to the November 17, 2009 positive eDNA report, IDNR contracted with a commercial fishing company to intensively fish a 5.5-mile stretch of the Cal-Sag Channel from December 1 through 6, 2009. They deployed nearly 3,000 yards of fishing nets. While the nets collected more than 1,000 fish, including 12 different species, no Asian carp were found.

63. On December 31, 2009, the Corps learned that the University of Notre Dame laboratory has initial indications of two positive eDNA results for Asian carp in a new area, specifically silver carp near the Wilmette Pumping Station. In accordance with the Quality Assurance/Quality Control ("QA/QC") protocols for the eDNA tests, the laboratory will need to run repeated polymerase chain reactions from the samples which

takes at least two days to ensure the genetic material is indeed silver carp DNA. In addition, the laboratory must run equipment controls, both positive and negative, for these samples and the cooler blanks from the collection date which can also take one to two days of processing time. The laboratory results will not be final until these processes are complete. The laboratory at the University of Notre Dame expects to provide the results from the positive samples, equipment controls, and cooler blanks, by January 7, 2010. Additionally, the University of Notre Dame has not yet processed 7 samples that were taken from locations near the Wilmette Pumping Station. The second priority will be to extract and analyze these samples.

64. Any consideration of changes to the operation of the Wilmette Pumping Station based on the new eDNA data must be addressed to MWRDGC, because MWRDGC, not the Corps, owns and operates the pumping station. The Wilmette Pumping Station is equipped with several pumps and a sluice gate. The pumps and the sluice gate are used to divert Lake Michigan water to the North Shore Channel (NSC) to improve water quality during warm months. The sluice gate is also used to relieve excessive storm water to the Lake during significant rain events. Due to relatively small head difference across the gate, the flow velocity through the gate is not high, and thus the velocity of the current does not pose a deterrent to fish migration.

65. The Corps plans to continue collecting and utilizing data from a variety of monitoring methods in the future. Currently, all reaches upstream of the fish barrier are surveyed monthly using both traditional techniques, such as electro-fishing, netting, and telemetry, and eDNA monitoring techniques. The Corps has estimated its projected

budget for fiscal year 2010 at more than $1 million for the ongoing monthly Asian carp monitoring and the ERDC studies discussed above.

66. The Corps has considered the totality of the monitoring data on Asian carp to date in its decision to continue operating the Chicago and O'Brien Locks. The Corps recognizes that there is some level of uncertainty in the various monitoring methods. In evaluating the results from the eDNA monitoring, the Corps has included in its considerations the fact that the eDNA method is a newly developed technology; the eDNA results from the current methodology do not provide information on the location and source of the carp DNA; and a validation study to refine the eDNA methodology will be undertaken.

Efficacy Study

67. In addition to operating the Dispersal Barriers and monitoring the waterways, the Corps is identifying alternative emergency measures in the Chicago waterway area to prevent Asian carp from by-passing the Barriers and entering the Great Lakes. As authorized by Section 3061 of WRDA 2007, the Corps is currently completing an Efficacy Study to identify threats to the efficacy of the barrier system. Work on this study is being presented in a series of reports which have been titled the Interim I, Interim II, and Final Efficacy Reports as described below. Section 126 of the 2010 Energy and Water Development Appropriations Act, Pub. L. 111-85, 123 Stat. 2845 ("Section 126") provides one year implementation authority for Efficacy study emergency measures as approved by the Assistant Secretary of the Army for Civil Works ("ASA (CW)").

68. The Interim I Efficacy Report describes proposed emergency measures to reduce the risk of Asian carp bypassing the Dispersal Barrier through either overland flow from

the Des Plaines River to the CSSC, or through culverts in the I&M Canal to the CSSC. The Interim I Report was completed in November 2009, and the NEPA review is currently being finalized. The proposed temporary emergency measures include the construction of approximately 34,600 feet of concrete barricades and approximately 33,400 feet of chain-link fence with 1/4-inch openings between the Des Plaines River and the CSSC. In addition, barriers will be placed in certain locations to prevent movement of Asian carp through the I&M canal. As stated above, approval by the ASA(CW) is required to implement the Des Plaines and I&M bypass structures. Currently, a briefing with the ASA (CW) is scheduled for early January 2010.

69. Upon approval from the ASA (CW), and receipt of Great Lakes Restoration Initiative Funds from EPA, the Corps plans to begin construction of the physical barriers between the Des Plaines and the CSSC and within the Illinois and Michigan Canal in the spring or summer of 2010. Construction is expected to be completed prior to October 28, 2010, when the current authorizing legislation expires. The projected cost of the project is $13.174 million. The Corps will also need to obtain real estate from multiple landowners to construct the project.

70. The Interim II Report will further refine the optimal parameters for operating the electric field of the Dispersal Barriers to deter both adult and juvenile Asian carp. This Report will consider and incorporate the current and ongoing ERDC studies described in Mr. Shea's Declaration and my earlier statements.

71. The Final Efficacy Study report will evaluate other potential measures to assure the efficacy of the Dispersal Barrier, including the potential construction of other electrical barriers and other types of barriers, evaluating existing structures to include

consideration of temporary closure of locks, measures to prevent assisted transits (ballast water, bait buckets) and population control. This report will also recommend permanent solutions to the issue of bypass along the Des Plaines River and the I&M Canal. It will include an analysis of other emergency measures that could be implemented under Section 126 to deter Asian carp in the Chicago waterway system, if the Section 126 authorization is extended. The report will provide a summary of all interim reports completed to date and recommend a long-term, multi-agency comprehensive strategy for improving the efficacy of the dispersal barriers and reducing the population effects of Asian carp within the Chicago Area Waterway System. The Corps intends to finalize this report in September 2010, with the goal of implementing the proposed actions in 2011 and 2012. Implementation of these measures would require additional Congressional authorization and appropriations. Additional studies may be undertaken in the future as technologies to limit the spread of aquatic nuisance species evolve.

The Interbasin Transfer Study

72. The Corps is also conducting a feasibility study of the options and technologies that could be applied to prevent or reduce the risk of aquatic nuisance species transfer between the Great Lakes (GL) and Mississippi River (MR) basins through aquatic pathways, pursuant to Section 3061 of WRDA 2007. The Interbasin Transfer Study was initiated in July 2009 on receipt of the initial appropriations. The initial focus of the Interbasin Transfer Study will be the immediate threat of Asian carp advancing toward Lake Michigan, and the evaluation of long-term measures to reduce the risk or prevent the Asian carp from using the Chicago Area Waterway System, including the Wilmette

Pumping Station, the Chicago Lock, the O'Brien Lock, and the Grand Calumet and Little Calumet Rivers, to spread into the Great Lakes.

73. Data collection for the Chicago Area Waterway portion of the Interbasin Transfer Study will continue into 2011. Accumulation of data for the larger, basin-wide study will be performed concurrently. Preparation and evaluation of alternatives will involve significant coordination with Federal, state, local, and nongovernmental agencies. Assuming sufficient appropriations, the Corps expects to complete development and refinement of such alternatives and pursue public scoping of them by the fall of 2012.

74. Assuming sufficient appropriations, the Corps expects to complete a record of decision for the complete Interbasin Transfer Study that investigates all potential pathways and other invasive species in 2014.

Effects of Closure on the Maintenance and Operation of the Chicago and O'Brien Locks

75. The Corps owns and operates the Chicago and O'Brien lock facilities. The Metropolitan Water Reclamation District of Greater Chicago ("MWRDGC") owns and operates the sluice gates at Chicago River Controlling Works connected to the Chicago lock facilities. The Corps owns the sluice gates at the O'Brien Lock and Dam, and operates these sluice gates under the direction of MWRDGC per a June 1966 agreement. The Corps and MWRDGC entered into agreements in January 1984 to coordinate their efforts in operating the Chicago Lock and Chicago River Controlling Works. The June 1966 agreement also addresses coordinating their efforts in operating the O'Brien Lock and Dam.

76. The proposed closure of the Chicago and O'Brien Locks during the winter months would impact the operational status of the locks, and may also lead to damage of the

structures. The effects and potential effects of closure on the O'Brien lock are discussed further in the Declaration submitted by Mr. Cox. If the Chicago Lock remains closed for an extended period during the winter months, ice buildup will lead to a situation where the lock gates would probably not be operational for an emergency flooding situation until the spring thaw. There is an additional risk that mechanical components of the lock mechanism will freeze or seize up from lack of lubrication via normal exercising of the equipment. In addition, ice formations may put significant pressure on the steel gates, causing the steel to deform or crack and necessitating additional repairs.

77. The Corps does not control the operation or maintenance of the sluice gates at CRCW. The Corps owns the sluice gates at the O'Brien Lock and Dam, and operates these sluice gates under the direction of MWRDGC per a 1966 agreement between these two agencies.

Efficacy of the Closure of the Chicago and O'Brien Locks on Migration Prevention Leakage

78. There are areas of leakage around the Chicago Lock gates, and thus closure of the lock gates may not fully prevent migration of fish through the lock. On the Chicago Lock gates, there are rubber seals along the outer edges, along the bottom and at the center where the gates come together. Over time, because of wear and tear of the roller tracks, significant leaks have developed along the outer edges and between the lock gates. New seals were installed in 1999 and numerous adjustments have been made to the gates/seals over the past ten years, but approximately 1 to 2 inch wide leaks remain along some portions of the vertical 21-foot seal lengths.

79. The Corps has bulkheads available for the Chicago Lock, but some leakage would still occur even if the bulkheads are installed because there would still be gaps of approximately one half inch along the sides of the bulkheads. Bulkheads consist of large metal plates that span the width of the canal and are stacked on top of each other to span the height of the canal. These large metal plates must be installed and removed using a crane; they are typically used when conducting maintenance of the lock gates.

80. Similar leakage issues exist at the O'Brien Lock, as described in Mr. Cox's Declaration, and the O'Brien Lock does not currently have readily available bulkheads.

Overtopping of the Chicago Lock

81. As discussed in Dr. Su's Declaration, it is likely that a sufficiently severe storm event would lead to overtopping of the Chicago Lock facilities if the Locks were closed, thus potentially allowing Asian carp to migrate to Lake Michigan via the water overtopping the facility structures. At this time we know that such overtopping is certain to occur at the Chicago Lock during a 500 year storm event if the sluice gates are open. If the sluice gates are closed the likelihood and extent of overtopping will increase. The likelihood of occurrence during 25, 50, and 100 year storm events is not currently known, but the issue is being analyzed as part of an ongoing study.

Impacts of Closure of Chicago and O'Brien Locks

82. Based on our preliminary analysis, the closure of the Chicago and O'Brien Locks and associated facilities, as requested by plaintiff, would have numerous significant impacts, including increased flood risk in the Chicago area, impacts to commercial and recreational vessels through the locks, and potential health and safety concerns as discussed below.

83. It is important to note that this preliminary analysis was developed on an expedited basis referencing available data from the Corps' Waterborne Commerce Statistics Center ("WCSC"), project information for the Little Calumet and Grand Calumet Rivers, and professional judgment. The analysis and preliminary statistics set forth below are therefore tentative and incomplete.

Flooding Impacts of Lock Closure

84. Closure of the Chicago and O'Brien Lock would increase the risk of flooding in the Chicago metropolitan area as discussed in Dr. Su's Declaration. The closure of the lock structures will increase the likelihood of flooding in the Chicago area including flooding to critical downtown businesses, Union Station, suburbs, the North Branch of the Chicago River, and it could lead to the overtopping of the Brandon Road Lock. Closure of the lock structures would also increase the likelihood of sewage backups in the Chicago area. If the associated sluice gates are closed, the flood risks would be more significant. These impacts are discussed in more detail in Dr. Su's Declaration.

85. Increased flood risk means increased public safety risks and potential loss of life. In addition, a preliminary estimate found that over $1 billion in property damage will potentially result if the Chicago Lock and sluice gates are closed during an extreme rainstorm event. This preliminary damage estimate was derived from information regarding lawsuits and insurance claims related to the 1992 flooding of downtown Chicago. Preliminary estimates also indicate that approximately 14,000 homes would be subject to increased flood risk if O'Brien Lock is closed with no backflow through the lock or the sluice gates.

86. A project to account for the additional flood risk created by the closure of the locks would likely be a very lengthy and costly process. For example, to address current flood risks to the Chicago metropolitan area, the Corps and MWRD are constructing a deep tunnel system with reservoirs. Construction of the tunnels began in 1975 and was completed in 2006. Construction of the reservoirs is ongoing. The total estimated cost of the completed project is approximately $3 billion.

Impact of Lock Closure on Commercial Vessels & Industry

87. The Chicago and O'Brien Locks are major transportation routes for many important commodities. According to statistics gathered by the Corps, total commercial tonnage for the O'Brien Lock in 2008 was nearly 6.9 million tons, valued at $1.7 billion over the same period, and included petroleum coke, bitumen, asphalt, sodium chloride, iron ore, Portland cement, and iron products. The Chicago Lock tonnage during the same period was more than 48,000 tons, valued at $17.5 million, and included fuel oils, calcium chloride, petroleum coke, bitumen, asphalt, scrap metals, and chemicals. Chicago Lock traffic also included nearly 700,000 passengers on commercial vessels, such as ferries and dinner cruises.

88. The 2008 commodity tonnage that moved through the O'Brien and Chicago Locks did so at an estimated transportation rate savings of $190 million and $2 million, respectively. The transportation rate savings is measured as the cost difference between the existing waterway routing and the least cost overland alternative. During disruptions of service at either of the locks, those commodities would be forced to move via alternative methods at higher cost, thus eroding the rate savings afforded by waterway shipping. Foregone transportation savings represent the measure of the economic

impacts of service disruption. For example, a 30-day disruption at O'Brien Lock is estimated to reduce the $190 million annual transportation cost savings by $ 7.7 million.

89. Permanent closure of the Chicago and O'Brien locks would eliminate the annual transportation cost savings into perpetuity. As a proxy for this impact, the present worth values of the next 50 years of transportation cost savings at each project were estimated to be $40 million from Chicago Lock and $3.8 billion from O'Brien Lock. Closure of the locks would force industries to seek alternative means of transportation, potentially resulting in hundreds of millions of dollars worth of additional annual costs.

90. While the Corps does not have a detailed analysis of the impact of lock closure on jobs in the region, a preliminary analysis indicates that thousands of jobs may be impacted. Termination of operations at Chicago and O'Brien Locks would likely have a significant impact on jobs directly related to the commercial navigation through the locks, and it could also impact indirect jobs for goods and services related and linked to port activities, such as: suppliers of parts and equipment, business services, and maintenance and repair services.

91. The closure of Chicago and O'Brien locks could also increase the number of petroleum and asphalt trucks daily in and around the greater Chicago area to allow for the distribution of these products in the absence of waterside storage. The longer term impacts of termination of operations could include relocation or closure of local facilities as businesses adjust to the altered transportation network.

Impact of Lock Closure on Recreational Vessels

92. In 2008, an estimated 43,000 recreation vessels transited Chicago Lock and 19,000 transited the O'Brien Lock. Permanent closure of the Chicago Lock will prohibit

lake access for vessels moored/placed in the water on the Chicago River. Potentially lower water levels on the waterways due to a lack of lake flows could also potentially impact recreational users, although these impacts have not been quantified. Annual recreation impacts for termination of operations at Chicago and O'Brien locks are preliminarily estimated at $700,000.

Potential Public Safety Impacts of Lock Closure

93. As discussed in the declaration by the U.S. Coast Guard, the closure of the Chicago Lock may impact their operations, including their search and rescue operations.

Potential Environmental and Water Quality Impacts of Lock Closure

94. The potential water quality impacts from permanently closing the Chicago Waterways and local river connections to Lake Michigan are not completely understood, but some impacts can be identified. We anticipate that these impacts will be addressed within the broader analyses being done to support the Interbasin Transfer Study and associated Environmental Impact Statements.

95. General impacts will include overall lower flow rates, particularly during dry weather, which in turn will lead to stagnant water conditions. Stagnant or very low flow rates in the channels and rivers would likely lead to low oxygen levels, especially in the summer, since dissolved oxygen is less soluble in warmer water, the poor quality sediment throughout the waterways would continue to exert a high oxygen demand, and there would not be a source of "fresh" lower temperature water.

96. With lower flowrates and less dilution into the system from Lake Michigan, contaminant levels, such as high seasonal chloride levels from road salt run-off, could also be magnified.

97. These general water quality problems could be at least partly mitigated through engineered responses. Aeration systems could be added in strategic locations to increase dissolved oxygen concentrations during warmer weather. However, the cost would be substantial. Water for dilution and to increase the flow rate in the waterways could be pumped from Lake Michigan, although this connection could allow invasive species to migrate from the Great Lakes to the inland waterways, potentially negating any benefits gained through lock closure.

98. General changes to water quality would likely have secondary effects and unanticipated consequences for water quality in the waterways system. For example, warmer water could potentially impact industrial cooling water users. Increases in chloride concentration could negatively affect downstream potable water users and harm aquatic species. Increases in the water temperature could also impact aquatic species downstream, since the temperature change would constitute a change to the aquatic habitat.

99. If lower flow rates occur, it could impact numerous public and industrial dischargers, since river dilution impacts are taken into account in the EPA's National Pollutant Discharge Elimination System discharge limits. Their pipelines would need to be extended directly to the lake or around the blockages or they may have to discharge directly into the lake.

100. Ultimately, closure of the locks could impact water quality outside the state of Illinois, since the waterways eventually connect to the larger rivers moving south (including, ultimately, the Mississippi). At this time we cannot gauge the nature and

extent of these impacts, but we anticipate addressing the issue as part of the ongoing Interbasin Study and associated Environmental Impact Statements.

Interim Barrier in the Grand Calumet River

101. The EPA's Great Lakes National Program Office is currently constructing a sediment remediation project on the Grand Calumet River, located in the neighboring cities of Hammond and East Chicago, Indiana. As part of the sediment remediation project, authorized under the Great Lakes Legacy Act, steel sheet-pile walls are being installed perpendicular to the flow of the channel, to isolate individual portions of the Grand Calumet River.

102. The steel sheet piles effectively create a temporary barrier to the passage of Asian carp during non-storm conditions. The sediment remediation project is being conducted in a reach of the Grand Calumet River where water depths are often two-feet or less, and there is a naturally occurring hydraulic dividing line. These sheet-pile walls allow for dewatering of the segregated management units, and excavation of contaminated sediments "in the dry".

103. The design height of the sheet-pile wall was coordinated with the Corps to provide hydraulic isolation during a 10-year flood event. In the case of a more significant rainfall event, the installed height of the walls would allow relief of flood waters toward Lake Michigan.

104. The sediment remediation project began in December 2009, and is anticipated to be complete in July of 2010. However, it is anticipated that at least one sheet-pile barrier will be left in place after construction in order to prevent recontamination of remediated portions of the river. Consequently, it is estimated that for the next 2-3 years, while

projects for remediating other segments of the river are being formulated and implemented, that a semi-permanent barrier will exist.

Impacts from Plaintiffs' Proposed Barrier in the Little Calumet River

105. The Little Calumet River flows through a flood prone watershed. In response, the Corps has been building a levee system along the Little Calumet River between Gary and Hammond/Munster.

106. As discussed in detail in Dr. Su's Declaration, a barrier structure across the Little Calumet River would decrease the effectiveness of the federal levee, and lead to a significant increased risk of flooding along the river corridor. Such increased flood risk leads to an increased potential for loss of life and other public safety concerns. A preliminary estimate of potential flood damages from closure of the Little Calumet River is approximately $56 million for a severe flood event.

107. In addition, a physical barrier on the Little Calumet River, depending upon the location in which it's located, could significantly impact the river's flow rate and thus cause potential negative water quality impacts by reducing dissolved oxygen in the water.

108. Currently, the Corps does not have the real estate rights or appropriations necessary to construct a barrier in the Little Calumet River.

Letter from Michigan Attorney General

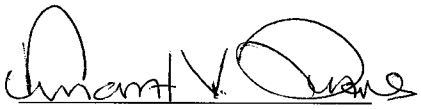
109. I received a letter from the Attorney General for the State of Michigan, Mike Cox, dated December 2, 2009, which requested that the Corps and other federal, state, and local agencies consider action to prevent the migration of Asian carp, including, "if

necessary, changes in lock and water control operations to prevent the passage of fish into Lake Michigan." See Exhibit 3.

I declare under penalty of perjury that the foregoing is true and correct, pursuant to 28 U.S.C. § 1746.

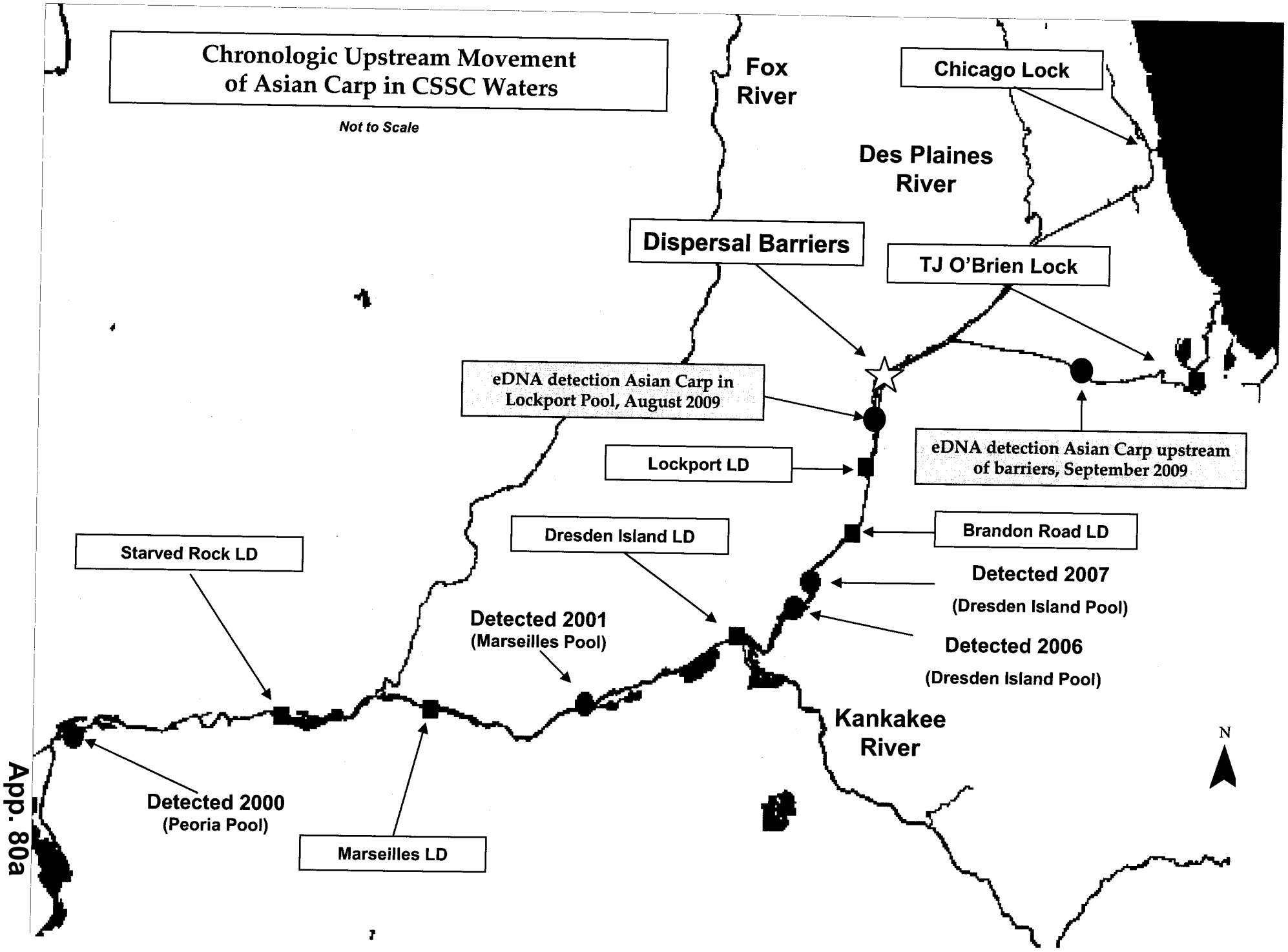
Executed on January 4, 2010

Chicago, Illinois



VINCENT V. QUARLES
Colonel

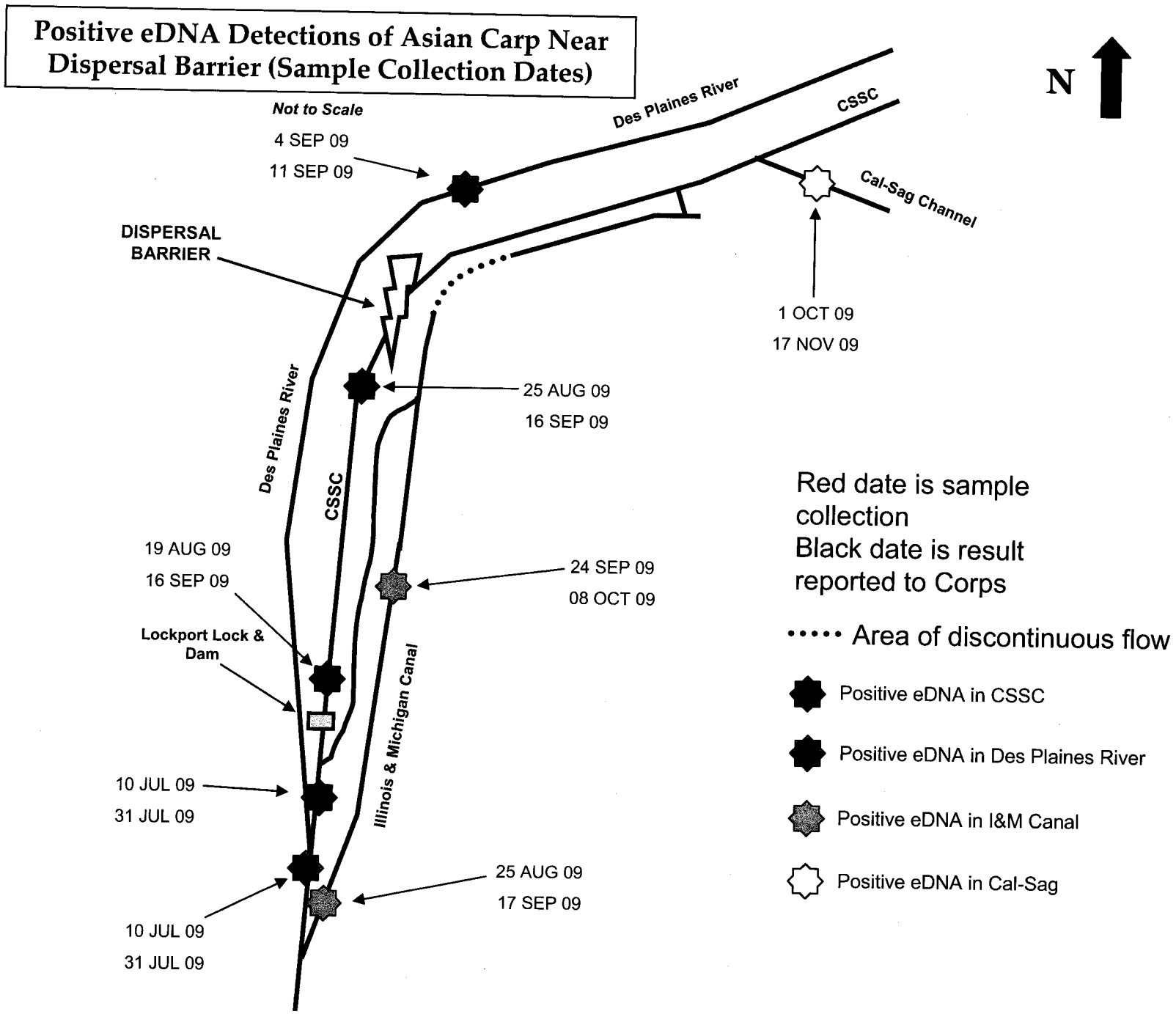
Exhibit 1
to Declaration of Vincent V. Quarles


Chronologic Upstream Movement of Asian Carp in CSSC Waters
Not to Scale
Fox River
Chicago Lock
Des Plaines River
Dispersal Barriers
TJ O'Brien Lock
eDNA detection Asian Carp in Lockport Pool, August 2009
eDNA detection Asian Carp upstream of barriers, September 2009
Lockport LD
Brandon Road LD
Dresden Island LD
Starved Rock LD
Detected 2007
(Dresden Island Pool)
Detected 2001
(Marseilles Pool)
Detected 2006
(Dresden Island Pool)
Kankakee River
N
Detected 2000
(Peoria Pool)
Marseilles LD

App. 80a

Exhibit 2
to Declaration of Vincent V. Quarles

Positive eDNA Detections of Asian Carp Near Dispersal Barrier (Sample Collection Dates)



App. 82a

Exhibit 3
to Declaration of Vincent V. Quarles

STATE OF MICHIGAN
DEPARTMENT OF ATTORNEY GENERAL

P.O. Box 30212
Lansing, Michigan 48909

MIKE COX
ATTORNEY GENERAL

December 2, 2009

Via e-mail and overnight mail

Colonel Vincent W. Quarles
Commander, Chicago District
U.S. Army Corps of Engineers
111 N. Canal Street, Suite 600
Chicago, IL 60606-7206

Terrence O'Brien
President, Board of Commissioners
Metropolitan Water Reclamation
District of Greater Chicago
MWRD Headquarters
100 East Erie Street
Chicago, IL 60611

Honorable Pat Quinn
Governor, State of Illinois
James R. Thompson Center
100 W. Randolph, 16-100
Chicago, IL 60601

Gentlemen:

As you well know, recent water sampling of the Chicago Shipping and Sanitary Ship Canal indicates that two species of Asian Carp may have already migrated beyond the electric barrier constructed and operated by the US Army Corps of Engineers to locations less than 10 miles from Lake Michigan. These voracious and destructive fish pose the gravest threat yet to a Great Lakes ecosystem already plagued by invasive species.

The State of Michigan has a vital interest in protecting the Great Lakes from the potentially devastating infestation by Asian Carp. We are in the heart of the Great Lakes basin and directly adjoin four of the five Great Lakes. Our citizens and our businesses critically depend upon the health of this ecosystem, as well as the fishery, recreational, and other resources the lakes provide.

As Michigan's chief law enforcement officer and a designated natural resource trustee, I strongly urge the federal government, the State of Illinois, and the Metropolitan Water Reclamation District of Greater Chicago to immediately assume the necessary leadership role both to avert this potential catastrophe and eliminate its root causes. At a minimum, this includes the following:

First, it is essential that all federal, state, and local agencies responsible for the protection of the Great Lakes and operation of the Chicago Sanitary and Ship Canal take immediate, coordinated action, using the full extent of their respective legal authorities, to abate the threat.

This should, at a minimum, include intensified monitoring and sampling to determine where the Carp are present, continued applications of fish poison to infested or potentially infested waters, and if necessary, changes in lock and water control operations to prevent the passage of fish into Lake Michigan.

Second, there must be a permanent and reliable solution to this threat. The federal government, in conjunction with the responsible state and local officials should develop and implement plans to ecologically and physically separate the carp-infested waterways from Lake Michigan.

Third, available financial resources, including the $475 million funding appropriated for the Great Lakes Restoration Initiative, should be targeted to urgently needed measures, both immediate and long-term, to protect the Great Lakes from Asian Carp.

I would appreciate an immediate response outlining the actions you will take to avert the immediate and long-term threat posed to the Great Lakes by the Asian Carp infestation of the waterways you control. Absent assurance that immediate action will be taken, I will be forced to consider all available legal remedies to protect the citizens of the State of Michigan and their greatest natural resource.

Sincerely,

Mike Cox
Attorney General

IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF MICHIGAN, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

DECLARATION OF MICHAEL COX, USACE, ON THE OPERATION OF O'BRIEN LOCK AND DAM

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1) Biography of Declarant

My current position is Operations Manager for the Illinois Waterway ("IWW"), U.S. Army Corps of Engineers, Rock Island District out of Peoria, IL. I have held this position permanently since August 2008 and temporarily since May 2007. I assist in keeping navigation running along the IWW. I am responsible for more than 160 workers serving at eight locks and dams, three maintenance and repair crews, two flood control reservoirs, and workers addressing permits, levee inspections, compliance issues, and support for the IWW

Visitor Center. Prior to this work, I served as Chief of the Lock and Dam Section on the IWW since Oct 2005. I also worked as the Channel Maintenance Coordinator for the District for more than ten years, working on dredging and dredged material placement issues, ensuring State and federal environmental and regulatory compliance with these activities. I have been with the Corps since 1978, and also served as survey technician, underwater diver, boat operator, and navigation specialist, among other duties. I have a bachelor's degree in biology.

I am currently a member of the Coasts, Oceans, Ports and Rivers Institute ("COPRI") of American Society of Civil Engineers ("ASCE"), the COPRI Waterways Committee (Past Chairman), the Western Dredging Association, the International Navigation Association, Toastmasters, and I am an affiliate member of ASCE. I have authored and co-authored various manuals and articles, co-authored one book and published a technical paper. I have drafted mitigation guidance for the Rock Island District, Corps of Engineers channel maintenance activities and worked to finalize the guidance, still in use today.

2) Background and Authority

The Thomas J. O'Brien Lock and Dam/Controlling Works ("O'Brien") is operated by the Army Corps of Engineers, Rock Island District. O'Brien is part of the IWW, which is a tributary of the Upper Mississippi River ("UMR"). The IWW extends from the mouth of the Chicago River on Lake Michigan in downtown Chicago, and from the O'Brien Lock and Calumet Harbor (part of the Port of Chicago) on the Calumet River on the southeastern side of Chicago, then proceeds through the canal system (including the Chicago Sanitary and Ship Canal, or "CSSC"), the lower Des Plaines River, and the Illinois River to the Mississippi

River at Grafton, Illinois. Extending for approximately 333 miles, the IWW links Lake Michigan with the Mississippi River and connects with the Atlantic Ocean via the Great Lakes Region, St. Lawrence Seaway, and Inland Coastal Waterway. The IWW Project, authorized by the River and Harbor Act of 1927, Pub. L. No. 69-560, 44 Stat. 1010, 1013 (1927), the River and Harbor Act of 1930, Pub. L. 71-520, 46 Stat. 918, 929 (1930), and the River and Harbor Act of 1935, Pub. L. No. 74-409, 49 Stat. 1028, 1035 (1935), includes a total of nearly 360 river miles of nine-foot commercial navigation channels with nine locks and eight dams from Chicago to the mouth of the Illinois River at Grafton, Illinois. The mouth of the IWW is located at UMR mile 218, approximately 34 miles upstream of St. Louis, MO. The navigable portions of the Illinois River and the locks and dams that allow waterway traffic to move from one pool to another are integral parts of a regional, national, and international transportation network.

The nine-foot navigation project refers to the depth of navigation channel (i.e., nine feet minimum depth) to which the project is authorized and that the Corps maintains for commercial navigation through channel maintenance dredging operations, water level management, or dredging reduction methods, as appropriate. See River and Harbor Act of 1927, Pub. L. No. 69-560, 44 Stat. 1010, 1013 (1927). More than 44 million tons of cargo was transported along the IWW in 2005, according to the most recent records available (Waterborne Commerce of the United States, Institute for Water Resources, 2005). Products transported include farm products, crude materials, chemicals, petroleum products, manufactured goods and coal. The IWW was listed as "Illinois Waterway Navigation Facilities" on the National Register of Historic Places in 2004.

3) Calumet-Sag Channel

The Calumet-Sag channel ("Cal-Sag") is part of the IWW. The Cal-Sag provides the connection between the CSSC and the Little Calumet River, the Calumet River, Calumet Harbor and Lake Michigan. The Cal-Sag Channel was built in 1911-1922 by the Metropolitan Sanitary District (now the Metropolitan Water Reclamation District, or "MWRD"). This construction was performed in an effort to reverse the drainage of the Grand and Little Calumet Rivers to prevent sewage and contaminants from entering into Lake Michigan (the confluence of the Grand and Little Calumet Rivers forms the Calumet River, which flowed into Lake Michigan prior to reversal). This construction effort was supplemented by high diversion flows from Lake Michigan. In 1958-1960 the Cal-Sag was widened and deepened by the Corps of Engineers and O'Brien was built on the Calumet River, lake-ward of the mouths of the Grand and Little Calumet Rivers. O'Brien forms a physical barrier between the Grand and Little Calumet Rivers and the Lake that prevents water from those rivers from flowing into Lake Michigan under normal conditions. The Cal-Sag serves as a link between the Calumet industrial region along the Illinois-Indiana border and the rest of the IWW.

4) Description of O'Brien

O'Brien is located at 134th Street and the Calumet River, in Chicago, IL, along the IWW on the Calumet River at River Mile 326.5, about one-half mile upstream of Sunset Harbor in Cook County. It is part of the federal nine-foot navigation project on the IWW. Authorization for O'Brien is found in the River and Harbor Act of 1946, Pub. L. No. 79-525, 60 Stat. 634, 636 (1946) (referencing H.R. Doc. No. 79-677 at 51-52 (1946)). O'Brien

opened to navigation in 1960 as part of the Cal-Sag widening project, replacing the previously existing Blue Island Lock (Blue Island Lock opened in 1922 as part of the original Cal-Sag project and was located "downstream" (river-ward) of the mouths of the Grand and Little Calumet Rivers – hence the need for supplemental Lake water diversions to reverse drainage away from the Lake).

O'Brien Lock is a low-lift sector gate lock. It provides a maximum lift of five feet for traffic passing between the Calumet River and Lake Michigan, although in recent years the lift has been less than two feet. The lock is designed for normal operations with river water levels being lower than the lake water levels. There are two sets of sector gates weighing 216 tons each at both the river and lake ends of the lock chamber. Sector gates are used here rather than typical miter gates because these gates can provide functionality with head at either side of the gates. Head refers to the lift differential between water levels at each end of the lock gate – under typical circumstances miter gates are used since the head will not reverse under a normal navigation channel or river scenario (water flows downhill). However, at O'Brien reverse flow (water flowing from the river into the lake) can occur due to storm water flowing into the canal system, causing the water downstream (at the river end) of the lock chamber to be elevated higher than Lake water levels. Reverse flow is discussed further below in item 6. The lock chamber is 1,000-feet long by 110-feet wide.

The O'Brien dam is 296.75 feet long. The controlling works consist of four large vertical slide gates (ten feet square) located near the center of the dam to regulate water flow. The dam controls the movement of water between Lake Michigan and the Calumet River while maintaining navigation through water level management. The lock and dam are also used for

flood control and waterway flushing and function as components of the diversion control system.

5) O'Brien Usage

O'Brien is part of the lock system along the IWW that allows traffic to transit between the UMR and Lake Michigan. O'Brien is heavily used and due to a plan to reduce the width of the Chicago River in the City of Chicago near the Chicago Lock barge traffic has been rerouted from the Chicago Lock to O'Brien. Nearly 7 million tons of cargo was transported through O'Brien in 2008 according to Lock records. Lock records are kept by entering data into the Corps' Operation and Maintenance of Navigation Installations ("OMNI") system and made available to the public. Tonnage has averaged nearly 8 million tons per year over the last 10 years, ranging from a high of 9.5 million tons in 2006 to a low of 6.8 million tons in 2001. Products transported include coal, manufactured goods, crude materials, petroleum products, chemicals and farm products.

More than 18,000 boats per year use O'Brien for recreational purposes. Many boaters use marinas along the river and pass through O'Brien Lock to access recreational activities in Lake Michigan.

The U.S. Coast Guard (USCG) maintains station and auxiliary boats at Calumet Harbor on the lake side of O'Brien. They use O'Brien to access the IWW to provide boating assistance and respond to casualties from boating incidents.

6) Operation of O'Brien

O'Brien is owned and operated by Corps of Engineers, Rock Island District. Consistent with current authorizations (CFR 207.425) and agreements water levels below O'Brien (on the river side of the lock and further downstream) are regulated/controlled by the MWRD. MWRD is required to maintain storm water flood control, to maintain river water levels below Lake levels for health reasons and to maintain water levels consistent with the Corps' nine-foot channel authority. The initial intent of this portion of the IWW project was storm and sewer water maintenance, with navigation added after initial construction – hence the various control agencies and authorities. MWRD maintains water levels consistent with the Corps navigation project as agreed upon - water levels must remain between -2.0 CCD (Chicago City Datum) and -0.5 CCD - for navigation purposes. The Corps maintains the navigation channel dimensions through typical dredging and dredging reduction methods.

MWRD directs workers at O'Brien regarding dam operation for flood relief and to control Lake Michigan diversions, according to a Memorandum of Agreement between the Corps and MWRD dated June 1966. (See attachment). MWRD also directs closure of O'Brien Lock during reverse flow. Reverse flow refers to when river water levels are higher in elevation than Lake water levels, causing water to reverse its flow from the rivers into the Lake. Reverse flow can be caused by storm runoff in the river and tributaries; it can also be caused by Lake water levels dropping below normal levels (the Great Lakes go through a natural cycling – for example, from 1999 through 2006, lake levels have averaged about 1-foot below the long-term average. During the 1990's the trend was reversed with lake levels averaging about 1-foot above the long-term average). As of the fall of 2007, the decline in lake levels had approached the long-term minimum that occurred in 1964 – current lake

levels have risen slightly since 2007. Reverse flow is not desired under normal operating conditions because of the concern about potentially contaminated river or tributary water flowing into Lake Michigan and contaminating the Chicago area's water supply. During normal flood conditions, flood waters are controlled by allowing excess flood waters to flow exclusively through the IWW toward the Mississippi. However, during extreme flood conditions (most recently September 2008) MWRD uses O'Brien for flood control and directs the Corps to open all dam and lock gates to enable excess flood waters below the lock and dam to enter Lake Michigan. If O'Brien were to remain closed during extreme flood conditions flood waters would not drain as described and flooding in the Chicago area would increase.

The IWW, including O'Brien, is open to navigation year round. Operating in cold weather can be challenging during severe winter conditions. For example, during the cold season the lock gates at O'Brien are cycled periodically to ensure that the locks remain operable for navigation purposes and also for flood control, if needed. Cycling refers to opening and closing the lock gates to keep the hydraulic system operating efficiently and to keep ice near the gates broken up. Normally lock gates are cycled once every four hours when temperatures are between 32 and 20 degrees Fahrenheit; during temps between 0 and 20 degrees the gates are cycled every hour and below zero the gates are run nearly continuously. It is necessary to perform these cycling operations to prevent excessive ice from forming in the lock sector gates, to prevent bevel gears in the gate operating machinery from freezing up, and to prevent hydraulic oil from stiffening up and placing additional stress on the system – if there is any water in the oil, the potential for additional freezing and hydraulic lines bursting increases unless the gates are cycled. The gates themselves would

freeze in place if not used for an extended period. Damage to gate steel would then occur due to built up ice buckling, warping, and potentially cracking the gate skin plate. Repairing such damage would require dewatering the lock chamber, entailing significant costs to the Corps and delays to navigation. With current concerns about Asian Carp we have been looking at ways to reduce or eliminate gate cycling but we have not found a reliable method so far. Additional equipment (e.g., additional heaters and pressure steamers) is in the process of being purchased, and cycling times have been reduced during moderate weather (slightly below freezing).

Running equipment as old as O'Brien's is vital to keeping it functioning and performing effectively. The operating systems at O'Brien are 60 years old. Most of the electrical components are original equipment. Continuously conducting normal operations at O'Brien prevents any increase in the moisture content in equipment/circuits and relays. An increase in moisture content in the equipment/circuits and relays would cause excess corrosion and potential for failure, causing the facility to become less reliable. The Rehabilitation Evaluation Report for O'Brien Lock and Dam Major Maintenance and Major Rehabilitation ("RER") states under "Lock Electrical Distribution System" that "[a]n electrical component failure could result in lock failure, which could cause delays to navigation traffic. Spare parts for the electrical components are increasingly difficult to obtain."

7) Resources for Closing the Facility

Closing O'Brien Lock "in a manner that would not allow fish to pass these structures," as requested in the Preliminary Injunction Motion, would require placing lock dewatering bulkheads at the lower end of the lock. This is because of leaks in the sector gates, which exist primarily due to missing gate seals. The leakage is small (approximately 100 cubic feet

per second, depending on head) but the gaps around the missing seals are up to six inches wide, large enough for even an adult carp to pass through. The lock would not have to be dewatered – the bulkheads would serve to stop the leakage at the sector gates. The IWW has no dedicated Lock bulkheads for this facility that could be used to aid in closing down the lock and dam. The IWW's bulkheads have been decommissioned due to age and deterioration and replacements are on backlog of maintenance. Closing O'Brien would require the Corps to obtain bulkheads from the Upper Mississippi River Project or from the St. Louis District, Corps of Engineers. The UMR bulkheads are located at the Mississippi River Project Office in Pleasant Valley, IA. It is unlikely that the Corps will be able to access these bulkheads during winter conditions due to ice buildup along the UMR. Some bulkheads are currently available at the St. Louis District and may be available for use at O'Brien. These bulkheads normally are stored at the St. Louis District to provide emergency response capabilities at UMR (and IWW) facilities as needed.

I declare under penalty of perjury that the foregoing is true and correct, pursuant to 28 U.S.C. § 1746.

Executed on January 4, 2010

Rock Island, Illinois

Michael O. Cox

Michael Cox

COPY

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AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO
FOR OPERATION OF
THE THOMAS J. O'BRIEN LOCK & DAM
IN CONNECTION WITH
LAKE DIVERSION, FLOOD RELIEF & POLLUTION

This Memorandum of Agreement, entered into this 9th day of June 1966, by and between the United States of America (hereinafter referred to as the "Government"), represented by the District Engineer executing this Agreement, and the Metropolitan Sanitary District of Greater Chicago (hereinafter referred to as the "Sanitary District"), a corporation of the State of Illinois. WITNESSETH:

1. The Government-owned Thomas J. O'Brien Lock & Dam, on the Calumet River (Illinois Waterway) near 134th Street, Chicago, Illinois, 326.4 miles above the Mississippi River at Grafton, Illinois, will be operated by the Chicago District Corps of Engineers for the Government. In addition to operating the lock for navigation, the Government will, consistent with the requirements of navigation, also operate the lock and the sluice gates as directed by the Sanitary District in order to:

a. Assist in the control of diversion from Lake Michigan.

b. Maintain the water surface at the south (downstream) end of the lock at or below the level of Lake Michigan except in times of excessive storm runoff into the watersheds downstream of the lock. Except as so noted the water surface at the south (downstream) end of the lock normally shall be held to minus 2.0 feet, Chicago City Datum.

c. Provide emergency flood relief by permitting temporary lakeward flows through the lock and dam in order to reduce flood damage from storm water runoff into the Little and Grand Calumet Rivers.

2. The following procedure is established in order to accomplish the above:

a. The Sanitary District will:

(1) Advise the Chicago District, Corps of Engineers by letter the names of all personnel authorized to order changes in the position of the lock and sluice gates. The lock gates will be held only in the fully closed or opened position.

(2) Such requests by any authorized employees will be made direct by telephone or any other means to the Chicago District, Corps of Engineers employee in charge of the lock at the time.

(3) In every instance, maintain a record of the name of the Sanitary District employee issuing the directive; the name of the Chicago District, Corps of Engineers employee contacted; the explicit instructions given, together with the date and time issued as well as time and date the directed operation was completed.

b. The Government, through the Chicago District, Corps of Engineers Lockmaster or his representative in charge of the O'Brien Lock & Dam will:

(1) Prompty activate the lock and sluice gates as directed insofar as such action will not unreasonably interfere with navigation.

(2) Advise the Sanitary District of the date and time directed operation was completed.

(3) Maintain a record of the name of the Chicago District lock employee receiving the directive; the name of the Sanitary District employee directing the change; the explicit instructions with date and time received; the date and time the directed action was completed; the time and completed action was reported to the Sanitary District, and the person to whom this was reported.

3. The Sanitary District shall hold and save the Government free from damages due to actions taken under this agreement.

In Witness Whereof, the parties hereto have executed this Memorandum of Agreement as of the day and year first above written.

THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO

BY: JOHN B. BRANDT (Signed)
Chairman, Committee on Finance
(Title)

Approved as to Form and Legality:

GEORGE A. LANE (signed)
Attorney
The Metropolitan Sanitary District of Greater Chicago

THE UNITED STATES OF AMERICA

BY: JOHN C. MATTINA (signed)
District Engineer, Chicago District
Title

DATED: June 9, 1966

IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF MICHIGAN, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

DECLARATION OF TZUOH-YING SU

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1. My name is Tzuoh-Ying Su. I have been employed by the United States Army Corps of Engineers ("Army Corps") since 2001.

2. I am currently employed by USACE as a supervisory hydraulic engineer and lead the hydraulic engineering team conducting hydrologic and hydraulic analyses and designs.

3. I earned a doctorate in hydraulic engineering from the University of Iowa

and have been a registered professional engineer in Illinois since 1982. I have 20 years of hydraulic engineering experience.

4. I am familiar with the facts relative to the above captioned civil action, and I submit this sworn Declaration in support of the United States' Opposition to the State of Michigan's Motion for Preliminary Injunction.

Flooding Impacts of Lock Closure

5. The Chicago River Controlling Works (CRCW) and the O'Brien Lock and Dam serve as controlling points to maintain proper water levels in the Chicago Waterway System to facilitate navigation and prevent flooding. The CRCW and the O'Brien Lock and Dam are critical components in mitigating the risk of severe flood damage in the Chicago metropolitan area during significant rain events.

6. The Army Corps and the Metropolitan Reclamation Water District of Greater Chicago ("MWRDGC") entered into agreements in January 1984 to coordinate their efforts in operating the CRCW. They also entered into agreements in June 1966 to coordinate their efforts in operating the O'Brien Lock and Dam. The Army Corps Chicago District owns and operates the lock facilities at the CRCW and the Army Corps Rock Island District owns and operates the lock facilities at O'Brien. The MWRDGC owns and operates the sluice gates at CRCW. The Army Corps owns the sluice gates at the O'Brien Lock and Dam, and operates these sluice gates under the direction of MWRDGC per the 1966 agreement.

7. The MWRDGC Maintenance and Operation Department has a control center in downtown Chicago which remotely monitors the operating conditions and river stages on the waterway system.

8. When the MWRDGC receives a rainstorm forecast, they initiate a "canal drawdown," effectively lowering water levels in the system so that it can accommodate excess runoff that would otherwise flood the City of Chicago and nearby environs.

9. During significant rainstorms, the sluice gates at CRCW, O'Brien Lock and Dam and Wilmette Pumping Station are opened and water flows from the waterway to Lake Michigan by gravity. This reversal of flow is also called backflow.

10. During severe rainstorm events, MWRDGC will request that the Army Corps open the locks at CRCW and/or O'Brien Lock and Dam, in addition to opening of the sluice gates, so that excess water can be diverted into Lake Michigan.

11. The Chicago Lock has been opened in response to severe rain events on eight occasions since 1954, most recently during a major rainfall event in September 2008. Four of these events have occurred since the Deep Tunnel project began operating in 1986.

12. The O'Brien Lock has been opened in response to severe rain events on four occasions since 1965, including the September 2008 rainfall event.

13. The locks also play a role in mitigating the effects of sewer backup during severe rain events. Sewer backup can occur when the outfall of the combined sewer overflow (CSO) is subject to abnormally high water levels in the waterway. Excess sewage is ordinarily discharged into Chicago area waterways, but during major rainfall events when water levels in the waterways are already high, the excess sewage may back up and cause basement flooding with a combination of storm water and sewage. Although we cannot predict the frequency of this occurrence, we know that closure of the Chicago and

O'Brien locks will increase the water level in Chicago area waterways, and will thereby increase the likelihood of sewer backups occurring.

14. The Chicago District, in conjunction with the State of Illinois, is currently conducting an ongoing Planning Assistance to States ("PAS") study which attempts to model the potential flooding in downtown Chicago during large storm events when the Chicago Lock is not available to relieve the increased storm water. The results of this study are expected to provide further insight as to what flooding impacts we can expect if the Chicago lock is closed. However, the study is not expected to be complete until May 2010.

15. Closing the CRCW and O'Brien Lock and Dam will raise water levels during severe storm events, and would therefore increase the likelihood of flooding in downtown Chicago, the Calumet region, and neighborhoods along the North Branch of the Chicago River. The likelihood of flooding would be even greater for Chicago area structures that are at lower elevations. While we cannot predict the exact likelihood of this occurrence at this time, the aforementioned PAS study examines the flood risk impact of closing the Chicago Lock, and this analysis will be provided in the final study report. The predicted effects of closing both Chicago and O'Brien locks can be incorporated into the scope of the study, but this will require additional funding.

16. It is probable that a severe storm event would also lead to overtopping of the Chicago Lock facilities if the Chicago Lock was closed, thus potentially allowing Asian Carp to migrate to Lake Michigan via the water overtopping the facility structures. At this time we know that such overtopping is certain to occur during a 500 year storm

event. The likelihood of occurrence during 25, 50, and 100 year storm events is not currently known, but the issue is being analyzed as part of the aforementioned PAS study.

17. The foregoing analysis assumes that the sluice gates are operating normally. Normal operation of the sluice gates would potentially allow Asian carp to migrate into Lake Michigan. If the sluice gates are closed, the risk that a flood will occur and the severity of any flood under these scenarios would be more significant.

Flooding Impacts of Closing Wilmette Pumping Station Sluice Gate

18. The Wilmette Pumping Station also is another critical component for flood risk reduction in the Chicago area. The sluice gate is a primary means by which excess storm water is reversed to Lake Michigan. MWRDGC, not the Corps, owns and operates the Wilmette Pumping Station.

19. Significant property damage occurred during the September 2008 flood along the North Branch of the Chicago River. However, the damage would have been much worse if the sluice gate at Wilmette Pumping Station were not opened to release 2,942 million gallons of storm water into Lake Michigan.

Flooding Impacts of Structures in the Little Calumet River

20. The Little Calumet River flows through a flood prone watershed characterized by flat terrain and watershed urbanization. Many levees, federal and local, exist along the Little Calumet River in Illinois and Indiana.

21. The Army Corps has been building a levee system along the Little Calumet River between Gary and Hammond/Munster. The levee was designed to protect a 200-year flood event with freeboard. A physical barrier placed in the Little Calumet River would significantly decrease the effectiveness of the levee. Based on a very preliminary

analysis, a barrier placed in the Little Calumet River at the control structure near Hart Ditch, could potentially lower the level of protection of the levee to a 25-year flood event. However, significant additional information, such as the precise location and design characteristics of the proposed flow blocking structure, as well as more topographic, hydrographic, and hydraulic research and analysis would be required to determine the impact with confidence.

22. If a physical barrier is constructed in the Little Calumet River, a significant number of residential and commercial structures in the river corridor would be at increased risk of flooding.

23. The impacts of constructing interim barriers on the Little Calumet River have not been thoroughly investigated, so it is not possible to say at this time what the precise impacts will be. Additional studies will be helpful in assessing the extent and likely impacts of the increased flood risk.

I declare under penalty of perjury that the foregoing is true and correct, pursuant to 28 U.S.C. § 1746.

Executed on January 4, 2010
Chicago, Illinois

TZUOH-YING SU

IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF MICHIGAN, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

DECLARATION OF CHARLES B. SHEA

---

1. My name is Charles B. Shea. I am the Project Manager for the Chicago Sanitary and Ship Canal Dispersal Barrier System for the Chicago District of the United States Army Corps of Engineers (the "Corps"). In this capacity, I lead the project team responsible for designing, constructing, operating, and maintaining the electric dispersal barriers; completing the dispersal barriers Efficacy Study; and conducting Asian carp monitoring in the Chicago metropolitan area.

2. I have held the position of Project Manager for the Chicago Sanitary and Ship Canal Dispersal Barrier System since July 2003. Prior to that time, I was an engineer and Project Manager for URS Corporation, an engineering consulting firm.

3. I have earned a Master of Science in Civil Engineering from the Georgia Institute of Technology and a Bachelor of Science in Civil Engineering from Northwestern University. I have been a registered Professional Engineer in Illinois since 1999 and a certified Project Management Professional since 2008.

4. I am familiar with the facts relative to the above captioned civil action, and I submit this sworn Declaration in support of the United States' Opposition to the State of Michigan's Motion for Preliminary Injunction.

Fish Barrier Optimal Voltage and Operation Parameters

5. The dispersal barriers operate by creating a waterborne pulsed direct current electric field in the Chicago Sanitary and Ship Canal ("CSSC"). Fish penetrating the electric field are exposed to increasingly unpleasant electrical stimuli. Thus, the electric field is repulsive to fish and deters them from swimming through the electrified area.

6. The barrier electric field can be characterized by the equipment parameters of frequency, length (duration) and amplitude (voltage) of the direct current pulses. The

effectiveness of the barrier is influenced by these equipment parameters and by environmental parameters such as water conductivity, water temperature, water flow velocity and waterway activity.

7. During the design of Barrier II, the Corps became aware of an independent study, titled "Aquatic Nuisance Species: An Evaluation of Barriers for Preventing the Spread of Bighead and Silver carp to the Great Lakes", 2004 Final Report, by Dr. Mark A. Pegg and Dr. John H. Chick, indicating that deterrence of smaller fish may require higher voltages than the 1 Volt per inch used at the Demonstration Barrier.

8. The research done by Pegg and Chick did not accurately model the electric fields generated by the CSSC dispersal barriers, nor did it examine the full range of barrier operating parameters. As a result, it is not desirable to use the Pegg & Chick report to set the barrier operating settings.

9. Barrier IIA was designed to be capable of operating at a variety of different pulse rates and pulse durations, and at a maximum in-water voltage of up to approximately 4 Volts per inch. Effective settings are not based upon output voltage alone, but a combination of pulse duration, frequency and voltage within the constraints of the equipment.

10. Barrier IIA was designed to operate over a wide range of pulse parameters and voltages in order to provide flexibility to adjust operations if new information becomes available on the optimal parameter combinations for stopping all sizes of fish.

11. In April 2009, the Corps' Engineer Research & Development Center (ERDC) and the Corps' barrier contractor, Smith-Root, Inc., began a collaborative, ongoing research

effort to identify optimal barrier operating parameters to deter all sizes of bighead and silver carp.

12. The first phase of testing involved exposing juvenile silver carp to barrier electric fields in a tank at various combinations of the three operating parameters (pulse frequency, pulse duration, and voltage).

13. Results of the first phase of testing indicated that all of the fish tested were stunned (knocked unconscious) by an electric field of 15 pulses per second with each pulse 6.5 milliseconds long and a maximum in-water electric field strength of 2 Volts per inch.

14. Based on these research results and information indicating Asian carp were moving closer to the CSSC barrier system, Barrier IIA was set for operating parameters of 15 pulses per second with each pulse 6.5 milliseconds long and a maximum in-water electric field strength of 2 Volts per inch in August 2009.

15. A second phase of tank testing using juvenile bighead carp and varying the water conductivity in the tanks was completed in December 2009. The results are being compiled and a final report will be available in the first quarter of 2010.

16. Initial results from the second phase of tank testing indicate that the current settings at Barrier IIA may not stun the smallest fish tested. However, one hundred percent of the exposed fish exhibited avoidance responses.

17. A third phase of research will involve exposing fish to modeled barrier electric fields in flumes or swim tunnels with flowing water. During the flume tests, the fish will be free to swim away from the barrier to test avoidance of the electric fields, whereas during the tank tests fish cannot swim away and are continuously subjected to the electric

field. During the swim tunnel tests, the effects of the electric fields on impeding swimming ability will be evaluated. These tests will allow the determination of the barrier parameters necessary to deter fish, which may be lower than the parameters necessary to stun fish. The third phase of testing is scheduled to be completed in January 2010.

18. As discussed above, initial research indicates it may not be necessary to operate Barrier IIA at maximum operating parameters to effectively repel fish.

19. It is undesirable to operate the barriers at higher operating parameters than necessary because over time the higher parameters will raise operating costs, increase wear and tear on the equipment (resulting in higher maintenance costs and more frequent maintenance needs), raise the risk of sparking incidents on vessels traversing the waterway, and increase the likelihood of injury or death to people who may become immersed in the water.

20. Environmental factors may affect the maximum voltage of the Barriers. Barrier operation is affected by environmental factors such as water conductivity and water temperature. The barriers were designed to operate under typical environmental conditions. Occasionally, there are short-term extreme variations in environmental conditions, such as peaks in water temperature during the summer months or peaks in water conductivity when road salts wash into the canal during winter thaws. These events place added stress on the barrier electronics and cooling systems. While the Corps can maintain barrier operation during these events, it may not be possible to operate at high voltages, pulse rates, or pulse durations until the environmental parameters return to more typical levels.

21. The Corps is working to extend the time interval between barrier maintenance operations that require barrier shutdown. Operating the barriers at maximum capacity will likely result in increased frequency of scheduled maintenance operations or increased emergency repairs, leading to more frequent shutdowns.

22. The U.S. Coast Guard may close the waterway for boat and barge traffic passing through the barrier if they determine that barrier operations create unsafe conditions for commercial or recreational navigation.

23. Barrier IIB will be capable of operating at parameters that meet or exceed the maximum operating parameters of Barrier IIA.

Maintenance of Barrier System

24. The barriers are electrical and mechanical systems, and as such they require regularly scheduled maintenance.

25. Some periodic maintenance activities at Barrier IIA require the barrier to be shut down for maintenance personnel safety.

26. It was originally estimated that Barrier IIA would need to be shut down for maintenance approximately every six months.

27. Barrier IIA was shut down for maintenance in early December 2009 in conjunction with the application of rotenone, a powerful fish toxin, in the CSSC by the Illinois Department of Natural Resources.

28. The rotenone was used to prevent the passage of fish during the time when Barrier IIA was off line for maintenance, since the Demonstration Barrier is incapable of operating at the levels currently believed optimal for stopping all sizes of fish.

29. Based on the condition of Barrier IIA observed in December 2009 and subsequent

after action reviews by the Corps and Smith-Root, the Corps believes the length of time between maintenance shutdowns may be extended to at least nine months.

30. As discussed above, increasing the Barrier IIA operating parameters is likely to increase the frequency of barrier maintenance shutdowns.

I declare under penalty of perjury that the foregoing is true and correct, pursuant to 28 U.S.C. § 1746.

Executed on January 4, 2010

Chicago, Illinois

Charles B. Shea
CHARLES B. SHEA

IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

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STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

DECLARATION OF DAVID M. LODGE

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1. I am a biologist and have been an active researcher on invasive species, especially freshwater species, for 26 years, including considerable experience at the science-policy interface. I received a D.Phil. from the University of Oxford as a Rhodes Scholar. I am the Director of the Center for Aquatic Conservation and a Professor of Biological Sciences at the University of Notre Dame. My colleagues, collaborators, and I have many on-going research projects on various aspects of invasive species. The topics of particular relevance to the potential invasion of the Great Lakes by silver carp (*Hypophthalmichthys molitrix*) and bighead carp (*H. nobilis*) include: (a) forecasting the spread and the environmental and economic impact of many aquatic nuisance species, especially in the Great Lakes; (b) measuring and controlling the impact of invasive species; (c) developing risk assessment (screening) protocols for intentionally imported species like silver and bighead carp; and (d) combining economic and ecological risk analyses to guide allocation of resources among management options. I have co-edited two books and have authored or co-authored at least 150 published scientific papers. I am a past Chairman of the national Invasive Species Advisory Committee. I was also the chairman of a committee appointed by the Ecological Society of America to write an assessment of the science and policy of invasive species, which was published in 2006 (Lodge et al. 2006). The current state of science, economics, management, and policy on invasive species was assessed by many scientists and economists in a recently published book my colleagues and I edited (Keller et al. 2009).

2. This declaration describes the recent surveillance efforts on silver and bighead carp by a team of researchers, including Mr. Lindsay Chadderton, Dr. Andrew Mahon, and Dr.

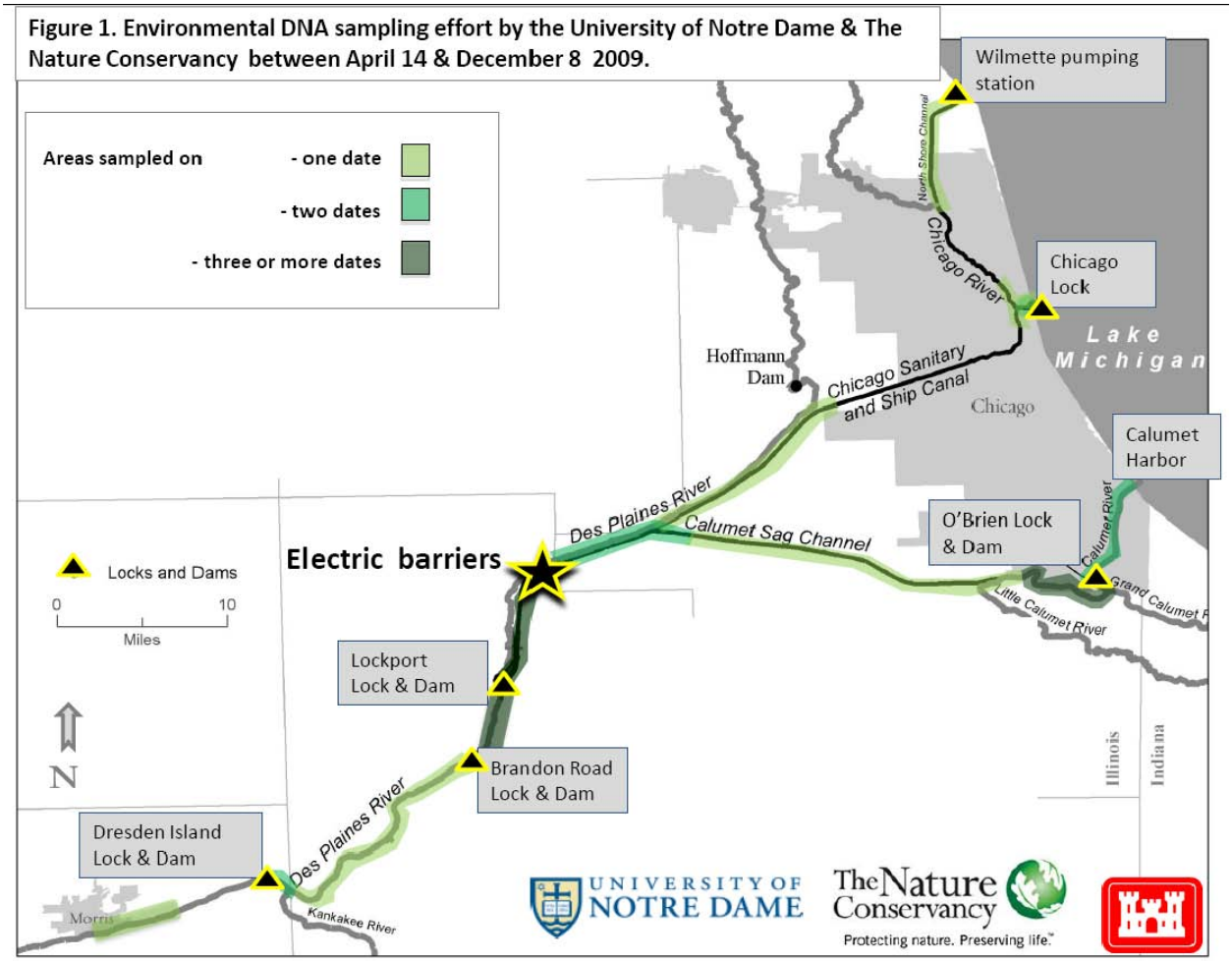
Christopher Jerde, and me. Mr. Chadderton is the Director for Aquatic Invasive Species, Great Lakes Project, The Nature Conservancy, has authored or co-authored at least 17 published scientific papers, and has over 15 years of experience in both New Zealand and the United States employing surveillance and rapid response efforts in the management of invasive species. Dr. Mahon is a Research Assistant Professor of Biological Sciences at the University of Notre Dame, has authored or co-authored at least 13 published scientific papers, and is an expert on ecological genetics. Dr. Jerde is a Research Assistant Professor of Biological Sciences at the University of Notre Dame, has authored or co-authored 14 published scientific papers, and is an expert on analyzing and interpreting ecological data, including presence-absence data of organisms.

3. This declaration represents the collective work of the individuals listed above and additional laboratory and field technicians. Each of the four team members listed above has reviewed this declaration and agrees that it is accurate to the best of our collective knowledge. Therefore the first person plural pronoun (i.e., "we") is used throughout the rest of this declaration.

4. In early 2009 we developed and tested a novel DNA-based surveillance tool for fishes, using both laboratory experiments and field observations. In early spring 2009, we first proposed to the U.S. Army Corps of Engineers that this tool could be useful in their efforts to learn the locations of the invasion fronts for silver and bighead carps in the Chicago area waterway. Beginning in summer 2009, the Army Corps of Engineers began to financially support our use of the environmental DNA (eDNA) tool as potentially the

best available technology to detect the presence of silver carp and bighead carp where they occur at low abundance. In this declaration, we describe our results from our first field samples in the waterway in April 2009 through samples taken on 8 December 2009 (our most recent sampling date).

5. By Chicago area waterway, we mean the connected set of natural and artificial waterways in the Chicago area represented in Figure 1. Hereafter for simplicity we use the term "waterway."



6. We employed the new DNA-based approach to detect the presence of silver and bighead carps because traditional tools for sampling fishes, while very useful for studying abundant species, are poor at detecting species that are not abundant (Magnuson et al. 1994, Fischer et al. 2009). By traditional tools, we mean primarily netting, electrofishing (stunning fish with an electric current emanating from a specially designed boat), and poisoning (using the toxin rotenone). (Hook-and-line angling does not apply to silver and bighead carps because they are primarily filter-feeders.) We have extensive experience with all of these traditional tools, and know that they capture only a very small proportion of individuals comprising a local population of a fish species. For example, even for small, physically confined fish populations (e.g., in small lakes) under intensive study, it usually takes extraordinary effort to catch as many as 10% of a population.

7. Where the habitat is open (e.g., the continuous riverine habitat) or deep, and where more modest sampling effort is expended relative to the area of the habitat, catches are likely to be one or more orders of magnitude lower than 10% (i.e., 1%, 0.1% capture rates or lower). Therefore where few individuals of the target species are present, none are likely to be caught (or bodies recovered in the case of poisoning). This is the situation in the waterway, where habitat is continuous over hundreds of miles (Figure 1), sampling effort by the agencies has been low relative to the volume of habitat, and, by definition, few individuals of the target species exist at the leading edge of the invasion as the two species of carps disperse northward.

8. The generally low sensitivity of traditional tools is further compounded for both silver and bighead carps: they are more difficult than most fishes to capture. Silver carp avoid stationary nets and jump over towed nets like seines. Bighead carp also avoid most stationary nets, but can be caught with seines (Kolar et al. 2007). Standard electrofishing is effective for any fish species only in shallow water (less than about 3 m deep), and many parts of the waterway are at least 8 m deep. Even in shallow water, both silver and bighead carps flee from boats more than most fishes and are thus not likely to be caught by electrofishing (Kolar et al 2007). Both species sink when killed (e.g., with poison) and their bodies are thus rarely recovered even when they are killed.

9. With respect to our involvement, the goal of the agencies managing the waterway is to learn where silver and bighead carp are, especially the location of the leading edge of the invasion by each of the two species. By definition, fish will be rare in those stretches of river that have most recently been colonized, and thus traditional tools for detecting fishes will be especially likely to fail to detect fish even when they are present.

10. Therefore, to assist the Army Corps of Engineers in detecting the invasion front of silver and bighead carps, we developed a more sensitive sampling tool. We improved and applied the eDNA procedures of Ficetola et al. (2008). By eDNA, we mean DNA shed from an organism and present in the aqueous environment, presumably in microscopic bits of tissue. We believe, for example, that eDNA from silver and bighead carp is likely to come from mucus, intestinal lining shed with feces, cells from the urinary tract shed in urine, cells sloughed from gills, or some combination thereof.

11. Ficetola et al. (2008) detected eDNA of American bullfrogs in the laboratory and in ponds in France. The probability of detecting eDNA was positively correlated with the abundance of bullfrogs as determined by other sampling methods. Where there were no bullfrogs, no eDNA was detected. Thus the detection of eDNA was an accurate indicator of the presence of bullfrogs (Ficetola et al. 2008).

12. We adapted and improved the eDNA method of Ficetola et al. (2008) so that we could detect the eDNA of silver carp and bighead carp in the waterway. Specifically, we identified and used species-specific molecular markers for silver carp and for bighead carp. These markers target sequences of DNA that occur only in silver carp or only in bighead carp and not in any other species of organism, as far as is possible to determine using the best available data and genomics tools. The species specificity of our primers has been confirmed by a recent Quality Assurance/Quality Control (QA/QC) review conducted by the U.S. Environmental Protection Agency (EPA)(see paragraphs 16-17).

13. Our general eDNA method was as follows: collect a 2 L water sample from the surface of the waterway; chill the water sample on ice and transport it to the laboratory; filter the water sample through a 0.45-1.0 micron filter; extract all the DNA (regardless of species) from the sample; conduct polymerase chain reaction (PCR) on aliquots of the extracted DNA, using primers for one of the target species (either silver carp or bighead carp) so that the DNA of the target species (if present) is replicated many times; and run the PCR product on an agarose electrophoresis gel in order to visualize the presence or absence of

DNA from the target species. At each step in the process, we applied painstaking precautions to avoid contamination with DNA from equipment or other samples. For PCR and gels, we always conduct at least eight replicate runs to increase our confidence in results. For each step, we also employed a variety of positive and negative controls to double-check for contamination, mistakes in the laboratory, or malfunctioning equipment. The recent QA/QC review had high confidence in our protocols (see paragraphs 16-17).

14. The protocols we used for each step in the eDNA analysis described above are very commonly used in ecological and/or molecular biology laboratories. The novelty of our work is the combination of protocols and the application of them to detecting rare organisms in the aquatic environment. Although our work is not yet published in a scientific journal (because we have only been doing it for about seven months), there are at least four reasons for high confidence that our detections of eDNA from silver and bighead carp are reliable.

15. First, Ficetola et al. (2008) showed that eDNA was an accurate indicator of the presence of bullfrogs. All other things being equal, the eDNA approach should work with any aquatic organism, contingent only on the rate of shedding of cellular material by the organism. In other words, there is no reason to think that what applied to detecting bullfrogs would not apply to detecting silver and bighead carp. Indeed, before we used the eDNA tool in the waterway, we tested the approach in laboratory experiments with

common carp (*Cyprinus carpio*), using more general primers, confirming that the tool was very sensitive at detecting the presence of common carp in laboratory containers.

16. Second, because of the importance to management and the novelty of our methods, all our eDNA protocols--from collection of water samples in the waterway to our laboratory practices, to the way in which we have reported results to the Army Corps of Engineers--were recently reviewed in detail by a QA/QC team that was organized by the Environmental Protection Agency and independent from the research team and the Army Corps of Engineers. The team was headed by Mr. Louis Blume, Quality Manager, EPA Great Lakes National Program Office; and consisting of Ms. Margie Vazquez, Quality Assurance Manager, EPA National Exposure Research Laboratory, Ecological Exposure Research Division; Dr. John Darling, ecological geneticist, EPA National Exposure Research Laboratory, Molecular Ecology Research Branch; and Dr. John Chandler, Senior Biochemist, Computer Sciences Corporation. The review team scrutinized all the reports that we have provided to the Army Corps of Engineers and our laboratory notebooks, inspected our laboratory at Notre Dame, observed and discussed with us all the details of our eDNA protocols, and provided us with blind samples to process during a 2-day site visit (15-16 December 2009).

17. Although the QA/QC team is still preparing their final report, they have already communicated to us and agency personnel in writing that they have concluded the following: “Our team believes that the eDNA method you are using is sufficiently reliable and robust in reporting a pattern of detection that should be considered actionable

in a management context. We have a high degree of confidence in the basic PCR method you are using for detecting Silver and Bighead carp environmental DNA" (17 December 2009 email from Louis Blume to David Lodge and cced to the rest of the eDNA team, the audit team, and seven Environmental Protection Agency and Army Corps of Engineers employees). The team was convinced that the eDNA we detect is specific to the target species (i.e., only from silver carp or bighead carp, respectively), and that our field, laboratory, and reporting protocols have appropriately minimized the risk of reporting false positives.

18. Third, where silver or bighead carp were previously known to be abundant from the use of traditional sampling methods (in the pools at the southern limits of our sampling; Figure 1), we detected eDNA from both species (details in paragraph 23).

19. Fourth, when personnel from management agencies applied traditional methods very intensively at a few locations where we found eDNA for silver or bighead carp, they saw or caught one silver carp and one bighead carp where, prior to our eDNA sampling, neither species was thought to occur. The silver carp individual was seen (but not captured) after seven boat-days of electrofishing by the US Fish & Wildlife Service on 26 August 2009 in the Chicago Sanitary and Ship Canal at the confluence with the Des Plaines River ((U.S. Geological Survey Invasive Species Data Base, http://nas.er.usgs.gov, USGS ID 263247). The dying bighead carp individual was recovered on 3 December 2009 just north of the Lockport Lock during the multi-agency rotenone application in the Lockport Pool on 2-3 December 2009. Given the low

probability of seeing or capturing rare species (for the reasons explained in paragraphs 6-9), these discoveries provide strong validation of the eDNA results for silver and bighead carp in the waterway.

20. Between 14 April 2009 and 8 December 2009, we sampled many parts of the waterway from the Marseilles Pool near Morris, Illinois (i.e., south of the Dresden Island Lock and Dam) northward to the connections by the Chicago River and the Calumet River with Lake Michigan (Figure 1). We have taken a total of 1061 water samples and fully processed (and reported results to the Army Corps of Engineers) for 725 water samples. (Some samples have not been fully analyzed because as we obtained results, we adapted our priorities for processing accordingly to make the most efficient use of time and resources; other samples have not yet been analyzed because time has not permitted.)

21. We began our sampling to the south and have generally worked our way northward because our goals were first to confirm that we could detect eDNA where the target species were known to occur, and second to identify the leading edge of the invasion to the north. While some reaches of waterway have been sampled more than three times (to confirm detections of eDNA from silver and/or bighead carp), we have not yet had time to sample some northerly reaches of the waterway even once, nor have we sampled any Indiana portions of the Grand Calumet and Little Calumet rivers (Figure 1).

22. The use of eDNA has been particularly appropriate in this situation because both carp species are dispersing from south to north, against the direction of water flow in the

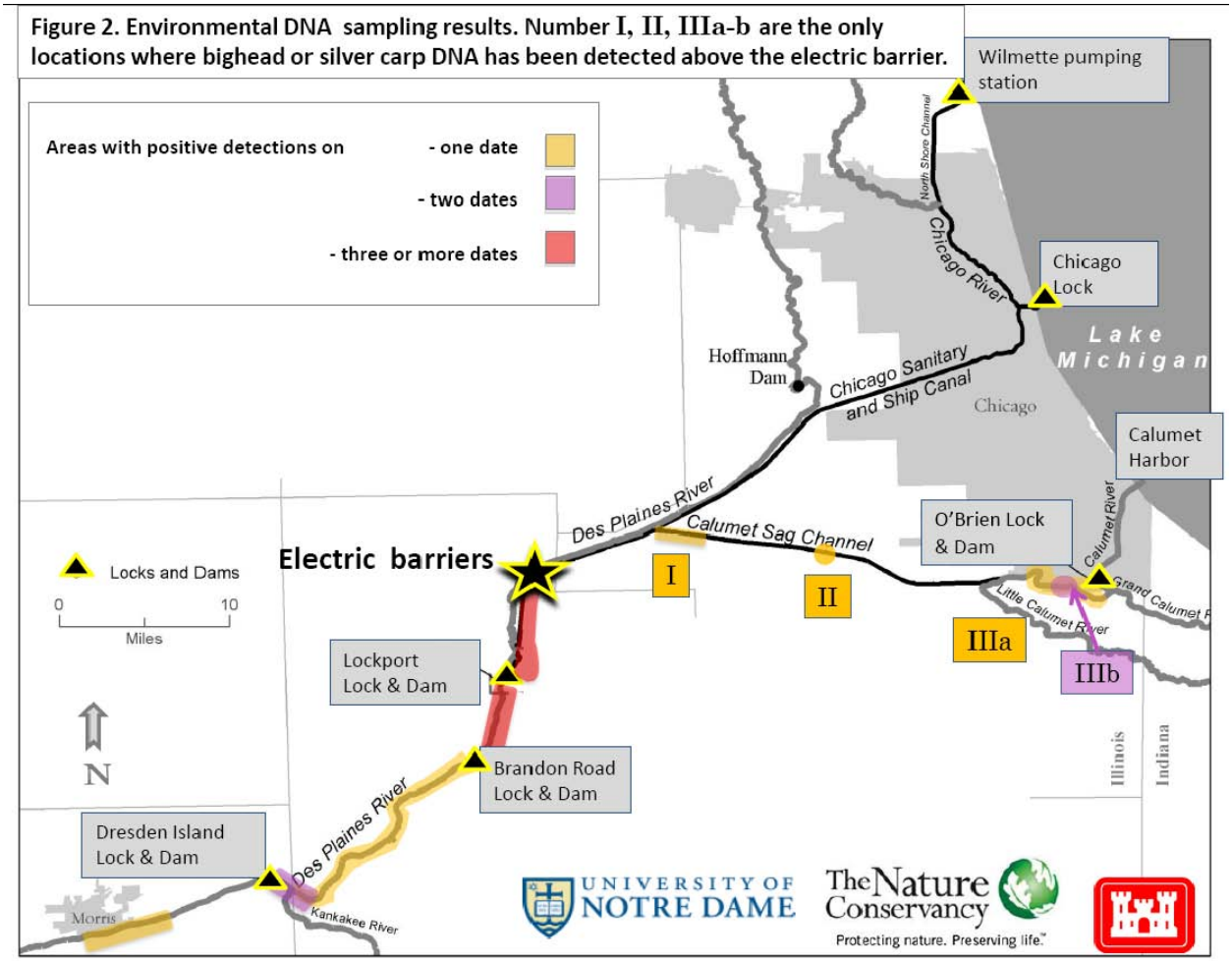
waterway. If the water flowed in the same direction as the fish were dispersing, eDNA might be present ahead of (to the north) of the invasion front. Given the flow direction, we can confidently infer that any source of eDNA we detect is at the location we detect it or upstream (northward). Thus in this situation where the target species are dispersing against the current, eDNA may estimate the location of the invasion front downstream (to the south) of its actual location.

23. We first confirmed the reliability of the eDNA tool by sampling where the species were known to occur. We detected eDNA from both silver and bighead carps in the pools of the Illinois River (Marseilles Pool) and the Des Plaines River (Dresden Island Pool, i.e., from the Dresden Island Lock and Dam northward to the Brandon Road Lock and Dam) (Figure 2), where management agencies employing traditional sampling tools had shown both species to be present in abundance.

24. However, even in these southerly pools where the target species were known to be abundant, only 47% of our samples for silver carp and 69% of our samples for bighead carp tested positive, indicating that the eDNA tool also has finite sensitivity. Therefore, to maximize our chances of detecting silver or bighead carp eDNA (if it is present), we have taken multiple samples at every sampling location, and sampled multiple locations within each reach of waterway that we have surveyed.

25. In the Brandon Road Pool of the Des Plaines River (i.e., from the Brandon Road Lock and Dam northward to the Lockport Lock and Dam), we detected both silver and bighead

carp eDNA on each of our four sampling dates (10 July, 19 August, 25 August, and 15 October 2009). No other surveillance method had detected Asian carp in this pool.



26. In the Lockport Pool (i.e., from Lockport Lock and Dam northward in the Chicago Ship and Sanitary Canal to beyond the electric barriers), we detected silver carp eDNA (on two dates) and bighead carp eDNA (on three dates) where traditional tools had not previously detected either species. All the positive results (i.e., detection of eDNA) in the Chicago Sanitary and Ship Canal were south of the electric barriers. At this point in our work, the eDNA evidence suggested that the invasion fronts for silver carp and bighead

carp were 22 miles and 15 miles, respectively, northward of where traditional tools had placed the invasion fronts.

27. The electric barriers in the Chicago Sanitary and Ship Canals were intended to prevent all fish species from moving between the Great Lakes-St. Lawrence River basin and the Mississippi River basin. The fact that we found eDNA just south of the electric barriers and not immediately north of the barriers is consistent with the expectation that the northward movement of the carp was being constrained by the electric barriers.

28. To keep the maps as clear as possible, we have not indicated sampling effort (Figure 1) or sampling results (Figure 2) in the Des Plaines River north of its confluence with the Chicago Sanitary and Ship Canal or in the I&M Canal. We detected silver carp eDNA at a single location in the Des Plaines River about four miles north of the electric barriers (which are in the Chicago Sanitary and Ship Canal). In this area, the Des Plaines River runs parallel to the Chicago Sanitary and Ship Canal on the Canal's west side <100 meters from the Canal; the two are separated by a small elevation which is breached during high floods. Likewise, in the I&M Canal, which in the same region parallels the Chicago Sanitary and Ship Canal on the east side of the Canal, we detected eDNA for silver and bighead carp at multiple locations.

29. With later sampling, we discovered eDNA for both silver and bighead carps in the Calumet Sag Channel. From samples taken near the confluence of the Calumet Sag Channel with the Chicago Sanitary and Ship Canal (Figure 2, location I), we detected

bighead carp eDNA from samples taken 1 October, but not from samples taken 24 November. We never detected silver carp eDNA from location I (Figure 2). From samples taken about midway between the confluence and the O'Brien Lock and Dam (Figure 2, location II), we detected both silver and bighead carp eDNA from samples taken 24 November (the only date this area has been sampled). From samples taken just to the south and west of the O'Brien Lock and Dam (Figure 2, location III), we detected both silver and bighead carp eDNA from samples taken on 23 September (Figure 2, location IIIa) and only bighead carp eDNA on 24 November (Figure 2, location IIIb). We detected no eDNA from either silver or bighead carps from our latest sampling date (8 December; Figure 2, location IIIa), but declining temperature is likely confounding these most recent results (see paragraphs 32).

30. In the Calumet River north of the O'Brien Lock and Dam to its confluence with Lake Michigan we did not detect eDNA from either silver or bighead carps from 28 fully processed samples taken on either 23 September or 24 November. Because over 35% of the samples from these dates have not been analyzed, processing continues. In addition, no samples taken on 8 December from this river reach have been analyzed; given the apparent effect of declining temperatures (paragraph 29), it is unlikely that results from 8 December will be meaningful.

31. We have sampled in the Chicago River in downtown Chicago on two dates (10 September, 1 December), a short reach of the Chicago River just north of downtown Chicago once (10 September), and the North Shore Channel up to Wilmette Pumping

Station once (22 October). Over 40% of the samples from those areas have not yet been analyzed, especially for silver carp. We have sampled in the Chicago Sanitary and Ship Canal north of the Calumet Sag Channel confluence once (1 October) (Figure 1). For both silver and bighead carps, about 25% of the samples from this reach have not been completely analyzed. To date, we have detected no eDNA for either silver or bighead carp in any of these reaches (Figure 2). Processing of the remaining samples continues.

32. We sampled once (22 October) in the North Shore Channel of the Chicago River up to the Wilmette Pumping Station (Figure 1). No bighead carp eDNA was detected in samples that have been processed. On 30 December 2009, the samples taken on 22 October were tested for silver carp; we presumptively detected silver carp eDNA in two samples. We regard these results as preliminary and refer to them as "presumptive positives" because we have not yet had time to complete all the QA/QC protocols that we have previously applied before officially reporting a positive eDNA detection to the Army Corps of Engineers. These QA/QC protocols, and the term presumptive positive to describe such preliminary results, were strongly endorsed by the EPA QA/QC review team (see paragraphs 16-17). Unlike all other positive results reported in this declaration, these results are being reported before we have processed all the relevant control samples that ensure these results are not due to contamination. For that reason, these results are not indicated on Figure 2. Approximately 30% of samples collected from October 22 sampling effort remain unprocessed for both bighead and silver carp.

33. General knowledge of the biology of fishes and results from locations where we have both detected eDNA and sampled repeatedly, including when water temperatures had

declined (see paragraph 29), suggest that the eDNA tool will be much less useful during winter than during warmer periods of the year. As cold-blooded organisms, fish activities (including movement, breathing, feeding, egestion, and excretion) decline as temperature declines. Thus we put less confidence in negative results from our most recent sampling trips (especially our 8 December trip) than from sampling efforts earlier in the year. We do not infer from recent negative results in the Calumet Sag Channel (see paragraph 29) that silver and bighead carp have left those locations (although that is possible). Rather we emphasize that the most plausible interpretation of recent negative results where earlier results were positive is that because of declining activity of fishes, less DNA is shed into the water. Hence we believe that we will be unable to detect silver or bighead carp eDNA during the winter.

34. Given the results reported above, we now consider more fully what a positive result means. Because of the care with which we have taken and processed samples, and the confidence expressed in our protocols by the EPA QA/QC team (paragraphs 16-17), there can be little, if any, doubt that the areas for which we have reported positive results (Figure 2) did indeed contain eDNA from the target species.

35. Although we consider other possible explanations (paragraphs 40-45) for the presence of eDNA in the water, we believe that by far the most plausible interpretation for the presence of eDNA is that at least one live individual fish of a target species is present or has been present in the recent past near the location or upstream. By recent past, we mean hours to at most two days. We base this inference on our laboratory experiments in

which we were no longer able to detect common carp eDNA after 6 to 48 hours in small laboratory tanks that previously held one common carp. We believe that under natural conditions in the waterway, the eDNA signal would degrade even more rapidly.

36. Positive results allow no reliable inferences about the absolute abundance of target species (i.e., the number of individual fish per unit area or volume of water). Our protocols detect only whether some eDNA was present, not how much eDNA was present. Furthermore, even if we knew the initial concentration of eDNA in the water sample, we still would not be able to draw any reliable inference about the absolute abundance of fish because we do not know how the abundance of eDNA relates quantitatively to the abundance of fish under even one given set of environmental conditions (e.g., temperature, current velocity).

37. Even inferences about the relative abundance of a target species (i.e., abundance compared to another location) cannot be drawn, especially if the habitats differ in ways that might affect the shedding, degradation, dispersal, or accumulation of eDNA. Thus, for example, we do not compare the percentage of positive samples between the southerly pools and the Calumet Sag Channel because large differences exist in environmental conditions. Relative to the more southerly parts of the waterway, the Calumet Sag Channel has much lower flow rates, and is narrower and shallower. Such comparisons between sites would be confounded further if different sites were sampled at different water temperatures (e.g., December vs. August samples). Thus the most informative statement we can confidently make is that a positive result indicates the presence of at

least one live fish. The results could just as well indicate the presence of tens or hundreds or more individual silver or bighead carp.

38. Confidence that eDNA indicates the presence of at least one individual live fish of a target species applies especially strongly to locations where we have detected eDNA on multiple sampling trips separated by multiple days (during which any eDNA not associated with a living fish would likely have degraded). Thus we have especially high confidence that at least one live bighead carp is present at location IIIb (Figure 2). Furthermore, detections in the Calumet Sag Channel of bighead and silver carp eDNA at multiple locations on at least one sample date suggest strongly that multiple individual fish of both species are present in the Calumet Sag Channel. Although bighead carp (and probably silver carp) can move long distances quickly (e.g., one individual moved about 9 miles in a day), more typical movement is about 1 mile per day (Kolar et al. 2007). Thus movement of a single fish is an unlikely explanation for positive results on one day at two locations separated by about 10 miles in the Calumet Sag Channel (Figure 2, locations II and III). Overall our results indicate with very high confidence that at least a few live bighead and silver carp inhabit the Calumet Sag Channel.

39. For reasons explained earlier (paragraphs 6-9), it is not at all surprising to us that not even one silver or bighead carp was caught recently in the Calumet Sag Channel with traditional sampling tools, even in the locations where we have detected eDNA.

40. Now that we have considered what inferences are justified from a positive result, we consider more fully what a negative result (lack of detection of eDNA) means. We draw inferences from negative results with considerably less confidence than from positive results because we know false negatives become more and more likely the lower the concentration of eDNA in the water. From sampling in the southerly pools, we know that even where target species are known to be present from traditional tools, we nevertheless did not detect eDNA in some samples (paragraph 24). Because low temperatures probably reduce the shedding of eDNA (paragraph 33), we are particularly cautious about negative results at low temperature. Thus, overall, negative results must be interpreted with great caution no matter what time of year. A negative result does not necessarily imply that no silver or bighead carp are present. It means only that the concentration of eDNA was lower than the detection limits of our current eDNA protocols.

41. As we stated above, we believe that the most plausible inference from a positive result is that at least one live fish is present near the sampled location, but it is important to consider possible alternative explanations for positive results even if they are of low probability. Alternative explanations for the presence of eDNA include i) sewage treatment effluent from humans that had consumed silver or bighead carp or discarded fish waste, ii) deposition of excrement by seagulls or other birds that may have consumed silver or bighead carp tissue at other locations, iii) humans discarding one or more carcasses of silver or bighead carp directly into the waterway, and iv) transport and release by barges of water containing eDNA. We consider each of these alternative explanations more fully below.

42. Sewage treatment effluent is unlikely to contain eDNA from fish that were consumed or even from fish waste that may have been put down a kitchen sink because the DNA would degrade during passage through a sewage treatment plant even more quickly than it would degrade in the environment. In addition, the spatial pattern of positive results (Figure 2) is not consistent with sewage treatment outfall(s) as a source(s).

43. Excrement from birds (or humans) is unlikely to contain detectable quantities of DNA because the DNA would degrade substantially during passage through the digestive tract.

44. It is possible that humans may occasionally discard the waste from a cleaned silver or bighead carp caught or purchased elsewhere, and that DNA could thus be detected in the water in the immediate vicinity of a carcass. Live, fresh and frozen bighead carp are commonly available for sale in Asian food markets in Chicago (and other major cities in the Great Lakes region). However, the geographic distribution of positive results and positive results in the same location on multiple dates suggest that discarded carcasses are an extremely unlikely general explanation for silver and bighead eDNA detections.

45. Transport of water used for ballast in barges could contain eDNA for silver and bighead carp if a barge took on water in carp-infested waters and discharged it as it traveled northward. We do not have any data on how much water barges typically carry or how likely this pattern of uptake and discharge might be. Hence it is possible that some of our positive results could be from barge ballast. However, we believe that it is unlikely that

enough water would be taken up and discharged in the spatial and temporal pattern required to generate the entire spatial and temporal patterns of our positive results in the Calumet Sag Channel (Figure 2).

46. Based on our understanding of the waterway and other potential pathways, we believe that no explanation other than the presence of multiple living silver and bighead carps can plausibly explain the entire spatial and temporal pattern of positive results for silver and bighead eDNA in the waterway.

47. The presence of living silver and bighead carps north of the electric barriers is most plausibly explained by failures of the electric barrier to completely restrict the northward movement of silver and bighead carps. However, it is also plausible that humans have intentionally released living silver or bighead carp individuals into parts of the waterway north of the electric barriers (Kolar et al. 2007). The confirmed presence of silver and/or bighead carps in multiple Chicago area park ponds is strong evidence that intentional human release of these carps is sufficiently common for multiple individual carp to survive in multiple ponds. It is also possible that juvenile silver and/or bighead carps have been unintentionally sold as live fish bait, most likely mixed with native fish species, some of which they resemble as juveniles. If so, some could have been released or escaped from anglers. The exact pathway by which silver and bighead carps reached the waterway north of the electric barrier should not affect the assessment of the current risk of invasion to the Great Lakes, but it should affect the consideration of appropriate risk management options.

48. Even if some of the silver and bighead carps that we have detected close to Lake Michigan (Figure 2) have escaped into Lake Michigan, or even if other individuals in the past have escaped into Lake Michigan, a self sustaining population in Lake Michigan by either or both silver and bighead carps will not necessarily result (Lockwood 2005, Drake & Lodge 2006). This is true even if the environment in Lake Michigan is suitable for one or both species to thrive, grow, and reproduce. Lots of potential invasions fail initially. For example, despite the capture of single bighead carp in Lake Erie multiple times in recent years (which are probably the result of intentional releases by humans; Kerr et al. 2005), the species has apparently not established there despite the apparently excellent environment in Lake Erie for bighead carp (and silver carp)(Kolar et al. 2007). Establishment success is positively related to propagule pressure (the number of individuals released and/or the number of introductions). Even in intentional stocking programs for animals, including multiple fish species, many introduction efforts fail, even when many individuals are released simultaneously in suitable habitat. Many factors contribute to such failure to establish, including Allee effects (e.g., failure to find a mate at low population densities) and unpredictable environmental and demographic events (Lockwood et al. 2005, Drake & Lodge 2006). Considering that invasion is not inevitable, there is a high probability that management actions now that prevent silver and bighead carp from entering Lake Michigan could prevent population establishment in Lake Michigan even if some individuals of one or both species have already entered Lake Michigan.

49. In summary, the establishment of a self sustaining population of either silver carp or bighead carp in Lake Michigan—what biologists would refer to as an invasion—is not a foregone conclusion even if multiple individuals have or will escape or are released into Lake Michigan multiple times. However, our eDNA results indicate that at least a few individuals of both silver and bighead carp have ready access to Lake Michigan via the O'Brien Lock and Dam (Figure 2). Because the probability of invasion increases the more individual carp enter Lake Michigan, the theory of invasion biology (Lockwood et al. 2005, Drake & Lodge 2006) and rich experience of managing invasions (Lodge et al. 2006, Keller et al. 2009) indicate clearly that there remains an urgent need to reduce the probability that both silver or bighead carp individuals can enter Lake Michigan.

I declare under penalty of perjury that the foregoing is true and correct, pursuant to 28 U.S.C. § 1746.

Executed on January 4, 2009

Notre Dame, Indiana

Location David M. Lodge

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IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF MICHIGAN, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

DECLARATION OF CHARLES M. WOOLEY

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1. My name is Charles M. Wooley. I am employed by the United States Fish and Wildlife Service as the Deputy Regional Director of the Midwest Region (Region 3). The Midwest Region includes the states of Minnesota, Iowa, Missouri, Michigan, Wisconsin, Illinois, and Ohio. I have been an employee of the Fish and Wildlife Service for 31 years and have served as Deputy Regional Director for the Midwest Region for 6 years. In my capacity as Deputy Regional Director for the Midwest Region, I am the line supervisor for all of the Region's biological programs, including the Region's Fisheries and Aquatic Resources Program. I report directly to the Regional Director. My responsibilities include the supervision of initiatives within the Midwest Region to manage and control aquatic invasive species.

2. The Fish and Wildlife Service, working through the Fisheries and Aquatic Resources program, provides leadership in collaborative efforts to prevent and reduce the risk of introduction, establishment, and spread of aquatic invasive species. The Fish and Wildlife Service partners with other federal, state, tribal, and local agencies to develop methods and conduct programs designed to prevent the introduction and spread of aquatic invasive species to new locations and to limit the growth of established populations.

3. In response to the increasing threat of the Asian carp expansion toward the Great Lakes and concerns with these fish placing greater pressure on barriers already in place to restrict their movement, the Fish and Wildlife Service has partnered with the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Coast Guard, the Illinois Department of Natural Resources, and the Metropolitan Water Reclamation District of Greater Chicago to create the Asian Carp Rapid Response Workgroup. The Rapid Response Workgroup convened in the fall of 2009 to develop rapid response actions to address the discovery of data indicating

that Asian carp may have been closer to Lake Michigan than previously thought. It is my understanding that the members of the Workgroup will continue to plan and develop further rapid response actions as needed.

FWS Participation in Recent Asian Carp response actions

4. During routine monitoring and surveillance for Asian carp, Fish and Wildlife Service staff observed what was believed to be a silver carp jumping from the water during surveys conducted near the confluence of the Des Plaines River and the CSSC, approximately 1 mile downstream from the Lockport Lock and Dam. The monitoring effort was part of the annual Carp Corral, conducted June 16-19, 2009.

5. In 2009, as part of its expanded Asian carp monitoring program, the U.S. Army Corps of Engineers began investigating a new technique to aid in identifying the presence of Asian Carp. The technique (environmental DNA, or "eDNA" analysis) was developed by researchers from the University of Notre Dame.

6. Results from eDNA analysis in late July 2009 provided new information that Asian carp may have moved farther upstream in the Chicago Sanitary and Ship Canal than had been previously known. These preliminary eDNA results indicated the possible presence of silver carp in the Brandon Road Pool near the Lockport Lock and Powerhouse, just 5-6 miles downstream of the Corps of Engineers' electric fish dispersal barriers (near river mile 296). In response to this new preliminary information, the Fish and Wildlife Service worked with the

Corps and other partner agencies to develop response actions to address the potential threat of Asian carp migrating toward Lake Michigan.

7. Commencing in August 2009, the Fish and Wildlife Service, the Corps of Engineers, the Illinois Department of Natural Resources, and the Illinois Natural History Survey conducted increased and focused monitoring for Asian carp, with the goal of capturing or retrieving Asian carp specimens in the locations where positive eDNA genetic findings had been recorded. Responsibility for conducting surveillance rotated monthly between the partner agencies. These surveys used electrofishing, a technique in which two electrodes are placed into the water to deliver a current to stun fish in the vicinity. Fish are affected by the electricity and experience an uncontrolled muscular convulsion known as galvanotaxis. Fish suffering galvanotaxis swim towards one of the electrodes, where they are easily netted. No Asian carp were visually detected during these electrofishing and monitoring efforts.

8. Additional eDNA testing results, released on September 16, 2009, indicated the possible presence of silver carp within the Lockport Pool, less than 1 mile from electric barrier IIA, as well as in the Des Plaines River several miles from its confluence with the Canal and about 5 miles upstream of where the electric barriers are located along the Canal. The partner agencies conducted further electrofishing and monitoring in these areas. No Asian carp were visually detected during these monitoring efforts.

Rotenone Rapid Response Action

9. In preparation for necessary maintenance on the Army Corps of Engineers' electric fish barrier IIA in the Chicago Sanitary and Ship Canal, the Rapid Response Workgroup planned an action to prevent Asian carp from migrating upstream of the location of the electric fish barriers during the time period in which barrier IIA would be offline. The Workgroup selected an action that involved the introduction of rotenone, a fish toxicant, to kill all fish, including Asian carp, in the stretch of the Canal between the Lockport Dam and the electric fish barrier array.

10. During the week of November 29, 2009, a multi-agency team of biologists and managers (300+) assembled in Romeoville, Illinois to conduct the rapid response containment operation. Rotenone was applied to the 5.7 miles of the Canal between Lockport Dam and Romeoville, Illinois (the location of the Corps' electric barrier array). FWS provided a total of 53 staff to assist in the containment operation, including representatives of the Region 3 Fisheries, Ecological Services, and Refuge programs and two staff members from Fish and Wildlife Service Northeast Region Office of Fisheries. In addition, the Fish and Wildlife Service provided 15 survey boats.

11. The application of rotenone began at 8:00 pm on December 2, 2009 and ended at approximately 1:00 am on December 3, 2009. The effects of the rotenone were contained to a 5.7 mile treated stretch of the Canal by neutralizing agents introduced at the end of the treated stretch. Upon the start of the rotenone application, boat crews were deployed to collect dead or distressed fish with nets. As fish encountered the rotenone, to escape the suffocating effect of

the poison, fish surfaced in an attempt to find air. As the distressed fish surfaced, they were easily spotted and netted.

12. The composition of species collected was dominated by common carp, gizzard shad, freshwater drum, buffalo, and ictalurids (catfish and bullheads); round goby also were collected. Additionally, "sentinel fish" (caged carp and other species) were deployed at various depths within the water column by biologists to verify efficacy of rotenone (mortality of fish) throughout the Canal's water column. All caged sentinel fish were found dead following rotenone application.

13. On December 3, a Fish and Wildlife Service survey boat collected one bighead carp, *Hypophthalmichthys nobilis* (length of 22") approximately 0.5 mile above the Lockport Lock and Dam, approximately 5 miles downstream of the electric barriers. When located, this bighead carp was swimming in circles at the surface gasping for air. Fish and Wildlife Service biologists positively identified the fish as a bighead carp at the collection site, and immediately transferred the specimen to Illinois Department of Natural Resources staff on site for custody and additional analysis. Genetic samples of the fish were taken by a Corps of Engineers biologist, and the fish was archived. Scheduled maintenance on electric fish barrier IIA was successfully completed during the operation.

14. Approximately one week after completion of the Rapid Response operation, fish carcasses were reported floating into and accumulating at the pool at the Lockport Lock and Dam, below the electric barrier. The Fish and Wildlife Service is aware of research conducted by the United States Geological Survey indicating that Asian carp killed by rotenone in

laboratory conditions will float within 24 hours of being killed. One grass carp was collected and identified (other carcasses were primarily common carp, gizzard shad, and other species). Grass carp is a species of Asian carp that is not viewed as posing the same potential threat to Lake Michigan as silver and bighead carp at this time. Most grass carp in this area are sterile and do not pose the risk of reproduction and population expansion. To date, no other Asian carp carcasses have been collected.

15. The Fish and Wildlife Service estimates the total weight fish collected as a result of the rotenone rapid response action to be approximately 55,000 lbs.

Commercial Netting Rapid Response Action

16. Soon after the rotenone rapid response action was completed, the Fish and Wildlife Service participated in an additional rapid response action on the Calumet River at the O'Brien Lock and Dam. This action was conducted based on positive eDNA findings in the immediate vicinity of the O'Brien Lock on the Calumet River (approximately 8 miles from the confluence with Lake Michigan).

17. Analysis of eDNA samples in mid-November 2009 by University of Notre Dame scientists indicated the possible presence of Asian carp near the O'Brien Lock on the Calumet River approximately 8 miles from the Confluence of the Calumet and Lake Michigan. The Workgroup met to evaluate appropriate response actions for the Calumet River, including application of rotenone and intensive monitoring. After considering its options, the Workgroup decided against conducting a rotenone action on the Calumet River for a number of reasons. The

Workgroup had information indicating that rotenone would not be as effective near the O'Brien Lock because of the colder water temperatures in the Calumet River. The effects of rotenone decrease with a decrease in water temperatures, and Workgroup concluded that the cooler water temperatures in the Calumet would result in a less effective operation than that on the Canal. Based on doubts as to the efficacy of rotenone in this location and concerns about the high cost and intensive staffing required for another rotenone action, the Rapid Response Team decided to conduct intensive monitoring and sampling near O'Brien Lock and Dam using commercial fishing gear set for multiple days by experienced commercial fishermen.

18. The Illinois Department of Natural Resources led the overall rapid response operation on the Calumet River. The Fish and Wildlife Service assisted in the efforts. From December 1-6, 2009, commercial fishermen – all with experience fishing for Asian carp in the lower Illinois and the Mississippi Rivers – deployed commercial trammel netting (2-3 layers of netting with a slack small mesh inner-netting between two layers of large mesh netting) in areas near the O'Brien Lock. In the first four days of the operation, fishing was restricted to near shore areas, adjacent to the lock wall, and the marina basin. On December 5 and 6, after the navigation safety zone was enforced and ship traffic was prohibited in the area, the Fish and Wildlife Service and Illinois Department of Natural Resources identified additional in-channel locations for fish sampling based on depth and bottom profile. The netting operation resulted in the catch of 1,026 fish representing 12 species, with common carp making up 87% of the total catch by number of individual fish. No Asian carp were captured during this netting operation.

Biological Information on Asian Carp species

19. The following paragraphs of my declaration summarize information collected and maintained by the U.S. Fish and Wildlife Service on the biology, reproduction, and life history of various Asian carp species. The following paragraphs largely summarize information presented in an internal Fish and Wildlife Service white paper entitled "The Cal-Sag and Chicago Sanitary and Ship Canal: A Perspective on the Spread and Control of Selected Aquatic Nuisance Fish Species" prepared by Fish and Wildlife Service employee Jerry L. Rasmussen. The Rasmussen paper (hereinafter "Rasmussen 2002"), attached an exhibit to this declaration, is an internal Fish and Wildlife Service document that has not been published in a scientific journal and has not been peer-reviewed. The Rasmussen paper relies on numerous sources, many of which are peer-reviewed and published articles, and includes a bibliography. Additional information was obtained from The Fisheries and Aquaculture Department of the Food and Agricultural Organization (FAO) of the United Nations, which maintains a website containing information on numerous fish species, including species of Asian carp.

Spawning Preferences of Asian Carp

20. **Silver Carp:** Silver carp reach sexual maturity at approximately 0.5 meters in length. Sexually mature females scatter between 50,000 and 200,000 eggs by females over the substrate in open water. Rasmussen 2002 at 11 (*citing* Froese and Pauly 2001). In its natural range, the silver carp migrates upstream to spawn and eggs and larvae drift downstream to floodplain zones. *Id.* (citing Froese and Pauly 2001). Spawning has been observed in Thailand from May through September. *Id.* (citing Froese and Pauly 2001). In the U.S., evidence of multiple silver

carp spawning events is found in the size classes of individuals observed in fish kills documented in Upper Mississippi River backwaters in 1999 and 2000. *Id.* at 13 (citing Surprenant 2000).

21. According to the FAO website:

> Silver carp spawn in late spring and summer, when the temperature of the water is relatively high. From April to August, either because of the rainstorms or the swollen upper reaches of streams and rivers, broodstock is concentrated in spawning locations where conditions are favorable, and the current swift, complicated, and irregular. Silver carp generally spawn between 18 ºC and 30 ºC, with an optimum of 22-28 degrees C. The eggs of silver carp, like all Chinese carps, are non-adhesive. After spawning, the eggs begin to absorb water through the egg membrane and swell until its specific gravity is slightly greater than that of water, so they can stay at the bottom (in the case of static waters) or float halfway in mid-water (in flowing waters) until the fry hatch.

See http://www.fao.org/fishery/culturedspecies/Hypophthalmichthys_molitrix/en (last visited January 3, 2010).

22. **Bighead Carp:** Spawning habits in U.S. rivers are not well documented. Rasmussen 2002 at 13. In Asia, bigheads typically spawn between April and June with a peak in late May. *Id.* at 12 (*citing* Verigin et al. 1978, Jennings 1988). Spawning typically takes place when the water temperature is between 25-30 degrees C. During rising water levels, bighead often migrate upstream to spawn, *id.* (*citing* Verigin et al. 1978), but spawning is also reported at the confluence of two rivers, behind sandbars, stonebeds, or islands. These areas are characterized

by rapid current (0.9 m/sec.) and mixing water. *Id.* (*citing* Huet 1970). Bigheads produce eggs that are semi-buoyant and require a current to float. *Id.* (*citing* Soin and Sukhanova 1972, Pflieger 1997). One day after fertilization, larval forms hatch and enter the ichthyoplankton drift. *Id.* (*citing* Etnier and Starne 1993). Seven days after hatching, bighead carp larvae migrate to shore, *id.* (*citing* Jennings 1988), and floodplains associated with rising water levels provide nursery areas for larvae and juvenile forms. Three studies, Huet (1970); Jennings (1988); and Pflieger (1997) found evidence of multiple spawning events in the Missouri River, suggesting an extended spawning period. Rasmusson 2002 at 12. Fertility increases with increasing age and body weight and is directly related to growth rate. *Id.* (*citing* Verigin et al. 1990). Vinogradov et al. (1966) found that first-time spawners average 288,000 eggs, while Sukhanova (1966) and Jennings (1988) documented egg production to range from 478,000-1,100,000, respectively.

Rasmusson at 12. Since 2002, USGS (Columbia, MO) has been conducting field studies of behavior and ecology of bighead and silver carp in the Missouri River, including spawning cues and habitat preferences.

Possible Mechanisms for Adaptation of Populations of Asian Carp in the Great Lakes

23. Bighead and silver carp all prefer a wide temperature range, indicating their ability to thrive from the northernmost waters of the Great Lakes to the waters of the middle Mississippi River Basin. Rasmusson 2002 at 16. The bighead and silver carps prefer temperatures well into the preferred range of salmon and trout. *Id.* These species prefer large river and lake habitats, with a propensity toward access to some standing or slow flowing water, both of which are abundant in the Great Lakes and Mississippi River Basin ecosystems. *Id.* at 17. Asian carp

species that become adapted to life in the Great Lakes would also likely invade the Lakes' tributary streams and rivers where they would most likely spawn. *Id.*

24. In terms of temperature tolerance and habitats, the Asian carps, except possibly the black carp (no data available), seem well suited to life in the Great Lakes. *Id.* Once populations are established in the Lakes, they would pose significant threats to the ecosystem's food web. *Id.* Because of their fast growth, large size (50-110 lbs), and appetites, these species would consume vast quantities of zooplankton, phytoplankton and vegetation. *Id.* With successful reproduction in Great Lakes tributaries, these fast growing, large fish could achieve large population numbers in just a few years. *Id.* Spawning will likely occur in many Great Lakes tributaries, with a limited period of time until critical mass is reached, population expansion occurs, and impacts become evident to fishers and the general public. The Asian carps are very prolific, multi-year spawners, which makes the survival of significant numbers of offspring highly likely. As previously demonstrated in the rivers of the Mississippi River System, invaded ecosystems can become overwhelmed with large population numbers in a relatively brief period of time. *Id.* at 19.

25. In the event Asian carp populations reach self-sustaining levels at or near the confluence of the Lake Michigan tributaries and canals in the Chicago vicinity, it is highly likely that range expansion within the lake's watershed would occur over time as a result of density-dependant dispersal. As higher concentrations of fish are realized within an established area, fish will move to new areas seeking suitable habitat and resources. Through this natural dispersal process, populations of Asian carp may become established in embayments, estuaries, lagoons, and river mouths of medium to large rivers and streams proximal to the home range of an established

population. These types of water bodies are found within Lake Michigan and throughout the entire Great Lakes basin.

26. Habitat conditions found within certain near shore waters of Lake Michigan provide suitable conditions for establishment of Asian carp populations; these conditions include increased turbidity and temperature, and the related higher levels of primary productivity (algae, plankton, etc). Open waters of Lake Michigan are more oligotrophic (less productive) and colder and are, therefore, less likely to provide suitable habitat for the establishment of Asian carp populations.

I declare in accordance with 28 U.S.C. § 1746, under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief, and is based on my personal knowledge and on information provided to me by employees of the United States Fish and Wildlife Service.

Executed on January 4, 2010
Ft. Snelling, Minnesota

Charles M. Wooley
Deputy Regional Director
Midwest Region
United States Fish and Wildlife Service

IN THE SUPREME COURT OF THE UNITED STATES

Nos. 1, 2 and 3, Original

STATE OF WISCONSIN, ET AL., PLAINTIFFS

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF MICHIGAN, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

STATE OF NEW YORK, PLAINTIFF

v.

STATE OF ILLINOIS AND METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, ET AL.

ON MOTION FOR PRELIMINARY INJUNCTION

DECLARATION

1. I am a citizen of the State of Pennsylvania and of the United States of America.
2. I hold the rank of Captain in the United States Coast Guard and currently serve as Commander, Sector Lake Michigan and Captain of the Port, Sector Lake Michigan.
3. I graduated with a degree in Management from the United States Coast Guard Academy in 1984. I have been employed by the United States Coast Guard in various duties since that date.
4. I have been the Commander, Sector Lake Michigan and Captain of the Port, Sector Lake Michigan since July 1, 2009.
5. The United States Coast Guard "administer[s] laws and promulgate[s] and enforce[s] regulations for the promotion of safety of life and property on and under the high seas and waters subject to the jurisdiction of the United States covering all matters not specifically delegated by law to some other executive department." 14 U.S.C. 2. The extent of the Coast Guard's statutory authority over a vessel depends in large part on whether the vessel is "inspected" or "uninspected." See generally 46 U.S.C. 2101 et seq., Subtit. II (vessels and seamen). "Inspected" vessels, listed in 46 U.S.C. 3301, include, for example, freight vessels, passenger vessels, seagoing motor vessels, tank vessels and certain types of barges. See also 46 U.S.C. 2101 (definitions of different vessel types). "Uninspected vessel[s]" are vessels not subject to inspection under Section 3301 that are not recreational vessels. 46 U.S.C. 2101(43).
6. "[T]o secure the safety of individuals and property on board" inspected vessels, the Secretary of the Department in which the Coast Guard is operating has comprehensive rulemaking authority over those vessels, including their design,

construction, alteration, repair, and operation. 46 U.S.C. 3306(a). The Coast Guard has exercised that authority on behalf of the Secretary by issuing comprehensive regulations. See generally 46 C.F.R. Ch. I; Homeland Security Act of 2002 § 888, 6 U.S.C 468, and Department of Homeland Security Delegation No. 0170.1.

7. The United States Coast Guard is assigned to perform 11 missions: Search and Rescue; Ports, Waterways and Coastal Security; Drug Interdiction; Aids to Navigation; Living Marine Resources; Marine Safety; Defense Readiness; Migrant Interdiction; Marine Environmental Protection; Ice Operations; and other Law Enforcement missions. See 14 U.S.C. generally.

8. As part of its search and rescue duties, the United States Coast Guard is authorized to "perform any and all acts necessary to rescue and aid persons and protect and save property" in distress on the waters over which the United States has jurisdiction. 14 U.S.C. §88(a).

9. The United States Coast Guard also performs law enforcement duties on the waters over which the United States has jurisdiction. 14 U.S.C. 89.

10. Waters subject to the jurisdiction of the United States and waters over which the United States has jurisdiction include the navigable waters of the United States. See 33 CFR §2.38.

11. Navigable waters of the United States include those internal waters of the United States not subject to tidal influence which are or have been susceptible for use in connection with interstate commerce. See 33 CFR § 2.36(3).

12. The Chicago Sanitary and Ship Canal, the Cal-Sag Channel and the Chicago River are navigable waters of the United States and as such fall under the jurisdiction of the United States Coast Guard[1].

13. 33 C.F.R. 3.45-1 establishes the area of responsibility for the Commander, Ninth Coast Guard District. The Ninth Coast Guard District comprises Michigan and portions of New York, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, and Minnesota, which portions include the U.S. portions of all of the Great Lakes. The District Office is in Cleveland, Ohio.

14. 33 C.F.R. 3.45-15 establishes the area of responsibility for my position of Commander, Sector Lake Michigan and Captain of the Port, Sector Lake Michigan. The boundaries of Sector Lake Michigan's Marine Inspection Zone and Captain of the Port Zone include Lake Michigan, the navigable waters in and around the city of Chicago, the Chicago Sanitary and Ship Canal, the Cal-Sag Channel and the Chicago, Calumet, Grand Calumet, and Little Calumet Rivers. Sector Lake Michigan's office is located in Milwaukee, WI.

15. Bighead Carp and Silver Carp ("Asian Carp") escaped into the Mississippi River basin in Arkansas in the 1970s and have been spreading throughout the basin ever since.

16. The Chicago Sanitary and Ship Canal (CSSC) forms a hydraulic connection between the Western Rivers (specifically the Illinois River) and the Great Lakes, thus providing a potential pathway for Asian Carp to enter the Great Lakes.

17. The Army Corps of Engineers (ACOE) developed and built two aquatic nuisance species electric dispersal barriers – Barrier I and Barrier IIA (the so-called "Fish

[1] 14 USC §2

Barrier"). These barriers were created to prevent the transmission of aquatic invasive species, including Asian Carp, between the two waterway systems.

18. The Fish Barrier is physically located on the CSSC in the vicinity of Romeoville, Illinois.

19. Barrier I operates at a maximum of one volt-per-inch; Barrier IIA is designed to operate at a maximum of four volts-per-inch, and is currently at two volts-per-inch.

20. Barrier IIB is currently in the design phase and is expected to be completed by Fall of 2010. This Barrier will be placed between Barrier IIA and Barrier I in the CSSC.

21. The ACOE funded a research project sponsored by the University of Notre Dame and the Nature Conservancy which uses a new technology known as environmental DNA (e-DNA). This process tests water samples for the presence of Asian Carp DNA. The full implications of the new technology may not be understood, but because of the importance of gathering all available information about the advance of Asian carp, e-DNA testing was implemented as a detection tool by the ACOE.

22. In August 2009, the ACOE discovered evidence of Asian Carp in the CSSC in the vicinity (south) of the Fish Barrier. This was derived from e-DNA sampling and the sighting of a Silver Carp by an Illinois Department of Natural Resources biologist in the vicinity of Lockport Locks along the CSSC.

23. Prior to August 2009, the ACOE operated Barrier IIA at one volt-per-inch. Immediately subsequent to the discovery of the e-DNA in the vicinity of the Fish Barrier, the ACOE increased the field strength from one volt-per-inch to two volts-per-inch.

24. In response to the voltage increase, I closed the portion of the waterway encompassing the electrified zone to all traffic until joint ACOE/USCG testing was completed and we were able to establish that the risks to vessels with conductive (metal) or non-conductive (fiberglass, wood) hulls could be mitigated with operating restrictions.

25. According to a Navy Dive Unit Study, there was a greater than 50% chance of someone dying from touching the water in the electrified zone at one volt-per-inch. Additional testing results have not been completed to determine what effect two volts-per-inch have on the human body when it falls into the water.

26. Mariners have reported sparking between barges, particularly when using wire rope to connect barges together. Further information from the testing indicated the possible ignition of certain flammable cargo from the sparks. This has led to the USCG requirement that all barges carrying flammable cargo with a flash point lower than 140 degrees Fahrenheit have a second tug known as a bow boat escort them through the electrified zone.

27. In response to the testing results, Commander, Ninth Coast Guard District established a Regulated Navigation Area encompassing the electrified zone and placed operational restrictions on transits of commercial and recreational vessels. These restrictions include size limitations, mandatory use of personal protective gear, call in points, traffic control and extra precautions for the transportation of certain flammable cargo.

28. A Regulated Navigation Area is a water area whereby each USCG District Commander may control vessel traffic which is determined to have hazardous

conditions by issuing specific operating requirements/regulations. See 33 CFR §§165.1 to .13.

29. The Coast Guard's latest Regulated Navigation Area[2] imposing controls on vessel traffic in the vicinity of the Fish Barrier was signed on 16 December 2009 and is scheduled to be published shortly in the Federal Register. This regulation is scheduled to be in effect for a year until Barrier IIB is brought on line.

30. In September 2009, the Interagency Asian Carp Rapid Response Work Group (RRWG) was formed to develop Asian Carp mitigation efforts and create a rapid response plan to deal with unexpected developments in the Asian Carp migration.

31. The U.S. EPA is coordinating the RRWG, which is led by Mr. Cameron Davis. Mr. Davis is a Senior Advisor to United States Environmental Protection Agency (EPA) Administrator Lisa P. Jackson advising on Great Lakes issues.

32. The Asian Carp Rapid Response Work Group includes the IL Department of Natural Resources, the U.S. ACOE, the U.S. EPA, the U.S. Fish and Wildlife Service, USCG, the Animal and Plant Health Inspection Service, the Chicago Department of Environment, the Metropolitan Water Reclamation District of Greater Chicago, the Great Lakes Commission, the Great Lakes Fishery Commission, the International Joint Commission, and Wisconsin Sea Grant. Fisheries management agencies from Indiana, Wisconsin, Michigan, Minnesota, Ohio, Pennsylvania, New York and Canada have provided support to the Rotenone operation.

33. In October 2009, the ACOE announced that it needed to take down Barrier IIA for maintenance or risk failure of the Barrier.

[2] Docket No. USCG-2009-1080

34. As a prophylactic measure to keep Asian Carp from migrating north of the physical location of the Fish Barrier while it was taken down for maintenance, the RRWG decided to conduct a "fish kill" and poison all fish in a 6 mile portion of the CSSC using rotenone, a fish toxicant. The "fish kill" was planned for December 2-7 2009. In conjunction with the rotenone operation, the United States Coast Guard imposed a safety and security zone closing the area to all vessel traffic except as permitted by me, to allow for the application and clean-up of the rotenone. 74 Fed. Reg. 61,283 (Nov. 24, 2009).

35. While preparing to conduct the rotenone operation, the ACOE announced, on November 20, 2009, it had discovered Asian Carp e-DNA north of the Fish Barrier along the Cal-Sag Channel.

36. In response to the discovery north of the Fish Barrier, a targeted fishing operation in the Cal-Sag Channel was planned by the Illinois Department of Natural Resources and the Fish and Wildlife Service to be conducted simultaneous to the fish kill operation in the CSSC.

37. The fish kill operation and targeted fishing operations were conducted from December 2 through December 7, 2009. One Asian Carp was found downstream of the Fish Barrier during the fish kill operation. No Asian Carp were found in the Cal-Sag Channel during the targeted fishing operation.

38. In August 2009, the ACOE postulated that a possible explanation of how e-DNA was found in the Cal-Sag Channel was that e-DNA, eggs, gametes or juvenile fish were transported across the barrier in ballast/void/bilge water of tugs, barges or other vessels transiting through the CSSC and then up the Cal-Sag Channel.

39. Ballasting Operations are defined as taking on water onboard a vessel to control or maintain, trim, draught, stability, or stresses of the vessel, regardless of how it is carried. See 33 CFR § 151.1504.

40. In order to have enough air clearance, some tow and barge operators temporarily take on ballast water to navigate under bridges along the CSSC. This could result in vessels ballasting while south of the barrier, clearing the bridge, then potentially de-ballasting north of the barrier.

41. One such bridge, the Burlington Northern Santa Fe Railroad Bridge, is approximately four miles north of the Fish Barrier.

42. Other possible means by which e-DNA or eggs could enter the voids of a towboat or barge is through cracked welds or damaged hull plating. This water then settles and becomes bilge water. Once sufficient water seeps into the bilges it is then normally pumped over the side into the inland rivers. Since the majority of the towboats and barges are currently uninspected, their material condition could permit the accidental introduction of water that could be transported and discharged above the barriers.

43. Nature Conservancy's Biologist, Lindsay Chatterton who is under contract to ACOE has stated that the transfer of Asian Carp e-DNA or eggs through ballast or bilge water is possible, but not probable.

44. At USCG request, the local towing industry voluntarily ceased the practice of ballasting south of the barrier in September 2009.

45. Until the actual risk from this potential vector can be properly analyzed, the Ninth Coast Guard District published a Temporary Interim Rule (TIR) establishing a safety zone (see 33 CFR 165.2) which prohibits the discharge of non-potable water

including ballast and bilge water, obtained from one side of the barrier, into the CSSC on the other side of the barrier, without my approval. Any vessel desiring or needing to discharge must contact me and present a plan to discharge the water in a biologically sound manner.

46. The USCG is assisting in the establishment of a Working Group consisting of scientists, towboat operators, mariners and representatives from each of the RRWG members to determine whether or not ballast/bilge/void water is a viable vector for transporting the Asian Carp eggs, gametes or fish across the Fish Barrier.

Closure of the Chicago and O'Brien Locks

47. It is difficult to project the impact that the closure of the Chicago and O'Brien locks would have on Coast Guard operations.

48. I have attempted to project potential impacts from these lock closures based upon data from the Coast Guard's Marine Information for Safety and Law Enforcement (MISLE) database documenting past operations. While these projections indicate that the proposed closure would significantly change maritime traffic in the Chicago waterways, it is difficult to anticipate how these new maritime traffic patterns will impact future Coast Guard operations.

49. The following discussion of potential impacts was prepared to meet a very urgent deadline and is based upon the best information available to me at this time. The following discussion is subject to revision as new information becomes available. I anticipate immediate impacts with regard to two of our 11 mission sets: Search and Rescue and Ports, Waterways and Coastal Security. However, I do not have

sufficient data to extrapolate how it will further impact the rest of the Coast Guard's missions.

50. United States Coast Guard Station Calumet Harbor (Station Calumet Harbor) is the Coast Guard unit that provides resources to execute Coast Guard missions in the vicinity of the Chicago and O'Brien locks. These missions primarily include Search and Rescue, Law Enforcement and Ports, Waterways and Coastal Security missions. Station Calumet Harbor's area of responsibility includes the waters of Lake Michigan and the inland rivers. This includes both sides of the Chicago and O'Brien locks.

51. Station (small) Chicago (Station Chicago) is a seasonal sub-station with Station Calumet Harbor as its designated parent station. It is open from Memorial Day through Labor Day and uses two small boats and support personnel from Station Calumet Harbor. Station Chicago's area of responsibility (AOR), the waters immediately in the vicinity of the city of Chicago, is a subset of Station Calumet Harbor's AOR. Station Chicago when open is located at the Chicago Maritime Safety Station (CMSS) (Old Coast Guard Station Chicago) adjacent to the Chicago lock operation.

52. Both Station Chicago and Station Calumet Harbor are located on the Lake Michigan side of the Chicago or O'Brien locks. Boats located at these stations have to lock through one of the locks to respond to any Search and Rescue or Law Enforcement cases on the inland rivers.

53. Station Calumet Harbor, including Station Chicago, runs over 125 search and rescue (SAR) cases and 600 law enforcement boardings each year. The Coast Guard, along with interagency partners, jointly supports 10 Presidential Security Zones, and over

75 marine events in the Chicago Area, including 4-6 major events such as the Chicago Air and Water Show. All of these events require waterborne security assets which currently use the locks to transit to various locations in and around the City of Chicago. At peak times and in anticipation of large spectator events, boats are sometimes locked through and stationed on the inland side in anticipation of caseloads.

54. The Commandant of the Coast Guard has established a Search and Rescue response standard of two hours.[3] This time is calculated from time of notification of the Coast Guard until the time of arrival on scene of a Search Response Unit. While this is a Search and Rescue resource planning standard, it is recognized that this response standard may not be met in all areas of responsibilities or other circumstances such as weather, traffic or equipment casualties.

55. In FY08-09, of the 125 Search and Rescue cases Station Calumet Harbor responded to, 54 reports of distress were on the Illinois Waterway, which is the inland side of Chicago and O'Brien Locks.[4]

56. The remaining 71 cases were located on the Lake Michigan side of the locks and on Lake Michigan proper.

57. I believe Coast Guard operations and mission performance would have dictated different responses by the Coast Guard had the locks been closed. In many instances, a Coast Guard vessel would have to be hauled out of the water, trailered, taken to a new location, and put back in the water in order to respond to an emergent situation. This would have increased response times well outside the Commandant's standard.

[3] Commandant Instruction 16130.2E.
[4] Data collected from CG MISLE Database

It is hard to quantify how much it would have delayed responses because of many variables, including proximity to boat ramps, distances needed to travel, road and boat traffic, weather, time of year, etc.

58. While there are no set response times for Law Enforcement operations, expediency is often a significant safety factor and lock closure will affect unit abilities to respond to Law Enforcement cases. Similar variables exist as above when calculating new response times and there is an added security concern of now having to transport weapons through the urban environment. This Law Enforcement mission includes assistance to other federal, state and local agencies in the area.

59. An additional mission the USCG executes in the waters of the Chicago area is the Ports, Waterways and Coastal Security Mission. Under the Ports and Waterways Safety Act, 33 U.S.C. § 1221 et seq. (PWSA), the Coast Guard is tasked with "preventing damage to structures in, on or immediately adjacent to the navigable waters of the United States."[5]

60. There are six permanent critical infrastructure assets which have been identified in the river system. The identification of these six structures is considered classified information by order of USCG Operation Neptune Shield.

61. To safeguard waterfront facilities pursuant to the PWSA, USCG policy, as established by the Coast Guard Operation Neptune Shield, provides for a regular patrol to be conducted by mounted automatic weapon (MAW) capable vessels and crews in the vicinity of the critical maritime infrastructure.

62. These vessels and crew normally deploy from Station Calumet Harbor and transit through the Chicago and O'Brien locks to enter the river system. If the locks are

[5] 33 USC §1221(c)(2).

closed, the Coast Guard would be forced to deploy these assets from a trailer. Deployment from a trailer would create potential security and political issues of transporting automatic weapons through the city streets and urban highways. Additionally, having to trailer a vessel and take it to the other side of the locks reduces the assets available to respond to cases on Lake Michigan.

63. I am currently unable to determine the impact of the lock closures on the other missions the Coast Guard routinely carries out in these waters including Marine Environmental Protection. Response times and even the ability of specialized vessels (such as oil retrieval or boom deployment craft) to arrive on scene will be seriously impacted as many of these vessels are not designed to be trailered and transported over land. The majority of the heavy industry, coal operations, and refineries in the Chicago area operate on the inland side of the locks.

Operation of the Fish Barrier at maximum operating power.

64. As discussed above, Barrier I is operating at its design maximum of one volt-per-inch and Barrier IIA is currently operating at two volts-per-inch.

65. The Coast Guard has serious marine safety concerns regarding Michigan's proposal to increase the voltage of the Barrier IIA to its design maximum of four volts-per-inch.

66. Previous testing of various vessels (commercial and recreational) transiting the water over the two barriers each barrier is operated at 1 volt-per-inch and 2 volts-per-inch respectively has revealed an unacceptable risk of death or serious bodily injury to individuals who may come into contact with that electrically charged water. This includes serious risk of cardiac arrest or respiratory restrictions. These risks

necessitated a safety zone restricting and closing the waterway to small recreational craft, and a regulated navigation area imposing certain operational restrictions on commercial vessels transiting the waterway. See 33 C.F.R. § 165.923, 70 Fed. Reg. 76,692 (Dec 28, 2005) and a series of temporary final rules published in the Federal Register to November 13, 2009 (74 Fed. Reg. 58,545).

67. If barrier IIA were operated at its designed capacity of four volts-per-inch, assuming that were possible (which is not necessarily true given other operational constraints on the system), I believe based on the testing on operating the two barriers at 1 volt-per-inch and 2 volts-per-inch respectively, that the increased risk to safety would likely necessitate further operational restrictions on the number, configuration and type of vessels that could be allowed to access those waters to minimize the potential increased risk to life or serious bodily injury.

68. If the Court should order the Fish Barrier IIA voltage raised, I have several concerns about the potential public safety impact. They include but are not limited to the increased electrical field size due to the amount of power needed to increase the volts-per-inch across the water column, the safety of coal loading operations near the barrier, the greater potential for producing arcing between vessels transiting through the heightened intensity of the field.

69. Therefore, I strongly believe that testing should be performed prior to increasing the voltage of Barrier IIA to its maximum capacity to ascertain the impacts on vessels and persons thereon transiting the affected waters.

70. The ACOE has conducted this operational and safety testing in the past and would be responsible for testing the barrier and its impact on vessels at the increased voltage.

The Coast Guard relies on the results of those test(s) to impose any necessary restrictions on vessel transits.

71. Promoting the safety of life and property on the water remains the Coast Guard's primary mission[6]. If the voltage of Barrier IIA were ordered increased to its maximum capacity, until testing is completed and test results could be analyzed and applied to the various vessels, configurations and personnel, I would expect to close down the waterway to all traffic until it could be determined that it is safe for recreational and interstate commerce to transit through the significantly increased electrical field generated by the fish barrier IIA operating at four volts-per-inch.

I declare under the penalty of perjury under the laws of the United States that the foregoing is true and correct.

Dated: 4 JAN 2010

Luann Barndt
Captain, U. S. Coast Guard
Commander, USCG Sector Lake Michigan

[6] 14 USC §2

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DECLARATION OF CAMERON DAVIS

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1. My name is Cameron Davis. I am Senior Advisor to United States Environmental Protection Agency (EPA) Administrator Lisa P. Jackson advising on Great Lakes issues. I have the following primary areas of responsibility. I assist the Administrator in the exercise of her responsibilities as Chair of the Great Lakes Inter-agency Task Force (Task Force) pursuant to Executive Order 13340 (May 18, 2004). I coordinate with other federal agencies in the implementation of the Great Lakes Restoration Initiative, a $475 million program to rehabilitate the ecosystem. I am also responsible for education and outreach to Congress about the Great Lakes Restoration Initiative.

2. I have held the position of Senior Advisor to the Administrator since July 13, 2009. Prior to my appointment, between 1998 and July 2009, I served as President and Chief Executive Officer (CEO) of the Alliance for the Great Lakes, and Executive Director of its predecessor organization, the Lake Michigan Federation. As President and CEO, I oversaw efforts by nearly 20 personnel to conserve and restore the Great Lakes, in partnership with other organizations and communities.

3. I am a graduate of Boston University with a major in International Relations. I received my juris doctor from the Illinois Institute of Technology Chicago-Kent College of Law, with a certification in energy and environmental law.

4. I am familiar with the facts relative to the above captioned civil action and I submit this sworn Declaration in support of the United States' Opposition to the State of Michigan's Motion for Preliminary Injunction.

5. **EPA's Role and Great Lakes Interagency Task Force.** EPA has a significant role in protecting and restoring the water quality and habitat of the Great Lakes. This is

accomplished primarily through the implementation of base statutory programs under the Clean Water Act, Clean Air Act, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Resource Conservation and Recovery Act (RCRA). In addition, under section 118 of the Clean Water Act, EPA, acting through its Great Lakes National Program Office, is charged with taking the lead in working with other federal agencies, states, and local authorities to meet the goals of the U.S.-Canada Great Lakes Water Quality Agreement (Agreement). The overall purpose of the Agreement is to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes. In its leadership role, EPA works with other governmental authorities and non-governmental organizations to develop and implement formal Great Lakes restoration and protection plans at the Great Lakes basin-wide, lake-wide, and local levels. Most recently, Executive Order 13340 created the Great Lakes Interagency Task Force (Task Force), whose purpose, among other things, is to "coordinate the development of consistent Federal policies, strategies, projects, and priorities for addressing the restoration and protection of the Great Lakes system and assisting in the appropriate management of the Great Lakes system." The Task Force is composed of eleven federal agencies and departments and is chaired by the Administrator of EPA. In this regard, EPA's role is one of ensuring effective communication and coordination, rather than that of final decisionmaker. In carrying out programs, each federal entity acts pursuant to its own statutory authority. The Executive Order does not change the responsibilities of federal agencies and departments of the Task Force, and does not vest EPA with control over other federal entities.

6. **Asian Carp Response.** EPA believes that, should viable populations of Asian carp become established in the Great Lakes, they would present a significant threat to the

ecology of the ecosystem. EPA has been involved in efforts to prevent Asian Carp from entering the Great Lakes in a number of ways. These efforts included supporting the U.S. Army Corps of Engineers' (the Corps) efforts to design and construct electric "dispersal" barriers to keep invasive species from moving between the Great Lakes and the Mississippi River basins, assessing effectiveness of prevention efforts, and enhancing public education and outreach on the threat of Asian carp.

7. In view of the threat posed by the Asian carp to the Great Lakes, EPA in the fall of 2009, under the auspices of the Task Force convened a multi-agency group known as the Asian Carp Executive Committee (Committee). The Committee's members included, among others, the Corps, the U.S. Fish and Wildlife Service, the U.S. Coast Guard, and the Illinois Department of Natural Resources (Illinois DNR). The purpose of the Committee is to promote the coordination of the activities of federal and interested non-federal agencies who are involved in preventing Asian carp from entering Lake Michigan by way of the Chicago Area Waterway System (CAWS), including the Chicago Sanitary and Ship Canal (Canal). In my role of assisting the Administrator in the discharge of her Task Force chairmanship responsibilities, I am serving to head the Committee. The Committee is an *ad hoc* group, the purpose of which is to facilitate integration of the efforts of the responding agencies. The Committee does not supplant the lines of authority within each federal entity, nor does is it possess delegated authority to make decisions on behalf of participating agencies and departments. My role is to convene the group and facilitate discussion; I exercise no authority over the members of the Committee, nor make any decisions on behalf of the Committee members.

8. **Rapid Response Plan.** EPA participated in efforts to assist the state of Illinois to update a 2004 Asian Carp Rapid Response Plan (Plan) along with our federal and non-federal partners. The 2004 Plan assessed measures that could be implemented to control or eradicate Asian carp prior to their entering the Great Lakes. In July 2009, the Illinois DNR requested EPA's involvement in updating the 2004 Plan to include any additional control and/or eradication efforts, and create an operational response plan that outlined how these efforts could be implemented in discrete segments of the potentially impacted watershed.

9. In November 2009, the Corps received updated environmental DNA (eDNA) evidence that indicated the possible presence of Asian carp downstream, away from Lake Michigan, of the O'Brien Lock and Dam but upstream of the Corps' electric barriers that were designed, built and are being operated by the Corps. The Corps is responsible for the construction, operation and maintenance of three electric barriers, two of which have been built, under separate statutory authority. Based on information from the Corps that one of its electric barriers known as "IIA" would need to be taken down for maintenance, the Rapid Response Working Group (RRWG) (a technical group consisting of multi-agency staff members and others) recommended a "Rapid Response" action to apply the fish biocide rotenone to reduce the risk of Asian carp migration into CAWS. This "Rapid Response" action would take place while barrier IIA was down for maintenance and in accordance with the updated Plan. Based on this recommendation, the Committee sought to ensure that the Rapid Response would take place in early December 2009. EPA also facilitated Committee communications about what response actions, if any, should occur in the body of water between the electric barriers and the O'Brien Lock and Dam.

10. As part of eDNA information released by the Corps, the Corps discussed the possible response of closure of locks and other structures serving essentially as gates between CAWS and Lake Michigan.

11. Corps representatives articulated that the Corps had, and continues to have authority to temporarily close structures for which they are responsible, but before temporary closure of the O'Brien Lock and Dam could take place within its authorities, the Corps would have to evaluate and take into account a number of additional factors, including flooding and water quality impacts.

12. **Attempts to find Asian carp**. In December 2009, participating agencies attempted to verify eDNA results through the Rapid Response rotenone action and other methods, such as electro-fishing, application of rotenone and extensive deployment of expert commercial anglers to use nets. Rotenone application produced only one known Asian carp downstream of the Corps' electric barriers, and other methods yielded no Asian carp upstream of the electric barrier toward Lake Michigan.

13. EPA agreed with the Corps' preliminary consideration to not close the locks on a temporary basis. EPA's input into the Corps' decision was based primarily upon the apparent inconsistency between eDNA evidence collected upstream of the electric barrier and the results of other methods (see Paragraph 12), and in recognition of the Corps' obligation to consider a multitude of factors in deciding whether to close the locks.

14. **Planning for Further Action.** EPA is committed to taking actions necessary to prevent Asian carp from entering the Great Lakes. EPA has dedicated more than $13,000,000 in funds from the Great Lakes Restoration Initiative to assist the Corps with short-term measures for preventing further carp migration between both the Des Plaines River and the

Canal, and the I & M Canal and the Canal. EPA is also dedicating Great Lakes Restoration Initiative funds to the Corps for validation of eDNA data.

15. The Committee and RRWG, including EPA personnel, are currently evaluating a number of additional activities to address further possible movement of Asian carp upstream of the electric barriers to preclude the migration of Asian carp into the Great Lakes. The activities being considered include: 1) enhanced detection through additional eDNA sampling beyond the electric barriers; 2) commercial fishing, seining and netting; electro-fishing, targeted fish sampling in high-risk habitat areas; 3) sampling of barges and other vessels for potential Asian carp; 4) possible implementation of secondary fish barriers to deter Asian Carp downstream of the electric barriers such as bubble or acoustic technologies; 5) supporting extensive public outreach and education programs on the threat posed by Asian carp; 6) funding the United States Geological Survey through use of Great Lakes Initiative funding to research and develop potential Asian Carp specific biological control agents; 7) advance planning for additional rotenone eradication efforts as necessary to prevent migration; 8) conducting tagged fish research to validate the effectiveness of all primary and secondary barriers; 9) supporting the expedited construction by the Corps of an additional electric barrier known as "IIB"; 10) providing for competitive funding opportunities through the Great Lakes Restoration Initiative to support additional technology development related to control or eradication measures; 11) assessing further restrictions or law enforcement options to preclude the importation of Aquatic Invasive Species; and 12) support for long-term, sustainable solutions for preventing the migration of invasive species between the Great Lakes and Mississippi River watersheds.

16. EPA assisted in the planning and execution of the December 2009 Rapid Response action. That effort demonstrated the ability of participating agencies to take a

multitude of actions swiftly and effectively to the waters in several CAWS areas. EPA, as a part of the RRWG, is working to assist in the development additional prevention and detection methods as noted above. Working within the RRWG, EPA will evaluate any evidence as it becomes available, and reassess strategy as appropriate. Together with the Corps, and other entities, EPA will consider all actions in accordance with its stated priority of preventing Asian carp from reaching the Great Lakes, including closure of any locks or construction of permanent structures as appropriate.

I declare in accordance with 28 U.S.C. § 1746, under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief, and is based on my personal knowledge and on information provided to me by employees of the United States Environmental Protection Agency.

Executed on January 4, 2010
Chicago, Illinois

Cameron Davis
Senior Advisor to the Administrator
United States Environmental Protection Agency